RIVERTON CITY, UTAH
RESOLUTION NO. 15-19

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, The County of Salt Lake (the "County") 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, 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 County 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 County;

NOW THEREFORE, BE IT RESOLVED by the City Council of Riverton City, Utah as follows:

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 County's hazard mitigation plan pursuant to the Disaster Mitigation Act.

Section2. 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.

Section 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 County's responsibilities under the Disaster Mitigation Act.

Section 4. This resolution shall take effect immediately.

PASSED AND ADOPTED by the City Council of Riverton, Utah, on this 17th day of February 2015 by the following vote:

	YES	NO	ABSTAIN	ABSENT
City Council Member Brent Johnson	___	___	___	X
City Council Member Trent Staggs	X	___	___	___
City Council Member Sheldon Stewart	X	___	___	___
City Council Member Tricia Tingey	X	___	___	___
City Council Member Paul Wayman	X	___	___	___

[SEAL]

RIVERTON CITY

ATTEST:

Bill Applegarth, Mayor

Virginia Loader, MMC
Recorder

CERTIFICATE OF PASSAGE

I, Virginia Loader, the duly acting and appointed Recorder for Riverton City hereby certify that the foregoing Resolution No. 15-19 was adopted by the Riverton City Council on the 17th day of February 2015.

Dated this 17th day of February, 2015

[SEAL]

Virginia Loader, MMC
Riverton City Recorder

Item No. 4.4

Issue Paper

Presenter/Submitted By:	Sheril Garn, Parks & Public Services Director

Subject: Resolution adopting the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan	**Meeting Date:** February 17, 2015
	Fiscal Impact: N/A
	Funding Source: N/A

Background:

FEMA Region 8 has accepted our Hazard Mitigation Plan pending adoption by all of the jurisdictions. Please review your plan's process for adoption and submit your plan's resolution to your Jurisdiction for adoption at your earliest possible time. We want to receive all of the resolutions by March 6th so that we can submit all of them to FEMA. Once that is completed the Federal Disaster Insurance will be in effect and we will receive the letter from FEMA stating that the insurance is in effect for five years.

Here is the statement from Margaret Doherty, Region 8.
"FEMA Region VIII has completed its review of the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan and has determined that it meets the requirements established by Title 44 CFR Part 201.6, pending its adoption. We will deliver an approval letter upon receipt of an adoption resolution from Salt Lake County and the Cities of Alta, Bluffdale, Cottonwood Heights, Draper, Herriman City, Holladay, Midvale, Murray City, Riverton City, Salt Lake City, Sandy, South Jordan, South Salt Lake, Taylorsville, West Jordan, and West Valley City.

Recommendation:

Adopt Resolution No. 15-19 – Adopting the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan

Recommended Motion:

"I move to adopt Resolution No. 15-19 – Adopting the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan."

Hazard Mitigation Plan (2014)

Table of Contents

ANNEX I: RIVERTON CITY
1 Introduction

1.1 Purpose

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, and (4) and 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 Riverton City and surrounding municipalities. This Plan is intended to enhance the 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 to each jurisdiction.

Riverton City and 16 other jurisdictions prepared this local hazard mitigation plan to guide hazard mitigation planning to better protect the people and property of the City from the effects of hazard events. This plan demonstrates the community'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 Riverton City and participating jurisdictions eligible 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), which could lower flood insurance premiums in CRS communities.

1.2 Scope

The plan utilizes Riverton City and applicable private hazard mitigation, emergency operations plans, census data and available GIS and assessor's data as resources for the planning team. Riverton City Emergency Management staff, planning team members, county, city, and applicable emergency managers/planners, subject matter experts, recruits from other jurisdictions such as other local government units, private sector, non-governmental, academia, airports, military, and the public were also consulted during this planning activity.

The Riverton City Pre-Disaster Mitigation Plan was based completed based on information from the Salt Lake County Natural Hazards Pre-Disaster Mitigation (PDM) Plan that was developed in accordance with the requirements of the FEMA Section 322 regulations, 44 CFR Part 201, the Utah Division of Emergency Management (UDEM) and local planning agencies. Regulations set forth by FEMA were followed during the development of this Plan. Future monitoring, evaluating, updating and implementation will occur annually or following any natural disaster. A major revision will occur every five years. Annual or any interim Plan review, updates and revisions will be the responsibility of each adopting jurisdiction.

Often, hazard mitigation is a neglected aspect within emergency management. When local governments place a low priority on mitigation implementation activities relative to the perceived threat, some important mitigation measures may be neglected in favor of higher priority activities. Mitigation success can be achieved, however, if accurate information is portrayed through complete hazard identification and impact studies, followed by effective mitigation management. Hazard mitigation is the key to greatly reducing long-term risk to people and property from natural hazards and their effects.

1.3 Authority

Local

Local governments play an essential role in implementing effective mitigation. For the purposes of this Plan, local governments include not only Riverton City and other local city and county government, but also special service districts with elected boards. Each local government 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. Local governments must be 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. All jurisdictions in Salt Lake County participated in providing

1.4 Goals and Objectives

The following are the plan goals and objectives of the Mitigation plan. 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.

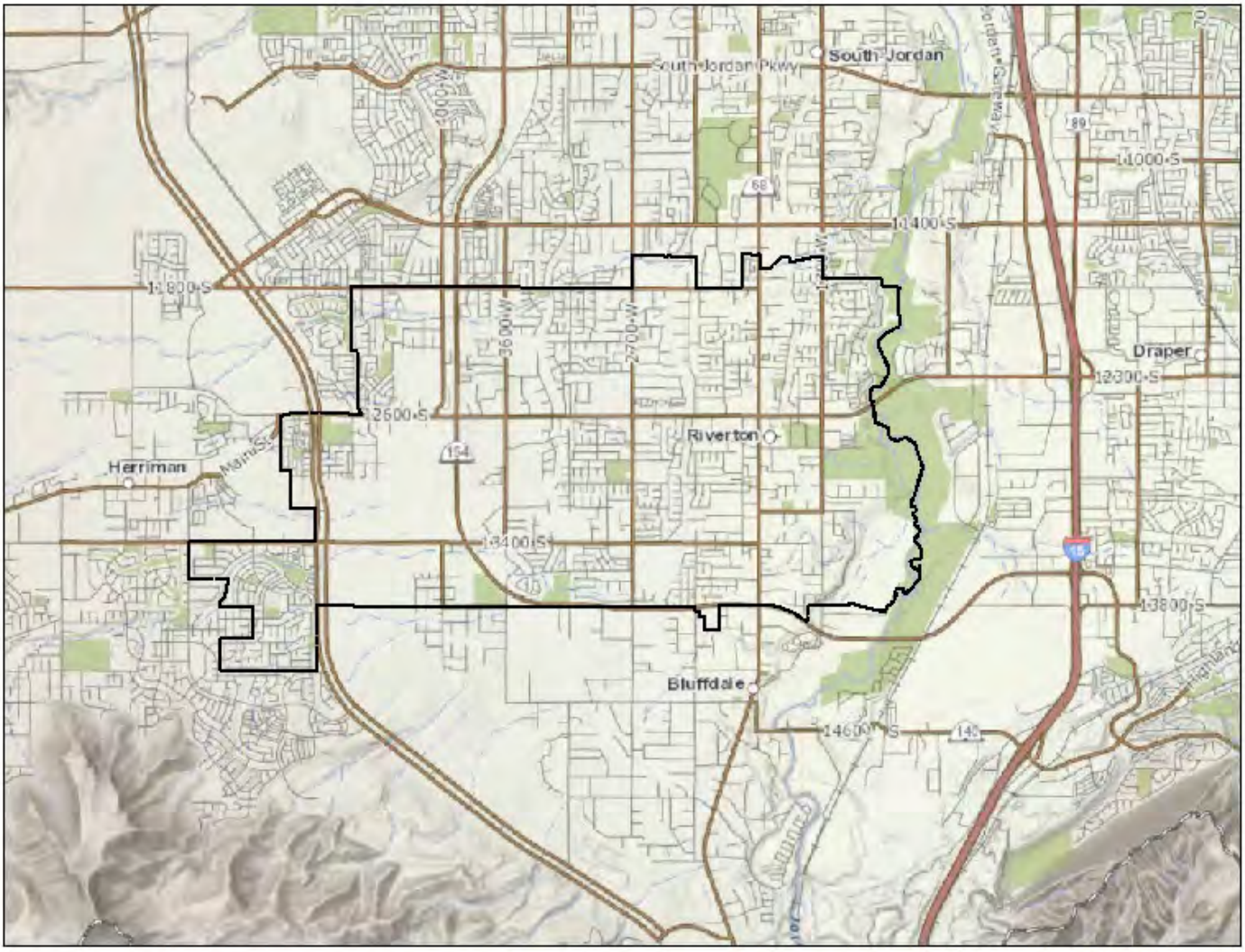
14. Accomplish mitigation strategies in such a way that negative environmental impacts are minimized.
15. Provide a basis for prioritizing and funding mitigation projects.
16. Establish a city-wide platform to enable the community to take advantage of shared goals and resources.

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.

Capital investment decisions must be considered in conjunction with natural hazard vulnerability. Capital investments can include homes, roads, public utilities, pipelines, power plants, chemical plants, warehouses and public works facilities. These decisions can influence the degree of hazard vulnerability of a community. Once a capital facility is in place, few opportunities will present themselves over the useful life of the facility to correct any errors in location or construction with respect to hazard vulnerability. It is for these reasons that zoning ordinances, which could restrict development in high vulnerability areas, and building codes, which could ensure that new buildings are built to withstand the damaging forces of hazards, are the most useful mitigation approaches a city can implement.



Map 1 Riverton City

2 Community Profile

Riverton City was incorporated as a City of the Third Class on July 3, 1967. Riverton is governed using a Six-Member Council form of government with City Manager by ordinance. Legislative powers are vested in the five-member Council, while executive powers lie with the Mayor. The Mayor is elected to serve the citizens at large, the Council Members are elected by voting districts. All elected officials serve four-year terms, which are staggered every two years (three Council seats in one election, two Council seats and the Mayor in the next election). The City Manager is responsible for the day-to-day operations and is responsible for the employees of the City. The City Manager and Department Heads comprise the senior staff team which recommends priorities to the Mayor and Council.

Riverton City provides a full range of services to its residents and businesses. General governmental services provided by the City include building inspection, construction and maintenance of street lighting, roadways and parks, as well as recreation and cultural events. The City also provides utility services for culinary water, secondary water, sanitation and storm water. The boundaries of the City cover 12.6 square miles with a population of approximately 40,500 with a potential for approximately 53,000 at build-out.

2.1 History

The first people that lived in the area that is now Riverton settled in the 1850s. They lived in crude, widely scattered, dugout homes along the river bottoms. Archibald Gardner was the largest landowner, and he might have been the first to live on Riverton land, though early accounts disagree. Because of this, the land along the Jordan River and surrounding area was called Gardnerville. Due to the lack of irrigation water, initial growth was slow. However, the town began to grow as settlers developed a cooperative to build a ditch, which later resulted in a canal that opened cultivation, which attracted new residents. Riverton later became incorporated into a town in 1948 and a city of the third class July 3, 1967.

By 1914, Riverton began to prosper as an agricultural community, due to additional water and people. Riverton's business district also thrived. In 1879, a judicial precinct was established and the settlement's name was officially changed from Gardnerville to Riverton by Judge Charles Smith. The first meetinghouse was constructed in 1879, which served as a church, a schoolhouse, and a community meeting place. A new meetinghouse was planned and the architect selected was Richard Kletting who also designed the Utah State Capitol. The entire community worked to haul material, by wagons, including granite from Little Cottonwood Canyon. The Old Dome Church, which it became to be known, continued to be used by the residents until it was torn down in 1940. The Old Dome Church

Before the turn-of-the-century, Riverton farmers gradually changed from self-sufficient to commercial farming. They specialized in alfalfa, wheat, sugar beets, tomatoes, poultry, sheep, and dairy cows. At this time, the LDS Church began to store tithed produce and livestock on land located at 1150 West 12400 South. This area is now known as Tithing Hill. In 1912, electricity first

came to Riverton and in 1913 the Salt Lake and Utah Railroad (Orem Line) was started and went through Riverton west of Redwood Road. It stretched from Salt Lake to Payson and was used as a commuter and freight line. Riverton had its own train depot and trains used this line from 1914 to 1945 after which the rails and ties, along with the depot, were torn down.

Riverton City has worked with residents to continue the traditions started many years before with the annual Town Days event and much more. With Riverton being located in the Salt Lake Valley, residents have quick access to many different types of Recreational activities. The Wasatch Mountains, Ski Resorts and Utah Lake are just a short drive to satisfy our many active residents.

2.2 Economy & Demographics

Riverton City's economic base consists of; construction, retail sales, education and health care services. Riverton has continued to increase the available housing units while still keeping the small town feel. Modern buildings and facilities have brought new light to the Western Business district along with the state-of-the-art Intermountain Riverton Hospital. While the West side of the city is continuing to grow with new developments, roads and businesses, the East side and Downtown are getting some big changes. The City's main park is getting a complete remodel including a building modeled from the famous Old Dome Church. Riverton's Downtown has grown and been updated over the past few years and with some recent updates is becoming a strong heart for the rest of the city.

Riverton residents work in a variety of fields, with the largest being retail (28.5% between both males and females) and Educational Services (15.1%) among females and Construction (15%) among males being the largest separated. Below is a breakdown of the common industries among genders and common occupations among genders in Riverton:

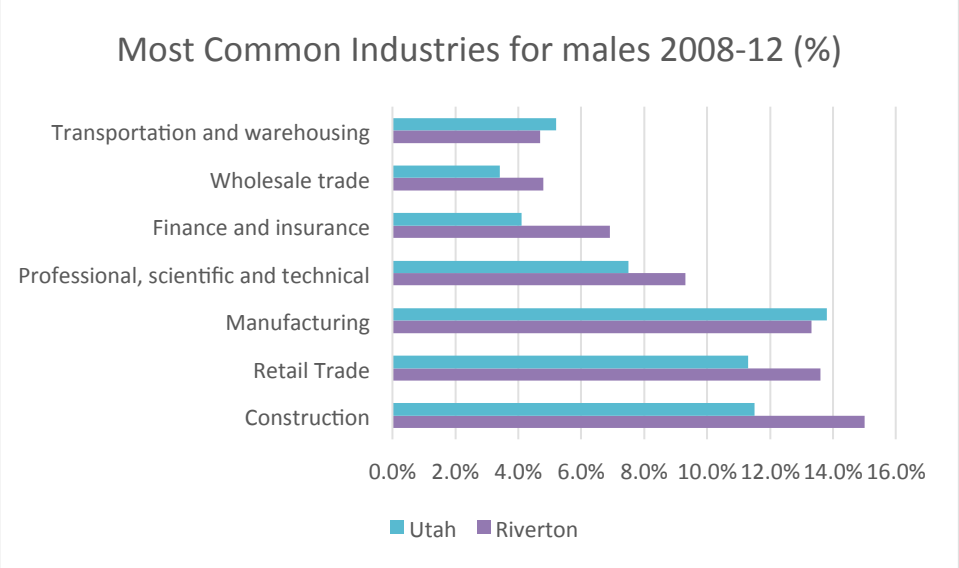
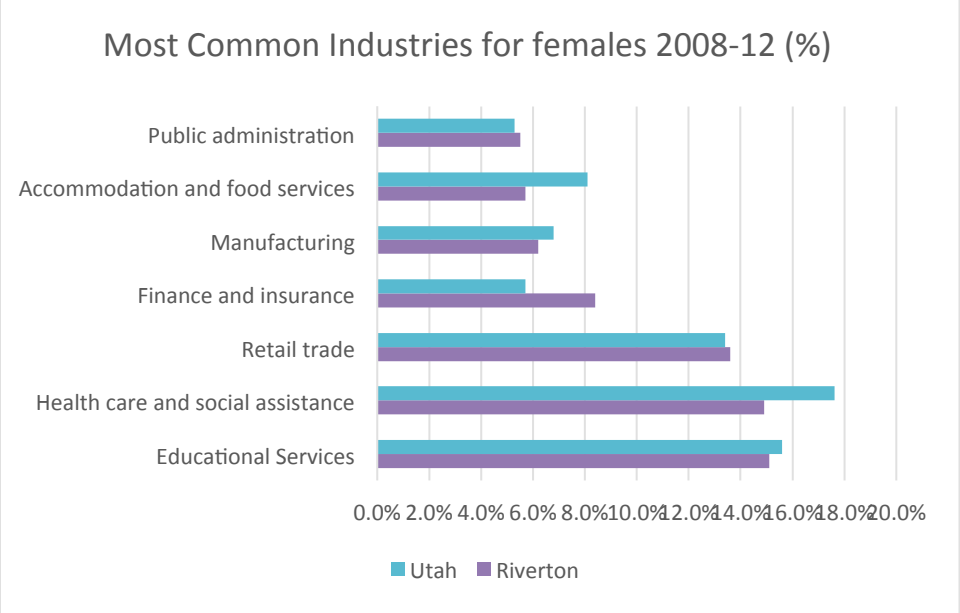


Table 1



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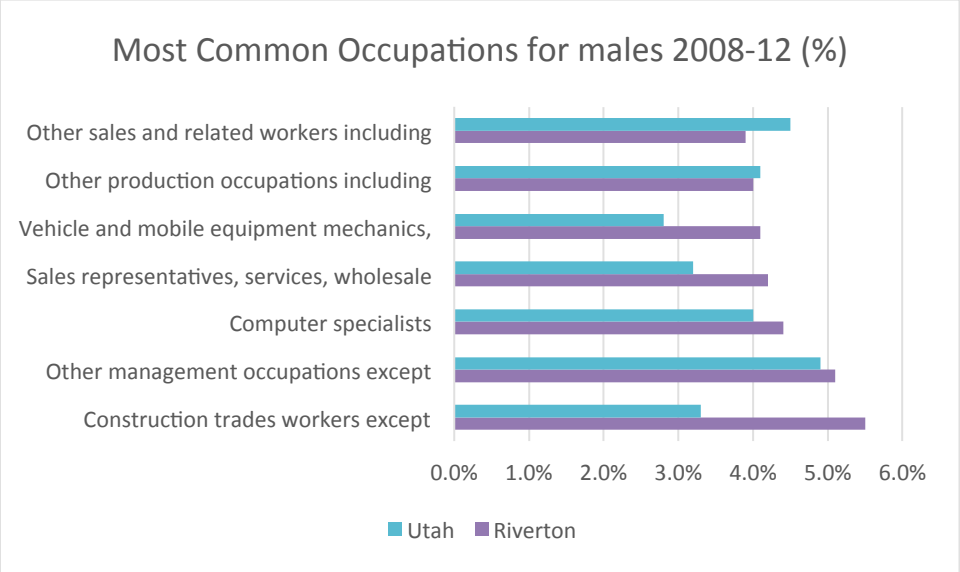

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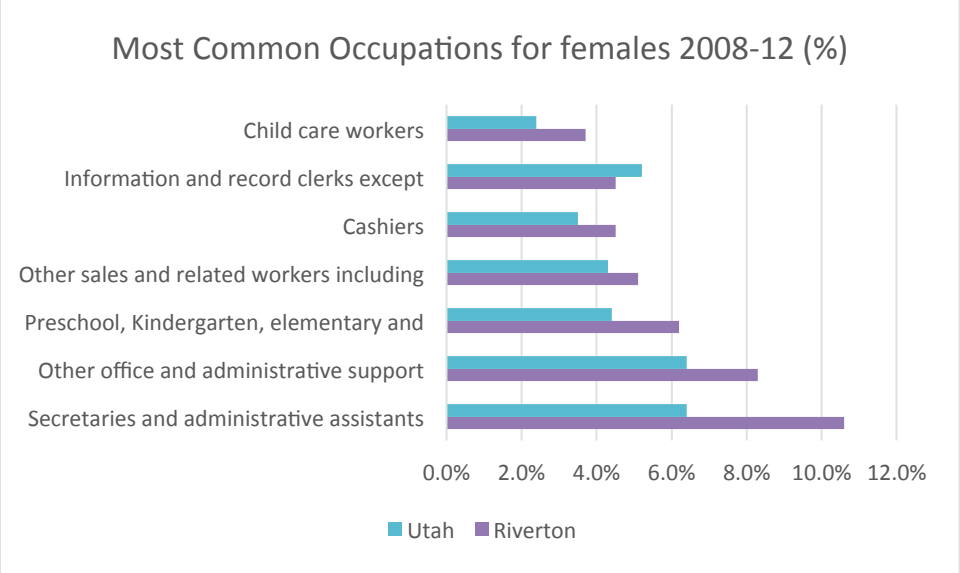
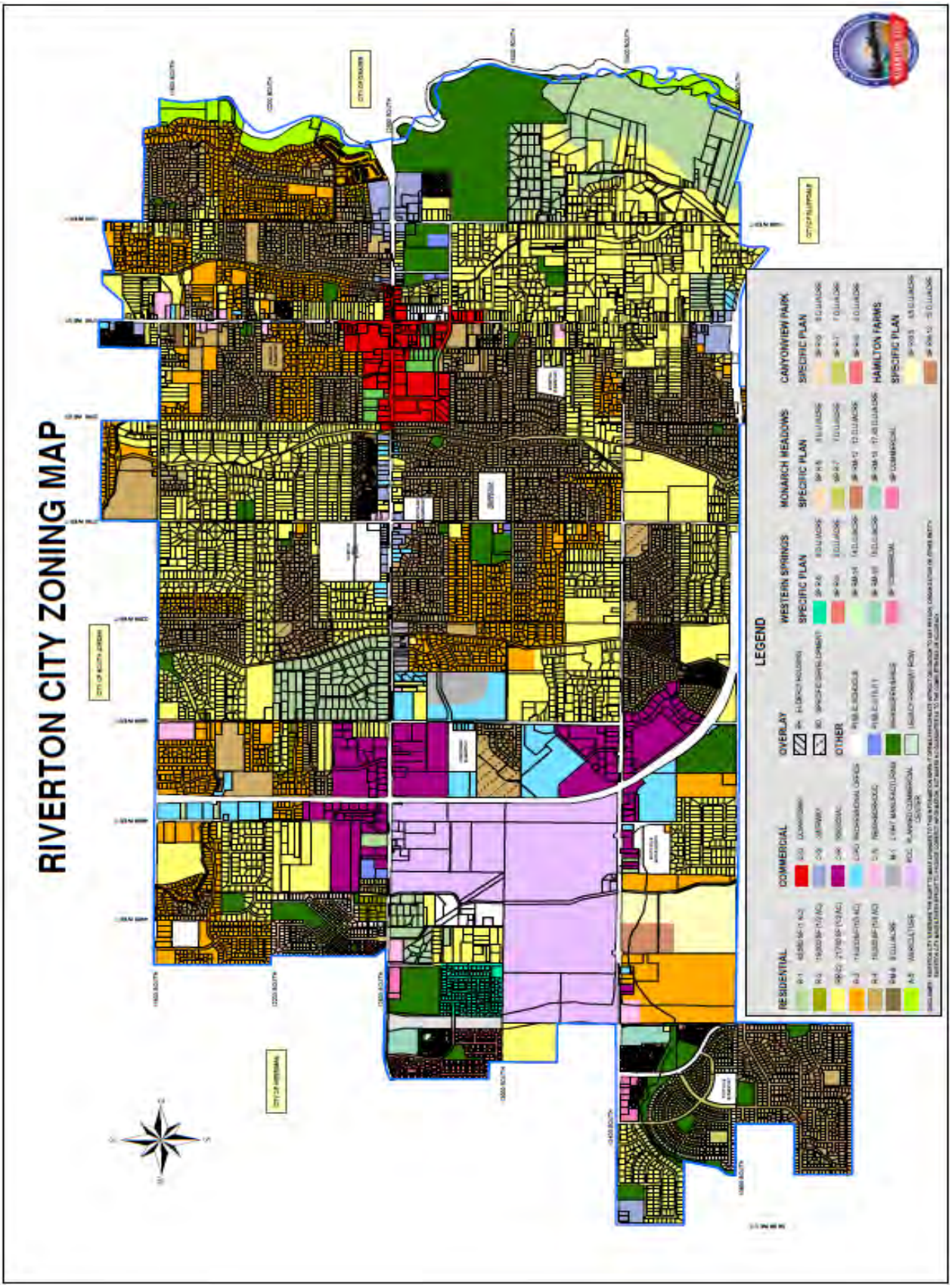


Table 4

Riverton City's Mayor, Council, Planning Commission and staff have worked together to provide a comprehensive plan for the future of Riverton City. The General Plan encompasses where the City is currently, identifies where it wants to be and provides an overall framework on how to achieve this future. The plan includes estimates about future population, household types and employment bases that allows for the City to plan to plan for land use, circulation and facilities that can be made for those future needs. Below is Riverton Cities current Zoning Map:



Map 2. Zoning Map

2.3 Population

In 2013, the total population for Riverton City was estimated at 40,921 residents. Below is a chart showing our growth in population since 1970:

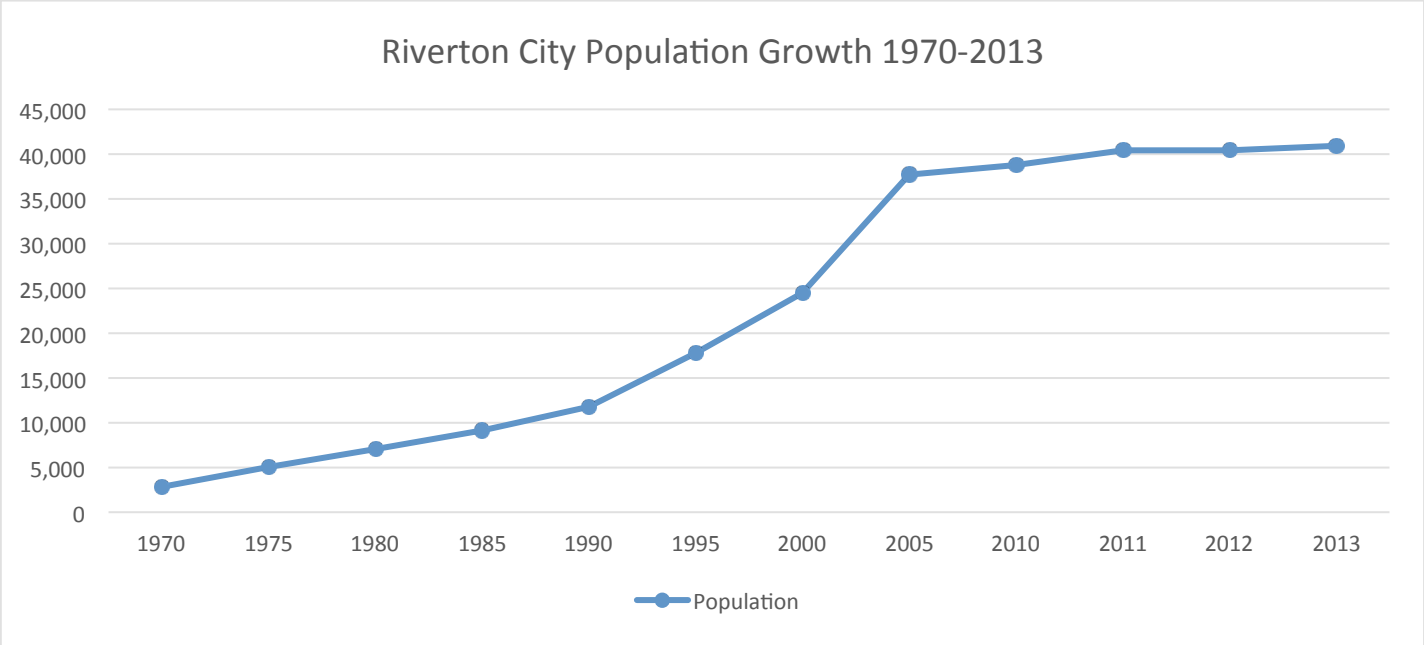


Table 5

2010 Population	2010 Population Estimate	Estimated % Change 2010-2014	2010 # of Housing Units	2014 Estimated # of Housing Units	Estimated % change 2010-2014
38,753	38.754	4.36%	10,810	11,089	2.63%

City's change in population and Housing Units, 2010-2014

3 Planning Process

Riverton participated in the Salt Lake County planning process which developed the criteria and plan for Salt Lake County. Riverton Emergency Management Personnel used the information from the County plan which pertained to the City and created the Riverton City Pre-Disaster Hazard Mitigation Plan. The Riverton City Planning Process includes by reference the Salt Lake County Planning Process.

3.1 Planning

Riverton City designated Sheril Garn, Parks & Public Service Director, as the jurisdiction representative. As the representative, she has attended meetings with other local jurisdictions and Salt Lake County to plan, develop and create this plan.

3.2. Organize Resources

A core planning team, comprised of at least one representative from each city within Salt Lake County, was convened early in the planning process. This Planning Team were the main constituents of the planning process to review the 2009 Pre-Disaster Mitigation Plan and recommend revisions, as well as to guide the Plan's overall revision process and content. Riverton City was invited to provide a representative to serve on the Planning team to ensure local input. Relevant input was solicited and obtained from our representative. Riverton City will adopt the final FEMA approved Plan.

Member Name	Organization Name
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

Salt Lake County Core Planning Team

Name	Organization
Brad Bartholomew	Utah Division of Emergency Management
Eric Martineau	Utah Division of Emergency Management
Katie LeLaCheur	Utah Division of Emergency Management
Amisha Lester	Utah Division of Emergency Management
Cynthia Morgan	Salt Lake Valley Health Department
Kevin Barjenbruch	National Weather Service
Tyre Holfeltz	Utah Forestry Fire and State Lands
David Marble	Utah Division of Water Rights
Steve Bowman	Utah Geological Survey
Jessica Castleton	Utah Geological Survey
Julie Baxter	FEMA Region VIII
Sean McNabb	FEMA Region VIII
Shelby Hudson	FEMA Region VIII

Supporting Agencies/Stakeholders

3.3 Public Officials Outreach

Riverton City's Jurisdiction Representative has provided updates to the City Council, Mayor and City Management as new changes and information were presented. In 2012, Riverton City Council approved a new Emergency Operation Plan and continues to update as changes are presented.

3.4 Data Review and Acquisition

The Riverton City Committee compiled data from the Salt Lake County, FEMA and other agencies. 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 committee evaluated revised data and maps, and through a consensus process developed the revised mitigation strategies based on current data.

3.5 City 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. Riverton City committee members further reviewed the data and made changes as needed.

3.6 City 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 and Riverton City's CAFR Report was used to estimate the number of structures and their value that could potentially be affected by hazards. Census 2010 data 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.

In some cases where the values were considered to still be valid, some data was used from the Salt Lake County Mitigation Plan. The new values determined by more recent data were used to update as needed.

3.7 Capabilities Assessment

During the 2012 Emergency Operations Plan process, Riverton City management and emergency staff compiled a current assessment of Riverton City's capabilities. The details from this plan were used and updated accordingly for the assessment in this plan.

3.8 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.

3.9 Mitigation Strategy Development

Developing the mitigation strategies was a process in which all of the previous steps were taken into account. Riverton City evaluated, identified and profiled the hazards, and vulnerability assessment completed by the Riverton City Committee and directors. The planning team met several times to brainstorm additional strategies and improve upon the existing strategies. Each mitigation strategy developed was evaluated to determine that actions met the objectives stated in the Introduction.

3.10 Prioritization of Identified Mitigation Strategies

DMA 2000 requires local governments to show how mitigation actions were evaluated and prioritized. The Riverton City Committee determined which strategies were highest priority, which departments were 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 Committee and Riverton City Council over a series of Council & Management 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 Committee.

3.11 Continued outreach

The risk assessment and proposed mitigation strategies were made available on the Riverton City website for public comment from September 22, 2014 to October 2, 2014. While no comments or suggestions were conveyed, the revised version of the plan will be posted on the website for future comments and suggestions.

3.12 State Review

Utah DEM created a formal Plan review committee to ensure local plans met the requirements of DMA 2000. This committee reviewed the Plans from September 15th, 2014 subsequent to submission to FEMA for final review and acceptance. Riverton City will adhere to these reviews.

3.13 Adoption

The Plan will be adopted by Riverton City.

3.14 Future Planning

Riverton City will continue to send the Jurisdiction Representative to future meeting with other local governments and continue to update the City Council, Mayor and City Management Staff to improve our Hazard Mitigation Plan. Below is a calendar outlining meetings our Jurisdiction Representative attended. Future meetings will also be recorded.

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.
	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, presentation from UDEM regarding community Risk MAP

Year	Date	Activity	Purpose
			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
	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.
2014	**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
	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.

Year	Date	Activity	Purpose
	September 8	Emergency Managers Meeting HMP scheduling	Continue One on One Meeting with each Jurisdiction to complete plan
	October 7	Submit final plan to Salt Lake County	County to review Jurisdiction plans and assemble entire County HMP
	October 15	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

Riverton City Jurisdiction Representative Meeting Schedule 2012-14

4 Risk Assessment

As defined by FEMA, risk 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 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 into 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 Hazard Identification: Natural Hazards identifies the natural hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
Section 4.2 Hazard Profiles discusses the threat to the planning area and describes previous occurrences of hazard events and the likelihood of future occurrences.
Section 4.3 Vulnerability Assessment assesses the City's total exposure to natural hazards, considering assets at risk, critical facilities, and future development trends.
Section 4.4 Human-Caused Hazards identifies the areas most susceptible to potential human-caused hazard events by evaluating which populations and facilities are most vulnerable to such hazards.
Section 4.5 Capability Assessment inventories existing mitigation activities and policies, regulations, and plans that pertain to mitigation and can affect net vulnerability.

Note: Neither the examination of human-caused hazards nor the capability assessment is required by FEMA.

This risk assessment covers the entire geographical extent of Riverton City. Since this plan is a multi-jurisdictional plan, the HMPC was required to evaluate how the hazards and risks vary from jurisdiction to jurisdiction. While these differences are noted in this chapter, they are expanded upon in the annexes of the participating jurisdictions. If no additional data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for the entire Salt Lake County planning area.

Each of the hazards that can affect Riverton City, and the potential impacts, will be described in this section, known as a Hazard Identification and Risk Assessment or HIRA.

4.1 Hazard Identification: Natural Hazards

The Salt Lake County HMPC conducted a hazard identification study to determine the hazards that threaten the planning area. From this assessment, Riverton City personnel determined those threats which pertained to the City.

4.1.1 Methodology and Results

Using existing natural hazards data and input gained through planning meetings, the HMPC agreed upon a list of natural hazards that could affect Riverton. Hazards data from the Utah State Department of Emergency Management and Mitigation, FEMA, the National Oceanic and Atmospheric Administration, and many other sources were examined to assess the significance of these hazards to the planning area. Significance 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 occurred in the past or have the potential to cause significant human and/or monetary losses in the future. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 4.3 Vulnerability Assessment.

The natural hazards identified and investigated for Riverton Multi-Hazard Mitigation Plan include:

- Earthquake
- Flood
- Slope Failure
- Severe Weather
- Dam Failure
- Pandemic
- Drought
- Infestation
- Radon
- Problem Soils

The HMPC eliminated the natural hazards listed below from further consideration in this risk assessment because they occur rarely or not at all in Riverton.

- Hurricane
- Wildfire

4.2 Hazard Profiles

The hazards identified in Section 4.1 Hazard Identification: Natural Hazards are profiled individually in this section. In general, information provided by planning team members is integrated into this

section with information from other data sources, such as those mentioned in Section 4.1. These profiles set the stage for Section 4.3 Vulnerability Assessment, where the vulnerability is quantified, where possible, for each of the priority hazards.
The following sections provide profiles of the natural hazards that the HMPC identified in Section 4.1 Identifying Hazards

The HIRA was initiated through a series of meetings with the Core Planning Team and subject matter experts from the following organizations:

City and county agencies
Jordan Valley Water Conservancy District
Salt Lake City Public Utilities
Utah Geological Survey
National Weather Service
Utah Division of Water Rights
Utah Forestry, Fire, and State Lands
Unified Fire Authority
Salt Lake Valley Health Department
Riverton City Staff

Each hazard is profiled in the following format:

Hazard/Problem Description— This section gives a description of the hazard and associated issues followed by details on the hazard specific to Salt Lake County /Riverton area. Where known, this includes information on the hazard extent, seasonal patterns, speed of onset/duration, and magnitude and/or secondary effects.

Past Occurrences— This section contains information on historical incidents, including impacts where known. The extent or location of the hazard within or near the Salt Lake County /Riverton planning area is also included here. Historical incident worksheets were used to capture information from participating jurisdictions on past occurrences.

Frequency/Likelihood of Future Occurrence— The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of an event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a drought in any given year). The likelihood of future occurrences is categorized into one of 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.

Hazard Matrix M-1 provides an initial assessment of the profiles and assigns a level of significance to each hazard. Those hazards determined to be of high significance were characterized as priority hazards that required further evaluation in Section 4.3 Vulnerability Assessment. Those hazards that occur infrequently or have little or no impact on the planning area were determined to be of low significance. Significance was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the planning area; thus enabling the County to focus resources where they are most needed.

The Planning Team identified the hazards in Table 4 as having the potential to affecting all or a portion of Salt Lake County, based on history of occurrences and/or future probability. Each of these was carried over from the 2009 WFRC Pre-Disaster Mitigation Plan, with the addition of Avalanche and Flu Epidemic.

The HIRA process was aided through the use of FEMA How-to Guidance Documents, FEMA Local Mitigation Planning Handbook, Local Mitigation Plan Review Guide, the Utah State Hazard Mitigation Plan, Utah Natural Hazards Handbook 2008, FEMA 386-1,2,3,7, Disaster Mitigation Act of 2000, 44 CFR Parts 201 and 206, Interim Final Rule, and FEMA Region VIII Crosswalk. The risk assessment process also utilized assistance from local GIS departments using the best available data.

Hazard	How Identified	Why Identified
Earthquake	• Review of County Emergency Operations Plans • Review of past disaster declarations • Input from City and County Emergency Operations Managers, USGS, UGS, Utah DEM, and community members	• Utah has a 1/5 chance, of experiencing a large earthquake within the nex fifty years. • Numerous faults throughout Utah including the Intermountain Seism Zone. • Yearly, Utah averages approximately 13 earthquakes having a magnitud 3.0 or greater. • Earthquakes can create fire, flooding, hazardous materials inciden transportation, and communication limitations. • The Wasatch Front has recorded large earthquakes in the past and can b expected to experience large earthquakes in the future.
Flood	• Review of past disaster declarations • Input from City and County Emergency Operations Managers, Utah DWS, UGS, Utah Army Corps of Engineers, Utah DEM, and community members • Review of Flood Insurance Studies, Floodplain maps, and FIRMs	• Several incidents have caused severe damage and loss of life. • Many of the rivers and streams are located near neighborhoods. • Many neighborhoods are located on floodplains, alluvial fans. • Topography and climate lead to cloudburst storms and heavy precipitatio can result in flash flooding throughout most of the Wasatch Front.
Slope Failure	• Input from City and County Emergency Operations Managers, USGS, UGS, NCDC, Utah DEM, and community members	• Have caused damage in the past to residential and commerci infrastructure. • Can be life threatening. • Generally occur in known historic locations therefore risks exist throughou much of the Wasatch Front. • To increase community awareness.
Severe	• Review of County Emergency	• Damage to communities, homes, infrastructure, roads, ski areas, and

Weather	Operations Plans • Review of past disaster declarations • Input from City and County Emergency Operations Managers, Utah Avalanche, Forecast Center, Utah Department of Transportation, and community members	people. • Can cause property damage and loss of life. • Results in economic loss. • Lightning is number one cause of natural hazard death in Utah. • Can be costly to recover from. • Affects the young and old more severely.
Dam Failure	• Review of County Emergency Operations Plans • Input from community members, Utah DWS, Dam Safety Section, Utah DEM • Review of inundation maps	• Can cause serious damage to life and property and have subsequent effect such as flooding, fire, debris flow, etc. • Many reservoirs located in the county. • Threat to downhill communities. • Subsequent effects include flooding, fire, and debris flows. • To increase community awareness. • To incorporate mitigation measures into existing plans to help serve loc residents.
Flu Epidemic	• Salt Lake Valley Health Department • Input from City and County Emergency Managers • Review of County Emergency Operations Plan	• Can affect large number of population • Disrupt services and result in economic loss • Can overwhelm health care providers
Drought	• Review of Utah State Water Plan • Input from community members, Utah DHLS, NWS, NCC, and NCDC	• Affects local economy and residents. • Reduces available water in reservoirs impacting culinary, irrigation, and municipal water supplies. • Drought periods may extend several years.
Infestation	• Review of Utah Department of Agriculture and Food Annual Insect Report and the Utah Forest Insect and Disease Report • Input from community members, UDAF, Utah FFSL, and the Utah State University Extension Service	• Consistently affects this region. • Declined forest health and agriculture losses. • Previous experiences have affected the residents of the Wasatch Front. • Results in economic loss. • Destruction can be severe and is very costly to mitigate. • To better understand mitigation and response techniques.
Radon	• UGS Maps • Utah Division of Radiation Control Testing Data.	• Is odorless and colorless. • Can cause lung cancer over time.
Problem Soils	• Review of County Emergency Operations Plans • Input from community members, Utah, DEM, and UGS • Researched historical data	• Related to subsequent effects from earthquakes. • Have affected infrastructure and local economy in the past.

Table 6

	Dam Failure	Drought	Earthquake	Flood	Infestation	Landslide	Pandemic	Problem Soils	Radon	Severe Weather
Riverton	High	Low	High	High	Low	Low	Mod	Mod	Low	Mod

Hazard Matrix M-1

4.2.1 Earthquake

The Utah Geologic Survey defines an earthquake as the "abrupt, rapid shaking of the Earth caused by sudden breakage of rocks that can no longer withstand the stresses that build up deep beneath the earth's surface". The rocks break along zones of weakness, called faults. Seismic waves are

then transmitted outward and also produce ground shaking or vibrations in the earth. (Utah Natural Hazards Handbook. 2008).

The Richter scale measures the magnitude of earthquakes on a seismograph. Generally an earthquake needs to be at least a magnitude 2.0 to be felt by humans, and about magnitude 5.5 before significant damage occurs. The amount of damage that occurs from an earthquake depends on soil type, rock type, ground-water depth and topography. Other factors include the type of construction in an area and the population density.

Secondary Hazards: Associated earthquake hazards include ground shaking, surface fault rupture and tectonic subsidence, soil liquefaction, flooding, avalanches, dam failure, fire, and slope failure.

Ground Shaking: Ground shaking is caused by the passage of seismic waves generated by an earthquake. Shaking can vary in intensity but is the greatest secondary hazard because it affects large areas and stimulates many of the other hazards associated with earthquakes. Moderate to large earthquake events generally produce trembling for about 10 to 30 seconds. Aftershocks can occur erratically for weeks or even months after the main earthquake event.

The waves move the earth's surface laterally and vertically and vary in frequency and amplitude. High frequency, small amplitude waves cause more damage to short, stiff buildings. Low frequency, large amplitude waves have a greater effect on high-rise buildings. The intensity depends on geologic features such as bedrock and rock type, topography, and the location and magnitude of the earthquake. Other significant factors include ground water depth, basin shape, thickness of sediment, and the degree of sediment consolidation. (UNHH 2008)

Surface Fault Rupture and Tectonic Subsidence: Surface fault rupture is the result from relative movement between blocks in the Earth's crust. In Utah, the result is the formation of scarps or steep breaks in the slope. The 1934 Hansel Valley earthquake resulted in a surface displacement of approximately 1.6 feet. Earthquakes having a magnitude of 6.5 or greater could result in surface faulting 16 to 20 feet high and 12 to 44 mile long break segments. Surface displacement generally occurs over a zone of hundreds of feet wide called the zone of deformation and can cause severe damage to building foundations or lifelines (roads, pipelines, communication lines) that cross the fault. Tectonic subsidence, or down dropping and tilting of the valley floor, generally depends on the amount of surface fault rupture, and can cause flooding by tilting lakebeds or dropping ground surface below the water table. The greatest amount of subsidence will be in the fault zone and will gradually diminish out into the valley (UDCEM 1991).

Soil Liquefaction: 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

earthfill dams to liquefy and fail, flooding by ground water in low-lying areas, back up of gravity fed systems, and/or cause 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)

Slope Failure: Ground shaking can cause rock falls and landslides in mountainous or canyon areas. Rock falls are the most common slope failure and can occur up to 50 miles away from a 6.0 magnitude earthquake. Landslides occur along steep slopes and benches in wet, unconsolidated materials. During a 6.0 magnitude earthquake, landslides typically occur within 25 miles of the source. (UNHH 2008)

Flooding: "Flooding can happen due to tectonic subsidence and tilting, dam failure, seiches (waves generated in standing bodies of water) in lakes and reservoirs, surface-water diversion or disruption, and increased ground-water discharge." (UNHH 2008)

Avalanches: Avalanches could be triggered because of the associated ground movement. The most vulnerable areas include those that have steep terrain, high precipitation, high earthquake potential, and high population density, and heavy backcountry use (UNHH 2008).

Sensitive Clays: Sensitive clays are a soil type that loose strength and are subject to collapse when shaken. The resulting type of ground failure is similar to liquefaction (UNHH 2008).

Subsidence: A settling or sinking of loose granular materials such as sand and gravel that do not contain clay. Western Utah is subject to this type of ground settlement (UNHH 2008).

Earthquake Hazard Profile

Potential Magnitude	***X***	**Catastrophic (>50%)**	**Probability**		**Highly Likely**
		Critical (25-50%)		**X**	**Likely**
		Limited (10-25%)			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Ground shaking will be felt throughout the entire county. Surface fault rupture can be found in areas of known historic fault movements. Liquefaction can be expected in areas of high to moderate liquefaction potential.				
Seasonal Pattern	None.				
Conditions	Liquefaction potential within areas with shallow ground water. Soil that is comprised of old lakebed sediments. Historic movement along faults. Intermountain Seismic Zone, Wasatch Fault.				
Duration	Actual ground shaking will be under one minute, aftershocks can occur for weeks or even months.				
Secondary Hazards	Fire, landslide, rock falls, avalanche, flooding, hazardous material release, transportation and infrastructure disruptions, essential service disruptions (communications, utilities).				
Analysis Used	Review of hazard analysis plans and other information provided by				

	the University of Utah Seismograph Station, UGS, USGS, FEMA, UDEM, AGRC.

Table 7

Location and Extent: 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)

The Wasatch Fault traces along the base of the Wasatch mountain range. It is made up of 10 segments that act independently, meaning that a part of the fault ruptures separately as a unit during an earthquake. The Salt Lake City Segment traverses Salt Lake County from north to south, roughly along the eastern foothills of the Wasatch Mountains. Within the Salt Lake City segment of the Wasatch Fault are three smaller segments from north to south known as Warm Springs Fault, Virginia Street Fault and the East Bench Fault.

Other faults within Salt Lake County include the West Valley Fault Zone and the East Great Salt Lake Fault Zone. Each of these fault zones has much longer return interval (2,500 years or more) and is not expected to produce a major quake in the near future.

History: Although no surface-faulting earthquakes have occurred on the Wasatch fault since settlement in Utah, evidence of numerous prehistoric events exists in the geologic record (The Wasatch Fault, UGS PIS 40). The segments between Brigham City and Nephi have a composite recurrence interval (average time between earthquake events) for large surface-faulting earthquakes (magnitude 7.0-7.5) of 300-400 years. The average repeat time on an individual segment is 1,200-2,600 years. The most recent surface-faulting earthquakes occurred about 500 years ago on the Provo and Weber segments, and about 350 years ago on the Nephi segment. (UNHH 2008)

Utah experiences approximately 700 earthquakes each year, and approximately six of those have a magnitude 3.0 or greater. On average, a moderate, potentially damaging earthquake (magnitude 5.5 to 6.5) occurs every 10 years. Large earthquakes (magnitude 6.5-7.5) occur on average every 50 years (UNHH 2008). The history of seismic activity in Utah and along the Wasatch Front suggests that it is not a matter of "if" but when an earthquake will occur. The probability of a large earthquake occurring along the central segments of the Wasatch Front is 13 percent in 50 years, or 25 percent in 100 years. (The Wasatch Fault, UGS PIS 40)

The two largest measured earthquakes to occur in Utah were the Richfield earthquake of 1901, with a magnitude of 6.5 and the Hansel Valley earthquake of 1934 with a magnitude of 6.6.

"*The Hansel Valley earthquake produced MM intensities of VIII in Salt Lake City, with numerous reports of broken windows, toppled chimneys, and structures twisted on their foundations. A clock mechanism weighing more than 2 tons fell from the main tower of the Salt Lake City County Building and crashed through the building. The only death that occurred during the event was*

caused when the walls of an excavation collapsed on a public-works employee south of downtown Salt Lake City." (Lund 2005)

Utah's most damaging earthquake was of a smaller magnitude (5.7), which occurred near Richmond in Cache Valley in 1962. This earthquake damaged over 75 percent of the houses in Richmond, as well as roads and various other structures. The total damage was about $1 million (in 1962 dollars). (UNHH 2008).

Significant earthquakes have occurred in Salt Lake County within the last 50 years. In 1962, a 5.2 Richter magnitude quake jolted the Magna area. In 1992, a magnitude 4.2 quake shook the southern portion of the County.

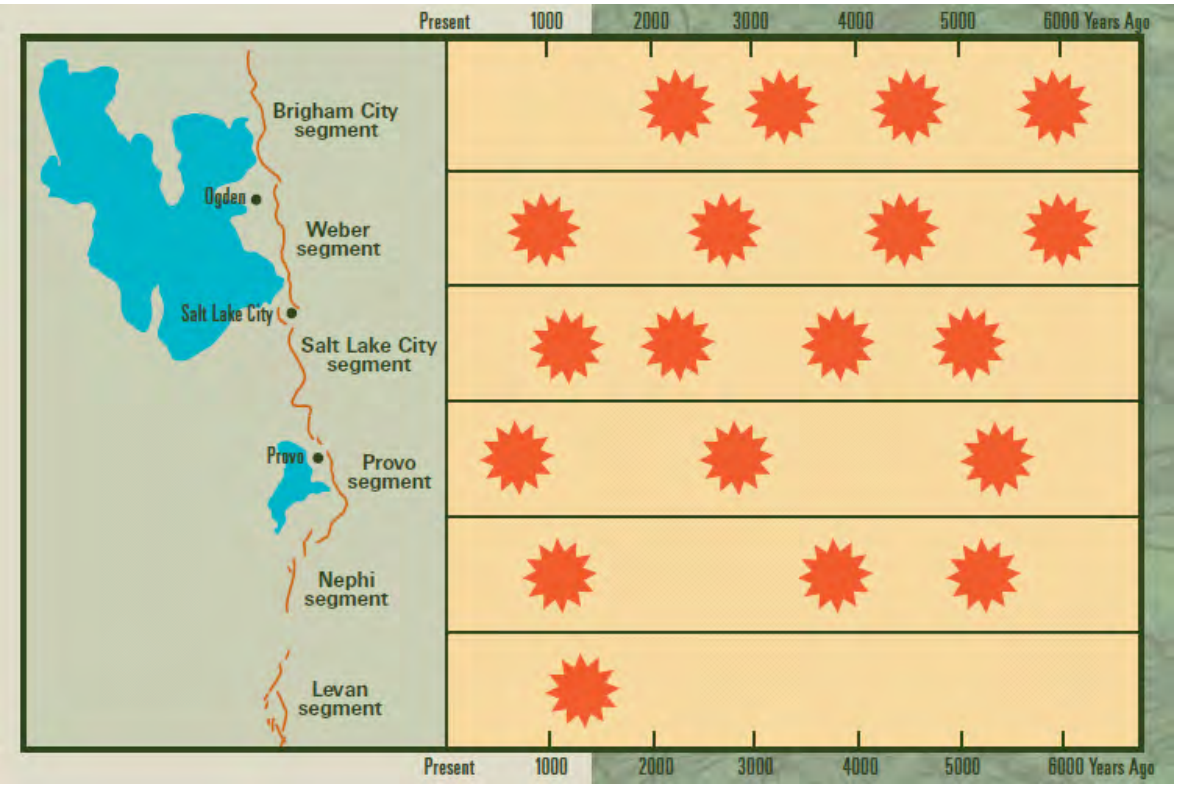


Table 8. Wasatch Fault Segments and Timeline of Major Ruptures ("The Wasatch Fault", Utah Geological Survey Public Information Series 40)

Liquefaction is one of the secondary hazards associated with an earthquake and affects nearly all of Salt County. The part of Riverton City that would be affected is located by the Jordan River. The City 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.

Vulnerability Assessment

Vulnerability of people and infrastructure to earthquake hazards in Riverton City was obtained from the modeling program HAZUS-MH, completed by FEMA Region VIII.

Jurisdiction	*Total Building Economic Loss*	*Loss Ratio*	*Total Debris (tons)*
Riverton	$ 252,898,310	7%	166,609

Table 9.

Jurisdiction	*Displaced Households*	*Individuals Seeking Public Shelter*	*Total Casualties*	*Life-Threatening Injuries and Fatalities*	*URM Count*
Riverton	393	260	100	10	596

Table 10.

Jurisdiction	*Life-Threatening Ratio to Total Pop*	*URM Ratio to Total Structures*
Riverton	0.025%	6%

Table 11.

2009 Vulnerability Assessment

The following values are from the HAZUS analysis performed by WFRC for the 2009 Regional Mitigation Plan. Because no significant changes in the level of risk or the condition of infrastructure, these values are still considered valid estimates of potential impacts to earthquake in Riverton City. They are based on a probabilistic 2500-year event with a Richter magnitude of 7.1 as well as an arbitrary 5.9 event located in close proximity to the county's most populated areas. These locations and magnitudes were chosen for their likelihood and proximity respectively. Default HAZUS-MH inventory for all infrastructure was used. (**For a more detailed explanation of the loss estimation methodology of HAZUS-MH MR2, please see Part VI or the HAZUS-MH Technical Manual (Earthquake Model) at www.fema.gov/hazus).

Community Assets

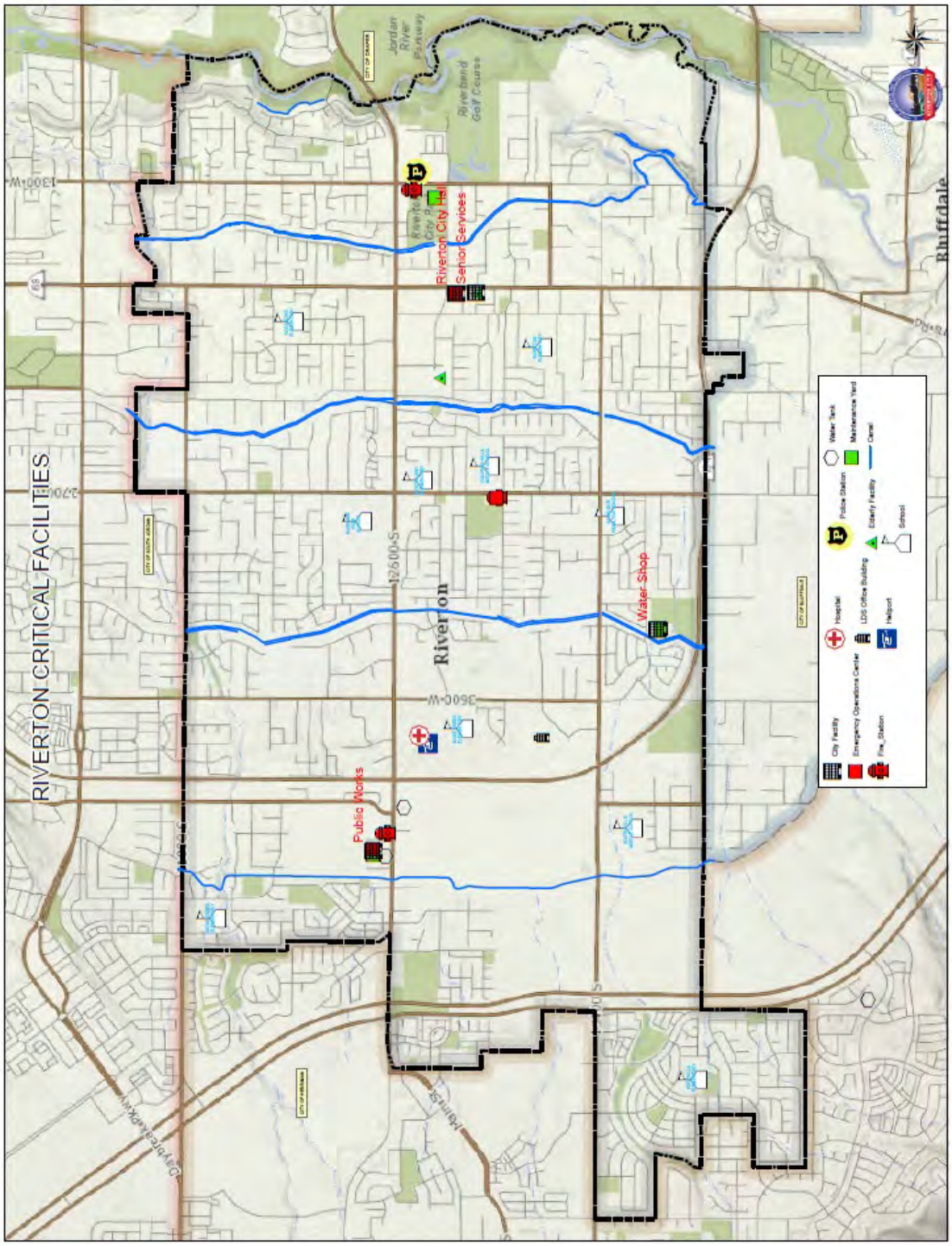
Additional significant community assets with potential impacts by earthquake hazards were identified by the Planning Team. These include areas of particular concern, critical facilities and infrastructure, areas of future development, major employers or economic sectors, cultural or historic facilities, significant populations, or significant natural resources. The following is a broad stroke look at community assets that will be covered in more detail in each Jurisdiction's Annex.

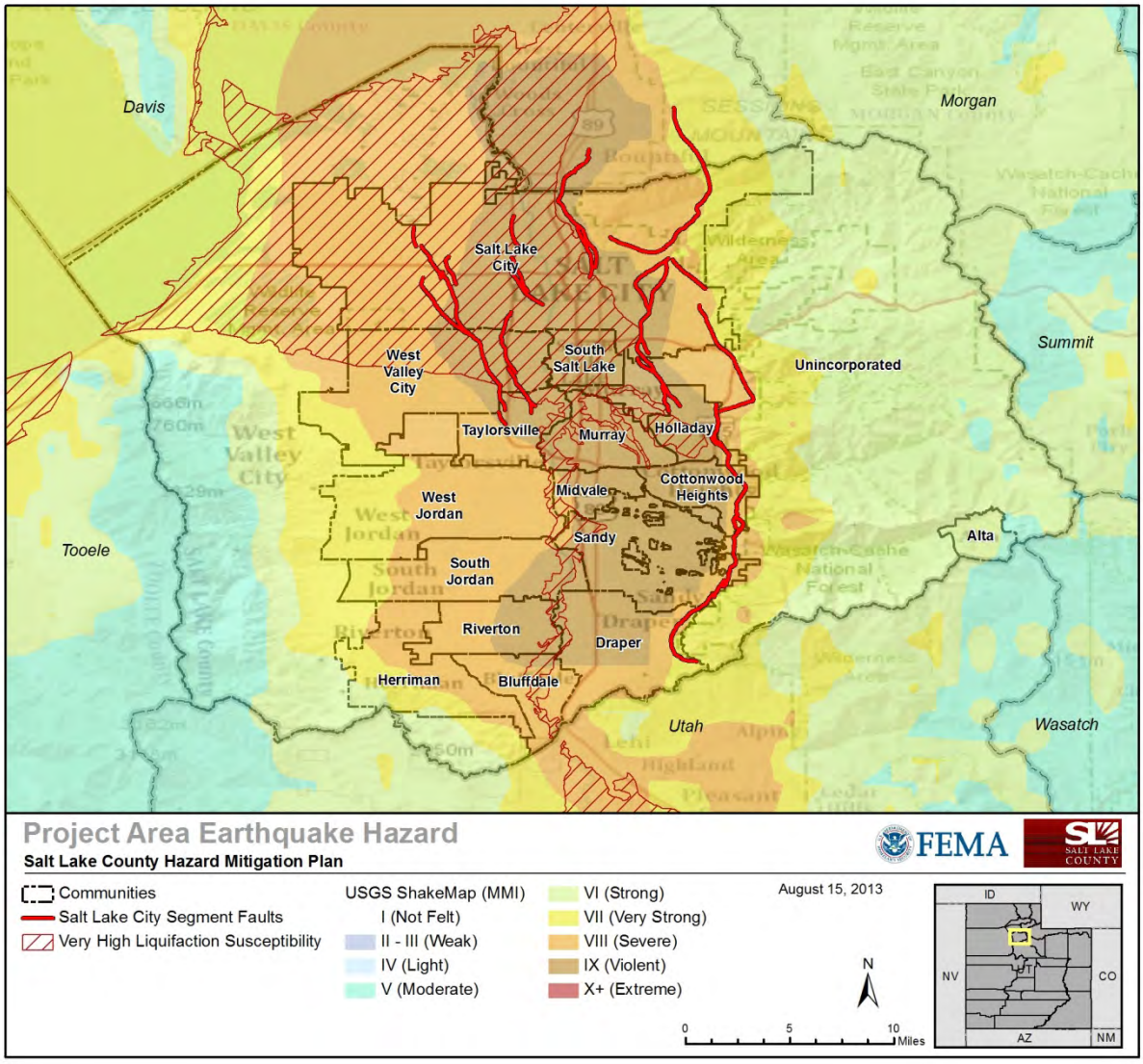
Riverton City Critical Facilities:

Riverton Public Works Building (EOC)
Riverton Water Shop
Riverton City Hall
Water Tanks: Main Tank, High Tank & Garamandi Tank
Intermountain Health Care Riverton Hospital
UFA Fire Stations Located at: 12600 S 4150 W, 112662 S 300 W, and 13000 S 2700 W
Riverton High School
South Hills Middle School
Oquirrh Middle School
Riverton Elementary

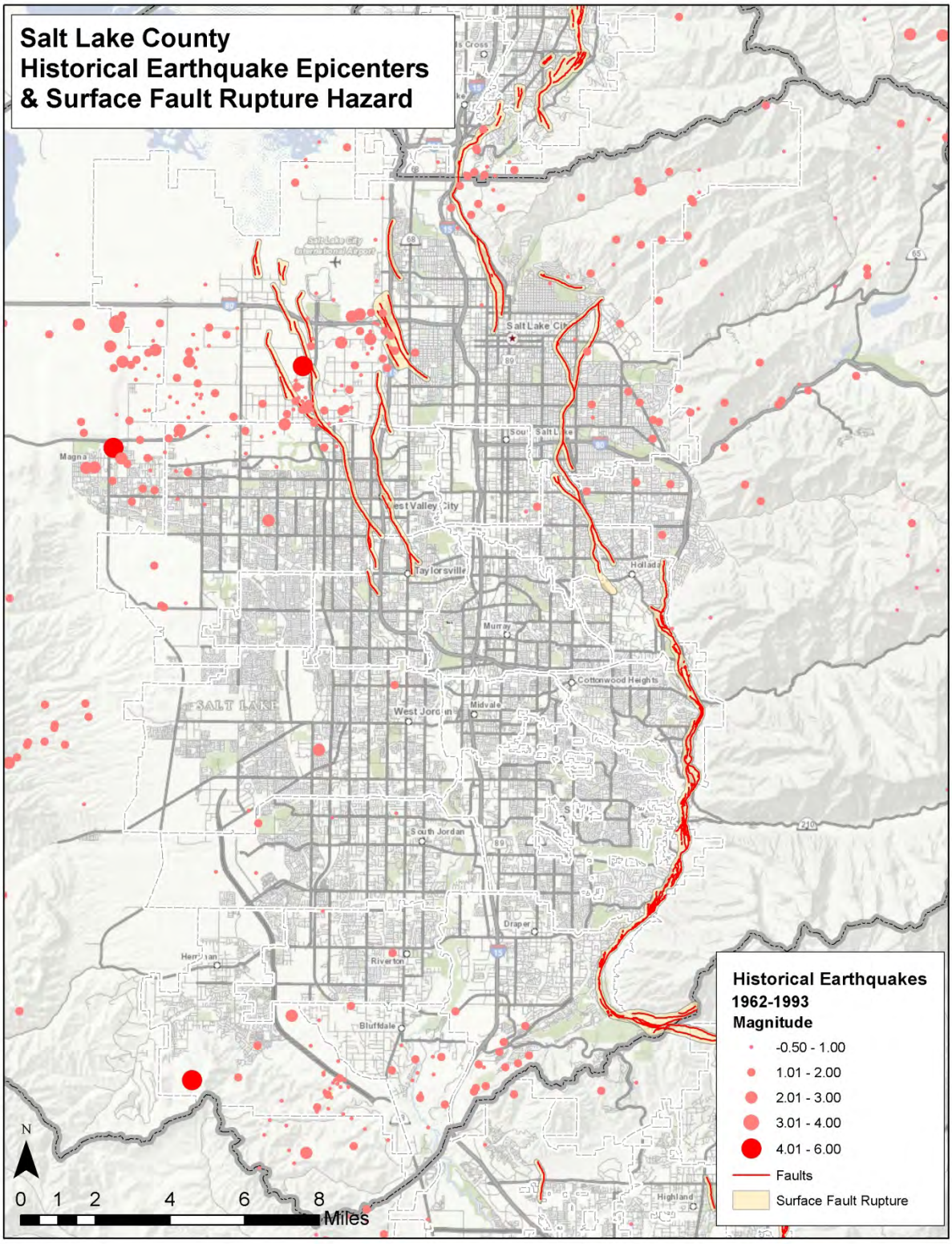
Southland Elementary
Midas Creek Elementary
Rose Creek Elementary
Rosamond Elementary
Kari Sue School

Map 3. Riverton Critical Facilities (LDS Church)

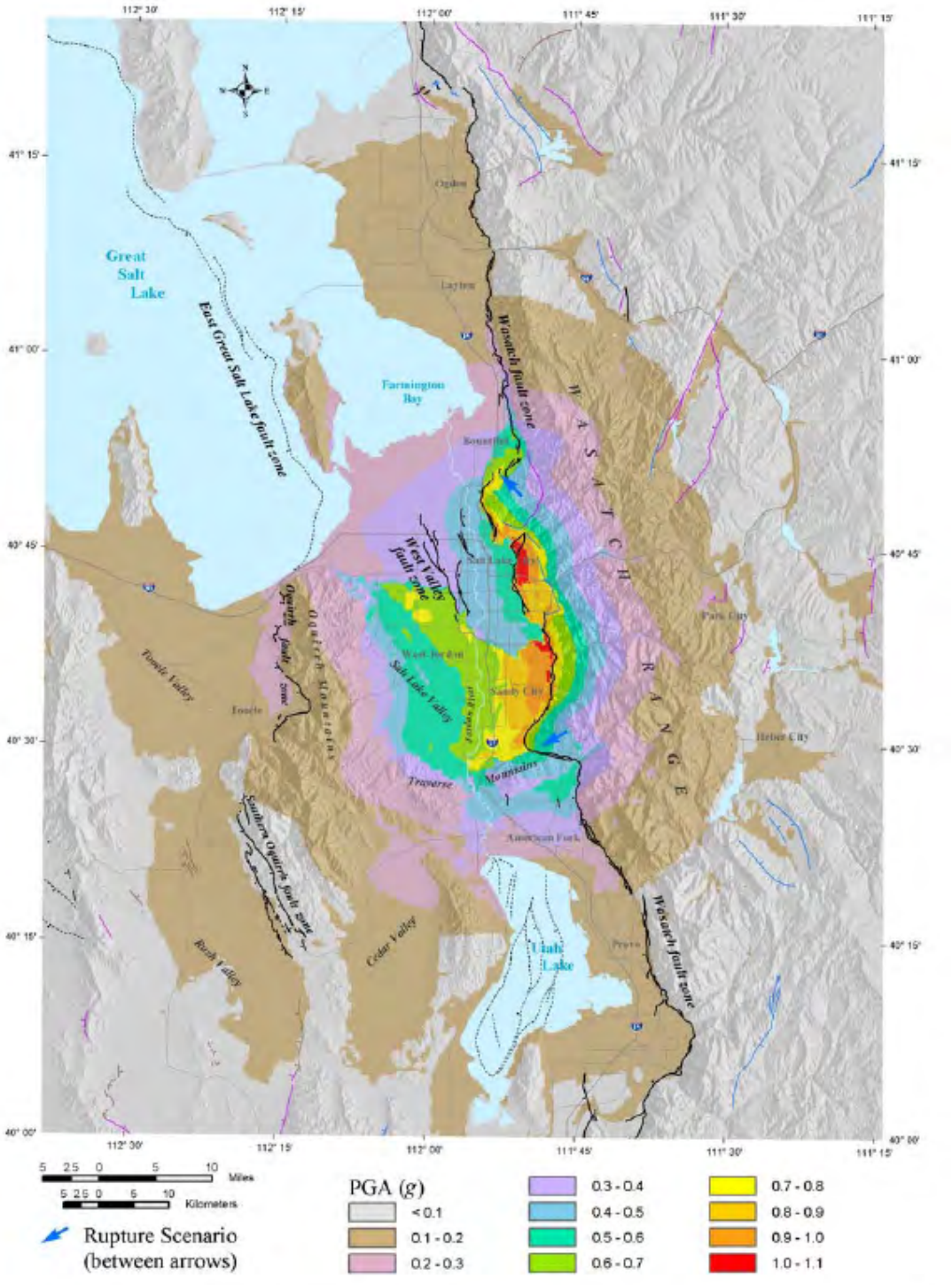

RIVERTON CRITICAL FACILITIES
Riverton City Hall
Senior Services
Water Shop
Public Works
Riverton
Bluffdale
12600 S
3600 W
Jordan River Parkway
Riverbend Golf Course
Water Tank
Maintenance Yard
Canal
Police Station
Elderly Facility
School
Hospital
LDS Office Building
Heliport
City Facility
Emergency Operations Center
Fire_Station


Davis
Morgan
Salt Lake City
West Valley City
South Salt Lake
Unincorporated
Summit
Taylorsville
Murray
Holladay
Cottonwood Heights
Midvale
West Jordan
Sandy
Alta
Tooele
South Jordan
Riverton
Draper
Herriman
Bluffdale
Utah
Wasatch
Project Area Earthquake Hazard
Salt Lake County Hazard Mitigation Plan
FEMA
Communities
Salt Lake City Segment Faults
Very High Liquifaction Susceptibility
USGS ShakeMap (MMI)
I (Not Felt)
II - III (Weak)
IV (Light)
V (Moderate)
VI (Strong)
VII (Very Strong)
VIII (Severe)
IX (Violent)
X+ (Extreme)
August 15, 2013
N
0
5
10
Miles
ID
WY
NV
UT
CO
AZ
NM

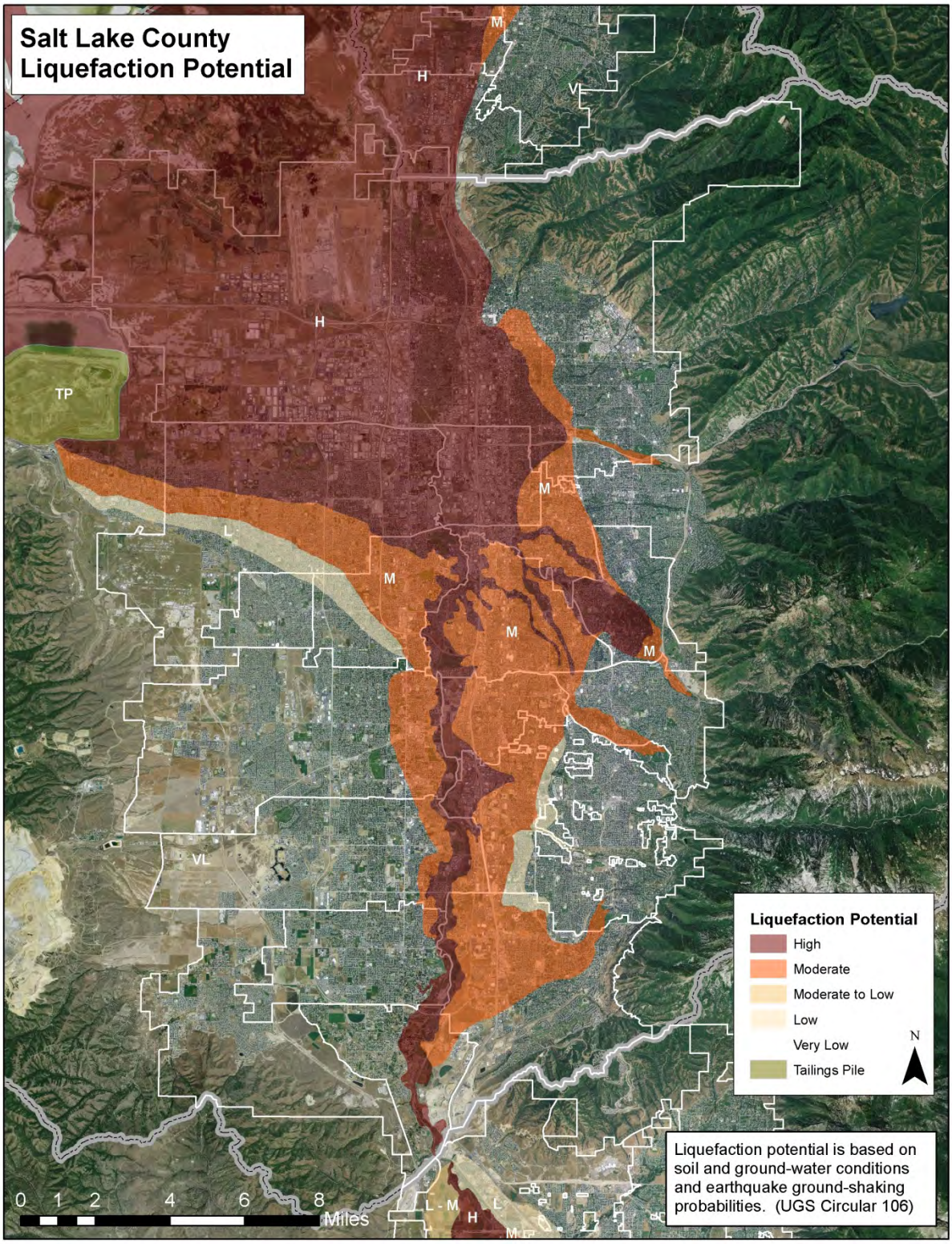
Map 4.



Map 5. Salt Lake County Earthquakes, 1962-1993



Map 6 (figure 4) from Earthquake-Hazards Scenario for a M 7 Earthquake on the Salt Lake City Segment of the Wasatch Fault Zone, Utah, Utah Geological Survey Special Study 111, 2004.



Map 7. Liquefaction Potential, Salt Lake County

4.2.2. Flood

Floods are related to fast snowmelt, heavy rainfall, or failure of natural or engineered impoundments onto riverbanks and adjacent floodplains. Floodplains are lowland areas near rivers, lakes, reservoirs, oceans and low terrain urban areas that are subject to recurring floods. Stream 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 Riverton, floods are typically localized events running out of mountain canyons or highly developed areas of the City. Urban areas are also prone to flooding because urban development such as buildings, streets, and parking lots prevent water infiltration into the soil and greatly increase runoff. Undersized piping, manmade drainage channels, or debris that obstructs passageways may further contribute to flooding. Flood damage includes saturation of land and property, erosion, deposition of mud and debris, and fast flowing water. Most injuries and deaths occur from fast moving floodwaters, while most property damage results from inundation by sediment-filled water.

Snowmelt floods: These are caused by rapid spring snowmelt of mountain snowpack. Most times, intense spring rainfall assists the flood scenario, causing additional rapid river rises. These events can last for weeks during the spring (generally April-June) and may result in loss of life and extensive damage affecting property owners and municipalities. More damage is occurring over the years as a result of increased development near the riverbanks of mountain streams (UNHH 2008). Snowmelt risk is greatest when snowpack is at or above normal and/or accompanied by an abrupt warming trend.

Flash-flooding: These are caused by intense thunderstorms and resultant intense rainfall. Intense rainfall may fall on areas of sparse vegetation, steep slopes, and impervious surfaces, and is then channeled into smaller waterways or conduits. Once the large volume of runoff begins to accumulate across the basin, it typically increases in volume and speed in a short time. Events are often short-lived, but very dangerous for those caught in a confined area, such as a canyon, during the time of the flood. (UNHH 2008). Flash flooding has caused 32 fatalities in Utah since 1950 (NOAA, Know Your Risk)

Areas of localized flooding may occur in urban areas not associated with existing waterways. Rain from high intensity thunderstorms may accumulate in low lying areas with no outlet or where storm drains have become overwhelmed. These types of flood and the resulting impacts are difficult to anticipate due to the uncertainty of when and where such storms will occur.

Long-term rainfall events: These rain events occur mostly in the fall or winter months and are produced by large synoptic weather systems originating out of the south, southwest, or west that produce rainfall for an extended period. Some melting of snow may occur as a result of the rainfall. Occur mainly in the southern half of the state (UNHH 2008).

Canal breach: Although not a natural hazard, the flood waters from a breached canal may behave similarly and cause similar types of damage to other flooding incidents. Riverton has 4 irrigation canals that pass through the City. South Jordan Canal, Utah and Salt Lake Canal, Utah Lake Distributing Canal, Welby Jacobs Canal

Most of these canals are trenched rather than built up bank type structures. There are concerns with bank stability of the South Jordan Canal in the area of Lovers lane. The City is monitoring seepage and stability of the banks in this area. The City is also working with the South Valley Sewer District and the South Jordan Canal Co. to identify hazards and rectify concerns.

Post-fire debris flow flooding: Enhanced runoff conditions from a fire-damaged watershed can result in debris flow flooding. As fires burn, they destroy vegetation and leave soils in a hydrophobic state, resulting in greater peak flows (UNHH 2008). This issue will be discussed further in the landslide section.

Flooding Hazard Profile

Location	Largely in and along Jordan River, Rose Creek Midas Creek, Canals and failed storm drainage systems.
Seasonal Conditions	Spring, and Summer heavy rainfall, and spring snowmelt runoff.
Conditions	Thunderstorms w/heavy rainfall, extended wet periods.
Duration	Flooding can last anywhere from hours to days and even months.
Secondary Hazards	Raw sewage/health risk, electrical fires, gas spills.
Analysis Used	Review of FIS, FIRM, Army Corp of Engineers Flood Study.

Table 1

Location and Extent

Flooding in Riverton is typically the result of excessive snowmelt runoff and/or heavy rainfall. Snowmelt flooding is usually the result of rapid melting of snowpack and occurs between April through June and occurs along the major existing streams and waterways. Thunderstorms can produce high intensity, short duration heavy rainfall that occurs over a relatively small area in the summer months. However, flooding can also occur from non-thunderstorm rainfall events.

August 2014 newly constructed Riverton Village Detention Basin

The major waterways in Riverton include the Jordan River, Rose Creek, Midas Creek, South Jordan Canal, Utah and Salt Lake Canal, Utah Lake Distributing Canal, and the Jacob Welby Canal. The flows of the Jordan River from Utah Lake into Salt Lake County are controlled and the flood potential from is somewhat reduced upstream of the major Jordan River tributaries. The Canals are permitted and controlled by Salt Lake County.

In 2010 Riverton experienced severe flooding from High intensity thunderstorms. Since that time the City has performed risk studies, identified major threats, created 5-year plans, and completed over $2,000,000 of projects to prevent or reduce the potential of flooding.

These projects include the following:
Foothills Regional Detention Basin
Riverton Village Regional Detention Basin
3600 West Regional Detention Basin and Outfall
Mountain View Regional Detention Basin and Outfall
Rose Creek Channel Reconstruction a@ 4000 West
Rose Creek Safety Project
Lampton View Storm Drain Project

History:
The following flood events are of notable significance:
2010 Sevier Thunder Storms resulting in the flooding of several homes
2007 Sevier Thunder Storms resulting in the flooding of several homes

4.2.3. NFIP

Riverton City has no repetitive loss claims 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.

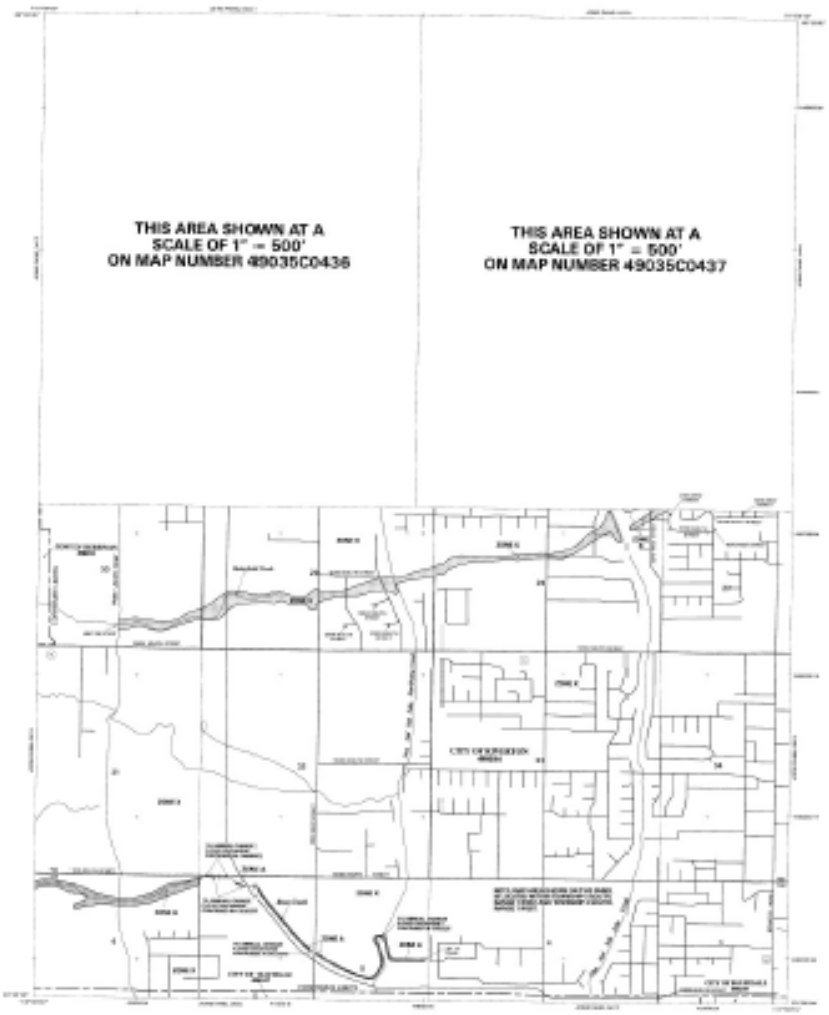
Vulnerability Assessment
A community assessment exercise was performed at the Risk MAP Discovery Meeting and at several community follow-up meetings. Community representatives worked together to gain a comprehensive understanding of previous flooding events and areas of concern (including future development 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.

Structure Exposure and Hazus-Generated Losses

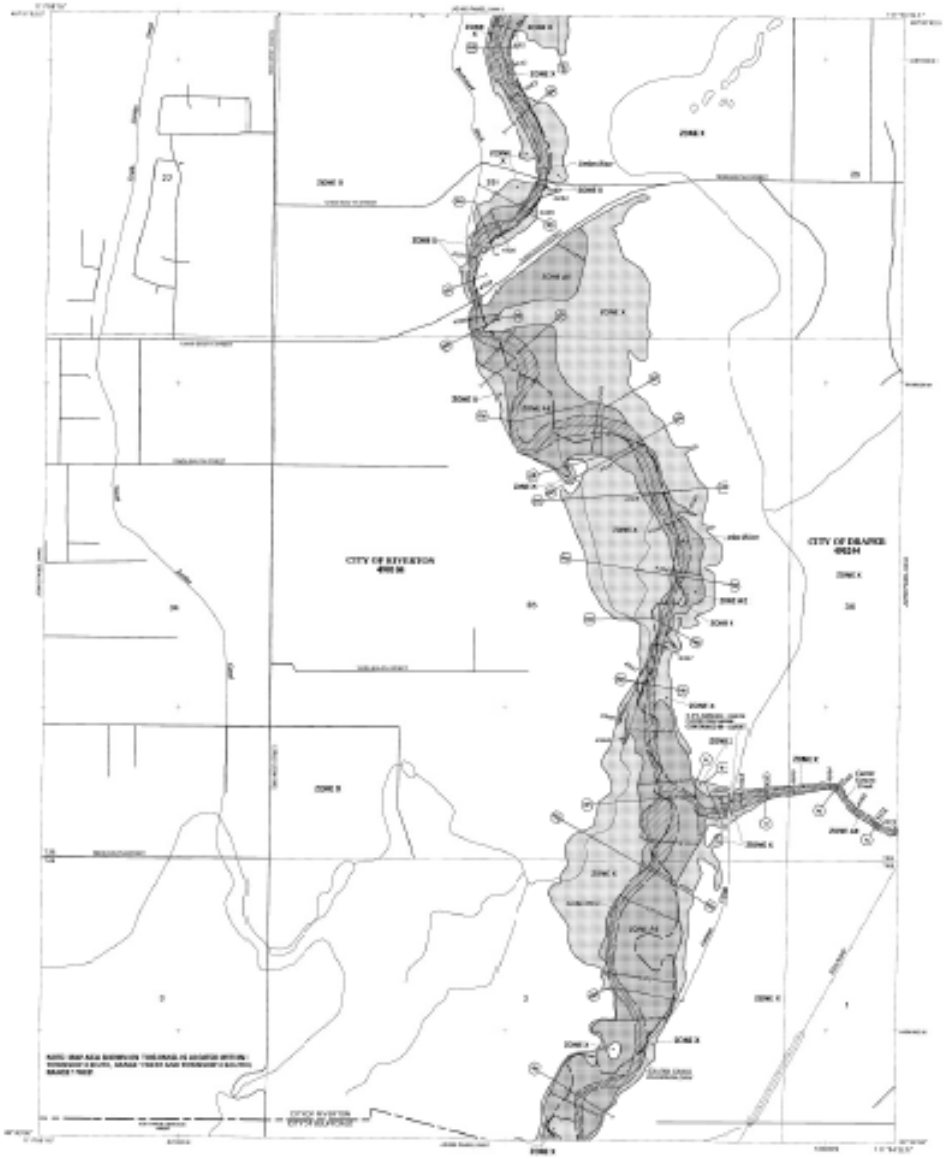
Jurisdiction	1% Annual Chance Building and Contents Loss*		Loss Ratio**	0.2% Annual Chance Structure Exposure	Building and Contents Loss		Loss Ratio
Riverton	2	$ 14,374	0.000%	102	$	1,209,806	0.03%

Table 19*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.

Map 7a

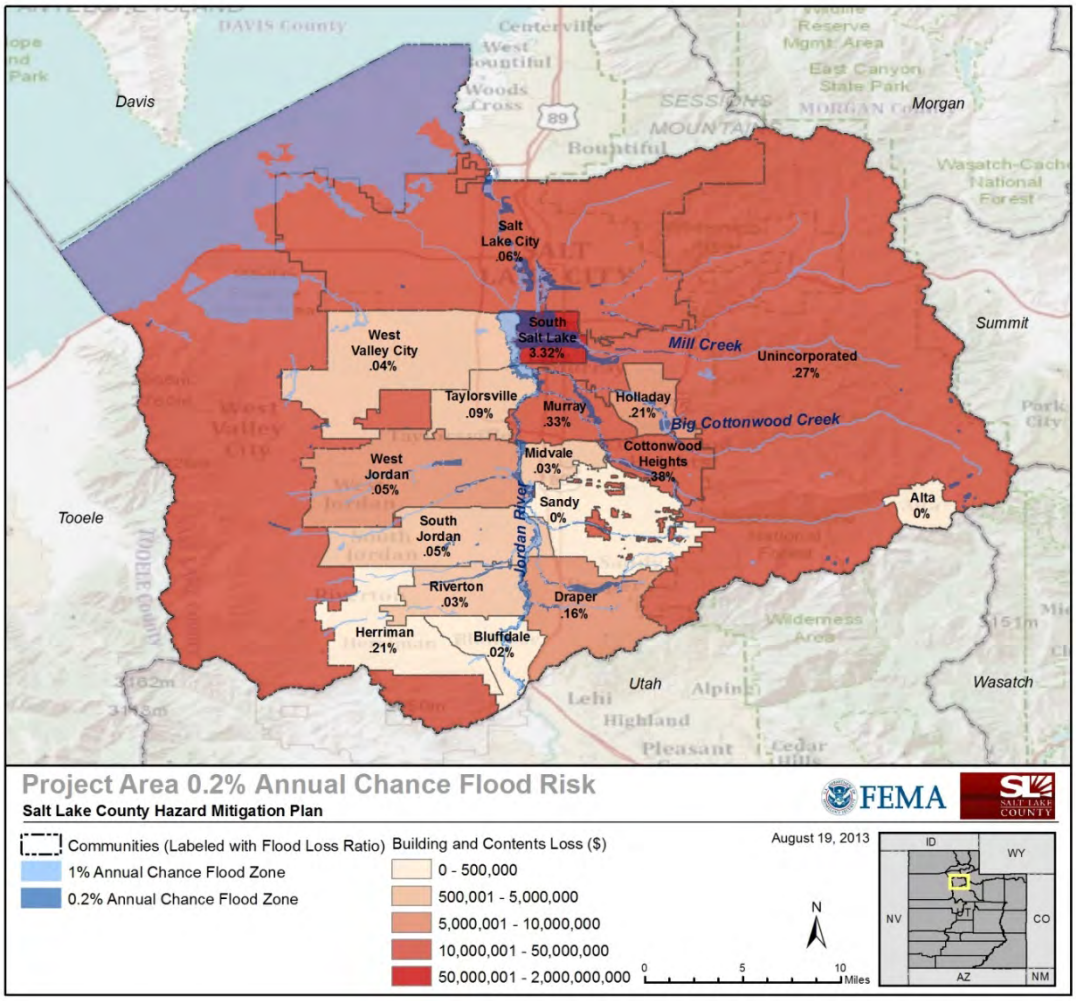


Map 7b

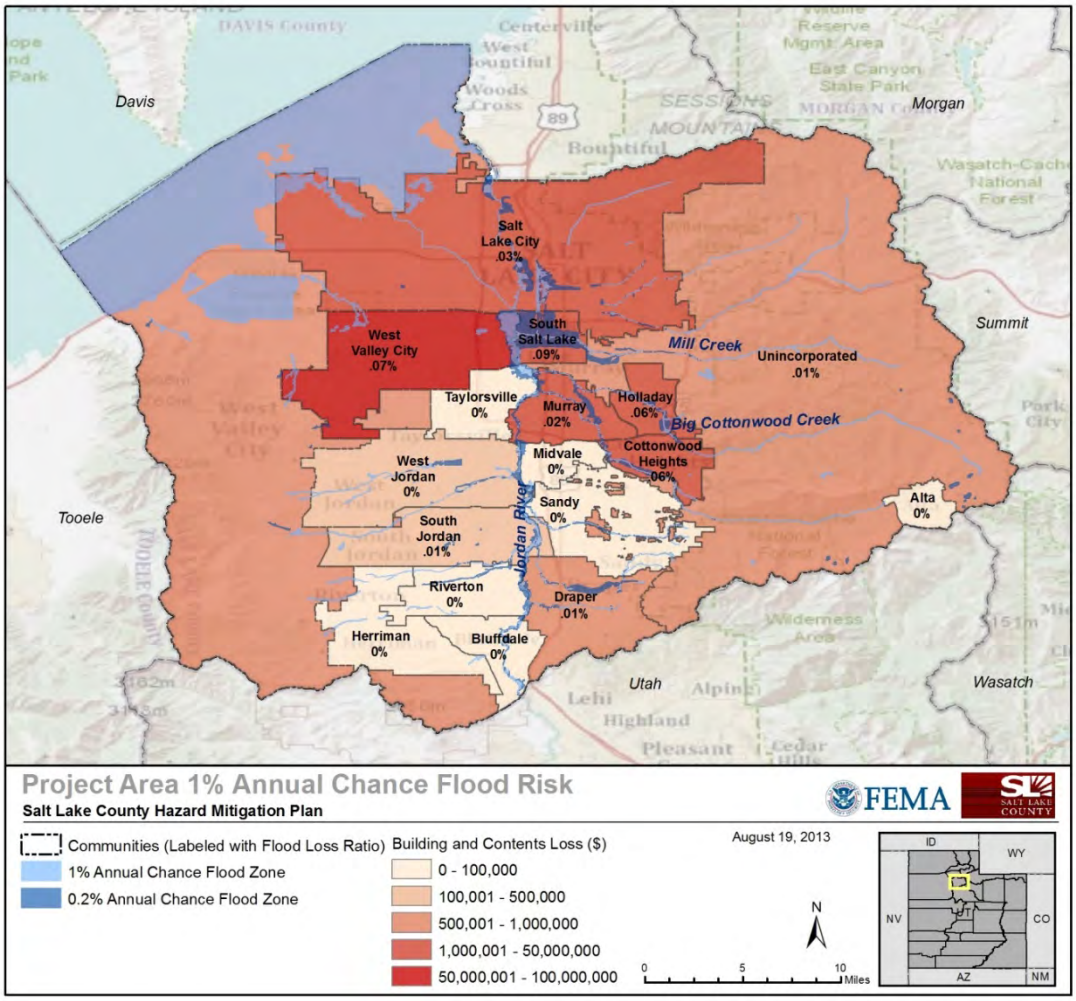
County Wide

Population Exposure

1% Annual Chance	7,421
0.2% Annual Chance	23,126

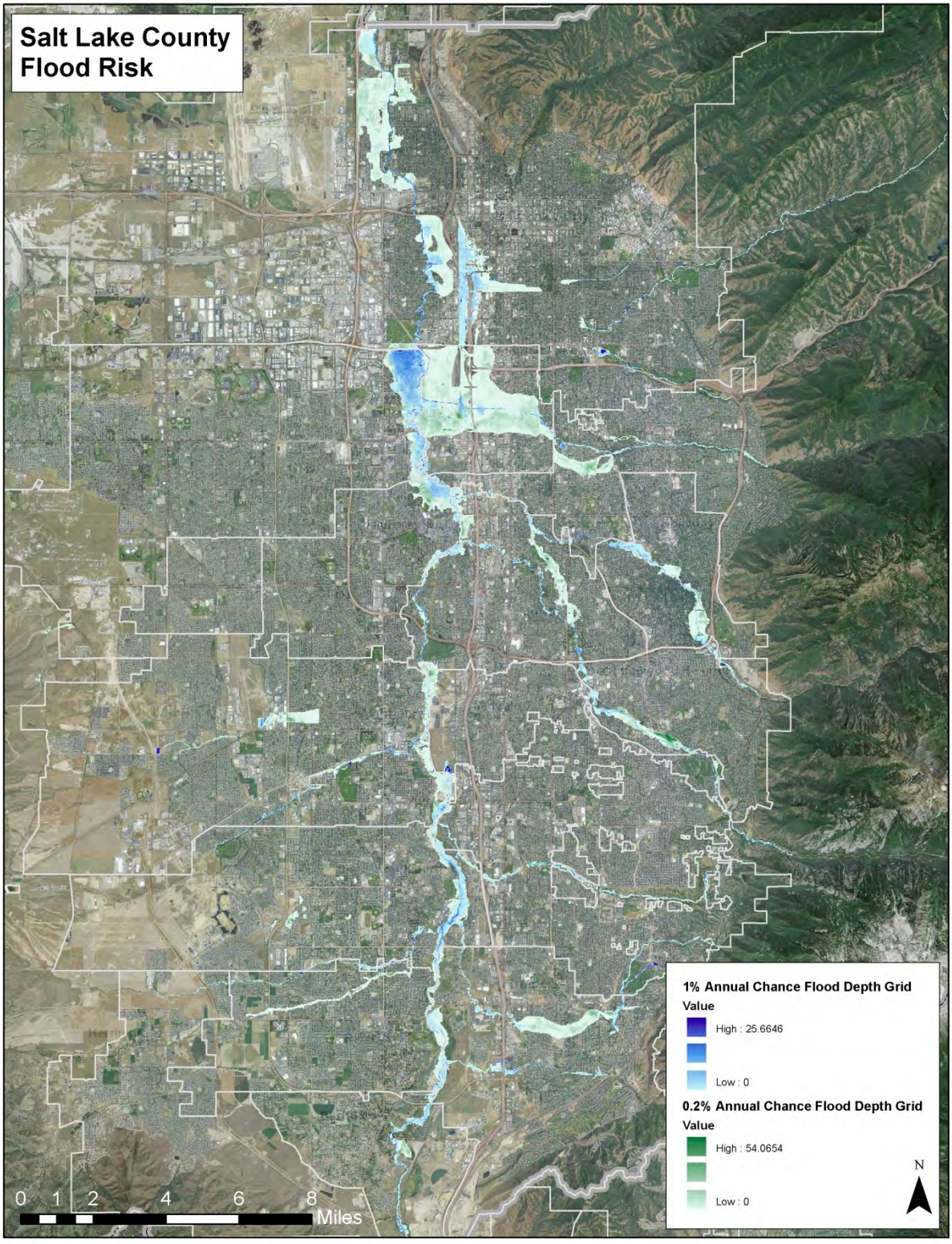


Map 8.



Map 9

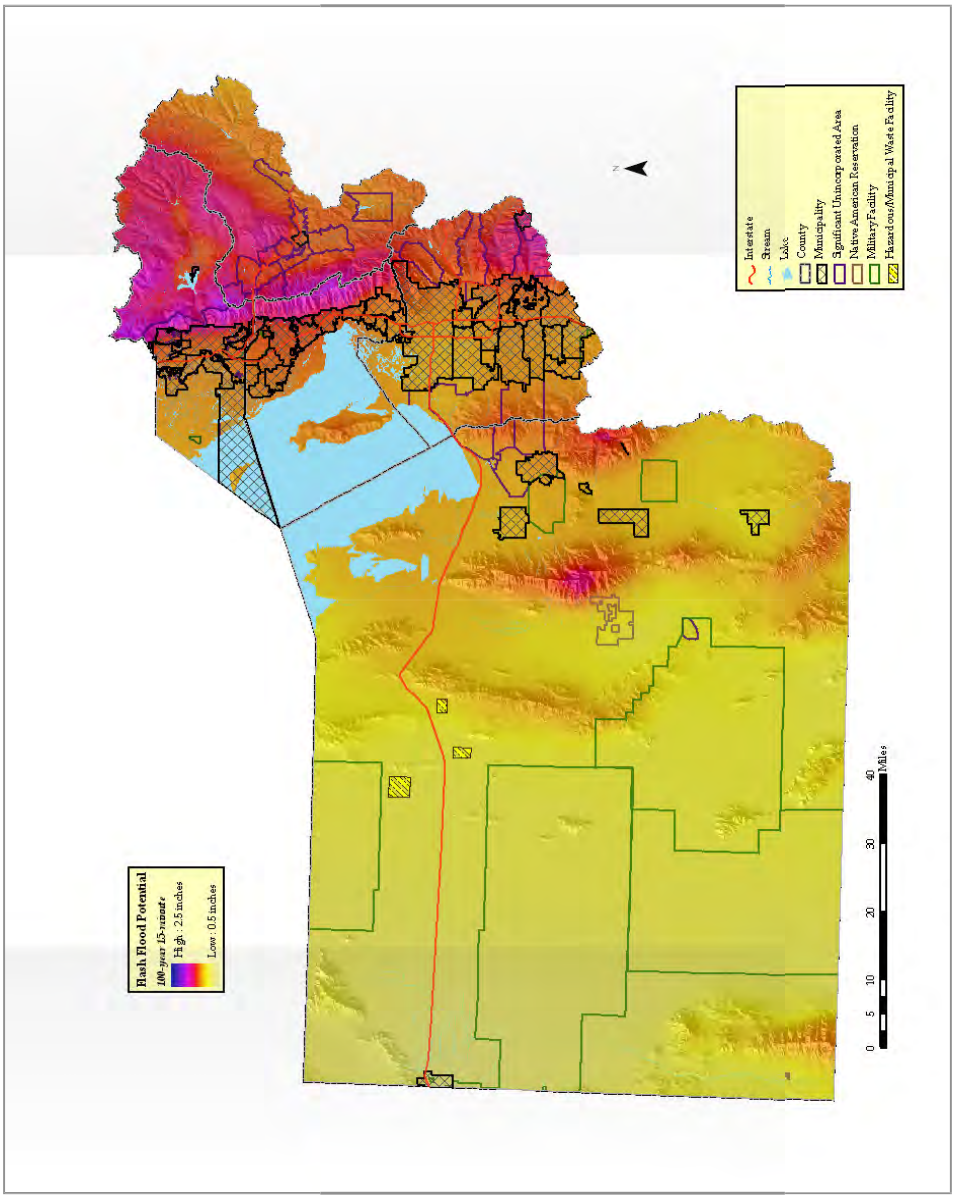
The following vulnerability assessment data for flooding in Salt Lake County (Tables 17 through 20) is carried over from the WFRC Pre-Disaster Mitigation Plan and was obtained from HAZUS-MH**. Vulnerability was assessed for both 100-year (NFIP Zone A) and 500-year (NFIP Zone B or Zone X (shaded) flood events. Analysis was completed using Digital Flood Insurance Rate Maps (DFIRM). Only streams that contained detailed flood cross-section data could be used. Flooding from the Great Salt Lake was not included. Consequently, the results should be considered conservative. (***For a more detailed explanation of the loss estimation methodology of HAZUS-MH MR2, please see Part VI of the WFRC Mitigation Plan or the HAZUS-MH Technical Manual (Flood Model) at www.fema.gov/hazus).*


Salt Lake County
Flood Risk
1% Annual Chance Flood Depth Grid
Value
High : 25.6646
Low : 0
0.2% Annual Chance Flood Depth Grid
Value
High : 54.0654
Low : 0
N
0 1 2 4 6 8
Miles

Map 10.

	Acres Flooded	Population Displaced	Number of Structures in Floodplain	
			Residential Units (Total Losses)	Commercial/Industrial Units (Total Losses)
100-year Flood	990.6	410	68 $15,367,860	46 $69,040,100
500-year Flood	1285.1	1,599	394 $143,637,730	57 $83,899,300

Table 13. Riverton City Flood Hazard



Map 11-FF Regional Flash Flood Hazard (Source: NWS Hydrometeorological Design Studies Center)

4.2.4. Landslide and Slope Failure

Slope failure is any type of ground disturbance on a surface with any slope, not flat ground. Landslides, also referred to as slope failures, are classified according to the type of movement and material involved. Movement types include falls, topples, slides, lateral spreads and flows. Materials include rocks, debris (coarse-grained soil), and earth (fine-grained soil). The most common landslides in Utah include rack falls, rock topples, debris slides, debris flows, earth slides, and earth flows (UNHH 2008).

A landslide is a mass of earth or rock that moves downslope by flowing, spreading, sliding, toppling or falling. Landslides are one of the most commonly occurring natural hazards in Utah. They are most common in areas having moderate to steep slopes, weak slope materials, and relatively wet climates. In these areas, most landslides are associated with precipitation events sustained above-average precipitation, individual intense rainstorms, or snowmelt events. Erosion, removal of vegetation by wildfires, and earthquake ground shaking increase the likelihood of landslides. Human activities such as grading of slopes or increasing soil moisture through landscape irrigation can also trigger landslides (UNHH 2008).

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. They can damage buildings, bridges, roads, railroads, and pipelines. (UNHH 2008).

Earth slides and flows are composed of fine-grained material, but earth flows contain more water than earth slides. Earth slides and flows vary in size, including some of the largest past earth slides in Utah. Like other landslides, they can damage anything in their path (UNHH 2008).

Slumps are common along road embankments and river terraces. They slip or slide along a curved plane away from the upper part of a slope, leaving a scarp. They generally do not move far from the source area.

Landslide distribution is dependent on geology, topography, and climate. They are most numerous in the Middle Rocky Mountains physiographic providence and in the High Plateaus section of the Colorado Plateau province. Weak rock types, steep slope gradients and relatively abundant precipitation are primary contributors to land sliding. Vegetative cover, slope aspect, and ground shaking from earthquakes can also influence slope stability (UNHH 2008). Nearly all landslides in Utah are reactivations of pre-existing landslides. Risk can be reduced by avoiding and/or stabilizing landslides (UNHH 2008).

Landslide and slope failure Hazard Profile

Potential Magnitude			Probability		
		Catastrophic (>50%)			Highly Likely
		Critical (25-50%)			Likely
	X	Limited (10-25%)		X	Possible
		Negligible (< 10%)			Unlikely
Location	Generally along channel slopes near Jordan River and in Foothills area				
Seasonal Pattern	Spring and summer months.				
Conditions	Usually caused by the stress release of over-weighted soils or loosening of rock and debris by wind, water or ground shaking.				
Duration	*Landslides/Rock falls:* Hours to Months. *Debris flows*: Instantaneous.				
Secondary Hazards	Flooding (natural dams), traffic accidents.				
Analysis Used	Information and maps provided by UGS, UDEM, AGRC.				

Profile3.

Location and Extent

Landslides and debris flows are most common in the foothills area west of 4800 West and along the bench above the Jordan River.

History

There is no significant reported history of Landslides in Riverton.

Vulnerability Assessment

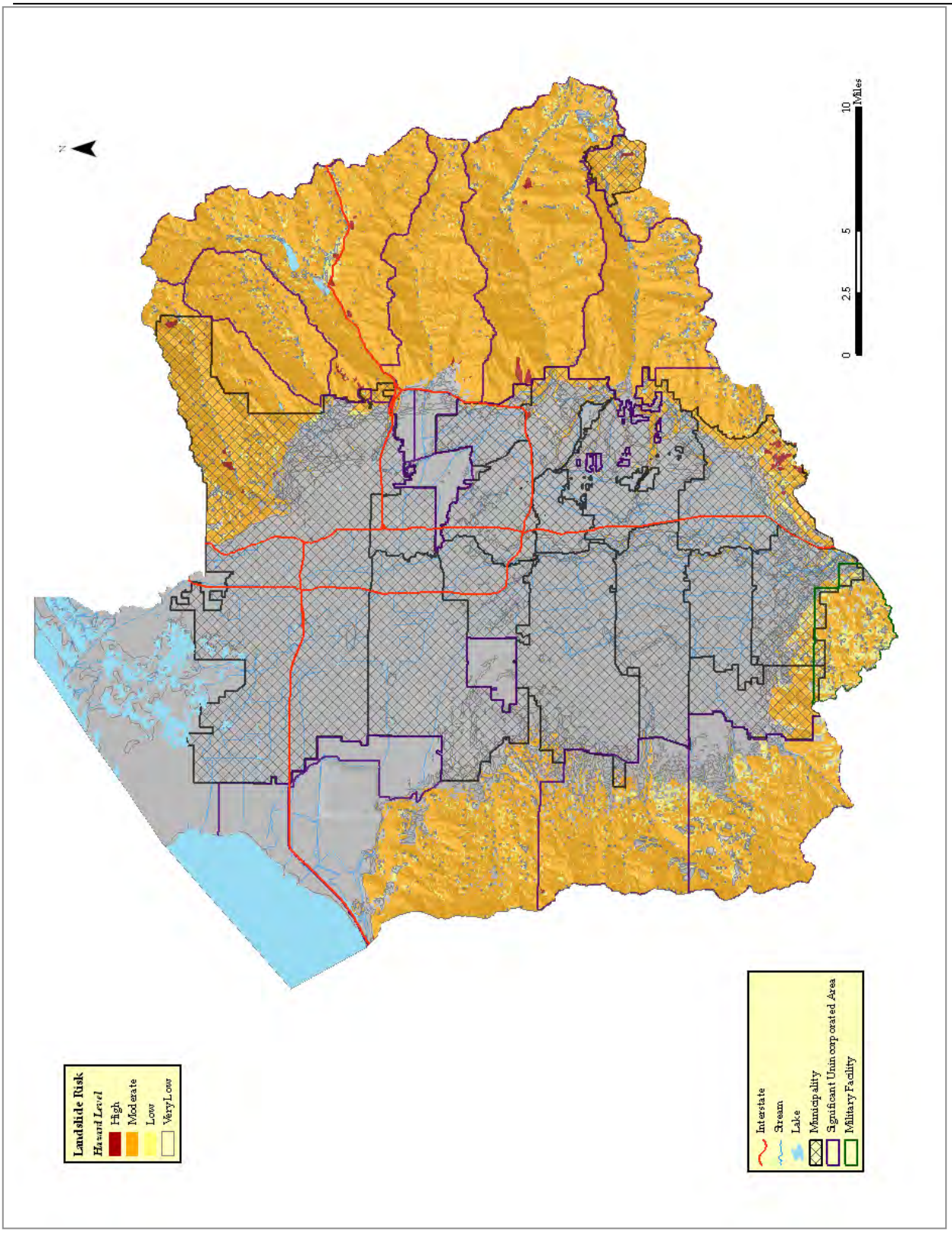
Table 26 estimates infrastructure vulnerable to landslides in Riverton. Provided are the number of units or total length of infrastructure vulnerable and the estimated replacement costs as provided by HAZUS-MH lost estimation software. Table 27 estimates the total area, population, and buildings vulnerable to landslides for individual cities. Table 28 examines the same for unincorporated areas. This data is carried over from the 2009 WFRC plan due to time constraints and minimal concern about change in hazard risk.

Item	Length (Miles) or Number of Units	Replacement Cost
Black Ridge Reservoir	1 Reservoir and Dam	????
Lovers Lane	1 mile	$800,000
Water Distribution Lines	1 miles	$530,000
Sewer Lines	1 miles	$316,800
Total Estimated Infrastructure Replacement Cost		**?????**

Table 14. Infrastructure Vulnerable to Landslides, Riverton

Areas	Acres Affected	Population Affected	Structures in Areas of Moderate or Greater Hazard	
			Residential (Replacement Value)	Commercial (Annual Sales)
Riverton	87	422	102 $20,869,200	2 $120,490

Table 15. Vulnerability Assessment for Landslides, Riverton



Map 12. Salt Lake County Landslide Hazard (Giraud and Shaw 2007)

4.2.5. Severe Weather

Severe Storms: Severe storms can include thunderstorms, lightning, hailstorms, heavy snow or rain. These storms are generally related to high precipitation events during the summer and winter months and can happen anywhere in the region. Damage can be extensive especially for agriculture, farming, and transportation systems; they can also disrupt business due to power outages.

Severe Thunderstorms: Severe thunderstorms are storms that either produce tornadoes, winds 58 mph or greater, wind damage, and/or hail three-quarters of an inch or larger in diameter. Thunderstorms can also lead to flash flooding from heavy rainfall.

Strong, rising air currents bring warm, moist air from the surface into the upper atmosphere where it condenses forming heavy rains, hail, strong winds and lightning. Based on historical evidence thunderstorms can strike anywhere in the region, mainly during the spring and summer months. Much of the valley's development has occurred on old alluvial fans from the canyon mouths. During heavy rain events, water and debris collect on these same alluvial fans, damaging residential, commercial property and infrastructure.

Hailstorms: Hailstorms occur when freezing water (in thunderstorm clouds) accumulates in layers around an icy core generally during the warmer months of May through September. Hail causes damage by battering crops, structures and automobiles. When hailstorms are large, damage can be extensive, especially when combined with high winds.
Heavy Precipitation: Heavy amounts of precipitation from rain or snow can result in flash flood events. The Wasatch Front has been susceptible to these types of storms because of close proximity to the mountain ranges.

Tornado: (Map 8-5) A tornado is a "violently rotating column of air extending from a thunderstorm to the ground". Some tornadoes can have wind speeds greater than 250 mph with a damage zone 50 miles long and greater than a mile wide. Although they are less common in the Intermountain Region, an average of 3 tornadoes per year occurs in Utah. Examples are the Salt Lake City tornado August 11, 1999 and the Manti tornado in 2002. Most tornadoes in Utah

Great Salt Lake, September 12th, 1998 – Waterspout *(Photo: KTVX News 4)*

Salt Lake City Tornado, August 11, 1999 – Orange fireball is a power sub-station exploding (*Photo:*

typically have winds less than 110 mph (F2 or smaller), and no wider than 60 feet and are on the ground no longer than a few minutes.

Historically, atmospheric conditions have not been favorable for tornado development in Utah due to a dry climate and mountainous terrain. Utah is one of the lowest ranked in the nation for incidences of tornadoes with only one F2 or stronger tornado every seven years. Utah averages about two tornados per year, which typically occur between May and August.

Despite this fact, interactions of the relatively cool air of the Great Salt Lake and relatively warm air of urban areas could create situations more favorable for tornado development. This phenomenon possibly contributed to the formation of the August 1999 Salt Lake City tornado (Dunn and Vasiloff 2001). The $170 million in damages caused by this tornado make it the costliest disaster in Salt Lake County history.

Tornado distribution for the region (Map 13) suggests many tornadoes are funnel clouds aloft coming into contact with the increasing elevation of the region's foothills and mountains.

Lightning: Lightning is the electric discharge between clouds or from a cloud to the earth. Lightning casualties occur most frequently during the summer monsoonal flow in July and August. Lightning is consistently one of the top three causes of weather-related deaths in the country, claiming more lives on average than tornadoes. In the U.S., an average of 400 individuals are struck by lightning per year, and an average 67 lives are lost per year.

Lewis Peak, North Ogden, Utah, August 8th, 2003 – Lightning *(Source: Utah's Weather and Climate, Photo*

In Utah, lightning causes the highest number of weather-related fatalities (NWS 2008). Lightning has claimed 65 (61 according to UHMP, +42 injuries) lives in Utah since 1950, more than any other thunderstorm-related hazard. 8 of those fatalities were within Salt Lake County.

Lightning is also the primary cause of wildland fires in Utah (NWS 2008), which could cause casualties or be disruptive to the economy. $4-5 billion is lost each year due to structural and wildland fire ignitions, and an additional $2 billion in costs to airline operations and passenger delays (UNHH 2008).

High winds: High winds can occur with or without the presence of a storm and are unpredictable in regards to time and place. Salt Lake County has experienced high winds in the past, and can expect future events.

Straight-line winds produced by thunderstorms are any winds not associated with the rotation of a tornado. Straight-line winds are responsible for most thunderstorm wind damage, and speeds can exceed 125 mph. Other damaging winds originating from thunderstorms include downbursts and microbursts. Utah has also experienced down slope wind events, which occur when wind generated as a deep layer of air is forced over a barrier. Winds accelerate down mountain slopes and generate high winds in a wave region formed at the base of the terrain. A down slope windstorm in December 2011 generated numerous reports of 60-80 mph winds, and maximum

gusts of 80-100 mph in the Bountiful/Centerville area, resulting in loss of power and significant damage in the region (NWS 2012, Definitions for Severe Weather).

Wasatch Front, April 4-6, 1983 – 70 mph
"East Winds" derailed this train in the Lagoon area.
Peak gusts were recorded at 104 mph.

Canyon winds can bring wind gusts greater than 100 mph through the canyon mouths into the populated areas of the Wasatch Front. Winds are usually strongest near the mouths of canyons and have resulted in the loss of power and the inability to heat homes and businesses. Winds have also damaged roofs, destroyed and knocked down large trees and fences, overturned tractor trailers and railroad cars, and downed small airplanes.

Winter Storms: Winter storms can pose a significant threat due to vehicle traffic accidents on icy roads, prolonged exposure to cold, damage to electrical, telephone or communication systems from ice or heavy snow accumulation, and indirectly related health threats such as individuals suffering heart attacks while shoveling snow. Prolonged exposure to cold can cause frostbite or hypothermia and can become life threatening. Winter weather can also have significant economic costs associated with snow removal, revenue and wage losses from road and airport delays or closures, flooding damage from rapid snowmelt, and agricultural and timber losses from frost and ice (UNHH 2008).

Fog: Temperature inversions often occur during the winter months as a result of high pressure trapping cold air in the valley. These inversions keep cold, moist air trapped on the Wasatch Front valley floor forming super-cooled fog. This fog can cause visibility restrictions and icy surfaces. Wind is needed to clear the inversion and fog. The Great Salt Lake has been shown to affect the prevalence of fog, especially when lake levels are high (Hill 1987).

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 Riverton, 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		**Catastrophic (>50%)**	**Probability**	X	**Highly Likely**
		Critical (25-50%)			**Likely**
	X	**Limited (10-25%)**			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Occur in localized areas throughout the county. 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.				

Profile 4.

Location and Extent

Every Year Riverton experiences various events related to severe weather. The majority of these events are mitigated as a part of ongoing routine maintenance activities. Table 26 lists activities which exceeded these criteria.

Salt Lake County Weather Damage by Event								
Year	Dense Fog	Flash Flood	Flood	Heavy Snow/ Winter Storm	High Wind	Thunderstorm/ Wind	Wildfire	Total
2007			$10,000	$30,000				$40,000
2010	$0	$0	$150,000	$0	$0	$150,000		$300,000

Table 16. Provided by Riverton City

Frequency/Likelihood of Future Occurrence—
Highly Likely—Near 100 percent chance of occurrence in next year or happens every year.

4.2.6. 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	*X*	**Catastrophic (>50%)**	**Probability**		**Highly Likely**
		Critical (25-50%)			**Likely**
		Limited (10-25%)		X	**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Black Ridge Reservoir, 3200 West Bangerter Highway Irrigation Pond, 4200 West 13600 South Irrigation Pond. (Map 15. Salt Lake County Dam Failure Hazard)				
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.				

Profile 5.

Location and Extent

There are 3 dams located in Riverton. These dams were built and are maintained by the Riverton City Water Department, They serve various functions such as flood control, water storage, and recreation. Two dams are owned solely by the City and Black Ridge Reservoir is jointly owned with Herriman City. It is the City's responsibility to maintain these dams, 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

Name	Rating
Riverton City – 3200 West Pond	High
Riverton City – 4200 West Pond	High
Riverton City – Black Ridge Reservoir	High

Table 17. High and Moderate Hazard Dams, Riverton *(Source: Utah Division of Water Rights)*

History

There is no record of dam failure incidents within Riverton.

Vulnerability Assessment

A Standard Operation Procedures and Emergency Action Plan has been developed for the 3200 West and 4200 West Irrigation Ponds. Copies of these plans are located at the Riverton City Water Shop located at 3323 Sanborn Drive and the Riverton City Public Works Building located at 12526 South 4150 West.

For the Black Ridge Reservoir there is an Operation Plan entitled "Riverton City/ Herriman City Black Ridge Reservoir Standard Operating Procedures and Emergency Action Plan". Copies of the plan can be found at the following locations:
Riverton City Public Works Building located at 12526 South 4150 West
Riverton City Water Shop located at 3323 Sanborn Drive
Riverton City Hall (City Manager's Office) located at 12830 South Redwood Rd

Due to the complexity and eminent disaster associated with a failure of the Black Ridge Dam, selected maps and flow charts from the plan have been added to this document for quick reference. This plan outlines the procedures and protocol for emergencies and contains the list of important contacts. Below are excerpts from the plan including contacts, and inundation maps.

2.1 Dam Administrator (Owner Responsibilities)

2.1.1 Conditions and Events Requiring Emergency Action

Riverton City is the owner of the dam and is responsible for monitoring, coordinating, and determining what events require emergency action. The City may consult with other entities on action to be taken. Section - 3 includes a discussion of possible emergency conditions along with action to be taken and the corresponding state of urgency.

2.1.2 Emergency Contact Communication

As shown on the Figure 1-1 Imminent Dam Failure Notification Flow Chart and Figure 1-2 Warning Notification Flow Chart, the Black Ridge Reservoir Dam Administrator is responsible for initiating emergency contact communication after contacted by the observer of a possible emergency situation. In order to efficiently and clearly communicate the emergency situation, the number of contacts to be made has been limited. If the observer is not able to contact appropriate City officials then the observer should contact the Salt Lake County Sheriff Department directly. Notification procedures should be followed as described in Section 3.5.

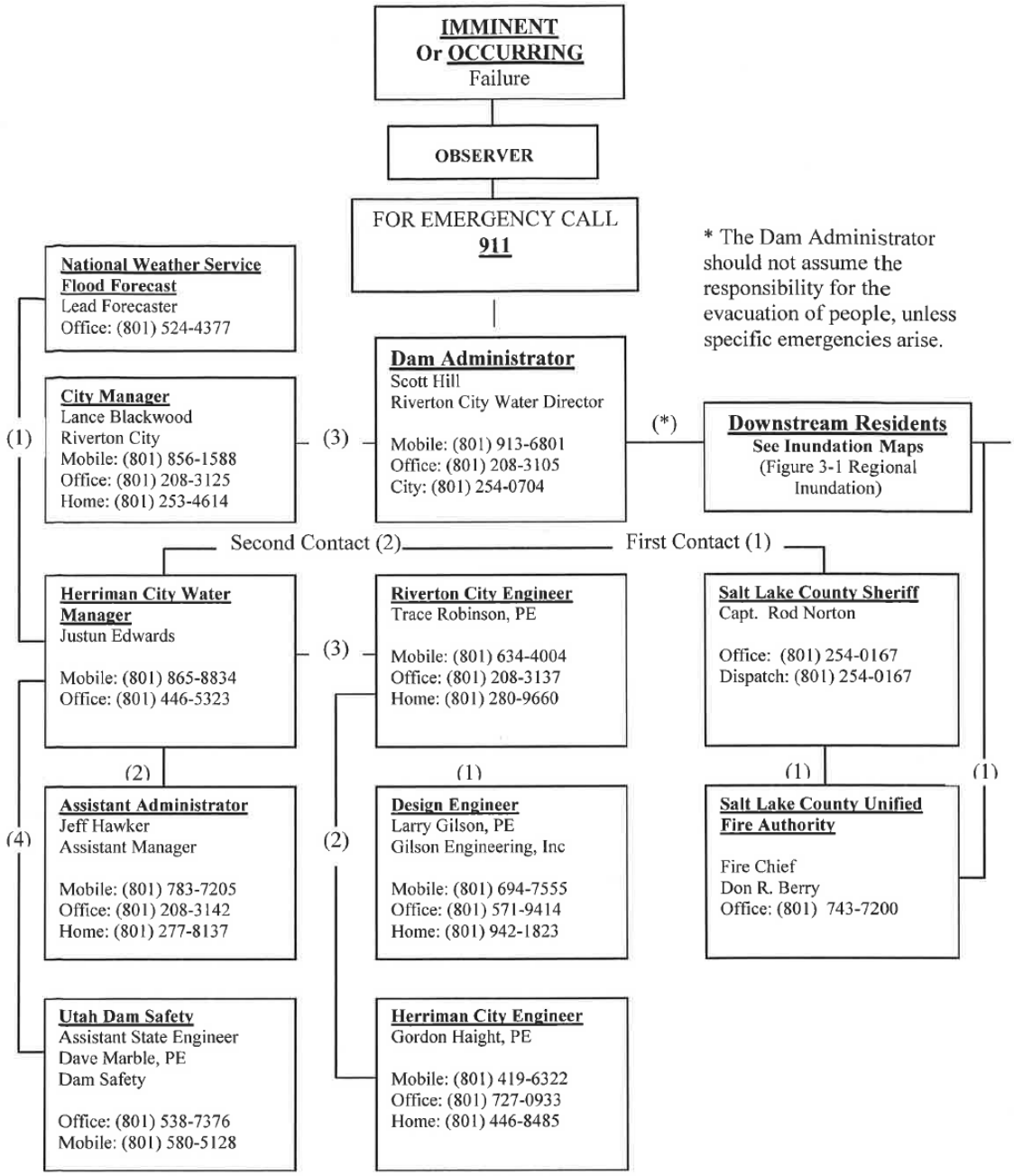


Figure 1-1 Imminent Dam Failure Notification Flow Chart

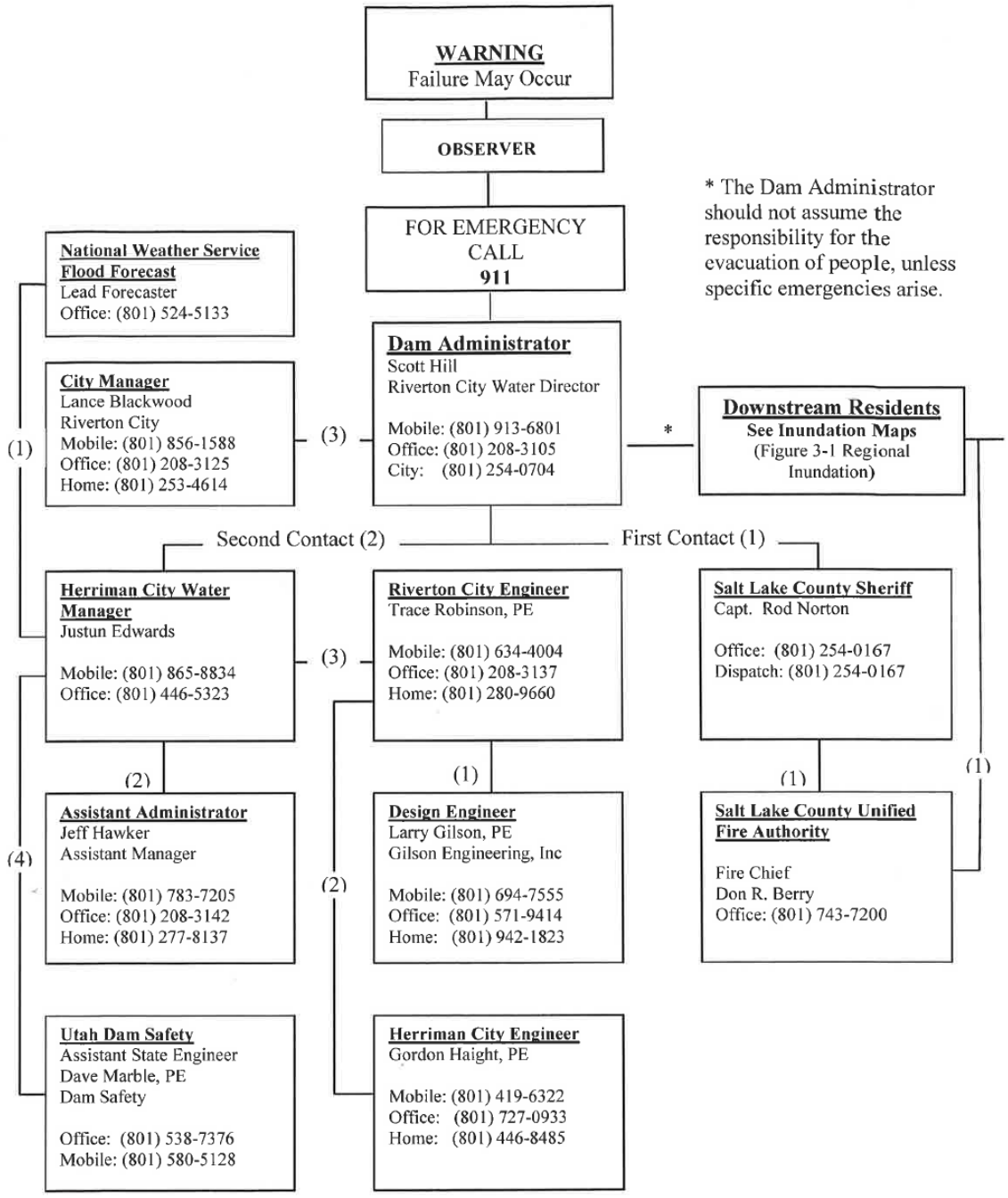
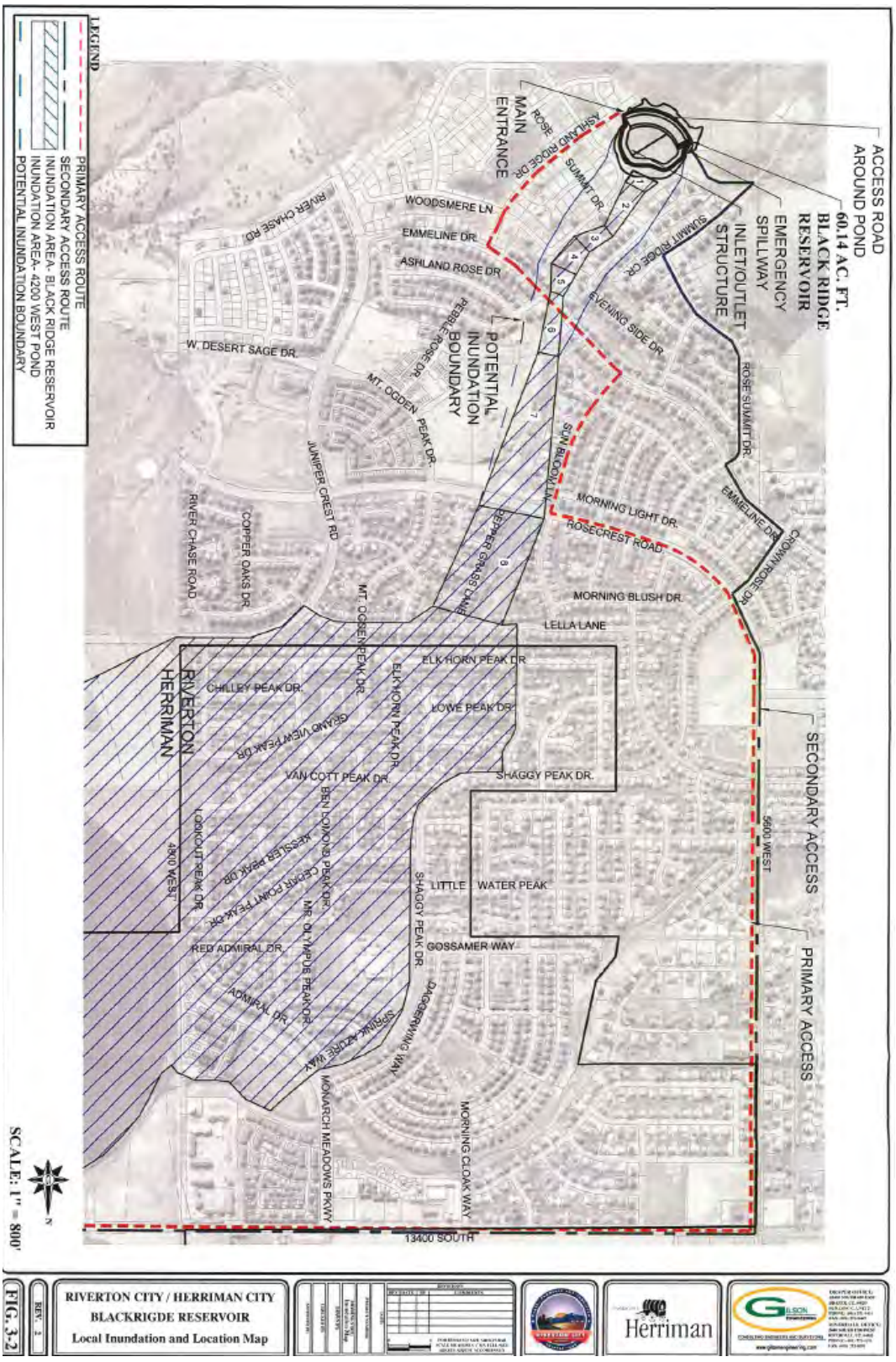
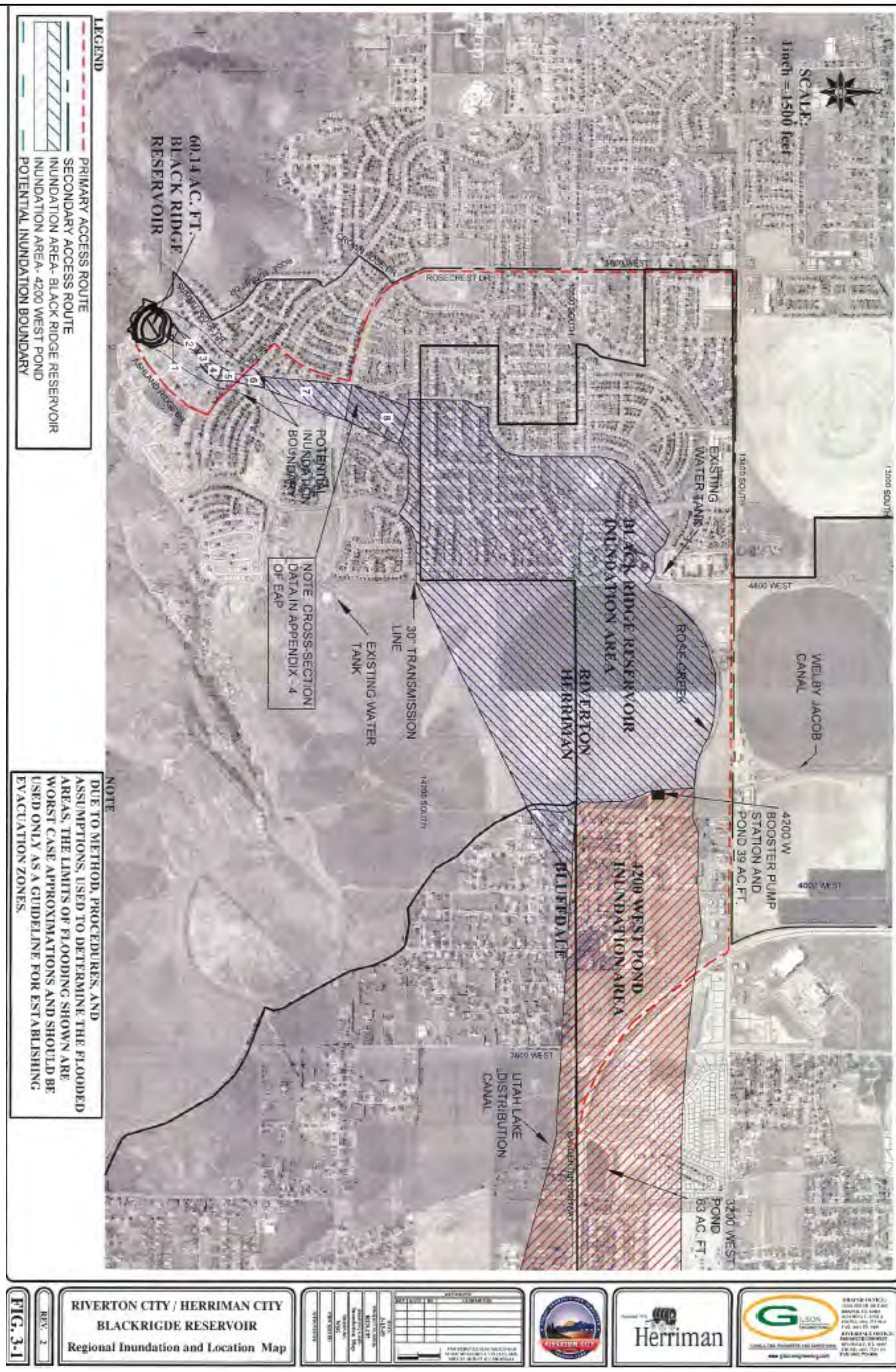


Figure 1-2 Warning Notification Flow Chart


LEGEND
PRIMARY ACCESS ROUTE
SECONDARY ACCESS ROUTE
INUNDATION AREA- BLACK RIDGE RESERVOIR
INUNDATION AREA- 4200 WEST POND
POTENTIAL INUNDATION BOUNDARY
ACCESS ROAD AROUND POND
60.14 AC. FT. BLACK RIDGE RESERVOIR
EMERGENCY SPILLWAY
INLET/OUTLET STRUCTURE
MAIN ENTRANCE
POTENTIAL INUNDATION BOUNDARY
SECONDARY ACCESS
PRIMARY ACCESS
RIVERTON
HERRIMAN
WOODSMERE LN
EMMELINE DR.
ASHLAND ROSE DR
ROSE
ASHLAND ROSE DR.
SUMMIT DR.
SUMMIT RIDGE CR.
EVENING SIDE DR.
ROSE SUMMIT DR.
RIVER CHASE RD.
W. DESERT SAGE DR.
PEBBLE ROSE DR.
MT. OGDEN PEAK DR.
JUNIPER CREST RD
SUN BLOSSOM LN
MORNING LIGHT DR.
ROSECREST ROAD
CROWN ROSE DR.
RIVER CHASE ROAD
COPPER OAKS DR.
BEEPER GRASS CIR.
MORNING BLUSH DR.
LELLA LANE
ELK HORN PEAK DR
CHILLEY PEAK DR.
LOWE PEAK DR.
GRAND VIEW PEAK DR.
VAN COTT PEAK DR.
SHAGGY PEAK DR.
5600 WEST
4800 WEST
LOOKOUT PEAK DR.
BEN NOMOND PEAK DR.
KESSLER PEAK DR.
CEDAR POINT PEAK DR.
LITTLE WATER PEAK
SHAGGY PEAK DR.
GOSSAMER WAY
MR. OLYMPUS PEAK DR.
RED ADMIRAL DR.
ADMIRAL DR.
SPRUNK RENSE WAY
DAGGERWING WAY
MONARCH MEADOWS PKWY
MORNING CLOAK WAY
13400 SOUTH
SCALE: 1" = 800'
FIG. 3-2
RIVERTON CITY / HERRIMAN CITY
BLACKRIGDE RESERVOIR
Local Inundation and Location Map
Herriman

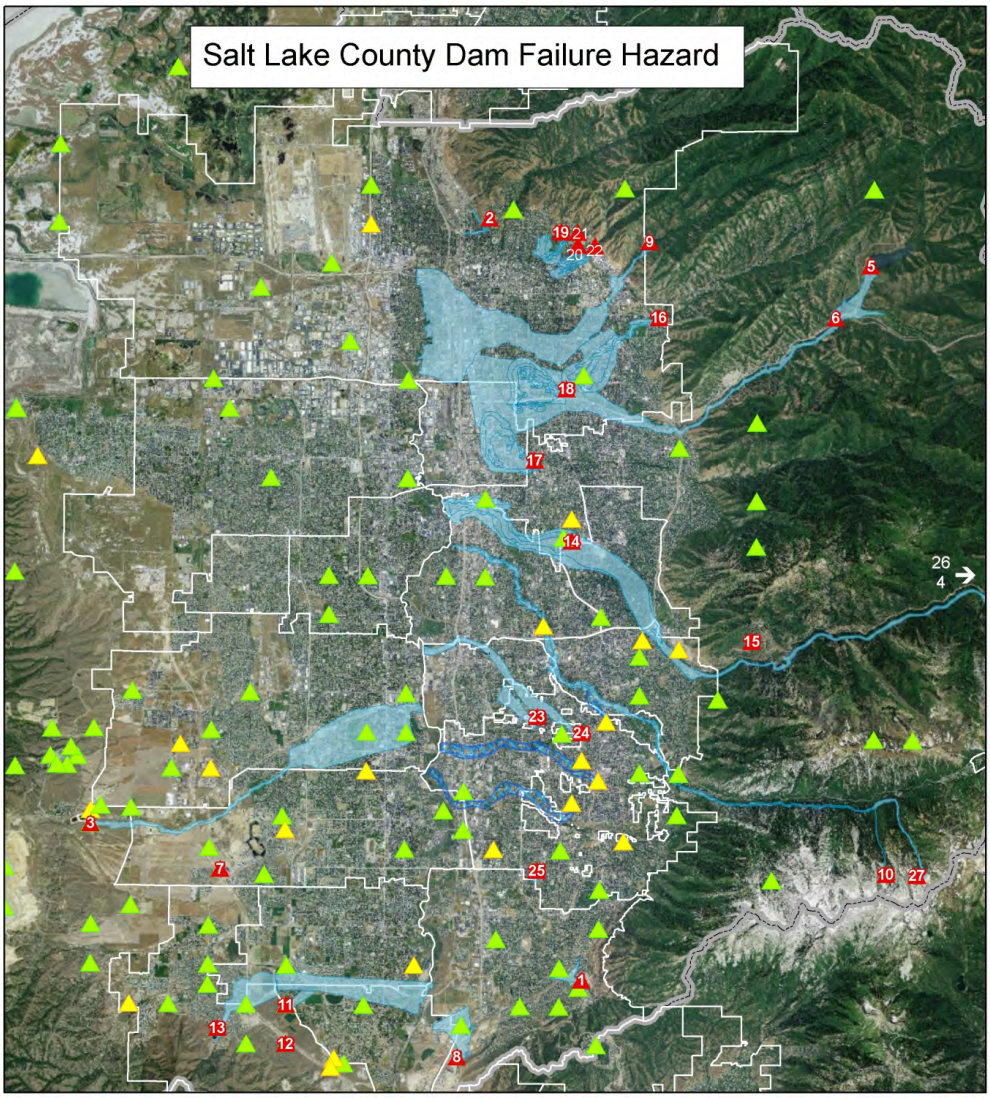

SCALE: 1inch = 1500 feet
LEGEND
PRIMARY ACCESS ROUTE
SECONDARY ACCESS ROUTE
INUNDATION AREA- BLACK RIDGE RESERVOIR
INUNDATION AREA- 4200 WEST POND
POTENTIAL INUNDATION BOUNDARY
60.14 AC. FT. BLACK RIDGE RESERVOIR
POTENTIAL INUNDATION BOUNDARY
NOTE: CROSS-SECTION DATA IN APPENDIX - 4 OF EAP
EXISTING WATER TANK
30" TRANSMISSION LINE
EXISTING WATER TANK
BLACK RIDGE RESERVOIR INUNDATION AREA
RIVERTON
HERRIMAN
ROSE CREEK
WELBY JACOB CANAL
4200 W BOOSTER PUMP STATION AND POND 39 AC. FT.
4200 WEST POND INUNDATION AREA
BLUFFDALE
UTAH LAKE DISTRIBUTION CANAL
3200 WEST POND 83 AC. FT.
ROSECREST DR.
4800 WEST
4000 WEST
13200 SOUTH
13400 SOUTH
14200 SOUTH
NOTE
DUE TO METHOD, PROCEDURES, AND ASSUMPTIONS, USED TO DETERMINE THE FLOODED AREAS, THE LIMITS OF FLOODING SHOWN ARE WORST CASE APPROXIMATIONS AND SHOULD BE USED ONLY AS A GUIDELINE FOR ESTABLISHING EVACUATION ZONES.
RIVERTON CITY / HERRIMAN CITY
BLACKRIGDE RESERVOIR
Regional Inundation and Location Map
FIG. 3-1
REV. 2
Herriman

Maps 13 & 14

Below is the estimated damage for failure of the dams within Riverton City.

Incorporated Areas	Acres Affected	Population Affected	Structures in Inundation Areas	
			Residential (Replacement Value)	Commercial (Annual Sales)
Riverton	853	3,710	969 $198,257,400	28 $14,217,055

Table 19. Vulnerability Assessment for Dam Failure, Incorporated Salt Lake County



Map 15. Dam Hazard Map, Salt Lake County (Utah Division of Water Rights 2013)

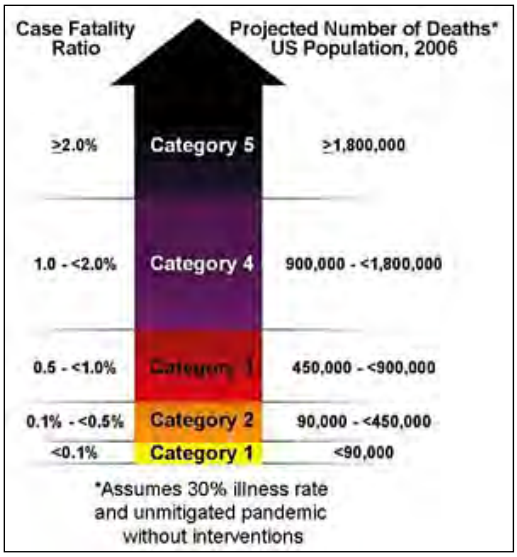
4.2.8. Public Health Epidemic/Pandemic

A pandemic is a worldwide disease outbreak. 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.

Interventions* by Setting	Pandemic Severity Index 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		**Catastrophic (>50%)**	**Probability**		**Highly Likely**
	X	**Critical (25-50%)**		X	**Likely**
		Limited (10-25%)			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	May occur throughout the county. 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.				

Profile 7.

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. Many problems will come from having children dismissed from schools and childcare programs. There are 15,874 children less than 18 years old currently in school in Riverton City, accounting for 37.8% of the population. An additional 8,123 residents are enrolled in college. Dismissing students from school would directly disrupt the schedule of 68.9% 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. Additionally 24.5% are single/living alone; 5.1% are 65 years of age and older. Persons who live alone may be unable to follow isolation requirements if they need to acquire medications or shop for other essentials.

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 of the population)	20-40	20-40	20-40	20-40	20-40
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 20. Community Mitigation Plan, Appendix H to the Salt Lake Valley Health Department Pandemic Influenza Preparedness and Response Plan

*** 41997 = Riverton population, 2014 estimate, Utah Population Estimate Committee and the Governor's Office of Planning and Budget, 2008 Baseline Economic and Demographic Projections.**

4.2.9. 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).

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 21. 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 8-2) (NDMC 2006).

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	City wide.				
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.				

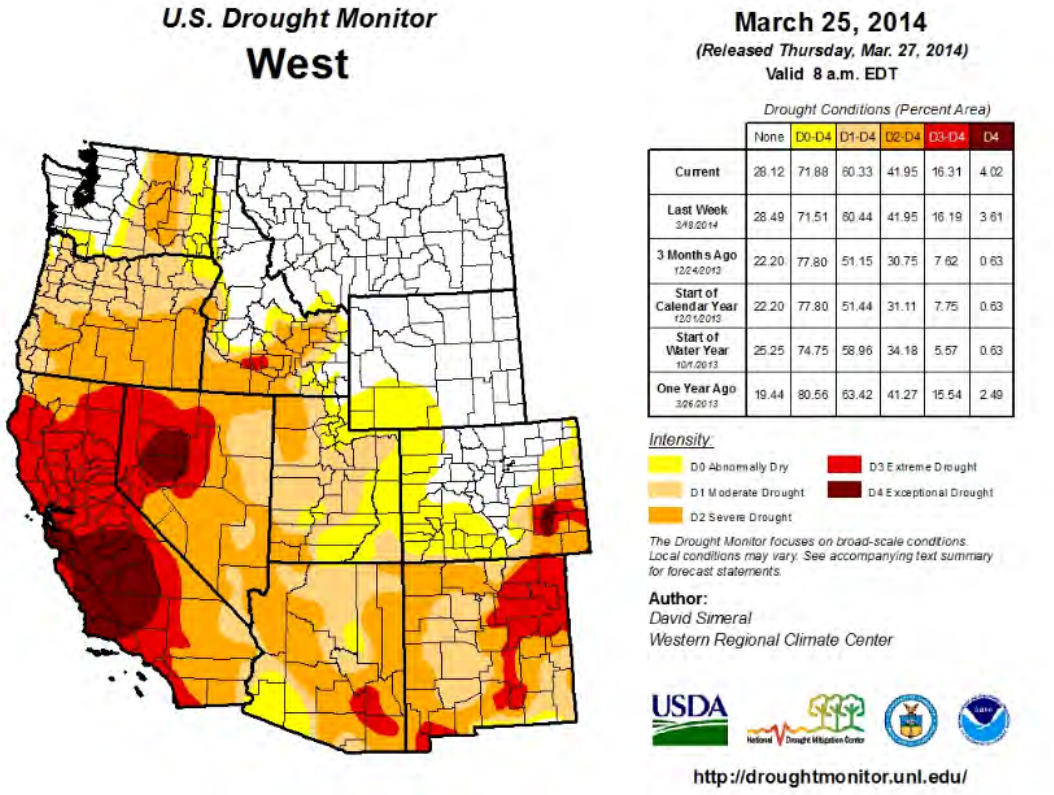
Profile 8.

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.

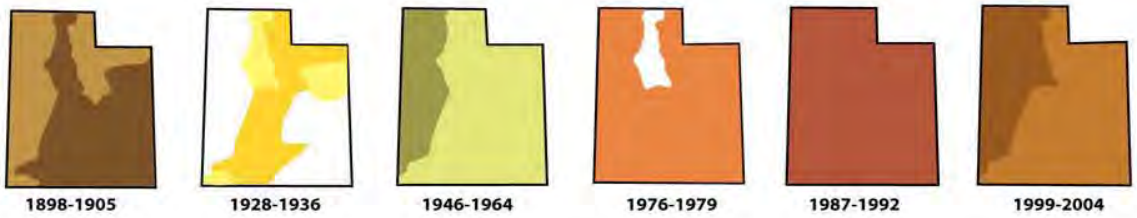
The most severe drought period in recorded history for the North Central and Northern Mountains regions occurred in 1934 at the height of the Great Depression and during the same drought period (1930 to 1936) that caused the “Dust Bowl” on the Great Plains. The longest drought period varies from 11 years 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
National Drought Mitigation Center
http://droughtmonitor.unl.edu/

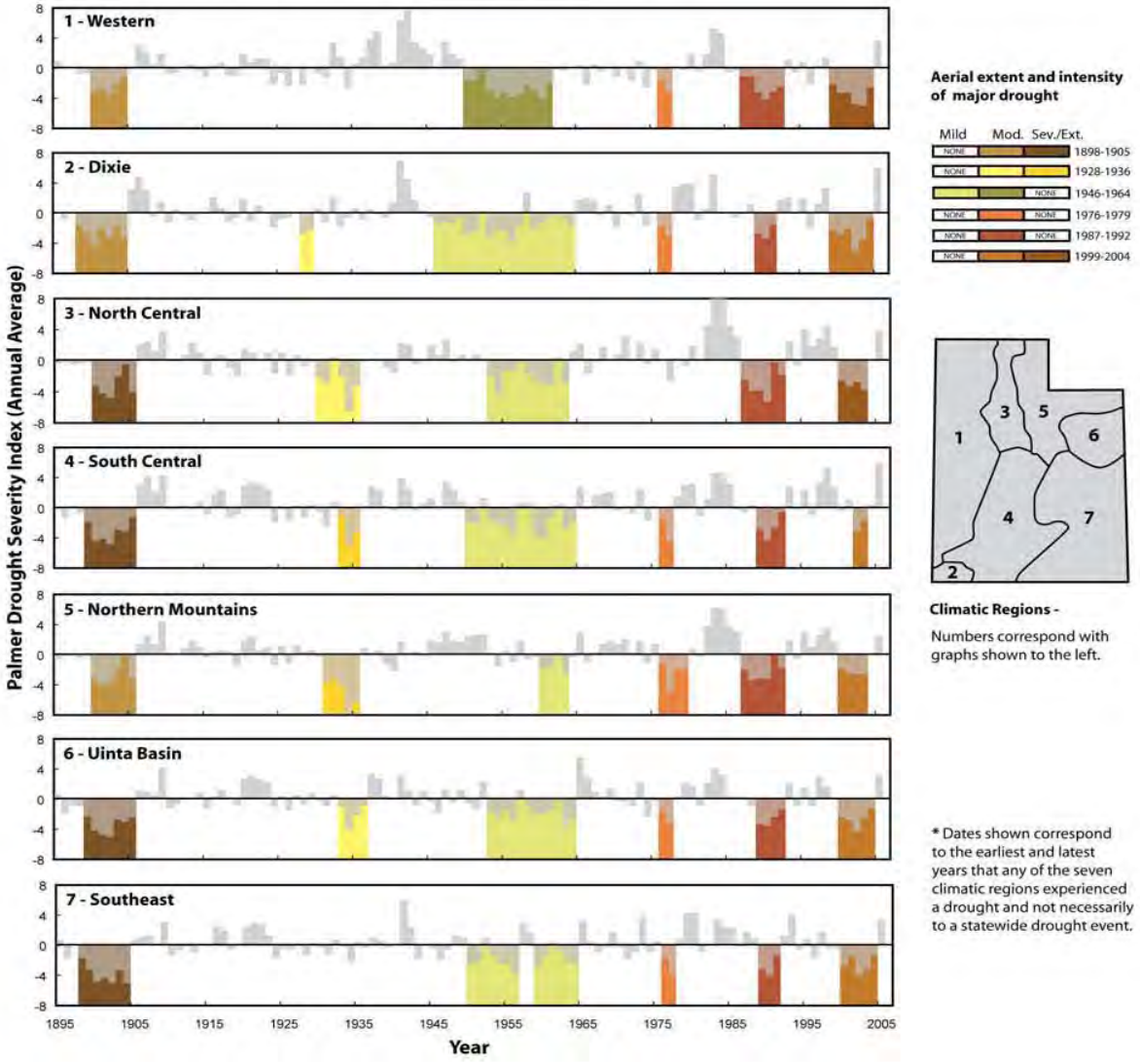
Map 15.

Recent Conditions

Areal Extent of Historical Drought Events *



Palmer Drought Severity Index by Region

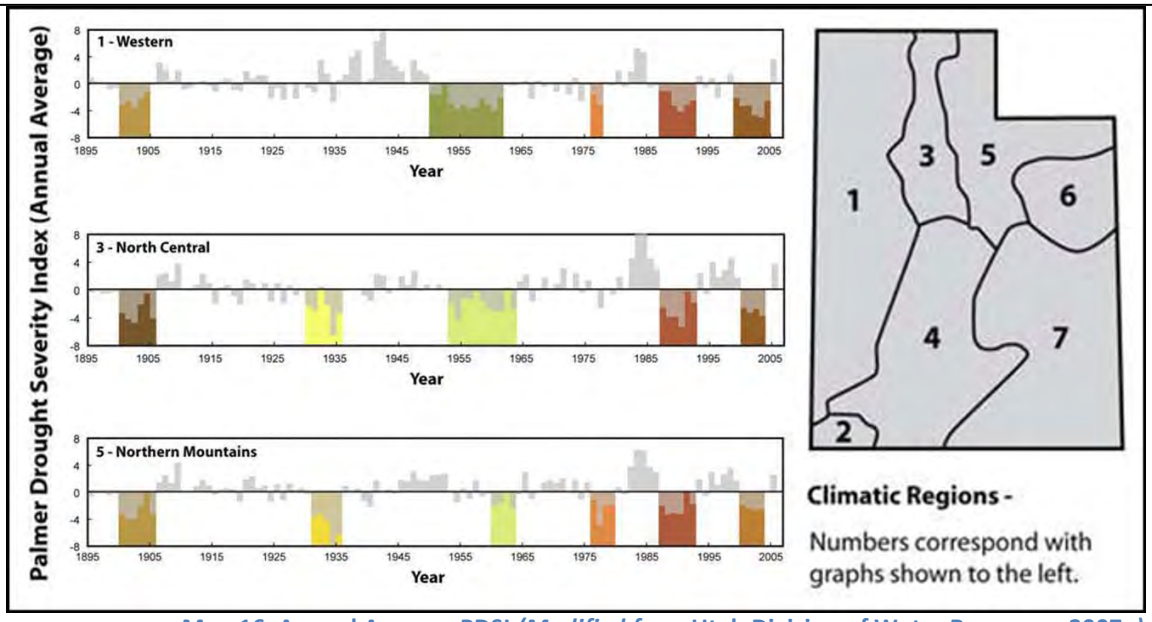


Aerial extent and intensity of major drought

Climatic Regions -

Numbers correspond with graphs shown to the left.

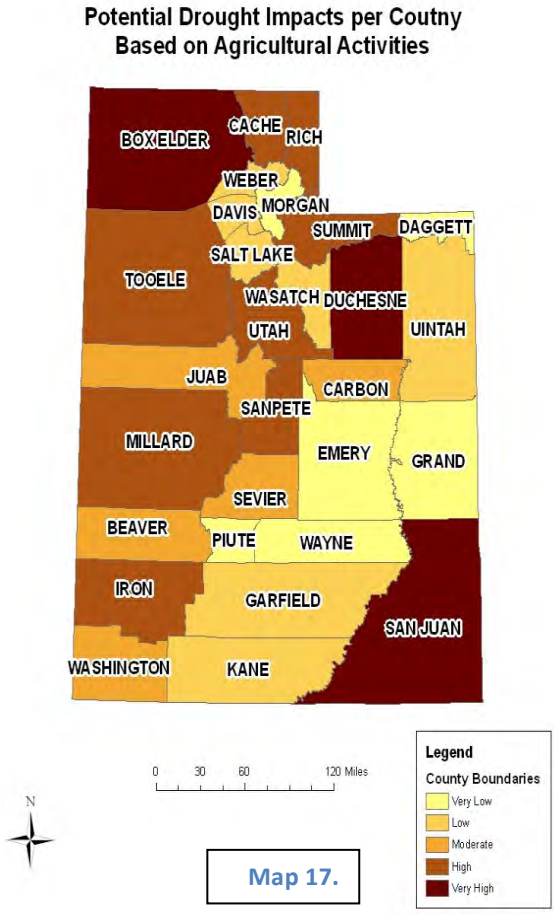
* Dates shown correspond to the earliest and latest years that any of the seven climatic regions experienced a drought and not necessarily to a statewide drought event.



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 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.



Map 17.

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)

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.

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.

4.2.10. 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			Probability		
		Catastrophic (>50%)			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).				

Profile 9.

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.

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).

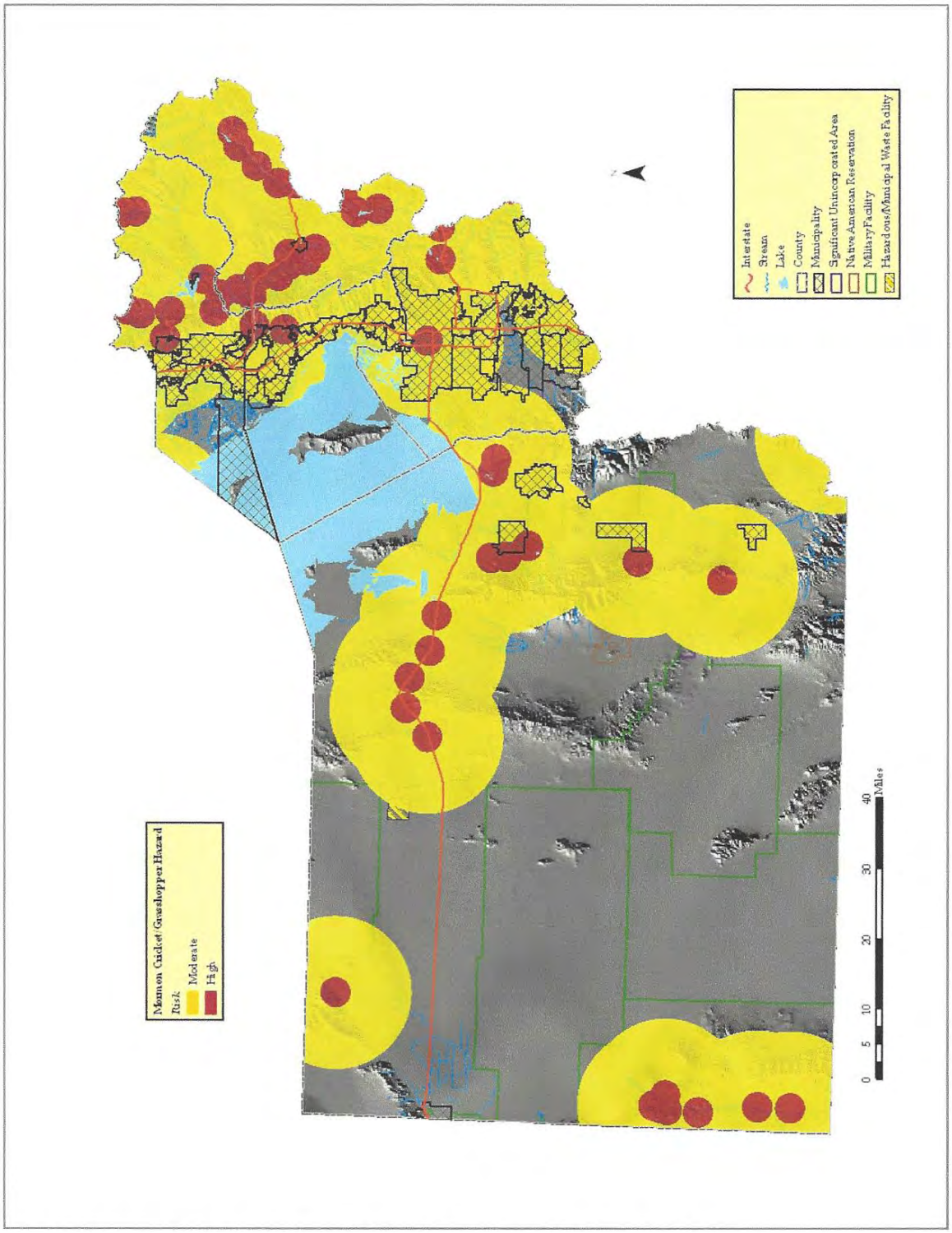
Africanized Honey Bee	European Corn Borer[3]	Grasshopper*[2]
Apple Maggot[1]	Egyptian Cottonworm[2]	Red Imported Fire Ant
Cherry Fruit Fly[1]	Silver Y Moth[2]	Black Imported Fire Ant
Asian Gypsy Moth[1]	False Codling Moth[1]	Mosquito/West Nile Virus*[2]
Rosy (Pink) Gypsy Moth[1]	North American Gypsy 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 22. 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.*"

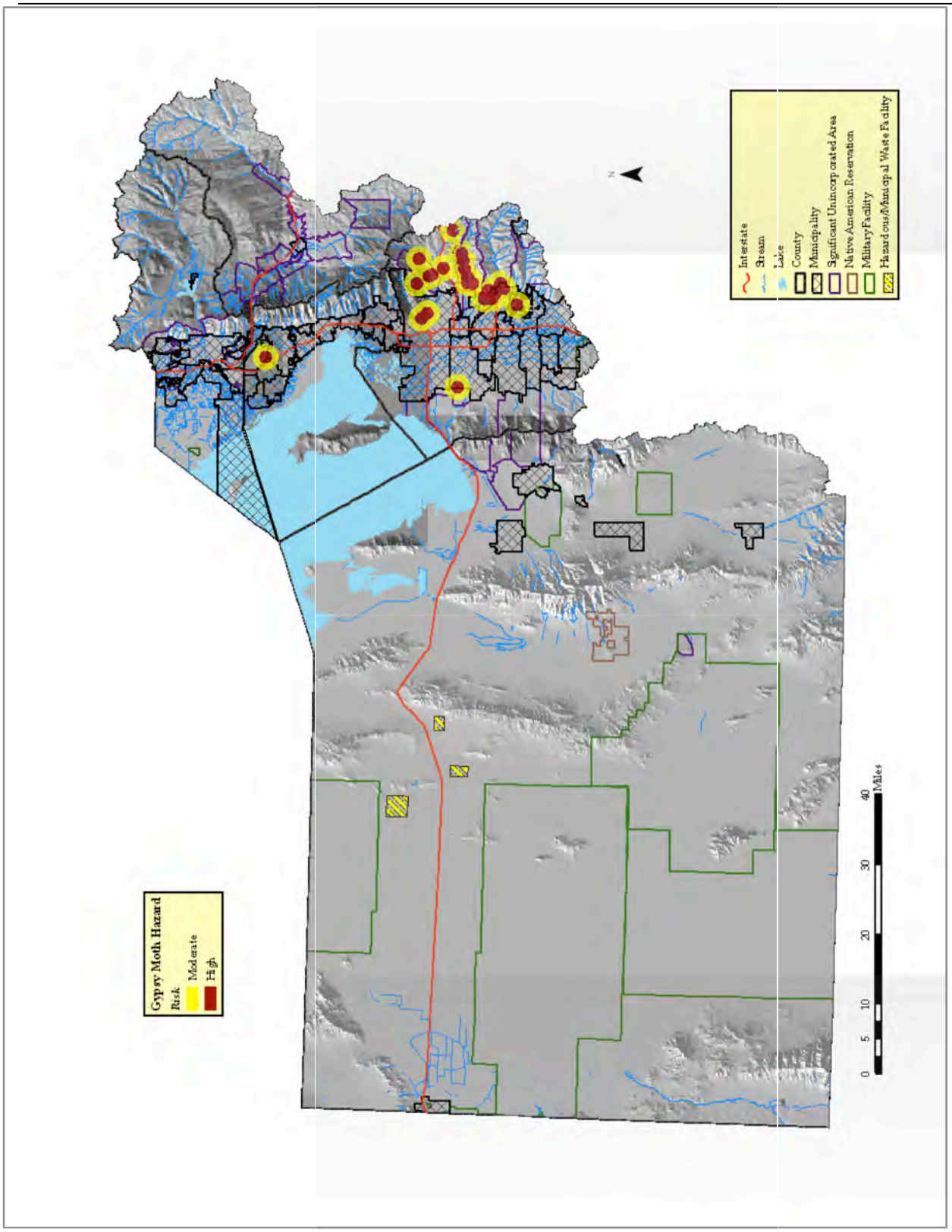
UDAF has used aerial treatment and ground baiting to manage populations of Mormon crickets and grasshoppers with success. Due to this success, no treatment is planned for 2008 (UDAF 2007a). See Map 8-10 for the Mormon cricket and grasshopper hazard potential.



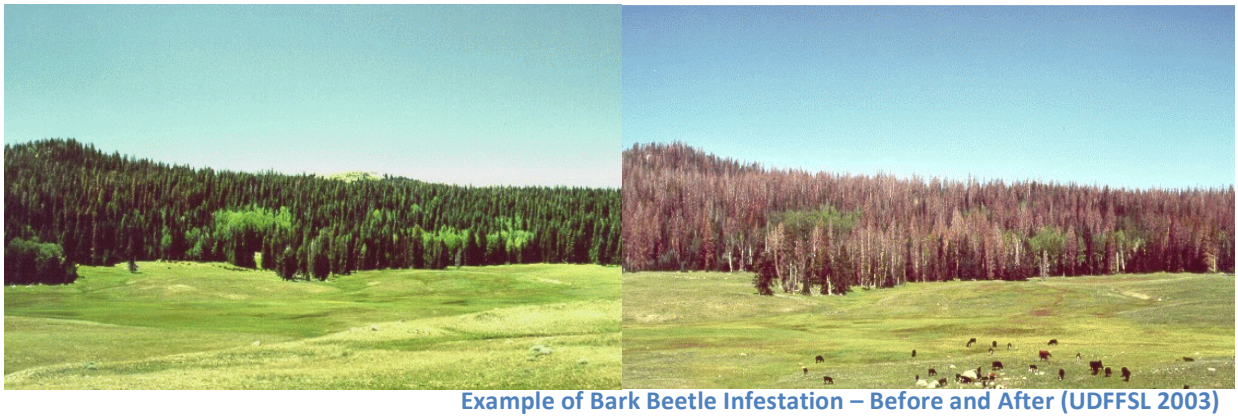
Map 18

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.



Map 19 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

Table 23 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 Riverton to determine the economic cost or vulnerability for the City as a stand-alone entity.

4.2.11. 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).

Problem Soil Hazard Profile

Potential Magnitude			**Probability**		
		Catastrophic (>50%)			**Highly Likely**
		Critical (25-50%)			**Likely**
	X	**Limited (10-25%)**		**X**	**Possible**
		Negligible (< 10%)			**Unlikely**
Location	City Wide				
Frequency	Continuous.				
Conditions	Conditions vary by geologic formation.				
Duration	Minutes to Years.				
Secondary Hazards	Flooding (broken water pipes), fire (broken gas pipes) structure damage (settling)				
Analysis Used	Utah Geological Survey and local Geotechnical Reports				

Profile 10.

Location and Extent

The largest problem in Riverton deals with expansive and collapsible soils. These soils are usually found 4 to 13 feet from the surface and have been identified during the development process in Geotechnical Reports. The majority of these types of soils are found between the Jordan River and 4800 West.

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).

Collapsible soils consist of loose, dry, low-density materials that collapse and compact under the addition of water or excessive loading. These soils are distributed throughout the southwestern United States, specifically in areas of young alluvial fans, debris flow sediments, and loess (wind-blown sediment) deposits. Soil collapse occurs when the land surface is saturated at depths greater than those reached by typical rain events. This saturation eliminates the clay bonds holding the soil grains together (Mulvey, 1992). Similar to expansive soils, collapsible soils result in structural damage such as cracking of the foundation, floors, and walls in response to settlement. In one particular case of soil collapse, 14 houses in a Cedar City, Utah neighborhood had to be jacked off their foundations and relocated due to severe settlement. (Rollins et all., 1992)

History

No recorded history of replacement or damage due to moisture-sensitive soils was found at the time of this draft.

Vulnerability Assessment

Moisture-sensitive soils are frequently encountered throughout Riverton City and identified through Geotechnical studies required as part of the development/construction process. These soils are encountered between 5 and 15 feet below the ground surface. There is a risk of differential settlement of structures, pavement, and exterior concrete flatwork where they are constructed above moisture-sensitive soils. Where the moisture-sensitive soil is left in-place below pavement and other improvements, the soil may collapse and become more compressible when wetted. Site specific evaluations will expose these risks and need to be accounted for as part of the design considerations.

4.2.12. 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.

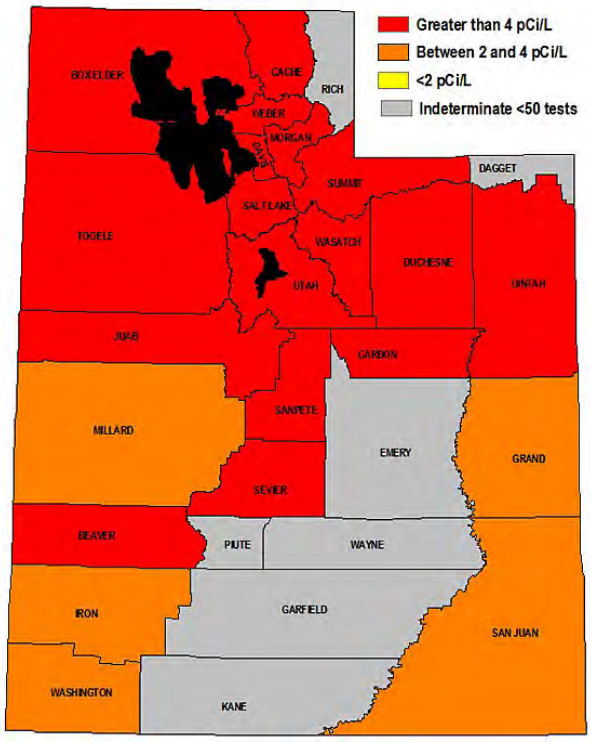
Radon Hazard Profile

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 that 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.

Profile 11

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).

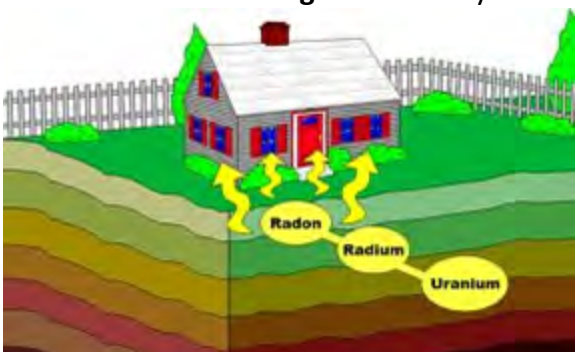
EPA's grant has been partially funding the Utah Division of Radiation Control's (DRC) Indoor Radon Program that enables the Division to respond to a continuous stream of public telephone and email inquiries, provide education to homeowners and professionals, conduct "target area" indoor radon assistance 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.

5 Mitigation Strategies

Requirement §201.6(c)(3): [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.

This section describes the mitigation strategy process and mitigation action plan.

Mitigation Action Plan. The following overall mitigation strategies have been created:

- **Share** all of the information gathered with the public in as many venues as possible. Also share the information with all emergency management personnel.
- **Follow** up on all stated actions to make sure all Departments are following through on their mitigation plans.
- Apply for grants and funds.

5.1 Goals and Objectives

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

The Riverton Planning Team has organized resources, assessed hazards and risks, and documented mitigation capabilities. The Team has identified and prioritized 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.

Goals for this mitigation plan are statements that:

- Represent the desires of the entire community;
- Include all members of the community both public and private;
- Can be accomplished in the future whether near term or long term

Goals form the basis for objectives and actions that will be taken and are not dependent on feasibility of implementation. Objectives, which are different than goals, define strategies that will accomplish the goals and are specific and measurable.

The following are the goals in a non-prioritized fashion:

Goal 1: Provide Protection for People's Lives from Hazards

Goal 2: Provide timely notification using reverse 911, internet, Face Book and Twitter, to all Riverton citizens of potential and imminent hazards

Goal 3: Protect public health and safety by preparation, response, and recovery related to natural disasters

Goal 4: Reduce exposure to natural hazards

Goal 5: Improve Community awareness to hazards and their potential to create long term effects both for the public and the business community

Goal 6: Provide Protection for Critical Facilities, Utilities, and Services from Hazard Impacts

Goal 7: Maintain Coordination of Disaster Planning

5.2 Identification & Analysis of Mitigation Actions

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

5.2.1 Establish Post-Disaster Action Plan for City Continuity of Operations Plan

Issue/Background: Establish a post-disaster action plan to be part of the City's continuity of operations plan (COOP) that will include the following elements:

- Procedures for public information
- Post-disaster damage assessment
- Grant writing
- Code enforcement
- Redundant operations

Other Alternatives: No action
Responsible Office: Riverton City Parks Department —City Emergency Manager
Priority (High, Medium, Low): High
Cost Estimate: $5,000
Potential Funding: General Fund
Schedule: 2 years

5.2.2 Train and Certify City Inspectors to Conduct Post-Disaster Damage Assessment

Issue/Background: City inspectors play a vital role in post-disaster building assessment and damage assessment. Pre-training and certification is vital in response and recovery to reduce loss of life, relocate populations, and ensure the rebuilding of local economies.
Other Alternatives: No action
Responsible Office: Riverton City Public Works Department Services
Priority (High, Medium, Low): High
Cost Estimate: $10,000
Potential Funding: General Fund and Grants
Benefits (Avoided Losses): This will improve response/recovery during an event through pre-training and certification of individuals responsible for performing assessment of structures and facilities impacted by disasters.
Schedule: 2 years

5.2.3 Setup and Operate City Emergency Operations Centers

Issue/Background: Riverton City has the need to have its own Emergency Operations Center and backup facility. This facility needs to be equipped with up to date technology and communication abilities. A backup facility also needs to be identified and equipped. City staff and executive officers need to be trained in the operation of the facilities.

Riverton recently constructed a new Public Works Facility to act as the primary EOC in the event of an emergency. A backup facility needs to be identified and equipped.
Other Alternatives: No action
Responsible Office: Riverton City Public Works Department and Parks Department/ Public Works Director and City Emergency Manager
Priority (High, Medium, Low): High
Cost Estimate: $30,000
Potential Funding: General Fund and Grants
Benefits (Avoided Losses): This will provide facilities for City personnel as a place to train and operate during emergencies.
Schedule: 3 years

5.2.4 Update and Enhance Riverton City Communications Plans

Issue/Background: Riverton City has the need to develop a multilevel communications program to notify citizens of disaster plans, mitigation measures and instructions. This program should include reverse 911, Face Book, Twitter, and the internet.
Other Alternatives: No action
Responsible Office: Riverton City Administration/PIO
Priority (High, Medium, Low): High
Cost Estimate: $8,000

Potential Funding: General Fund and Grants
Benefits (Avoided Losses): This will provide a method of contacting and providing instruction to the Citizens of Riverton City prior to, during, and after emergencies.
Schedule: 1 year

5.2.5 Complete City Culinary Mapping and Models

Issue/Background: Riverton City has the need to develop and update the Culinary Water Model and system maps. In the event of a disaster, the City needs to have the most up-to-date information to reduce risk and aid in the mitigation of the disruption to the City's water system.
Other Alternatives: No action
Responsible Office: Riverton City Public Works Department and Water Department/Water Resources Engineer and Water Director
Priority (High, Medium, Low): High
Cost Estimate: $7,500
Potential Funding: Culinary Water Enterprise Fund
Benefits (Avoided Losses): Completion of the City Wide Model and Mapping will identify potential risks to the system and aid in the recovery process after a disaster.
Schedule: 1 year

5.2.6 Complete Critical Storm Drain Facilities

Issue/Background: Riverton City has the need to construct critical storm drain facilities that have been identified by engineering studies. As a result of past flooding events the City contracted with an engineering firm to conduct a study to identify risks and provide a priority list of tasks and projects.
Other Alternatives: No action
Responsible Office: Riverton City Public Works Department / Public Works Director and Stormwater Utility Manager
Priority (High, Medium, Low): High
Cost Estimate: $3,000,000
Potential Funding: Stormwater Utility Enterprise Fund/Impact Fees
Benefits (Avoided Losses): Reduce the risk of flooding.
Schedule: 7 years

5.2.7 Train Personnel

Issue/Background: Well trained personnel are essential to the management and recovery of emergencies. Riverton has many disaster plans, which are Department specialized and familiar to only a few of the City employees. The need to cross training staff is imperative between divisions and departments. Riverton also has emergency plans with other jurisdictions for which multiple responsibilities are shared. The staffs of all involved should to be trained in the operation and coordination of the plans between entities.

Other Alternatives: No action
Responsible Office: Riverton City Public Works, Water, and Parks Department/ Public Works Director, Water Director, and City Emergency Manager
Herriman City, South Jordan City, and Salt Lake County
Priority (High, Medium, Low): High
Cost Estimate: $5,000
Potential Funding: General Fund
Benefits (Avoided Losses): This will provide the training necessary for staff to understand all emergency plans and their roles in each.
Schedule: 2 years

5.2.8 Implement a GPS Tracking System on City Maintenance Vehicles

Issue/Background: Purchase and install GPS tracking system on all pertinent maintenance equipment. In the event of an emergency, maintenance equipment can be located and monitored. This will allow managers to track and assign resources during emergency events.
Other Alternatives: No action

Responsible Office: Riverton City Public Works Department / Public Works Director and Public Works Operations Manager
Priority (High, Medium, Low): High
Cost Estimate: $15,000 initial $12,000/ Year
Potential Funding: General Fund/Class C Road Funds
Benefits (Avoided Losses): This will provide tools for City personnel to manage equipment during emergencies.
Schedule: 2 years

5.3 Mitigation Action Plan

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

The Action plan identified in (c)(3)(ii) has been prioritized by the Riverton City Sr. Staff. Prioritization is based on 1)Public Risk 2)City Exposure (3 Budget Constraints (4 City Resources.

Each City Department will provide their best practices for mitigating each strategy as it pertains to their responsibility. Each of these mitigation strategies is build into the City's annual Strategic Planning Process with the City Council. From this process the strategies are placed into 5 year

plans, funded, and executed. Any new mitigation actions will be incorporated and applied to the plan. The actions will be logged into table 5.1

Action
Multi-Hazard Mitigation Actions
5.3.1 Establish Post-Disaster Action Plan for City Continuity of Operations Plan Each City Department has been given the assignment to write SOP's for their day to day operations. These procedures are shared between departments and employees are being cross trained in these procedures.
5.3.2 Train and Certify City Inspectors to Conduct Post-Disaster Damage Assessment In the event of an emergency where structural damage has been encountered, the Engineers, Building Inspectors, and Public Works inspectors will be paired to assess stability and safety of the structure. Two Engineers have been trained in damage assessment. Over the next two years the City will pursue and train the remainder of our assessment teams.
5.3.3 Setup and Operate City Emergency Operations Centers The City recently built a new Public Works Facility to house the City EOC. The Building was build with various training, conference, and meeting rooms to house the various branches of the operation center. The facility has a 1400 AMP generator and has multiple out buildings, which can be used for various purposes during an emergency. Over the next 3 years or as budget dictates we will add equipment, supplies, and communication capabilities to the facility. Additional facilities will be identified and equipped in the future.
5.3.4 Update and Enhance Riverton City Communications Plans July of 2014, Riverton hired a full time media and communications expert. One of the responsibilities of this position is to set up and provide multiple modes of communication for public outreach in the event of an emergency.
5.3.5 Complete City Culinary Water System Mapping and Models A great concern of the City is the protection of the Water System. March 2014 the City move the responsibility of all engineering related to the water system to the Public Works Department. July 2014, the City hired a Water Resources Engineer and began the process of updating the model and mapping the City Network. The process will identify weakness and be used to built redundancy to the system.
5.3.6 Complete Critical Storm Drain Facilities In 2011 Riverton hired a consultant to conduct a study a region of the City prone to flooding and property damage. This study was completed along with other studies conducted by the Engineering Division. From these studies a list of capital improvement projects and procedures was generated and prioritized. These projects were placed on a 5 to 7 year project list which is being funded be the Stormwater Utility. Approximately $1,500,000 has been spent updating the City's infrastructure.
5.3.7 Train Personnel Riverton City has multiple emergency plans and SOP's as it relates to Dam's, Severe Weather, and Flooding. The plans are only familiar to a few City Supervisors. The City will familiarize, train, and cross train all maintenance and field personal in the emergency operation of these plans.
5.3.8 Implement a GPS Tracking System on City Maintenance Vehicles In the event of an emergency tracking resources and personnel is essential. The City has implemented a program to install real-time GPS tracking on its vehicles. To date 16 vehicles have been equipped. Additional units will be installed as budget permits.

Table 24 Riverton City Mitigation Actions

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

Riverton City 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

5.5 Status of 2009 Wasatch Front Mitigation Plan Mitigation Strategies in Riverton

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 Riverton City. The following summary highlights Riverton 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 Riverton 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	Ongoing	Riverton City continues to improve and maintain it's communications 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	Ongoing	Riverton City continues to participate in training and exercises designed to practice using communication tools and equipment
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 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	Riverton City 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 /Ongoing	Riverton City continues to evaluate areas of vulnerability and develop solutions to ensure communication systems or alternate solutions are viable
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	Riverton City relies on the Valley 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 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	Riverton City recently received a new 800 mg license and purchased upgraded radios to assist with communications
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	Ongoing	Riverton City 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	Ongoing	Riverton city GIS personnel actively participate in several coordinating groups tat 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	Riverton City GIS personnel continue to develop and add to the geographic data as part of the City's overall geographic information system

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	Ongoing	Riverton City GIS personnel makes 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	Riverton City continues to educate and implement hazard monitoring networks in it's Emergency Operations Center
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	Riverton City continues to implement monitoring capabilities by increasing is data base to allow texting, and other types of social media
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	Ongoing	As part of Riverton City Public Works facility an EOC component has been added to its infrastructure, efforts to complete other components of the EOC are in progress
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	Ongoing	Riverton City continues to inspect it's to allow redundancy as well as it's levels 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	Ongoing	Riverton is identifying options and opportunities to address issues
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	Riverton has formal agreements for Police, Fire and water.

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	Riverton City is working with outside agencies for Mutual-aid 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	Ongoing	Riverton City attends and participates in community based trainings
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	Ongoing	Riverton City attends and participates in training and community out reach programs.
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	Ongoing	Riverton City 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	Ongoing	Riverton City personnel are working to compile a make 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.	Ongoing	Riverton City educates the community by using programs such as Be Ready Utah to help educate the community during a variety of events
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	Ongoing	Riverton City enforces all current ordinance 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	Ongoing	Riverton City continues to update and make available to the public through social media all changes and improvements to ordinances and codes

Category	Goal / Objective	Action	Status	Comments
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	Ongoing	As part of the Water Department Emergency Operations plan Riverton City updates and trains employees on care and necessary upgrades and improvements to the Black Ridge Reservoir as well as the 3200 W Pond and 4200 W pond
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	Competed	The three Riverton city secondary water ponds have been identifies in the Riverton City Emergency Preparedness plan as possible risks
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	Riverton City continues to educate and remind the importance of conservation with both culinary and secondary water systems
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	Riverton City continues to educate citizens concerning water consumption
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	Riverton City continues to educate and share ideas on water consumption
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	Riverton City has installed a secondary water system throughout the city and is available to all residents. 90% of city parks are watered with secondary 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.	Ongoing	Riverton City responds immediately to water breaks and leaks. Water department performs regular inspections of water system leaks as well as theft of services.

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	Ongoing	Riverton City 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	Ongoing	Through social media , monthly newsletters Riverton City educates and offers information to citizens concerning water consumption
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	This is not applicable to Riverton City
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	Riverton City has a secondary water system throughout the city
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	Ongoing	Riverton City is working with GIS, Fire, Emergency Management on a Risk Management plan, on a risk management plan 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	Riverton City does not have funding to support this type of program. Riverton does not intend to move this activity forward due to the limited number of URM structures in the community.
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 there are not major retrofit or rehabilitation projects needed at this time in Riverton City

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	Not completed	There are very few URM homes and businesses located in Riverton that would make this activity cost effective for the City to engage in. Riverton City support 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.	N/A	Not applicable to Riverton City
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	N/A	
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	N/A	
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	Ongoing	The City Engineer and Public Woks Director regularly review the impact of development and the need for flood control infrastructure and make recommendations as needed.
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 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	Ongoing	The Stormwater Division of the Public Works Department continues to maintain and repair all drainage systems in the City.

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	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	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	N/A	Riverton City does bot have a Weather Operations Plan and does not participate in the Storm Ready 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	N/A	Riverton City does not have a Weather Operations Plan and does not participate in the Storm Ready 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	On going	Riverton City participates in briefings provided by NWS
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	Riverton City supports the NWS efforts for education ad 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	Riverton City supports the efforts for education and outreach

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	Not completed	Riverton City 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	N/A	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	N/A	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	Ongoing	Riverton City 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	Complete	This is a very low probability in Riverton 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	Complete	This is a very low probability in Riverton 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	1 – Designate and promote county-wide annual initiative for clearing fuels	Not Complete/ Not applicable	This is a very low probability to Riverton 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	Complete	This is not considered a threat to Riverton City

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	Complete	Not considered a threat to Riverton City
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	Complete	Not considered a threat to Riverton City
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	Complete	Not considered a threat to Riverton City
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	Complete	Not considered a threat to Riverton City
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	Complete	Not considered a threat to Riverton City
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	Complete	Not considered a threat to Riverton City
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	The Riverton City water system meets and or exceeds requirements for providing water flow for firefighting purposes in the City

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	4 – Assist communities in developing Community Wildfire Protection Plans or similar plans	Complete	Not considered a threat to Riverton City
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 Wild land-Urban Interface Code	Complete	Not considered a threat to Riverton City
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 wild land-urban interface and develop digital maps of the WUI	Complete	Not Considered a threat to Riverton City

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).

Adoption Date:

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.

7.1 Implementation

Incorporate mitigation strategies into day to day Standard Operation Plans (SOP). Insert SOP's into plan

7.2 Maintenance

7.2.1 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.

Annual Review Procedures

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 Mitigation Planning committee comprised of individuals from each Department responsible to implement the described mitigation strategies. Progress toward the completion of the strategies will be assessed and revised as warranted. Each Department emergency manager will regularly monitor the Plan and is responsible to make revisions and updates.

Five Year Plan Review

The entire Plan including any background studies and analysis shall be revised and updated every five years. 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.

7.2.2 Plan Amendments

The Mitigation Committee will initiate amendments and updates to the Plan.

Upon initiation of an amendment to the Plan, Mitigation Committee will forward information on the proposed amendment to all Departments residents and businesses. Depending on the magnitude of the amendment the Committee will determine who will be notified of modifications.

At a minimum, the information will be made available through public notice in a newspaper of general circulation or on the Riverton City website www.rivertoncity.com. The review and comment period for the proposed Plan amendment will last for not less than forty-five (45) days.

At the end of the comment period, the proposed amendment and all comments will be reviewed by the Committee. The Committee will then determine whether to include comments into the plan amendment.

7.2.3 Implementation through Existing Programs

Once the Plan is promulgated, The Riverton City Council will adopt the plan or amendments to the Plan by Resolution.

7.2.4 Maintenance Evaluation Process

It will be the responsibility of Mayor or designee; to ensure these actions are carried out no later than the target dates he sets.

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. The City shall continue to seek outside funding assistance for mitigation projects in

7.2.5 Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Plan and its updates. The Plan will be available on the Riverton City Website to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of the Riverton City Recorders office.

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RESOLUTION NO. 12 OF 2015
(Salt Lake County Multi-Jurisdictional Multi-Hazard Disaster Mitigation Plan)

A resolution adopting the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan, as required by the Federal Disaster Mitigation and Cost Reduction Act of 2000.

WHEREAS, President William J. Clinton signed H.R. 707, the Disaster Mitigation and Cost Reduction Act of 2000 into law on October 30, 2000 establishing 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 of 2000 requires, to be eligible for Federal Emergency Management Agency (FEMA) post-disaster funds, jurisdictions develop and be covered by a Pre-Disaster Hazard Mitigation Plan that identifies 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 Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan has been prepared in accordance with FEMA requirements as 4 C.F.R. 201.6 in coordination with Salt Lake County's Bureau of Emergency Management and other local jurisdictions; and

WHEREAS, Salt Lake City is within Salt Lake County and participated in the update of the multi-jurisdictional Plan, the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan; and

WHEREAS, Salt Lake City is concerned about mitigating potential losses and 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 City Council of Salt Lake City that:

1. The City adopts the Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan (Attachment A hereto) pursuant to the Disaster Mitigation Act.

Passed by the City Council of Salt Lake City, Utah, this 28th day of April, 2015.

SALT LAKE CITY COUNCIL

By: _____
CHAIRPERSON

ATTEST AND COUNTERSIGN:

_____
CITY RECORDER

APPROVED AS TO FORM
Salt Lake City Attorney's Office
Date 3-2-15
By _____

HB_ATTY-#43573-V1-Resolution_Adopting_Salt_Lake_County_Multi-Hazard_Mitigation_Plan.DOC

Hazard Mitigation Plan (2014)

ANNEX J: SALT LAKE CITY

1 Introduction

1.1 Background

Salt Lake City is the capital and the most populous city in the state of Utah. With an estimated population of 191,180 in 2013, the city lies in the core of the Salt Lake City metropolitan area, which has a total population of 1,140,483 as of the 2013 estimate. Salt Lake City is further situated in a larger urban area known as the Salt Lake City-Provo-Orem, UT Combined Statistical Area. This region is a corridor of contiguous urban and suburban development stretched along an approximate 120-mile segment of the Wasatch Front, comprising a total population of 2,389,225 as of 2013.

Given the nature of Utah's population concentration along the Wasatch Front, it is important that Salt Lake City support regional planning and maintain relationships with Salt Lake County and the other municipalities located in the county. Salt Lake City is a member of Utah's Pre-mitigation planning for the Wasatch Region, comprised of five counties, Salt Lake, Summit, Tooele, Davis, and Utah. The region representatives meet to coordinate activities and funding received from the state through the State Homeland Security Program. Salt Lake City has participated in area Gap Analysis and Threat Assessments, the Regional Resilience and Assessment Program (RRAP), and was funded to develop a Local Energy Assurance Plan. Salt Lake City also became a part of the Urban Area Security Initiative (UASI) in 2008 and again in 2014. The Urban Area Working Group (UAWG) includes Salt Lake County with representatives from public safety agencies, volunteer organizations and the state for regional all-hazards planning, mitigation, response and recovery.

1.2 Purpose

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, and (4) and 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 Salt Lake County and surrounding municipalities. This Plan is intended to enhance the awareness for elected officials, agencies and the public of these hazards and their associated threat to life and property.

1.3 Scope

This Mitigation Plan is Salt Lake City's Annex to the stand alone mitigation plan for Salt Lake County and replaces the Wasatch Front Regional Council Natural Hazard Pre-Disaster Mitigation Plan (WFRC-PDM).

The plan scope includes the following deliverables:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- A vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input, and development of mitigation actions complementary to those goals. A range of actions must be identified specifically for each jurisdiction;
- Demonstration that there has been a proactively offered opportunity for participation in the planning process by all community stakeholders (examples of participation include relevant involvement in an any planning process, attendance at meetings, contributing research, data, other information, commenting on drafts of the plan);
- Documentation of an effective process to maintain and implement the plan.

1.4 Authority and Reference

Local

Salt Lake City Code Title 22 et al. Salt Lake City executives are responsible for carrying out plans and policies. City government must be 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.

2 Community Profile

2.1 Geography and Environment

Salt Lake City is located in the northeast corner of the Salt Lake Valley surrounded by the Great Salt Lake to the northwest and the steep Wasatch and Oquirrh mountain ranges on the eastern and south western borders, respectively. Its encircling mountains contain several narrow glacial and stream carved canyons. Among them, City Creek, Emigration, Millcreek, and Parley's border the eastern city limits. Salt Lake City has a total area of 110.4 mi² and an average elevation of 4,327 feet above sea level. The lowest point within the boundaries of the city is 4,210 feet near the Jordan River and the Great Salt Lake, and the highest is Grandview Peak, at 9,410 feet .

The Great Salt Lake is separated from Salt Lake City by extensive marshlands and mudflats. The metabolic activities of bacteria in the lake result in a phenomenon known as "lake stink", a scent reminiscent of foul poultry eggs, two to three times per year for a few hours. The Jordan River flows through the city and is drainage of Utah Lake that empties into the Great Salt Lake.
The Salt Lake Valley floor is the ancient lakebed of Lake Bonneville, which existed at the end of the last Ice Age. Several Lake Bonneville shorelines can be distinctly seen on the foothills or benches of nearby mountains.

The climate of the Salt Lake City area is typically characterized as semi-arid. Under the Köppen climate classification, Salt Lake City has a dry-summer continental climate (Dsa), a relatively rare form of the continental climate where a region experiences dry summers and wet winters. The city experiences four distinct seasons. Both summer and winter are long, with hot, dry summers and cold, snowy winters. Spring is the wettest season, while summer is very dry.

The nearby Great Salt Lake is a significant contributor to precipitation in the city. The lake effect can help enhance rain from summer thunderstorms and produces lake-effect snow approximately 6 to 8 times per year, some of which can drop excessive snowfalls. It is estimated that about 10% of the annual precipitation in the city can be attributed to the lake effect.

Salt Lake City features large variations in temperatures between seasons. During summer, there are an average of 56 days per year with temperatures of at least 90 °F (32.2 °C), 23 days of at least 95 °F (35 °C), and 5 days of 100 °F (37.8 °C). However, average daytime July humidity is only 22%. Winters are quite cold but rarely frigid. While there are an average of 127 days that drop to or below freezing, and 26 days with high temperatures that fail to rise above freezing, the city only averages 2.3 days at or below 0 °F (−17.8 °C). The record high temperature is 107 °F (42 °C), which occurred first on 26 July 1960 and again on 13 July 2002, while the record low is −30 °F (−34 °C), which occurred on 9 February 1933.

During mid-winter, strong areas of high pressure often situate themselves over the Great Basin, leading to strong temperature inversions. This causes air stagnation and thick smog in the valley from several days to weeks at a time and can result in the worst air-pollution levels in the U.S., reducing air quality to unhealthy levels.

2.1.1 Community Facts

The city was founded in 1847 by Brigham Young, Isaac Morley, George Washington Bradley and several other Mormon followers, who extensively irrigated and cultivated the arid valley. Immigration of international LDS members, mining booms, and the construction of the first transcontinental railroad initially brought economic growth, and the city was nicknamed the Crossroads of the West. It was traversed by the Lincoln Highway, the first transcontinental highway, in 1913, and presently two major cross-country freeways, I-15 and I-80, intersect in the city. Salt Lake City has since developed a strong outdoor recreation tourist industry based primarily on skiing, and hosted the 2002 Winter Olympics. It is the industrial banking center of the United States.

2.1.2 Population and Demographics

Salt Lake City's population is predominantly White 75.1% and Hispanic 22.3% based on the2010 Census. It also consists of 2.7% African American, 1.2% American Indian and Alaska Native, 4.4% Asian, 2.0% Native Hawaiian and Other Pacific Islander, 10.7% from other races and 3.7% of mixed descent.

As of the census of 2010, there are 186,440 people (up from 181,743 in 2000), 75,177 households, and 57,543 families residing in the city. This amounts to 6.75% of Utah's population, 18.11% of Salt Lake County's population, and 16.58% of the new Salt Lake metropolitan population. The area within the city limits covers 14.2% of Salt Lake County. Salt Lake City is more densely populated than the surrounding metro area with a population density of 1,688.77/sq. mi (1,049.36/km²). There are 80,724 housing units at an average density of 731.2 per square mile (454.35/km²). The median age is 30 years. For every 100 females there are 102.6 males. For every 100 females age 18 and over, there are 101.2 males. The median income for a household in the city is $36,944, and the median income for a family is $45,140. Males have a median income of $31,511 versus $26,403 for females. The per capita income for the city is $20,752. 15.3% of the population and 10.4% of families are below the poverty line. Out of the total population, 18.7% of those under the age of 18 and 8.5% of those 65 and older are living below the poverty line. Large family sizes and low housing vacancy rates, which have inflated housing costs along the Wasatch Front, have led to one out of every six residents living below the poverty line.

Salt Lake City is still home to the headquarters of The Church of Jesus Christ of Latter-day Saints (LDS Church) however less than 50% of Salt Lake City's residents are members of The Church of Jesus Christ of Latter-day Saints. This is a much lower proportion than in Utah's more rural municipalities; altogether, LDS members make up about 62% of Utah's population.

2.1.3 Data Sources and Limitations

Background information and data for this Plan was obtained from the sources listed below. From these sources, the planning team 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 region, it was determined by the Working Group that the entire Plan would be updated.

Sources for Background Information

- Census Profiles
- 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

3 Planning Process

3.1 Update Process and Participation Summary

The WFRC plan was reviewed to evaluate its strengths, weakness and utility. The hazards, vulnerabilities and risks were reviewed and revised as to their impact, how hazards may affect the population, and their severity. Updates also describe hazard impacts that have occurred since the last plan revision. The planning team considered previously unidentified hazards to include in the plan update. A capabilities assessment was conducted to identify potential mitigation needs and to further align the mitigation plan with other community planning efforts. The revision process also included a review of proposed mitigation goals, objectives and actions and to determine their validity and how effective they have been/or will be at reducing vulnerability in the county. New priorities have been set to support changes that were identified. The Mitigation Plan was also evaluated to support the State Mitigation Plan goals and objectives, as well as other local planning efforts. Finally, an implementation strategy and timeline will assign the responsibility and schedule for tracking implementation of the identified mitigation actions. The Mitigation Plan will be adopted through the normal legal process and will establish authority and guide all mitigation activities outlined in the plan.

The plan utilized current county, city and applicable private hazard mitigation, emergency operations plans, census data and available GIS and assessor's data as resources for the planning team. Salt Lake City Emergency Management staff, mitigation planning team members, county, and applicable emergency managers/planners, subject matter experts, recruits from other jurisdictions such as other local government units, private sector, non-governmental, academia, airports, military, and the public were also consulted during this planning activity.

3.2 The Planning Team - Acknowledgements

Salt Lake City Emergency Management would like to acknowledge the following individuals and agencies for their dedication and valuable contribution to this document.

Salt Lake City Emergency Management
Cory Lyman,
Eric Witt,
Audrey Pierce

Internal Stakeholders
Wes Ing, SLC Public Utilities
Martha Ellis, Fire Marshal
Brain Gourdie, SLC Public Services
Brandon Fleming, Parks Operations
Tim Doubt, SLC Police
Debbie Lyons, SLC Sustainability

Pat Peterson, SLC Engineering
Terry Craven, SLC Airport
David Wharff, SLC Fire
Kevin Bell, SLC IMS/GIS
Laura Briefer, SLC Public Utilities

External Stakeholders

Amy Shingleton, Rocky Mountain Power
Robert Neilson, Questar
Laird Severinsen, Century Link
Jan Buttrey, UT Hospital Association
Hugh Johnson, RMA –Archives
Carlton Christensen, SLCo Regional Development
Clint Mecham, SLCo EM-UFA
Jackie Nicholl, SLCo Emergency Services
Jeff Graviet, SLCo Emergency Services
John Leonard, Utah Dept of Transportation
Richard Boddy, Utah Transit Authority
Mark Lemery, Utah SAIC
Reed Scharman, West Jordan Fire Dept
Jon Harris, Murray City Fire
Wade Watkins, SLCo-UFA
John Evans, West Valley City Fire
Jerrianne Kolby, Utah Dept Emergency Management
Marty Shuab, University of Utah
Jalae Thompson, Red Cross
Chris Crnich, UT Dept of Agriculture
Cynthia Morgan, SL Valley Health Dept
Bob Jeppessen, SL Valley Health Dept
Terry Begay, SL Valley Health Dept
Mindy Colling, UT Dept of Health
Leon Berrett, SLCo Public Works
Mike Barrett, SLCo EMergency Services

3.3 Meetings and Documentation

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.	

		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, 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
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
	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
	July 14	Mitigation Planning Team Prioritization Workshop	Planning Team reviews final mitigation strategies to assign responsibility, estimate costs, and define priority
		Revision of remaining Plan sections.	For review.
		Public comment period.	Draft placed on UFA/SLCOEM website for public involvement
		Prepare plan Crosswalk	
		Submitted Plan to Utah DHLS for initial State review and FEMA conditional review.	State and federal review.
		Continued Plan revision.	Final Plan proofreading, mitigation strategy updates. Addition of Special Service District data
		Submit Plan to Utah DHLS for final State review.	State review.
		Plan forwarded to FEMA for final approval.	Federal review may take up to 45 days, Appendix
		Local Jurisdiction Plan Adoption	

Planning Process Timeline

3.4 Public Stakeholder Participation

To ensure the public and their officials were supportive of the Plan, the SLCEM Mitigation Planner presented at the Salt Lake County Council of Governments meeting in March 2013. Salt Lake City's Chief Executive was present at this meeting.. The draft of this annex is posted on Salt Lake City's Emergency Management webpage for review and public input.

Getting Started

Salt Lake City has participated in the County multi- jurisdictional planning committee based on the Memorandum of Understanding to create a standalone mitigation plan that will meet the 44CFR 201.6 planning requirements and will result in a FEMA approved mitigation plan since 2012.

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, and many common objectives. This presented a unique opportunity to share resources, integrate programs, and implement a more comprehensive approach to risk reduction for Salt Lake City Officials since water resources have interdependencies across the valley.

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 Risk MAP team, County, and Salt Lake City 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.

Data Review and Acquisition

The 2009 WFRC PDM Plan was reviewed by 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.

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). Assessor data was used to estimate the number of structures and their value that could potentially be affected by hazards. Census 2010 data 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. The FEMA modeling program Hazards United States – Multi-Hazards (HAZUS-MH) was used to determine earthquake and flood vulnerability. 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. Vulnerability and Risk Analysis (VRA) provides stakeholders with a guide to understanding the impacts that are associated with major deficiencies, disruptions, and response processes. In practical terms, VRA analysis provides insight into the following questions:

1. What are the City's specific vulnerabilities?
2. What are the potential consequences of disruptions in particular critical assets?
3. What are the most relevant event-driven vulnerabilities?

Capabilities Assessment

Salt Lake City completed the Capabilities Assessment Worksheet and Hazard Identification Matrix with city planners, economic development, building and zoning officials, engineers, floodplain administrators, GIS Analyst or others as appropriate. It encouraged them to review existing plans, studies, reports or other technical information. 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 them to identify which hazards present the greatest threat to Salt Lake City.

Mitigation Strategy Development

Developing the mitigation strategies was a process in which all of the previous steps were taken into account. Each participating jurisdiction evaluated, identified and profiled the hazards, and vulnerability assessment completed by SLCOEM. The strategies from the 2009 WFRC plan were reviewed to identify which projects had been completed, which were ongoing, and whether others should be carried over into the current plan. The planning team met several times to brainstorm additional strategies and improve upon the existing strategies. Each mitigation strategy developed

was evaluated to determine that actions met the objectives stated in Section D (page 10) of the Introduction.

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 priority, 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.

4 Risk Assessment

4.1 Update Process Summary

Risk Assessment Review
Salt Lake City has meet with stakeholders from multiple disciplines public and private sector to identify the risk. Including but not limited to involvement with the following projects that focused on risk to the area: Regional Resilience Assessment Program (RRAP), Local Energy Assurance Planning (LEAP), and the Salt Lake County HMP2013-Flood and Earthquake Risk Assessment.

4.2 Hazard Identification

4.2.1 Table of Presidential Disaster Declarations

Salt Lake City Presidential disaster declarations related to flooding in 1983 and 1984. Following these events of an enormous amount of mitigation was completed in Salt Lake City along the urban areas of the Wasatch Front. The State of Utah constructed a county flood control project in which pumps were installed on the Great Salt Lake to pump excess water into the west desert. Salt Lake City benefited from the pump project and the following upgrades: an advanced water-monitoring network of stream gauges, SNOTEL sites, and automated stream flow gates give warning of elevated flows.

4.2.2 Summary of Hazards

Each of the hazards that can affect Salt Lake City, and the potential impacts, will be described in this section, known as a Hazard Identification and Risk Assessment or HIRA.

Hazard Description: These are general descriptions of the causes and characteristics of each hazard to give a general understanding of each hazard and why, when and how the hazards occur.

Hazard Profile: This section describes the potential impact of each identified hazard, including its:

- Severity or magnitude (as it relates to the percentage of the jurisdiction that can be affected)
- Probability: likelihood that the hazard will occur
- Conditions that make the area prone to the hazard, including seasonal patterns
- Hazard history
- Geographic location or extent - maps

The hazards were profiled based on historical evidence, local input, emergency operations plans, scientific reports, scenario based models, county master or general plans, hazard analysis plans, and historical evidence.

A hazard profile table was created for each hazard, which highlights the above mentioned characteristics. Hazard magnitude is based on the anticipated level of damage on a city-wide basis described on a scale of Catastrophic to Negligible. The probability of a hazard event was determined through the amount of risk to the county. Probability was identified by four categories: Highly Likely, Likely, Possible, and Unlikely.

Vulnerability Analysis: The vulnerability analysis is based on asset identification and potential loss estimates for located within identified hazard areas. For each hazard, a risk assessment was conducted. The vulnerability analysis summarizes the results of the risk assessment and describes the potential impacts of each hazard. This includes a description of exposure to the hazard for each jurisdiction and the potential losses based on scenario models or historical occurrences.

Asset Identification: The vulnerability analysis combines the data from each of the hazard profiles and merges it with community asset information to analyze and quantify potential damages from future hazard events. The asset inventory identifies critical facilities and infrastructure that can be damaged or affected by hazard events. Critical facilities are of particular concern because of the essential services and products they provide to the general public. These critical facilities may fulfill important public safety, emergency response, and/or disaster recovery functions. The facilities identified in this plan include hospitals, police and fire stations, schools, communication facilities, utility companies, water and wastewater treatment plants. In order to assess where and to what extent the identified hazards will affect the assets of each jurisdiction, the locations of these assets were identified and overlaid with the mapped hazards using GIS software. Additional community assets considered were assets of historical or economic significance, vulnerable populations, or natural resources.

Potential Loss Estimates: Potential dollar loss estimates were identified using the same method as the asset identification and were completed for existing infrastructure only. When data permitted, structure, content, and function of the identified vulnerable infrastructure was incorporated into the vulnerability assessments. Describing the vulnerability in terms of dollar losses provides the community and state with a common framework in which to measure the effects of hazards on assets.

The estimated potential losses for the identified hazards using the methodology explained in the FEMA document titled "Understanding Your Risks: Identifying Hazards and Estimating Losses", along with Utah Division of Emergency Management historical data and GIS data.

The information sources used to complete the vulnerability assessment portion of this plan include; Utah DEM, county and city GIS departments, Salt Lake County Assessor's Office, Salt Lake County Planning and Development, FEMA Region VIII RiskMAP and HAZUS-MH data, and the Utah Automated Geographic Reference Center (AGRC). This data was compiled into GIS layers that were used as overlays to identify critical facilities, municipalities, roads, and residents. The assets that have been identified are based on the best available data during the development of this plan.

The HIRA was initiated through a series of meetings with the Core Planning Team and subject matter experts from the following organizations:

- City and county agencies
- Jordan Valley Water Conservancy District
- Salt Lake City Public Utilities
- Utah Geological Survey
- National Weather Service
- Utah Division of Water Rights
- Utah Forestry, Fire, and State Lands
- Unified Fire Authority
- Salt Lake Valley Health Department

The Planning Team identified the hazards in Table 4 as having the potential to affecting all or a portion of Salt Lake County, based on history of occurrences and/or future probability. Each of these was carried over from the 2009 WFRC Pre-Disaster Mitigation Plan, with the addition of Avalanche and Flu Epidemic.

The HIRA process was aided through the use of FEMA How-to Guidance Documents, FEMA Local Mitigation Planning Handbook, Local Mitigation Plan Review Guide, the Utah State Hazard Mitigation Plan, Utah Natural Hazards Handbook 2008, FEMA 386-1,2,3,7, Disaster Mitigation Act of 2000, 44 CFR Parts 201 and 206, Interim Final Rule, and FEMA Region VIII Crosswalk. The risk assessment process also utilized assistance from local GIS departments using the best available data.

Hazard	How Identified	Why Identified
Earthquake High	• Review of County Emergency Operations Plans • Review of past disaster declarations • Input from City and County Emergency Operations Managers, USGS, UGS, Utah DEM, and community members	• Utah has a 1/5 chance, of experiencing a large earthquake within the next fifty years. • Numerous faults throughout Utah including the Intermountain Seismic Zone. • Yearly, Utah averages approximately 13 earthquakes having a magnitude 3.0 or greater. • Earthquakes can create fire, flooding, hazardous materials incident, transportation, and communication limitations. • The Wasatch Front has recorded large earthquakes in the past and can be expected to experience large earthquakes in the future.
Flood **Low**	• Review of past disaster declarations • Input from City and County Emergency Operations Managers, Utah DWS, UGS, Utah Army Corps of Engineers, Utah DEM, and community members • Review of Flood Insurance Studies, Floodplain maps, and FIRMs	• Several incidents have caused severe damage and loss of life. • Many of the rivers and streams are located near neighborhoods. • Many neighborhoods are located on floodplains, alluvial fans. • Topography and climate lead to cloudburst storms and heavy precipitation can result in flash flooding throughout most of the Wasatch Front.
Wildland Fire High	• Review of County Emergency Operations Plans • Review of Community Wildfire Plans • Input from County Emergency Managers, Utah DEM, Utah FFSL, Utah FS, NWS, FEMA, and local community members	• Serious threat to life and property. • Much of county is at risk • Increasing threat due to urban growth in WUI areas. • Secondary threat associated with flooding, drought, and earthquake. • Additional funding and resources offered by local and state agencies to reduce risk • To increase community awareness.
Slope Failure **Low**	• Input from City and County Emergency Operations Managers, USGS, UGS, NCDC, Utah DEM, and community members	• Have caused damage in the past to residential and commercial infrastructure. • Can be life threatening. • Generally occur in known historic locations therefore risks exist through-out much of the Wasatch Front. • To increase community awareness.
Severe Weather **Mod**	• Review of County Emergency Operations Plans • Review of past disaster declarations • Input from City and County Emergency Operations Managers, Utah Avalanche, Forecast Center, Utah Department of Transportation, and community members	• Damage to communities, homes, infrastructure, roads, ski areas, and people. • Can cause property damage and loss of life. • Results in economic loss. • Lightning is number one cause of natural hazard death in Utah. • Can be costly to recover from. • Affects the young and old more severely.
Dam Failure **Low**	• Review of County Emergency Operations Plans • Input from community members, Utah DWS, Dam Safety Section, Utah DEM • Review of inundation maps	• Can cause serious damage to life and property and have subsequent effects such as flooding, fire, debris flow, etc.. • Many reservoirs located in the county. • Threat to downhill communities. • Subsequent effects include flooding, fire, and debris flows. • To increase community awareness. • To incorporate mitigation measures into existing plans to help serve local residents
Drought Mod	• Review of Utah State Water Plan • Input from community members, Utah DHLS, NWS, NCC, and NCDC	• Affects local economy and residents. • Reduces available water in reservoirs impacting culinary, irrigation, and municipal water supplies. • Drought periods may extend several years. • Secondary threat associated with wildfire. • Utah is the nation's second driest state. • Can impact farming and ranching operations. • Neighboring communities have been affected by culinary and irrigation water shortages

Table Local Hazards Identification

4.3 Hazard Profiles

4.3.1 Hazard 1-Earthquake

4.3.1.1 Location and Extent

The Salt Lake City segment of the Wasatch fault lies 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)

The Wasatch Fault traces along the base of the Wasatch mountain range. It is made up of 10 segments that act independently, meaning that a part of the fault ruptures separately as a unit during an earthquake. The Salt Lake City Segment traverses Salt Lake County from north to south, roughly along the eastern foothills of the Wasatch Mountains. Within the Salt Lake City segment of the Wasatch Fault are three smaller segments from north to south known as Warm Springs Fault, Virginia Street Fault and the East Bench Fault. Earthquakes originating in any of the five Wasatch faults pose a direct threat to Salt Lake City.

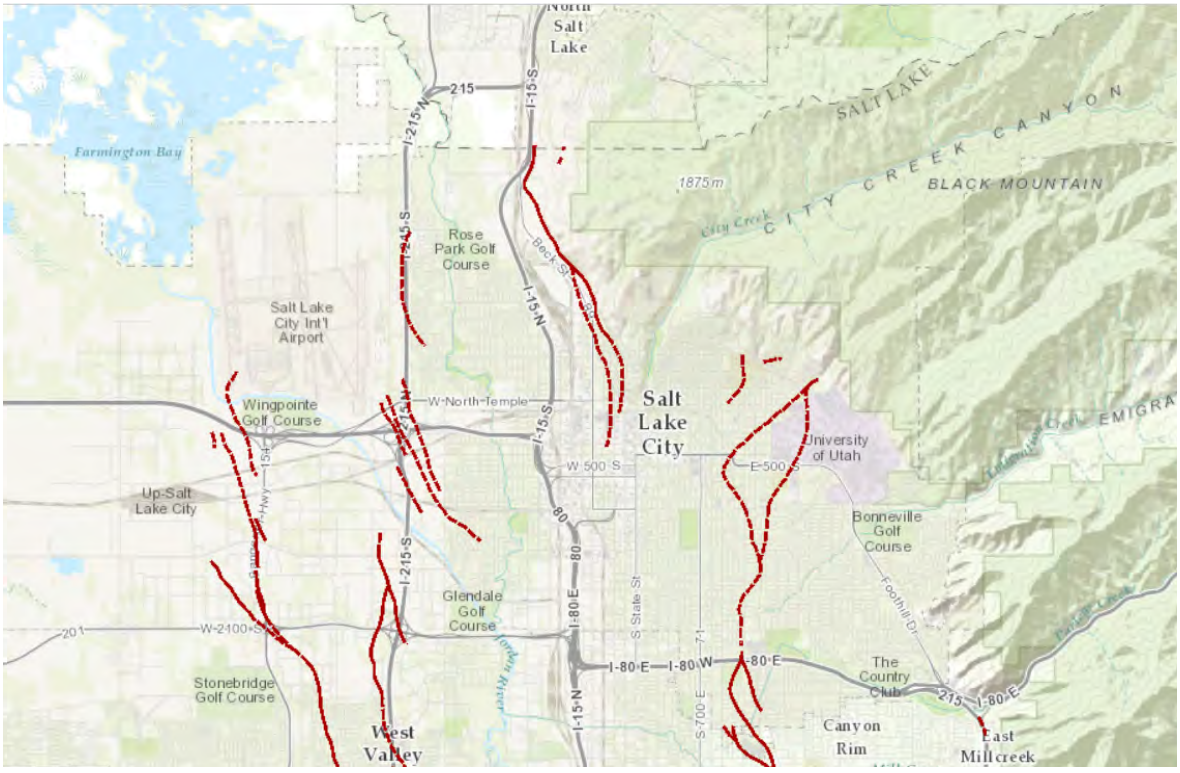


Image of Fault Segments in Salt Lake City

Name	Fault Type	Length (km)	Time of Most Recent Deformation	Recurrence Interval
East Great Salt Lake fault zone, Antelope Island section	Normal	35	586+201/-241 cal yr B.P.	4,200 years
Wasatch fault zone, Salt Lake segment	Normal	43	1,300±650 cal yr B.P.	1,300 years
West Valley fault zone, Granger segment	Normal	16	1,500±200 cal yr B.P.	2,600-6,500 years
West Valley fault zone, Taylorsville segment	Normal	15	2,200±200 cal yr B.P.	6,000-12,000 years

Table. Quaternary Faults, Salt Lake County (UGS 2002, UGS 2006) cal. Yr. B.P.=calendar years before present

4.3.1.2 Range of Magnitude

Utah experiences approximately 700 earthquakes each year, and approximately six of those have a magnitude 3.0 or greater. On average, a moderate, potentially damaging earthquake (magnitude 5.5 to 6.5) occurs every 10 years. Large earthquakes (magnitude 6.5-7.5) occur on average every 50 years (UNHH 2008). The history of seismic activity in Utah and along the Wasatch Front suggests that it is not a matter of "if" but "when" an earthquake will occur. The probability of a large earthquake occurring along the central segments of the Wasatch Front is 13 percent in 50 years, or 25 percent in 100 years. (The Wasatch Fault, UGS PIS 40)

Earthquake Hazard Profile

Potential Magnitude	***X***	**Catastrophic**	**Probability**		**Highly Likely**
		Critical (25-50%)		**X**	**Likely**
		Limited (10-25%)			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	***Fault Activity within the Wasatch area magnitude 5.0 or greater poses a direct threat to Salt Lake City.***				
Seasonal Pattern	None.				
Conditions	Liquefaction potential within areas with shallow ground water. Soil that is comprised of old lakebed sediments. Historic movement along faults. Intermountain Seismic Zone, Wasatch Fault.				
Duration	Actual ground shaking will be under one minute, aftershocks can occur for weeks or even months.				
Secondary Hazards	Fire, landslide, rock falls, avalanche, flooding, hazardous material release, transportation and infrastructure disruptions, essential service disruptions (communications, utilities).				
Analysis Used	Review of hazard analysis plans and other information provided by the University of Utah Seismograph Station, UGS, USGS, FEMA, UDEM, AGRC.				

4.3.1.3 Past Occurrence

Although no surface-faulting earthquakes have occurred on the Wasatch fault since settlement in Salt Lake, evidence of numerous prehistoric events exists in the geologic record (The Wasatch Fault, UGS PIS 40) The segments between Brigham City and Nephi have a composite recurrence interval (average time between earthquake events) for large surface-faulting earthquakes

(magnitude 7.0-7.5) of 300-400 years. The average repeat time on an individual segment is 1,200-2,600 years. The most recent surface-faulting earthquakes occurred about 500 years ago on the Provo and Weber segments, and about 350 years ago on the Nephi segment. (UNHH 2008)

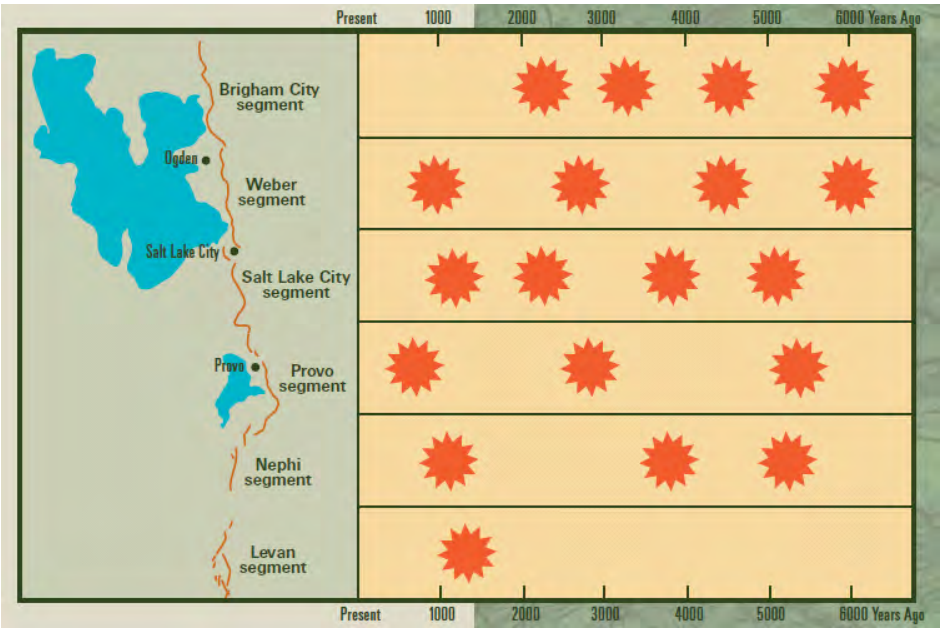


Table Wasatch Fault Segments and Timeline of Major Ruptures
("The Wasatch Fault", Utah Geological Survey Public Information Series 40)

Significant earthquakes have occurred in Salt Lake County within the last 50 years. In 1962, a 5.2 Richter magnitude quake jolted the Magna area. In 1992, a magnitude 4.2 quake shook the southern portion of the County.

Liquefaction is one of the secondary hazards associated with an earthquake and affects nearly all of Salt City. The City 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.

4.3.1.3 Future Occurrence

Other faults within Salt Lake County include the West Valley Fault Zone and the East Great Salt Lake Fault Zone. Each of these fault zones has much longer return interval (2,500 years or more) and is not expected to produce a major quake in the near future.

4.3.1.4 Potential Loss Estimates

Building Damage

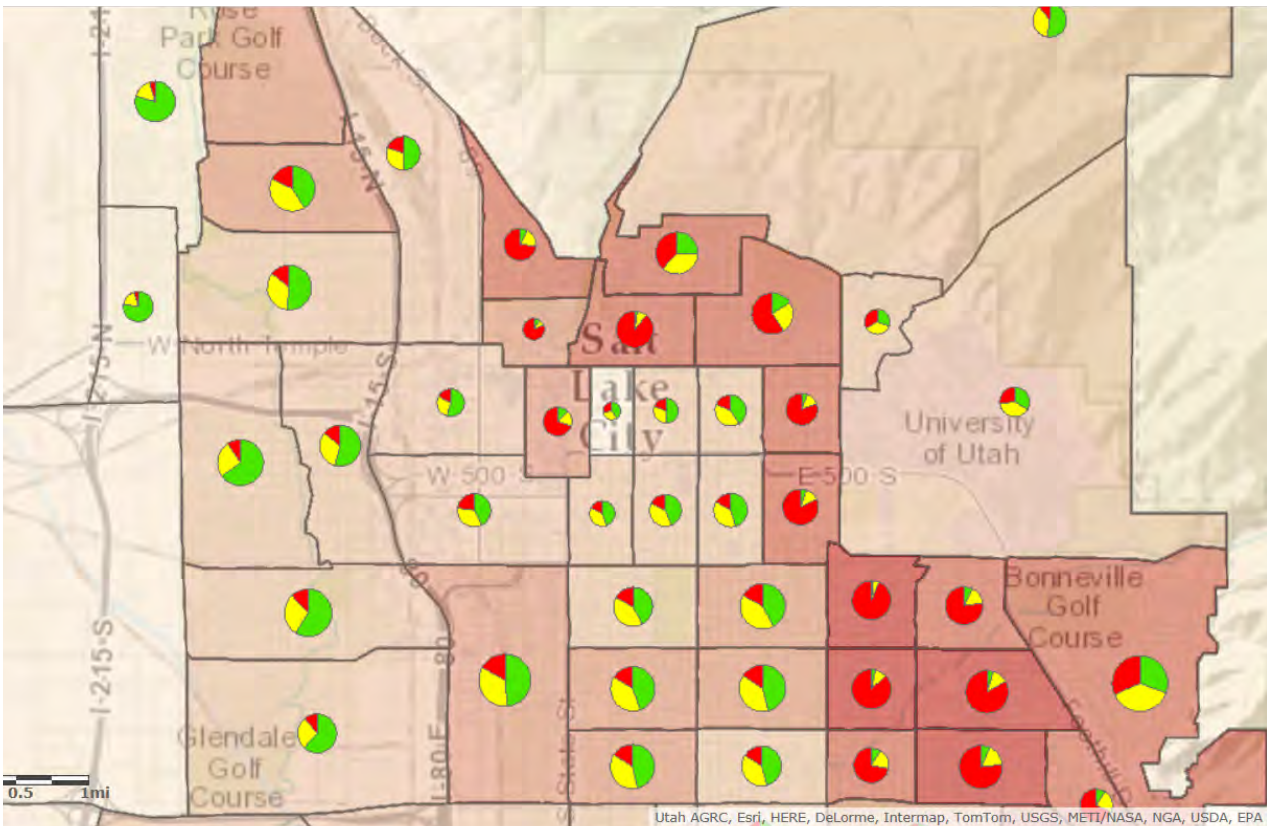
HAZUS-MH classifies building damage into five states: none, slight, moderate, extensive and complete. Table 11 lists the number of buildings by occupancy estimated to sustain moderate to complete levels of damage during an arbitrarily-determined Richter magnitude 5.9 (M5.9)

earthquake scenarios or a probabilistic Richter magnitude 7.1 (M7.1) earthquake scenario. Also listed are the estimated monetary losses to structures, contents/inventory, and income.

Models show Salt Lake City will have $12,249,473,845 of total building economic loss and 7,966,834 tons of debris. As a result of our $32,341 unreinforced masonry buildings 35,786 households will be displaced, 21,629 individuals seeking public shelter, 13,698 casualties and 1,397 life threatening injuries and fatalities.

Category	Number of Structures with > 50% Damage		Category	Estimated Losses	
	Salt Lake M5.9	2500-yr M7.1		Salt Lake M5.9	2500-yr M7.1
Residential	30,342	157,705	Structural Losses	$519,320,000	$3,419,030,470
Commercial	1,896	5,199	Non-Structural Losses	$1,818,647,000	$12,331,504,070
Industrial	495	1,367	Content Losses	$719,709,000	$4,114,455,740
Government	167	475	Inventory Losses	$29,216,000	$175,756,410
Education	51	159	Income and Relocation Losses	$623,140,000	$3,263,449,580
Totals	32,951	164,905	Totals	**$3,710,032,000**	**$23,304,196,270**

Table. Building Damage Counts and Estimated Losses using HAZUS MH



Building Damage Estimates: Red 70-100%, Yellow 30-70%, Green 5-30%

Transportation and Utilities Damage

Damages to transportation and utility infrastructure are in illustrated below. Infrastructure sustaining moderate or worse damage and estimated monetary losses are both shown.

Category	Total	At Least Moderate Damage >50%		Estimated Losses	
		Salt Lake M5.9	2500-yr M7.1	Salt Lake M5.9	2500-yr M7.1
Waste Water Facilities	5	2	4	$44,008,000	$146,243,000
Waste Water Pipelines	3.975 km	637 leaks/breaks	14,005 leaks/breaks	$2,294,000	$50,416,000
Potable Water Pipelines	6,625 km	805 leaks/breaks	17,706 leaks/breaks	$2,900,000	$63,744,000
Natural Gas Pipelines	2,650 km	681 leaks/breaks	14,970 leaks/breaks	$2,452,000	$53,893,000
Electrical Power Facilities	7	3	7	$92,024,000	$343,874,000
Communication Facilities	42	9	34	$242,000	$1,478,000
Highway Bridges	698	126	496	$81,646,000	$468,944,000
Railway Bridges	17	0	8	$9,000	$358,000

Railway Facilities	6	0	6	$3,494,000	$7,525,000
Bus Facilities	2	0	2	$490,000	$1,157,000
Airport Facilities	3	0	3	$2,675,000	$7,450,000
Total Losses				$232,234,000	$1,145,082,000

Table. Damage to Transportation and Utilities

Debris Removal

Table below shows how much debris would be generated by the earthquake and how many loads it would take to remove the debris, based on 25 tons per load. One truck can likely haul one load per hour. A second debris removal issue is landfill space. Fifty thousand tons at a weight-to-volume ratio of one ton per cubic yard would cover more than ten acres to a depth of three feet.

Category	Salt Lake M5.9	2500-yr M7.1
Brick, Wood & Others	581,000 tons / 23,240 loads	3,356,000 tons / 134,240 loads
Concrete & Steel	1,195,000 tons / 47,800 loads	7,678,000 tons / 307,120 loads

Table . Debris Generated/Number of Loads

Fires Following an Earthquake

Multiple ignitions and broken water mains following an earthquake can make firefighting nearly impossible. HAZUS-MH uses estimated building damages, loss of transportation infrastructure and estimated winds to calculate the estimated area that would be burned following an earthquake.

Category	Number of Structures	
	Salt Lake M5.9	2500-yr M7.1
Ignitions	49	80
Persons Exposed	806	2,116
Value Exposed	$50,232,000	$120,188,000

Table 14. Fire Following Event, Population Exposed, and Building Stock Exposed

Casualties

Table below estimates casualties likely to occur during each earthquake scenario. The nighttime scenario (2 a.m. local time) assumes a primarily residential concentration of persons, the daytime scenario (2 p.m. local time) a commercial concentration, and the commute scenario (5 pm. local time) a concentration of persons on commuting routes. Categories of casualties include those not requiring hospitalization (minor), those requiring treatment at a medical facility (major), and fatalities.

Night Event	Salt Lake M5.9	2500-yr M7.1	Day Event	Salt Lake M5.9	2500-yr M7.1	Commute Event	Salt Lake M5.9	2500-yr M7.1
Minor	1,024	10,475	**Minor**	1,883	17,110	**Minor**	1,432	13,442

Major	219	3,224	**Major**	502	6,192	**Major**	369	4,688
Fatalities	44	758	**Fatalities**	122	1,742	**Fatalities**	87	1,258

Table . Casualties

4.3.1.5 Mitigation Strategy

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 through HAZUS data and building inspections.

Time Frame: Ongoing

Funding: Municipal

Estimated Cost: Minimal

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

Time Frame: Ongoing

Funding: Municipal

Estimated Cost: Minimal

Action 3: Complete seismic rehabilitation/retrofitting projects of public buildings at risk. For example the City and County building has undergone seismic retrofitting and then new Public Safety Building was constructed to withstand 7.5 earthquake

Time Frame: Complete

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. Particularly marketing Fix the Bricks Program to educate home and business owners about masonry reinforcement.

Time Frame: Ongoing

Funding: Municipal

Estimated Cost: Minimal

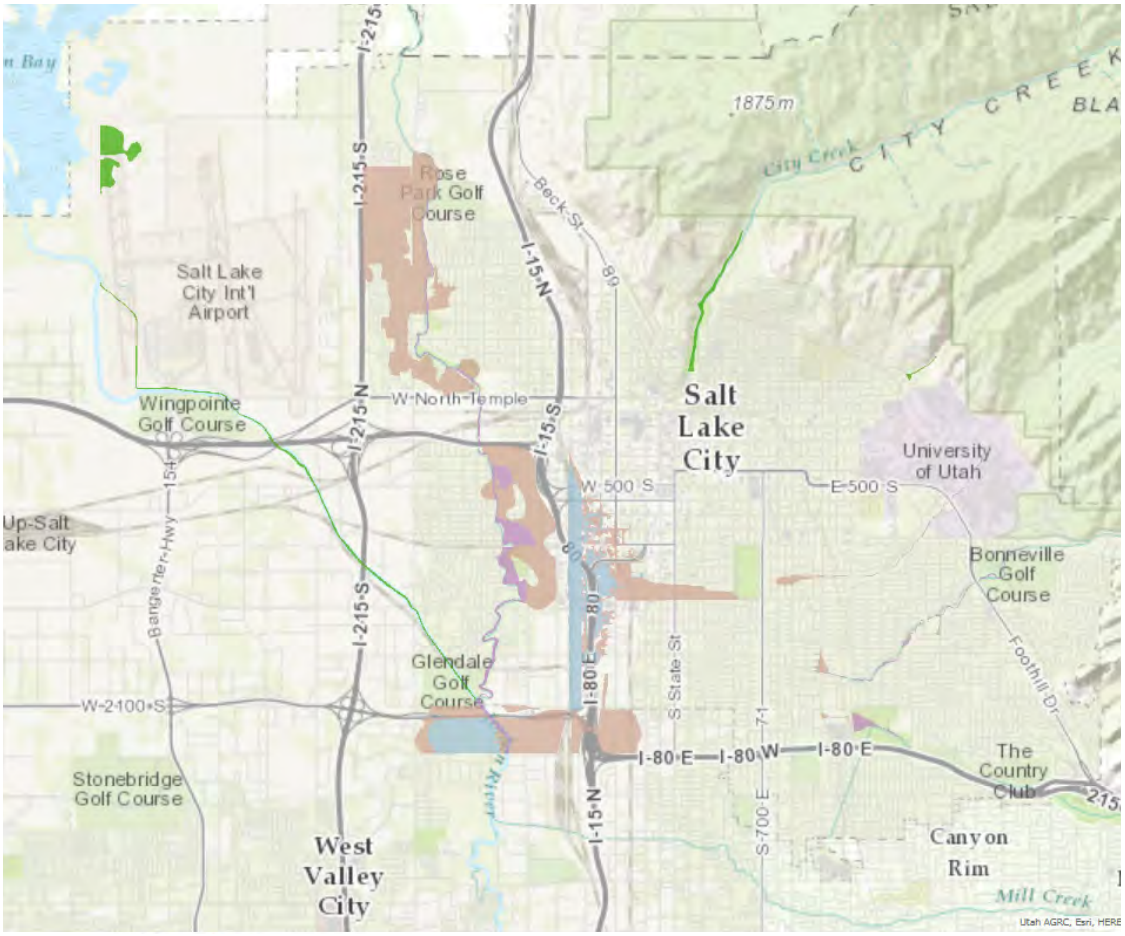
4.3.2 Hazard 2-Flooding

Although located in a semi-arid region, Salt Lake City is subject to flash flooding due to heavy rainfall and rapid snowmelt. 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. Significant flood mitigation measures were implemented following the major floods of 1983-84 that greatly reduced the flood threat to Salt Lake City. Of the many causes for flooding Salt Lake City's most likely event is from Post-fire debris flow flooding. Enhanced runoff conditions from a fire-damaged watershed can result in debris flow flooding. As fires burn, they destroy vegetation and leave soils in a hydrophobic state, resulting in greater peak flows.

4.3.2.1 Location and Extent

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. Parley's Creek has flood storage capacity at Mountain Dell and Little Dell Reservoirs and is routed through a retention basin in Sugarhouse Park. Big and Little Cottonwood Creeks and have a number of smaller flood storage lakes and ponds providing some flood protection, such as Wheeler Historic Farm. In Salt Lake City, Emigration Creek and Red Butte Creek come together at 700 East and 1300 South and can be discharged in or bypass Liberty Park pond. Parley's Creek discharges to the 1300 South drain at State Street.

Areas to monitor include 13th South between 700 East and State Street, 7th West and North Temple Streets. Retention ponds are also used to store runoff from commercial and residential development areas.



4.3.2.2 Range of Magnitude

Flooding Hazard Profile

Potential Magnitude		Catastrophic	Probability		Highly Likely
		Critical (25-50%)			Likely

	X	**Limited (10-25%)**		**X**	**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Fire damaged areas where soil is in hydrophobic				
Seasonal Conditions	Spring, heavy rainfall, and spring snowmelt runoff.				
Conditions	Thunderstorms w/heavy rainfall, extended wet periods.				
Duration	Flooding can last anywhere from hours to days and even months.				
Secondary Hazards	Raw sewage/health risk, electrical fires, gas spills.				
Analysis Used	Review of FIS, FIRM, Army Corp of Engineers Flood Study.				

4.3.2.3 Past Occurrence

History: The following flood events are of notable significance:

2011 - Large snowpack meant larger resulting spring runoff flows

2010 - Spring snowmelt combined with heavy rains caused several streams to overtop their banks

1987 – Great Salt Lake reached its all-time maximum water level (4211.6 feet)

1983 - Large snowpack was coupled with a rain-on-snow event, (City Creek diverted down State Street)

1983/1984 - Large snowpack overwhelmed Utah Lake and affected Jordan River downstream

1952 - Rapid melt of a large snowpack

Salt Lake City implemented mitigation efforts post 1983-84 floods and subsequently there are no repetitive loss claims due to flooding identified under 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.

4.3.2.4 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.

4.3.2.5 Mitigation Strategies

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 # 2: Encourage communities to actively participate in NFIP.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

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.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 2: Address identified problems through construction of debris basins, flood retention ponds, energy dissipaters or other flood control structures.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

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

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.
Time Frame: Ongoing
Funding: Municipal

Action 2: Modify structures as needed to address deficiencies.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Jurisdiction	1% Annual Chance Building and Contents Structure Exposure	1% Annual Chance Building and Contents Loss*	1% Annual Chance Loss Ratio**	0.2% Annual Chance Building and Contents Structure Exposure	0.2% Annual Chance Building and Contents Loss	0.2% Annual Chance Loss Ratio
Salt Lake City	424	$ 14,806,691	0.034%	1,835	$ 24,286,386	0.06%
County Total	**1,533**	**$ 118,217,947**		**6,763**	**$ 320,309,430**	**0.23%**

Structure Exposure and HAZUS Generated Losses

***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.**

The following data for flooding is carried over from the WFRC Pre-Disaster Mitigation Plan and was obtained from HAZUS-MH**. Vulnerability was assessed for both 100-year (NFIP Zone A) and 500-year (NFIP Zone B or Zone X (shaded) flood events. Analysis was completed using Digital Flood Insurance Rate Maps (DFIRM). Only streams that contained detailed flood cross-section data could be used. Flooding from the Great Salt Lake was not included. Consequently, the results should be considered conservative. (***For a more detailed explanation of the loss estimation methodology of HAZUS-MH MR2, please see Part VI of the WFRC Mitigation Plan or the HAZUS-MH Technical Manual (Flood Model) at www.fema.gov/hazus).*

4.3.3 Hazard 3-Wildfire

Wildfires are particularly concerning in the wildland-urban interface. The wildland-urban interface (WUI) is the line, area or zone where structures or other human development meet or intermingle with undeveloped wildland or vegetative fuel. Homes, storage sheds, recreational facilities, transmission lines and other buildings may meet or intermingle with trees, brush, and grasses in the WUI. The three conditions that affect fire behavior are topography, vegetation and weather.

Topography: Topography includes factors such as slope, aspect and elevation. Fires spread faster upslope because fuels are closer to flames. Aspect influences fuel moisture content. Fuels tend to be drier on south and west-facing slopes. Higher elevation is related to cooler temperatures and higher relative humidity, as well as changes in vegetative fuel types.

Vegetation: The type of vegetation has a major effect on how quickly a fire will spread. For example, light grasses burn rapidly, whereas heavy, dense fuels like Douglas fir burn slowly but with greater intensity. Different fuels burn at different rates of spread, intensity, and will resist control to different degrees.

Size, continuity and compactness also affect the fuel's rate of spread. Large fuels do not burn as readily as small fuels, and take more heat to ignite. Small fuels ignite easier and fire will spread more rapidly through them. Continuity describes how a fuel is arranged horizontally. Fuels that are broken up in patches burn unevenly and slower than uniform fuels. Compactness is how fuel is arranged vertically. Compact fuels burn slower than tall, deep fuels that have more oxygen available

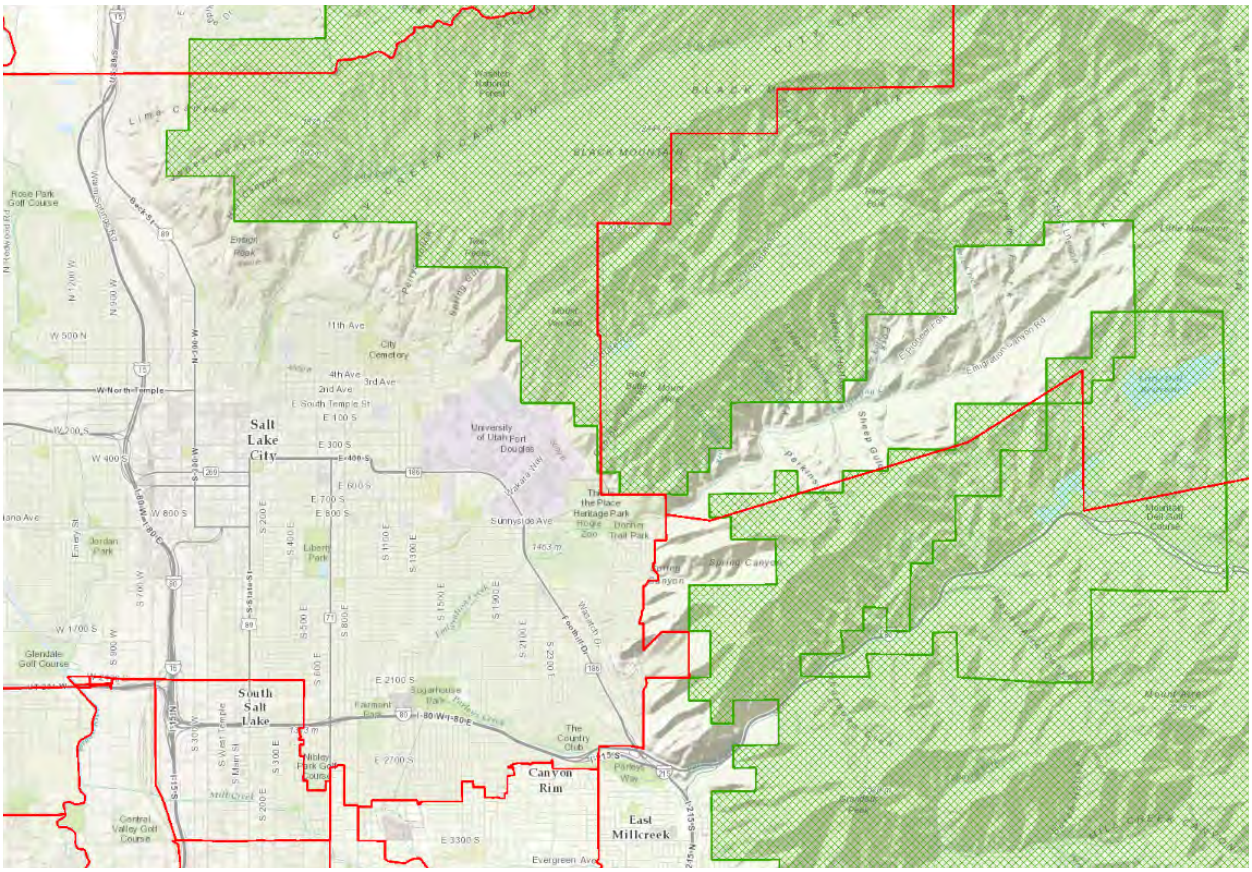
Weather: Weather (temperature, humidity, precipitation, and wind) affects the ease with which a fuel ignites, the intensity at which it burns, and how easy control may be. High temperatures heat fuels and reduce water content, which increases flammability. A decrease in relative humidity causes a proportionate decrease in fuel moisture, promoting easier ignition and more intense burning. Wind carries the heat from a fire into unburned fuels, drying them out and causing them to ignite easier. The wind may also blow burning embers into unburned areas ahead of the main fire that may start spot fires.

Wildfire removes vegetation that protects soil from excessive rainfall and resulting runoff. It also damages soil by making the soil hydrophobic, or water repellent. These conditions contribute to depletion of wildlife resources, soil erosion, water runoff, and in some cases severe slope failures and debris flows .

Providing adequate fire protection in the WUI can be difficult. Local suppression methods and resources may not be suited to wildfire suppression, and personnel can become easily overwhelmed when multiple structures are threatened simultaneously. Energy output from a wildfire may make protection of homes almost impossible and involves tremendous danger to firefighters and homeowners.

4.3.3.1 Location and Extent

The portions of Salt Lake City that could experience significant amount of destruction due to a wildland fire include the foothills and the bench areas on or near the Wasatch Range. These WUI areas are threatened most because of the amount of forested lands and the increasing population growth spreading into the foothills. Another concern is vegetation type in these areas such as sagebrush, mountain scrub oak, cheat grass, pinion and juniper trees, and rural and riparian vegetation. Sagebrush and mountain shrub burn hot and fast, spreads easily and is found throughout the county. During prime burning conditions (hot, dry and windy) the pinion juniper class will burn. The image below illustrates where Salt Lake City's WUI occurs and includes fire response boundaries (red lines) in conjunction with the forestry service areas (green patches).



4.3.3.2 Range of Magnitude

Past wildfires in Salt Lake City have had a significant impact on watersheds, resulting in slope failure, debris flows and other forms of erosion. State and local agencies have worked together to enhance ordinances and other measures to protect these watersheds.

Wildfire Hazard Profile

Potential Magnitude			Probability		
		Catastrophic			**Highly Likely**
	X	**Critical (25-50%)**		X	**Likely**
		Limited (10-25%)			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Wildland-Urban Interface (WUI) zones near the foothills and in forested areas				
Seasonal Pattern	June-October.				
Conditions	Areas affected by drought; heavily overgrown and dry brush and debris; lightning and human triggers.				
Duration	Days to months; depends on climate and fuel load as well as resources (financial, manpower) to extinguish the fire.				
Secondary Hazards	Landslides, debris flows/flash floods, erosion, traffic accidents, air pollution.				
Analysis Used	Review of plans and data provided by US Forest Service, FFSL, FEMA, AGRC, County Hazard Analysis Plans, WWA, and UDEM.				

4.3.3.3 Past Occurrence

Several notable wildfires have occurred in Salt Lake County since the last Mitigation Plan was completed. These include the Corner Canyon Fire in Draper City in August 2008, The Machine Gun fire in Herriman City in September, 2010, and the Rose Crest fire and Pinion Fire also in Herriman City in 2012. These fires prompted major fire response, required evacuations of large numbers of citizens, and created the threat of debris flows in following years. Even though these fires did not occur within Salt Lake City boundaries they impacted our resources and capabilities due to mutual aide response.

4.3.3.4 Future Occurrence

As population growth continues, pressure to develop in WUI areas is likely to increase the threats associated with fire. Mitigation measures will need to be recognized and enforced to reduce these threats.

4.3.3.5 Vulnerability Assessment

The next two tables estimate the total area, population and buildings vulnerable to wildland fire for Salt Lake City. These values are based on a new GIS analysis to account for population growth and new structures. Salt Lake County Assessor data and 2010 Census data were overlaid on the located within Moderate, High or Extreme wildfire risk. Wildfire Hazard Risk data is shown in Map 10 to determine population and structures.

Incorporated Areas	Total Population Affected	Total Households	Total Structures		
				Residential (Total Assessed Value)	**Commercial (Total Assessed Value)**
Salt Lake City	2680	1095	611	410 $83,640,000	60 $209,789,232

Table. Population vulnerability and structures in areas of Moderate or Greater Hazard, based on BLM Wildfire Hazard data. 2007

Communities At Risk	Fire Occurrence	Fuels Hazards	Values Protected	Fire Protection Capability	Overall Score
Salt Lake City	2	3	2	1	8

4.3.3.6 Mitigation Strategy

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.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 2:Educate homeowners on the need to create defensible space near structures in WUI.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

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 county-wide annual initiative for clearing fuels.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 2: Provide waste removal, such as chipping of green waste by Public Works, following designated fuel clearing day/week.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

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

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

Funding: Municipal
Estimated Cost: Minimal

Action 2: Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Objective 2.3 (Priority HIGH): Complete wildfire protection projects
Action 1: Reduce fuels around publicly owned structures.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 2: Implement fire breaks and other protective measures.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

4.3.4 Hazard 4-Landslide and Slope Failure

Slope failure is any type of ground disturbance on a surface with any slope, not flat ground. Landslides, also referred to as slope failures, are classified according to the type of movement and material involved. Movement types include falls, topples, slides, lateral spreads and flows. Materials include rocks, debris (coarse-grained soil), and earth (fine-grained soil). The most common landslides include rack falls, rock topples, debris slides, debris flows, earth slides, and earth flows.

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. Similar failures occurred in canyons adjacent to Salt Lake City, but none reached developed areas.

4.3.4.1 Location and Extent

Landslides and debris flows are most common in the foothills along the base of the Wasatch Mountain Range from wet climatic conditions. Some major landslide areas include the Grand View Peak rockslide in upper City Creek Canyon. As urbanization spreads into geologically unstable areas the risk to life and property increases.

4.3.4.2 Range of Magnitude

Landslide and slope failure Hazard Profile

Potential Magnitude			*Probability*		
		Catastrophic			**Highly Likely**
		Critical (25-50%)		**X**	**Likely**
	X	**Limited (10-25%)**			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Foothills and nearby canyons				
Seasonal Pattern	Spring and summer months.				
Conditions	Usually caused by the stress release of over-weighted soils or loosening of rock and debris by wind, water or ground shaking.				
Duration	*Landslides/Rock falls:* Hours to Months. *Debris flows*: Instantaneous.				
Secondary Hazards	Flooding (natural dams), traffic accidents.				
Analysis Used	Information and maps provided by UGS, UDEM, AGRC.				

4.3.4.3 Past Occurrence

A cluster of historical landslides is visible from the hairpin turn in Bonneville Boulevard in lower City Creek Canyon in Salt Lake City. Movement of the largest and most damaging of these landslides has been monitored since June 1998 by the UGS and the Salt Lake City surveyor. Since June 1998, the toe of the landslide has moved about 24 feet, and the main scarp has offset the ground surface about the same amount. Like most recurrently active landslides in northern Utah, movement typically occurs between March and June as ground-water levels rise following the snowmelt. Four houses at the top of the slide are threatened, and efforts to protect one house have cost in excess of $300,000. In 2006 the landslide reactivated again, moving about 2 feet, despite drier-than-normal conditions in Salt Lake City. (Utah Hazard Mitigation Plan)

Subsidence is possible in City Creek, Emigration, Parley's, and Big Cottonwood Canyons due to the prevalence of dissolvable limestone. Subsidence can also occur in the Avenues area of Salt Lake City due to collapsible soils that are compactable upon wetting.

Incorporated Areas	**Acres Affected**	**Population Affected**	**Structures in Areas of Moderate or Greater Hazard**	
			Residential (Replacement Value)	**Commercial (Annual Sales)**
Salt Lake City	15,701	15,762	6,327 $1,294,504,200	176 $47,480,280

Table . Vulnerability Assessment for Landslides

4.3.4.4 Mitigation Strategy

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.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

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.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

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.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

4.3.5 Hazard 5-Severe Weather

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.

4.3.5.1 Types of Weather Events

Vulnerability Assessment

Severe Storms: Severe storms can include thunderstorms, lightning, hailstorms, heavy snow or rain. These storms are generally related to high precipitation events during the summer and winter months and can happen anywhere in the region. Damage can be extensive especially for agriculture, farming, and transportation systems; they can also disrupt business due to power outages.

Severe Thunderstorms: Severe thunderstorms are storms that either produce tornadoes, winds 58 mph or greater, wind damage, and/or hail three-quarters of an inch or larger in diameter. Thunderstorms can also lead to flash flooding from heavy rainfall.

Hailstorms: Hailstorms occur when freezing water (in thunderstorm clouds) accumulates in layers around an icy core generally during the warmer months of May through September. Hail causes damage by battering crops, structures and automobiles. When hailstorms are large, damage can be extensive, especially when combined with high winds.

Heavy Precipitation: Heavy amounts of precipitation from rain or snow can result in flash flood events. The Wasatch Front has been susceptible to these types of storms because of close proximity to the mountain ranges.
Major winter storms can produce five to ten times the amount of snow in the mountains than in the valley locations. Heavy snow can cause a secondary hazard in avalanches.
Much of the valley's development has occurred on old alluvial fans from the canyon mouths. During heavy rain events, water and debris collect on these same alluvial fans, damaging residential, commercial property and infrastructure.

Tornado: A tornado is a "violently rotating column of air extending from a thunderstorm to the ground". Some tornadoes can have wind speeds greater than 250 mph with a damage zone 50 miles long and greater than a mile wide. Although they are less common in the Intermountain Region tornados have occurred in Salt Lake City. Historically, atmospheric conditions have not been favorable for tornado development in Salt Lake due to a dry climate and mountainous terrain. Utah is one of the lowest ranked in the nation for incidences of tornadoes with only one F2 or stronger tornado every seven years.

4.3.5.2 Past Occurrence

Winter Storms: Winter storms can pose a significant threat due to vehicle traffic accidents on icy roads, prolonged exposure to cold, damage to electrical, telephone or communication systems from ice or heavy snow accumulation, and indirectly related health threats such as individuals suffering heart attacks while shoveling snow. Prolonged exposure to cold can cause frostbite or hypothermia and can become life threatening. Winter weather can also have significant economic costs associated with snow removal, revenue and wage losses from road and airport delays or closures, flooding damage from rapid snowmelt, and agricultural and timber losses from frost and ice.

Fog: Temperature inversions often occur during the winter months as a result of high pressure trapping cold air in the valley. These inversions keep cold, moist air trapped on the valley floor forming super-cooled fog. This fog can cause visibility restrictions and icy surfaces. Wind is needed to clear the inversion and fog. The Great Salt Lake has been shown to affect the prevalence of fog, especially when lake levels are high.

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.

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". 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 City, 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.

Tornado: Most tornadoes in Utah typically have winds less than 110 mph (F2 or smaller), and no wider than 60 feet and are on the ground no longer than a few minutes. Tornado distribution for the region suggests many tornadoes are funnel clouds aloft coming into contact with the increasing elevation of Salt Lake City's foothills and mountains. Despite this fact, interactions of the relatively cool air of the Great Salt Lake and relatively warm air of urban areas could create situations more favorable for tornado development. This phenomenon possibly contributed to the formation of the August 1999 Salt Lake City tornado. The $170 million in damages caused by this tornado make it the costliest disaster in Salt Lake history.

4.3.5.3 Mitigation Strategy

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.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

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.
Time Frame: Complete

Funding: N/A
Estimated Cost: N/A

Action 2: Assist NWS in making other agencies and departments aware of available resources.
Ongoing: Salt Lake City (all city departments represented at meetings w/NWS),
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Objective 1.3 (Priority HIGH): Examine the vulnerability of attendees at large event venues to extreme weather events.

Action: Work with the NWS to develop large event venue weather safety and evacuation procedures.
Time Frame: Ongoing
Funding: Municipal

4.3.6 Hazard 6-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. 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.

4.3.6.1 Location and Extent

There are 3 dams located in Salt Lake City. These dams are built by different agencies, and may serve various functions such as flood control, water storage, recreation, and power generation. 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).

Name	Rating
Little Dell	High
Mountain Dell	High
Red Butte Dam	High

Table 26. High and Moderate Hazard Dams, Salt Lake City *(Source: Utah Division of Water Rights)*

4.3.6.2 Range of Magnitude

Dam Failure Hazard Profile

Potential Magnitude		**Catastrophic**	**Probability**		**Highly Likely**
	X	**Critical (25-50%)**			**Likely**
		Limited (10-25%)		**X**	**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Little Dell, Mountain Dell, and Red Butte Dam				
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.				

4.3.6.3 Past Occurrence

No record was found of dam failure incidents within Salt Lake City.

4.3.6.4 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. 3 of the 50 highest priority dams are located within Salt Lake City.

1. Mountain Dell
2. Little Dell
10. Red Butte Dam

4.3.6.5 Mitigation strategy

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 City Emergency Operations Plans.
Time Frame: Not Necessary
Funding: N/A
Estimated Cost: N/A
Action 2: Utilize inundation maps to identify potential evacuation areas and routes.
Time Frame: Not Necessary

Funding: N/A
Estimated Cost: N/A

4.3.7 Hazard 9-Drought

Because the Salt Lake 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.

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.

4.3.7.1 Range of Magnitude

Drought Hazard Profile

Potential Magnitude		***Catastrophic (>50%)***	***Probability***		***Highly Likely***
		Critical (25-50%)		***X***	***Likely***
	X	***Limited (10-25%)***			***Possible***
		Negligible (< 10%)			***Unlikely***
Location	Citywide.				
Seasonal Pattern	Impacts typically noticeable in summer, conditions can be year round.				
Conditions	*Meteorological Drought:*				
	Agricultural Drought:	Lack of precipitation 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.

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).

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. 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 (NDMC 2006).

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.

4.3.7.2 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 City falls within two climatic regions: the North Central region (3), and the Northern Mountains region (5). 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.

4.3.7.3 Past Occurrence

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 (Figure 8-1 above) 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).

4.3.7.4 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.

4.3.7.5 Mitigation strategy

Goal 1 – Reduce and prevent hardships associated with water shortages

Objective 1.1 (Priority HIGH): Limit unnecessary consumption of water

Action 1:Continue to encourage water conservation utilizing and promoting outreach material

Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 2: Emergency Managers will coordinate with public utilities to support ongoing conservation efforts.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 3: Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses.
Time Frame: Complete
Funding: N/A
Estimated Cost: N/A

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

Funding: Municipal
Estimated Cost: Minimal

Action 5:Repair, maintain and improve water distribution infrastructure to prevent loss from leakage, breaks, etc.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 6: Coordinate public safety water use, such as hydrant testing.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

Action 7: Provide information on landscaping alternatives for persons subject to green area requirements.
Time Frame: Complete
Funding: N/A
Estimated Cost: N/A

Objective 1.2 (Priority MEDIUM): Encourage development of secondary water systems

Action 1: Coordinate with water districts to plan for, develop and/or expand secondary water systems.
Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal

5 Mitigation Strategy

5.1 Mitigation Goals and Objectives

The following plan goals and objectives of the Mitigation plan were retained 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 county-wide planning process that meets each planning component identified in the FEMA Region VIII Crosswalk document, Utah Division of Emergency Management (DEM) planning expectations, and local input.

Short Term Local Goals

The following general goals were used in the development of the Mitigation Plan. 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.

Long Term Local Goals

1. Eliminate or reduce long-term risk to human life and property.
2. Aid private and public sectors in understanding the risks they may be exposed to and identify mitigation strategies to reduce those risks.
3. Avoid risk of exposure to natural and technological hazards.
4. Minimize the impacts of risks that cannot be avoided.
5. Mitigate the impacts of damage as a result of identified hazards.
6. Accomplish mitigation strategies in such a way that negative environmental impacts are minimized.
7. Provide a basis for prioritizing and funding mitigation projects.
8. Establish a county-wide 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.

Capital investment decisions must be considered in conjunction with natural hazard vulnerability. Capital investments can include homes, roads, public utilities, pipelines, power plants, chemical plants, warehouses and public works facilities. These decisions can influence the degree of hazard vulnerability of a community. Once a capital facility is in place, few opportunities will present themselves over the useful life of the facility to correct any errors in location or construction with respect to hazard vulnerability. It is for these reasons that zoning ordinances, which could restrict development in high vulnerability areas, and building codes, which could ensure that new buildings are built to withstand the damaging forces of hazards, are the most useful mitigation approaches a city can implement.

5.2 Mitigation Action Plan

Implementation through Existing Programs (Including NFIP)

Once the Plan is promulgated the City will integrate the strategies into existing programs and planning processes. These could include the Master Plan, Capital Improvements Plan, Emergency Operations Plan, etc. Many of the mitigation actions developed have elements of mitigation implementation including the National Flood Insurance Program (NFIP), the Utah Wildland-Urban Interface Code, the Building Code Effectiveness Grading System (BCEGS), and Community Rating System (CRS), all of which have been implemented.
Salt Lake City 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.

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).

Process

It will be the responsibility of Mayor, as he sees fit, 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 Plan Maintenance

6.1 Monitoring, Evaluating & Updating the Plan

Periodic monitoring and updates of this Plan are required to ensure that the goals and objectives for the Region 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.

Annual Review Procedures

The 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 county organizing a 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. If determined that a modification of the Plan is warranted, an amendment to the Plan may be initiated as described below.

Five Year Plan Review

The entire Plan including any background studies and analysis shall be revised and updated every five years 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.

Plan Amendments

The Utah DEM State Hazard Mitigation Officer, Local Mitigation Committee, or the Salt Lake City Mayor will initiate amendments and updates to the Plan.

Upon initiation of an amendment to the Plan, UDEM will forward information on the proposed amendment to all interested parties. including, but not limited to, all affected city departments, residents and businesses. Depending on the magnitude of the amendment, the full planning committee may be reconstituted.

At a minimum, the information will be made available through public notice in a newspaper of general circulation or on the Salt Lake City Emergency Management website www.slcgov.com/em. The review and comment period for the proposed Plan amendment will last for not less than forty-five (45) days.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered:

- There are errors or omissions made in the identification of issues or needs during the preparation of the Plan; and/or
- New issues or needs have been identified which were not adequately addressed in the Plan; and/or
- There has been a change in information, data or assumptions from those on which the Plan was based.
- The nature or magnitude of risks has changed.
- There are implementation problems, such as technical, political, legal or coordination issues with other agencies.

Then one of the following actions will take place:

1. Adopt the proposed amendment as presented.
2. Adopt the proposed amendment with modifications.
3. Defer the amendment request for further consideration and/or hearing.
4. Reject the amendment request.

2009 Wasatch Front Mitigation Plan strategies status

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	Capabilities were assessed and new communications systems have been implemented.
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	ongoing	This has to be done on a regular basis for staffing purposes.
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	Some of the current systems are shared across the valley and have agreements for who is responsible for maintenance, etc.
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	
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	
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	New Integrated communications system across the valley.

Category	Goal / Objective	Action	Status	Comments
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 and ongoing	A group was formed that played a role in the systems we have now.
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	Completed	See answers above
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	Ongoing	A GIS position and capabilities were added to our EOC. A GIS working group has been established
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	Ongoing	GIS working group is trying to address these issue by forming a Common Operating Picture (COP).
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	Ongoing	In conjunction with our other projects new data is added to the GIS layers
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	Ongoing	See comment above on forming a COP
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.	NA	

Category	Goal / Objective	Action	Status	Comments
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.	NA	
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	Ongoing	GIS data used to estimate which buildings will fail and how much debris they will create. Data on URMs was used to create maps, planning tools and educational materials.
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	Ongoing	Gathered data while participating in various programs (LEAP, RRAP, etc.) to use in planning/response. Plan to implement use of IP gateway.
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	Ongoing	Having mobile command center capabilities. Keep 96hr supplies and equipment in various key locations for rapid access to after an event.
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	Putting them in places that be readily accessed like the WebEOC library

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	
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	Ongoing	Added a community preparedness coordinator to staff and we utilize several forms of outreach (fairs, workshops, web pages, social media, etc.)
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	Ongoing	Increasing Hazard awareness through our Fix the Bricks program and URM maps. Promote community participation in programs like SAFE neighborhoods
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	Ongoing	Via Fix the Bricks and SAFE Neighborhoods
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	NA	However we do post hazard maps and public outreach materials on our local jurisdictions webpage.
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	We partner with the local Red cross and SLC district on SAFE Neighborhoods Program. We also promote other public educations programs; such as Be Ready Utah.

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	Ongoing	Adopted current international building code
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	Complete	
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	Complete	We coordinate regularly with our Public Utilities 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	3 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	complete	
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	SLC policy that public facilities meet LEEDs silver standard at a minimum
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	
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	Ongoing	
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	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	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	NA	

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	Used data to create URM maps, planning tools and education materials.
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	Complete	Established Fix the Bricks 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	Ongoing	
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	Ongoing	Fix the Bricks was added to our community outreach materials and publications
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.	NA	
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	NA	
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	

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	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Ongoing	Evaluated Regularly
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	Evaluated Regularly
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	Evaluated Regularly
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	Evaluated Regularly
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	Evaluated Regularly
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	Ongoing	
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	

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	Ongoing	
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	
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	Ongoing	
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	Ongoing	
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	
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	

Category	Goal / Objective	Action	Status	Comments
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through "Firewise" program	Ongoing	We promote Firewise when 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	Ongoing	Part of Firewise
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	NA	
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	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	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	Ongoing	

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	1 – Identify all facilities, businesses, and residences, particularly in the canyons, and assign addresses according to current county addressing standards	NA	
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	Ongoing	
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	Ongoing	
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	NA	
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	Ongoing	
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	Ongoing	

Category	Goal / Objective	Action	Status	Comments
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	Complete	
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	Complete	

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Hazard Mitigation Plan (2014)

SALT LAKE COUNTY

Hazard Pre-Disaster Mitigation Plan
2014

Index

ANNEX K: UNINCORPORATED SALT LAKE COUNTY
1 Introduction

1.1 Community Profile

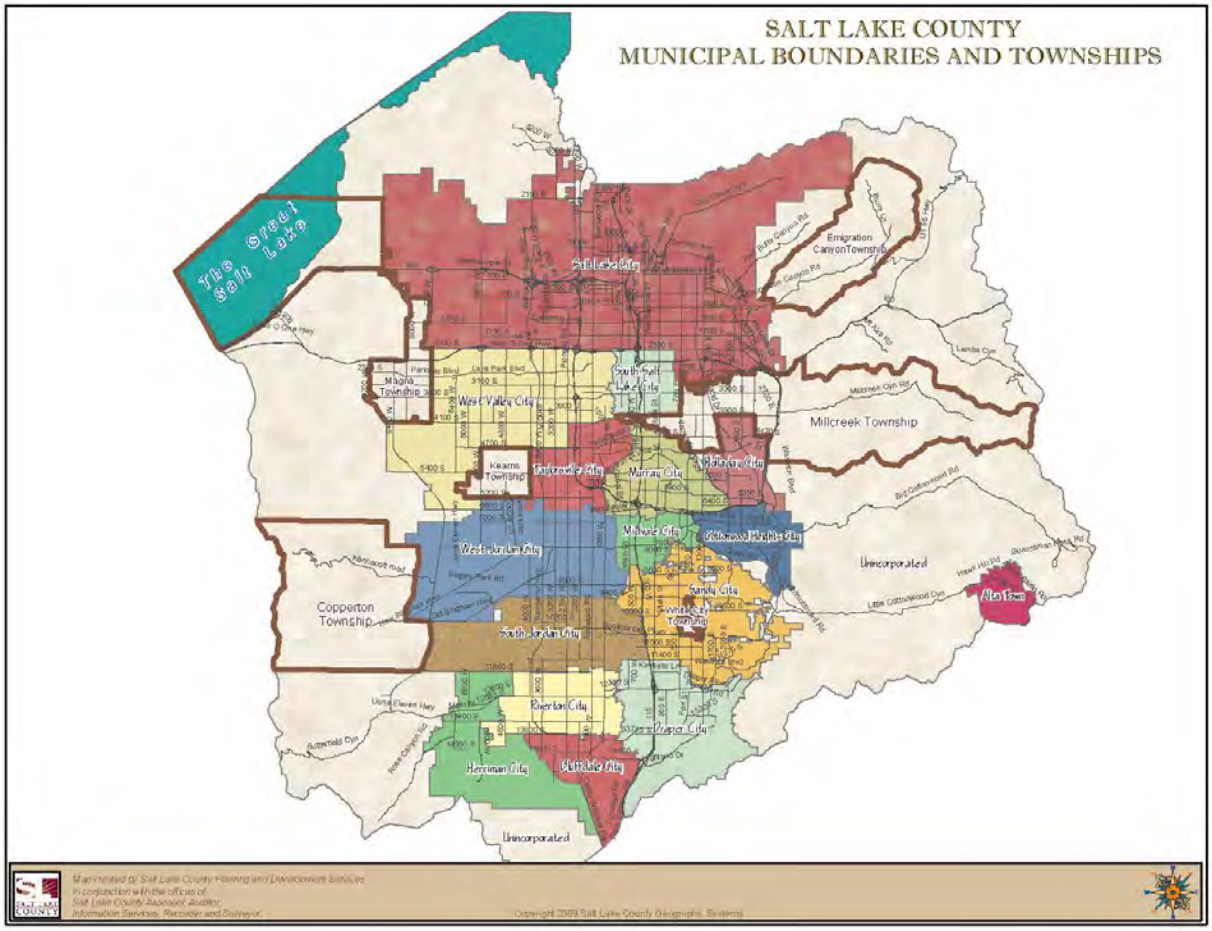
Salt Lake County is a county located in the U.S. state of Utah. As of the 2010 census, the population was 1,029,655, making it the most populous county in Utah. Its county seat and largest County is Salt Lake County, the state capital.

Salt Lake County occupies the Salt Lake Valley, as well as parts of the surrounding mountains, the Oquirrh Mountains to the west and the Wasatch Range to the east (essentially the entire watershed of the Jordan River north of the Traverse Mountains). In addition, the Great Salt Lake is partially within the northwestern section of the county. The county is famous for its ski resorts, which led to Salt Lake County hosting the 2002 Winter Olympics.

Salt Lake County is part of the Salt Lake County, UT Metropolitan Statistical Area.

Figure 1.1-A
Location in the State of Utah

With statehood in 1896, a county commission was created. At this time, County government had a County Auditor, Assessor, Attorney, Clerk, Recorder, Sheriff, Surveyor, and Treasurer – the same independent offices that exist today. In 1900, Salt Lake County had 77,725 residents.



The first formal meeting of Salt Lake County government occurred on March 15, 1852—eighteen months after the Utah Territory was established by the United States Congress.

Probate judges and county selectmen functioned in what was known as the County Court. The duties of the County Court included both judicial and executive powers for the administration of county government. They managed claims against the County; controlled timber and water privileges; granted mill sites; created schools, roads, and election districts; and levied taxes. They authorized payment of bills and wages; laid out roads, irrigation canals and dams; and appointed county officials such as the fruit tree inspector and coroner.

Over time, more duties were added including granting business licenses, most of which were liquor licenses, and approving the incorporation of towns.

Figure 1.1 – B Satellite View of Salt Lake County

1.1.1 Infrastructure

Transportation

Because there are only four major entrances to the Salt Lake Valley (to the north, east, and west of Salt Lake County proper as well as far to the south at Point of the Mountain), routes for long distance travel through the valley are mainly confined to an east-west strip through Salt Lake County and South Salt Lake and a north-south strip near the Jordan River. These corridors cross in the area between South Salt Lake and Downtown Salt Lake County and together form a Latin cross of transportation infrastructure that is almost perfectly oriented north-to-south.

Air transportation

Salt Lake County International Airport is the only airport with scheduled passenger service in the county, and South Valley Regional Airport is the only other public airport. Another small airport, Skypark Airport, is just to the north of Salt Lake County, however. The main runways of all of these airports are oriented approximately north-to-south (parallel to the Oquirrh and Wasatch mountains).

Railroads

All four major entrances to the Salt Lake Valley once carried rail traffic, but the line in Parley's Canyon was never built to high standards and was covered by Interstate 80 in the mid-20th century, leaving intact railroads only at the north, south, and west entrances to the valley. All three of these entrances carry passenger trains as well as freight: the Utah Transit Authority's (UTA) FrontRunner commuter rail line provides all-day service to Ogden (with select peak hour trips going to Pleasant View) on the north (via Davis County) and Provo on the south. Amtrak's California Zephyr runs once a day in each direction between Garfield and Point of the Mountain via Salt Lake County Station (on its route between Emeryville, California and Chicago, Illinois). Union Pacific controls all long distance freight tracks entering and leaving the county, though the Utah Railway, BNSF, and Salt Lake, Garfield, and Western have long-standing trackage rights. The Salt Lake County Southern and Savage Bingham and Garfield railroads operate totally within the county.

A light rail system, known as TRAX, is operated by the Utah Transit Authority (UTA) and currently has three lines. The Blue Line runs from Downtown Salt Lake County to Draper), the Red Line from South Jordan to the University of Utah, and the Green Line from West Valley County to the Salt Lake County International Airport (via Downtown Salt Lake County). There are currently 50 stops in the system. The original line opened in 1999 from downtown to Sandy, with the line to the University of Utah completed in 2001, and to West Valley County and South Jordan in 2011. In April 2013 the extension to the airport (Airport Station) on the Green Line opened and the extension to Draper (Draper Town Center Station) on the Blue Line opened in August 2013.

An historic streetcar was also expected to be constructed along 2100 South from the TRAX station to the historic business district in the Sugar House neighborhood. The proposal was refined, and a modern, rather than historic, streetcar system (S Line, formerly known as Sugar House Streetcar) operated by UTA is complete. It will open December 2013 and will run east from the Central

Pointe TRAX Station to just east of Highland Drive in Sugar House. A future extension is planned to run north along Highland Drive and 1100 East to 1700 South.

Roads

The county is traversed by three Interstate Highways and one U.S. Highway, as well as an additional freeway and one major expressway. US-89 enters from Davis County to the north and traverses the county arrow-straight until merging with I-15 in north Draper. It is known as State Street along most of the route and is the primary surface road in the valley. I-15 and I-80 intersect just west of Downtown Salt Lake County, merging for approximately 3 miles (4.8 km) north-to-south. I-80 continues west past the Salt Lake County International Airport and east through Parley's Canyon and into the Wasatch Range. I-15 traverses the valley north-to-south, providing access to the entire urban corridor. The freeway is 10-12 lanes wide after a major expansion project from 1998 to 2001 undertaken in preparation for the 2002 Winter Olympics. I-215 directly serves many of the suburbs of Salt Lake County in the western, central, and eastern portions of the valley in a 270° loop. SR-201, alternatively known as the "21st South Freeway", provides access to West Valley County and the west side of the valley. Bangerter Highway (SR-154) is an expressway that traverses the entire western end of the valley from the airport, ending at I-15 in southern Draper. SR-68, or Redwood Road, is the only surface street that traverses the entire valley from north-to-south. The Legacy Parkway opened in 2008 to connect with I-215 at the north end of the valley, providing an alternative route into Davis County to alleviate congestion. The Mountain View Corridor is a freeway planned to be constructed down the far west side of the valley - construction began in 2010.

The Utah Transit Authority operates bus routes throughout the valley and along the Wasatch Front, to Park County and Tooele, and to the ski resorts in winter.

Pedestrian and bicycle trails

The Jordan River Parkway trail (and its northern extension, the Legacy Parkway trail) runs north-south in the center of the valley from Utah County to Davis County (though it has a few gaps), and the planned Crosstown and Parley's trails will together form the primary east-west route from Parley's Canyon to Garfield. The Bonneville Shoreline Trail runs along the face of the Wasatch mountains, skirting the edge of the built up areas of the east bench, though there are large gaps in the central part of the county. A large number of more remote trails provide access throughout the Wasatch-Cache National Forest.

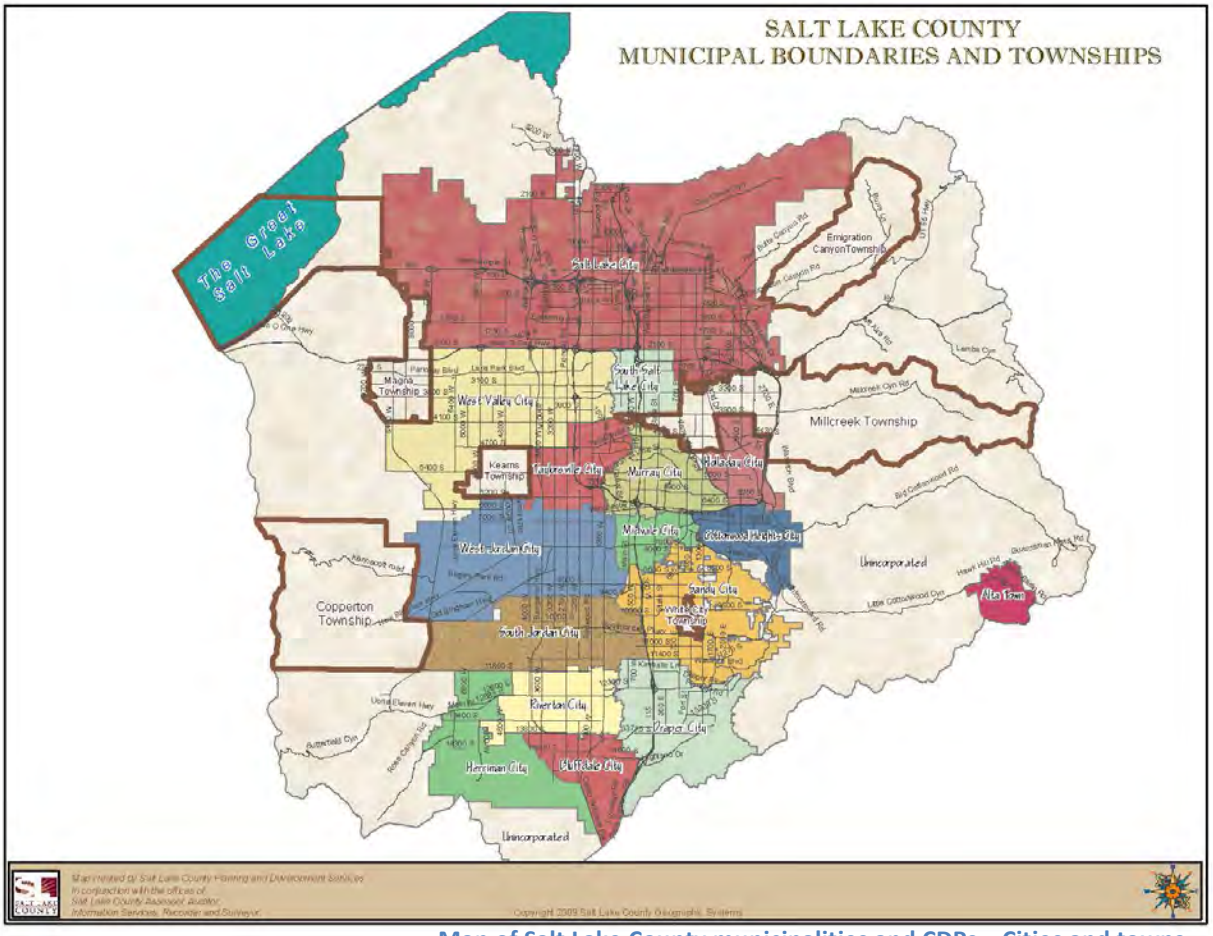
1.1.2 Health care

The largest health care providers in the county are Intermountain Health Care and University of Utah Healthcare, though three major hospitals (St Mark's, Pioneer Valley, and the Veterans Affairs Hospital) are run by other organizations. Hospitals in the county include:

Alta View Hospital
Huntsman Cancer Hospital
Intermountain Medical Center
Jordan Valley Hospital
LDS Hospital
Pioneer Valley Hospital
Primary Children's Medical Center
Salt Lake Regional Medical Center

Shriners Hospital (Salt Lake County)
St Mark's Hospital (Utah)
The Orthopedic Specialty Hospital
University of Utah Hospital
VA Hospital (Salt Lake County)

1.1.3 Communities



Map of Salt Lake County municipalities and CDPs—Cities and towns

At present there are 15 cities and one town (Alta) in the county:

Alta, incorporated in 1970
Bluffdale, incorporated in 1978
Cottonwood Heights, incorporated in 2005
Draper, incorporated in 1978
Herriman, incorporated in 1999
Holladay, incorporated in 1999
Midvale, incorporated in 1900s
Murray, incorporated in 1902
Riverton, incorporated in 1946
Salt Lake County, incorporated in 1851
Sandy, incorporated in 1893
South Jordan, incorporated in 1935
South Salt Lake, incorporated in 1938
Taylorsville, incorporated in 1996
West Jordan, incorporated in 1941
West Valley County, incorporated in 1980

Unincorporated communities

The county has created "townships" and "community councils" in unincorporated areas, largely for planning purposes only. As of 2010, all of the townships are also census-designated places (CDPs), but the boundaries set by the Census Bureau and the county do not always coincide.

Townships

Copperton
Emigration Canyon
Kearns
Magna
Millcreek
White County

Community councils

Big Cottonwood Canyon
Granite (also a CDP)
Parley's Canyon
Sandy Hills and Willow Canyon (enclaves of Sandy)
Southwest (area south of Copperton and South Jordan and west of Herriman)

Former communities

Bingham Canyon, incorporated 1904, disincorporated 1971. The last buildings were razed in 1972 as the Bingham Canyon Mine absorbed the town. At its peak its population was around 15,000.

Forest Dale, incorporated 1902, disincorporated 1912 and subsequently annexed by Salt Lake County.[28]

Lark was a small town on the southwest side of the valley that was dismantled entirely in 1978 to make way for overburden from the Bingham Canyon Mine. At its peak its population was around 800.

1.2 Purpose

The purpose of this plan is to enumerate hazards that could affect the Unincorporated Salt Lake County, describe mitigation strategies for each of those hazards, and provide a framework for revision of hazard mitigation strategies. This document was created by Unincorporated Salt Lake County staff in collaboration with 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 Authority and Reference

In 2000, a new Mayor/Council form of government was chosen by the voters to replace the County Commission. The population of the County was 898,387. The County expanded services to

include a new jail, more libraries and recreation centers and more programs for its aging population.

In 2008, SALT LAKE COUNTY is a diverse community of 16 cities and 6 townships. County government serves almost 1 million residents providing public safety, health services, and cultural and recreation opportunities while also managing property, growth and development issues.

Salt Lake County Elected Officials

Assessor
Establishes the assessed value and classification for all locally assessed property including incorporated cities within Salt Lake County. Assesses and collects the personal property tax.

Auditor
Calculates the tax rates for all taxing entities in the county. Acts as clerk for the Board of Equalization. Prepares and delivers annual Valuation Notice (also known as the Truth in Tax Notice) to all property owners.

Clerk
The Salt Lake County Clerk directs the Elections Division, Marriage and Passport Divisions, and the Council Clerk Division.

Council
Adopts the County budget, a portion of which is supported by property taxes, and directs the activities of the Board of Equalization.

District Attorney
The District Attorney's Office is responsible for a wide variety of legal work, including prosecution of all felony criminal matters in the County, as well as handling civil governmental legal work and government litigation.

Mayor
The Mayor enforces policies established by the County Council by assigning work in the executive branch including Public Works, Human Services, and Community and Support Services as well as exercising power of veto.

Recorder
Maintains records of property ownership, liens, filings, etc. as well as legal descriptions and related plats of all property in the county, including incorporated cities within Salt Lake County.

Sheriff
The Salt Lake County Sheriff's Office, in partnership with the community, protects and serves the community through progressive, comprehensive, and cost-effective law enforcement, corrections initiatives, and court services.

Surveyor
Provides quality surveying and mapping services to protect, preserve, and perpetuate property boundary rights, including incorporated cities within Salt Lake County.

Treasurer
Bills and collects all real property taxes, administers statutory tax relief programs, refunds tax overpayments, distributes all taxes collected to local tax entities.

Governments within Salt Lake County
Salt Lake County is home to 16 incorporated cities ranging in size from nearly 182,000 people to less than 400. One County was incorporated more than 150 years ago while the most recent was established in 1999.

County governments provide municipal services to nearly 600,000 Salt Lake County residents--although Salt Lake County Government provides those same services to another quarter million people.

2 Community Profile

2.1 Geography, Environment & Climate

Geography

According to the U.S. Census Bureau, the county has a total area of 807 square miles (2,090 km2), of which 742 square miles (1,920 km2) is land and 65 square miles (170 km2) (8.1%) is water. The county borders on the Great Salt Lake and is intersected by the Jordan River.

The western portion of the county descends toward the valley of the lake, but perhaps the most dominating physical feature in Salt Lake County are the Wasatch Mountains in the eastern portion of the county, famous for both summer and winter activities. The mountains are administered as part of the Wasatch-Cache National Forest. The snow in the region is often coined the "Greatest Snow on Earth" for its soft, powdery texture, and led to Salt Lake County winning the bid for the 2002 Winter Olympics. In Salt Lake County there are four ski resorts; Snowbird and Alta in Little Cottonwood Canyon and Solitude and Brighton in Big Cottonwood Canyon. Hiking and camping are especially popular summer activities. Marking the western portion of the county are the Oquirrh Mountains. These two mountain ranges together, along with the much smaller Traverse Mountains to the south of the valley, delimit Salt Lake Valley, which is also flanked on the northwest by the Great Salt Lake, and the north by the Salt Lake Anticline (most notably Ensign Peak).

On the north and east benches, the houses sometimes climb as far as halfway up the mountain, to the boundary of the national forest, and new communities are also being constructed on the southern and western slopes. Rapid residential construction continues in the west-central, southwest, and southern portions of the valley. In the far west, southwest, and northwest, rural areas still exist, but rapid growth threatens what remains of the natural environment in the valley. Mitigating this, the Salt Lake County government operates several large parks in the valley (even some that are within incorporated cities), including Big Cottonwood Park, Crestwood Park, and an Equestrian Center.

Climate

The Salt Lake Valley receives approximately 15 inches (380 mm) of precipitation annually, usually with more on the east side and less on the west side, as most storms come from the Pacific Ocean and the west side is in the rain shadow of the Oquirrh Mountains. Up to 500 mm is received on the east benches. Most of this precipitation is received in spring. The summer is dry, with the majority of precipitation arriving from the monsoon that rises from the south. Short, localized, and often dry thunderstorms are usually associated with the monsoon. However, some of them can be very intense. These storms can also cause flash floods and wildfires (due to dry lightning and powerful winds). Precipitation is heaviest in late fall/early winter and in spring, while early summer is the driest season.

The valley receives 55 inches (140 cm) or more of snow in a year, with up to 100 inches (250 cm) received on the benches. Most of the snow falls from mid-November through March. The mountains receive up to 500 inches (1,270 cm) of light, dry snow and up to 55 inches (1400 mm) of precipitation annually. The dry snow is often considered good for skiing, contributing to the four ski resorts in the county. Snow usually falls from October through May. The heavy snow totals across the county can be attributed to the lake effect, where precipitation is intensified by the warm waters of the Great Salt Lake, which never entirely freezes due to the lake's high salinity. The lake-effect can affect any area of the county. The dry snow is attributed to the low humidity of the region.

During winter, temperature inversions are a common problem. The inversion will trap pollutants, moisture, and cold temperatures in the valley while the surrounding mountains enjoy warm temperatures and brilliant sunshine. This can cause some melting snow in the mountains and unhealthy air quality and low visibility in the valley. This weather event lasts from a few days to up to a month in extreme cases, and is caused by a very strong high pressure positioned over the Great Basin.

Access

The vast majority of traffic into and out of the Salt Lake Valley passes through only four geographic features, all of which are narrow. These are Parley's Canyon leading to Summit County to the east (as well as to Morgan County to the northeast via more remote Little Dell Canyon), the space between the Salt Lake Anticline and the Great Salt Lake leading into Davis County to the north, the Point of the Mountain and adjacent Jordan Narrows leading to Utah County to the south, and a space (known as Garfield) between the Oquirrh Mountains and the Great Salt Lake leading to Tooele County to the west. Of these, only the connection to Davis County to the north is wide enough and flat enough to accommodate transportation routes without reliance on earthworks.

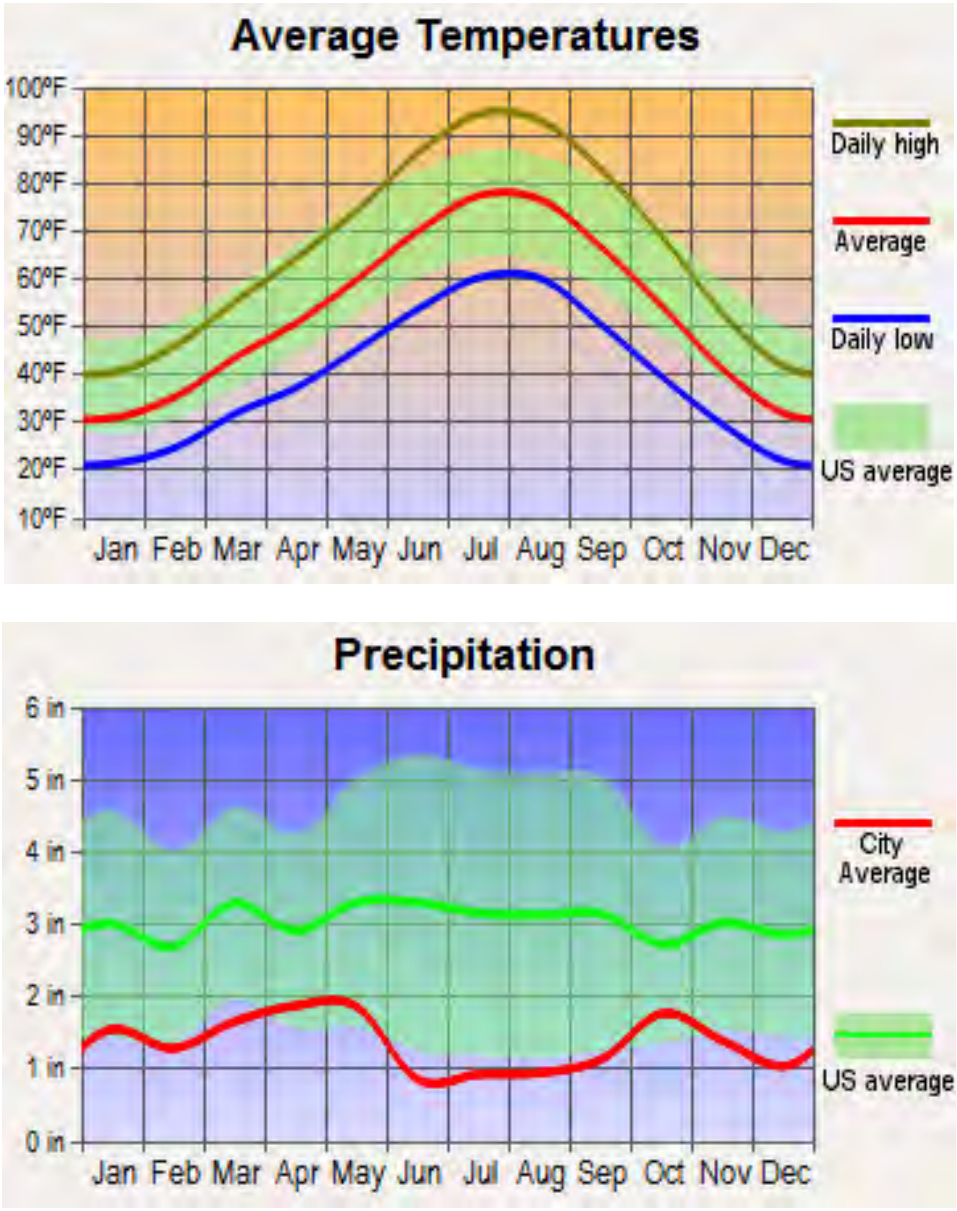


Figure 2. The Unincorporated Salt Lake County's Average Temperatures and Precipitation

2.2 Community Facts and History

History of Salt Lake County

The first residents of the Salt Lake Valley were natives known as the "Desert Gatherers" or the "Fremont Indians." They were followed by Shoshonean tribes, such as the Shoshone, Paiute, Goshute and Ute who were living in the valley when the Mormon pioneers arrived in 1847 to establish a religious settlement.

Once the "State of Deseret" government was created, the Legislative Assembly officially created Great Salt Lake County on January 31, 1850. Over 11,000 residents lived in the County at that time. The first formal meeting of Salt Lake County government occurred on March 15, 1852—eighteen months after the Utah Territory was established by the United States Congress.

Probate judges and county selectmen functioned in what was known as the County Court. The duties of the County Court included both judicial and executive powers for the administration of county government. They managed claims against the County; controlled timber and water privileges; granted mill sites; created schools, roads, and election districts; and levied taxes. They authorized payment of bills and wages; laid out roads, irrigation canals and dams; and appointed county officials such as the fruit tree inspector and coroner.

Over time, more duties were added including granting business licenses, most of which were liquor licenses, and approving the incorporation of towns.

With statehood in 1896, a county commission was created. At this time, County government had a County Auditor, Assessor, Attorney, Clerk, Recorder, Sheriff, Surveyor, and Treasurer – the same independent offices that exist today. In 1900, Salt Lake County had 77,725 residents. County government provided social services to residents by operating a Girl's Home, a Hospital and Infirmary, and providing pensions to the poor and widows. During the Depression, the County provided relief to over 11,500 people. Public works projects were funded at over $340,000 in wages to offset unemployment.

Throughout WWII County government served the residents by providing funds for recreation centers for minority military personnel and daycare for women working in defense industries. As the County grew, so did government. More functions were performed by elected officials and newly created administrative agencies. By the 1930's, the County Commission heard more individual property tax adjustment requests and the County Library system opened with seven branches in 1937. The Recreation Division was created in 1946.

In 1944, a Planning Board was organized and by the 1950's, zoning changes and improvements were heard by the County Commission.

The 1960's saw the creation of the Health department in 1962 and the Planetarium opened on November 26, 1965. By 1990 there were more than 700,000 residents.

During the 1970's more administrative offices were created to assist with the management of County government: Facilities, Emergency Services, the Finance Department, Data Processing and Human Resources were all created during this decade. The Highways Department and Flood Control were created in the early 1970's. By 1978 an official Public Works Department was created by ordinance. During the 1980's, the county continued to grow. Government services expanded to accommodate the 725,956 residents who lived here by 1990.

Sports were important to residents and by the mid-1990's, Parks and Recreation offered two dozen neighborhood parks, thirteen community parks and eight regional parks for residents.

2.3 Population and Demographics

As of the 2010 Census, there were 1,029,655 people, 343,218 households, and 291,686 families residing in the county. The population density was 1,274 people per square mile (791/km²). There were 364,031 housing units at an average density of 450 per square mile (279/km²). The racial

makeup of the county was 81.2% White, 1.59% Black or African American, 0.89% Native American, 3.3% Asian, 1.53% Pacific Islander, 8.35% from other races, and 3.14% from two or more races. 17.09% of the population was Hispanic or Latino of any race.

In 2010 there were 343,218 households out of which 40.10% had children under the age of 18 living with them, 57.80% were married couples living together, 10.40% had a female householder with no husband present, and 27.50% were non-families. 20.80% of all households were made up of individuals and 6.20% had someone living alone who was 65 years of age or older. The average household size was 3.00 and the average family size was 3.53.

In the county, 30.50% of the population was under the age of 18, 12.90% from 18 to 24, 30.60% from 25 to 44, 18.00% from 45 to 64, and 8.10% who were 65 years of age or older. The median age was 29 years. For every 100 females there were 101.70 males. For every 100 females age 18 and over, there were 99.70 males.

The median income for a household in the county was $48,373, and the median income for a family was $54,470. Males had a median income of $36,953 versus $26,105 for females. The per capita income for the county was $20,190. About 5.70% of families and 8.00% of the population were below the poverty line, including 9.00% of those under age 18 and 5.50% of those age 65 or over.

The Census' 2005 American Community Survey indicated that 11.4% of Salt Lake County's population living in households (as opposed to group arrangements such as college dormitories) spoke Spanish at home.

Historical population

1860 - 11,295
1870 - 18,337
1880 - 31,977
1890 - 58,457
1900 - 77,725
1910 - 131,426
1920 - 159,282
1930 - 194,102
1940 - 211,623
1950 - 274,895
1960 - 383,035
1970 - 458,607
1980 - 619,066
1990 - 725,956
2000 - 898,387
2010 - 1,029,655
2012 - 1,063,842

U.S. Decennial Census
1790-1960; 1900-1990; 1990-2000; 2010-2012

Religion

56% Mormon
33% Non Religious
5.9% Catholic
5.1% Other

2.4 Economy

Economy

The region's economy used to revolve around LDS services and mining. While both are still important to the economy, they have declined in significance greatly since the 19th century. Since World War II, defense industries in the region have also played a very important role in the economy due to its strategic central location in the Western United States, as well as the largely uninhabited and desolate Great Salt Lake Desert to the west (used for training, weapons testing, and storage of hazardous materials).

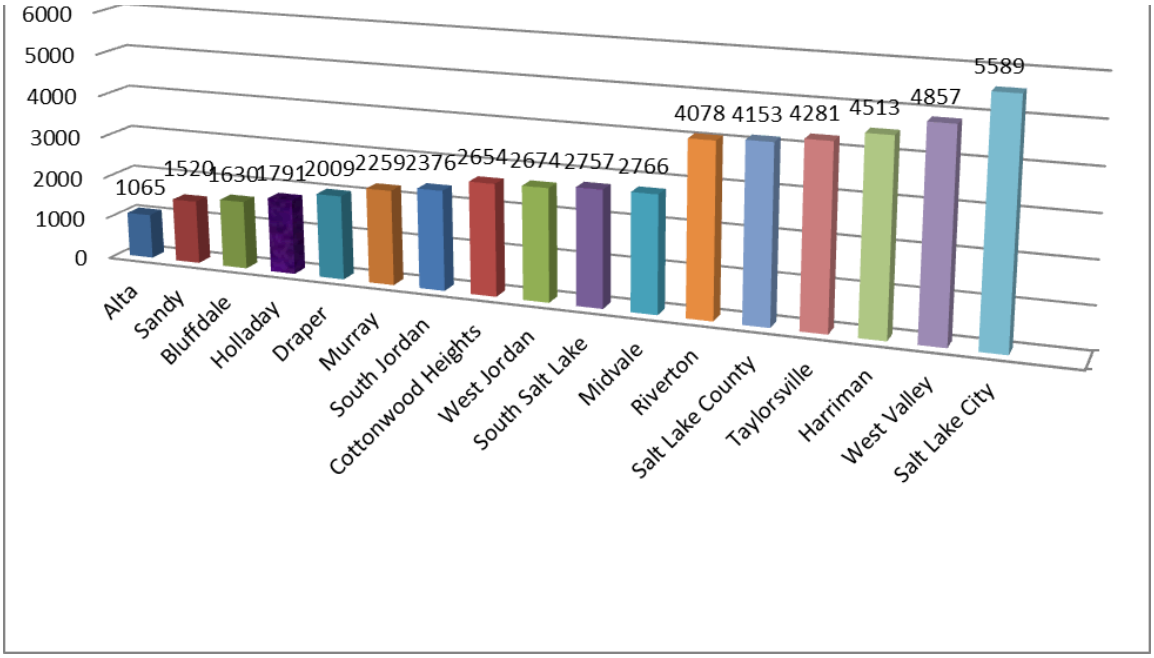
Beginning in 1939, with the opening of Alta Ski Area, skiing and other winter sports (as well as summer sports), have become a major force in the economy. In 1995, Salt Lake County won the bid to host the 2002 Winter Olympics. The 2002 Olympics boosted tourism and the economy, and helped to dramatically improve transportation throughout the county. Transportation has been a major focus, as the county continues to rapidly grow in population. It was drastically improved beginning in the late 80s and through the 90s, and continues to this day. Beginning in the 1960s, a more service-oriented economy began to develop, and information technologies began to arrive in the 80s and 90s. Although this business has waned in recent years, information and computer companies, such as Overstock.com, are still a thriving business here.

History of Salt Lake County 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 County also fluctuate slightly each year. A property tax increase occurs when a County chooses to increase the property tax beyond the amount of the certified tax rate.

Comparative Property Tax Rates

Salt Lake County's property tax rate (.001791 for fiscal year 20012-2013) is considerably lower than that of most other municipalities located within Salt Lake County.



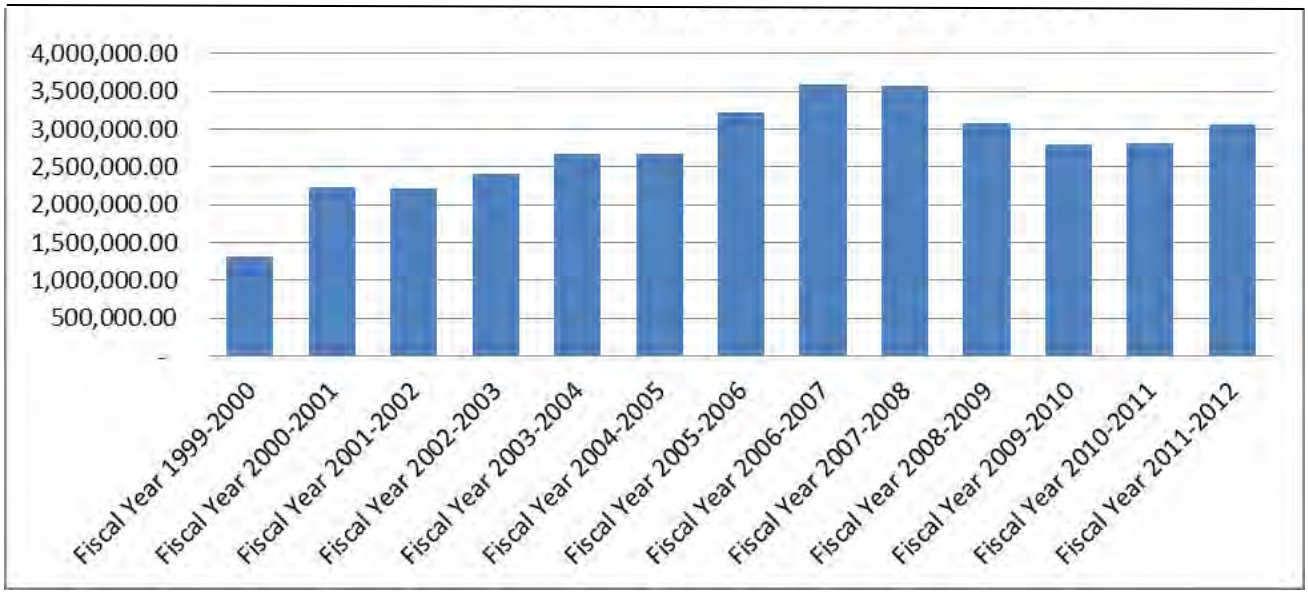
Tax Rates including Unified Fire and Unified Police

Salt Lake County's Municipal Energy Tax

In 2008 Salt Lake County adopted a municipal energy tax dedicated to pay for road repairs. The tax is a 6% surcharge added onto monthly electric 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 Salt Lake County property tax generated $3.888 million. Extrapolating from these numbers, if the energy tax were added to the County 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).

Salt Lake County Sales Tax

Salt Lake County's sales taxes have fluctuated in response to general economic conditions. County 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. County sales tax receipts for fiscal year 2011-2012 were $3.054 million.



Sales Tax Collected 1999-2012

General Fund vs. Municipal Services Fund

Salt Lake County manages two separate budgets: the General Fund and the Municipal Services Fund.

The General Fund is the budget that goes towards all of Salt Lake County. For instance, our Divisions of Flood Control, Parks and Recreation, Aging Services, etc. are paid for from the General Fund because these services are used countywide; that includes within County boundaries and in the unincorporated areas.

The Municipal Services Fund is the budget that applies solely to the unincorporated areas of Salt Lake County. That means that because the county is the primary local government for the unincorporated areas, the county provides County-type services such as snow plowing, road maintenance, addressing, etc. to our unincorporated communities. (Some cities within Salt Lake County contract with (hire) the county for some of these services.)

The Municipal Services Fund receives its funding entirely from sales tax revenue in unincorporated Salt Lake County.

- See more budget information on our Financial Administration. . Website.
- See basic tax information here.

Fire and Police Services

For unincorporated residents, fire and police services are provided by the Unified Fire Authority (UFA) and the Unified Police Department (UPD), respectively. These fire and police services are funded entirely through property tax revenue from unincorporated Salt Lake County.

- UFA and UPD have separate governing boards that oversee their budgets. They are the Salt Lake Valley Fire Service Area and the Salt Lake Valley Law Enforcement Service Area (SLVESA).

- The property tax rate for the Salt Lake Valley Fire Service Area is .002079.
- The property tax rate for the Salt Lake Valley Law Enforcement Service Area is .001999.
- *The Police Fee is no longer in effect. Read more about the police fee here.

Franchise Taxes

Residents in unincorporated Salt Lake County do not pay utility or gas franchise taxes.
A franchise tax or municipal energy tax is a tax imposed by many cities to pay for fire and police services, or other municipal services. This tax is often tacked onto electric or gas utility bills. Cities may also impose a telecommunications tax on phone bills.

County residents and unincorporated county residents pay a right-of-way franchise fee on their cable bill. This fee is allowed by the federal government, by way of the Cable Communication Act of 1984.

2.5 Growth and Development Trends

Business & Economic Development

The Mayor's Office of Business and Economic Development was created to increase the number of jobs and investments in Salt Lake County, Utah. The office has a three-fold mission.

1. Support business creation and growth in the county through training, coordination with chambers of commerce and local economic development organizations, and resource development. The county contracts with the Economic Development Corporation of Utah for outside business recruitment of companies interested in relocating or expanding to Utah.
2. Technology Development including support of the USTAR program and the preliminary development of a world-class technology park for new and growing technology businesses.
3. Support of commercial and industrial development in unincorporated areas of the county through redevelopment tools.

In addition to the mission above, the County leads collaborative efforts with key local partners ranging from the Economic Development Corporation of Utah, Salt Lake County Chambers of Commerce, cities located within the county, commercial real estate and development groups, financial organizations, and small business support agencies.

Small business is the engine that drives the economy. The best way to balance the county's budget and keep taxes low is to grow the private sector. We are here to help you with business development needs. Can we help you with a business license or give you information about starting a new business in the unincorporated area?

For information about business licensing and permits please visit the Planning and Development Services business assistance portal.

For information about economic development, including details about available real estate, business incentives, and, office, retail, and industrial opportunities in unincorporated Salt Lake County visit our Economic Development portal. Or contact economic development director Brigham Mellor at bmellor@slco.org or 385-468-7131.

Economic Development

Utah is an attractive place to do business, and Salt Lake County is the state's premier destination. 13 percent of the county's population lives in the unincorporated areas—which are serviced by the Office of Township Services and are home to six townships, 160,000 residents, and more than 4,000 businesses.

Municipal unincorporation provides a number of benefits to commercial corporate entities:

Cost Effective Municipal Services – Unincorporated Salt Lake County is the second-largest municipality population wise in the state of Utah. Economies of scale make the fees for services the lowest in the Salt Lake Metro area.

No Impact Fees – Other municipalities charge impact fees for development that can limit a project's scope or be the reason real estate sits vacant for years. The unincorporated areas of Salt Lake County do not charge impact fees for that reason.

Streamlined Service – The Office of Townships Services is a one-stop shop for local government taxation, services, and compliance. This limits the layers of bureaucracy and can help cut through red tape on projects.

Triple AAA Bond Rating – Salt Lake County is one of only 32 counties in the U.S. that has a AAA bond rating from all major rating entities—a bonding unmatched on a municipal level.

2.6 Data Sources and Limitations

Salt Lake County utilized the following sources to provide data for this report:

- Salt Lake County GIS
- Salt Lake County Office of Regional Development
- Salt Lake County Community and Economic Development
- Salt Lake County Planning and Development Services
- Salt Lake County Cooperative Plan, General Plan, and other plans.
- State of Utah
- US Census Bureau
- National Weather Service

3 Planning Process

3.1 Update Process and Participation Summary

Salt Lake County 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 Salt Lake County Hazard Mitigation Update was produced over 2 years by taking the previous Wasatch Front Hazard Mitigation Plan from 2009 and reviewing commitments contained within that plan. 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 jurisdictions that were shared at the many meetings that were held over the two year period. Michael Barrett of Salt Lake County Emergency Services was the main contact and author of the Unincorporated County plan, which was completed with the cooperation of the entire Salt Lake County Staff, the Public, and other agencies listed throughout this and the County's documents.

3.2 The Planning Team

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

Michael Barrett	Salt Lake County Emergency Services – Author and Coordinator
Scott Baird - Director	Flood Control and Engineering
Brent Beardall	Flood Control and Engineering
Michael Durfee	Chief Building Official
Greg Baptist	Engineering, Storm Water and Natural Hazards – Planning and Development Services
Tom Zumbado	GIS – Planning and Development Services
Max Johnson	Lead Land-use Planner– Planning and Development Services
Spencer Brimley	Business, Community, and Economic Development

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 County
Mike Barrett	Salt Lake County Emergency Services
Brent Beardall	Salt Lake County Flood Control
Leon Berrett	Salt Lake County Public Works
Dawn Black	Cottonwood Heights
David Chisholm	Salt Lake County
Eldon Farnsworth	South Salt Lake County
Bob Fitzgerald	West Valley County
Sheril Garn	Riverton County
Tina Giles	Herriman County
Jeff Graviet	Salt Lake County Emergency Services
Jon Harris	Murray County
Matt Jarman	South Jordan County
Connie Jones	Bluffdale County
Scott Jones	Salt Lake Community College
Jeff King	Jordan Valley Water Conservancy District
Ken Kraudy	Salt Lake County
Bart LeCheminant	Draper County
Dustin Lewis	South Jordan County
Cory Lyman	Salt Lake County
Kade Moncur	Salt Lake County Flood Control
Reed Scharman	West Jordan County
Lisa Schwartz	Taylorsville County/Midvale County
Marty Shaub	University of Utah
Garth Smith	Draper County
Jared Smith	Salt Lake County
Justin Stoker	Salt Lake County Flood Control
Claire Woodman	Unincorporated Salt Lake County

3.3 Public Meetings, Agency meetings, and Documentation

Planning Process and Participants

Mitigation planning is a regulated and ongoing process in Unincorporated Salt Lake County and involves all cities, townships, and community Councils. Mitigation planning, activities, regulation and enforcement are found within the Salt Lake County Ordinances and Regulations and include State and Federal regulations. All hazards which affect Salt Lake County are addressed in ordinance, and include; Natural Hazards, Man-made Hazards, Health and Safety Hazards, to name

a few. All ordinances, master plans, cooperative plans are required and subject to the public review process per ordinance. Although revisions and updates to this plan will be ongoing and continuous, a formal review of this plan will be conducted every three years and according to the current standard for public and stakeholder review and will incorporate and reflect all progress to date.

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	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.

Year	Date	Activity	Purpose
	February 27	Sandy County BCDM (Business Continuity Development Meeting)	Outreach effort, presentation/overview of mitigation plan to Sandy County 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, 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

Year	Date	Activity	Purpose
			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, 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

Year	Date	Activity	Purpose
	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 Salt Lake County.

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

Representatives from Unincorporated Salt Lake County attended the planning meetings with key members and representatives from local jurisdictions including special service districts and the private sector. The County's designee 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 and vice-versa

3.5 Incorporation of existing plans and technical information

The Unincorporated Salt Lake County 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 Salt Lake County Building department and code enforcement department have incorporated this data into codes, ordinances and regulations to insure that new development is not placed in areas with unacceptable hazard potential.

Salt Lake County reduces their risk, vulnerability and exposure to hazards through the adoption and strict enforcement of relative codes, ordinances and standards. The ordinances outlined on the following pages address and mitigate the County's exposure to relevant hazards.

30-40% of new construction interfaces with one or more listed natural hazards. Hazard Disclosures are required to be recorded on the property title.

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 Strategies

Hazard: Dam Failure

Problem Identification: National statistics show that overtopping due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for 34% of all dam failures. Foundation defects, including settlement and slope instability, account for 30% of all failures. Piping and seepage cause 20% of national dam failures. This includes internal erosion caused by seepage, seepage and erosion along hydraulic structures, leakage through animal burrows, and cracks in the dam. The remaining 16% of failures are caused by other means.

Goal #1 Include dam failure inundation in future County planning efforts

Objective 1.1: Priority MEDIUM, Review current State Dam Safety information on all identified high hazard dams in the County.

Action: Include dam inundation maps in current County and County and Special Service District EOPs.

Status: ***Accomplished for the County EOP***

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: Accomplished through "Firewise" project.

- The mitigation plans have been revised based on growth in the County and changing priorities and problems since 2009.

Hazard: Drought

Problem Identification:
Salt Lake County is located in a desert region, and water supplies therein are chronically limited. That in addition to the normal limited state of water supplies. Salt Lake County is currently suffering from drought conditions. That, as a result of such conditions, the availability of water for culinary, agricultural, domestic, commercial, municipal or other uses is severely limited. All users of water within the unincorporated area of Salt Lake County must practice methods of conservation to preserve the supply of water. A need exists to protect the supply of such water by mandating certain practices, which will conserve water and prevent its waste within the unincorporated area of Salt Lake County. Salt Lake County has adopted ordinances and regulations to address these issues.

10.70.030 - Advisory stage water conservation practices.
10.70.040 - Moderate stage water conservation practices.
10.70.050 - Critical stage water conservation practices.
10.70.060 - Definition of offenses, penalty, enhancement of penalty.

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 County in the County.

Status: Accomplished with "Slow the Flow" program, and, Required Water Conservation Practices

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: Accomplished with "Firewise" project

Hazard: Earthquake

Problem Identification: The Wasatch Fault and Warm Springs Fault are located along the Wasatch Bench and through the County center with a potential magnitude of +7.0

Goal 1: Determine and forecast potential damage throughout specific areas within the Salt Lake Valley.

Objective 1.1: Priority HIGH - Ensure adequate coordination of disaster response and recovery activities.

Action: Assess EOC's and critical facilities (countywide).

Status: Ongoing. Unincorporated Salt Lake County participates in all County-wide earthquake exercises. Current building codes are enforced including the appropriate seismic design standards.

Hazard: Flooding

Problem Identification: Although located in a semi-arid region, Salt Lake County is subject to cloudburst and snowmelt floods. Salt Lake County provides strict requirements and enforcement through the Natural Hazards Ordinance, which include NFIP requirements. This ordinance applies to any development within the jurisdiction of Salt Lake County that interfaces with or resides within a natural hazard zone.

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: Accomplished. Salt Lake County now participates in the NFIP

Objective 1.2: Priority MEDIUM Provide current FIRMs for emergency planners.

Action: Update & digitize floodplain maps.

Status: Accomplished: Floodplain maps have been digitized and have been completely updated.

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: Accomplished with "Firewise" project.

4.1 Historical Hazard Events

The following are recent hazard events that have impacted Salt Lake County:

- Flood and Debris Flow, August 19 2010
- Spring Flooding along Willow Creek and throughout County 2011
- Bell Canyon Fire, August 15, 2011

4.2 Hazard Analysis

Please refer to the County HMP Plan for a general description of hazards that affect Salt Lake County. 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
Salt Lake County	Low	Low	Mod	Low	Mod	Low	Mod	Low	Low	Low	Low	Mod

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	
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	

Comprehensive Plan	Yes	No
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	
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?	X	
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	
3. Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	X	

Zoning Ordinance	Yes	No
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. SLCO Floodplain Manager	334 Policies
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	0 Claims
How many structures are exposed to flood risk within the community?	Community Floodplain Manager	334 160 LOMCs
Describe any areas of flood risk with limited NFIP policy coverage	Community FPA and FEMA Insurance Specialist. County Floodplain Manager	NONE
Staff Resources		
Does the community have a dedicated Floodplain Manager or NFIP Coordinator?	Floodplain Administrator – Roland Yoshinaga	Floodplain Manager – Timothy Beavers
Is the Floodplain Manager or NFIP Coordinator certified?	Yes – Salt Lake County Engineering and Flood Control – Timothy Beavers	
Is floodplain management an auxiliary function?	Floodplain Manager – Primary Function	
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Floodplain Manager Tim Beavers holds CFM –ASFPM certification and PE license	Flood Control performs permit review, GIS, education and outreach, inspections, and engineering
What are the barriers to running an effective NFIP program in the community, if any?	Floodplain Manager	Could do more public outreach and education. Participate in the CRS

Compliance History		
Is the community in good standing with the NFIP? YES	State NFIP Coordinator, FEMA NFIP Specialist, community records Floodplain Manager	
Are there any outstanding compliance issues (i.e., current violations)? NO	No - Salt Lake County Engineering and Flood Control	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)? 2014	2014 - Salt Lake County Engineering and Flood Control	
Is a CAV or CAC scheduled or needed? NO	No - Salt Lake County Engineering and Flood Control	
Regulation		
When did the community enter the NFIP? Initial NFIP map date – 03/29/1974	Community Status Book http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book	
Are the FIRMs digital or paper? Digital - ArcView	Floodplain Manager	
Does the Floodplain Ordinance meet or exceed FEMA or State minimum requirements? If so, in what ways? YES	Floodplain Manager	Additional review and coordination with other hazards by ordinance
Provide an explanation of the permitting process and include a copy of floodplain permit. Available on the SLCO Flood Control and Engineering website. http://slco.org/pweng/flood/html/permits/permits.html	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? NO	Community FPA, State, FEMA NFIP	
What is the community's CRS Class Ranking? N/A	Flood Insurance Manual http://www.fema.gov/flood-insurance-manual	
What categories and activities provide CRS points and how can the class be improved?	MA	
Does the plan include CRS planning requirements YES even though we do not participate in CRS	Community FPA, FEMA CRS Coordinator, ISO representative CRS manual http://www.fema.gov/library/viewRecord.do?id=2434	

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 Salt Lake County'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 Salt Lake County and includes data for the portions of Salt Lake County in Salt Lake County.

Salt Lake County-Unincorporated	*Real Property Value*	*Personal Property Value*	*Central Assessed Value*	*Total*
Unincorporated Salt Lake County Portion of Salt Lake County	*$6,572,233,860*	*$388,886,397*	*$205,049,650*	*$7,166,169,907*

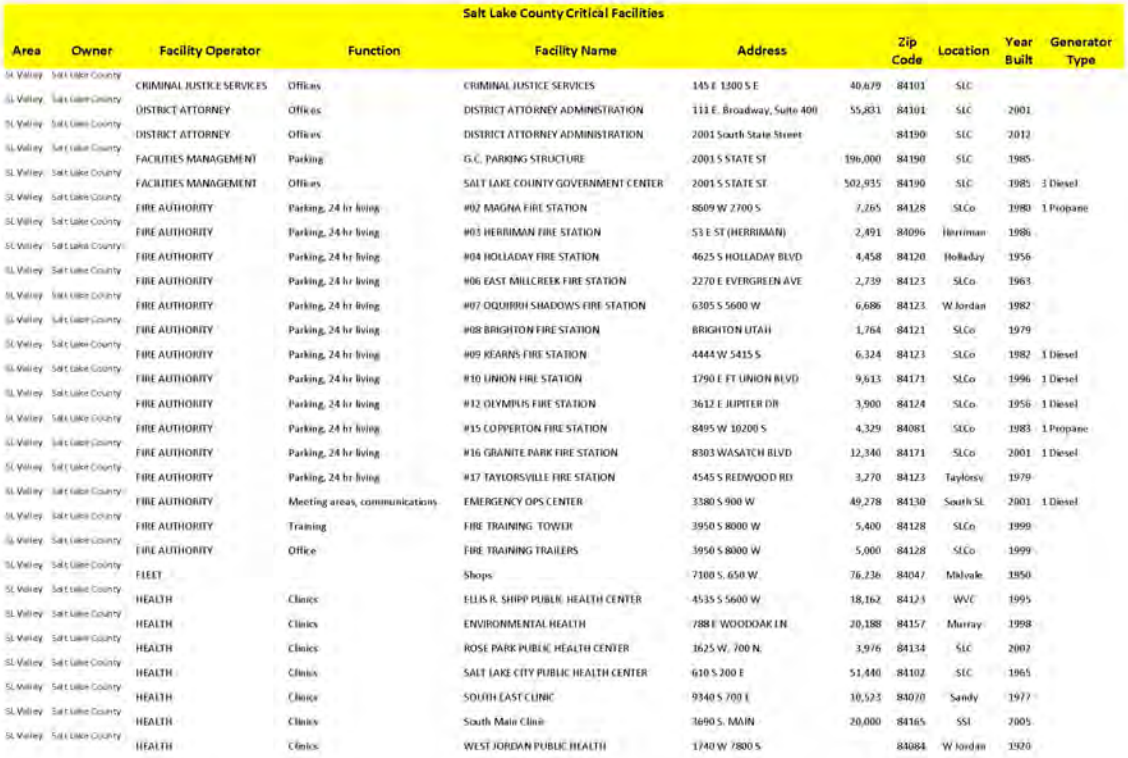
Table 4. Assessed Property Value Data for Salt Lake County

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

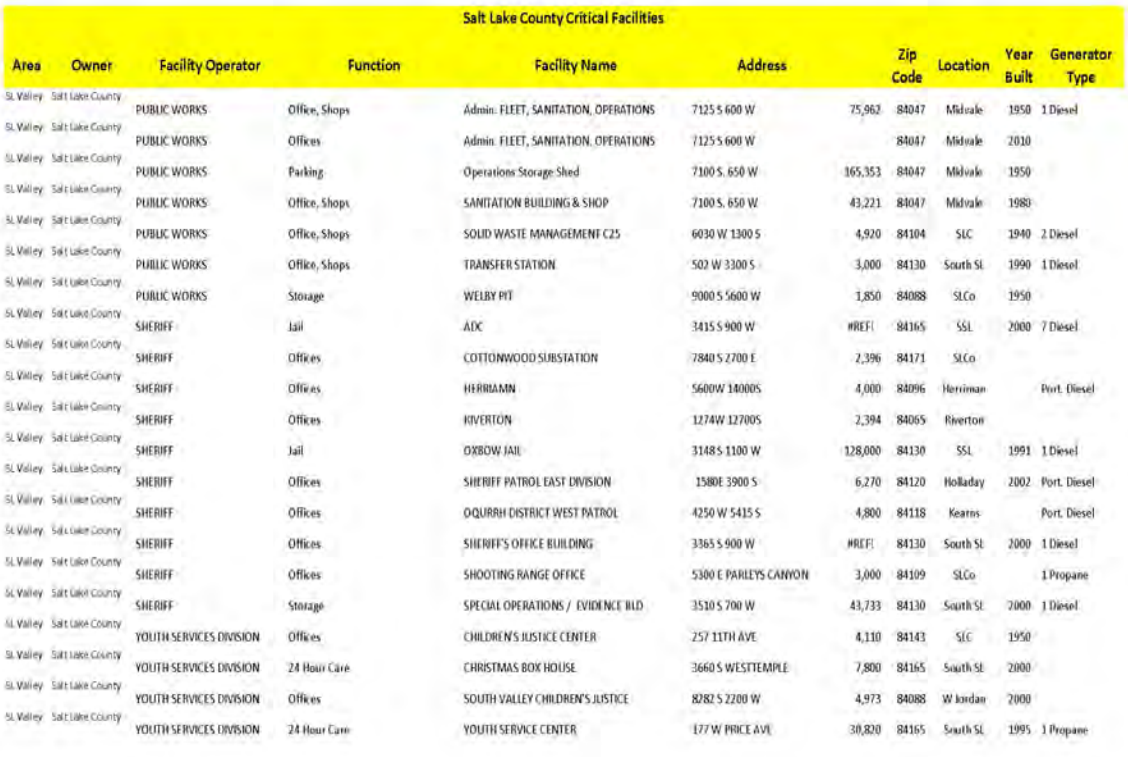
Figure 12 and 13 shows essential facilities that are located within Salt Lake County.



Salt Lake County Critical Facilities

Area	Owner	Facility Operator	Function	Facility Name	Address		Zip Code	Location	Year Built	Generator Type
SL Valley	Salt Lake County	CRIMINAL JUSTICE SERVICES	Offices	CRIMINAL JUSTICE SERVICES	145 E 1300 S E	40,679	84101	SLC		
SL Valley	Salt Lake County	DISTRICT ATTORNEY	Offices	DISTRICT ATTORNEY ADMINISTRATION	111 E. Broadway, Suite 400	55,831	84101	SLC	2001	
SL Valley	Salt Lake County	DISTRICT ATTORNEY	Offices	DISTRICT ATTORNEY ADMINISTRATION	2001 South State Street		84190	SLC	2012	
SL Valley	Salt Lake County	FACILITIES MANAGEMENT	Parking	G.C. PARKING STRUCTURE	2001 S STATE ST	196,000	84190	SLC	1985	
SL Valley	Salt Lake County	FACILITIES MANAGEMENT	Offices	SALT LAKE COUNTY GOVERNMENT CENTER	2001 S STATE ST	502,935	84190	SLC	1985	1 Diesel
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#02 MAGNA FIRE STATION	8609 W 2700 S	7,265	84128	SLCo	1980	1 Propane
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#03 HERRIMAN FIRE STATION	53 E ST (HERRIMAN)	2,491	84096	Herriman	1986	
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#04 HOLLADAY FIRE STATION	4625 S HOLLADAY BLVD	4,458	84120	Holladay	1956	
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#06 EAST MILLCREEK FIRE STATION	2270 E EVERGREEN AVE	2,739	84123	SLCo	1963	
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#07 OQUIRRH SHADOWS FIRE STATION	6305 S 5600 W	6,686	84123	W Jordan	1982	
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#08 BRIGHTON FIRE STATION	BRIGHTON UTAH	1,764	84121	SLCo	1979	
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#09 KEARNS FIRE STATION	4444 W 5415 S	6,324	84123	SLCo	1982	1 Diesel
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#10 UNION FIRE STATION	1790 E FT UNION BLVD	9,613	84171	SLCo	1996	1 Diesel
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#12 OLYMPUS FIRE STATION	3612 E JUPITER DR	3,900	84124	SLCo	1956	1 Diesel
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#15 COPPERTON FIRE STATION	8495 W 10200 S	4,329	84081	SLCo	1983	1 Propane
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#16 GRANITE PARK FIRE STATION	8303 WASATCH BLVD	12,340	84121	SLCo	2001	1 Diesel
SL Valley	Salt Lake County	FIRE AUTHORITY	Parking, 24 hr living	#17 TAYLORSVILLE FIRE STATION	4545 S REDWOOD RD	3,270	84123	Taylorsv	1979	
SL Valley	Salt Lake County	FIRE AUTHORITY	Meeting areas, communications	EMERGENCY OPS CENTER	3380 S 900 W	49,278	84130	South SL	2001	1 Diesel
SL Valley	Salt Lake County	FIRE AUTHORITY	Training	FIRE TRAINING TOWER	3950 S 8000 W	5,400	84128	SLCo	1999	
SL Valley	Salt Lake County	FIRE AUTHORITY	Office	FIRE TRAINING TRAILERS	3950 S 8000 W	5,000	84128	SLCo	1999	
SL Valley	Salt Lake County	FLEET		Shops	7100 S. 650 W	76,236	84047	Midvale	1950	
SL Valley	Salt Lake County	HEALTH	Clinics	ELLIS R. SHIPP PUBLIC HEALTH CENTER	4535 S 5600 W	18,162	84123	WVC	1995	
SL Valley	Salt Lake County	HEALTH	Clinics	ENVIRONMENTAL HEALTH	788 E WOODOAK LN	20,188	84157	Murray	1998	
SL Valley	Salt Lake County	HEALTH	Clinics	ROSE PARK PUBLIC HEALTH CENTER	1625 W. 700 N.	3,976	84134	SLC	2002	
SL Valley	Salt Lake County	HEALTH	Clinics	SALT LAKE CITY PUBLIC HEALTH CENTER	610 S 200 E	51,440	84102	SLC	1965	
SL Valley	Salt Lake County	HEALTH	Clinics	SOUTH EAST CLINIC	9340 S 700 E	10,523	84070	Sandy	1977	
SL Valley	Salt Lake County	HEALTH	Clinics	South Main Clinic	3690 S. MAIN	20,000	84165	SSL	2005	
SL Valley	Salt Lake County	HEALTH	Clinics	WEST JORDAN PUBLIC HEALTH	1740 W 7800 S		84084	W Jordan	1920	

Figure 12. Essential Facilities Salt Lake County

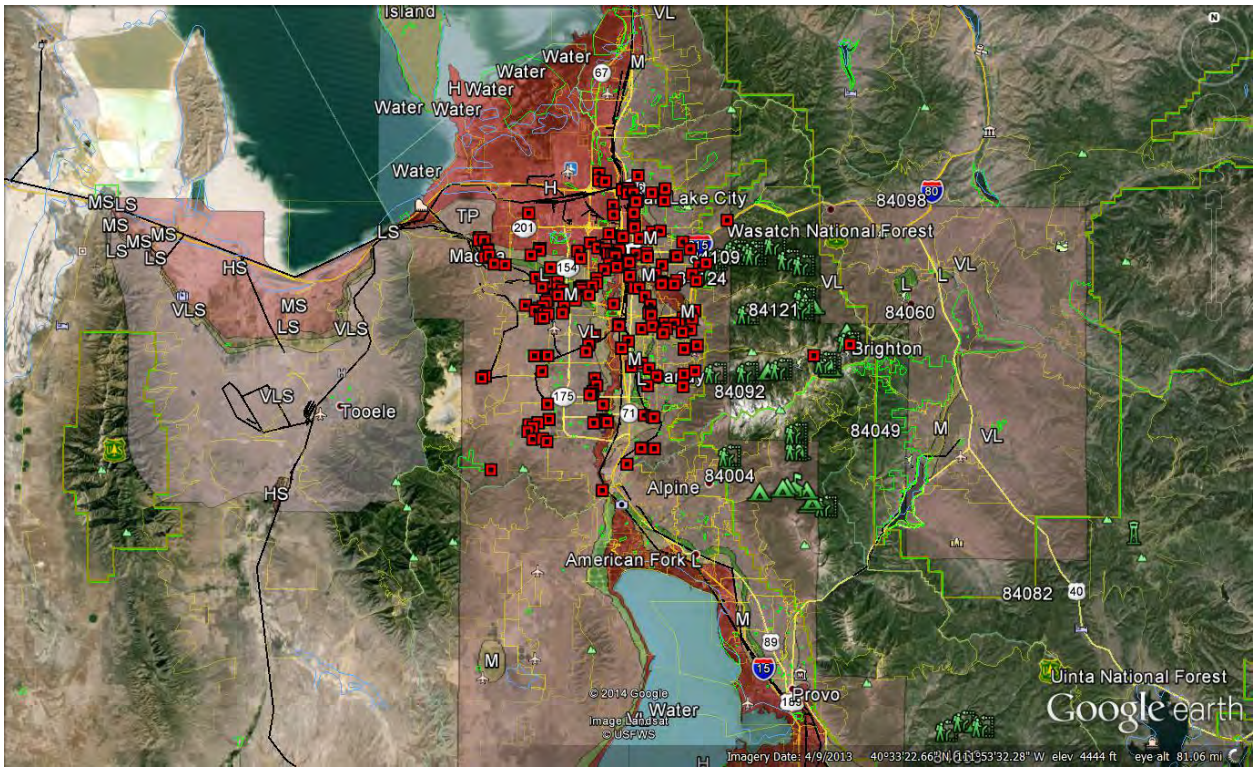


Salt Lake County Critical Facilities

Area	Owner	Facility Operator	Function	Facility Name	Address		Zip Code	Location	Year Built	Generator Type
SL Valley	Salt Lake County	PUBLIC WORKS	Office, Shops	Admin. FLEET, SANITATION, OPERATIONS	7125 S 600 W	75,962	84047	Midvale	1950	1 Diesel
SL Valley	Salt Lake County	PUBLIC WORKS	Offices	Admin. FLEET, SANITATION, OPERATIONS	7125 S 600 W		84047	Midvale	2010	
SL Valley	Salt Lake County	PUBLIC WORKS	Parking	Operations Storage Shed	7100 S. 650 W	165,353	84047	Midvale	1950	
SL Valley	Salt Lake County	PUBLIC WORKS	Office, Shops	SANITATION BUILDING & SHOP	7100 S. 650 W	43,221	84047	Midvale	1980	
SL Valley	Salt Lake County	PUBLIC WORKS	Office, Shops	SOLID WASTE MANAGEMENT C25	6030 W 1300 S	4,920	84104	SLC	1940	2 Diesel
SL Valley	Salt Lake County	PUBLIC WORKS	Office, Shops	TRANSFER STATION	502 W 3300 S	3,000	84130	South SL	1990	1 Diesel
SL Valley	Salt Lake County	PUBLIC WORKS	Storage	WELBY PIT	9000 S 5600 W	1,850	84088	SLCo	1950	
SL Valley	Salt Lake County	SHERIFF	Jail	ADC	3415 S 900 W	#REF!	84165	SSL	2000	7 Diesel
SL Valley	Salt Lake County	SHERIFF	Offices	COTTONWOOD SUBSTATION	7840 S 2700 E	2,396	84121	SLCo		
SL Valley	Salt Lake County	SHERIFF	Offices	HERRIAMN	5600W 14000S	4,000	84096	Herriman		Port. Diesel
SL Valley	Salt Lake County	SHERIFF	Offices	RIVERTON	1274W 12700S	2,394	84065	Riverton		
SL Valley	Salt Lake County	SHERIFF	Jail	OXBOW JAIL	3148 S 1100 W	128,000	84130	SSL	1991	1 Diesel
SL Valley	Salt Lake County	SHERIFF	Offices	SHERIFF PATROL EAST DIVISION	1580E 3900 S	6,270	84120	Holladay	2002	Port. Diesel
SL Valley	Salt Lake County	SHERIFF	Offices	OQUIRRH DISTRICT WEST PATROL	4250 W 5415 S	4,800	84118	Kearns		Port. Diesel
SL Valley	Salt Lake County	SHERIFF	Offices	SHERIFF'S OFFICE BUILDING	3365 S 900 W	#REF!	84130	South SL	2000	1 Diesel
SL Valley	Salt Lake County	SHERIFF	Offices	SHOOTING RANGE OFFICE	5300 E PARLEYS CANYON	3,000	84109	SLCo		1 Propane
SL Valley	Salt Lake County	SHERIFF	Storage	SPECIAL OPERATIONS / EVIDENCE BLD	3510 S 700 W	43,733	84130	South SL	2000	1 Diesel
SL Valley	Salt Lake County	YOUTH SERVICES DIVISION	Offices	CHILDREN'S JUSTICE CENTER	257 11TH AVE	4,110	84143	SLC	1950	
SL Valley	Salt Lake County	YOUTH SERVICES DIVISION	24 Hour Care	CHRISTMAS BOX HOUSE	3660 S WESTTEMPLE	7,800	84165	South SL	2000	
SL Valley	Salt Lake County	YOUTH SERVICES DIVISION	Offices	SOUTH VALLEY CHILDREN'S JUSTICE	8282 S 2200 W	4,973	84088	W Jordan	2000	
SL Valley	Salt Lake County	YOUTH SERVICES DIVISION	24 Hour Care	YOUTH SERVICE CENTER	177 W PRICE AVE	30,820	84165	South SL	1995	1 Propane

Figure 13. Essential Facilities Salt Lake County

Liquefaction Hazards



High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Salt Lake County. Salt Lake County 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 County.

Transportation and Lifeline Facilities

Transportation and lifeline facilities are located within the boundaries of Salt Lake County. I-15 is the major freeway thoroughfare through Salt Lake County that runs north to south through the State of Utah. There are major freight and a passenger rail lines that goes through the County 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 County. The Salt Lake Aqueduct also reside in the County and are operated by the Metropolitan Water District.

5.1.1– Hazard Descriptions Summary

Hazard	Location (Geographic Area Affected)	Magnitude, Strength (Maximum Probable Extent)	Probability of Future Events	Overall Significance
Avalanche	Limited Canyons – Big and Little Cottonwood, Parleys Maps – Planning	Moderate	Highly Likely	Moderate
Dam Failure	Negligible Throughout Salt Lake County Maps – Public works	Moderate	Unlikely	Low
Drought	Significant County Wide State has this map http://droughtmonitor.unl.edu/	Severe	Likely	High
Earthquake	Extensive Maps – State HAZUZ Modeling	Extreme	Unlikely	High
Flood	Limited Maps – Flood Control	Moderate	Occasional	Moderate
Infestation	Negligible State	Weak	Occasional	Low
Landslide	Limited Maps – Planning	Moderate	Occasional	Moderate
Infectious Disease	Significant County Wide	Severe Event specific – data for each type of infectious disease	Occasional	High
Problem Soils	Significant County Wide Maps – State	Moderate	Likely	Moderate

Radon	Limited County Wide Maps – State	Weak	Occasional	Low
Severe Weather	Significant County Wide NOAA	Severe	Highly Likely	High
Wildfire	Limited Wild Land Urban Interface Areas; FCOZ East and West Maps - UFA	Extreme	Likely	Moderate
Plane Crashes	Limited County Wide	Extreme	Unlikely	Moderate
Terrorist Events	Negligible County Wide	Extreme	Unlikely	Moderate
Transportation	Significant Salt Lake County and State Roads	Severe	Likely	High
Hazardous Materials	Significant County Wide Unified Fire Authority	Moderate	Occasional	Moderate

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.

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Agricultural Hazards	Likely	Limited	Medium	Medium
Avalanche	Likely	Limited	Critical	Medium
Dam Failure	Occasional	Limited	Critical	Medium
Drought	Likely	Extensive	Limited	High
Earthquake	Occasional	Extensive	Catastrophic	High
Flood	Occasional	Significant	Critical	High
Landslide	Occasional	Limited	Limited	Medium
Severe Weather				

Extreme Heat	Likely	Extensive	Limited	Medium
Extreme Cold/Freeze	Likely	Extensive	Critical	Medium
Fog	Highly Likely	Significant	Medium	Medium
Snow	Highly Likely	Extensive	Medium	Medium
Heavy Rain/	Highly Likely	Extensive	Medium	Medium
Thunderstorm/Hail/	Likely	Limited	Limited	Medium
Lightning/Wind	Likely	Significant	Medium	Medium
Tornado	Unlikely	Limited	Limited	Medium
Soil Hazards				
Expansive Soils	Highly Likely	Extensive	Critical	High
Soil Erosion	Likely	Limited	Limited	Low
Land Subsidence	Unlikely	Limited	Negligible	Low
Volcano	Unlikely	Limited	Limited	Low
Wildfire	Likely	Limited	Critical	Medium
Man-made/Industrial				
Overpressure	Occasional	Limited	Critical	Medium
Mining	Occasional	Limited	Medium	Medium
Transportation	Likely	Limited	Limited	High
Health, Safety, Infectious Disease	Likely	Extensive	Critical	High
Terrorism	Occasional	Limited	Critical	High

Guidelines for Hazard Rankings

Frequency of Occurrence:

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

Spatial Extent:
Limited—Less than 10% of planning area Significant—10-50% of planning area Extensive—50-100% of planning area
Potential Magnitude: Catastrophic—More than 50% of area affected
Critical—25 to 50%
Limited—10 to 25%
Negligible—Less than 10%
Significance (subjective):
Low, Medium, High
Technological hazards were not assessed in the same manner as the natural hazards, thus they are not included in the table above. It is important to note that technological hazards (transportation hazards/hazardous materials release) are a concern for Salt Lake County.

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[13]	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 and below
Earthquake	Modified Mercalli Scale[14]	I to IV	V to VII	VII	IX to XII
	Richter Magnitude[15]	2, 3	4, 5	6	7, 8
Hurricane Wind/ Storm Surge	Saffir-Simpson Hurricane Wind Scale[16]	1	2	3	4, 5
Tornado	Fujita Tornado Damage Scale[17]	F0	F1, F2	F3	F4, F5

[13] Cumulative meteorological drought and wet conditions: http://ncdc.noaa.gov/

[14] Earthquake intensity and effect on population and structures: http://earthquake.usgs.gov

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

[16] Hurricane rating based on sustained wind speed: http://nhc.noaa.gov

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.

[1] Tornado rating based on wind speed and associated damage: http://spc.noaa.gov

Geologic Hazards Maps

Figures 5.1 - A and 5.1 -B shown in the maps below represent geological hazards in unincorporated Salt Lake County.

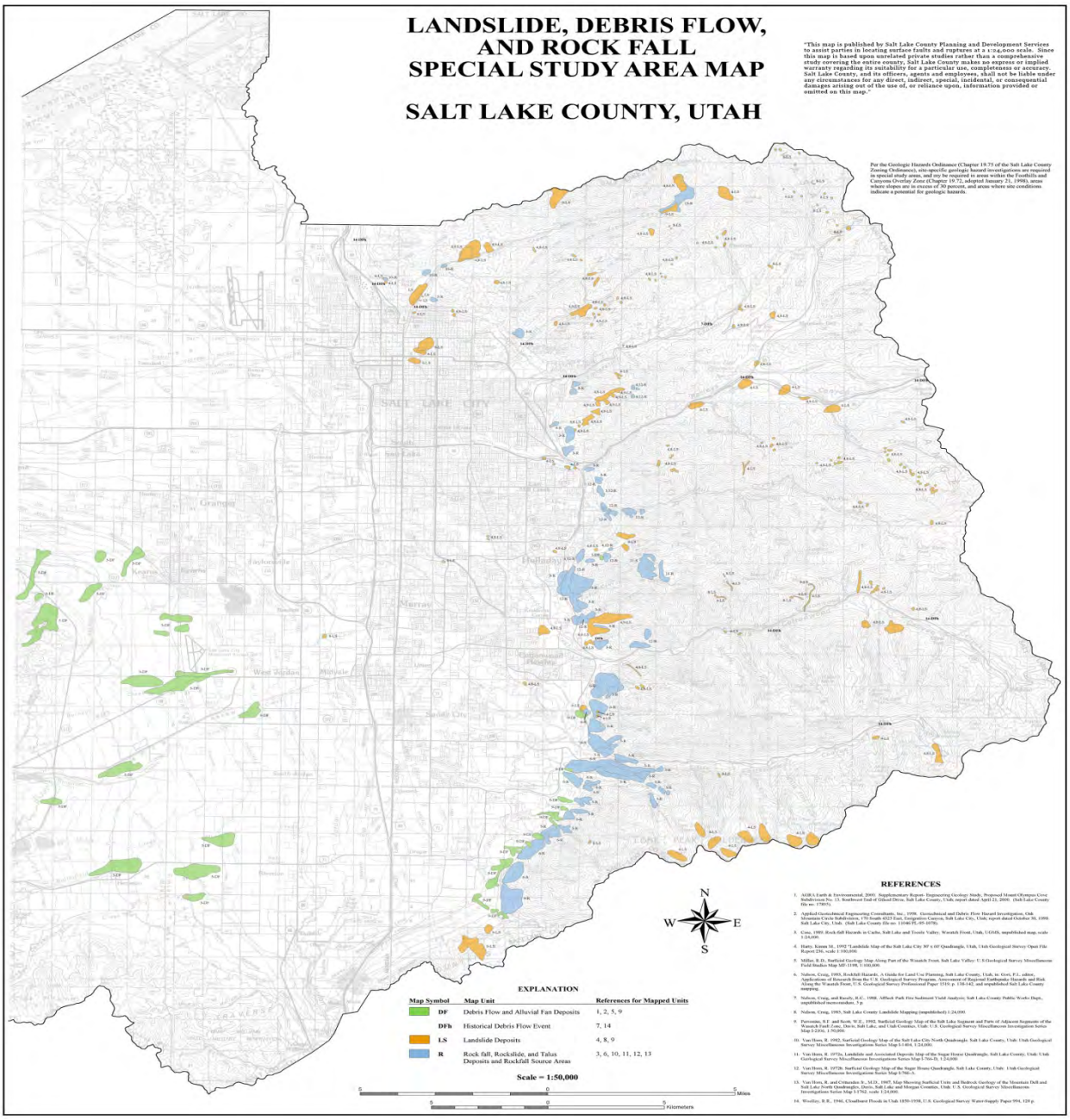


Figure 5.1-A

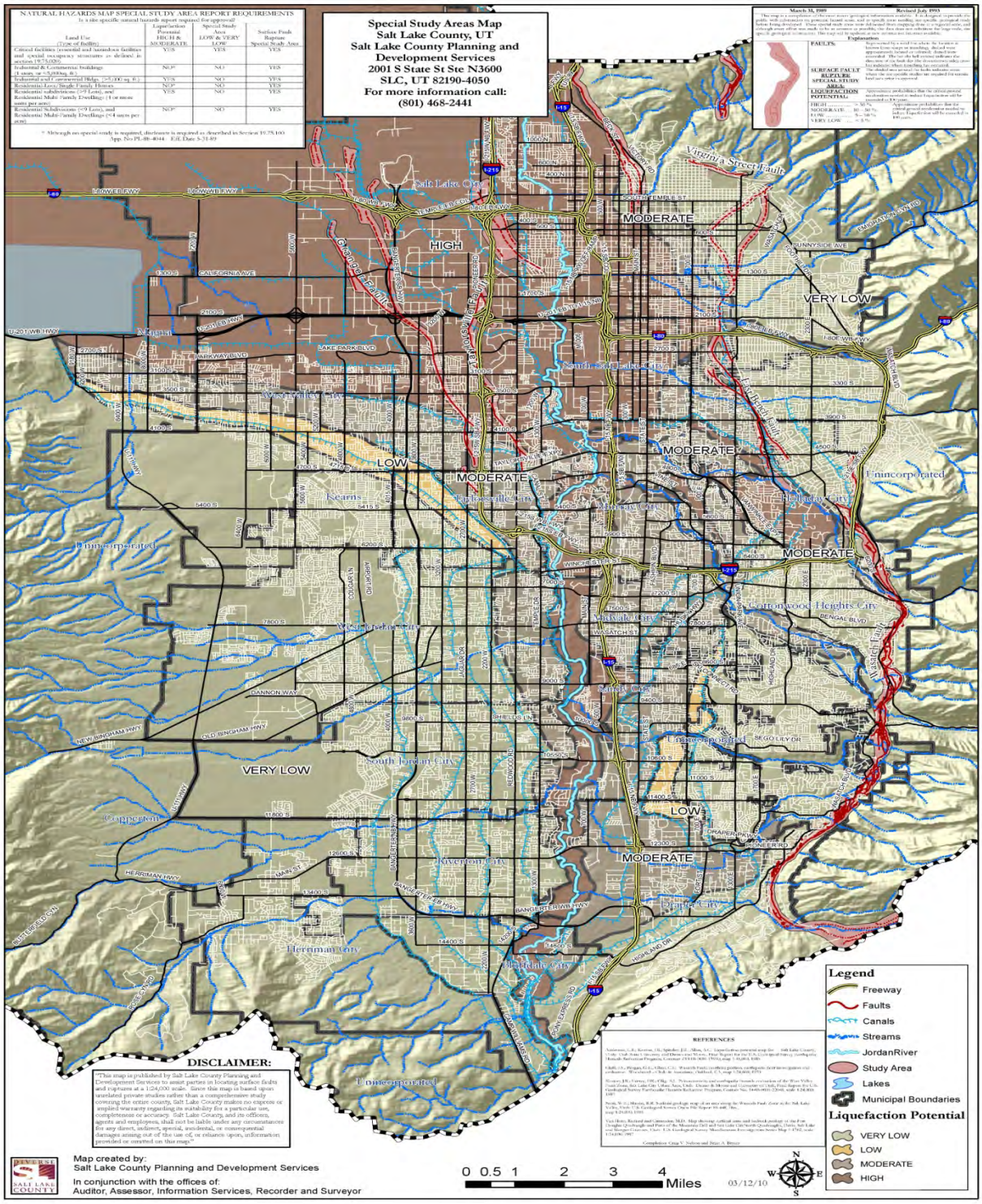


Figure 5.1-B Special Study Area Map

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

- Spring Flooding along Willow Creek and throughout County 2011
- Machinegun Wildfire - 2011
- Rosecrest Wildfire - 2012
- Kennecott Slope Failure - 2012
- Yearly Avalanches in Big and Little Cottonwood Canyons
- Flood and Debris Flow, August 19 2010
- Bell Canyon Fire, August 15, 2011

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 1989 to Present	Yes - See Salt Lake County Cooperative Plan, Wasatch Canyons Master Plan, Big Cottonwood, Copperton, Granite, Emigration Canyon, Kearns, Magna, Millcreek, Canyon Rim, East Millcreek, Millcreek, Mt. Olympus, Parleys Canyon, Sandy Hills, Southwest, White City, Willow Canyon, Willow Creek – Township and Community Plans.
Capital Improvements Plan	Current	Yes to All
Economic Development Plan	Current	Yes to All
Local Emergency Operations Plan	Current	Yes to All
Continuity of Operations Plan	Current	Yes to All
Transportation Plan	Current	Yes to All

Stormwater Management Plan	Current	Yes to All
Community Wildfire Protection Plan	Current	Yes to All
Other special plans (i.e., brownfields redevelopment ,disaster recovery, coastal zone management, climate change adaptation)	Current	Yes to All

Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	Yes – 2012 International Codes (ICC)
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	Score: 4
Fire department ISO rating	Yes	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	Yes	Yes to All
Subdivision ordinance	Yes	Yes to All
Floodplain ordinance	Yes	Yes to All
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Yes to All
Flood insurance rate maps	Yes	Yes to All
Acquisition of land for open space and public recreation uses	Yes	Yes to All
Other		Yes to All
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	There is a planning commission for each community and township. All development is heard and reviewed by each and the public as well
Mitigation Planning Committee	Yes	Representatives from the agencies listed in this document are members of the Mitigation Planning Committee
Maintenance programs to reduce risk, e.g., tree trimming, clearing drainage systems	Yes	Ongoing – Regulated through ordinance and part of the County's responsibility as well
Mutual aid agreements	Yes	Public Works and other County Agencies have mutual aid agreements with the other jurisdictions and special service districts throughout the vally as well as neighboring counties.
Staff	**Yes/No FT/PT18**	**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 to All
Floodplain Administrator	Yes	Yes to All
Emergency Manager	Yes	Yes to All
Community Planner	Yes	Yes to All
Civil Engineer	Yes	Yes to All
GIS Coordinator	Yes	Yes to All
Other		

[18] 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	Yes – As shortfalls are identified, action is taken to correct deficiencies. The 911 System is currently being overhauled.
Hazard data and information	Yes	Hazards data and information is available on the Salt Lake County Emergency Services Website. Real-time information is pushed out through computer displays, VOIP phone system, social media, web site, text and e-mail
Grant writing	Yes	Salt Lake County employs a number of personnel who seek and write grant proposals. Grant personnel are also found throughout the various departments and agencies of Salt Lake County.
Hazus analysis	Yes	The County performs HAZUS analysis and uses this data in conjuction with all planning efforts.
Other		

How can these capabilities be expanded and improved to reduce risk?

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	Yes – NRCS for Flood Control Facilities
Authority to levy taxes for specific purposes	Yes	Yes - Fire Area Tax – Levied with property taxes
Fees for water, sewer, gas, or electric services	Yes	Yes - These services are provided in part by the private sector
Impact fees for new development	Yes	Yes - All new development.
Storm water utility fee	Yes	Yes -
Incur debt through general obligation bonds and/or special tax bonds	Yes	Yes – Used to upgrade water systems to meet fire-flow requirements
Incur debt through private activities	Yes	
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	Yes – Open Space initiatives and Meals on Wheels programs and other social programs administered by the County Health Department
Ongoing public education or information program, e.g., responsible water use, fire safety, household preparedness, environmental education.	Yes	Yes – County Agencies providing public outreach – Flood Control, Planning and Development Services – Building Department, County Health Department, Business and Economic Development.
Natural disaster or safety related school programs	Yes	Cooperation with schools with the "Safe Neighborhoods Program"
StormReady certification	Yes	
Firewise Communities certification	Yes	
Public-private partnership initiatives addressing disaster-related issues	Yes	Yes – Participation with the Private Sector Coordinating Council
Other		

How can these capabilities be expanded and improved to reduce risk?

5.4 Mitigation Prioritization

Prioritize Critical Infrastructure

Form a resilience and recovery working group to engage public and private critical infrastructure owners and operators in an integrated risk assessment process that identifies critical lifeline sector assets, cross-sector dependencies, and restoration resources within unincorporated Salt Lake County.

SALT LAKE COUNTY PUBLIC WORKS ENGINEERING 5 YEAR PLAN is attached here to which includes the projected costs to maintain/replace/harden critical infrastructure assets such as Class-B Roads, Flood Control Facilities, etc. within unincorporated Salt Lake County.
This PLAN is ongoing and strictly contingent upon budget approval for the requested amounts

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

Unincorporated Salt Lake County identified **Flooding, Transportation, Building, Construction and Development, Environmental, Health and Safety, and Records** as six focus areas for vulnerabilities / hazards / mitigation in addition to those shown in the Hazards Matrix above. The hazards and mitigation activities are addressed within these focus areas with integration throughout all six. Additional prioritization of mitigation actions is outlined below, and although there is room for improvement, comprehensive hazard mitigation activity in Salt Lake County is ongoing. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and schedule are included within the narratives and by ordinance.

6.1.1– Mitigation Action Evaluation and Prioritization

- 1= Highly effective or feasible
- 0=Neutral
- -1=Ineffective or not feasible

Create and Integrate a Formal Post-Disaster Transportation Recovery Plan (1)
Coordinate with Salt Lake County Public Works and Engineering agencies to develop an earthquake transportation recovery plan that details how inspection and subsequent debris removal and repair operations will be linked to priority routes that serve key critical infrastructure assets. Transportation assets and resources should be allocated according to their infrastructure dependencies such as building and government facilities, fuel terminals, flood control assets, and other County infrastructure.

Post-Earthquake Response and Recovery Efforts for Supply Chain Disruptions (0)
Salt Lake County should engage in detailed planning efforts to address potential critical supply-chain disruptions for critical government needs and services.
Unincorporated Salt Lake County's General Plan guides the County's development and growth. Salt Lake County Ordinances and Standards contain goals and policies related to mitigation. These mitigation-related goals and policies are included in this document and the attached spreadsheets.

Goals

- To prevent loss of life and serious injury, resulting from natural or manmade hazards, to the residents of Unincorporated Salt Lake County.
- To prevent serious structural damage to critical facilities and structures where large numbers of people are expected to congregate at one time.
- To ensure the continuity of vital services to the area in case of disaster.
- To provide a leadership role in education on public safety.

Hazard Specific Objectives, Policies and Ordinances (1)

Seismic Safety Objectives

- Identify additional risks from updated fault and liquefaction studies to Unincorporated Salt Lake County.
- Establish and maintain a plan to minimize identified risks from seismic hazards.
- Establish and maintain a plan for responding to a seismic disaster and for the provision of emergency services.
- To adopt a Transportation Plan reflecting primary and secondary disaster access routes and designating appropriate evacuation routes.

The County should maintain and update a plan/s including the following:

- Provisions for continuity of governmental services.
- Program to coordinate the repair and restoration of essential systems and services.
- Coordination of emergency operations with other jurisdictions,
- Inspection program to identify and inventory all existing unreinforced masonry structures in the County.
- The County should continue to abate all identified dangerous buildings.
- Emergency communication centers, fire stations, and other emergency service or critical facilities should be examined to determine earthquake resistance. A program to mitigate deficient facilities should be established.
- Emergency procedures should be identified for public and private utility districts.
- Primary and secondary hazards from seismic activity should continue to be evaluated in all environmental assessment and reporting processes.
- The list of critical facilities for Unincorporated Salt Lake County should be reviewed and updated.
- Critical facilities should be designed to the standards established by the current and adopted Building Codes. A critical facility means essential facilities as provided for in the Building Code.

Focus Area Specific Mitigation Strategies

Flooding (1)
Mitigation Strategy –
Seek additional funding and possible grants to complete improvement projects in a more timely fashion.

Transportation (1)
Mitigation Strategy –
Adopt a Transportation Plan reflecting primary and secondary disaster access routes and designating appropriate evacuation routes.

Building, Construction and Development (1)
Mitigation Strategy –
Critical facilities should be designed to the standards established by the current and adopted Building Codes. A critical facility means essential facilities as provided for in the Building Code.

Environmental (1)
Mitigation Strategy –
Complete cleanup of two Superfund Sites - Flagstaff and Davenport located in the Granite Oaks and Treseder Subdivisions at the mouth of Little Cottonwood Canyon. Lead and Arsenic and other Heavy Metals.

Health and Safety (1)

Mitigation Strategy –
Develop internal response plans, policies and procedures to ensure continuity of essential government services in the event of a pandemic emergency. Exercise pandemic response and recovery plans across all County agencies.

Records (1)
Mitigation Strategy –
Continue and improve record management and cyber-security policies and procedures, including data transfer and records storage to off-site facilities.

Other Mitigation Efforts
- Unincorporated Salt Lake County is involved in some targeted mitigation efforts, these include the following:
- Unincorporated Salt Lake County is currently working on its Disaster Management Plan, education and implementation of the plan throughout County and County government, and an educational outreach program for the citizens of Salt Lake County.
- Salt Lake County is currently performing assessments on all County owned/operated buildings. This includes seismic and life-safety reviews and analysis.
- Updating the Natural Hazards Ordinance in cooperation with USGS and other agencies to include most recent findings and studies for slope stability and mitigation requirements; avalanche and debris flow mitigation; and liquefaction mapping to include the new data for the Warm Springs Fault located in the North segment of the Salt Lake valley.

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 Implementation of 2009 Wasatch Front

Mitigation Plan Strategies

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 County of Salt Lake County-UI on October 6, 2009. The following summary highlights the County of Salt Lake County-UI'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 Salt Lake County-*UI, a short description is provided as to why it was not relevant or if it is included as part of the updated plan.
*UI – "Unincorporated"

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	Salt Lake County-UI continues to improve and maintain its communication capabilities. Example: upgraded and activated 32 satellite phones for ESF and COOP agencies 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	Salt Lake County-UI participates in training and exercises designed to practice using communication tools and equipment. Example: The County uses and integrates 2-way and 800 MHz Radios during building evacuations and exercises, and provides training and exercise for satellite phone users to the phone bridge.

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	Salt Lake County-UI 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	Salt Lake County-UI 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	Salt Lake County-UI 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 Salt Lake County-UI engages in discussions with other jurisdictions 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	Salt Lake County-UI has upgraded existing equipment and purchased new equipment to maintain operability

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	Salt Lake County-UI GIS personnel actively participate in and hosts 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	Salt Lake County-UI 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	Salt Lake County-UI GIS personnel continue to develop and add to the geographic data as part of the County'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	Salt Lake County-UI 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	Salt Lake County-UI has implemented the use of monitoring equipment such as stream gages, seismographs, SNOTEL sites to provide situational awareness and forecasting capabilities Example: The Salt Lake County-UI 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 Salt Lake County-UI Emergency Services Director receives alerts from the USGS and NWS via text message and email

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	1 – Utilize GIS to identify facilities and infrastructure at risk	Completed	In 2013 Salt Lake County-UI GIS, Fire and Emergency and Risk Management and facilities personnel began performing extensive hazard and risk assessment on all County-owned/operated structures to evaluate their level of risk and capability.
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 2013 Salt Lake County-UI GIS, Fire and Emergency and Risk Management and facilities personnel began performing extensive hazard and risk assessment on all County-owned/operated structures to evaluate their level of risk and capability.
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	Salt Lake County-UI is identifying options and opportunities to address issues identified during the ongoing facility assessments
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	Salt Lake County-UI has formal agreements for Police, Fire, and Water, American Red Cross and other agencies
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	Salt Lake County-UI is currently working on enlisting participation in a new public works MAA

Category	Goal / Objective	Action	Status	Comments
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	Salt Lake County-UI Emergency Services 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	Salt Lake County-UI'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	Salt Lake County-UI GIS personnel have compiled and made available hazard maps to help educate the public on potential hazards in the County
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	Salt Lake County-UI has worked with Be Ready Utah and other programs to make presentations and will continue to invite them to events and other activities in the community
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	Salt Lake County-UI enforces all current ordinances and building codes including our Natural Hazards and FCOZ 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 Salt Lake County-UI ordinances are available online at: https://www.municode.com/library/ut/salt_lake_county/codes/code_of_ordinances

Category	Goal / Objective	Action	Status	Comments
Dam Failure	1 – Include dam failure inundation in future County and County 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, County and Special Service District Emergency Operations Plans	Completed	The inundation maps for the dams located within Salt Lake County are included in the County's Emergency Plans and Engineering/Flood Control website and documents
Dam Failure	1 – Include dam failure inundation in future County and County 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 maps have been considered in identifying potential evacuation routes, if needed
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	Salt Lake County Engineering and Flood Control Manager provides outreach material 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	Completed / Ongoing	Salt Lake County-UI coordinates with the Jordan Valley Water Conservancy District and leads the County'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 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Completed / Ongoing	Salt Lake County Planning and Development Services Division has a variety of incentive programs that it offers to builders and residents related to water conservation. Example: Rebate program for installing low flow toilets
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	Salt Lake County-UI 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	Salt Lake County Public Works coordinates with the many water retailers and 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	Salt Lake County-UI Public Works coordinates with the many water retailers regarding 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	Salt Lake County-UI 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	Not Completed	This is not applicable to Salt Lake County-UI
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	Salt Lake County-UI 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	Completed	In 2013 Salt Lake County-UI GIS, Fire and Emergency and Risk Management and facilities personnel began performing extensive hazard and risk assessment on all County-owned/operated structures to evaluate their level of risk and capability.

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 Completed	Salt Lake County-UI does not currently have funding to support this type of program. Salt Lake County-UI is reviewing the "Fix-the-Bricks program in Salt Lake City and considering the implementation of that program in Salt Lake County.
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	Risk Management and facilities personnel began performing extensive hazard and risk assessment on all County-owned/operated structures which will include seismic evaluations and recommendations for the appropriate seismic upgrades. This information will then be used to seek budgetary support for capital improvement projects.
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 / Ongoing	Salt Lake County Planning and Development Services – Building Department Provides educational materials to unreinforced masonry home and business 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.	Ongoing	Salt Lake County Engineering and Flood Control is overseeing this project. Refer to the 2005 Red Butte Dam Rehabilitation Geotechnical Summary Report
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	Completed / Ongoing	Salt Lake County-UI has been a participating community in the NFIP since 1974

Category	Goal / Objective	Action	Status	Comments
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	Salt Lake County-UI 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	Salt Lake County Planning and Development Services and Engineering and Flood Control regularly review the impact of development and the need for flood control infrastructure and make recommendations as needed
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	Salt Lake County Flood Control and Engineering oversee the construction of flood control structures and facilities Example: Significant construction efforts were completed on Mill Creek including upsizing culverts, channel stabilization, etc.
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	Flood Control and Engineering /Public Works Department continues to maintain and repair all drainage systems in the County
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	Salt Lake County Public Works Engineering Division in cooperation with the Public Works Department regularly review and inspect County-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	Salt Lake County Flood Control and Engineering in cooperation with the Public Works Department make repairs as needed to deficient structures

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	Completed / Ongoing	Salt Lake County-UI participates 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	Completed / Ongoing	Salt Lake County-UI participates 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	Salt Lake County-UI 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	Salt Lake County-UI 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	Salt Lake County-UI 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	Salt Lake County-UI 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	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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 / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s

Category	Goal / Objective	Action	Status	Comments
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	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through "Firewise" program	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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 / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s

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	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 Salt Lake County-UI 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 Salt Lake County-UI is complete
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 / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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 Salt Lake County-UI water system meets and/or exceeds requirements for providing water flow for firefighting purposes in the County
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	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s
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	Completed / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s

Category	Goal / Objective	Action	Status	Comments
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 / Ongoing	Salt Lake County Planning and Development Services addresses and enforces this through the Natural Hazards Ordinance/s

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
Local Plans and Regulations											
County Cooperative Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Natural Hazards Ordinance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Building & Development Reg.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Structure and Infrastructure Projects											
Critical Facilities Assessment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Flood Control Upgrades	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
County Roads Upgrade	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Natural Systems Protection											
Waterway Bank Improvements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Open Space Program	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Nat. Hazards Ord. Update	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Education and Awareness Programs											
Website Education Portal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Emergency Vol. Coordinators	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes		
Safe Neighborhoods Prog.	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes		

6.2.1 – Mitigation Action Implementation

Planning Process and Participants

Mitigation planning is a regulated and ongoing process in Unincorporated Salt Lake County and involves all cities, townships, and community Councils. Mitigation planning, activities, regulation and enforcement are found within the Salt Lake County Ordinances and Regulations and include State and Federal regulations. All hazards which affect Salt Lake County are addressed in ordinance, and include; Natural Hazards, Man-made Hazards, Health and Safety Hazards, to name a few. All ordinances, master plans, cooperative plans are required and subject to the public review process. Although revisions and updates to this plan will be ongoing and continuous, a formal review of this plan will be conducted every three years and according to the current standard for public and stakeholder review and will incorporate and reflect all progress to date. This plan represents an overview of the ongoing mitigation efforts in Salt Lake County.

The Unincorporated Salt Lake County Hazard Mitigation Plan was developed through a cooperative effort of Salt lake County Departments and Agencies:

Michael Barrett – Emergency Services – Author and Planning Coordinator
Scott Baird – Director – Flood Control and Engineering
Brent Beardall – Flood Control and Engineering
Max Johnson – Lead Land Use Planner – Planning and Development Services
Mike Durfee – Building Official – Planning and Development Services
Greg Baptist – Engineering, Storm Water and Natural Hazards – Planning and Development Services
Spencer Brimley – Economic Development

Jurisdiction:	Unincorporated Salt Lake County
Mitigation Action/Project Title:	Create and Integrate a Formal Post-Disaster Transportation Recovery Plan
Background/Issue:	A process is needed to perform inspection and subsequent debris removal and repair operations will be linked to priority routes that serve key critical infrastructure assets.
Ideas for Integration:	Coordinate with Salt Lake County Public Works and Engineering agencies to develop an earthquake transportation recovery plan that details how inspection and subsequent debris removal and repair operations will be linked to priority routes that serve key critical infrastructure assets.

Responsible Agency:	Emergency Services, Public Works and Engineering
Partners:	Utah Department of Transportation, Salt Lake County Planning and Development Services, Emergency Services, Township Services, Office of Regional Development
Potential Funding:	Annual Budget
Cost Estimate:	**$25,582,782**
Benefits: (Losses Avoided)	Salt Lake County recognizes that roads, highways and pedestrian access are a critical lifeline infrastructure and play a significant role in the safety, economic and social aspects of the community. County roads and highways are vulnerable to natural and man-made hazards and have previously been subject to significant damage from flooding and other hazards. **$127,913,910**
Timeline:	5 Year Plan
Priority:	High
Worksheet Completed by:	Scott Baird – Salt Lake County Public Works – Engineering Division Michael Barrett – Salt Lake County Office of Regional Development – Division of Emergency Services

6.2.2 – Mitigation Action Implementation

Jurisdiction:	Unincorporated Salt Lake County
Mitigation Action/Project Title:	Flood Control
Background/Issue:	The Salt Lake Basin has in recent years been subject to several devastating floods resulting in substantial property damage. During floods, the prime responsibility of the Engineering Division is the control of flood waters in the major rivers and channels throughout the Basin. Therefore, assistance to individual property owners from our experienced flood control personnel is not always immediately possible. Flood hazard areas of Salt Lake County are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.
Ideas for Integration:	Control the inundation caused by the cumulative effect of channel obstructions and damaged or inadequate flood control facilities which increase flood heights and velocities. Regulate or prohibit uses that are inadequately flood-proofed, elevated or otherwise protected from floodwater also contribute to flood loss. The degree of flood protection required is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by manmade or natural causes. This does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. (§ 1 (part) of Ord. passed 11/13/85: prior code § 22-39-1) **Methods of Reducing Flood Losses** • Restricting or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases of erosion, 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 • Prevent or regulate the construction of flood barriers which will divert floodwaters or which may increase flood hazards in other areas (§ 1 (part) of Ord. passed 11/13/85: prior code § 22-39-3)
Responsible Agency:	Salt Lake County Engineering and Flood Control, Salt Lake County Planning and Development Services
Partners:	FEMA, State of Utah
Potential Funding:	Annual Budget
Cost Estimate:	**$50,630,856**
Benefits: **(Losses Avoided)**	These regulations promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions by provisions designed to: • Protect human life and health • Minimize expenditure of public money for 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 flood-blight areas • Ensure that potential buyers are notified that property is in an area of special flood hazard • Ensure that those who occupy the areas of special flood hazards assume responsibility for their actions (§ 1 (part) of Ord. passed 11/13/85: prior code § 22-39-2) **$253,154,280**
Timeline:	5 Year Plan
Priority:	High
Worksheet Completed by:	Scott Baird – Salt Lake County Public Works – Division of Flood Control and Engineering Michael Barrett – Salt Lake County Office of Regional Development – Division of Emergency Services

6.2.3 – Mitigation Action Implementation

Jurisdiction:	Unincorporated Salt Lake County
Mitigation Action/Project Title:	Buildings, Construction and Development – Exposure to Natural Hazards

Background/Issue:	Salt Lake County Ordinances are designed and enacted for the purpose of promoting the health, safety, morals, conveniences, order, prosperity and welfare of the present and future inhabitants of Salt Lake County, including, among other things, the lessening of congestion in the streets or roads, securing safety from fire and other dangers, providing adequate light and air, classification of land uses and distribution of land development and utilization, protection of the tax base, securing economy in governmental expenditures, fostering the county's agricultural and other industries, and the protection of both urban and nonurban development. Salt Lake County adopts and enforces the most current codes and building standards. The building department is staffed by qualified, licensed and certified building inspectors. The International Building Code (IBC) and the International Residential Code (IRC) along with any amendments, as adopted by the state as the construction standard to be adhered to by political subdivisions of the state (Section 58-56-4, Utah Code Annotated) is adopted by the county together with the fee table, and the following chapters of the Appendix to the International Building Code. The International mechanical code, International plumbing code, National electrical code, International fuel gas code, International fire code and International energy conservation code along with any amendments as adopted by the state of Utah as the construction standards to be adhered to by political subdivisions of the state (Section 58-56-4, Utah Code Annotated), as well as the Uniform Code for the Abatement of Dangerous Buildings, 1997 Edition, published by the International Conference of Building Officials, is adopted and incorporated herein by reference into this code. (Ord. 1491 § 5 (part), 2002: Ord. 1413 § 1 (part), 1997)
Ideas for Integration:	Ensure that each building, structure and subdivision fully complies with the provisions and land use regulations of the County, and, the formal application and review procedures for subdivisions are enforced.
Responsible Agency:	Salt Lake County Planning and Development Services

Partners:	International Code Council, Salt Lake County Flood Control and Engineering, Recorder, Surveyor, State of Utah
Potential Funding:	Annual Budget
Cost Estimate:	**$2,160,000**
Benefits: **(Losses Avoided)**	Salt Lake County reduces their risk, vulnerability and exposure to hazards through the adoption and strict enforcement of relative codes, ordinances and standards. The ordinances regulate and mitigate the exposure of the built environment to relevant hazards. 30-40% of new construction interfaces with one or more of the referenced natural hazards. Hazard Disclosures are recorded on the property title. **$10,800,000**
Timeline:	5 Year Plan
Priority:	High
Worksheet Completed by:	Mike Durfee, Randy Allen, Salt Lake County Planning and Development Services Michael Barrett, Salt Lake County Emergency Services

7 Plan Implementation & Maintenance

7.1 Implementation

Mitigation is incorporated into the day-to-day functions and priorities of Salt Lake County. Development in Salt Lake County 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 develoment, police and fire requirements, and County policies and agreements. The public be involved in this process as required by ordinance in every aspect.

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

Salt Lake County integrates mitigation strategies into its building codes, development regulations and ordinances, land use and master plans, policies and actions of the Council and other relevant County agencies and governing authorities and provides education during daily, weekly, and monthly agency and public meetings.

7.2 Maintenance Schedule

Periodic monitoring and updates of this Plan will be available on the Emergency Services website to ensure that the goals and objectives for the County 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 procedures for completing revisions and updates will be outlined on the website. The Plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster as needed.

Plan review and updates will include the information from the Mitigation Plan Annual Review Questionnaire.

7.2.1 – Plan Review and Update Evaluation

Mitigation Plan Annual Review Questionnaire		
Plan Chapter	**Considerations**	**Explanation**
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision- maker priorities related to hazard mitigation?	
Risk Assessment	Has a natural and/or man-made disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	
Vulnerability Analysis	Do any new critical facilities or infrastructure need to be added to the asset lists?	

Mitigation Plan Annual Review Questionnaire		
Plan Chapter	**Considerations**	**Explanation**
	Have any changes in development trends occurred that could create additional risks?	
	Are there repetitive losses and/or severe repetitive losses to document? Has NFIP participation changed in the participating jurisdictions?	
Capability Assessment	Are there different or additional technical, financial, and human resources available for mitigation planning?	
	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Implementation Strategy? Should existing mitigation actions be eliminated from the	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
Plan Maintenance Process	Was the plan monitored and evaluated as anticipated?	
	Have elements of the plan been incorporated into other planning mechanisms?	

Annual Review Procedures

Salt Lake County 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 County 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 County 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 and at least every five years. Salt Lake County Emergency Services will determine if there have been any significant changes in the County 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

Salt Lake County will amend and update its Hazard Mitigation Plan as needed.

7.4 Maintenance Evaluation Process

It will be the responsibility of the designated Emergency Services Project Manager, Division Director, Mayor and County 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. Salt Lake County may 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 Salt Lake County that this Hazard Mitigation Plan will be adopted by reference 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 Salt Lake County District Attorney, Division of Risk Management.

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RESOLUTION R2015 – 16

A RESOLUTION OF THE MAYOR OF SANDY CITY, UTAH, 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, Sandy 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, Sandy 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 hazard; and

WHEREAS, Sandy City, in coordination with governmental and non-governmental stakeholders having an interest in reducing the impact of natural hazards throughout Salt Lake County and with input from the private sector and other members of the public, was an active participant in the development of the *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan*, which identifies natural hazards that have the potential to occur in Salt Lake County and Sandy 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, Sandy City is concerned about mitigating potential losses and 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, THERFORE, BY THE POWER VESTED IN ME AS MAYOR OF SANDY CITY, UTAH, IT IS HEREBY ORDERED:

SECTION 1. Adoption. That Sandy City adopts the *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan* as the jurisdiction's Multi-Hazard Mitigation Plan, and resolves to provide such assistance as may be necessary or appropriate to implement the provisions of the Plan in accordance with the Disaster Mitigation Act.

SECTION 2. Effective Date. This Resolution shall become effective immediately.

APPROVED BY THE MAYOR OF SANDY CITY, UTAH, ON THIS 12th **DAY OF** May **, 2015.**

Tom Dolan, Mayor

Attest: City Recorder

Council Chair

SANDY CITY, UTAH INCORPORATED 1893

SANDY CITY
UTAH

Hazard Mitigation Plan
2014

Prepared by
Jared Smith
Sandy City Emergency Manager
jsmith@sandy.utah.gov
801-568-7279

ANNEX L: CITY OF SANDY
1 Introduction

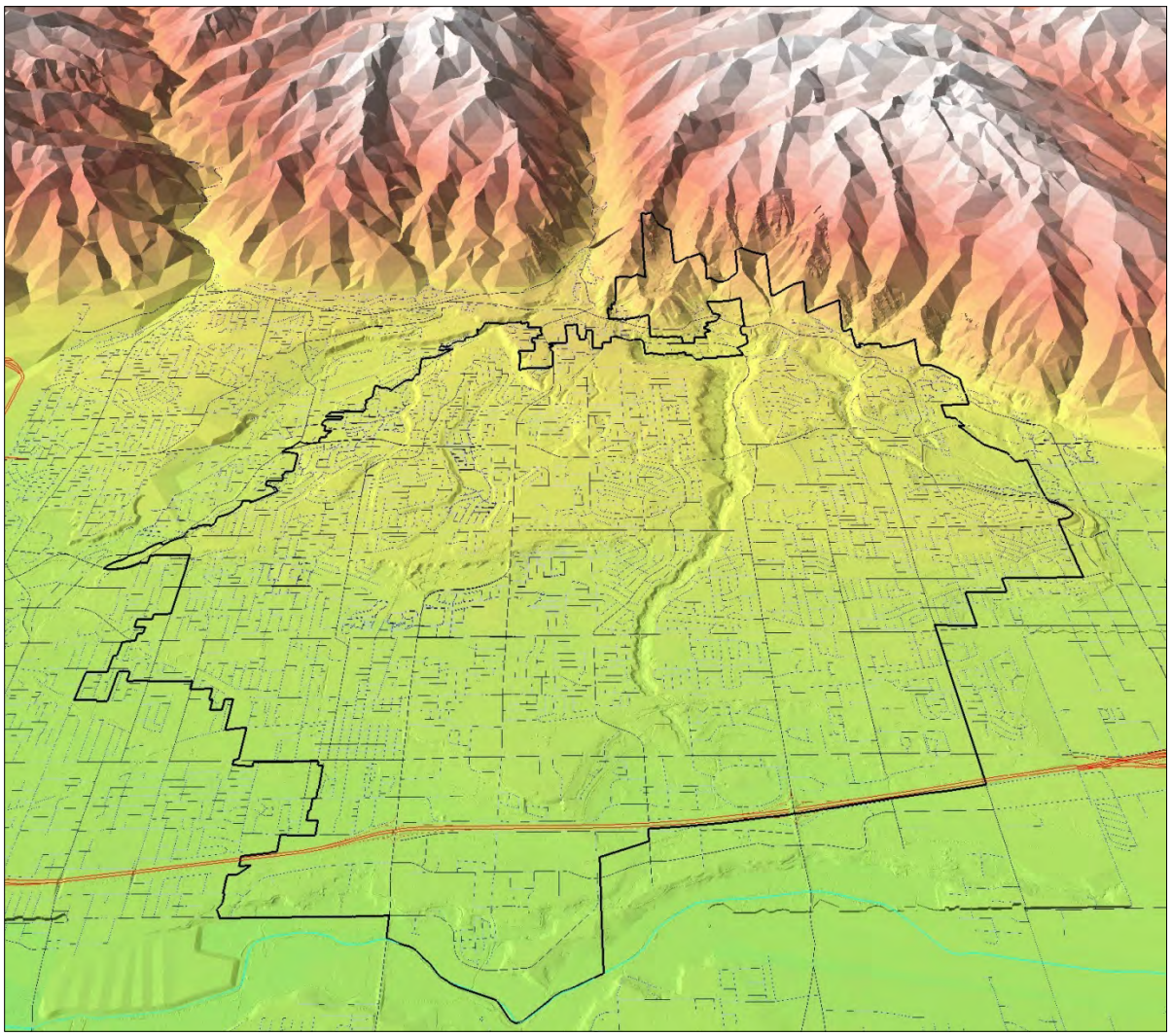
1.1 Community Profile

Sandy City is Utah's sixth largest city. The nearby Wasatch Mountains provide water, recreational opportunities, and a scenic backdrop. The I-15 corridor and TRAX light rail line on the west side of the city provide both access to downtown Salt Lake City (approximately 15 miles to the north) and the opportunity to be a commercial center for the south end of the valley.

Sandy is home to several cultural, recreational, and entertainment venues, namely, the Sandy Amphitheater, the Living Planet Aquarium, the Sandy Museum, and Rio Tinto Stadium, home of Real Salt Lake soccer. Also, world-class ski resorts, such as Alta and Snowbird, are located just minutes away from Sandy's borders.

Sandy experienced tremendous growth both in land area and population during the past thirty years. Annexation of previously unincorporated land has resulted in growth from 6.6 square miles in 1970 to nearly 23 square miles today. Annexations combined with new construction resulted in population growth from 6,438 to 87,461 in that same time period. Many of the new homes built during the 70's and the 80's were bought by young families which resulted in one of the lowest median ages in the nation. In recent years, the population has aged as many of the children in the young families have grown and left home. The median age of Sandy City changed from 20.3 years in 1980 to 29.1 years in 2000. This demographic shift has had an effect on the city budget in such areas as declining participation in recreation programs and a reduced rate of growth in both sales tax revenue and state road funds which are based partially on population.

Commercial growth, however, continues along the I-15 corridor which in turn continues to fuel a strong economy and tax base and provides job opportunities for residents.



Sandy City border on a relief map produced by Sandy GIS staff (view is facing east; I-15 shown in red)

1.2 Authority and Reference

Sandy is a Strong Mayor City of the First Class. Sandy has seven City Council representatives governing over it.

2 Community Profile

2.1 Geography, Environment & Climate

Sandy is located in the southeast quadrant of Salt Lake County and in the northwest quadrant of Utah County. Sandy covers 22.3 square miles.

Adjacent to Sandy City on its east are the Wasatch Mountains and the base of those mountains are within the boundaries of Sandy. Adjacent to Sandy City on its west is the Jordan River, which is the city boundary line between Sandy and West Jordan / South Jordan. Draper City borders Sandy on the South. Sandy is characterized by a mixture of land uses, comprising commercial, industrial, residential, agricultural, vacant land and 2,000 acres of open space areas within its boundaries. The open space area is used for recreational purposes by residents of Sandy and the surrounding communities and has many multi-use trails and areas within.
Sandy has an average annual temperature of 53.7°F and receives 15.69 inches of rain.

Figure 1 displays a map showing the location of Sandy City within Salt Lake County and the State of Utah.

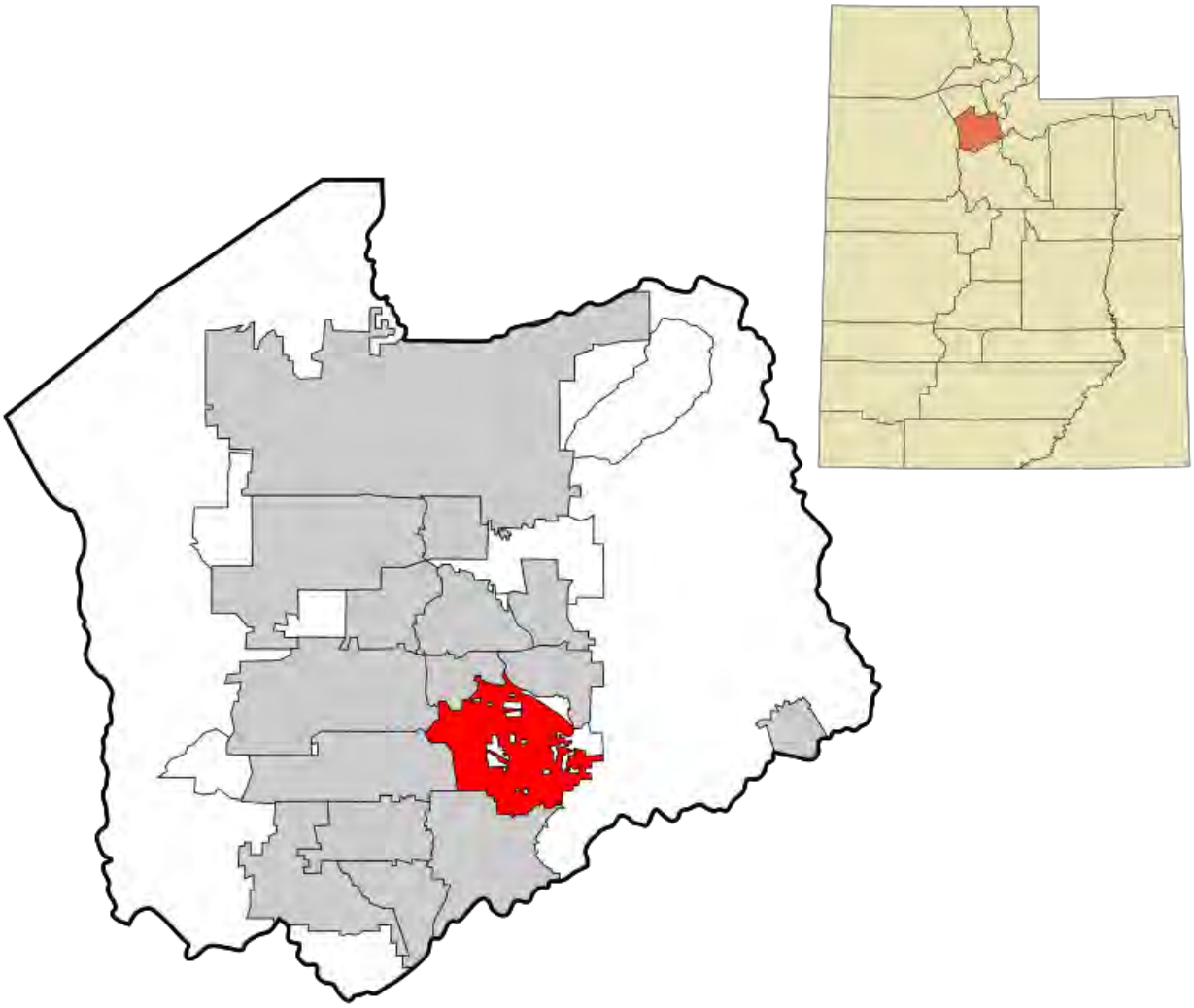
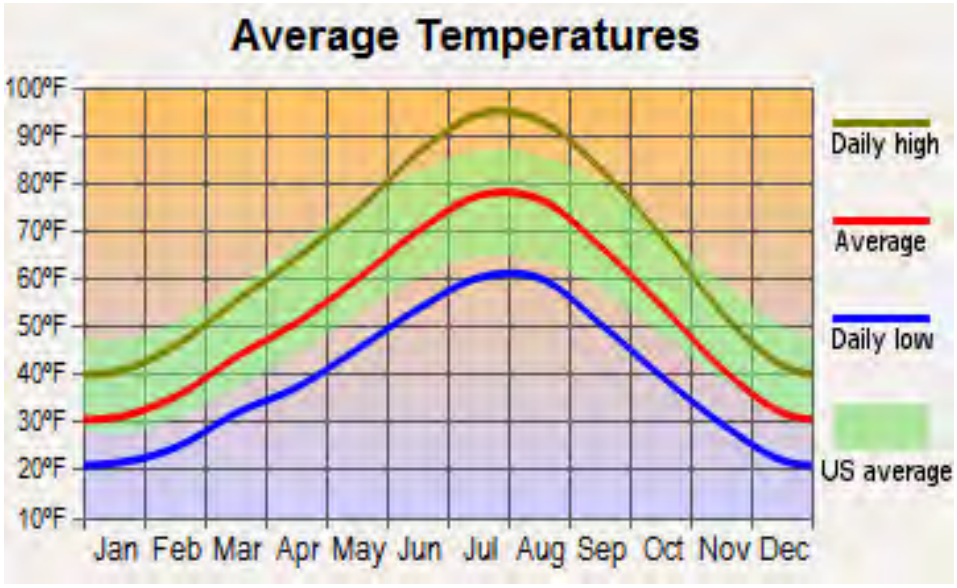


Figure 1. The City of Sandy



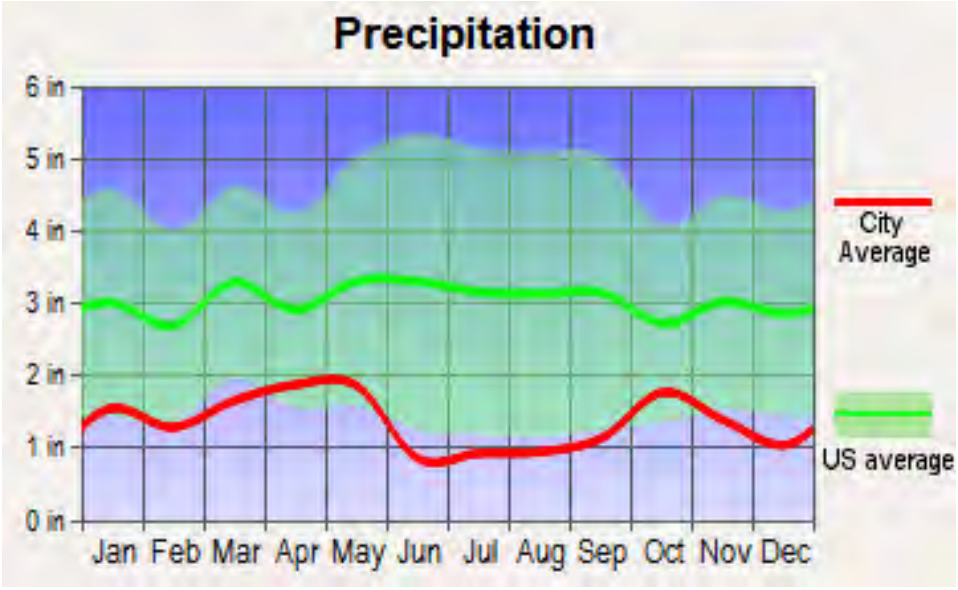


Figure 2. The City of Sandy's Average Temperatures and Precipitation

2.2 Community Facts and History

Located at the base of the Wasatch Mountains thirteen miles (19 km) south of Salt Lake City, Sandy was a likely area for early settlement. The area was first used by nomadic bands of Paiute, Shoshone, and Bannock Indians who roamed along the base of the mountains as they travelled from their winter home at Utah Lake to their summer fishing grounds at Bear Lake.

Permanent settlers first moved into Sandy during the 1860s and 1870s because of the availability of land in the less crowded southern end of the Salt Lake Valley. The original plat was essentially one square mile, situated on an alluvial terrace running north and south along the eastern edge of the Jordan River drainage system and paralleling the mountain range.

The origin of its name has not been established with any certainty. Perhaps most widely believed is that Brigham Young named Sandy for its thirsty soil, but there is no historical evidence for this.[3] Another theory is that the name came from a legendary and colorful Scotsman, Alexander "Sandy" Kinghorn, the engineer who ran the first train line to this end of the Salt Lake Valley. Though this seems bolstered by the original name (Sandy Station or Sandy's Station), historians consider it unlikely in view of the short period between the start of the train service and the first instances of the name.[4]

In 1863, there were only four homes between Union (7200 South) and Dunyon (Point of the Mountain): the Thayne homestead at 6600 South and 800 East, one in Crescent, one at Dunyon, and a fourth outside present-day Sandy boundaries altogether. Within a few years, Thomas Allsop, a Yorkshire farmer who had immigrated to Utah in 1853, owned almost half of present-day Sandy from County Road to Fourth East along Alta Road to Lindell Parkway. LeGrand Young owned the land between Fourth East and State Street.

Farmers willing to try their hand at the thirsty soil that inspired Sandy's name took up land along State Street, which stretched from downtown Salt Lake City to Point of the Mountain. But it was mining that shaped Sandy's first four decades. When silver mining began in Little Cottonwood Canyon, entrepreneurs recognized Sandy's value as a supply station; soon its main street was lined with hotels, saloons, and brothels serving miners ready to spend their newly earned wages. Three major smelters were located in Sandy. They were the Flagstaff, the Mingo, and the Saturn. These made Sandy the territory's most significant smelting center for a number of years.

The railroad was also significant in determining the course of Sandy's history. Built in 1873, the railroad connected Sandy to Salt Lake City and facilitated the transportation of ore and other products both in and out of the area. A streetcar line in 1907 facilitated the transportation of locals to jobs in Salt Lake City; and the automobile later continued to serve that function.

When the mines failed in the 1890s, Sandy faltered, then underwent a significant economic transformation into an agricultural community. The fact that Sandy did not disappear, like so many other mining towns that dwindled with their mother lodes, was due to its location, resources, and the spirit of its inhabitants.

2.3 Population and Demographics

In 2012, the total population for the City of Sandy was estimated at 89,344 by the U.S. Census. Sandy City’s Median Household Income is $75,284. Sandy City has more than 23,000 households. The median age is 30.7 years.

2.4 Economy

Sandy City is home to the Real Salt Lake Major League Soccer Team. Their stadium holds over 20,000 people. As well as hosting the Soccer Team, the City contains businesses that employ nearly 40,000 people.

Sandy City has a reputation as a great place to live. Sandy has maintained a small town community spirit, which is exemplified by such community events as the annual Sandy July 4th celebration and the many events held at the Sandy City Amphitheater. Sandy's unique growth opportunities and outdoor recreational venues, continues to attract new residents, developers, businesses, and industries to the City.

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

Trade, Transportation & Utilities	8,832
Government	5,164
Professional & Business Services	3,486
Education and Health Services	4,715
Leisure and Hospitality	6,368
Construction	2,811
Financial Activities	2,581
Manufacturing	2,686
Other Services	1,262
Information	1,979

Table 1. Sandy Residential Employment Sector

2.5 Growth and Development Trends

The growth surge that Sandy 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 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. While the city has been mostly built out, there continues to be minor growth from incorporating county islands.

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 106th 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 strongest future business growth areas are expected to be in the vicinity of the major north/south corridors. 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.

2.6 Data Sources and Limitations

Sandy City utilized the following sources to provide data for this report:

- Sandy City GIS
- Sandy City Community Development
- Sandy 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

Sandy 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 Sandy City Mitigation Planning Team are listed in the table below.

Jared Smith	Sandy City Emergency Manager
Korban Lee	Sandy City Assistant Manager
James Sorenson	Assistant Community Development Director
Scott Marsell	Chief Building Official
Eric Richards	Communications
Ray Montgomery	GIS Manager
Paul Browning	Deputy 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	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
Jared Smith	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

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 October 11, 2014.

3.4 Multi-Jurisdictional Planning

Sandy 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 Sandy 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 Sandy City:

- Flood and Debris Flow, August 19 2010
- Spring Flooding along Willow Creek and throughout City 2011
- Bell Canyon Fire, August 15, 2011

4.2 Hazard Analysis

A disaster can occur at anytime within Sandy City. Rather than attempt to prepare for every potential disaster, the intent of Sandy 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 Sandy 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 Sandy 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 Sandy 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 Sandy City Public Utilities maintains a waterway at Bell's Canyon Reservoir. The dam is on a regular maintenance and inspection schedule. There is no history of problems at this reservoir and in the event of failure, flooding would occur along the riverways.

4.2.3 Drought

Sandy 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 D.2. below shows average temperatures and precipitation amount for Sandy City by month.

Sandy City Average Temperature Table

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. Sandy City Average Temperature Table

4.2.4 Earthquake (Seismic Hazard)

The most likely hazard to Sandy 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 Sandy and are susceptible to liquefaction-induced ground failure during a large earthquake. Each incident may require a unique response from Sandy 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, Sandy 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.

4.2.5.1 NFIP in Sandy City

Sandy City does not have any repetitive loss claims due to flooding identified under the National Flood Insurance Program (NFIP). Sandy City does participate in the NFIP.

Sandy City's Community Development Director and Public Utilities Director coordinate to enforce the floodplain management requirements adopted by the City, including:

(1) Regulating new construction in Special Flood Hazard Areas (SFHAs)
(2) Floodplain identification and mapping, including any local requests for map updates and descriptions of community assistance and monitoring activities.

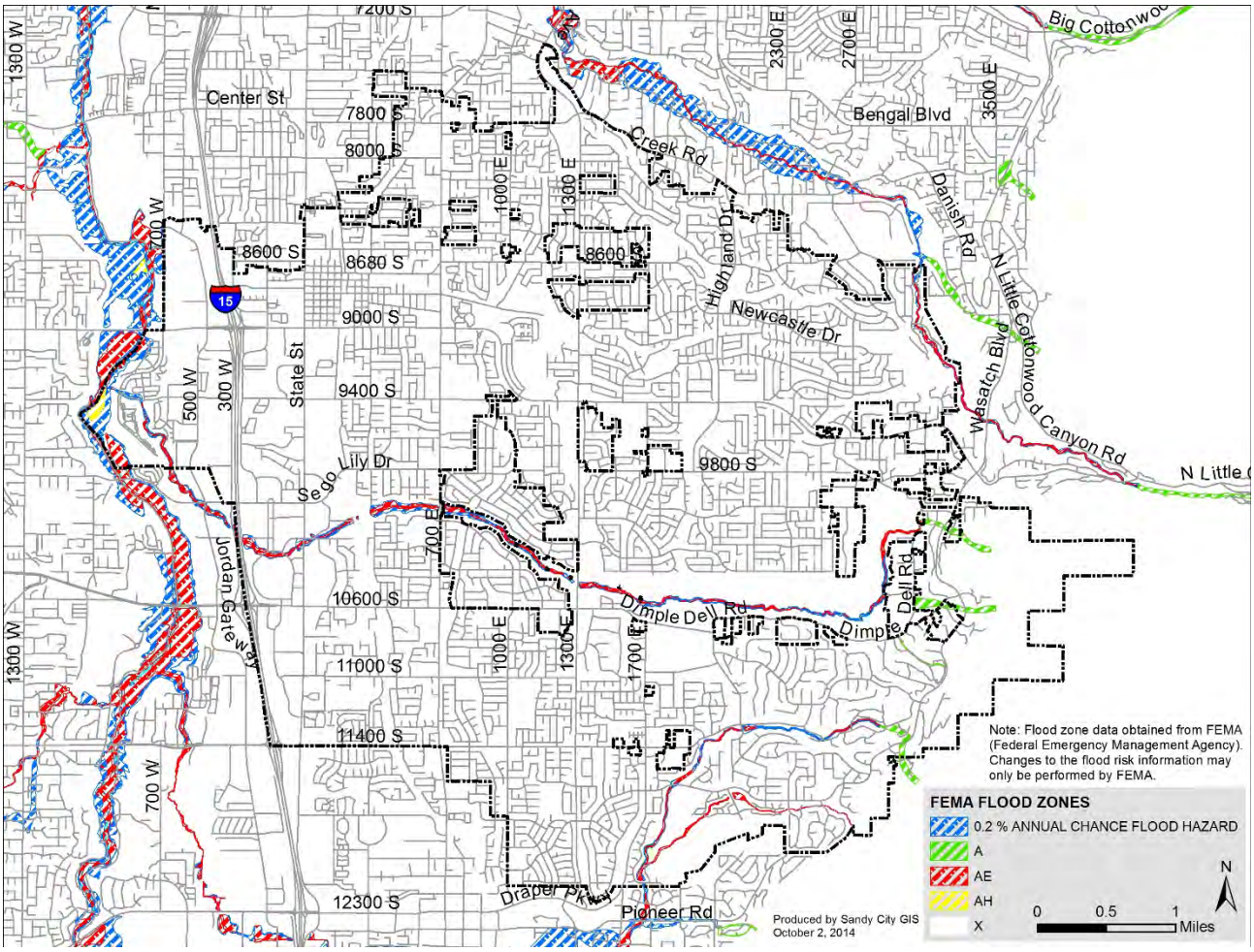


Figure 6. The City of Sandy's Flood Zones

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 Sandy City. A flood risk 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	-	-	56	$ 2,260,858
Residential	220	$ 5,541,815	447	$ 17,912,175
Total	**220**	**$ 5,541,815**	**470**	**$ 188,173,033**

Table 3. City of Sandy – Estimated Flood Loss Information

4.2.6 Infestation

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

4.2.7 Landslide and Problem Soils (Geologic Hazard)

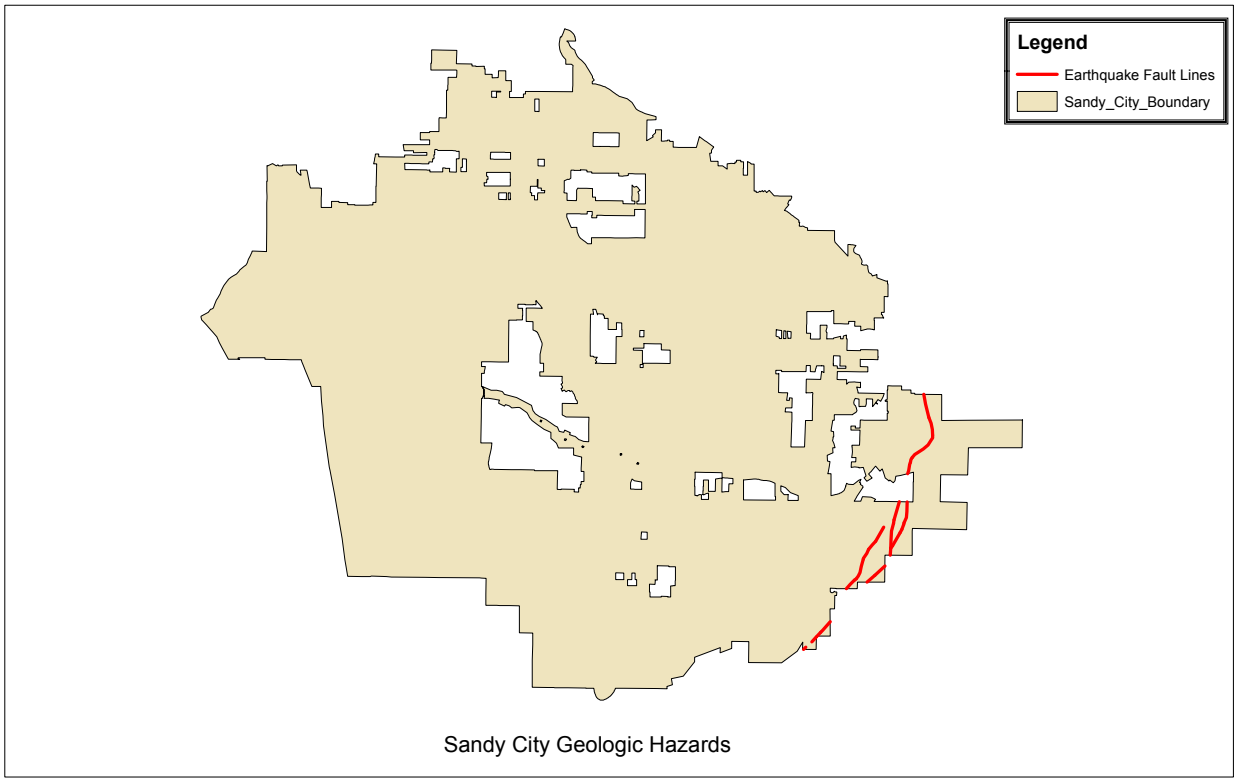


Figure 8. The City of Sandy's Geologic Hazards

Numerous geologic hazards exist in Sandy 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 Sandy City, and in the instance of a major mudslide or debris flow, outside assistance will be necessary.

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 Sandy 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, Sandy 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.

4.2.10 Severe Weather

The potential for severe weather is a reality in Sandy 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 Sandy 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 Sandy 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.

Sandy 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.

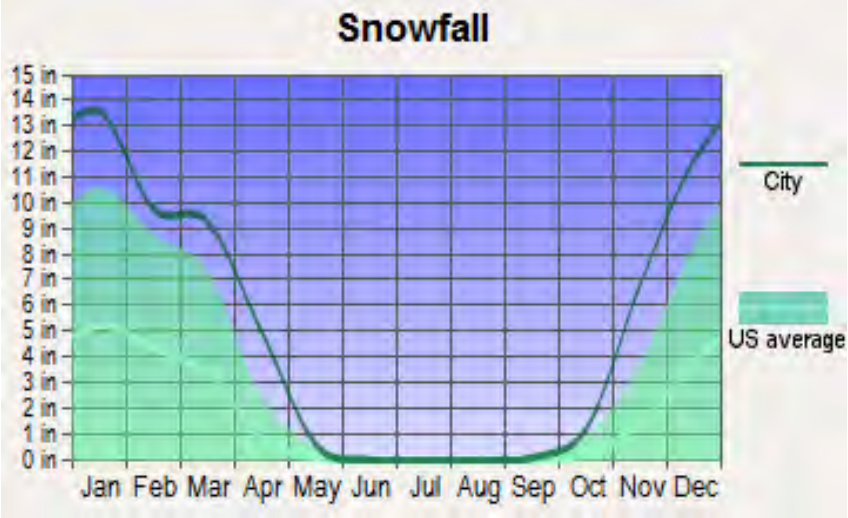


Figure 10. The City of Sandy's Average Snowfall

Although infrequent, Sandy 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.

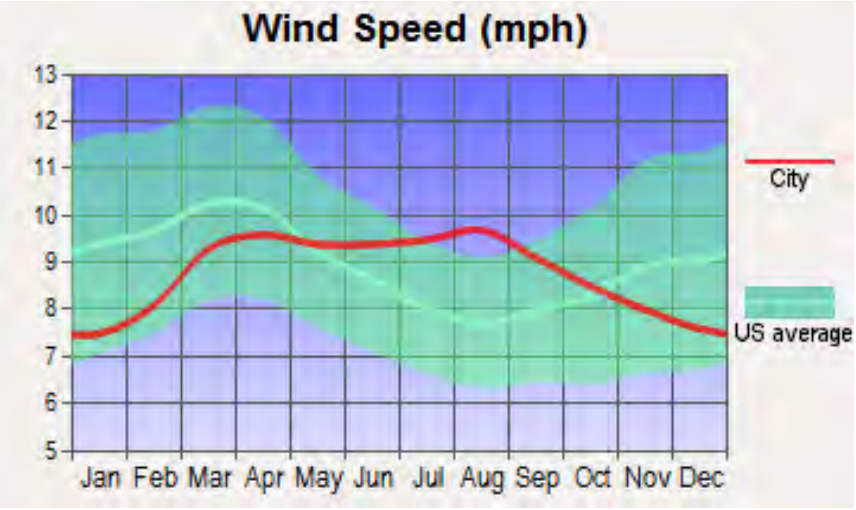


Figure 11. The City of Sandy's Average Wind Speed

4.2.11 Wildfire (Fire Hazard)

Perhaps the most likely hazard in Sandy 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 Sandy 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. Sandy 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.

Sandy City has adopted strict zoning and planning ordinances to help mitigate the hazard for wildfires. As the eastern border of the City lies within the urban wildland interface, constant education and enforcement is practiced along the communities in this area.

4.3 Hazard Assessment

Salt Lake County and Sandy City have conducted an all-hazards assessment of potential vulnerabilities within Sandy City. This assessment assisted with prioritization and outlined a direction for planning efforts. Salt Lake County and Sandy 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 D.4 provides information to understand risks and their corresponding likelihood and consequences in Sandy 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 Sandy 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 Sandy'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 Sandy City and includes data for the portions of Sandy in Salt Lake County and Utah County.

Sandy City	*Real Property Value*	*Personal Property Value*	*Central Assessed Value*	*Total*
Salt Lake County Portion of Sandy	*$6,572,233,860*	*$388,886,397*	*$205,049,650*	*$7,166,169,907*

Table 4. Assessed Property Value Data for Sandy 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 Sandy.

Name of Facility	Address	City
Alta View Hospital	9400 South 1300 East	Sandy
Sandy City Hall	10000 South Centennial Parkway	Sandy
Sandy City Hall (EOC and Police Dept.)	10000 South Centennial Parkway	Sandy
Metropolitan Water Plan	8890 Wasatch Blvd	Sandy
Sandy Fire Station 31	9000 South 150 East	Sandy
Sandy Fire Station 32	9400 South Highland Drive	Sandy
Sandy Fire Station 33	11270 South 2015 South	Sandy
Sandy Fire Station 34	10765 South 700 East	Sandy
Sandy Fire Station 35	8186 South 1300 Est	Sandy
Sandy City Public Works	8850 South 700 West	Sandy
Sandy City Public Utilities	9150 South 150 East	Sandy
Alta High School	11000 South 900 East	Sandy

Jordan High School	10000 South State Street	Sandy

Figure D.12. Essential Facilities Sandy City

High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Sandy. Sandy 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 Sandy. I-15 is the major freeway thoroughfare through Sandy 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 reside in the City and are operated by the Metropolitan Water District.

5.2 Regulatory Mitigation Capabilities

Table D.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 Sandy.

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. Sandy City's Regulatory Mitigation Capabilities

6 Mitigation Strategy

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. The f*ollowing summary highlights the City of Sand'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 Sandy, 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	50% Complete	Inventories need to be updated and coordinated
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	Yes	
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	No	Need to 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	Yes	Included as part of the Sandy City EOP
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	Yes	Done, in conjunction with Salt Lake City Dispatching

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	2 – Establish redundancy for dispatch centers and other critical communications	Yes	Handled by Dispatch Services throughout Salt Lake County
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	Yes	Sandy City Emergency Management Team
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	In Process	Communications Committee formed by Sandy City to determine process to best update and integrate new communications equipment
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	Yes	Sandy City GIS & Emergency Management Team
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	Yes	Sandy City GIS
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	Yes	Sandy City GIS
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	Yes	Sandy City GIS, Sandy City Emergency Operations Center
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.	Partial	Sandy City uses an extensive network of cameras throughout the city (mesh node) to provide hazard monitoring to the EOC. Need to consider additional hazard monitoring capabilities.

Category	Goal / Objective	Action	Status	Comments
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.	Partial	Need to consider additional hazard monitoring capabilities.
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	Yes	Sandy City GIS
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	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	Yes	Facility improvements to critical infrastructure 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	Partial	Inventory of MOU's completed. Need to continue and identify deficiencies.
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	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	On-going

Category	Goal / Objective	Action	Status	Comments
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	On-going, Citizen Corps Council, Community Coordinators
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	On-going, Citizen Corps Council, Community Coordinators
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	On-going
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	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	Yes	Sandy City Community Development Department
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	Yes	Sandy City Community Development Department
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	Yes	
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	Yes	

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	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Yes	Sandy City Public Utilities
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	Yes	Sandy City Public Utilities
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	Yes	Sandy City Public Utilities
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	Yes	Sandy City Parks and Recreation
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.	Yes	Sandy City Public Utilities
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	Yes	Sandy City Fire Department, Public Utilities
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	Yes	Sandy City Public Utilities
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	N/A

Category	Goal / Objective	Action	Status	Comments
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	No	No
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	Yes	Sandy City GIS
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	Need to do	Have 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	Partial	Studies of seismic retrofitting have been done on some public buildings. Cost benefits and future plans still pending.
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	Need to do	
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.		
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		
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		

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	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	Yes	Sandy City GIS, Sandy City Public Utilities
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	Yes	Sandy City Public Utilities
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	Yes	Sandy City Public Utilities, Storm Water Division
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	Yes	Sandy City Public Utilities
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	Yes	Sandy City Public Utilities
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	Yes	StormReady City
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		
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	On-going

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	Need to do	
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	Yes	On-going
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	Need to do	Sandy City has a severe weather annex to the Emergency Operations Plan – need to update
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	Need to do	
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	Yes	Sandy City Community Development Department – Overlay Zones
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	Yes	Sandy City Community Development Department – Overlay Zones
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	Yes	Sandy City Fire Department
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	Yes	Sandy City Fire Department

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	On-going	Sandy City Fire Department
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	Yes	Sandy City Public Works Department – Spring and Fall Clean Up
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	Yes	Sandy City Fire Department
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	Yes	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	Yes	Sandy City Community Development Department
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	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	1 – Reduce fuels around publically owned structures	Yes	Sandy City Parks and Recreation
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	Yes	Sandy City Fire Department
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	Yes	Sandy City Public Utilities
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	Yes	Sandy City Fire Department
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	Partial	Sandy City Fire Department and Sandy City Community Development Department
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	Yes	Sandy City GIS

6.1 Mitigation Actions

The planning team for the Sandy City identified and prioritized 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, such as ideas for implementation, responsible office, potential funding, estimated cost.

6.1.1 Avalanche

Issue/Background: Sandy City resides beneath the west-facing slopes of the Wasatch Mountains, with homes residing on the benches of those slopes. Threat of heavy snow and subsequent avalanche is a weak threat due to the amount of snow the valley typically receives, the distance and height of the mountains and the fact that the slope faces west. A large snowfall and avalanche, however, would have a moderate impact to the homes and infrastructure of neighborhoods on the benches.

Activity 6.1.1.1- Provide education and outreach to residents and businesses located on the benches.
Other Alternatives: None
Responsible Office: Public Works, Public Information Office
Priority: Low
Cost Estimate: None
Potential Funding: NA
Benefits: Greater awareness of potential of avalanches and coordination of mitigation efforts with residents and the City.

6.1.2 Dam Failure

Issue/Background: Sandy City resides below a fairly large reservoir called “Bell Canyon” reservoir. The dam is regularly inspected according to the State of Utah’s inspection schedule. A dam failure is unlikely and the threat is weak, however, in the event of a failure, homes along the stream beds would be susceptible to flooding damage. The flow of water would not be widespread but mostly contained along the stream flow channels.

Activity 6.1.2.1- Work with the Sandy City Public Utilities Department to identify drainage pathways and seek cost/benefit analysis of placing diversion structures or add capacity for drainage.
Other Alternatives: None
Responsible Office: Public Utilities
Priority: Low
Cost Estimate: None
Potential Funding: NA
Benefits: Would allow for greater planning along flood plain and increase awareness regarding mitigation plans.

6.1.3 Drought

Issue/Background: Located in the heart of the intermountain west as part of the Great Salt Lake Valley, the City is in a desert climate defined by lack of water and periods of drought conditions.

Measures must be taken to conserve water and to address water shortages for both culinary and agricultural uses.

Activity 6.1.3.1 – Development of a 5-year Water Conservation Plan
Other Alternatives: None
Responsible Office: Public Works
Priority (High, Medium, Low): High
Cost Estimate:
Potential Funding:
Benefits (Avoided Losses):
Schedule**:** 2015

Activity 6.1.3.2 – Offer Annual Sprinkler Maintenance Workshops to promote efficient and effective watering of landscapes.
Other Alternatives: None
Responsible Office: Public Works
Priority (High, Medium, Low): Medium
Cost Estimate:
Potential Funding:
Benefits (Avoided Losses): Public education on how to maintain and operate a sprinkler system will help conserve water by avoiding waste from leaks and/or ineffective systems and practices.
Schedule**:** Offered annually starting in 2015

Activity 6.1.3.3 – Promotion of "Water Week" with elementary students to promote best management practices for water conservation.
Other Alternatives: None
Responsible Office: Public Works
Priority (High, Medium, Low): Medium
Cost Estimate:
Potential Funding:
Benefits (Avoided Losses): Teaching elementary students about water conservation will help promote best management practices in the homes of residents and helps share information about how individuals can make a difference in conserving water.
Schedule**:** Annually in May of each year.

6.1.4 Earthquake

Issue/Background: Earthquakes pose a significant threat to the State of Utah, the Salt Lake Valley and the City of Sandy. Given the City's close proximity to the Wasatch Fault and other smaller faults and its previous history of experience the effects of smaller earthquakes efforts should be made to reduce the potential impact that earthquakes pose.

Activity 6.1.4.1 – Install automatic gas shut off fixtures on any City-owned buildings or structures with gas service/meter that do not have one currently.
Other Alternatives: Train staff to check the meter immediately following an earthquake event and shut off service if necessary.

Responsible Office: Administrative Services – Facilities Division
Priority (High, Medium, Low): Low
Cost Estimate: $50,000 - $100,000
Potential Funding: General Fund, Grants
Benefits (Avoided Losses): Automatic shut off valves will stop the flow of gas after a significant event if there is damage to the system. This could potentially save the structure from potential fire or a hazardous materials incident.
Schedule**:** Activity to be considered as part of any capital improvement project or as part of any building remodel, if warranted, or as funding is made available through specific grants as available.

Activity 6.1.4.2 – Distribution of earthquake hazard preparedness / response information. Post such information on the City's website.
Other Alternatives: None
Responsible Office: Administrative Services – Emergency Management, Information Technology
Priority (High, Medium, Low): Medium
Cost Estimate: Minimal - < $5,000
Potential Funding: General Fund
Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps build community support for other hazard mitigation efforts such as strong building codes and enforcement of existing codes such as the flood damage prevention ordinance.
Schedule**:** Distribution of earthquake related information is ongoing / continuous. Information posted to website in 2015. Additional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

6.4.5 Flood

Issue/Background: Flooding risks exist in the community from a variety of sources, including; riverine flooding, infrastructure failures (canal breech, dam failure, water main rupture), and groundwater sources. Areas near the Jordan River are in a mostly undeveloped state.

Activity 6.4.5.1 – Maintain community participation in the National Flood Insurance Program.
Other Alternatives: None
Responsible Office: Development Services
Priority (High, Medium, Low): Medium
Cost Estimate: Minimal - < $5,000
Potential Funding: General Fund
Benefits (Avoided Losses): Participation in the National Flood Insurance requires the City to maintain and enforce a flood damage prevention ordinance and other regulatory authorities to minimize the effects of flooding to structures in the community. Enforcement of the ordinance will reduce the number of structures at risk of damage from flooding. Participation also aids in distributing public information and awareness of flood hazards.
Schedule**:** The City of Sandy is currently participating in the National Flood Insurance Program and intends to maintain its eligibility to participate during the next five-year period.

Activity 6.4.5.2 – Distribution of flood hazard and flood preparedness / response information such as the *"Flooding: What you should Know when Living in Utah"* brochure which the City partnered in developing in 2014, or similar types of information. Post such information on the City's website.
Other Alternatives: None
Responsible Office: Administrative Services – Emergency Management, Information Technology
Priority (High, Medium, Low): Medium
Cost Estimate: Minimal - < $5,000
Potential Funding: General Fund
Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps build community support for other hazard mitigation efforts such as strong building codes and enforcement of existing codes such as the flood damage prevention ordinance.
Schedule**:** Distribution of flood related information is ongoing / continuous. Information posted to website in 2015. Additional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

Activity 6.4.5.3 – Update of the City's Stormwater Master Plan to include specific flood mitigation projects in flood prone areas of the City.
Other Alternatives: None
Responsible Office: Public Works, Development Services
Priority (High, Medium, Low): High
Cost Estimate: $50,000 - $100,000
Potential Funding: General Fund, Enterprise Funds
Benefits (Avoided Losses): Once updated, the Stormwater Master Plan will identify specific infrastructure needs that will help reduce the potential for flooding. The Plan will be used in determining priority based needs throughout the City. Funding for specific projects may come from a variety of sources and will appear as part of the capital improvements plan.
Schedule**:** Scheduled for completion in 2015.

6.4.6 Infestation

Issue/Background: Infestations are not a significant issue in the City of Sandy. No mitigation projects or activities have been identified during this planning process.

Activity 6.4.6.1 – No Activities identified for this hazard
Other Alternatives: None
Responsible Office: NA
Priority (High, Medium, Low): NA
Cost Estimate: NA
Potential Funding: NA
Benefits (Avoided Losses): NA
Schedule**:** NA

6.4.7 Landslide

Issue/Background: Sandy City resides at the base and in the foothills of the Wasatch Mountains. Hazard risks associated with landslide are moderate to severe. For this reason the Sandy City Building Officials, and Planning Department has made and continues to enforce strict regulations on building in areas susceptible to flooding. Continued study of landslide areas and zoning enforcement will be ongoing. Most of the land area of the City has been built out so there may be possible pressure to allow building on areas where landslides may be more likely to occur.

Activity 6.4.7.1 – Perform a comprehensive soil sample of slope areas of the City
Other Alternatives: None
Responsible Office: Community Development
Priority (High, Medium, Low): Medium
Cost Estimate: 20,000-30,000
Potential Funding: Grants, budget
Benefits (Avoided Losses): Provide greater leverage in denying building in susceptible areas
Schedule**:** 1-5 years

6.4.8 Pandemic Hazard Reduction Activities

Issue/Background: 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. A 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 City of Sandy is located in the middle of a larger urban area that is influenced by a tremendous amount of travel into and out of the area on a daily basis, making the area even more susceptible to potential situations where a pandemic may result.

Activity 6.4.8.1 – Development of a Pandemic Response & Recovery Plan
Other Alternatives: None
Responsible Office: Administrative Services – Emergency management, Fire Department - EMS
Priority (High, Medium, Low): Medium
Cost Estimate: < $5,000
Potential Funding: General Fund, Grants
Benefits (Avoided Losses): Having a response and recovery plan will help the City to be more prepared, identify potential protocols for response and implement strategies that prioritize public safety and help reduce the economic impacts on the City from the potential effects of a pandemic crisis.
Schedule**:** 2015, annual reviews after completion

6.4.9 Radon

Issue/Background: 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.

Activity 6.4.9.1 – Creation of a radon hazard map showing potential areas of the community that may be affected by radon.
Other Alternatives: None
Responsible Office: Administrative Services – Emergency Management, Information Technology, Development Services
Priority (High, Medium, Low): Medium
Cost Estimate: Minimal - < $5,000
Potential Funding: General Fund
Benefits (Avoided Losses): A map showing the extent of the hazard will be useful in helping residents determine if they should consider testing for radon and/or engaging in their own efforts to mitigate radon in their structures. The map will also help to raise awareness of the issue in the community.
Schedule: Map developed in 2015 – 2016 and information posted to website.

Activity 6.4.9.2 – Distribution of information on Radon. Post such information on the City's website.
Other Alternatives: None
Responsible Office: Administrative Services – Emergency Management, Information Technology
Priority (High, Medium, Low): Medium
Cost Estimate: Minimal - < $5,000
Potential Funding: General Fund
Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps build community support for other hazard mitigation efforts such as strong building codes and enforcement of existing codes such as the flood damage prevention ordinance.
Schedule: Information posted to website in 2015. Additional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

6.4.10 Severe Weather

Background: Severe weather can have a significant impact on the community, affecting transportation, regional commerce, and other daily activities. Severe weather can cause significant damage to property and pose a risk to life safety.

Activity 6.4.10.1 – Engage in the process to become a "Storm Ready Community" with the National Weather Service
Other Alternatives: None
Responsible Office: Administrative Services – Emergency Management, Public Works
Priority (High, Medium, Low): Medium
Cost Estimate: $25,000 - $50,000
Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Participation in the "Storm Ready Community" will help raise awareness of the dangers of severe weather and provide tools to the community to aid in preparing for and responding to severe weather events.
Schedule**:** 2016

Activity 6.4.10.2 – Promote public education in the community regarding severe weather. Post such information on the City's website.
Other Alternatives: None
Responsible Office: Administrative Services – Emergency Management, Information Technology
Priority (High, Medium, Low): Medium
Cost Estimate: < $5,000
Potential Funding: General Fund, Grants
Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps build community support for other hazard mitigation efforts such as strong building codes and enforcement of existing codes.
Schedule**:** Distribution of flood related information is ongoing / continuous. Information posted to website in 2015. Additional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

6.4.11 Wildfire

Issue/Background: Seen as a significant threat to the City of Sandy, the City has exposure in the eastern interface areas of the community. Utah's typical wildfire season is late May through October with lightning and miscellaneous human activities causing the majority of fires.

Activity 6.4.11.1 – Support of community education programs that raise awareness and provide information to property owners on how to protect their structures from wildfire damage. Post such information on the City's website.
Other Alternatives: None
Responsible Office: Administrative Services – Emergency Management, Fire Department, Information Technology
Priority (High, Medium, Low): Low
Cost Estimate: < $5,000
Potential Funding: General Fund, Grants
Benefits (Avoided Losses): Raised awareness of people who may determine to live in areas that are at risk for wildland fire.
Schedule: Distribution of wildland fire related information is ongoing / continuous. Information posted to website in 2015. Additional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

Activity 6.4.11.2 – Maintain a wildland fire response unit.
Other Alternatives: None
Responsible Office: Fire Department
Priority (High, Medium, Low): Low

Cost Estimate: $100,000
Potential Funding: General Fund, Grants
Benefits (Avoided Losses): Provides the City with an initial response unit as well as the ability to support neighboring jurisdictions with their response efforts.
Schedule: A replacement wildfire response unit to be purchased in 2015.

Activity 6.4.12.3 – Prohibit the use of fireworks in high risk areas.
Other Alternatives: None
Responsible Office: Fire Department
Priority (High, Medium, Low): Medium
Cost Estimate: Minimal
Potential Funding: General Fund, Grants
Benefits (Avoided Losses): Fireworks restrictions in high risk areas help reduce the potential for ignition sources and the need for additional response units.
Schedule: Annually consider the need and issue restrictions as appropriate.

Activity 6.4.12.4 – Training for firefighters in wildland firefighting.
Other Alternatives: None
Responsible Office: Fire Department
Priority (High, Medium, Low): Low
Cost Estimate: $50,000
Potential Funding: General Fund, Grants
Benefits (Avoided Losses): While we only have a few firefighters that are "red card" certified, our firefighters could receive training in wildland fire so there are better able to assist if needed.
Schedule: Annual consideration.

6.5 Integration of Mitigation Strategies

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

Sandy City will integrate mitigation strategies into its building codes, the planning commission, and the actions of the City Council and other relevant agencies. This will be accomplished as feasible through an education process by the Emergency Manager during available public meetings.

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. Sandy 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

Sandy 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 Sandy 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

Sandy 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. Sandy 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 Sandy City website to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of Sandy 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 Sandy 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 Sandy City Recorder's office.

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RESOLUTION R2015 - 16

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SOUTH JORDAN, UTAH, 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, South Jordan 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, South Jordan 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 hazard; and

WHEREAS, South Jordan City, in coordination with other governmental and non-governmental stakeholders having an interest in reducing the impact of natural hazards throughout Salt Lake County and with input from the private sector and other members of the public, 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 of South Jordan 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, South Jordan City is concerned about mitigating potential losses and 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 CITY COUNCIL OF SOUTH JORDAN CITY, UTAH:

SECTION 1. Adoption. That South Jordan City Adopts the *Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan* as the Jurisdiction's Multi-Hazard

Mitigation Plan, and resolves to provide such assistance as may be necessary or appropriate to implement the provisions of the Plan in accordance with the Disaster Mitigation Act.

SECTION 2. Effective Date. This Resolution shall become effective immediately upon passage.

APPROVED BY THE CITY COUNCIL OF THE CITY OF SOUTH JORDAN, UTAH, ON THIS 3RD DAY OF MARCH, 2015 BY THE FOLLOWING VOTE:

	YES	NO	ABSTAIN	ABSENT
Mark Seethaler	X			
Chuck Newton	X			
Donald Shelton	X			
Steve Barnes	X			
Christopher Rogers	X			

Mayor: _____
David L. Alvord

Attest: _____
City Recorder

Approved as to form:

_____
Office of the City Attorney

City of South Jordan CORPORATE Seal State of Utah

CITY OF SOUTH JORDAN

Comprehensive Update 2014

SOUTH JORDAN
UTAH

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ANNEX M: SOUTH JORDAN
Preface

The *City of South Jordan's Multi-Hazard Mitigation 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 herein 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 is applicable 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.

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Promulgation

This plan is promulgated as the "*City of South Jordan's Multi-Hazard Mitigation Plan"*. The plan is designed to comply with all applicable Federal, State and local ordinances and resolutions and provides guidance to be followed to prepare for and mitigate hazards that threaten the community.

This plan has been constructed with the best information available and from a planning perspective. It is recognized that as new information becomes available, decisions and actions may be different than the plan envisioned at the time the plan was developed.

The City of South Jordan gives full support to the plan and urges all officials, employees, and others involved in the total emergency management effort, individually and collectively, to do their share in making the City of South Jordan a disaster resistant and resilient community.

This plan supersedes all previous hazard mitigation plans.

Promulgated this _____ day of _____, _____.

_____

Mayor

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Insert copy of resolution that adopts the Multi-Hazard Mitigation Plan

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Executive Summary

Hazard mitigation is sustained action taken to reduce or eliminate the risk to life, property and the environment from natural and manmade hazards. The Local Hazard Mitigation Plan is a requirement of the Federal Emergency Management Agency (FEMA), which must be satisfied for jurisdictions to receive future mitigation funding before or after a disaster. The Disaster Mitigation Act of 2000 (DMA 2000) established requirements for programs and projects to be created to minimize the loss of life, property, and the total cost of disasters.

The preparation of this plan began as a collaborative effort with Salt Lake County and the neighboring jurisdictions of Alta, Bluffdale, Cottonwood Heights, Draper, Herriman, Holladay, Midvale, Murray. Riverton, Salt Lake City, Sandy, South Salt Lake, Taylorsville, West Jordan and West Valley. Together we identified and evaluated each of the hazards that could potentially affect our communities, gathered public input, researched potential mitigation efforts and their effectiveness and developed partnerships to work together to reduce and lessen the effects of disasters on our communities.

Contained in this plan is the application of these efforts combined with the work of several South Jordan Departments to further describe the risks to our community and the specific projects and activities that might be considered to mitigate them. The City of South Jordan has identified the following mitigation goals:

- Develop and maintain an understanding of risks from the full range of natural hazards that can affect the City, and initiate mitigation activities to address the potential effects of those hazards.
- Find and develop opportunities to work with other agencies to leverage mitigation funds, and to share information about the risks of natural hazards.
- Promote partnerships among Federal, State, County, and local governments to identify, prioritize and implement mitigation actions.
- Maintain the viability of South Jordan businesses by preventing damages from hazards.
- Ensure that the City maximizes its opportunities for access to grants and other kinds of assistance.
- Provide effective implementation of existing floodplain regulations and building codes.
- Ensure that the City continues to be represented in the determination of county-wide mitigation actions.
- Stay involved with citizen and technical groups.

The plan further identifies 23 activities that are designed to raise public awareness and preparedness, protect community assets, enhance planning and preparedness efforts and help make the community more disaster resistant and resilient. In some cases, no specific mitigation effort has been identified yet.

Public involvement in the development of this plan is an important component and all stakeholders are encouraged to remain engaged in the process of continuing to identify and evaluate hazards and to identify potential mitigation efforts that may become available during the planning cycle.

This plan represents the efforts of the City of South Jordan to update and revise previous plans developed by the Wasatch Front Regional Council in collaboration with other entities. During the

revision of this plan, Salt Lake County received funding from the Utah Department of Public Safety to begin the planning process and provide some assistance to communities. The City received no direct funding for the development of this plan.

The plan is organized in 9 sections which include an introduction, community profile, description of the planning process, hazard identification, 46y and risk assessment, capability assessment, mitigation strategies, plan maintenance procedures and the plan adoption process.

Section 1: Introduction

The City of South Jordan, Utah has prepared this multi-hazard mitigation plan to guide hazard mitigation planning to better protect the people and property of the City of South Jordan from the effects of hazardous events. Previous hazard mitigation planning has been accomplished in cooperation with the Wasatch Front Regional Council in conjunction with Davis, Morgan, Salt Lake, Tooele and Weber Counties with assistance from the Utah Division of Homeland Security.

This plan builds on work previously accomplished in 2003 and 2008 and demonstrates the City's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. Other purposes include making the City of South Jordan eligible for certain federal disaster assistance. South Jordan has been affected by natural hazards in the past and is thus committed to reducing future disaster impacts and maintaining eligibility for federal funding.

1.1 Background

The Federal Emergency Management Agency (FEMA) has mandated that all communities within the United States establish all local hazard mitigation plans as a means to reduce future losses from natural or man-made hazard events before they occur.

In addition, communities must have locally adopted all hazard mitigation plans in order to apply for Pre-Disaster Mitigation Program (PDM) Grants or the Hazard Mitigation Grant Program (HMGP). In response to this mandate, the City of South has prepared this plan in cooperation with community stakeholders, subject matter experts, and neighboring jurisdictions in the Salt Lake Valley.

1.2 Purpose

The primary purposes of this plan are to:

- Identify and assess the hazards that pose a threat to residents and property
- Assess progress on the previously identified mitigation measures in previous plans
- Assess ongoing mitigation measures in the community
- Identify and evaluate additional mitigation strategies that should be undertaken
- Fulfill Federal and State hazard mitigation planning requirements

This Mitigation Plan is intended to enhance the 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 to each jurisdiction.

1.3 Scope

The scope of the *City of South Jordan Multi-Hazard Mitigation Plan* is citywide. While this planning effort, and resulting plan, is specific to the City of South Jordan, it does take into consideration the need to collaborate with neighboring jurisdictions in the Salt Lake Valley to identify and address multiple hazards and vulnerabilities that are common to many stakeholders.

The construction of several components of this plan relies on a multi-jurisdictional approach in their development.

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. Information in this plan may be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future.

1.4 Authority and Reference

1.4.1 Federal Authorities

- Robert T. Stafford Relief and Emergency Assistance Act, (PL 93-288), as amended, 42 U.S.C. 5121

  Section 322 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act, 42 USC 5165, enacted under Section 104 the Disaster Mitigation Act of 2000, P.L. 106-390, provides new and revitalized approaches to mitigation planning. A major requirement of the law is the development of a local hazard mitigation plan. Section 322, in concert with other sections of the Act, provides a significant opportunity to reduce the Nation's disaster losses through mitigation planning.

- Federal Civil Defense Act of 1950, (PL 81-950), as amended
- Disaster Relief Act of 1974, (PL 93-288), as amended
- Title III, of the Superfund Amendments and Reauthorization Act of 1986, (SARA), (PL 100-700)
- Code of Federal Regulations (CFR), Title 44, Emergency Management and Assistance October 1, 2008

1.4.2 State Authorities

- Utah Code – Title 53, Chapter 2a – Emergency Management Act

1.4.3 Local Authorities

- Salt Lake County Policy 1410 – Emergency Management
- Salt Lake County Ordinance 2.86.010-120
- South Jordan Municipal Code 2.16

1.4.4 Additional Reference Materials

See Appendix B for a complete list of materials used as references during the planning process.

Section 2: Community Profile

2.1 Geography and Environment

South Jordan occupies 22.1 square miles in the southwestern portion of Salt Lake County. The City is located between the Cities of West Jordan to the north, Sandy to the East, Draper to the southeast, Riverton to the south, Herriman to the southwest and the Oquirrh Mountains on the west.

Figure 2 – City of South Jordan's location in the State of Utah.

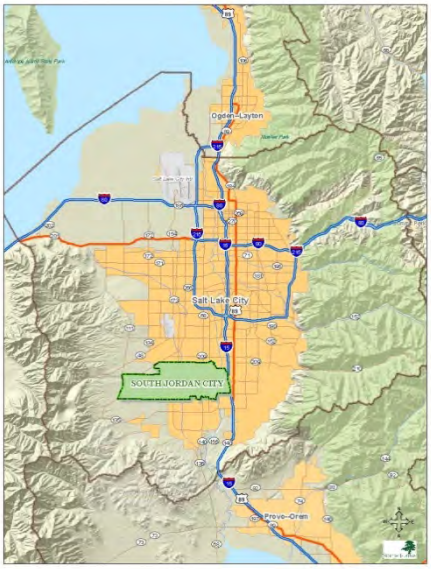


Figure 1 – City of South Jordan's location in Salt Lake County.

Significant geographic features include the Jordan River near the City's eastern boundary which flows from south to north through the city. Elevations in South Jordan range from approximately 4,300 feet near the Jordan River and rises gently to about 5,200 feet at the City's western boundary on the slopes of the Oquirrh Mountains. The entire area is located in the area once covered by Lake Bonneville and as a result the area is fairly flat and the soils are mostly old lakebed sediments. One notable exception is an old sandbar that creates a bluff like topography just west of the Bangerter Highway.

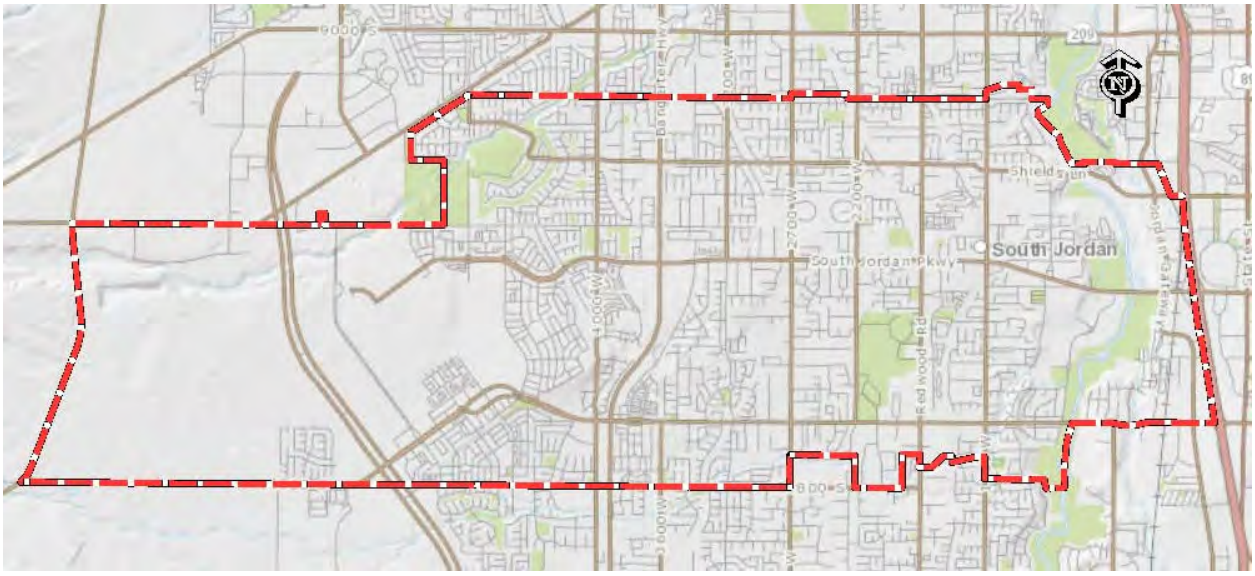


Figure 3 – Map showing the corporate limits of the City of South Jordan.

South Jordan is centrally located between Provo and Ogden, the Wasatch Front Region. It extends westward from the interstate freeway, I-15, to state road U-111 and between about 9400 south and 11800 South. It is easily accessible by road, within minutes of the Salt Lake International Airport, and is intersected by rail line. Freeway ramps off of Interstate 15 are located at 10600 South and 11400 South. The valley's light rail system (TRAX) that has two stations to the western portion of the city. The commuter rail line connecting from Ogden to Provo also has a station in South Jordan.

2.2 History and Community Facts

Settled in 1859 by Alexander and Catherine Beckstead, South Jordan was primarily a rural farming community for many years before eventually incorporating in 1935. The Beckstead's purchased land between 9000 south and 12500 south and between the Jordan River to 1300 west from George A. Smith. They built a "dug-out" home in the bluffs along the west banks of the Jordan River and set about irrigating the land for farming, portions of the main ditch is still in use today. Many families soon followed the Becksteads to the area, however by 1960 the population had grown to a mere 1354 individuals.

The City is located in the "Heart of the Wasatch" and has been among the fastest growing cities in Utah over the last few decades. Beginning in 1960, the City's population would double or nearly double every decade through the present day. South Jordan is experiencing tremendous population and commercial growth which is projected to continue for the next twenty to twenty-five years. Throughout the current rapid growth, South Jordan continues to maintain a sense of community and strong family values.

South Jordan timeline:

1859 – Settled by the Becksteads
1863 – LDS Church created the South Jordan Branch, giving the area its name
1876 – South Jordan Canal completed
1894 – Jordan Mercantile opened
1895 – Faun Flour Mill built
1914 – Working water, electrical systems, and an Interurban railroad (the Red Heifer) completed
1931 – Utah Lake Canal completed
1935 – South Jordan became an incorporated city
1974 – Introduction of city-wide sewer system
1975 – Bingham High School moved to current building
1981 – Completion of the Jordan River LDS Temple
2003 – Hindu Temple completed, Work begins on the Daybreak Subdivision
2009 – City's Sesquicentennial Celebration, Oquirrh Mountain LDS Temple Completed

(See South Jordan General Plan 2010)

2.3 Economy

South Jordan is located in the southwest portion of the Salt Lake Valley, 20 minutes from downtown Salt Lake City and the Salt lake International Airport. South Jordan also benefits from economic interaction with the Provo/Orem area 25 miles to the south. Businesses are attracted to South Jordan City because of its proximity to these older and larger business districts, as well as the locations of University of Utah, Brigham Young University, Utah Valley University. This proximity allows economic access to metropolitan areas and the associated air, rail and truck transportation system that expand a company's local, regional, national and international business capabilities

Access to South Jordan is readily available via I-15 at the 10600 South and the newly constructed 11400 south exits, via South Jordan Parkway, 114000 South, Redwood Road (1700 West), Bangerter Highway (3600 West) and she Mountain View Freeway. Expansion of surface roads, Redwood Road reconstruction and widening, new construction on I-15 on/off ramps in the area and new connections to western valley highways and freeways continues to improve transportation in the City of South Jordan. UTA now runs the Mid-Jordan Spur TRAX line (Light Rail) and through the west side of the City and the FrontRunner (Commuter Rail) through the east side of the City. The TRAX line connects South Jordan with areas between Daybreak and the University of Utah and the FrontRunner line connects South Jordan with areas between Provo and Ogden.

Socioeconomic

According to many socioeconomic indicators, South Jordan maintains a high quality of life. South Jordan performs better than the nation, state, and county in measurements for median income, homeownership rates, and educational attainment. South Jordan's median household income ($75,433), according to the 2000 Census is nearly twice the median household income of these other entities, however it appears that it is somewhat a function of larger household size. The per capita income ($20,938) is average compared to these other entities. The greatest difference is seen in the percent of those living in above poverty. Poverty is seven times lower in South Jordan (1.7%) than the national rate (12.4%). More South Jordan households own their homes (89.7%) as compared to the nation (69.0%), state (71.5%) and county (66.2%) by significant margins.

High home values are a reflection of South Jordan City's stability and sense of community. South Jordan City. Also according to the 2010 Census, South Jordan City has an average of 3.52 persons per household. The robust housing market in South Jordan, fueled by the Daybreak development and infill development in the rest of the City has increased the drive for expansion of retail, office space and light industrial. This boost has changed the economic picture in South Jordan drastically.

Major Industries / Businesses (Large Employers)

1000 + employees

MERIT MEDICAL SYSTEMS, INC.
ULTRADENT PRODUCTS, INC.
JORDAN SCHOOL DISTRICT

500 – 999 employees

WALMART (3 STORES)
EXTEND HEALTH, INC.
INTERMOUNTAIN HOMECARE
RIO TINTO SERVICES INC

250 – 499 employees

DEALERTRACK SYSTEMS, INC
CITY OF SOUTH JORDAN
MORGAN STANLEY SMITH BARNEY, LLC
MEDICONNECT.NET, INC.
UNIVERSITY OF UTAH HEALTHCARE
ADP ADVANCEDMD, INC
HARMONS (2 STORES)
MARKETSTAR CORPORATION
LANDESK SOFTWARE, INC.
MEGAPLEX 20 AT THE DISTRICT
PROGRESSIVE FINANCE HOLDINGS, LLC
EARTHFRUITS LLC
MONAVIE, LLC
ALTIUS HEALTH PLANS, INC.

100 – 249 employees

LIFETIME FITNESS
INGRAM MEDICAL, LLC
COSTCO WHOLESALE #1019
OOCL (USA) INC
VERISK HEALTH INC
TARGET STORE T-2123
ACE DISPOSAL, INC.
HARMAN PROFESSIONAL INC.
MERRICK BANK CORPORATION
ROSEMAN UNIVERSITY
SAMS CLUB #4718
CERIDIAN BENEFITS SERVICES, INC
PROVO CRAFT & NOVELTY INC
VERISYS CORPORATION
BOART LONGYEAR COMPANY
MYTREX, INC.
ALLEGIANCE, INC
PHYSICIAN GROUP OF UTAH, INC
THE OLIVE GARDEN
CARMAX THE AUTO SUPERSTORE
W.J. BRADLEY MORTGAGE CAPITAL, LLC

2.4 Population

The majority population (distinguished by the US Census bureau as white, not of Hispanic descent) accounted for 94% of the population at the time of the 2000 Census. The remaining population is either of Hispanic origin or of a minority race. The Hispanic population grew by 300% from 1990 to 2000, doubling its share of the population from 2% to 4%. This follows a national trend of an increasing minority population, specifically Hispanic.

The median age was 25 in 2000. This is somewhat deceiving as that age group is among the smallest by 5-year age group. South Jordan is largely comprised of middle-aged families with teenage children. The age structure is likely a function of the housing stock, largely higher valued homes and fewer housing units available to younger families, singles and the elderly. The national median age is 35. This also happens to be the largest 5-year age group (35-39).

The most recent census data (ACS 2006- 2008), reveals that that the increase in the Hispanic population is continuing. It also reflects more diversity in the population age structure as the City has added housing units more compatible with young families, singles, and elderly. (see Population Pyramids).

The estimated population for August 1, 2014 was 61,068.

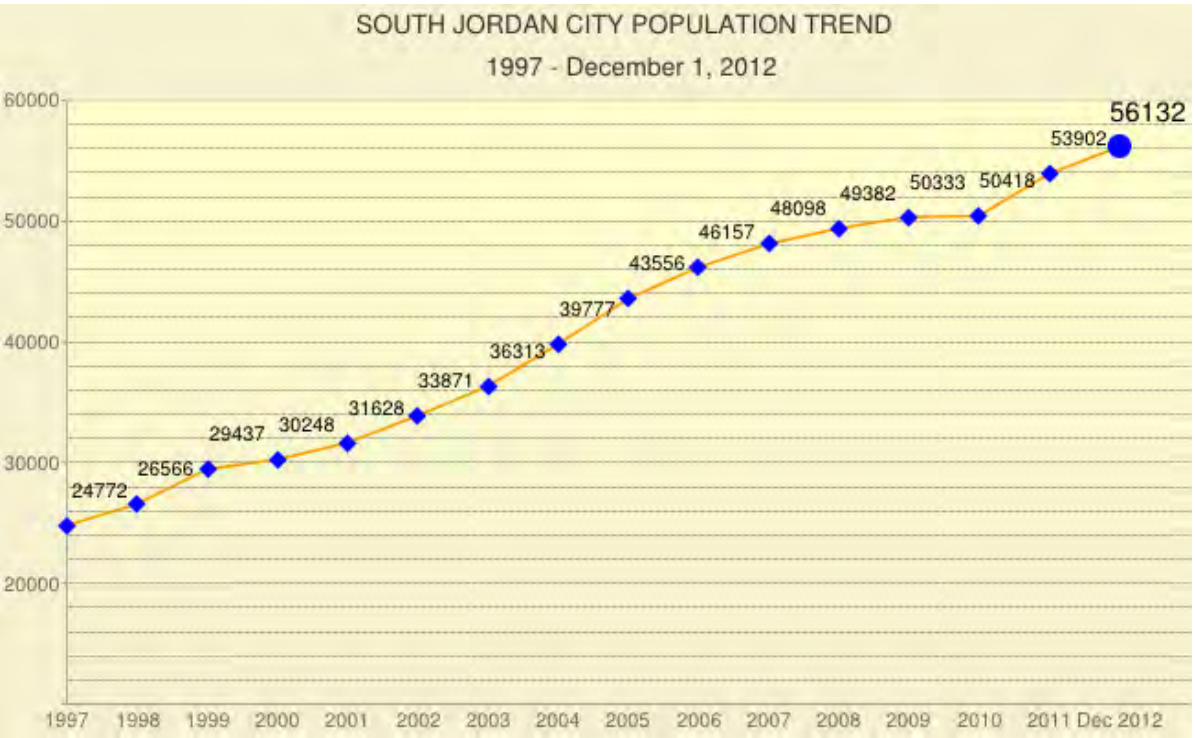
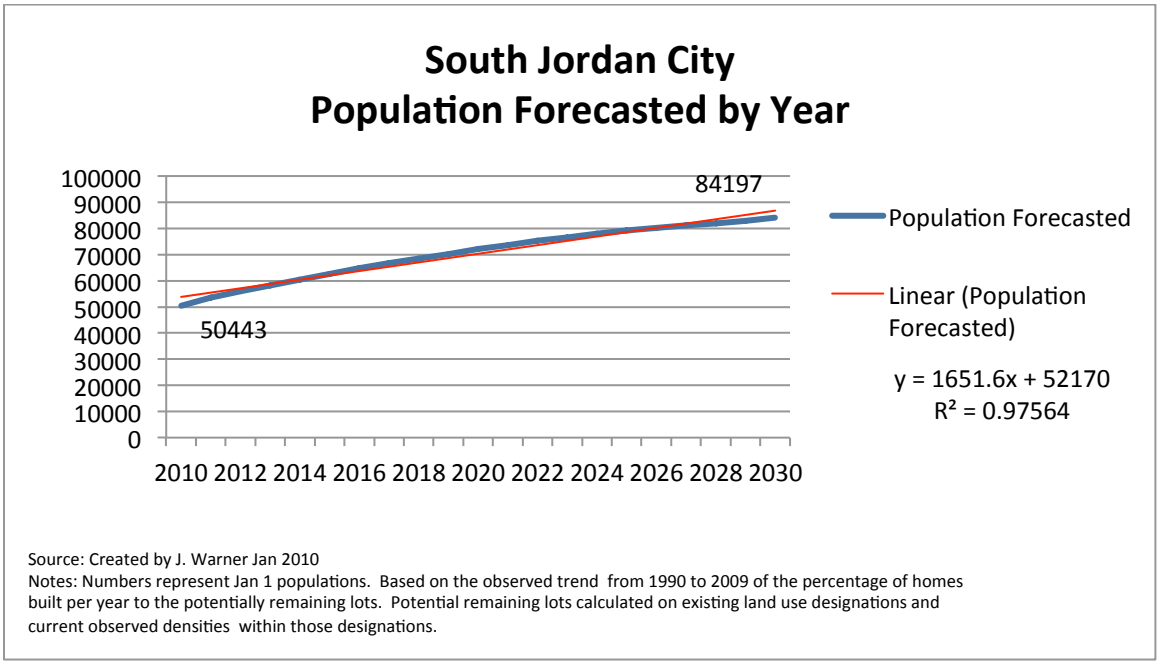
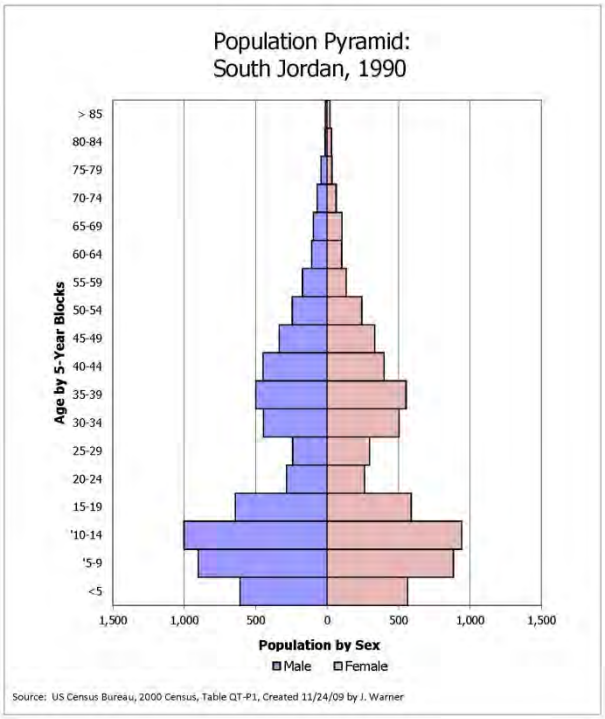


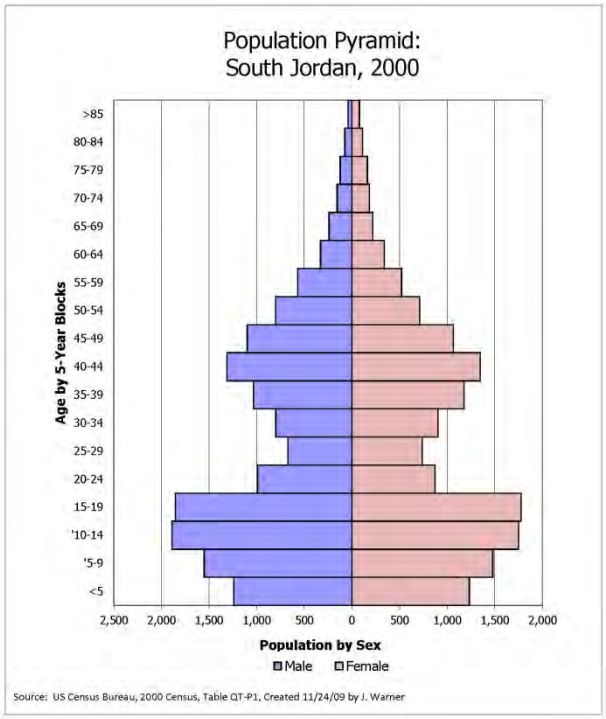
Figure 4 - Population growth in the City of South Jordan 1997 to 2012.



Source: Created by J. Warner Jan 2010
Notes: Numbers represent Jan 1 populations. Based on the observed trend from 1990 to 2009 of the percentage of homes built per year to the potentially remaining lots. Potential remaining lots calculated on existing land use designations and current observed densities within those designations.

Figure 5 - Forecasted population growth in the City of South Jordan 2010 to 2030.





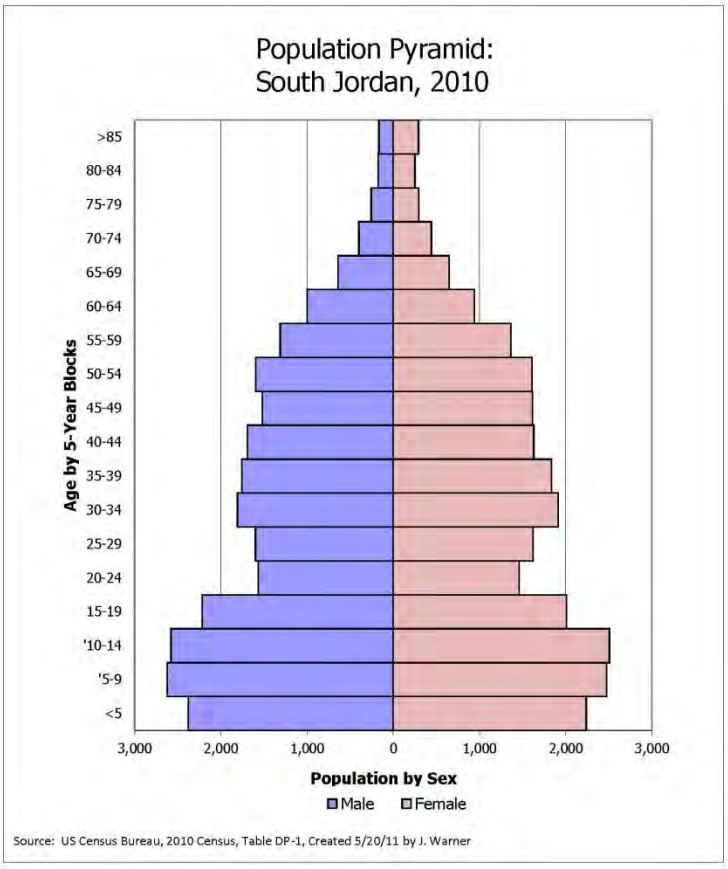


Figure 6 - Population Pyramids. (See South Jordan General Plan for Additional Details)

2.5 Demographics

South Jordan city is still one of the fastest growing cities in the State of Utah. Since 1960 the population has grown from 1,345 to 61,068 (August 1, 2014). South Jordan had the 2nd highest annual average growth rate from 1990 to 1999 in the State of Utah with 9.4%. South Jordan is one of the largest cities in the State of Utah and has been since 2000.

South Jordan Ranks as the 11th largest city in the state and the 6th largest in Salt Lake County. Residential growth will continue for the next 20 to 25 years until the City reaches its ultimate population projection (85,000 - 95,000). The growth is fueled by the availability of land, a community lifestyle based on open space, large lots, a rural atmosphere, and a general population increase in the Salt Lake Valley.

South Jordan City has a median home value of $346,000. High home values are a reflection of the South Jordan City's stability and sense of community. According to the 2010 Census, South Jordan City has an average of 3.52 persons per household.

South Jordan's population is highly educated. According to the 2010 US Census, 97% of the City's population, 25 years and older have a high school diploma and nearly of half of those have a college degree.

The reported median age for South Jordan residents is 29.9.

High-income levels have a stabilizing effect upon economic growth and the high-income levels in South Jordan City are an attractive feature to incoming businesses. The median household income is $91,578 and per capita income is $28,716 with only 1.5% of families falling below the poverty level.

2.6 Land Use & Development

South Jordan has evolved from a community known for its agricultural land use to a community known for its residential use. Nearly two thirds of the total acreage of the City is or is planned to be used for residential designations. The agricultural feel still exists through larger parcels that continue to be farmed and areas of exceptionally low density residential. Generally, land use in the City falls into one of the following general uses:

- Residential
- Commercial
- Office
- Industrial
- Open Space
- Public
- Planned Community/Daybreak

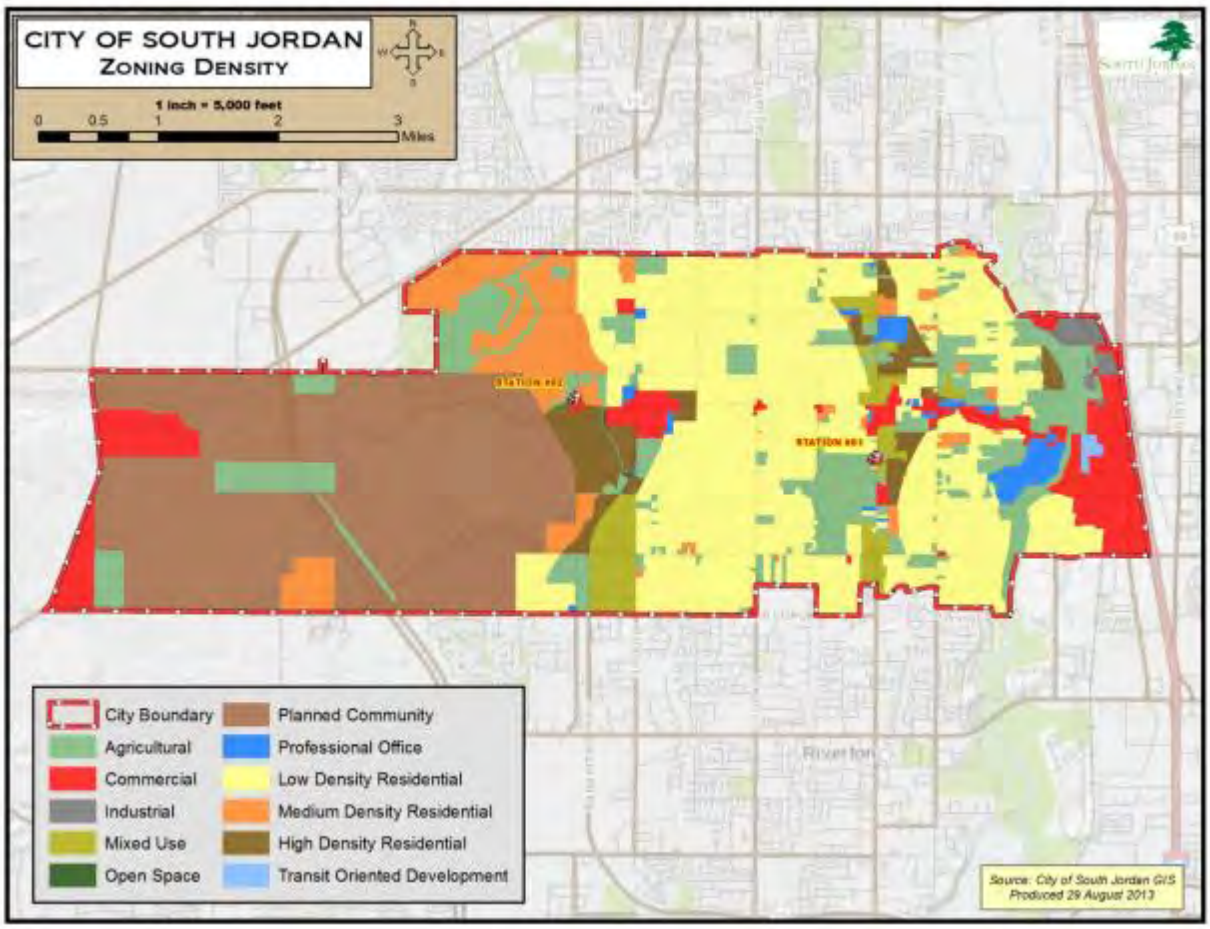


Figure 7 - Current Land Use Types in the City of South Jordan.

2.6.1 Land Use Designations

Residential – (Rural Residential, Low Density Residential, Medium Density Residential, Medium High Density Residential, High Density Residential)

Commercial – (Commercial, Village Commercial)

Office – (Office)

Industrial – (Industrial)

Public – (Public)

Historic – (Historic)

Open Space – (Natural Open Space, Open Space)

Mixed Use – (Village Mixed Use, Towne Center Mixed Use, Transit Oriented Development Mixed Use, Large Scale Master Planned Community)

Section 3: Planning Process

3.1 Update Process and Participation Summary

Previously the City of South Jordan has worked closely with the Wasatch Front Regional Council in the development and preparation of the mitigation plans in 2003 and 2008. In 2012, the Unified Fire Authority of Salt Lake County applied for and was awarded a Pre-Disaster Mitigation Planning grant to facilitate the updating of the Wasatch Front Region Natural Hazard Pre-Disaster Mitigation Plan for 2014. The purpose of the planning project was to update the Salt Lake County portion of the 2009 Wasatch Front Regional Council Pre-Disaster Mitigation Plan and develop a stand-alone mitigation plan that will meet the 44CFR 201.6 planning requirements. Each jurisdiction in the County was left with the responsibility of developing their own specific hazard mitigation planning annex for inclusion in Salt Lake County's 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. The City of South Jordan has been an active participant in the revision and updating process.

Salt Lake County Emergency Management assigned a staff member to act as the lead planner throughout the planning process with additional support staff offering assistance as needed. The Salt Lake County mitigation planning team members are outlined in section 3.2.1. These members were involved in the planning process from the initiation of the Planning grant request, to the development and coordination, and resolution of the Plan's adoption.

A core County planning team, comprised of at least one representative from each city, was convened early in the planning process. The team started the planning process by reviewing the 2009 Pre-Disaster Mitigation Plan and recommended revisions, as well as guided the plan's overall revision process and content. Every jurisdiction in the County was invited to provide a representative to serve on the planning team to ensure local input. Relevant input was solicited and obtained from every jurisdiction from each county. Subject matter experts were also invited to contribute specific information regarding identified hazards and to discuss possible ideas for mitigation efforts.

3.2 Planning Team

3.2.1 Salt Lake County Mitigation Planning Team

The Salt Lake County Hazard Mitigation Planning Team included the following members:

Name	Agency		Name	Agency
Chris Cawley	Town of Alta		Eldon Farnsworth	South Salt Lake
Claire Woodman	Town of Alta		Ben Gustafson	Taylorsville City
Connie Jones	Bluffdale City		Lisa Schwartz	Taylorsville City
Mike Halligan	Cottowoood Heights		Dirk Andersen	Taylorsville City

Dawn Black	Cottonwood Heights		Reid Scharman	West Jordan
Garth Smith	Draper City		Bob Fitzgerald	West Valley
Bart LeCheminant	Draper City		Scott Jones	Salt Lake Community College
Tina Giles	Herriman City		Jeff Graviet	Salt Lake County Emergency Services
David Chisholm	Holladay City		Mike Barrett	Salt Lake County Emergency Services
Jarin Blackham	Midvale City		Brent Beardall	Salt Lake County Flood Control
Jon Harris	Murray City		Kade Moncur	Salt Lake County Flood Control
Sheril Garn	Riverton City		Marty Shaub	University of Utah
Ken Kraudy	Sandy City		Kate Smith	Unified Fire Authority
Jared Smith	Sandy City		Cathy Bodily	Unified Fire Authority
Cory Lyman	Salt Lake City		Embret Fossum	Unified Fire Authority
Justin Stoker	Salt Lake City		Roger Kehr	Unified Fire Authority
Dustin Lewis	South Jordan		Steve Sautter	Unified Fire Authority
Matt Jarman	South Jordan		Aaron Nelson	Unified Fire Authority

Figure 8 - Salt Lake County Mitigation Planning Team Members

The Salt Lake County Mitigation Planning Team was assisted and supported by the following individuals at various times during the process: **Kevin Barjenbruch**, National Weather Service; **Justin Stoker**, Jordan River Commission; **Steve Bowman**, Utah Geological Survey; **Greg McDonald**, Utah Geological Survey; **Jeff King**, Jordan Valley Water Conservancy District; **Jessica Castleton**, Utah Geological Survey; **Tyre Holfeltz**, Utah Forestry, Fire and State Lands; **Riley Pilgrim**, Unified Fire Authority; **Clint Mecham**, 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

3.2.1 City of South Jordan Mitigation Planning Team

The City of South Jordan Hazard Mitigation Planning Team included the following members:

Name	**Department / Division**
Dustin Lewis	Administrative Services / Emergency Management
Aaron Sainsbury	Administrative Services / Risk Management
Matt Jarman	Information Technology / GIS
Marc Seliger	Information Technology GIS
Ken Short	Development Services / Engineering
Cory Day	Development Services / Engineering
Brad Klavano	Development Services / Engineering
Dave Dansie	Development Services

Greg Schindler	Development Services / Planning
Jake Warner	Development Services / Planning
Jason Rasmussen	Public Works
Colby Hill	Public Works
Chris Evans	Fire
Reed Thompson	Fire
Andy Butler	Fire
Lindsay Shepherd	Police
Jason Knight	Police
Rob Hansen	Police
Ryan Loose	Office of General Counsel

Figure 9 – City of South Jordan Mitigation Planning Team Members

The City of South Jordan Mitigation Planning Team was assisted and supported by the following individuals at various times during the process: **Gary Whatcott**, City Manager; **Tari Brandi**, Risk Analyst; **Charity Brienz**, Staff Attorney; **Sunil Naidu**, Finance Director;

3.3 Meetings and Documentation

To ensure the public and their officials were supportive of the Salt Lake County's efforts in updating and revising the Plan, the Salt Lake County 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 from each jurisdiction in the County, including the City of South Jordan. The lead planners also attended other City/County Councils meetings to discuss the efforts under way to prepare revisions to the plan.

Below is a table summarizing the meetings held by the Salt Lake Mitigation Planning Team to review, revise and collective work on the development of the mitigation plan. The City of South Jordan was an active participant in the various meetings and provided and shared information relative to the City.

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	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

Year	Date	Activity	Purpose
	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, 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

Year	Date	Activity	Purpose
			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, 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 17	Submit final plan from each Jurisdiction	Salt Lake County to review Jurisdiction plans and assemble entire County HMP
		Submit Mitigation Plan to State	State Submission requirement prior to FEMA submission

Figure 10 - Mitigation Planning Meetings and activities September 2012 to October 2014

3.4 Public & Stakeholder Participation

Salt Lake County led the effort to solicit public involvement and provided opportunities during the review and development process and incorporated them throughout the revision of this Plan. Such opportunities included a public website and public meetings for review and comment. Emergency managers, fire and sheriff departments, state and local agencies, business leaders, educators, non-profit organizations, private organizations, and other interested members that could be affected by a hazard within the region or other interested members, were all a part of the planning process.
The first draft of the 2009 Mitigation Plan was placed on the Unified Fire Authority / Salt Lake County Emergency Management website for greater than a 30-day public comment and review period. There were no public comments received on that draft of the Plan. Members of the public and elected officials from each jurisdiction were notified of the lack of public comments at County Council of Government meetings.

Additionally, the City of South Jordan sought comment from additional stakeholders for assistance with the development and revision to the plan specific to South Jordan. This included outreach to neighborhood groups for the purpose of discussing the hazards that can occur in the City, how to best prepare for them and to identify any other potential hazards. The South Jordan Historic Committee was also solicited for their input regarding historic events that should be considered and to learn about past mitigation measures that may have been taken to prevent future events.

Upon completion of the City of South Jordan's plan, it will be posted again on the City's website for a period of at least 30 days for additional public review and comment in preparation for each jurisdiction and special service district to approve the plan in a public meeting.

The City will continue to solicit public input and comment throughout the planning cycle by annually posting a notice and link to the plan on the City's website and encouraging input which will be collected and used to start the revision process for the next plan.

3.5 Multi-Jurisdictional Planning

While the hazard and risk assessment in this plan focuses on the geographical extent of the City of South Jordan, the City worked closely with other agencies and jurisdictions in the Salt Lake Valley to identify, study, and evaluate the extent and scope of each hazard. Most of the hazards identified in this plan are not restricted to geographical or geopolitical boundaries and therefore require a multi-jurisdictional approach in identifying and implementing some forms of mitigation activities. Since this plan is part of a larger multi-jurisdictional plan, the team looked at hazards in general and allowed each jurisdiction to focus on the variations within their own community.

Background information and source data for this Plan was obtained from a variety of sources as each of the Jurisdictions participated in the planning process. From these sources, the Salt Lake County Mitigation Planners and the City Emergency Manager extracted relevant information and data as it pertains to the City of South Jordan. That information and data was subsequently submitted to the City's Mitigation Team for their consideration and approval for inclusion into the Plan. A full list of resources that were used and considered in the development of this plan are included in Appendix B.

Section 4: Hazard Identification & Summary

4.1 Introduction

Identifying the hazards is the first step in any effort to prepare for, respond to, recovery from and engage in activities to reduce community vulnerability through mitigation. The hazard analysis involves identifying all of the hazards that potentially threaten the community and analyzing them individually to determine the degree of threat that is posed by each. The hazard analysis determines; what hazards can occur, how often they are likely to occur, how severe the situation is likely to get, how these hazards are likely to affect the community, and how vulnerable the community is to the hazard.

This information in this hazard analysis should be used as part of the basis for the development of emergency response and operations plans, mitigation plans, and recovery plans. It indicates which hazards merit special attention, what actions might be necessary to reduce the impact of those hazards, and what resources are likely to be needed.

Hazard analysis and risk assessment includes the completion of five steps:

1. Identifying the hazard.
2. Creating a profile of each hazard.
3. Develop a community profile.
4. Compare and prioritize risk.
5. Create and apply scenarios.

4.2 Hazard Identification

A community hazard analysis considers all types of hazards. Categories of hazards include natural hazards, such as storms and seismological events, and technological or "man-made" hazards, such as an incident at a nuclear power plant, failure of oil or gas pipelines and other accidents at hazardous materials facilities. Some hazards may be the result of civil or political issues such as a neighborhood that has been the scene of rioting or large demonstrations. Cascading emergencies, or situations when one hazard triggers others in a cascading fashion, are also considered. For example, an earthquake that ruptured natural gas pipelines could result in fires and explosions that dramatically escalate the type and magnitude of events.

The following is a list of the hazards that have occurred, or could potentially occur, in South Jordan City. Identified hazards in South Jordan include both naturally occurring and "man-made" events:

Natural Hazards

- *Floods*
- *Earthquakes*
- *Wildfire*
- *Drought*
- *Pandemic / Epidemic*
- *Slope Failure*
- *Avalanche*
- *Severe Weather*
  - *Winter Storms*
  - *Thunderstorms*
  - *Tornados*
  - *HighWinds / Microbursts*
- *Problem Soils*
- *Radon*

Technological & "Man-made" Hazards

- *Hazardous Materials Incidents*
- *Fallen Aircraft*
- *Civil Disturbance*
- *Railway / Transportation Incidents*
- *Power Outages*
- *Terrorism / Criminal Acts*
- *Dam Failure*

4.3 Hazard Profiles

For each hazard identified in South Jordan, a hazard profile has been created which includes some basic information about the hazard, historic and past occurrences and the following information for each:

- **Frequency of occurrence** - how often it is likely to occur. Frequency has been separated into four categories:

  Highly Likely – nearly 100% probability in the next year.
  Likely - Between 10 and 100% probability in the next one year, or at least one chance in 10 years.
  Possible - Between 1 and 10% probability in the next one year, or at least one chance in 100 years
  Unlikely – Less than 1% probability in the next 100 years.

- **Magnitude and potential intensity** - how bad it can get. Magnitude has been separated into four categories:

  Catastrophic – Affects more than 50% of the community.
  Critical – Affects between 25% and 50% of the community.
  Limited – Affects between 10% and 25% of the community.
  Negligible – Affects less than 10% of the community.

- **Location** - where in the community this hazard is most likely to occur and the probable spatial extent or how large an area it is likely to affect.

- **Duration** - how long the initial event or occurrence can be expected to last.

- **Seasonal pattern** -the time of year during which it is more likely to occur.
- **Speed of onset** -how fast it is likely to occur. Speed of onset has been separated into four categories:

  Minimal or no warning
  6 to 12 hours warning
  12 to 24 hours warning
  More than 24 hours warning

- **Availability of warnings** - how much warning time there is, and whether a warning system exists.

4.3.1 Floods

Floods are one of the most common types of hazards in the world and can occur almost anywhere. Flood effects can be local, impacting a neighborhood or community, or very large, affecting entire river basins over a large area. They are often associated with, or triggered by, other disaster events such as severe weather and dam failures. Flooding is defined as the temporary inundation of normally dry land areas.

Figure 11 - Flooding along 11800 South during a 2007 thunderstorm event.

Not all floods are the same. Some develop slowly over time, maybe days or weeks, while others occur with little or no warning. Flash floods often have a dangerous wall of roaring water that carries rocks, mud, and other debris and can sweep away most things in its path. Overland flooding occurs outside a defined river or stream, such as when a levee is breached, but still can be destructive. Flooding can also occur when a dam breaks, large pipes, canals, or other infrastructure that contain or convey water for irrigation or culinary purposes fail, producing effects similar to flash floods.

Several different types of flooding are possible and can be expected in South Jordan and include; riverine, flash flood, infrastructure failure including dam failure, urban drainage and subsurface drainage. The Federal Emergency Management Agency in conjunction with the National Flood Insurance Agency has mapped areas of special flood hazards in South Jordan on the Flood Insurance Rate Maps for Salt Lake County. These maps show areas likely to be inundated by the base flood, or "100 year flood".

Frequency of Occurrence:	POSSIBLE. Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	Riverine flooding can be expected along the Jordan River, Midas Creek and Little Willow Creek. The potential for flooding also exists along the old channel of Bingham Creek, the Beckstead Ditch and any of the four canals which transverse the city. (Welby Jacob Canal, Utah Distributing Canal, Utah Salt Lake Canal, & South Jordan Canal.) Localized floods and flash flooding are possible in all areas of the City. Subsurface flooding problems near the Jordan River and eastern portions of the city. See the FEMA Flood Insurance Rate Map for details on other known mapped special flood hazard areas. An area has also been identified for potential inundation due to failure at the Oquirrh Lake Dam (See the Oquirrh Lake Dam Emergency Action Plan).
Duration:	May last hours or days. Extended periods of flooding may last a week or more in some areas.

Seasonal Pattern:	Flooding may occur at any time from infrastructure or dam failure. Flooding caused by rapid snowmelt will most likely will occur in late spring and early summer. Heavy rain or seasonal thunderstorms may occur in the spring and late summer months creating possible riverine or flash flooding.
Speed of Onset:	12 to 24 hours warning; may occur with little or no warning.
Availability of Warnings:	None. Monitoring of conditions may give some advanced notice. The National Weather Service sometimes issues flood watches and warnings.
Historic Events in South Jordan:	
August 2013 -	21 homes affected by thunderstorm flooding on west side of South Jordan.
December 2010 -	Several homes were flooded from groundwater seeping into basements in the area of 1300 West.
August 2007 -	30+ homes affected by thunderstorm flooding on west side of South Jordan.
No date -	Many small events.

Additional Information related to this hazard:

More detailed information regarding flood hazards within the City may be obtained from the Flood Insurance Rate Maps and Flood Insurance Study. Copies of these documents are maintained in the Office of the City Engineer.

FIRM #: 49035CIND0B Map Revision Date: September 25, 2009

Panels that cover South Jordan include: 0416G, 0417G, 0436G, 0437G, 0441G, 0442G, 0429G, 0433G, and 0434G.

There are no NFIP insured structures located in the jurisdiction that are considered repetitive flood loss properties. The City of South Jordan intends to continue participating in the NFIP and maintain its continued compliance with NFIP requirements.

4.3.2 Earthquakes

An earthquake occurs when there is sudden movement between of blocks of rock along a break in the earth's crust. Utah has a significant risk for earthquakes. There are hundreds of earthquakes each year in Utah. While most of these earthquakes are small events, there are a few large enough quakes each year that are felt by humans (about 2%). Earthquakes with a magnitude 5.5 to 6.5 occur about every 4 to 5 years in Utah and the potential exists along the Wasatch Front for earthquakes with a magnitude of up to 7.0 – 7.5 to occur.

Ground shaking is the most damaging and widespread geologic hazard caused by an earthquake and induces many of the other geologic hazards. All areas of South Jordan are susceptible to the effects of ground shaking. Property damage may occur to man-made structures such as buildings, highways, bridges, dams, utility lines and falling objects may cause injuries.

Figure 12- Rescue Crews train to respond to possible building damage caused by earthquakes.

Besides ground shaking, earthquakes may also trigger other geologic hazards such as liquefaction, surface fault rupture, rock falls, landslides and slope failures and sometimes flooding. Liquefaction occurs when loose, wet soils react to ground shaking from large earthquakes (magnitude 5.0 or greater) and act like a thick liquid and become incapable of supporting buildings or other infrastructure. Areas of high liquefaction are located in South Jordan, especially in the eastern half of the city and near the Jordan River. Surface fault rupture may occur in the area near the fault zone and may range from a few inches to as much as twenty feet. The resulting "crack" may be a few hundred feet to several miles long. Surface fault rupture in South Jordan is not likely based on the distance from the Wasatch Fault Zone. Based on its local geography, rock falls, landslides and slope failures would be rare in South Jordan.

Geologic hazards can occur from an earthquake that occurs from more than 100 miles away. When evaluating the potential risk from earthquake hazards it is important to consider the following;

- The size (or magnitude) of the event and the distance from where it occurs
- The local geology such as the underlying rock type, soil cover and ground water conditions
- Any of the geologic hazards that might result from ground shaking (liquefaction, landslides, etc.)
- The location of, design, and construction methods of man-made structures and utility systems

While no one knows when the next large earthquake in Utah will occur, many researchers and scientists believe that we are "over-due" for a major event based on historic evidence in the geologic record.

Since the mid 1800's, two largest earthquakes in Utah occurred in Hansel Valley in 1934 (magnitude 6.6) and near Richfield in 1901 (magnitude 6.5). The two most damaging events in Utah occurred in 1962 near Richmond in the Cache Valley (magnitude 5.7) and St. George in 1992 (magnitude 5.8).

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is at risk for ground shaking. Certain areas are at risk for liquefaction (see map). It does not appear that there is a significant chance for surface rupture.
Duration:	Initial Ground Shaking may last for a few seconds or nearly a minute or more. The primary event will most likely be followed by aftershocks for hours, days, weeks and possibly months.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None.
Historic Events in South Jordan:	
2007 - 28 May	Earthquake with a magnitude 2.3 and epicenter in South Jordan. Ground Shaking felt over parts of the Salt Lake Valley
2006 - 8 Feb	Earthquake with a magnitude of 2.1 and epicenter in South Jordan. Ground shaking felt over parts of the Salt Lake Valley.
2001 - 24 May	Earthquake magnitude of 2.9 and epicenter in South Jordan
1981 - 20 Feb	Earthquake magnitude of 4.7 and epicenter in South Jordan
1981 - 17 Dec	Earthquake magnitude 2.2 and epicenter in South Jordan

4.3.3 Wildfire

Wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around.

A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. An urban-wildland interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with the wildland or vegetative fuels.

South Jordan does have some urban-wildland interface along the Jordan River and the western portions of the city.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	NEGLIGIBLE - Less than 10%
Location:	Undeveloped areas along the Jordan River where natural vegetation is abundant. Other undeveloped areas, open areas, some agricultural areas. See map for further information.
Duration:	Hours to days.
Seasonal Pattern:	Most likely to occur mid-summer through late fall.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None. Some factors may be observed that indicate the potential is higher.

Historic Events in South Jordan:

Most events have been small grass and brush fires. No significant events have occurred.

4.3.4 Drought

A drought is defined as "a period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area." -Glossary of Meteorology (1959). Simply stated, a drought is a period of unusually persistent dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area.

There are actually four different ways that drought can be defined.

Meteorological	A measure of departure of precipitation from normal. Due to climatic differences, what might be considered a drought in one location of the country may not be a drought in another location.
Agricultural	Refers to a situation where the amount of moisture in the soil no longer meets the needs of a particular crop.
Hydrological	Occurs when surface and subsurface water supplies are below normal.
Socioeconomic	Refers to the situation that occurs when physical water shortages begin to affect people.

Impacts of drought:

Lack of rainfall for an extended period of time can bring farmers and metropolitan areas to their knees. It does not take very long; in some locations of the country, a few rain-free weeks can spread panic and affect crops. Before long, we are told to stop washing our cars, cease watering the grass, and take other water conservation steps. In this situation, sunny weather is not always the best weather.

Here in the semi-arid desert climate in Utah, a few weeks without rain are not uncommon. However, when the weeks turn to months, serious problems can arise. Because of the fact that much of our drinking water comes from snowmelt, a dry winter can have serious implications in terms of how much water is available for the following summer season. Most locations have sufficient water reservoirs to make it through one dry winter. The real problem becomes back to back dry winter seasons.

Noticeable effects of drought in the area:

Lowered water levels in reservoirs
Lower flows in streams
Fluctuation in levels of the Great Salt Lake
Less water recharge in aquifers

Increased demand for wells

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CRITICAL - 25 – 50 %
Location:	All areas of the community, may especially impact agricultural areas.
Duration:	Multiple years.
Seasonal Pattern:	Likely to occur in 3 to 10 year patterns.
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	The National Weather Service Forecast Office monitors drought conditions around the country and makes forecasts and predictions regarding drought conditions.

Historic Events in South Jordan:

1896 – 1907	Statewide drought conditions
1930 – 1936	Statewide drought conditions
1953 – 1965	Statewide drought conditions
1974 – 1978	Statewide drought conditions
1988 – 1993	Statewide drought conditions
1999 – 2003	Statewide drought conditions

4.3.5 Pandemic

A pandemic is an outbreak of an infectious disease, also known as an epidemic, which spreads across a large region of the world. According to the World health Organization there are three conditions that must be met in order for a pandemic to break out:

- The emergence of a disease new to the population
- The agent infects humans, causing serious illness
- The agent spreads easily and sustainably among humans

The potential for disruption by pandemic is growing larger all the time as more worldwide travel and commerce become common. While it is difficult to predict the magnitude that such an event may have on human activity, there are some scenarios that can be anticipated. Such an event may lead to increased absenteeism for schools and businesses, interruption of services and deliveries, fear, panic, and death.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CRITICAL - 25 – 50 %
Location:	All areas of the community.
Duration:	Weeks to months.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time. Some events may be likely to occur during the period between late fall and early spring when people are more likely to be indoors and in closer contact with each other.
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	U.S. Center for Disease Control may issue warnings and advisories. Salt Lake Health Department may issue warnings and advisories.

Historic events around the world:

165-180 AD	Antonine Plague
1300's	Black Plagued or "Black Death"
1918	"Spanish Flu" (or avian flu)
1950's	Asian Flu
1960's	Hong Kong Flu
2002-2003	SARS
2009-2010	Swine Flu

4.3.6 Severe Weather

Utah is well known for its rapid and often severe changes in weather. Severe weather includes; winter storms, large scale wind events, thunderstorms, lightning, hail, tornadoes, flooding, and avalanches. While some types of these events can be predicted, others will occur with little or no warning.

4.3.6.1 Winter Storms

Known for some of the greatest snow on earth, Utah can receive from several inches to several feet of snow in a single storm event. Snowfall is often influenced by the Great Salt Lake which produces localized bands of snowfall and can produce some of the area's most severe winter storms.

Severe winter storms can significantly impact transportation routes and pose logistical problems with snow removal during prolonged events. Heavy accumulations of snow can lead to property damage, power outages, and force people to stay in their homes for lengthy periods of time. Air temperatures following the days after a winter storm can become very cold leading to other concerns for people out of power or heat sources.

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days. Effects of the storms may last up to a week.
Seasonal Pattern:	Most likely to occur from late fall through spring. May occur day or night.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	The National Weather Service issues Watches, Warnings and Advisories.
Historic Events in South Jordan:	

4.3.6.2 Thunderstorms

Thunderstorms occur in South Jordan on an annual basis. Sometimes the intensity of these storms can cause them to be quite destructive to property, create flash floods, and interrupt power services.

Thunderstorms usually affect relatively small areas when compared to other types of disasters. Despite their small size, all thunderstorms are dangerous. They can be the source for other weather related hazards such as tornadoes, lightning, hail, flash floods, and strong winds.

A typical thunderstorm is 15 miles in diameter and lasts about 30 minutes. Of the estimated 100,000 thunderstorms that occur in the United States each year, about 105 are classified as severe. All thunderstorms need three things; moisture to form clouds and rain, unstable air (warm air that can rise rapidly), and something that is capable of lifting air, such as a warm or cold front, mountains or the suns heat.

Frequency of Occurrence:	HIGHLY LIKELY - Near 100% Probability in the next year
Magnitude:	NEGLIGIBLE - Less than 10%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From a few minutes to hours.
Seasonal Pattern:	Most likely to occur from late spring through early fall. Most common during the afternoon and evening hours. Very rare in winter.
Speed of Onset:	6 to12 hours warning
Availability of Warnings:	The National Weather Service issues Watches and Warnings.
Historic Events in South Jordan:	

4.3.6.3 Tornado

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. Tornados are caused by thunderstorms when cold air overrides a layer of warm air, causing the warm air to rise rapidly. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long. Tornadoes are among the most unpredictable of weather phenomena. While not very common in Utah, tornadoes have occurred in the Salt Lake valley.

Tornado Statistics for Utah;

Size of Tornados: Funnel diameter is usually 10 to 20 yards wide. Largest reported funnel diameters: 440 yards wide on December 2, 1970; 800 feet wide on September 8, 2002; 200 yards wide on May 30, 1986 and August 30, 1992; 100 to 200 yards wide on August 11, 1999; and 100 yards wide on May 6, 1981 and July 25, 1991.

Duration of Tornados: Usually only a few seconds to a few minutes. Greatest amount of time on the ground: 15 minutes on July 9, 1962, July 25, 1991, August 30, 1992, July 24, 1998 and September 8, 2002.

Color of Tornados: Usual color- gray or brown. Other colors: black on July 9, 1962; red on July 24, 1981; and white on December 2, 1970 and March 29, 1982. Tornado Statistics for Utah: January 1950 to the Present

Since 1950 there have been 123 confirmed tornados in Utah, 15 of those have occurred in Salt Lake County. Stated monetary damage from all 123 tornados is $173,011,200+. Generally these tornados have not been severe, but at least 7 of them have been classified as F2 on the Fujita Intensity Scale, or F-scale, which is used to rate tornado intensity. One tornado, occurring in the Uinta Mountains in August 1993 was classified as a F3.

Tornado occurrences by month in Utah 1950-2006:

January	1	July	14
February	1	August	24
March	4	September	21
April	7	October	0
May	29	November	2
June	18	December	2

For more detailed information and statistics see the National Weather Service website at: http://newweb.wrh.noaa.gov/slc/climate/tornado.php (as of 27 Feb 2012)

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	Actual tornado may only be active for a few minutes, but the associated storm may last for hours.
Seasonal Pattern:	Most likely to occur from late spring through early fall. Most common during the afternoon and evening hours. Very rare in winter.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	The National Weather Service issues Watches and Warnings.

Historic Events in the area near South Jordan:

1965 - February 9	A tornado that developed ahead of a cold front in Magna, Salt Lake County.
1968 - August 14	A tornado moved through downtown Salt Lake City.
1986 - September 9	A tornado was spotted in a field in the Kearns area of the Salt Lake Valley. It lasted for a minute and did no damage.
1989 - January 10	A tornado produced a fair amount of damage to a south Sandy neighborhood during the morning hours of January 10, 1989.

1989 - March 2	A tornado touched down near 3699 South and 7500 West.
1989 - July 8	Strong microburst winds and a tornado hit the Midvale area just west of 1-15 at about 7200 South.
1990 - August 16	A tornado was sighted along Interstate 80 in Magna by a motorist. It briefly touched down then dissipated. There were no injuries of damage.
1992 - August 30	**On the afternoon of August 30, a tornado was spotted by a number of people in the southwestern part of the valley near Kennecott Mines.**
1998 - May 8	At about 4:15 PM, a weak tornado (rated FO) was reported in West Valley City.
1998 - July 24	**A tornado touched down over the old Kennecott dumping grounds south of Copperton.**
1999 - August 11	Tornado in Salt Lake City, killed 1 person, 100+ persons injured. 300 buildings damaged, 34 homes left uninhabitable. Wide spread power outages, significant debris, estimated costs at over 170 million.
2000 - May 25	A small tornado (F0) was observed in the Holladay area with a funnel cloud and possible touchdown earlier in West Jordan and Murray. Total damage was estimated at about $100,000.
2001 - August 21	A weak (F0) tornado briefly touched down in the Sugarhouse area.

4.3.6.4 Microburst / High Winds

High winds can occur with or without the presence of a storm and are unpredictable in regards to time and place. Straight-line winds produced by thunderstorms are any winds not associated with the rotation of a tornado. Straight-line winds are responsible for most thunderstorm wind damage, and speeds can exceed 125 mph. Other damaging winds originating from thunderstorms include downbursts and microbursts. Utah has also experienced down slope wind events, which occur when wind generated as a deep layer of air is forced over a barrier. Winds accelerate down mountain slopes and generate high winds in a wave region formed at the base of the terrain.

South Jordan has experienced high winds in the past, and can expect future events.

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From a few minutes to hours, maybe even days. Effects of the storms may last up to a week.
Seasonal Pattern:	May occur anytime of year, most common in spring months. May occur day or night.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	The National Weather Service issues Watches, Warnings and Advisories.

Historic Events in South Jordan:

** One weather related phenomenon that occurs that should be noted is that of weather related inversions. These inversions tend to occur most often in the months of December, January and February when pockets of cold air become trapped in the valley between the Oquirrh Mountain range and the Wasatch Mountain range. These temporary inversions can last several days and lead to poor air quality for residents in the valley and restrictions placed on burning some types of fuels.

4.3.7 Slope Failure

Slope failure is any type of ground disturbance on a surface with any slope and not on flat ground. Landslides, also referred to as slope failures, are classified according to the type of movement and material involved. Movement types include falls, topples, slides, lateral spreads and flows. Materials include rocks, debris (coarse-grained soil), and earth (fine-grained soil). The most common landslides in Utah include rack falls, rock topples, debris slides, debris flows, earth slides, and earth flows (UNHH 2008).

A landslide is a mass of earth or rock which moves downslope by flowing, spreading, sliding, toppling or falling. Landslides are one of the most commonly occurring natural hazards in Utah. They are most common in areas having moderate to steep slopes, weak slope materials, and relatively wet climates. In these areas, most landslides are associated with precipitation events sustained above-average precipitation, individual intense rainstorms, or snowmelt events. Erosion, removal of vegetation by wildfires, and earthquake ground shaking increase the likelihood of landslides. Human activities such as grading of slopes or increasing soil moisture through landscape irrigation can also trigger landslides (UNHH 2008).

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**.** The greatest damage from rock falls has been to roads, railroads, and aboveground pipelines (UNHH 2008).

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. They can damage buildings, bridges, roads, railroads, and pipelines (UNHH 2008).

Earth slides and flows are composed of fine-grained material, but earth flows contain more water than earth slides. Earth slides and flows vary in size, including some of the largest past earth slides in Utah. Like other landslides, they can damage anything in their path (UNHH 2008).

Slumps are common along road embankments and river terraces. They slip or slide along a curved plane away from the upper part of a slope, leaving a scarp. They generally do not move far from the source area.

Landslide distribution is dependent on geology, topography, and climate. They are most numerous in the Middle Rocky Mountains physiographic providence and in the High Plateaus section of the Colorado Plateau province. Weak rock types, steep slope gradients and relatively abundant precipitation are primary contributors to land sliding. Vegetative cover, slope aspect, and ground shaking from earthquakes can also influence slope stability (UNHH 2008). Nearly all landslides in Utah are reactivations of pre-existing landslides. Risk can be reduced by avoiding and/or stabilizing landslides (UNHH 2008).

Frequency of Occurrence:	POSSIBLE – Between 1 and 10% probability in next one year, or at least one chance in ten years
Magnitude:	NEGLIGIBLE – Affects less than 10% of the community

Location:	Given South Jordan's relatively flat geography and location near the center of the Salt Lake Valley, this hazard is not common. Areas of the community that may be affected include the very western portions of the city at the foot of the Oquirrh Mountains near Bacchus Highway, and some areas near the Jordan River Corridor. There may be other areas that might have some unique geologic or geographic conditions where a slope failure may occur.
Duration:	From hours, days, months or years. May be slow to develop and/or continue for extended periods of time.
Seasonal Pattern:	May occur anytime. May be associated with periods of intense or prolonged rainfall. May be associated with earthquakes.
Speed of Onset:	Minimal or no warning or More than 24 hours warning.
Availability of Warnings:	No systems in place. Some warning may be made by agencies like the Utah Geologic Survey or the United States Geological Survey as problems or situations become apparent.

Historic Events in the area near South Jordan:

2013- April 10	A significant landslide triggered by mining activities occurred just west of South Jordan at the Kennecott Copper Mine.

4.3.8 Avalanche

A snow avalanche is the rapid down slope movement of a mass of snow, ice and debris. Snow avalanches occur in the mountains of Utah during the winter and spring as a result of snow accumulation and unstable snowpack conditions. Avalanches can be extremely destructive due to the forceful energy of rapidly moving snow and debris, and the burial of areas in the run out zones. Avalanches can cause damage to property, interruption of communications, blockage of transportation routes and streams and can result in injury and death (UNHH 2008).

Avalanches have caused more fatalities than any other natural hazards in Utah. Over the past 20 years on average four people have been killed in the state each year. The primary risk exists in the Wasatch Range and Uinta mountains—due to their high recreation use and increasing development—although they occur throughout Utah's mountainous areas. Avalanche paths may not have a serious avalanche for years or even decades, but the potential is there especially during above average snowfall years (UNHH 2008). In Utah, 100 avalanche deaths have occurred from 1958-2010, and by comparison 61 deaths from lightning since 1950.

Even though most avalanches occur in wildland areas, recreational endeavors—hiking, hunting, mountain climbing, skiing, snowboarding, snowmobiling and other wintertime activities—bring the population into contact with avalanche-prone areas. Due to the immense popularity of these activities, avalanches are actively mitigated within well-traveled areas. Persons venturing into the backcountry are more at risk. Homes and businesses along the foothills and in mountain areas have been damaged from avalanches.

Avalanches can occur naturally, or can be triggered artificially by explosives or by people such as snowmobilers, backcountry skiers, or other outdoor recreationists. Two main natural factors that affect avalanche activity are weather and terrain.
Weather events create a layered snow pack. When strong layers or slabs form on top of weak layers, the snow pack can become unstable. The amount of snow, rate of accumulation, wind speed and direction, moisture content and snow crystal type all contribute to snowpack stability conditions. Most natural avalanches occur during or within 24 hours after a storm. In Utah, the avalanche potential is greatest from December through April.

Terrain factors affecting avalanches include slope angle, elevation, aspect, shape and roughness. Slope angle is the primary factor of avalanche probability, with most occurring in the optimum angles between 30 and 45 degrees. Elevation and aspect dictate the depth, temperature and moisture characteristics of the snow pack. Slope shape and roughness contribute to stability. For example, bowl-shaped slopes are more prone to avalanches than ridges. Boulders, shrubs and trees contribute to the slope's roughness and provide some stability (UNHH 2008).

Types of avalanches include wet and dry slab. Wet-slab avalanches occur most often in warming conditions on southerly-facing slopes. Dry-slab avalanches occur mostly on northerly-facing slopes in mid-winter. Wind can accelerate snow deposition leading to larger and/or more frequent avalanches (UAC 2008).

Frequency of Occurrence:	UNLIKELY – Less than 1% probability in the next 100 years
Magnitude:	NEGLIGIBLE – Affects less than 10% of the community

Location:	There are no identifiable areas subjet to avalanche in the City
Duration:	Not applicable
Seasonal Pattern:	Winter through late spring.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	The National Weather Service issues Watches, Warnings and Advisories.
Historic Events in South Jordan:	None

4.3.9 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.

Frequency of Occurrence:	UNLIKELY – Less than 1% probability in the next 100 years
Magnitude:	NEGLIGIBLE – Affects less than 10% of the community
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days.
Seasonal Pattern:	None
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	None
Historic Events in South Jordan:	None

4.3.10 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.

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	CRITICAL - 25 – 50 %
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	Not Applicable
Seasonal Pattern:	None
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	None
Historic Events in South Jordan:	

4.3.11 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).

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days.
Seasonal Pattern:	None
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	None
Historic Events in South Jordan:	

4.3.12 Hazardous Materials (HAZMAT)

Hazardous materials are substances that are either flammable or combustible, explosive, toxic, noxious, corrosive, oxidizable, an irritant or radioactive. A hazardous material spill or release can pose a risk to life, health or property. An incident can result in the evacuation of a few people, a section of a facility or an entire neighborhood.

There are a number of Federal laws that regulate hazardous materials, including: the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Resource Conservation and Recovery Act of 1976 (RCRA), the Hazardous Materials Transportation Act (HMTA), the Occupational Safety and Health Act (OSHA), the Toxic Substances Control Act (TSCA) and the Clean Air Act.

Title III of SARA regulates the packaging, labeling, handling, storage and transportation of hazardous materials. The law requires facilities to furnish information about the quantities and health effects of materials used at the facility, and to promptly notify local and State officials whenever a significant release of hazardous materials occurs.

Frequency of Occurrence:	HIGHLY LIKELY - Near 100% Probability in the next year
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another and the chemicals involved in the incident.
Duration:	From hours to potentially days, or longer.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. An incident could occur at any time. Weather may be a factor in how long or how severe an incident is.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None.

Historic Events in South Jordan:

2000 Merit Medical

4.3.13 Power Outage

Widespread power outages may have a significant impact on the community. Typically a power outage is a cascading effect of a larger natural hazard. Since a power failure may be caused by the disruption of power transmission due to an accident, sabotage, natural hazards or equipment failure, the probability of failure occurrences persist. This type of incident, depending on severity, could pose significant health and safety risks and may require the involvement of the local emergency management organization to coordinate provisions of food, shelter, water, heating, etc.

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	CRITICAL - 25 – 50 %
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	May last hours to days.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time. May be associated with the occurrence of another hazard. Most severe effects may be felt during the colder months of the year.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None. Some advance warning may be issued for known outages for maintenance or repair. Advisories may be issued to conserve or to notify of rolling “black-outs” or “brown-outs”.

Historic Events in South Jordan:

Most events have been minor incidents.

4.3.14 Fallen Aircraft

South Jordan City lies in the flight paths of two airports, Salt Lake International and Airport #2. Under normal flight patterns most plans landing at these airports make their landing approach from south to north over the city. Other air traffic over the city includes helicopters and small aircraft for various purposes.

While not common, for planning purposes this hazard could also include any other falling objects such as meteor or asteroid, or any other large objects that could create a hazardous situation.

Figure 13 - Small aircraft crash, June 2002 on west side of City.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	NEGLIGIBLE - Less than 10%
Location:	The entire city is subject to this type of event. Most likely to occur in the areas that lie in the flight paths for nearby airports and in agricultural areas where planes are used in crop dusting operations.
Duration:	Initial event, minutes. Effects may last days or weeks.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None.

Historic Events in South Jordan:

June 2002 - Small plane crash in U-111 on west side of City

4.3.15 Terrorism / Acts of Violence

Terrorism, as defined under the Homeland Security Act of 2002, is any activity that involves an act dangerous to human life or potentially destructive of critical infrastructure or key resources; is a violation of the criminal laws of the United States or of any State or other subdivision of the United States in which it occurs; and is intended to intimidate or coerce the civilian population or influence or affect the conduct of a government by mass destruction, assassination, or kidnapping. See Section 2 (15), Homeland Security Act of 2002, P.L. 107−296, 116 Stat. 2135 (2002).

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another. Public gathering places, community icons or monuments, government buildings, schools, churches, and commercial buildings may be potential targets.
Duration:	Depends on type of event. May be hours, days, or weeks.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time. Could possibly occur around public celebrations or annual events, on anniversary dates of previous terrorist events, and/or other significant dates such as a terrorist or political leader's birthday, anniversary, etc.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None. Public safety officials are apprised of potential threats on a regular basis. Public awareness may also provide some warning or prevention of terrorist activities.

Historic Events in South Jordan:

Various dates	**Release of mink from various mink farms.**

4.3.16 Civil Disturbance

A civil disturbance is the intentional disobedient behavior by an individual or group of people in violation of public policy, laws or regulations, that results in some form of community disruption.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	Public gathering places, government buildings, schools, parks, commercial areas. Could occur anywhere in city.
Duration:	Minutes to hours. May depend on the event, numbers of persons involved, etc.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time. Most like to occur in combination with another event that creates public outcry, anger, or political unrest.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None.

Historic Events in South Jordan:

December 25, 2010	Oquirrh Mountain temple incident

4.3.17 Dam Failure

The largest dam located in South Jordan is the Oquirrh Lake Dam located in the Daybreak Development area in the western portion of the city and is owned and operated by the Kennecott Land Company. The dam is classified as a "medium dam" due to its storage capacity and proximity to an urban population according to Utah Administrative Code Rules R655-12. However, due to the downstream location of residential structures and the Bangerter Highway, the State Engineer has classified the dam as a "High" hazard Dam.

Hydraulic and Structural Information

Year Built	2006
Structural Height:	17 Feet
Hydraulic Height:	11 Feet
Reservoir Area at Spillway Crest:	Acres
Reservoir Storage at Spillway Crest:	800 Acft
Reservoir Storage at Dam Crest:	1100 Acft
Dam Crest Elevation:	4804 Feet MSL
Dam Crest Length:	230 Feet
Dam Crest Width:	20 Feet

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	Area of potential inundation identified in the Oquirrh Lake Dam Emergency Action Plan
Duration:	Hours.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	None
Historic Events in South Jordan:	None

4.3.18 Railway / Transportation Incidents

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days.
Seasonal Pattern:	May occur anytime. May occur day or night.
Speed of Onset:	No warning
Availability of Warnings:	None

Historic Events in South Jordan:

December 1, 1938	Jordan High Bus Accident

Section 5: Vulnerability & Risk Assessment

5.1 Introduction

The vulnerability assessment applies the information collected through hazard identification and profiling to our community's assets to summarize the impacts from hazards on the community and its vulnerable structures. These impacts are represented by measures such as population at risk, percent damages, and dollar loss estimation. Information provided by the vulnerability assessment includes the areas of our community that are susceptible to each hazard and the areas where the highest losses could occur. This type of information will provide a factual basis for developing effective mitigation strategies.

The primary objective of the vulnerability assessment is to prioritize hazards of concern for our community so that a framework for mitigation strategy and policy development is established.

5.2 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.

5.2.1 Essential Facilities at Risk (City Owned)

Facility	Location	Function
City Hall	1600 W Towne Center Drive	Police Department Emergency Operations Center
Fire Station 61	10758 S Redwood Road	Fire / EMS / HAZMAT
Fire Station 62	4022 W South Jordan Parkway	Fire / EMS / Heavy Rescue
Municipal Services Building	10996 S Redwood Road	Public Works Emergency Operations Center
Animal Shelter	10882 S Redwood Road	Animal Services
Community Center	10778 S Redwood Road	Emergency Operations Center Possible Sheltering Location

Fitness & Aquatics Center	10866 S Redwood Road	Possible Sheltering Location
Gale Center	10300 S Beckstead Ln	
Mulligans	692 W South Jordan Parkway	

Figure 14 - Essential Facilities at Risk (City Owned)

5.2.2 Essential Facilities at Risk (Non-City Owned)

Facility	Location	Function
Bingham High School	2160 W 10400 South	Possible Sheltering Location
Valley High School	325 W 11000	Possible Sheltering Location
South Jordan Middle School	10245 S 2700 West	Possible Sheltering Location
Elkridge Middle School	3659 W 9800 South	Possible Sheltering Location
Elk Meadows Elementary	3448 W 9800 South	Possible Sheltering Location
Jordan Ridge Elementary	2636 W 9800 South	Possible Sheltering Location
Monte Vista Elementary	11121 S 2700 West	Possible Sheltering Location
South Jordan Elementary	11205 S 1375 West	Possible Sheltering Location
Welby Elementary	4130 W 9580 South	Possible Sheltering Location
Daybreak Elementary	4544 W Harvest Moon Drive	Possible Sheltering Location
Eastlake Elementary	4389 W Isla Daybreak Rd	Possible Sheltering Location
Salt Lake County Library	10673 S Redwood Road	
Salt Lake County Fair Grounds	2100 W 11400 South	Open Space / Possible Sheltering Location
South Jordan Health Center / University of Utah Hospital	5126 W Daybreak Pkwy	Medical Services

Figure 15 - Essential Facilities at Risk (Non-City Owned)

5.2.3 Essential Infrastructure at Risk

Facility	Location	Function

Tank 1A	<undisclosed for security>	Water Storage
Tank 1B	<undisclosed for security>	Water Storage
Tank 2	<undisclosed for security>	Water Storage
Tank 3A	<undisclosed for security>	Water Storage
Tank 3B	<undisclosed for security>	Water Storage
Tank 5A	<undisclosed for security>	Water Storage
Tank 5B	<undisclosed for security>	Water Storage
Tank 6	<undisclosed for security>	Water Storage
Semaphore	9790 South & 4000 West	Traffic Control
Semaphore	9800 South & 3200 West	Traffic Control
Semaphore	9800 South & 2700 West	Traffic Control
Semaphore	Shields Lane & 1300 West	Traffic Control
Semaphore	Shields Lane & 1000 West	Traffic Control
Semaphore	10600 South & 4000 West	Traffic Control
Semaphore	11400 South & 4000 West	Traffic Control
Semaphore	11800 South & 4000 West (Shared)	Traffic Control
Semaphore	11800 South & 3600 West (Shared)	Traffic Control
Semaphore	11800 South & 3200 West (Shared)	Traffic Control
Semaphore	11800 South & 2700 West (Shared)	Traffic Control
Semaphore	Shields Lane & Jordan Gateway (Shared)	Traffic Control
Canal Service Roads	Various	Service Access

Figure 16 - Essential Infrastructure at Risk

5.2.4 Other Structures at Risk by Hazard Type

All structures in the community by type. (May be considered at risk for Drought, Earthquake, Fallen Aircraft, HAZMAT, High Wind, Power Outage, Severe Winter Weather, Terrorism, Thunderstorms, and Tornado)

Type of Structure / Building	Subtype	Number in SJC
Church	Accessory	54
Church	Meeting House	37
Church	Seminary	4
Church	Temple	3
Commercial	Accessory	232
Commercial	Business	293
Commercial	MDU	1
Commercial	Office	11
Commercial	Utility	5
Public	Building	9

Public	Accessory	147
Public	City Hall	1
Public	Fire Station	2
Public	Library	1
Public	Police (Animal Control)	1
Public	Post Office	2
Public	Utility	54
Residential	Accessory	6,349
Residential	Clubhouse	17
Residential	Dwelling	16,664
Residential	MDU	59
School		19
School	Accessory	79

Type of Structure / Building	**Subtype**	**Number in SJC**

Total Structures in South Jordan	24,044

Structures with a Specific Flooding Risk (as per FEMA FIRM)

100 year floodplain (Zones A, AH, AO, AE)	count	%
Residential (Single Family Dwellings)	35	0.21
Residential (Accessory Buildings)	33	0.52
Commercial Businesses	4	1.72
Public (Accessory Buildings)	7	4.76
	Total	79

500 year floodplain (Zones X)	count	%
Residential (Single Family Dwellings)	130	0.78
Residential (Accessory Buildings)	53	0.83
Commercial Businesses	13	4.44
Commercial Businesses (Accessory Buildings)	1	0.43
Public (Accessory Buildings)	3	2.04
Total	200	

* Note copies of FEMA FIRMs are available for review in the office of the City Engineer.

Structures with a Liquefaction Specific Risk

High Risk		count	%
Church Accessory		1	1.85
Church Meetinghouse		1	2.70
Commercial Accessory		37	15.95
Commercial Business		33	11.26
Commercial Office		2	18.18
Commercial Utility		1	20.00
Public Accessory		24	16.33
Public Bldg		1	11.11
Public Utility		1	1.85
Residential Accessory		186	2.93
Residential Dwelling		518	3.11
Residential MDU		13	22.03
	Total	818	

Moderate Risk			
Church Accessory		6	11.11
Church Meetinghouse		3	8.11
Church Temple		1	33.33
Commercial Accessory		72	31.03
Commercial Business		61	20.82
Commercial Office		1	9.09
Public Utility		1	1.85
Residential Accessory		1,095	17.25
Residential Clubhouse		1	5.88
Residential Dwelling		1,501	9.01
Residential MDU		37	62.71
School		2	10.53
School Accessory		1	1.27
	Total	2,782	

Low Risk	
All other buildings	20,444

5.3 Identification of Critical Facilities and Assets by location

5.3.1 Government Buildings

Several governmental buildings are located in South Jordan. A portion of these buildings are essential for community service in the event of a large scale disaster or emergency. The buildings that are critical in nature consist of fire stations, police stations, city hall, and public works facilities. Other less than critical buildings include the post office and animal shelter.

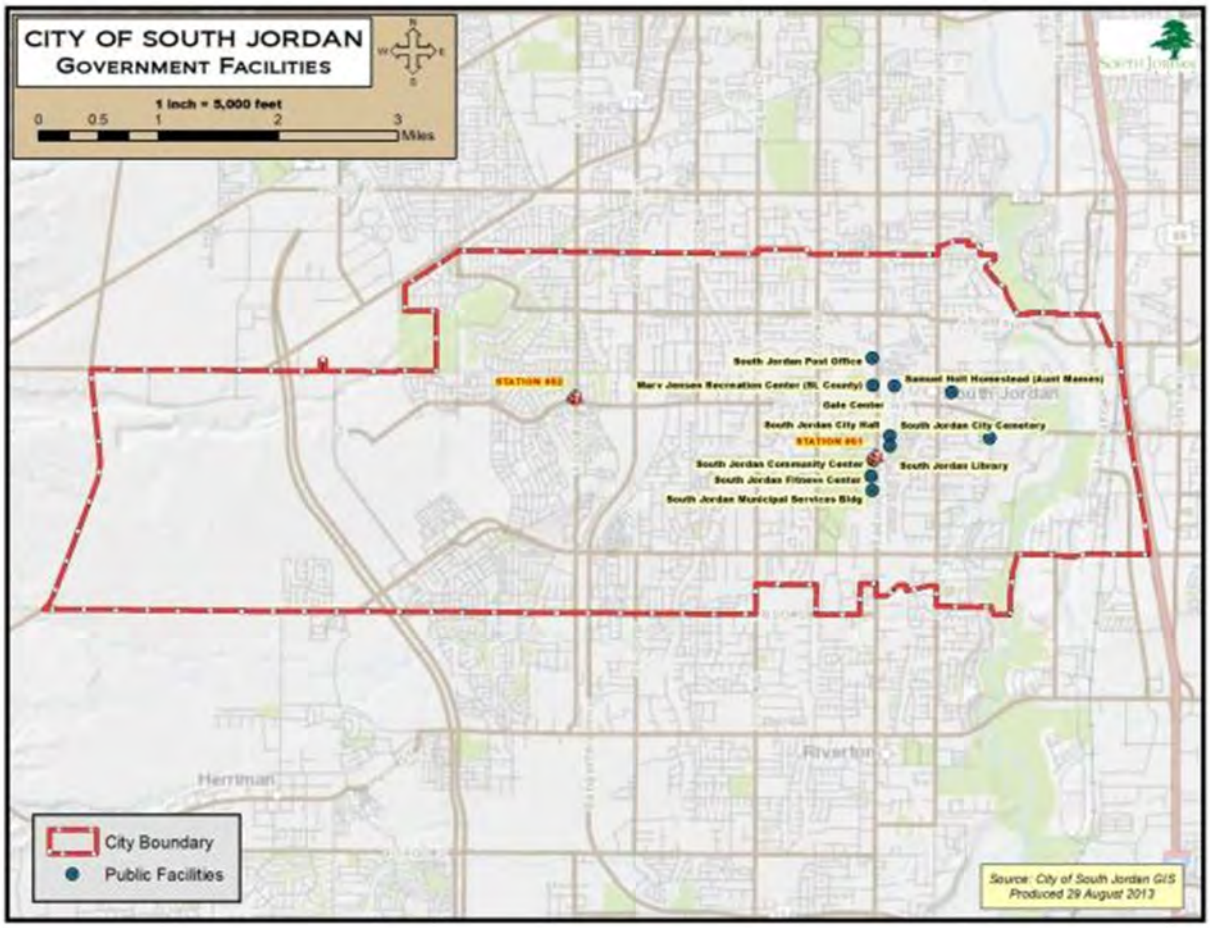


Figure 17 - Map of selected government buildings

5.3.2 Schools/Universities

South Jordan City has multiple schools located in its city limits. These schools consist of 7 elementary schools, 2 middle schools, and 2 high schools, and 1 special education facility. As per the Jordan School District there are 12,423 students enrolled in the district schools located in South Jordan. South Jordan also has several private schools and universities located throughout the city.

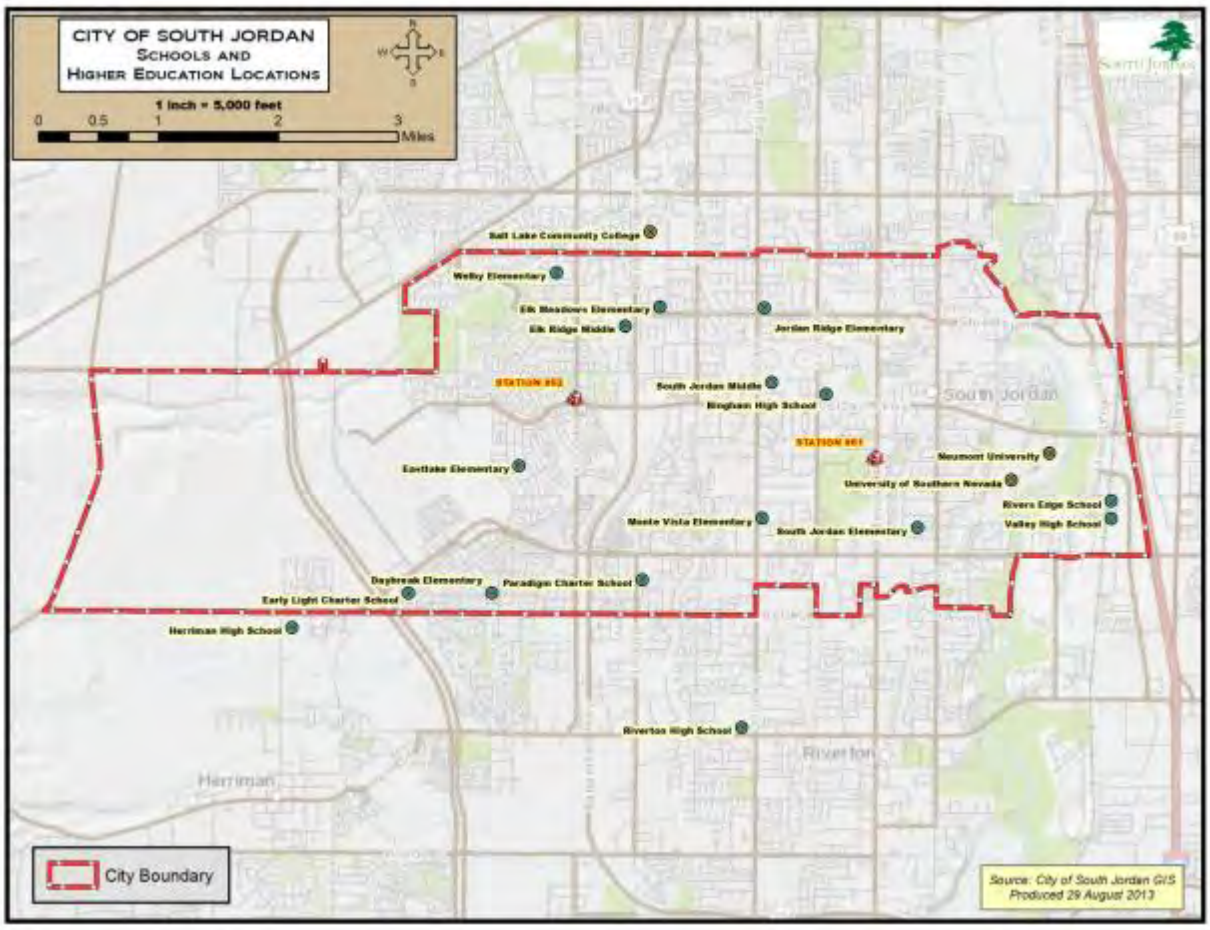


Figure 18 - Selected Schools and other educational institutions

5.3.3 Mass Gatherings / Congregational Grouping

A variety of congregational facilities are located in South Jordan, the majority of these consist of buildings used for religious worship. South Jordan also has a large shopping center with a 20 screen movie theatre, an equestrian center where large events such as the county fair are held, and multiple other outdoor gatherings including South Jordan's Country Fest at the city parks.

Regardless of the reason for the gathering, anytime this occurs there is an increased potential for a mass casualty type of incident to occur. This mass casualty could occur due to a variety of reasons including: severe weather, fire, haz-mat, or terroristic activity.

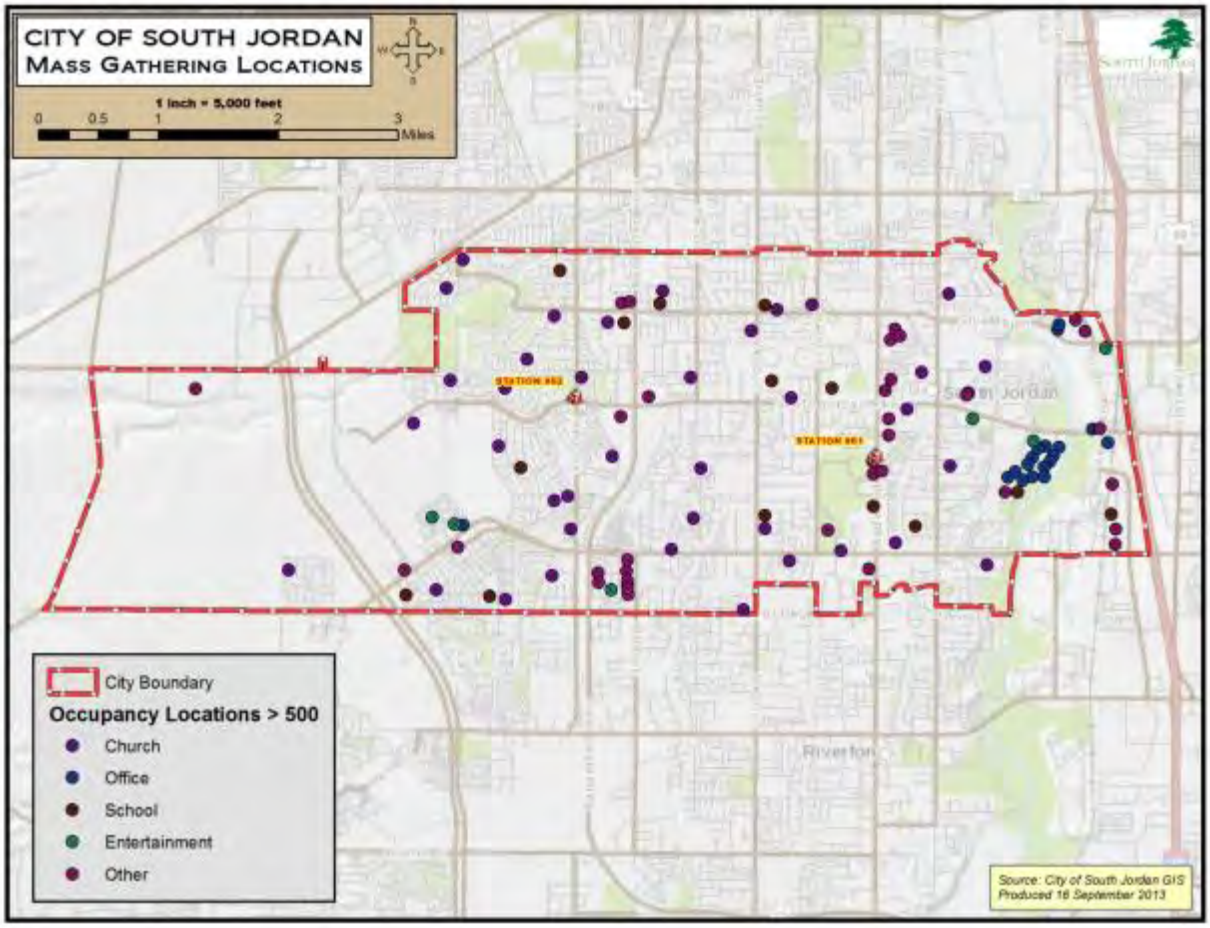


Figure 19 - Selected sites where persons may gather or congregate in large numbers

5.3.4 Medical Facilities

There are multiple medical facilities located in South Jordan. Most of these facilities consist of small clinics and InstaCare type facilities; however one large stand-alone emergency department is located in the city as well. This emergency department is owned and operated by the University of Utah, and in the future will be developed into a hospital. There are also multiple assisted living facilities located in the city as well.

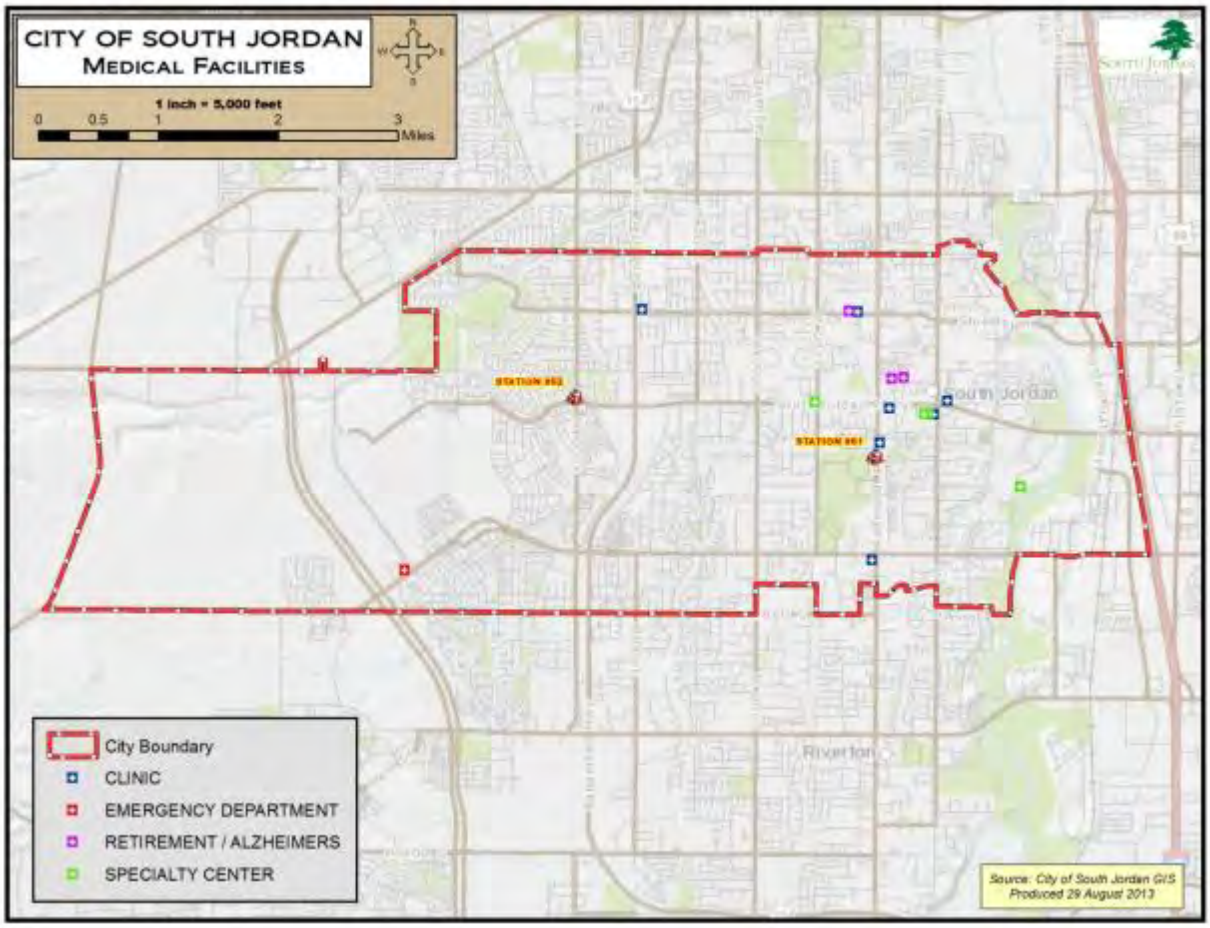


Figure 20 - Selected medical facilities in the City

5.3.5 High Rise Buildings

High-Rise structures consist of those buildings that are more than five stories in height. These structures present additional risk to responding fire department personnel as well as increase the complexity of an incident. Hotels and office buildings are some of the common high-rises located in South Jordan. The evacuation of occupants from these locations is a time-consuming task in the event of an emergency. As depicted in the following map all of the high-rises in South Jordan are currently located on the east side of the city in the commercial section near the Jordan River and along the frontage road of I-15.

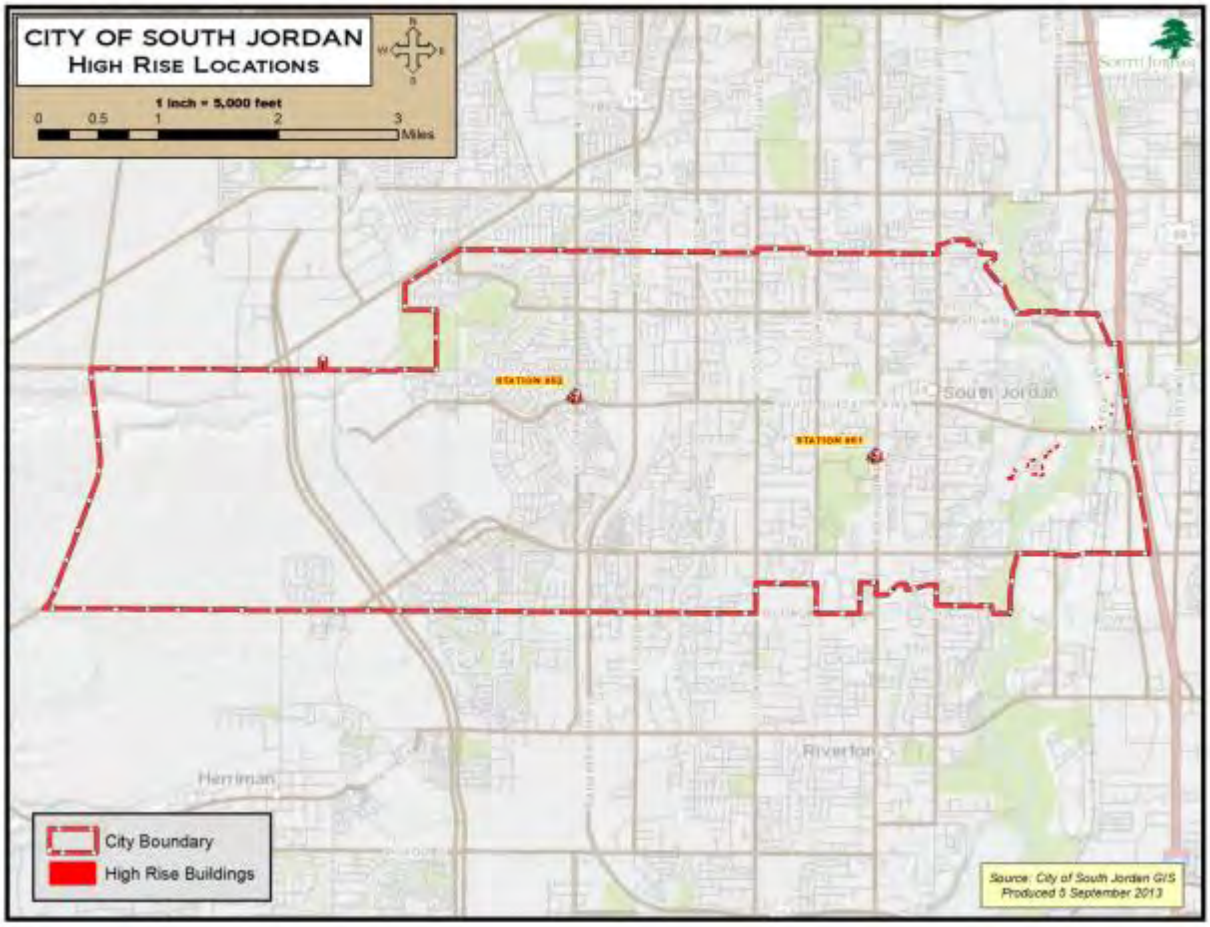


Figure 21 - Location of selected high rise buildings

5.3.6 Large Square Footage Buildings

Occupancies with a large floor plan such as warehouses, home improvement stores and supermarkets are another type of occupancy that presents unique hazards to firefighting personnel. In addition to their unusually high fire load, firefighters are often required to use a longer than normal hose lay in order to reach the entire structure. We have deemed any building larger than 50,000 square feet to be considered large square footage in nature. The ensuing map diagrams the location of these large occupancies located in South Jordan.

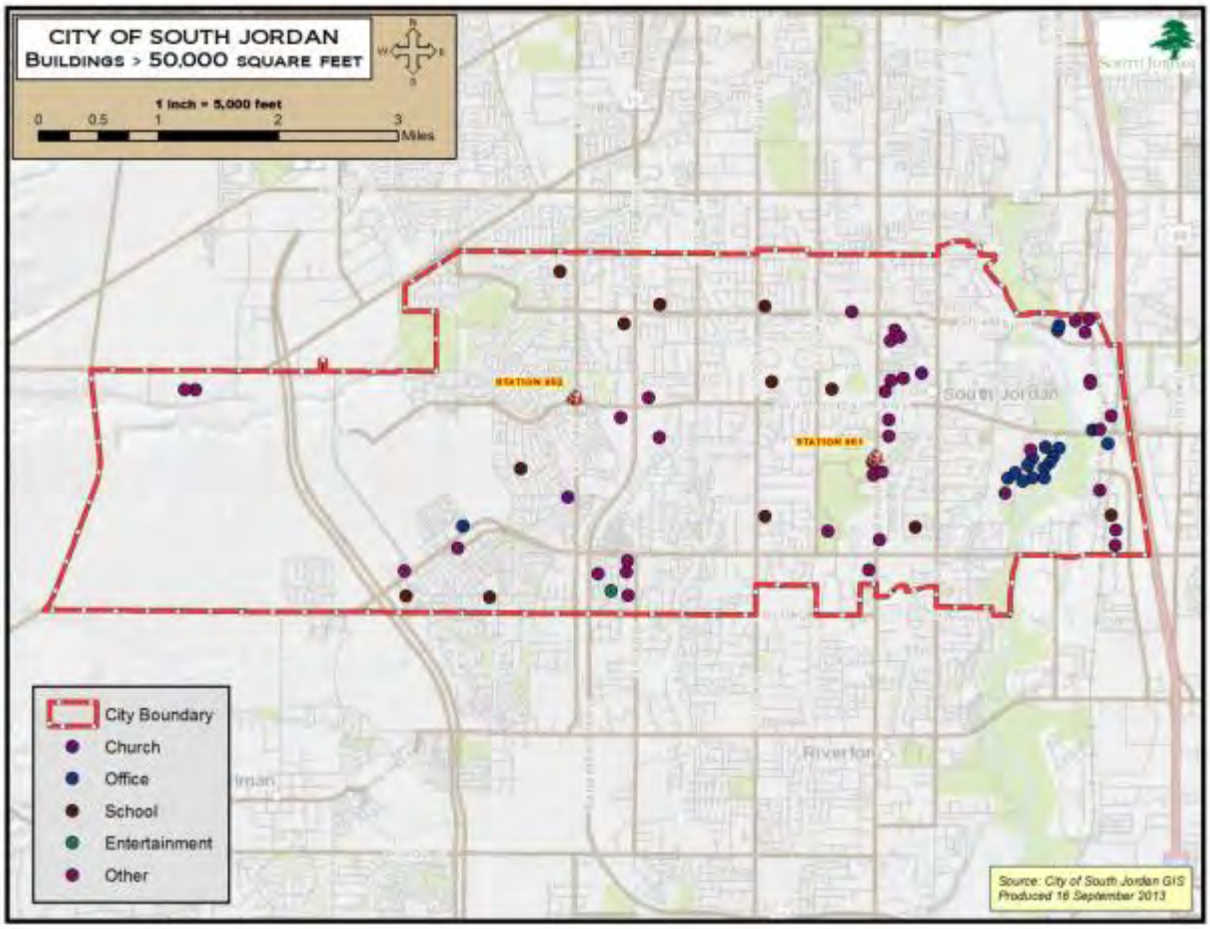


Figure 22 - Selected buildings with greater than 50,000 square feet

5.3.7 Buildings That Require Higher Fire Flow

Needed fire flow (NFF) is the amount of water that is needed to control a fire in occupancies with 100% fire involvement. The NFA's formula for calculating needed fire flow is length x width/3 or L x W/3=NFF. Obviously each floor of a multi-story structure will have to be accounted for individually. CFAI defines high fire flow as 3,000 to 4,000 gallons per minute for three hours. The following map illustrates the occupancies which require a minimum fire flow of 3,000 gallons per minute to mitigate a fire at the facility.

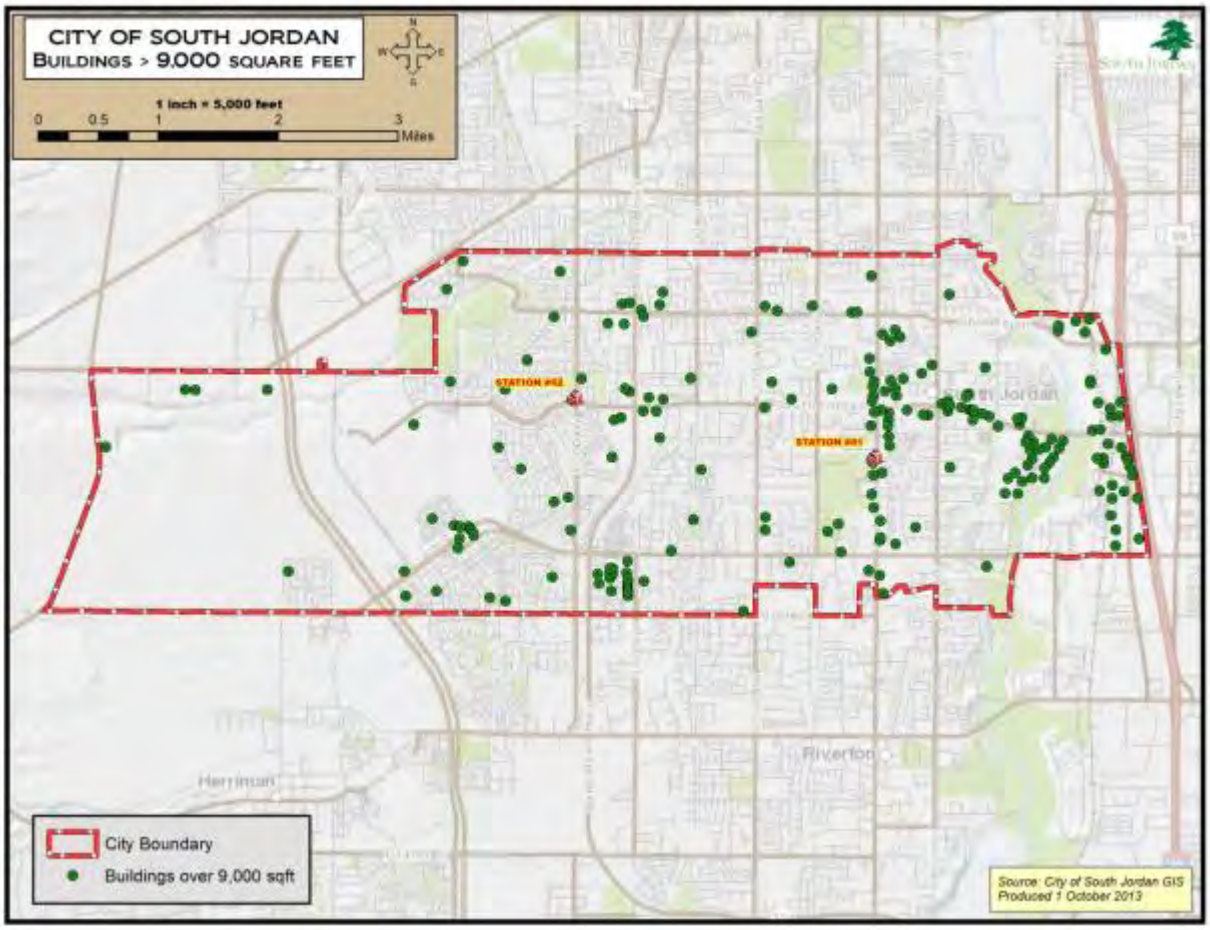


Figure 23 - Selected buildings requiring higher fire flow

5.3.8 Transportation Networks

South Jordan has two major railways located in the city. The first is located on the east side of the city and is used by both passenger as well as freight trains. UTA's FrontRunner has one stop located in South Jordan at 10351 So. South Jordan Gateway. FrontRunner is a mass transit train that runs along the I-15 corridor through several counties in Utah. Two FrontRunner trains run through the city every half-hour during commuting hours, these trains travel at speeds up to 79 mph. Large freight trains also frequent the tracks throughout the day.

UTA also has a smaller Trax line that runs along the west side of the city. These trains are smaller than the FrontRunner trains and travel at speeds of 55 mph. There are two Trax stops located in South Jordan; these stops are located at 10605 So. Grandville Ave. and 11405 So. Grandville Ave. A third freight railroad track is located in the northwest portion of the city; however, it is not an active line at present.

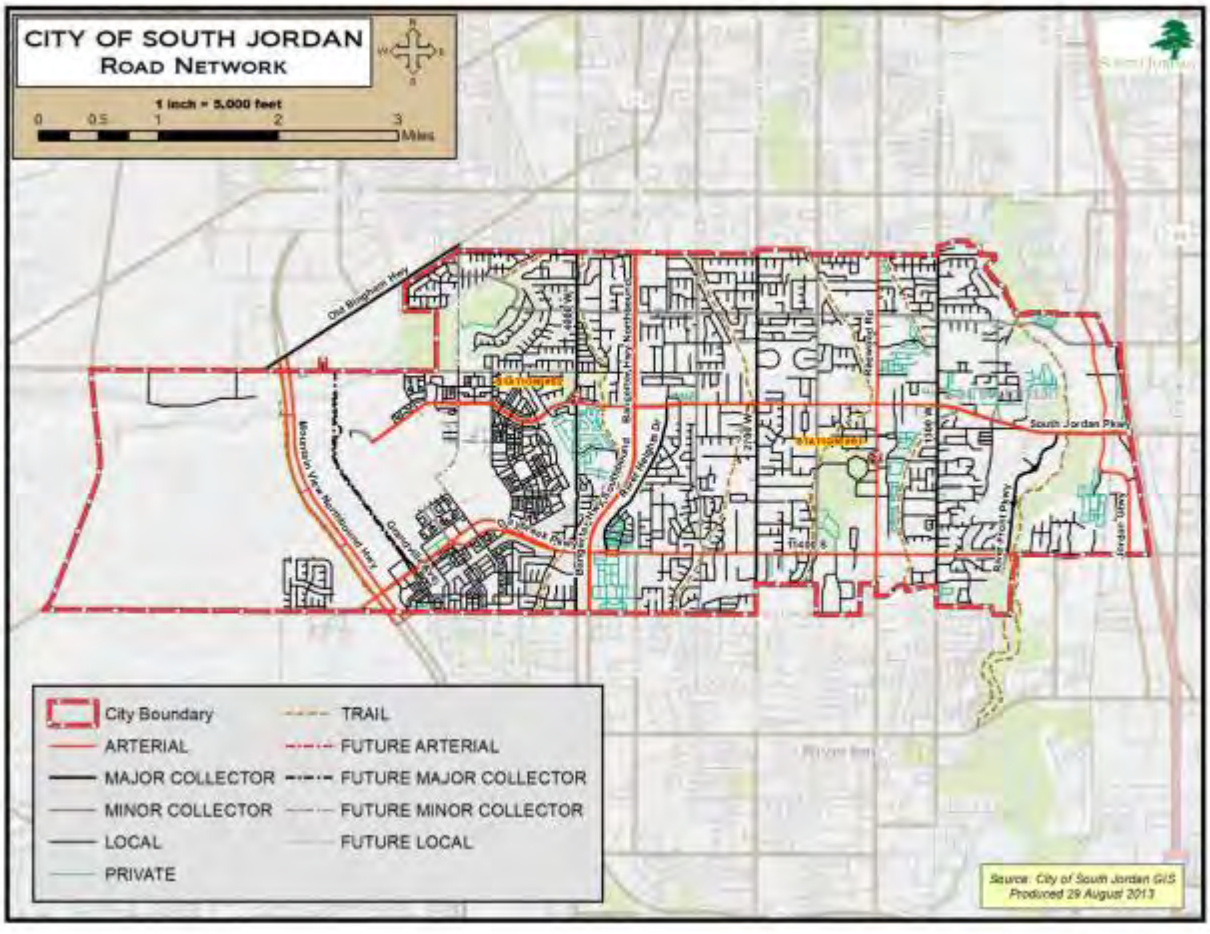


Figure 24 - Selected transportation networks

5.4 Risk Index Summary

HAZARD	MAGNITUDE	FREQUENCY	WARNING TIME	SEVERITY	SPECIAL CHARACTERISTICS AND PLANNING CONSIDERATIONS	RISK PRIORITY
Agricultural	Negligible	Possible	24 + hours	Limited	Agricultural areas are being reduced as homes are being built.	Low
Avalanche	Negligible	Unlikely	None	Negligible	Does not occur in South Jordan	Low
Civil Disturbance	Negligible	Possible	Minimal	Limited	Most likely to occur at "major event' or as the result of political issues.	Low
Dam Failure	Limited	Possible	12-24 hours	Limited	The lake is still being built. Dam is owned by a private company.	Low
Drought	Likely	Catastrophic	24 + hours	Limited	Cyclic events. Severity and end of event uncertain.	Low
Earthquake	Catastrophic	Possible	None	Critical	Cannot be predicted. Scientists say that we are "overdue" for a large event in this area.	**High**
Fallen Aircraft	Negligible	Possible	Minimal	Negligible	Proximity to airports and flight paths makes this possible.	Low
Floods	Limited	Possible	12-24 hours	Limited	Flooding can occur in any part of the City for a variety of reasons	Low
Hazardous Materials Incident	Critical	Likely	Minimal	Limited	Areas near the interstate, railroad tracks and centers of manufacturing are at greatest risk.	**High**
Infestation	Negligible	Unlikely	24+ hours	Limited	May be from wildlife or vegetation.	Low
Liquefaction	Critical	Possible	Minimal	Limited	Will be a cascading effect of an earthquake. Areas near the Jordan River are most at risk	Medium
Pandemic	Critical	Possible	24 + hours	Catastrophic	Could require restricting travel, commerce, schools, and other social issues	Medium
Power Outage	Catastrophic	Likely	Minimal	Limited	Depending on duration of the event, may cause many problems.	**High**
Problem Soils	Negligible	Possible	24 + hours	Limited	Specific Geotech reports may be needed for details on specific properties or areas.	Low

HAZARD	MAGNITUDE	FREQUENCY	WARNING TIME	SEVERITY	SPECIAL CHARACTERISTICS AND PLANNING CONSIDERATIONS	RISK PRIORITY
Radon	Critical	Likely	24+ hours	Limited	Simple tests can be done to identify problems at specific locations.	Medium
Railway / Transportation Incidents	Negligible	Likely	Minimal	Negligible	Several rail and transportation corridors exist in the City.	Medium
Severe Winter Weather	Catastrophic	Likely	12-24 hours	Limited	Occurs almost annually. May cause power outages as a cascading event.	**High**
Slope Failure	Limited	Possible	24 + hours	Limited	May occur in isolated areas.	Low
Terrorism	Critical	Possible	Minimal	Negligible	There are few "targets" in the City, but it is still possible that malicious acts may occur for other reasons.	Medium
Thunderstorms	Negligible	Highly Likely	6-12 hours	Limited	These events often trigger flooding. Microburst storms have caused many homes to have flooding that are not in a mapped floodplain.	Medium
Tornado	Limited	Possible	Minimal	Limited	Unlikely to occur, but they have been more frequent in Utah in recent years	Low
Wildfire	Negligible	Possible	Minimal	Limited	Will most likely occur near the Jordan River or in the western portions of the City.	Low

5.5 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 South Jordan'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 South Jordan, 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	South Jordan continues to improve and maintain its communication capabilities. Example: upgrade and purchase of 4 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	South Jordan 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 SoJo marathon 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	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	South Jordan 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	South Jordan 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	South Jordan 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 South Jordan 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	South Jordan 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	South Jordan 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	South Jordan GIS personnel actively participate in several coordinating groups that address issues associated with geographic data

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	3 – Update and expand data on hazards, critical facilities, and critical infrastructure according to assessed needs	Completed / Ongoing	South Jordan 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	South Jordan 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	South Jordan has implemented the use of monitoring equipment such as stream gages, seismographs, SNOTEL sites to provide situational awareness and forecasting capabilities Example: The South Jordan 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 South Jordan 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 2013 South Jordan 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 2013 South Jordan 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	South Jordan is identifying options and opportunities to address issues identified during the risk assessments in 2013
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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan'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	South Jordan 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	South Jordan has worked with Be Ready Utah and other programs to make presentations in South Jordan and will continue to invite them to events and other activities in the community
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	South Jordan 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 South Jordan ordinances are available online at: http://www.sterlingcodifiers.com/codebook/index.php?book_id=488
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	The inundation map for the dam at Oquirrh Lake 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 Oquirrh Lake has been considered in identifying potential evacuation routes, if needed

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	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Completed / Ongoing	South Jordan has hired a Water Conservation Manager who provides outreach material 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	Completed / Ongoing	South Jordan has hired a Water Conservation Manager who coordinates 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 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Completed / Ongoing	South Jordan has a variety of incentive programs that it offers to its residents related to water conservation. Example: Rebate program for installing low flow toilets
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	South Jordan has implemented several projects including using secondary 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 South Jordan 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 South Jordan Water Division coordinates all water use, including the testing of hydrants in partnership with the fire 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	7 – Provide information on landscaping alternatives for persons subject to green area requirements	Completed / Ongoing	South Jordan 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	Not Completed	This is not applicable to South Jordan
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	South Jordan 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	Completed	In 2013 South Jordan 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	South Jordan does not have funding to support this type of program. South Jordan does not intend to move this activity forward due to the very limited number of URM structures in the community and the lack of potential funding sources to support it
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 South Jordan

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	Not Completed	There are very few URM homes and businesses located in South Jordan that would make this activity cost effective for the City to engage in. South Jordan 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 South Jordan 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	South Jordan has been a participating community in the NFIP since 1974
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	South Jordan 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
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 were completed on Midas Creek including upsizing culverts, channel stabilization, etc.

Category	Goal / Objective	Action	Status	Comments
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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan supports the NWS efforts for education and outreach and makes internal departments aware of NWS resources

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	Completed / Ongoing	South Jordan 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	South Jordan 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	South Jordan 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	Completed	South Jordan 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 South Jordan 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 South Jordan 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 South Jordan 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

Section 6: 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. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

6.1 Update Process Summary

The purpose of conducting a capability assessment is to determine the ability of the City to implement a comprehensive mitigation strategy, and to identify potential opportunities for establishing for enhancing specific mitigation policies, programs or projects. The assessment has two primary components: an inventory of the City's relevant plans, laws, regulations and policies and/or programs already in place and an analysis of its capacity to carry them out. A careful examination of capabilities will detect any existing gaps, shortfalls or weaknesses associated with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate hazard vulnerability. The capability assessment also provides an opportunity to highlight the positive mitigation measures already in place or being implemented throughout the City, which should continue to be supported and enhanced if possible through future mitigation efforts.

6.2 Capability Assessment Findings

The City of South Jordan has developed, adopted and maintained several ordinances and plans that aid in the promotion and development of mitigation activities. These existing plans highlight opportunities and guide the City's rapid growth. Existing ordinances help ensure that the homes, businesses, and other community infrastructure are built and maintained in a safe manner. The City also has several subject matter experts in various fields and disciplines that serve as advisors in guiding activities and projects in the City. The City is also fiscally responsible, maintaining high credit ratings and balanced annual budgets.

6.2.1 Planning and Regulatory Capability

Regulatory Tool	Yes/No	Adopted / Initiated	Comments
General Plan	Yes	Last update adopted 6-1-2010	Resolution No. R2010-17
Zoning Ordinance	Yes	Various Dates	Title 17 South Jordan Municipal Code – Planning and Land

			Use
Subdivision Ordinance	Yes	Various Dates	Title 17 South Jordan Municipal Code – Planning and Land Use & Title 16 South Jordan Municipal Code – Development Code
Site Plan Review Requirements	Yes	Various Dates	Title 16 South Jordan Municipal Code – Development Code
Growth Management Ordinance	- -	Updated periodically	See General Plan
Floodplain Ordinance	Yes	January 2010	S.J.C.M.C. § 13.24
Special Purpose Ordinances (i.e. stormwater, water conservation, wildfire)	Yes	Stormwater and Flood Control	S.J.C.M.C. § 13.12
		Stormwater Utility (June 2013)	S.J.C.M.C. § 9.10
		Stormwater Utility (June 2013)	S.J.C.M.C. § 16.44
Building Code	Yes	Various Dates	Title 15 South Jordan Municipal Code – Buildings and Construction
Fire Department ISO Rating	Yes		Current rating is a 4. Last site visit was in 2009.
		June 2013	Fire Code adopted S.J.C.M.C. § 8.12
Erosion or Sediment Control program			
Stormwater Management Program	Yes	Last update adopted 12-23-2013	
Capital Improvements Plan	Yes	Updated on an annual basis	
Economic Development Plan			
Local Emergency Operations Plan	Yes	Adopted 9-20-2005	Currently under revision

Other Special Plans			
Flood Insurance Study (or other engineering study for streams)	Yes	September 25, 2009	

Figure 25 – City of South Jordan Regulatory Mitigation Capabilities

6.2.2 Administrative & Technical Capability

Personnel / Resources	Yes/No	Department / Position
Planner / Engineer with knowledge of land development/land management practices	Yes	Development Services – Each planner has some degree of knowledge in each area
Engineer/professional trained in construction practices related to buildings and/or infrastructure		
Planner/engineer/scientist with an understanding of natural hazards		
Personnel skilled in GIS	Yes	GIS Coordinator, GIS Technician, IT Department
Full-time Building Official		
Floodplain Manager		
Emergency Manager	Yes	
Grant writer		
Other personnel	Yes	Land Use Attorney
GIS Data—Land use	Yes	
GIS Data—Links to Assessor's data	Yes	
Warning systems/services(Reverse 9-11, outdoor warning signals)	Yes	Emergency Alert System & Reverse Notification System (available through VECC)

Figure 26 - City of South Jordan Administrative & Technical Capabilities

6.2.3 Fiscal Mitigation Capability

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 Private Activities	Yes
Withhold Spending in Hazard Prone Areas	Yes

Figure 27- City of South Jordan Fiscal Mitigation Capabilities

6.2.4 Mitigation Education, Outreach & Partnerships

6.2.5 Other Mitigation Efforts / Plan Integration

When appropriate, this hazard mitigation plan should be considered as a tool to assist other efforts to enhance and promote effective multi-hazard mitigation planning at all levels of government in partnership with public and private stakeholders. Copies of the plan will be made available for consideration by any boards, committees, commissions or other groups that have the responsibility to give consideration and/or recommendations related to development in the community. The City encourages other efforts to develop plans to include the integration of risk communication and risk reduction measures into any of the plans, policies, tools or processes that lead to safer and more resilient communities.

Section 7: Mitigation Strategy

7.1 Update Process Summary

Previous hazard mitigation plans have identified County-wide level mitigation activities and projects. In this update and revision the City of South Jordan has focused on community level based activities as well as opportunities to work with the State, County and neighboring jurisdictions where it may be possible to take advantage of economies of scale or to leverage other resources.

In order to identify and select mitigation measures to support the mitigation goals, each hazard identified in Section 4 was evaluated. Once it was determined which hazards warranted the development of specific mitigation measures, the South Jordan Hazard Mitigation Planning Team analyzed a set of viable mitigation alternatives that would support identified goals and objectives.

Mitigation projects and activities were considered in the following five areas:

1) Structural Projects
2) Property Protection
3) Natural Resource Protection
4) Emergency Services
5) Public Information

7.2 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 South Jordan'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 South Jordan, 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	South Jordan continues to improve and maintain its communication capabilities. Example: upgrade and purchase of 4 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	South Jordan 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 SoJo marathon 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	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	South Jordan 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	South Jordan 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

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	2 – Establish redundancy for dispatch centers and other critical communications	Completed / Ongoing	South Jordan 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 South Jordan 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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan GIS personnel make data available to first responders and others involved in emergency management efforts

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.	Completed / Ongoing	South Jordan has implemented the use of monitoring equipment such as stream gages, seismographs, SNOTEL sites to provide situational awareness and forecasting capabilities Example: The South Jordan 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 South Jordan 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 2013 South Jordan 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 2013 South Jordan 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	South Jordan is identifying options and opportunities to address issues identified during the risk assessments in 2013
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	South Jordan has formal agreements for Police, Fire, and Water

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	Completed / Ongoing / In Process	South Jordan 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	South Jordan 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	South Jordan'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	South Jordan 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	South Jordan has worked with Be Ready Utah and other programs to make presentations in South Jordan and will continue to invite them to events and other activities in the community
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	South Jordan enforces all current ordinances and building codes including ordinances like our Flood Damage Prevention and Land Disturbance ordinances.

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	Completed	All current South Jordan ordinances are available online at: http://www.sterlingcodifiers.com/codebook/index.php?book_id=488
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	The inundation map for the dam at Oquirrh Lake 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 Oquirrh Lake has been considered in identifying potential evacuation routes, if needed
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	South Jordan has hired a Water Conservation Manager who provides outreach material 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	Completed / Ongoing	South Jordan has hired a Water Conservation Manager who coordinates 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 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Completed / Ongoing	South Jordan has a variety of incentive programs that it offers to its residents related to water conservation. Example: Rebate program for installing low flow toilets
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	South Jordan 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	The South Jordan 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 South Jordan 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	South Jordan 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	Not Completed	This is not applicable to South Jordan
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	South Jordan 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	Completed	In 2013 South Jordan 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 Completed	South Jordan does not have funding to support this type of program. South Jordan does not intend to move this activity forward due to the very limited number of URM structures in the community and the lack of potential funding sources to support it
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 South Jordan
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 South Jordan that would make this activity cost effective for the City to engage in. South Jordan 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 South Jordan 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	South Jordan has been a participating community in the NFIP since 1974
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	South Jordan actively participates in the NFIP

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	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
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 were completed on Midas Creek including upsizing culverts, channel stabilization, etc.
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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan 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	South Jordan 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

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	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	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	Completed	South Jordan 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 South Jordan 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 South Jordan 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 South Jordan 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	Completed / Ongoing	South Jordan GIS and Fire Department have created maps indicating areas that may have an increased risk for wildfire.

Figure 28- 2009 Mitigation Strategies Progress and Summary

7.3 Mitigation Goals & Objectives

The City of South Jordan desires that its residents, assets and operations have the best possible protection from the effects of natural and technological hazards that may occur in the community. As such the following mitigation objectives have been identified:

- Develop and maintain an understanding of risks from the full range of natural hazards that can affect the City, and initiate mitigation activities to address the potential effects of those hazards.
- Find and develop opportunities to work with other agencies to leverage mitigation funds, and to share information about the risks of natural hazards.
- Promote partnerships among Federal, State, County, and local governments to identify, prioritize and implement mitigation actions.
- Maintain the viability of South Jordan businesses by preventing damages from hazards.
- Ensure that the City maximizes its opportunities for access to grants and other kinds of assistance.
- Provide effective implementation of existing floodplain regulations and building codes.
- Ensure that the City continues to be represented in the determination of county-wide mitigation actions.
- Stay involved with citizen and technical groups.

7.4 Identification and Analysis of Mitigation Techniques

Strategies are specific course of action to achieve the objectives. City of South Jordan mitigation planning strategies include:

- Maintain awareness of the potential effects of natural hazards on City of South Jordan assets.
- Implement cost-effective projects and actions to reduce risk from natural hazards, both for the City of South Jordan assets and operations, as well as for residents and businesses in the planning area.
- Promote public understanding, support and demand for hazard mitigation.
- Undertake vulnerability and risk studies to better understand the potential for future damages.
- Use new information from damaging events to increase local knowledge of risks
- Seek grants to fund mitigation activities.
- Continuously monitor and update this Plan to ensure that it remains current with regard to risks, strategies, priorities and mitigation actions.
- Encourage and facilitate the development or updating of General Plans, Land and Zoning, Building Construction, Fire Protection and Floodplain Management Ordinances to limit development in hazard areas.

7.5 Mitigation Action Plan

Below is a summary of mitigation activities selected to help the community to reduce the threats from natural hazards.

Hazard(s)	Comments	Activity / Action Description	Plan Section

Flooding	Flood Hazard Reduction Activities	**Activity 7.4.1.1** – Maintain community participation in the National Flood Insurance Program.	7.4.1.1
		Activity 7.4.1.2 – Distribution of flood hazard and flood preparedness / response information	7.4.1.2
		Activity 7.4.1.3 – Update of the City's Stormwater Master Plan	7.4.1.3
Earthquakes	Earthquake Hazard Reduction Activities	**Activity 7.4.2.1** – Installation of automatic gas shut off fixtures on City-owned buildings	7.4.2.1
		Activity 7.4.2.2 – Distribution of earthquake information	7.4.2.2
Wildfire	Wildland Fire Hazard Reduction Activities	**Activity 7.4.3.1** – Support of community education programs that raise awarenes	7.4.3.1
		Activity 7.4.3.2 – Maintain a wildland fire response unit.	7.4.3.2
		Activity 7.4.3.3 – Prohibit the use of fireworks in high risk areas.	7.4.3.3
		Activity 7.4.3.4 – Training for firefighters in wildland firefighting.	7.4.3.4
		Activity 7.4.3.3 – Maintain automatic/mutual aid agreements	7.4.3.5

Drought	Drought Hazard Reduction Activities	**Activity 7.4.4.1** – Rebate program to promote water conservation	7.4.4.1
		Activity 7.4.4.2 – Development of a 5-year Water Conservation Plan	7.4.4.2
		Activity 7.4.4.3 – Offer Annual Sprinkler Maintenance Workshops	7.4.4.3
		Activity 7.4.4.4 – Promotion of "Water Week"	7.4.4.4
		Activity 7.4.4.5 – Provide real-time water use data to customers	7.4.4.5
Pandemic	Pandemic Hazard Reduction Activities	**Activity 7.4.5.1** – Development of a Pandemic Response & Recovery Plan	7.4.5.1
Severe Weather	Severe Weather Hazard Reduction Activities	**Activity 7.4.2.1** – Engage in the process to become a 'Storm Ready Community"	7.4.6.1
		Activity 7.4.6.2 – Promote public education in the community	7.4.6.2
Slope Failure	No Slope Failure Hazard Reduction Activities Identified		
Avalanche	Avalanche Hazard Reduction Activities	**Activity 7.4.8.1** – Support of community education programs	7.4.8.1
Infestation	No Infestation Hazard Reduction Activities Identified		7.4.9

Radon	Radon Hazard Reduction Activities Identified	**Activity 7.4.10.1** – Creation of a radon hazard map	7.4.10.1
		Activity 7.4.10.2 – Distribution of information on Radon	7.4.10.2
Problem Soils	No Problem Soils Hazard Reduction Activities Identified		7.4.11
All Hazards	Other Hazard Reduction Activities	**Activity 7.4.12.1** – Development of a Communications Response Team and Emergency Communications Plan	7.4.12.1
		Activity 7.4.12.2 – Adoption and Enforcement of Building Codes	7.4.12.2

Figure 29 – Summary of Mitigation Activities

7.4.1 Flood Hazard Reduction Activities

Issue/Background: Flooding risks exist in the community from a variety of sources, including; riverine flooding, infrastructure failures (canal breech, dam failure, water main rupture), and groundwater sources. Areas near the Jordan River are in a mostly undeveloped state.

Activity 7.4.1.1 – Maintain community participation in the National Flood Insurance Program.

Other Alternatives: None

Responsible Office: Development Services

Priority (High, Medium, Low): Medium

Cost Estimate: Minimal - < $5,000

Potential Funding: General Fund

Benefits (Avoided Losses): Participation in the National Flood Insurance requires the City to maintain and enforce a flood damage prevention ordinance and other regulatory authorities to minimize the effects of flooding to structures in the community. Enforcement of the ordinance will

reduce the number of strucutes at risk of damage from flooding. Participation also aids in distributing public information and awareness of flood hazards.

Schedule**:** The City of South Jordan is currently Participating in the National Flood Insurance Program and intends to maintain its eligibility to participate during the next five year period.

Activity 7.4.1.2 – Distribution of flood hazard and flood preparedness / response information such as the *"Flooding: What you should Know when Living in Utah"* brochure which the City partnered in developing in 2014, or similar types of information. Post such information on the City's website.

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Information Technology

Priority (High, Medium, Low): Medium

Cost Estimate: Minimal - < $5,000

Potential Funding: General Fund

Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps buiild community support for other hazard mitigation efforts such as strong building codes and enforcement of exisiting codes such as the flood damage prevention ordinance.

Schedule**:** Distribution of flood related information is ongoing / continuous. Information posted to website in 2015. Aditional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

Activity 7.4.1.3 – Update of the City's Stormwater Master Plan to include specific flood mitigation projects in flood prone areas of the City.

Other Alternatives: None

Responsible Office: Public Works, Development Services

Priority (High, Medium, Low): High

Cost Estimate: $50,000 - $100,000

Potential Funding: General Fund, Enterprise Funds

Benefits (Avoided Losses): Once updated, the Stormwater Master Plan will identify specific infrastructure needs that will help reduce the potential for flooding. The Plan will be used in determining priority based needs throughout the City. Funding for specific projects may come from a variety of sources and will appear as part of the capital improvements plan.

Schedule**:** Scheduled for completion in 2015.

7.4.2 Earthquake Hazard Reduction Activities

Issue/Background: Earthquakes pose a significant threat to the State of Utah, the Salt Lake Valley and the City of South Jordan. Given the City's close proximity to the Wasatch Fault and other smaller faults and its previous history of experience ethe effects of smaller earthquakes efforts should be made to reduce the potential impact that earthquakes pose.

Activity 7.4.2.1 – Install automatic gas shut off fixtures on any City-owned buildings or structures with gas service/meter that do not have one currently.

Other Alternatives: Train staff to check the meter immediately following an earthquake event and shut off service if necessary.

Responsible Office: Administrative Services – Facilities Division

Priority (High, Medium, Low): Low

Cost Estimate: $50,000 - $100,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Automatic shut off valves will stop the flow of gas after a significant event if there is damage to the system. This could potentially save the structure from potential fire or a hazardous materials incident.

Schedule**:** Activity to be considered as part of any capital improvement project or as part of any building remodel, if warranted, or as funding is made available through specific grants as available.

Activity 7.4.2.2 – Distribution of earthquake hazard preparedness / response information. Post such information on the City's website.

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Information Technology

Priority (High, Medium, Low): Medium

Cost Estimate: Minimal - < $5,000

Potential Funding: General Fund

Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps buiild

community support for other hazard mitigation efforts such as strong building codes and enforcement of exisiting codes such as the flood damage prevention ordinance.

Schedule**:** Distribution of earthquake related information is ongoing / continuous. Information posted to website in 2015. Aditional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

7.4.3 Wildfire Hazard Reduction Activities

Issue/Background: While not a significant threat to the City of South Jordan, the City still has some exposure in liited areas of the community. There is very little wildland/urban interface in the City's boundaries, but neighboring jurisdictions have a much higher risk. Utah's typical wildfire season is late May through October with lightning and miscellaneous human activites causing the majority of fires.

Activity 7.4.3.1 – Support of community education programs that raise awarenessand provide information to property owners on how to protect their structures from wildfire damage. Post such information on the City's website.

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Fire Department, Information Technology

Priority (High, Medium, Low): Low

Cost Estimate: < $5,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Raised awareness of people who may determine to live in areas that are at risk for wildland fire.

Schedule**:** Distribution of wildland fire related information is ongoing / continuous. Information posted to website in 2015. Aditional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

Activity 7.4.3.2 – Maintain a wildland fire response unit.

Other Alternatives: None

Responsible Office: Fire Department

Priority (High, Medium, Low): Low

Cost Estimate: $100,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Provides the City with an initial response unit as well as the ability to support neighboring jurisdictions with their response efforts.

Schedule**:** A replacement wildfire response unit to be purchased in 2015.

Activity 7.4.3.3 – Prohibit the use of fireworks in high risk areas.

Other Alternatives: None

Responsible Office: Fire Department

Priority (High, Medium, Low): Medium

Cost Estimate: Minimal

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Fireworks restrictions in high risk areas help reduce the potential for ignition sources and the need for additional response units.

Schedule**:** Annually consider the need and issue restrictions as appropriate.

Activity 7.4.3.4 – Training for firefighters in wildland firefighting.

Other Alternatives: None

Responsible Office: Fire Department

Priority (High, Medium, Low): Low

Cost Estimate: $50,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): While we only have a few firefighters that are "red card" certified, our figherfighters could receive training in wildland fire so there are better able to assist if needed.

Schedule**:** Annual consideration.

Activity 7.4.3.3 – Maintain automatic/mutual aid agreements and assist neighboring jurisdictions as requested.

Other Alternatives: None

Responsible Office: Fire Department

Priority (High, Medium, Low): Medium

Cost Estimate: Minimal

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Having automatic and mutual aid agreements will help the community be more prepared with access to resources when needed. It will also make it easier to assist neighboring jurisdictions if requested.

Schedule**:** Annual consideration.

7.4.4 Drought Hazard Reduction Activities

Issue/Background: Located in the heart of the intermountain west as part of the Great Salt Lake Valley, the City is in a desert climate defined by lack of water and periods of drought conditions. Measures must be taken to conserve watter and to address water shortages for both culinary and agricultural uses.

Activity 7.4.4.1 – Rebate program to promote water conservation

Other Alternatives: None

Responsible Office: Public Works

Priority (High, Medium, Low): Medium

Cost Estimate:

Potential Funding:

Benefits (Avoided Losses): The City offers rebates to persons who upgrade their exisitng infrastrucutre with new devices that use less water. This includes fixing leaking toilets and upgrading to low flow, installing smart irrigation systems, planting drought tolerant plants, etc. The results of these efforts should reduce the consumption of water by users in the community.

Schedule**:** Ongoing program. Additional rebates may be considered in future years.

Activity 7.4.4.2 – Development of a 5-year Water Conservation Plan

Other Alternatives: None

Responsible Office: Public Works

Priority (High, Medium, Low): High

Cost Estimate:

Potential Funding:

Benefits (Avoided Losses):

Schedule**:** 2015

Activity 7.4.4.3 – Offer Annual Sprinkler Maintenance Workshops to promote efficient and effective watering of landscapes.

Other Alternatives: None

Responsible Office: Public Works

Priority (High, Medium, Low): Medium

Cost Estimate:

Potential Funding:

Benefits (Avoided Losses): Public education on how to maintain and operate a sprinkler system will help conserve water by avoiding waste from leaks and/or ineffective systems and practices.

Schedule**:** Offered annually starting in 2015

Activity 7.4.4.4 – Promotion of "Water Week" with elementary studentsto promote best management practices for water conservation.

Other Alternatives: None

Responsible Office: Public Works

Priority (High, Medium, Low): Medium

Cost Estimate:

Potential Funding:

Benefits (Avoided Losses): Teaching elementary students about water conservation will help promote best management practices in the homes of residents and helps share information about how individuals can make a difference in conserving water.

Schedule**:** Annually in May of each year.

Activity 7.4.4.5 – Provide real-time water use data to customers

Other Alternatives: None

Responsible Office: Public Works

Priority (High, Medium, Low): Medium

Cost Estimate:

Potential Funding:

Benefits (Avoided Losses): Water users can monitor their own use of water resources in real time to help them make determinations about their water use practies.

Schedule**:** System will be available in late 2015.

7.4.5 Pandemic Hazard Reduction Activities

Issue/Background: 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. A 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 City of South Jordan is located in the middle of a larger urban area that is influenced by a tremendous amount of travel into and out of the area on a daily basis, making the area even more suceptible to potential situations where a pandemic may result.

Activity 7.4.5.1 – Development of a Pandemic Response & Recovery Plan

Other Alternatives: None

Responsible Office: Administrative Services – Emergency management, Fire Department - EMS

Priority (High, Medium, Low): Medium

Cost Estimate: < $5,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Having a response and recovery plan will help the City to be more prepared, identify potential protocols for response and implement strategies that prioritize public safety and help reduce the economic impacts on the City from the potential effects of a pandemic crisis.

Schedule**:** 2015, annual reviews after completion

7.4.6 Severe Weather Hazard Reduction Activities

Issue/Background: Severe waether can have a significant impact on the community, affecting transportation, regional commerce, and other daily activities. Severe weather can cause significant damage to property and pose a risk to life safety.

Activity 7.4.6.1 – Engage in the process to become a "Storm Ready Community" with the National Weather Service

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Public Works

Priority (High, Medium, Low): Medium

Cost Estimate: $25,000 - $50,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Participation in the "Storm Ready Community" will help raise awarness of the dangers of servere weather and provide tools to the community to aid in prepapring for and responding to severe weather events.

Schedule**:** 2016

Activity 7.4.6.2 – Promote public education in the community regarding severe weather. Post such information on the City's website.

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Information Technology

Priority (High, Medium, Low): Medium

Cost Estimate: < $5,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps buiild community support for other hazard mitigation efforts such as strong building codes and enforcement of exisiting codes.

Schedule**:** Distribution of flood related information is ongoing / continuous. Information posted to website in 2015. Additional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

7.4.7 Slope Failure Hazard Reduction Activities

Issue/Background: Slope failures are not a significant issue in the City of South Jordan. No mitigation projects or activities have been identified during this planning process.

Activity 7.4.2.1 – No Activities identified for this hazard

Other Alternatives: None

Responsible Office: NA

Priority (High, Medium, Low): NA

Cost Estimate: NA

Potential Funding: NA

Benefits (Avoided Losses): NA

Schedule**:** NA

7.4.8 Avalanche Hazard Reduction Activities

Issue/Background: While the City of South Jordan does not have a direct threat from avalanche, the threat exists in many nearby areas that our residents may visit and/or desire to participate in activities. AS a result the City desires to provide public education and information to better inform it's residents of the potential dangers that may exist in hazard prone areas.

Activity 7.4.8.1 – Support of community education programs that raise awarenessand provide information to property owners on the dangers and risks of avalanches. Post such information on the City's website, including links to the Utah Avalanche Center.

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Information Technology

Priority (High, Medium, Low): Low

Cost Estimate: < $5,000

Potential Funding: General Fund, Grants

Benefits (Avoided Losses): Raised awareness of people who may desire to participate in activities that are at risk for avalanche.

Schedule**:** Information posted to website in 2015. Aditional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

7.4.9 Infestation Hazard Reduction Activities

Issue/Background: Infestations are not a significant issue in the City of South Jordan. No mitigation projects or activities have been identified during this planning process.

Activity 7.4.9.1 – No Activities identified for this hazard

Other Alternatives: None

Responsible Office: NA

Priority (High, Medium, Low): NA

Cost Estimate: NA

Potential Funding: NA

Benefits (Avoided Losses): NA

Schedule**:** NA

7.4.10 Radon Hazard Reduction Activities

Issue/Background: 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.

Activity 7.4.10.1 – Creation of a radon hazard map showing potential areas of the community that may be affected by radon.

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Information Technology, Development Services

Priority (High, Medium, Low): Medium

Cost Estimate: Minimal - < $5,000

Potential Funding: General Fund

Benefits (Avoided Losses): A map showing the extent of the hazard will be useful in helping residents determine if they should consider testing for radon and/or engaging in their own efforts to mitigate radon in their structures. The map will also help to raise awareness of the issue in the community.

Schedule**:** Map developed in 2015 – 2016 and information posted to website in.

Activity 7.4.10.2 – Distribution of information on Radon. Post such information on the City's website.

Other Alternatives: None

Responsible Office: Administrative Services – Emergency Management, Information Technology

Priority (High, Medium, Low): Medium

Cost Estimate: Minimal - < $5,000

Potential Funding: General Fund

Benefits (Avoided Losses): Dissemination of information raises public awareness, resulting in a more knowledgeable community that is prepared for potential threats. It also helps buiild community support for other hazard mitigation efforts such as strong building codes and enforcement of exisiting codes such as the flood damage prevention ordinance.

Schedule**:** Information posted to website in 2015. Aditional emphasis and effort will be placed on distribution of materials at some City sponsored events such as the annual Health, Safety & Preparedness fair.

7.4.11 Problem Soils Hazard Reduction Activities

Issue/Background: Problem Soils Hazards are not a significant issue in the City of South Jordan. No mitigation projects or activities have been identified during this planning process.

Activity 7.4.11.1 – No Activities identified for this hazard

Other Alternatives: None

Responsible Office: NA

Priority (High, Medium, Low): NA

Cost Estimate: NA

Potential Funding: NA

Benefits (Avoided Losses): NA

Schedule**:** NA

7.4.12 General Hazard Reduction Activities

Issue/Background: The following activities will address multiple hazards or there effects and help to prepare the City of South Jordan to be more disaster resistant and resiliant.

Activity 7.4.12.1 – Development of a Communications Response Team and Emergency Communications Plan

Other Alternatives: None

Responsible Office: Administrative Services, Police Department, Fire Department, Public Works

Priority (High, Medium, Low): High

Cost Estimate: >$50,000

Potential Funding: General Funds, Grants

Benefits (Avoided Losses): A communication response team will help to ensure that the City can develop and maintain a viable communication system that will enable the City to have communications capabilities after a significant event occurs.

Schedule: Development of Communications Plan in 2015. Some capabilities are existing. Additional purchase of equipment, team training, and other components of the team to continue in development in 2015 and following years.

Activity 7.4.12.2 – Adoption and Enforcement of Building Codes

Other Alternatives: None

Responsible Office: Development Services

Priority (High, Medium, Low): High

Cost Estimate: < $5,000

Potential Funding: General Funds, Grants

Benefits (Avoided Losses): Adopting and enforcing appropriate building codes will ensure that new constrcution projects will benefit from new technologies, construction design, and lessons learned from previous disasters.

Schedule: Annually

Section 8: Plan Maintenance

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This section 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 section also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

8.1 Implementation

This plan is designed to be implemented over time so that the City's vulnerability to natural hazards can be reduced. This plan contains many worthwhile mitigation actions, and while some are already completed or underway, the City 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.

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 City's General Plan, Parks and Recreation Master Plan, Economic Development Plan, Master Transportation Plan and others . 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 South Jordan 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 City 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.

8.2 Monitoring, Evaluating & Updating the Plan

The City will be responsible to annually review the mitigation strategies described in this Plan, or 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 Mitigation Planning committee comprised of individuals from departments responsible to initiate and/or implement the described mitigation strategies. Progress toward the completion of the strategies will be assessed and revised as warranted. The City's Emergency Manager, or designee, will regularly monitor the Plan and is responsible to make revisions and updates. If a modification of the Plan is warranted, an amendment to the Plan may be initiated.

This plan will be updated, 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.

8.3 Continued Public Involvement

Continued public involvement is also imperative to the overall success of the plan's implementation. The update 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 update period.

The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, and press releases to local media.

Section 9: Plan Adoption

The purpose of formally adopting this plan is to secure buy-in from the City of South Jordan, raise awareness of the plan, and formalize the plan's implementation. The governing body for the City of South Jordan, the South Jordan City Council, has adopted this multi-hazard mitigation plan by passing a resolution. A copy of the executed resolution is included in the front of this plan. The previous plan, *Wasatch Front Region Natural Pre-Disaster Mitigation Plan* was originally adopted on October 6, 2009 by Resolution R2009-32.

Appendices

Appendix A – Hazard Maps

A-1 – Flood Hazard Map
A-2 – Geologic Hazard Map
A-3 – Potential Hazmat Scenario Map
A-4 – Dam Failure / Inundation Map

A-1 – Flood Hazard Map (Overview)

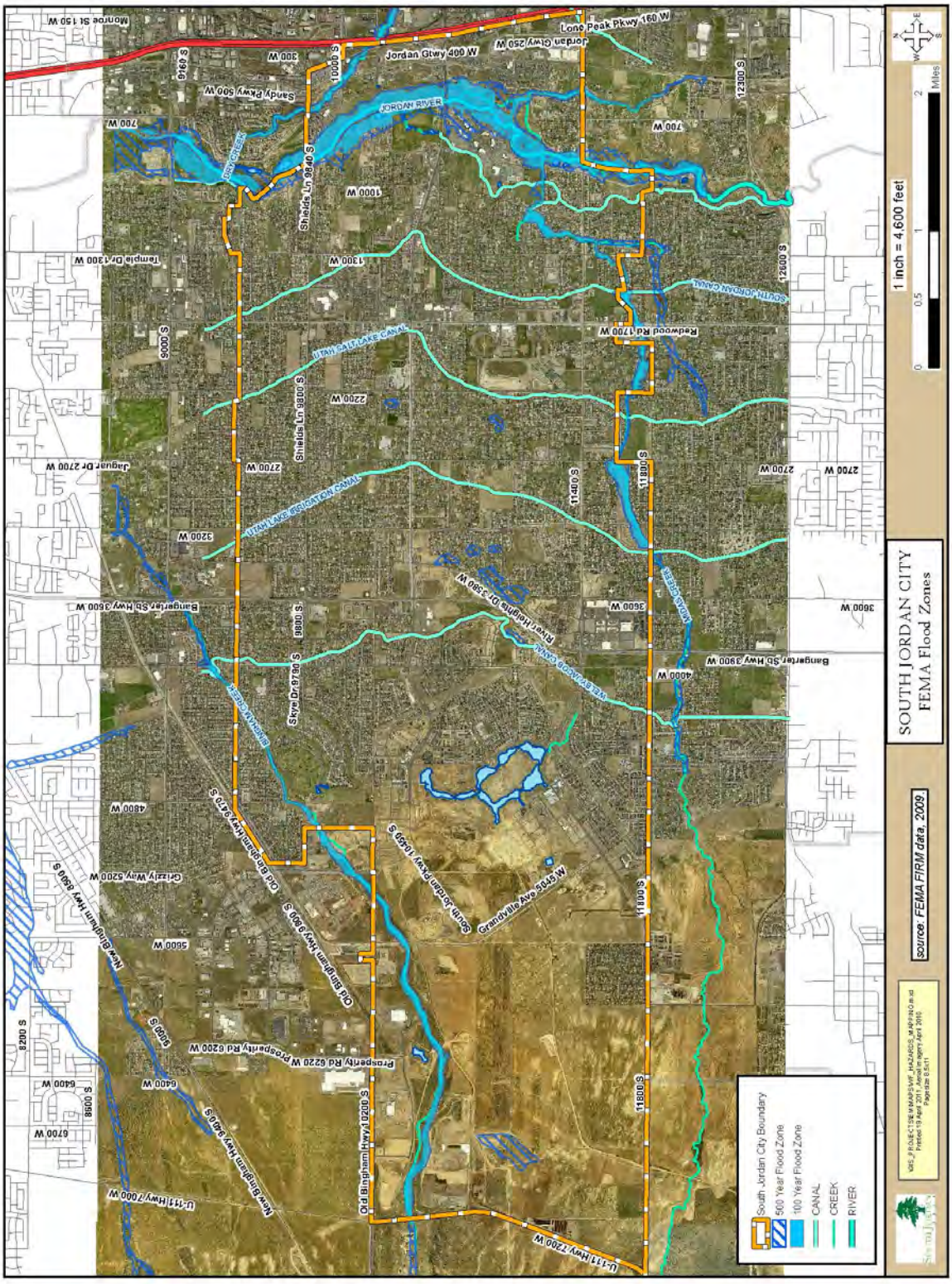


Figure 30 - Flood Hazard Map

A-2 – Geologic Hazard Map (Overview)

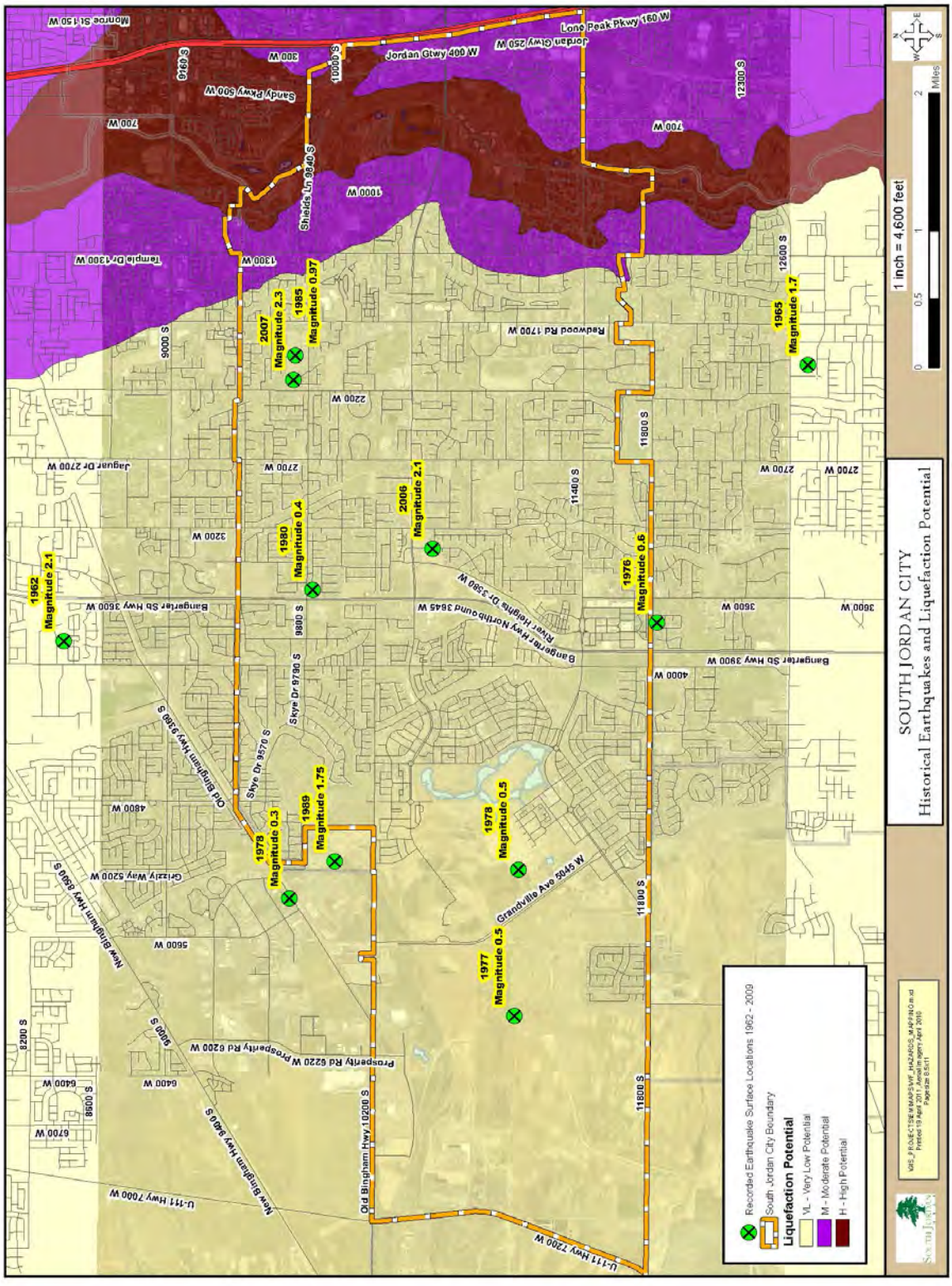


Figure 31 - Geologic Hazards Map

A-3 – Potential HAZMAT Scenario Impact Map

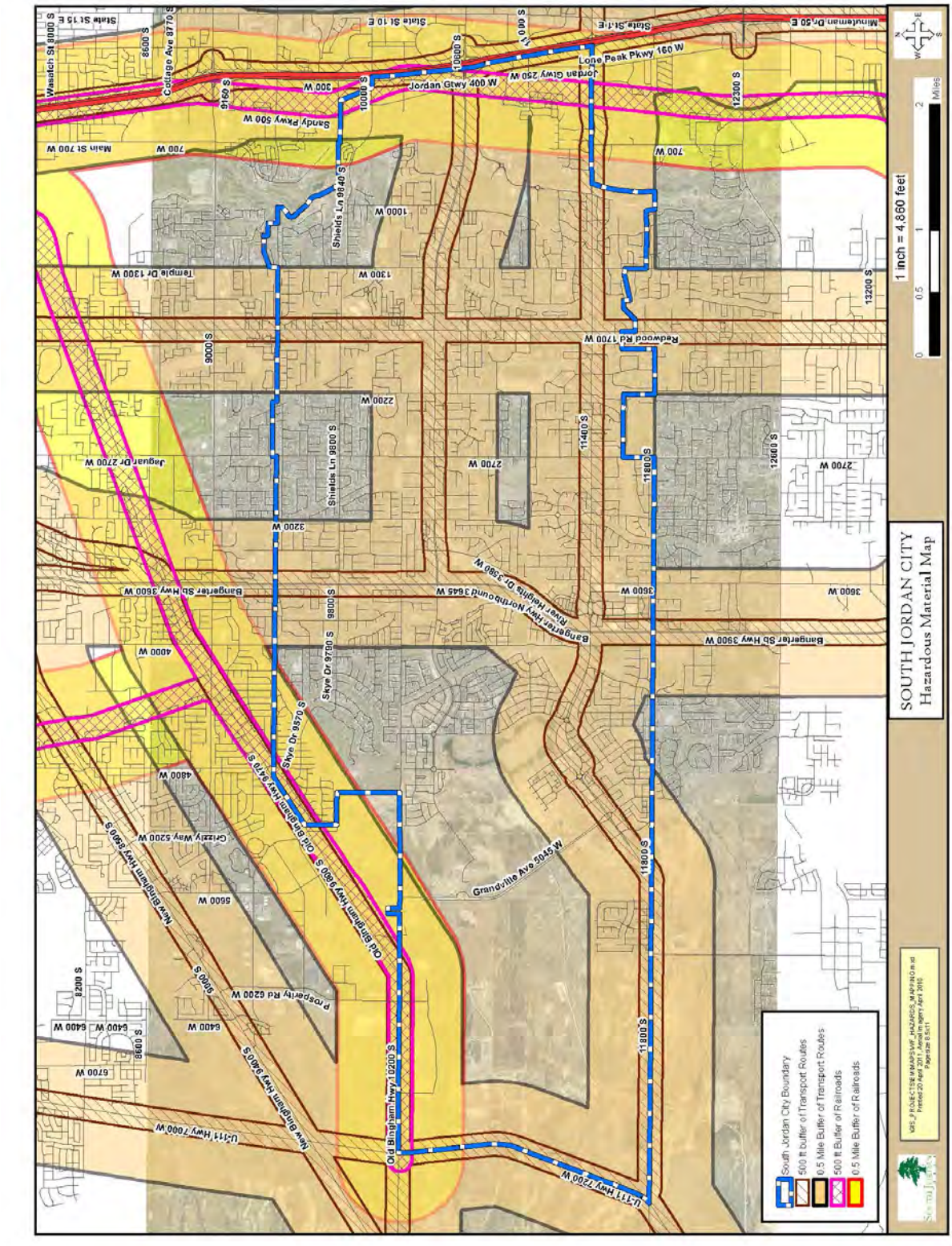


Figure 32 - Potential HAZMAT Scenarios Map

A-4 – Dam Failure / Inundation Map

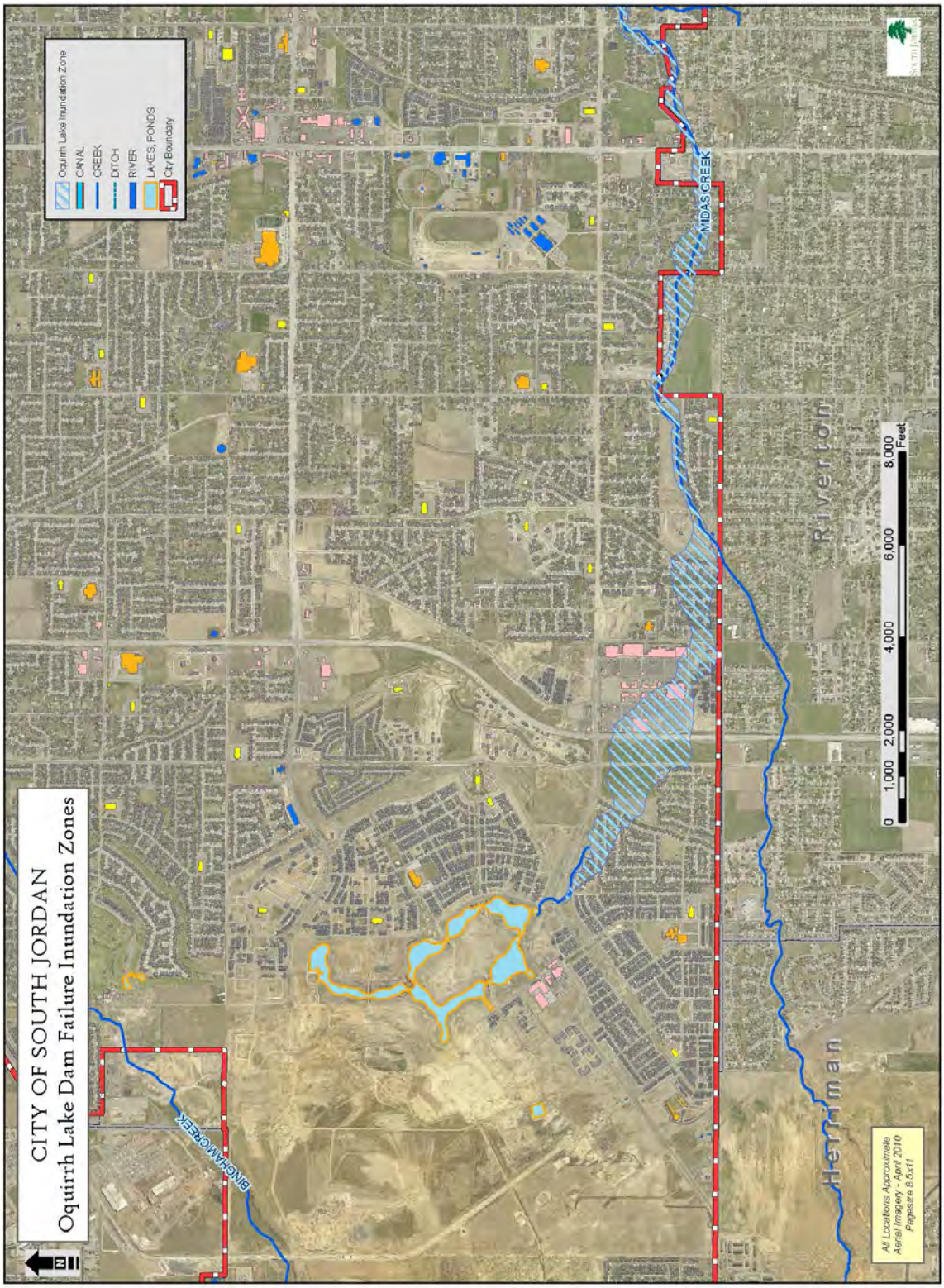


Figure 33 - Dam Failure / Inundation Map

Appendix B – Bibliography & References

Existing Plans Developed by or Maintained by the City of South Jordan

General Plan – City of South Jordan: Developed by the Community Development Department, 2010. Adopted by South Jordan City Council June 1, 2010 (Resolution No: R2010-17).

South Jordan City Emergency Management Plan: Developed by the Emergency Management Division. Adopted by South Jordan City Council September 20, 2005 (Resolution No R2005-50).

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EXECUTIVE ORDER NO. 2015-03

Whereas, the federal Disaster Mitigation Act of 2000, Public Law 106-390, established 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 and local 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 hazards, and establish a coordinated process to implement such plans; and

Whereas, the County of Salt Lake with its governmental and non-governmental partners has developed a Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan; and

Whereas, such Plan has been approved by the Federal Emergency Management Agency (FEMA) subject to adoption by the County of Salt Lake and local governments within the County.

Now, therefore, by power vested in me as Mayor of the City of South Salt Lake, and as the City's Chief Executive Officer, it is hereby ordered:

1. The Salt Lake County Multi-Jurisdictional Multi-Hazard Mitigation Plan, which includes Annex L (City of South Salt Lake) is hereby adopted as the City of South Salt Lake Hazard Mitigation Plan pursuant to the federal Disaster Mitigation Act.

2. This order shall take effect upon recording by the City Recorder.

Cherie Wood
Mayor

Craig Burton
City Recorder

May 14, 2015
Date recorded

Hazard Mitigation Plan (2014)

ANNEX N:
CITY OF SOUTH SALT LAKE

1 Community Profile

Figure 1 displays a map and the location within Salt Lake County of the City of South Salt Lake and its sphere of influence. Figure O.2 displays a map of the City of South Salt Lake.

Figure 1. The City of South Salt Lake within Salt Lake County

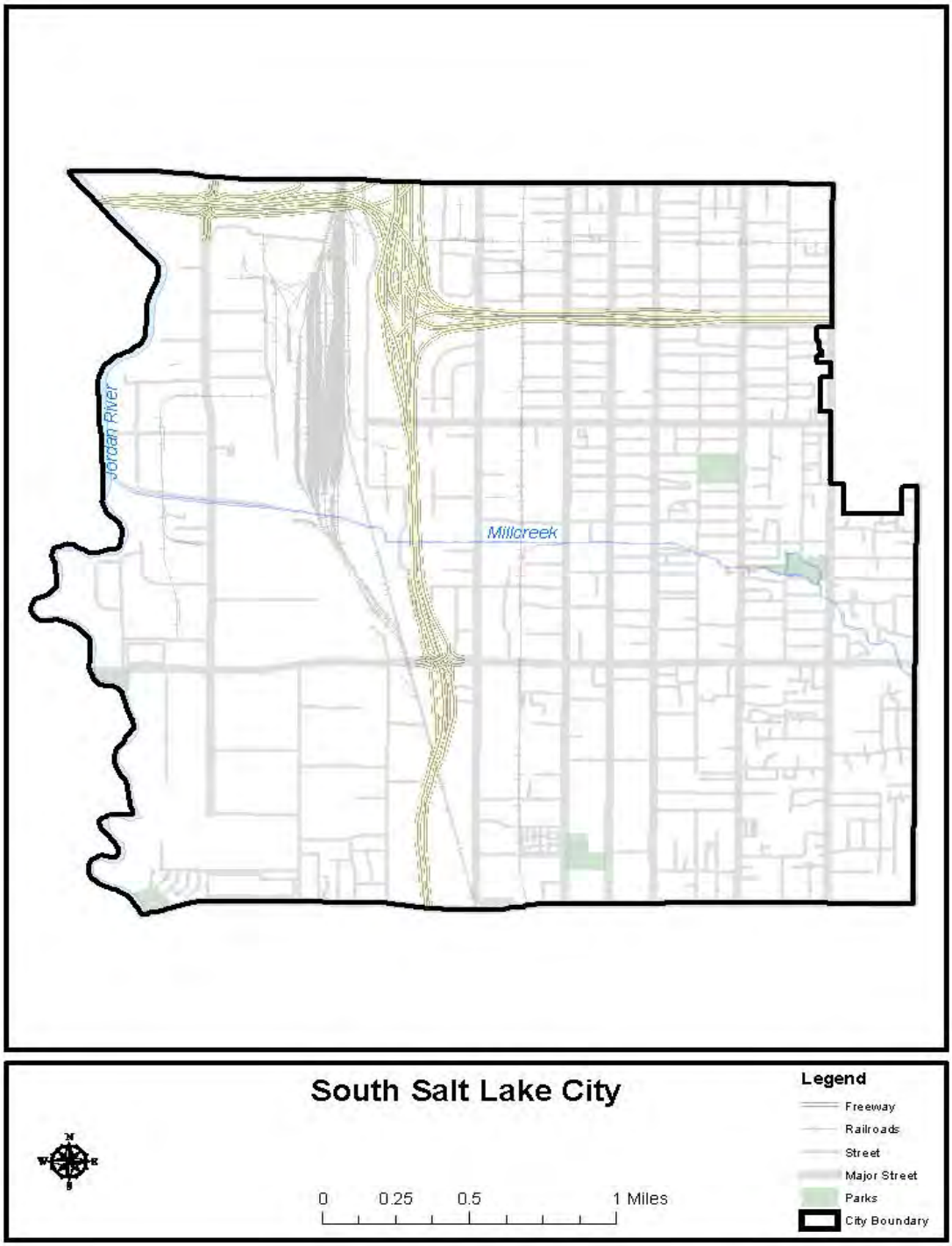


Figure 2. The City of South Salt Lake

1.1 Geography and Climate

The City of South Salt Lake is located at the heart of Salt Lake County and is central to the regions employment, transportation and government partners. The City occupies 7 square miles and

shares borders with Salt Lake City, West Valley and Unincorporated Salt Lake County. The City is a major business provider of the County with over 2,000 businesses and brings approximately 40,000 workers to the City each day. Business areas account for approximately two-thirds of the land use area of jurisdiction. The municipality is the crossroads for the region's transportation network. The major interstates of I-15 and I-80 intersect within the municipal boundaries. The City's residents are among the highest users of public transportation thanks to major bus routes, three light rail stations and three new stops as part of the South Salt Lake/Salt Lake City streetcar. The City is also the center for government, utility, and education. The State of Utah, Salt Lake County, Utah Transit Authority, and Granite School District have offices and key facilities in South Salt Lake which encompasses approximately 21% of the land in South Salt Lake.

The City of South Salt Lake has average annual temperature of 52 degrees F and receives an average of 16.1 inches of rain. While the average temperature is relatively temperate, each season can bring unique and sometimes unpredictable weather patterns. During the summer months the average temperature can exceed 90 degrees F. In the winter months the average temperature is 27 degrees F with temperatures dipping below well below during the night time hours.

1.2 History

Originally, South Salt Lake was made up of three distinct unincorporated areas: Millcreek to the north, Central Park and Southgate to the south. Jesse Fox Jr. developed the area South Salt Lake refers to as Central Park around 1890. It runs approximately from State Street to 300 East and 2500 South to 3000 South.

On Thursday, September 29, 1938 a meeting was called to order at 8:30 p.m. by Robert R. Fitts. Also in attendance at this meeting were Alma Kasteler, A.S. Dykman, Clyde H. Peck, and Ariel A. Jensen. The official resolution as passed by Salt Lake County creating the Town of South Salt Lake and appointing the first town board was read. Board members took their oath before Justice Herman Gygi. And so it began, The Town of South Salt Lake with Mr. Fitts as the first town president. The town was created because of a need for a sewer system. Salt Lake City was going to annex the area in 1936 but couldn't get a sewer system to the area for several years. According to Mr. Fitts the community needed other things as well, like a bank, post office and fire department. After a close vote, residents approved incorporation. The sewer system was a Works Project Administration project. The deadline to file the sewer system plans was two days after the city was incorporated. The project began in 1939 at a cost of $462,000.

The original boundary of South Salt Lake was from 5th East to 3rd West and 2100 South to the center of Millcreek stream. Over the years the population grew, businesses came, and schools were built. On August 1, 1950 the population was such that the Town of South Salt Lake became the City of South Salt Lake and declared a third class city by the county. This changed the form of government to a mayor and city council. During his administration, Marlow Callahan went from Town President to the first mayor of The City of South Salt Lake.
In the 1990s, South Salt Lake annexed portions of unincorporated Salt Lake County to the south, and nearly doubled the boundaries of the City and population.

The current mayor is Cherie Wood. Mayor Wood is a lifelong resident of the City of South Salt Lake, and the first female mayor.

1.3 Economy

The City's economic base consists of light manufacturing, construction trades, distribution, retail sales and wholesale businesses (Table O.1). Two-Thirds of the City is zoned for business uses and the City has over 2,000 businesses within its borders. South Salt Lake's central location in the County, large business districts, and transportation system contribute to its great reputation to do business.

Even with its large business district and proximity to the capital city, South Salt Lake has been able to maintain its small town spirit, which is exemplified in its many community events. The City holds a yearly July 3rd Freedom Festival, Huck Finn Day, Night Out Against Crime, and many other seasonal events.

	Share of Firms	**Share of Employment**
Construction	9.9%	9.0%
Manufacturing	9.5%	12.3%
Trade, Transportation, and Utilities	35.6%	25.6%
Financial Activities	6.4%	6.4%
Business and Professional Services	17.4%	16.2%
Health and Education	3.3%	5.1%
Leisure and Hospitality	5.2%	4.5%
Other	8.3%	3.5%
Government	2.5%	15.3%
Mining and Information	0.0%	2.2%

Table 1 – City of South Salt Lake Business Sectors
Source: Utah Department of Workforce Services, Workforce Research & Analysis, Annual Report of Labor Market Information, 2012.

1.4 Population

In 2012, the total population for the City of South Salt Lake was estimated at 24,668

2 Hazard Identification & Summary

The City of South Salt Lake team referred to the Emergency Operation Plan, developed in May of 2011, to identify hazards that would affect our community (Table 2)

Hazard	Frequency of Occurrence	Potential Magnitude	Population / Area at Risk
Avalanche	N/A	N/A	N/A
Landslide	Low	Low	Site
Drought	Low	Medium	Countywide
Earthquake	Medium	Catastrophic	Countywide
Flooding	Medium	High	Site
Severe Weather			
Snowstorm	High	Medium	Countywide
Severe Cold	Medium	Medium	Countywide
Severe Heat	Medium	Medium	Countywide
Lightning	High	Low	Site
Tornado	Low	High	Site
Utility Outage/Shortage	low	High	Site/Countywide
Hazardous Materials Spill	High	Medium	Site

Table 2 – Hazard Summaries

Guidelines for Hazard Ranking

Rating	Frequency	Consequences
Low	Less than every 25 years	Some impact possible. Usually handled with available community resources
Medium	Between 1 and 25 years	Localized damage may be severe; citywide impact minimal to moderate. Handled with community resources and some mutual aid
High	Annual	Moderate to high citywide impact. May require State of Federal Assistance
Catastrophic		Causing or liable to cause widespread damage or death

2.1 Planning Process

The City of South Salt Lake is planning a continually update to this Hazard Mitigation Plan and defines the processes by which continued resident participation will be encouraged in the process.

2.2 Planning Team

Members of the City of South Salt Lake Mitigation Planning Team as listed below:

Cherie Wood	Mayor
Charee Peck	Chief of Staff
Blaine Daimaru	Emergency Manager
Dennis Pay	Public Works Director
Mike Florance	Community Development Director
Larry Suggars	Building Inspector
Niels Melville	GIS
Roger Kehr	All Hazards Mitigation Specialist

3 Vulnerability Assessment

The purpose of this section is to assess the City of South Salt Lake's vulnerability separate from that of the planning area as a whole. Vulnerability Assessment should be our main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranking them from low to high significance that may vary from other parts of the planning area.

3.1 Assets at Risk

This section reflects the City of South Salt Lake's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing service 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 an impact on this community as well as the surrounding communities.

Essential Facilities

- City Hall - 220 East Morris Avenue
- Columbus Community Center - 2531 South 400 East
- Fire Station # 41 - 2600 South Main Street
- Fire Station # 42 - 3265 South 900 West
- Fire Station # 43 - 3640 South West Temple
- Police Department - 2835 South Main Street
- Public Works - 195 West Oakland Avenue
- SSL Animal Services - 2274 South 600 West

High Potential Loss Facilities

Central Valley Water Reclamation Facility is located on the West portion of the City (800 West Central Valley Road) and handles sewage for the North end of the Salt Lake County area.

Transportation and Lifeline Facilities

Transportation and lifeline facilities are located in the following areas throughout the City of South Salt Lake. Utah Transit Authority (UTA) has three locations for maintenance and offices. They are located at Meadowbrook Bus Yard, Maintenance and Offices (3600 South 700 West & 3610 South 900 West) and their Light Rail Maintenance (2200 South 900 West). UTA's TRAX Light Rail goes through the City and two rails systems, one West bound and one East bound, intersect at the North end of the City. Interstates I-80 and I-15 interconnect in the City of South Salt Lake. Union Pacific Railroad has a maintenance shop and railcar transfer facility located on the Northwest of

the City. Large quantities of product and hazardous materials travel through this facility on a day bases.

An inventory of critical facilities in the City of South Salt Lake is provided in Table 3 and Figure 3.

Critical Facilities Type	Number
Community Centers and City Hall	3
Detention Centers	4
Emergency Operation Centers	2
Fire Departments	3
Health Care Facilities	3
Law Enforcement Facilities	2
Maintenance Yards	4
Residential Elderly Care Facilities	3
Schools and Child Care Facilities	8
Water and Sewer	4
Total	**35**

Table 3 – City of South Salt Lake Critical Facilities

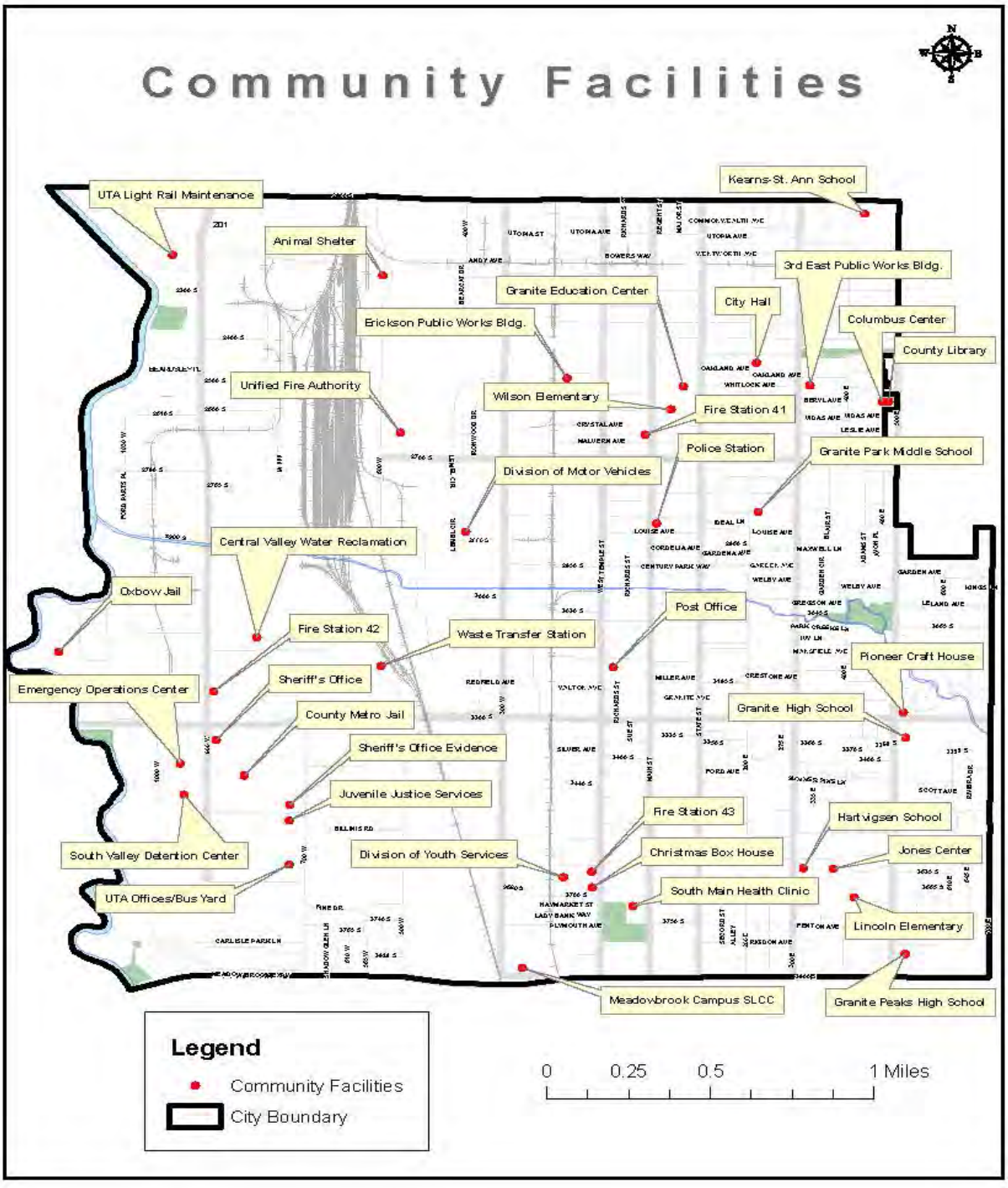


Figure 3 – Facilities Map

Historical Resources

The City has one site, Kearns St. Ann School, which is on the National Register of Historic Places. There are several other historically important sites within South Salt Lake that define the community and represent the City's history. Some of the historical sites of importance to South Salt Lake are listed below

- Columbus Center

- Historic Scott School
- Granite High School
- Former Granite School District Administrative Offices
- Water Tower
- Woodrow Wilson Elementary

Economic Assets

The City of South Salt Lake is the work place for approximately 40,000 employees each work day. Because of two major interstates and a heavy rail system and distribution had the City contributes greatly to the supply of goods to all location around the State and regionally in the Western United States. The City also contributes significantly to the to the sales tax revenue in the millions of dollars to the State of Utah. Loss of either employers or the transportation network would have a significant impact on employers, employees, tax revenue and the distribution of goods.

Growth and Development Trends

Due to the City's proximity to Salt Lake City and vast transit networks, the City has seen over the past eight years, a substantial increase in home building. Because the City is essential "built out" land is in short supply and the cost of land can be expensive. For this reason, most development in the City is more of an urban nature with small lot single family detached home, townhomes and multi-family development. Below is a chart showing the number of residential units built from 2006 to present.

Table 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 estimate is 24,668 with a ten-year average rate of 1.6 percent. Figure 4 indicates the number of units built from 2006 to 2014 as per the South Salt Lake building permit records.

2000 Population	2010 Population	Estimated Percent Change 2000-2010	Yr. 2000 # of Housing Units	Yr. 2010 Estimated # of Housing Units	Estimated Percent change 2000-2010
24,380	24,668	+ 1.6%	10,532	11,022	+5%

Table 4 City of South Salt Lake Change in Population and Housing Units 2000-2010
Source: United States Census Bureau

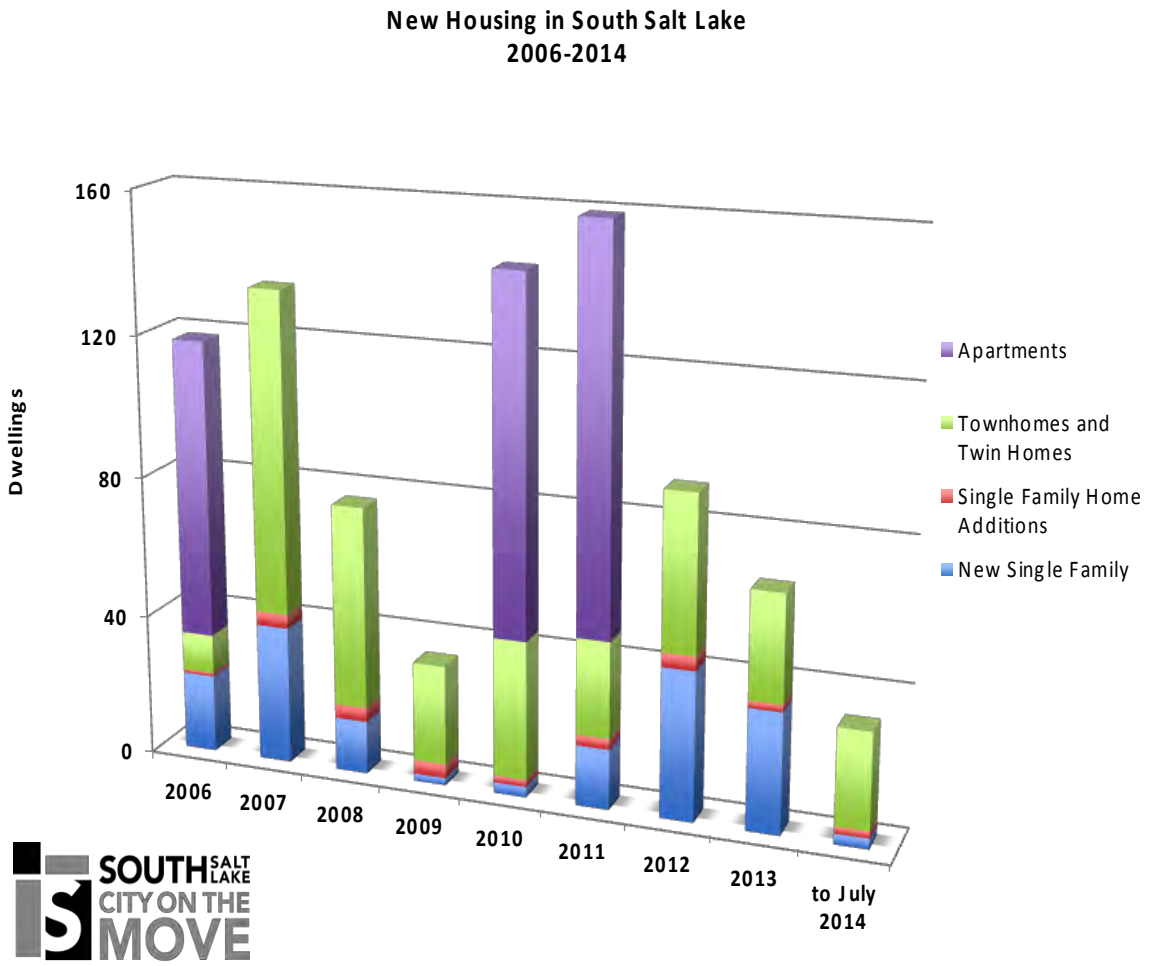
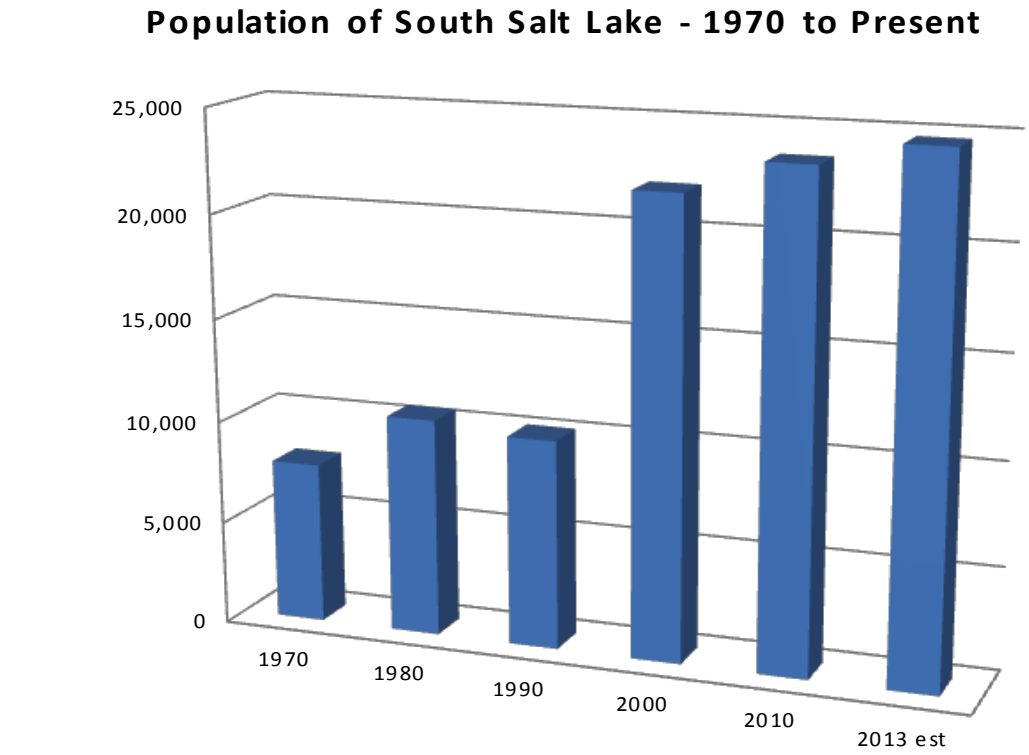


Figure 4 – New City of South Salt Lake Housing



Source: U.S. Census Bureau, South Salt Lake General Plans

Note: In 1998, South Salt Lake City annexed a portion of unincorporated Salt Lake County. This annexation increased the city's population by over 10,000 residents.

Figure 5 – Population Changes from 1970-2013

The City has a number of new housing projects either planned or under construction that will add to the housing inventory in the City. The following table provides an overview of upcoming development.

Name of Development	Number of Units	Type of Project	Time Frame
East Streetcar Corridor	450	Multi-family	6-12 months
Central Pointe	1,500	Multi-family	2-10 years
River Front	380	Single family, townhomes, multi-family	6-18 months
Sharon Gardens	58	Multi-family senior housing	6-12 months

Table 5 – Upcoming Housing Developments in the City of South Salt Lake

Utah State Code 10-9a-401 requires that each municipality prepare and adopt a comprehensive, long range general plan to address needs of the municipality, and growth and development of all or any part of the land within the municipality. The general plan may provide for the following:

- Health, general welfare, safety, energy conservation, transportation, prosperity, civic activities, aesthetics, and recreational, educational, and cultural opportunities;
- The reduction of the waste of physical, financial, or human resources that result from either excessive congestion or excessive scattering of population;
- The efficient and economical use, conservation, and production of the supply of:
- Food and water;
- Drainage, sanitary, and other facilities and resources;
- The use of energy conservation and solar and renewable energy resources;
- The protection of urban development;
- The protection or promotion of moderate income housing;
- The protection and promotion of air quality;
- Historic preservation;
- Identifying future uses of land that are likely to require an expansion or significant modification of services or facilities provided by each affected entity; and
- An official map.

Adopted in 2009, The City of South Salt Lake General Plan 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. Estimates are made about future housing, population, employment base, traffic, land use, economic development, parks and community values (Figures O.6 and O.7). The general plan represents an agreement on the fundamental values and vision that is shared by the residents and the business community of South Salt Lake. Its purpose is to provide decision makers and City staff with direction for confronting present issues as an aid in coordinating future planning of the City.

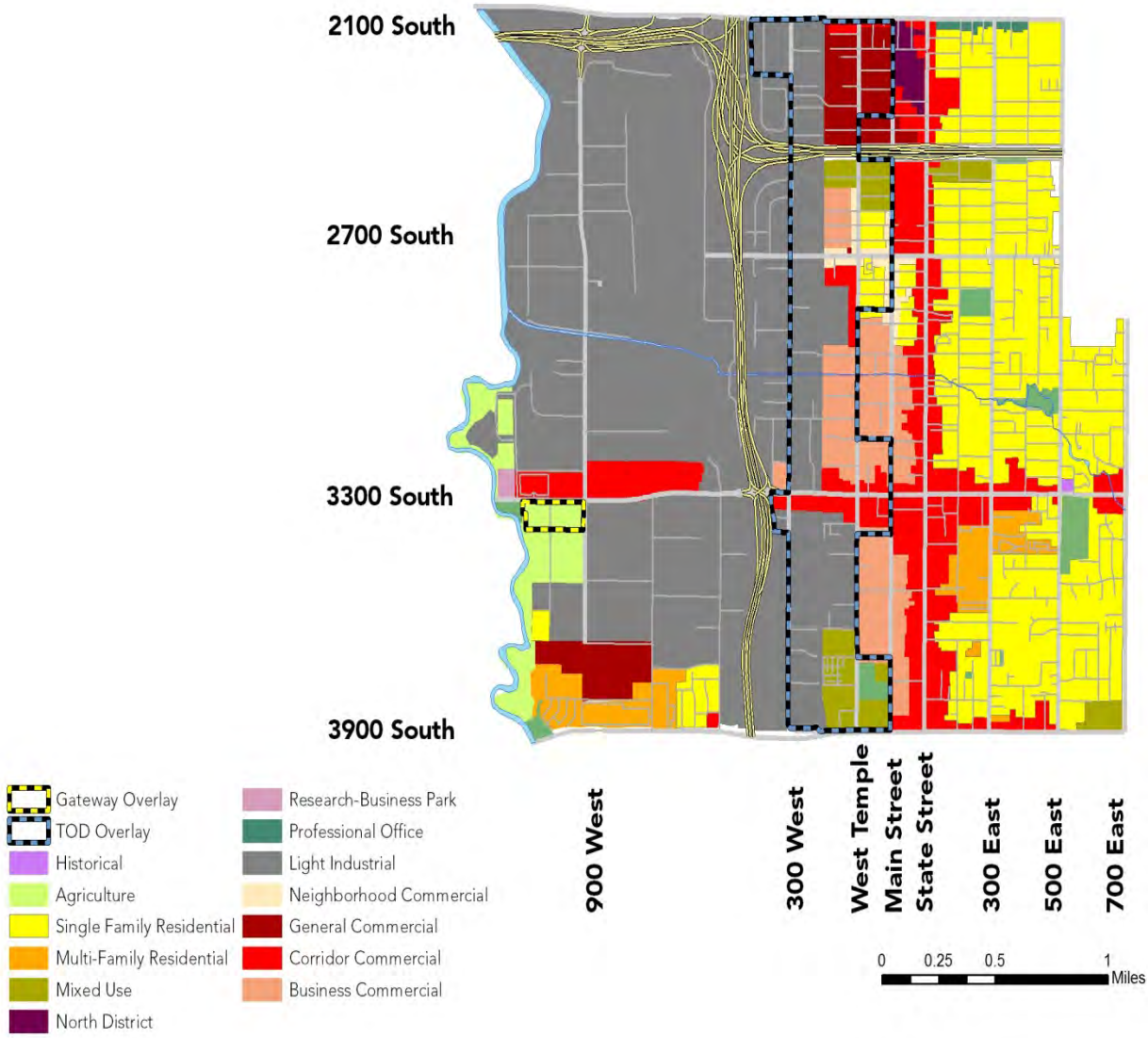


Figure 6 – City of South Salt Lake Zoning Map

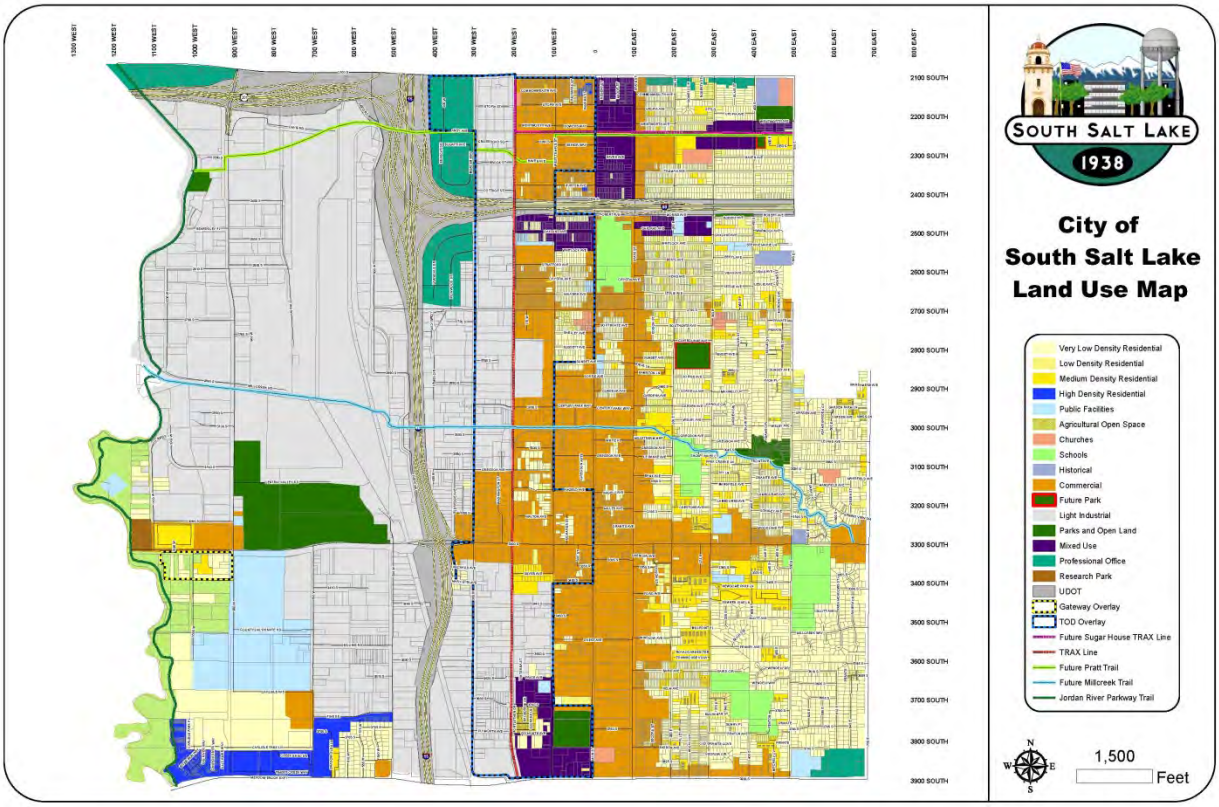


Figure 7 – City of South Salt Lake Land Use Map

3.1.1 Drought

Figure 8 shows the 6 canyon stream flows from 2000 -2012 based on each year's percentage above or below the mean flow. As can be seen, the stream flows have been below mean 9 times and above mean 4 times – clearly demonstrating that the Wasatch Canyon watersheds have been affected by the drought covering much of West.

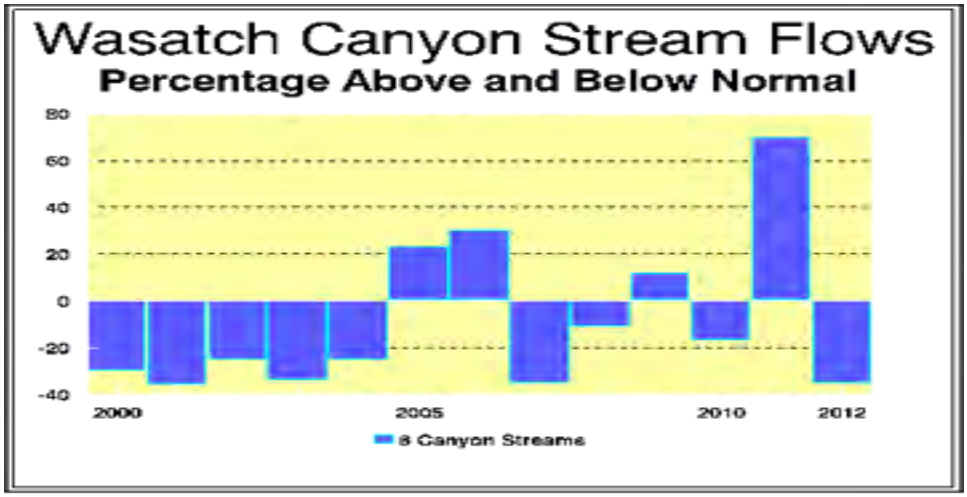


Figure 8 Flows emanating from the Wasatch Canyon streams. The copious snow and resulting runoff of 169 percent of normal interrupted the drought in 2011. Data provided by Salt Lake City Public Utilities hydrology specialist Larry Alserda.

3.1.2 Earthquake

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, utilities, railroads and major transportation routes. However, potential damage is not limited to fault zone areas. Fine-grained, lake-bottom sediments are common and are susceptible to liquefaction-induced ground failure during a large 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.

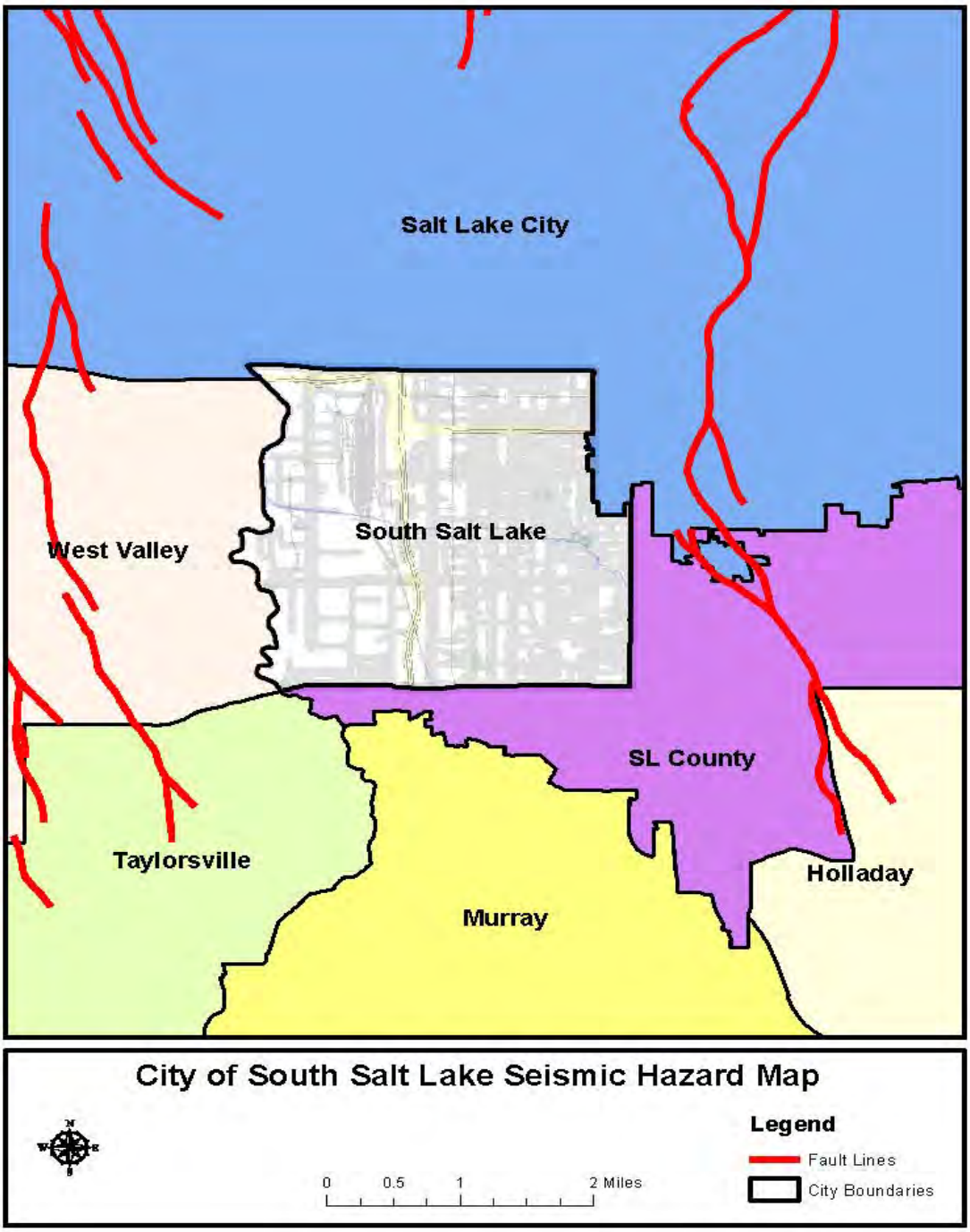


Figure 9 – City of South Salt Lake Seismic Map

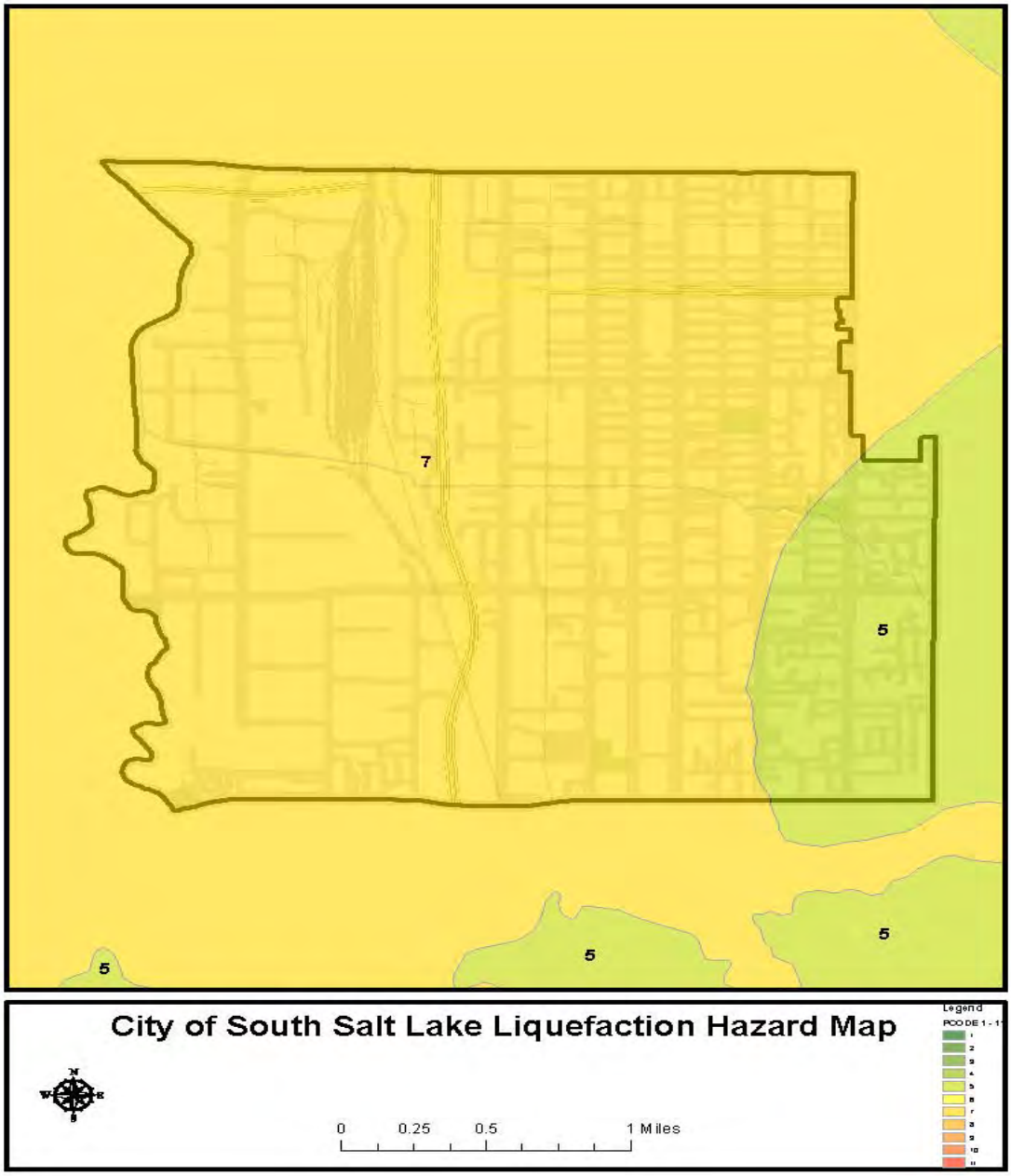
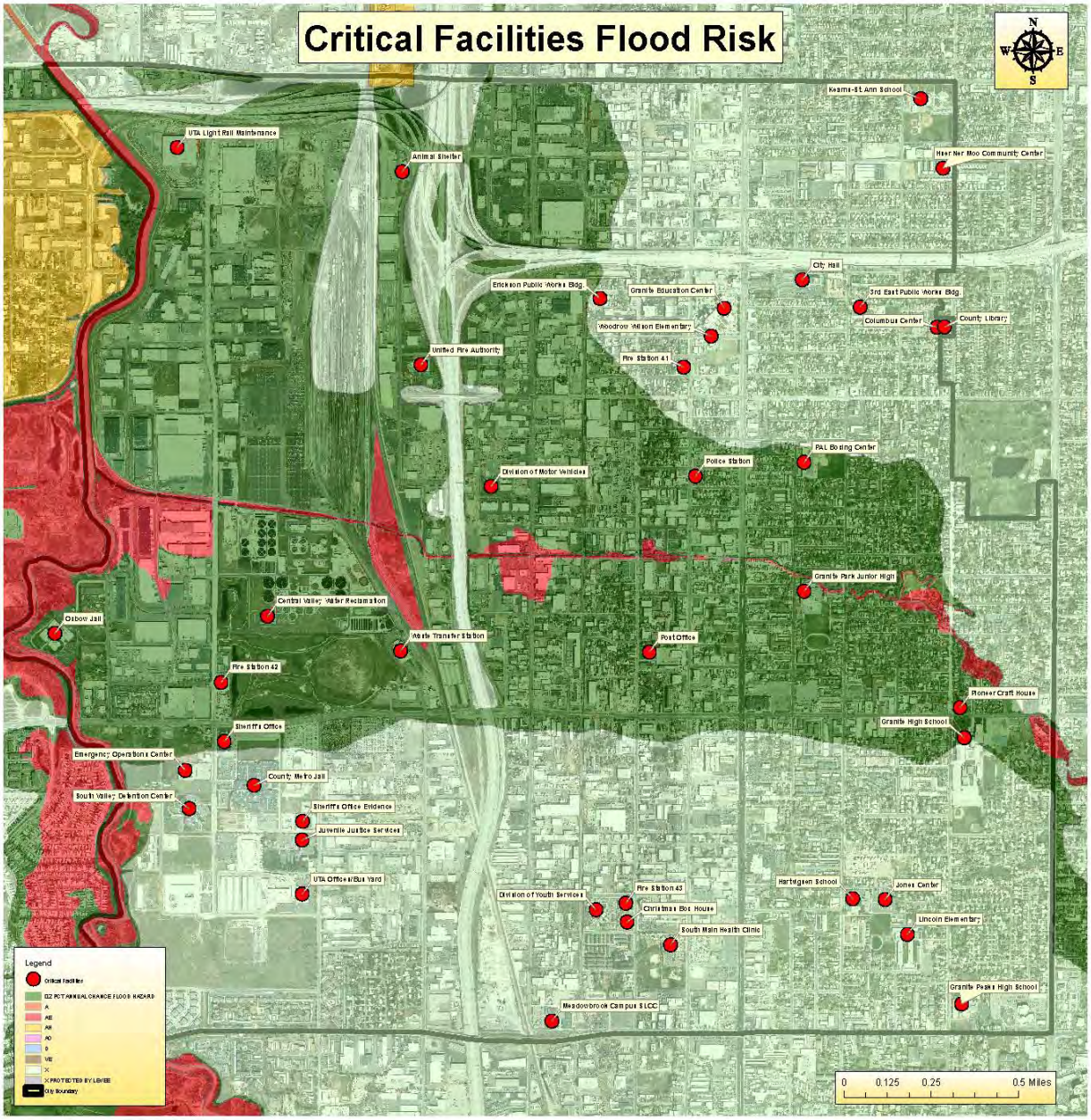


Figure 10 – City of South Salt Lake Liquefaction Map

Liquefaction Hazard:
PCODE 5 - $450,839,620
PCODE 7- $3,091,978,400

3.1.3 Flood

The city of South Salt Lake has no repetitive losses identified under the National Flood Insurance Program (NFIP).



Flood Hazard:
AE flood zone - $111,586,350
.2 flood zone- $1,465,354,400
X flood zone- $2,129,059,520

Figure 11 – City of South Salt Lake Critical Flood Risk Map

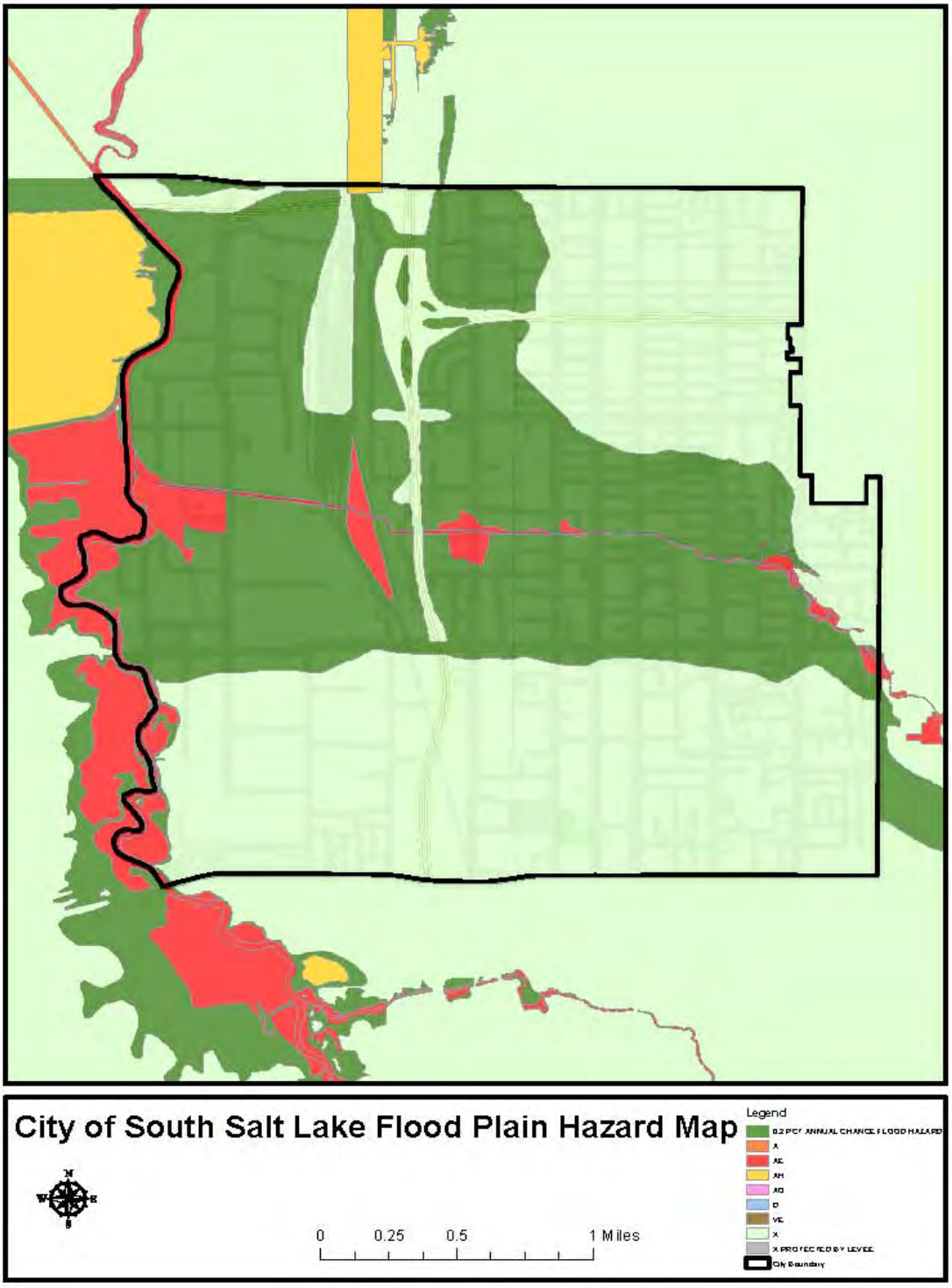


Figure 12 – City of South Salt Lake Flood Plain Hazard Map

Severe Weather: Extreme Cold

Average Number of Days with a minimum temperature of 0° F or less:

Month	Number of Days
• December	1
• January	1
• February	1

Greatest number of days in a month with a minimum temperature of 0°F or less:

Month and Year	Number of Days
• January 1949	15
• January 1937	14
• December 1990	10
• December 1972	9
• January 1973	7
• January 1974	6

Average number of days with a minimum temperature of 32°F or less:

Month	Average Number of Days
• January	28
• February	22
• March	16

Greatest number of days in a month with a maximum temperature of 32°F or lower:

Month and Year	Number of Days
• January 1949	26
• January 2004	25
• January 2013	24
• January 1973	23
• January 1984	22

Severe Weather: Extreme Heat

Greatest number of days in one month with a temperature of 100°F or greater:

Month and Year	Number of days
• July 1960	15
• July 2003	14
• July 2013	13
• July 2007	11
• July 2006	9
• June 2005	8

Greatest number of days in one month with a temperature of 95°F or greater:

Month and year	Number of days
• July 2007	24
• July 1960	23
• July 2013	22
• August 2013	21

3.1.4 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.

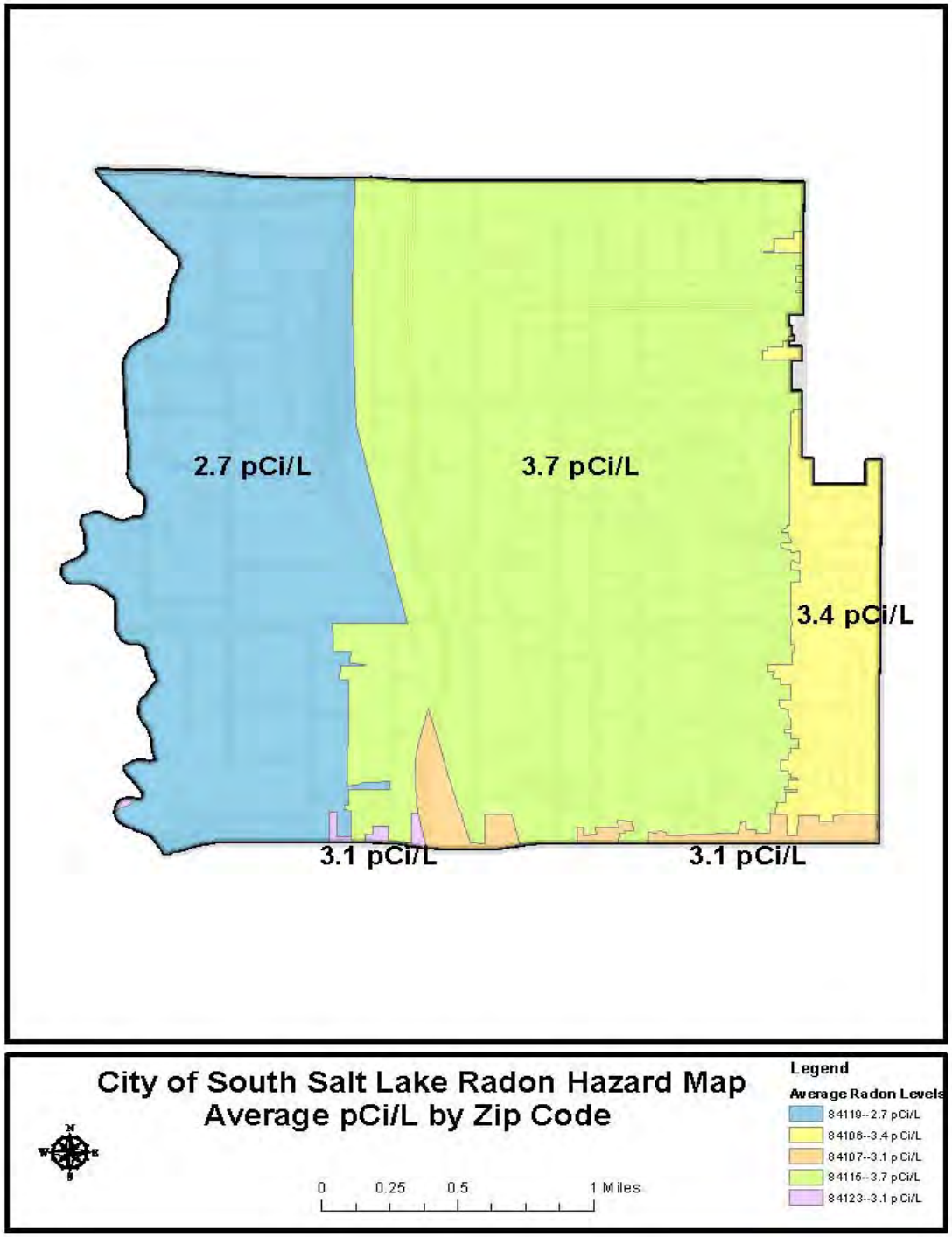


Figure 13 – City of South Salt Lake Radon Hazard Map

3.2 National Flood Insurance Policy (NFIP)

National Flood Insurance Program

Most of the known floodplain areas in the United States have been mapped by Federal Emergency Management Agency, which administers the National Flood Insurance Program (NFIP). The NFIP gathersflood risk data for specific water-courses, lakes, and coastal flood hazard areas, maps, and causes of flooding within a community. This information is compiled into a Flood Insurance Study that designates special flood hazards areas, flood risk zones and establishes base flood elevations (State and Local Mitigation Planning 2-12). Table 1National Flood Insurance Status for Wasatch Front Regional Council identifies the members.

Community Name	**Community ID**	**Date of Entry**(Emergency Program (E) or Regular Program (R))	**Current Effective Map** (No Special Flood Hazard Area (NSFHA), all zone C)
South Salt Lake, City of	490219	12/18/85®	05/15/02

Table 1. National Flood Insurance Status

The City's Community Development Director 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.

4 Mitigation Strategy

4.1 Mitigation Actions

4.1.1 Drought

Update the City landscape code in order to reduce the amount of water used by South Salt Lake businesses and residents
Issue/Background: The Utah climate is characterized as semi-arid. For the last few years the western United States has experienced lower than expected rain fall and snow pack. While South Salt Lake has not experienced, as of yet, water rationing for irrigation it is considered a valuable resource. In 2013, the South Salt Lake City Council adopted a new landscaping code and handbook. The landscape code set minimum requirements for drought tolerant vegetation and planting areas. The handbook, lists plant and tree species that do well in the Wasatch Front climate and require very little water. The handbook also provides examples and considerations when installing irrigation systems. Landscape regulations are implemented for new construction or when landscaping is replaced.
Other Alternatives: No action
Responsible Office: South Salt Lake Community Development Department
Priority: Medium
Cost Estimate: $0
Potential Funding: $0
Benefits: Less water being used and implementing sustainable practices
Schedule: Complete and being implemented

4.1.2 Flood

Regulate development as per South Salt Lake City Code Title 15.20 (Flood Damage Prevention) and when development is proposed in a designated flood plain area as per the Federal Flood Insurance Rate Maps.
Issue/Background: Title 15.20 regulates development and setback standards for new construction. The City ordinance also designates a flood administrator who implements the ordinance in areas designated by the Flood Insurance Rate Maps. Developers are notified of higher design and construction standards when they build in a flood plain area.
Other Alternatives: No action
Responsible Office: South Salt Lake Community Development Department
Priority: Low
Cost Estimate: $0
Potential Funding: $0
Benefits: Buildings constructed in the designated flood plain areas are built to a higher construction standard. Buildings must also meet specific setback requirements to ensure a proper flood plain area.

Schedule: Complete and being implemented

4.1.3 Earthquake

Train and Certify City Inspectors to Conduct Pre/Post-Disaster Damage Assessment
Issue/Background: City inspectors will play a vital role in pre-disaster building assessment for city owned public buildings by training on potential seismic issues. Pre-training is vital for both response and recovery to reduce in loss of life, relocate populations, and ensure in the rebuilding of the local economies.
Other Alternatives: No action
Responsible Office: South Salt Lake Community Development Department
Priority (High, Medium, Low): High
Cost Estimate: Community Development Department budgets $2,500 a year for inspector training that can be used for such trainings
Potential Funding: General Fund
Benefits (Avoid Losses): This will improve response and the recovery during an event through pre-training and certifications. Currently our staff is certified in the model codes (International Building, Plumbing, Mechanical, International Residential and NFPA Electrical code). Specific training will enhance the individuals responsible for preforming the assessment of structures and facilities impacted by disasters.
Schedule: As trainings become available in the local area

Conduct a Seismic Vulnerability Assessment of City owned critical facilities
Issue/Background: The city is interested in preforming a building-specific, seismic vulnerability assessment of city-owned critical facilities, and to include the infrastructure. Included in this assessment will be recommended mitigation alternatives that meet the goals and objectives of this plan.
Other Alternatives: No action
Responsible Office: South Salt Lake Community Development Department
Priority (High, Medium, Low): High
Cost Estimate: Inspector salary
Potential Funding: General Fund
Benefits (Avoid Losses): This will prevent the loss of human life, economic and property loss to City owned facilities
Schedule: Long term

4.1.4 Problem Soils

Geotechnical Study
Issue/Background: The city requires a soils investigation report referred to as "Geotechnical Study" on most large building or structures. Geotechnical studies play a major role for site development projects. This study has been required for the better part of five years. Two conditions play a substantial part in South Salt Lake City soil make up, ground water and lake bottom type soils. Much of our city is located on or close to an aquifer.

Other Alternatives: No action
Responsible Office: South Salt Lake Community Development and Public Works departments
Priority (High, Medium, Low): High
Cost Estimate: $0
Potential Funding: Paid for by developer
Benefits: The City and developer know what types of soils that are being built upon. An engineer is makes recommendations for structural and soil improvements
Schedule: The Community Development Department will put together a schedule for inspecting City owned buildings

4.1.5 Emergency Managers Mitigation Schedule:

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

4.1.5.2 The cost for this mitigation effort is minimal.
4.1.5.3 The benefit will range from hundreds of thousands of dollars to millions of dollars.
4.1.5.4 The benefit to cost ratio is almost infinite

4.1.6 Pandemic

South Salt Lake 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. "**

4.1.6.2 The cost for this mitigation effort is minimal.
4.1.6.3 The benefit will range from hundreds of thousands of dollars to millions of dollars.
4.1.6.4 The benefit to cost ratio is almost infinite

4.1.7 Radon

4.1.7.1 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.

YOUR JURISDICTION NAME GOES HERE 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 disclamer 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 professonal for prices and ways to fix the problem. The Utah Department of Environmental Quality has this list.

4.1.7.2 The cost for this mitigation effort is minimal.
4.1.7.3 The benefit will range from hundreds of thousands of dollars to millions of dollars in the potential reduction of healthcare costs.
4.1.7.4 The benefit to cost ratio is almost infinite

4.1.8 Problem Soils

4.1.8.1 Problem Statement

South Salt Lake City is prone to areas of collapsible soil.
South Salt Lake City 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.

4.1.8.2 The cost for this mitigation effort is minimal.
4.1.8.3 The benefit will be approximately hundreds of thousands of dollars.
4.1.8.4 The benefit to cost ratio is almost infinite

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

South Salt Lake City 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.

4.2 Integrating the 2009 Wasatch Front Mitigation Plan into South Salt Lake City's 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 South Jordan on October 6, 2009. The following summary highlights the City of South Jordan'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 South Jordan, 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

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	Ongoing	So. S.L. 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	So. S.L. participates in training and exercises designed to practice using communication tools and equipment. Example: using amateur radio volunteers to support special events like the 4TH of July Celebration to exercise its communication 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	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	So. S.L. 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	Ongoing	So. S.L. evaluates areas of vulnerability and develops solutions to ensure communication systems or alternate solutions are viable
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	So. S.L. relies on the Valley Emergency Communications Center (VECC) for dispatch services. They coordinate with other PSAPS to provide redundancy.

Category	Goal / Objective	Action	Status	Comments
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 So S.L. 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	So. S.L. 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	So. S.L. 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	So. S.L. 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	So. S.L. 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	So. S.L. 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.	Not Addressed	
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 Addressed	

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	1 – Utilize GIS to identify facilities and infrastructure at risk	Ongoing	So. S.L. GIS, Fire and Emergency and Risk Management personnel are working on a 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	In Process	So. S.L. GIS, Fire and Emergency and Risk Management personnel are working on a 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	So. S.L. is identifying options and opportunities to address issues
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	So. S.L. 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	So. S.L. 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	In Process	So. S.L. Emergency Management is meeting with groups to discuss the hazards in the community and what residents can do to be prepared

Category	Goal / Objective	Action	Status	Comments
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	In Process	So. S.L. Emergency Management is meeting with 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	3 – Develop education programs to target specific groups including homeowners, developers, schools and people with special needs	Ongoing	So. S.L. Emergency Management is meeting with 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	4 – Utilize maps and similar products on County EM website and other media to educate public on areas at risk to hazards	Ongoing	So. S.L. GIS personnel have 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.	Ongoing	So. S.L. has worked with Be Ready Utah and other programs to make presentations in the City and will continue to invite them to events and other activities in the community
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	Ongoing	So. S.L. 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	In Process	So. S.L ordinances are available on line from their Home Page
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 Applicable	This is not applicable to So. S.L.

Category	Goal / Objective	Action	Status	Comments
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 Applicable	
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	So. S.L. encourages water conservation and provides material 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	So. S.L. encourages water conservation
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 Applicable	
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	In Process	So. S.L. encourages water conservation
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	So. S.L. Water Dept. 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	So. S.L. Water Dept. 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	Ongoing	So. S.L. encourages water conservation

Category	Goal / Objective	Action	Status	Comments
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 So. S.L.
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 Applicable	This is not applicable to So. S.L.
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	In Process	So. S.L. GIS, Fire and Emergency and Risk Management personnel are working on a 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 Applicable	No Research
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 Addressed	
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 Addressed	
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 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	1 – Assist Cities with NFIP application	Not Addressed	

Category	Goal / Objective	Action	Status	Comments
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 Addressed	
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
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 Office 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 Office 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 Applicable	So. S.L. 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 1.1 – Maintain status as a StormReady Community	2 – Maintain Contact with NWS prior to re-application in 2010	Not Applicable	So. S.L 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	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	2 – Assist NWS in making other agencies and departments aware of available resources	Not Applicable	
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 Applicable	
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 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 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	So. S.L Engineering and Planning reviews recommendations as provided pertaining to development within the City

Category	Goal / Objective	Action	Status	Comments
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 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 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	1 – Designate and promote county-wide annual initiative for clearing fuels	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	Ongoing	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	In Process	So. S.L has some transportation capabilities 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 So. S.L. 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 2.3 – 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 So. S.L. is complete
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	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 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 So. S.L. water system meets 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	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 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 2.5 – Encourage proper development practices in the WUI	2 – Define wildland-urban interface and develop digital maps of the WUI	Not Applicable	This is a very low probability event for the City and not applicable

5 Plan Implementation & Maintenance

5.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The City of South Salt Lake 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.

5.2 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.

5.2.1 Annual Review Procedures

The City of South Salt Lake 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.

5.2.2 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 the City of South Salt Lake 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.

5.3 Hazard Mitigation Plan Amendments

The City of Holladay will amend and update its Hazard Mitigation Plan as needed.

5.4 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. Business 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.

5.5 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.

6 Hazard Mitigation Plan Adoption

It is the intent of the City of South Salt Lake 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 South Salt Lake Recorder's office.

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TAYLORSVILLE, UTAH
RESOLUTION NO. 16-05

A RESOLUTION OF THE CITY OF TAYLORSVILLE TO ADOPT THE SALT LAKE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the Taylorsville City Council (the "Council") met in regular session on January 20, 2016, to consider, among other things, adopting the Salt Lake County Multi-Jurisdictional Hazard Mitigation Plan as described in Exhibit "A", attached hereto; and

WHEREAS, on August 7, 2012, the City of Taylorsville's (the "City") former emergency response coordinator, Lisa Schwartz, signed a Memorandum of Understanding committing the City to participate in Salt Lake County's multi-jurisdictional hazard planning process (the "Plan"); and

WHEREAS, the Federal Emergency Management Agency's Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans; and

WHEREAS, the intent of the Plan is to allow for multi-jurisdictional mitigation plans to address issues that may be better resolved by coordination at the county, regional, or watershed level; and

WHEREAS, the Council has determined that it is in the best interests of the citizens of the City to adopt the County's multi-jurisdictional hazard plan.

NOW, THEREFORE, BE IT RESOLVED that the Taylorsville City Council hereby adopts the Salt Lake County Multi-Jurisdictional Hazard Mitigation Plan as described in Exhibit "A", attached herein.

This Resolution, assigned Resolution No. 16-05, shall take effect immediately upon passage and acceptance as provided herein.

PASSED AND APPROVED by the Council of Taylorsville, Utah, this 20 day of January, 2016.

TAYLORSVILLE CITY COUNCIL

Ernest Burgess

Ernest Burgess, Chairman

SEAL

VOTING:

Dama Barbour	✓ Yea	___ Nay
Ernest Burgess	___ Yea	___ Nay
Brad Christopherson	~~___ Yea~~	~~___ Nay~~ excused
Dan Armstrong	✓ Yea	___ Nay
Kristie Overson	___ Yea	___ Nay

PRESENTED to the Mayor of the City of Taylorsville for approval this 22 day of January, 2016.

APPROVED this 22 day of January, 2016.

Lawrence Johnson, Mayor

ATTEST:

Cheryl Peacock Cottle

Cheryl Peacock Cottle, City Recorder

DEPOSITED in the office of the City Recorder this 22 day of January, 2016.

RECORDED this 22 day of January, 2016.

Hazard Mitigation Plan (2014)

For questions or information about this plan, please contact:

Ben Gustafson
Emergency Response Coordinator
(801) 576-6560
bgustafson@taylorsvilleut.gov

ANNEX O: CITY OF TAYLORSVILLE
1 Introduction

1.1 Background

The City of Taylorsville is located at the heart of Salt Lake County lying just west of the Jordan River. The city is approximately 9 miles south of Salt Lake City and neighbors West Jordan, West Valley and Murray Cities and Kearns.

Dating from a pioneer settlement in 1848, From a 70% majority vote in 1995, the City of Taylorsville was incorporated during the State of Utah's centennial celebrations making the City "Utah's Centennial City."

The city has nearly 14,000 households with a population surpassing 60,000 in 2012 according to records and trends according to the US Census making it Utah's 10th largest city by population while covering only 10.8 square miles; Utah's 52nd largest city by land area.

1.2 Purpose

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

Its mission statement says, "It is the mission of the City of Taylorsville, its elected officials, employees and volunteers to provide efficient and cost effective services that enhance the quality of life and community identity by being accessible, proactive, innovative, accountable and responsive to the needs of the community."

The values of the City include:

- Integrity and honesty in everything we do
- Respect for human dignity
- Quality service and cooperation

Its goals include:

- Improve and enhance customer service
- Make life better
- Increase efficiency and effectiveness
- Assure public safety

1.3 Authority and Reference

The City of Taylorsville is governed by a three branch system. A full-time Mayor acts as the Chief Executive of the Executive Branch, the City Council, chaired by a chairperson, serves as the Legislative Branch and the Presiding Judge oversees the Judicial Branch. The City Manager is full-time and works under the direction of the Mayor.

Taylorsville 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. In the cities within Salt Lake County, the local executives are responsible for carrying out plans and policies, including the county council and city or town mayors and administrators. Taylorsville must be 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.

2 Community Profile

2.1 Geography, Environment & Climate

The City of Taylorsville is located in the center of the Salt Lake Valley lying just west of the Jordan River covering 10.8 square miles.

While in the center of the valley, the City is encircled by neighboring jurisdictions including West Jordan, West Valley and Murray Cities as well as an unincorporated area, Kearns. In the near distance, the city is propped central to the Wasatch and Oquirrh Mountain ranges. Much of the land is dedicated to developed residential and commercial use while large areas still remain open.

The City of Taylorsville has an average annual temperature of 53.1°F and receives 14.7 inches of precipitation.

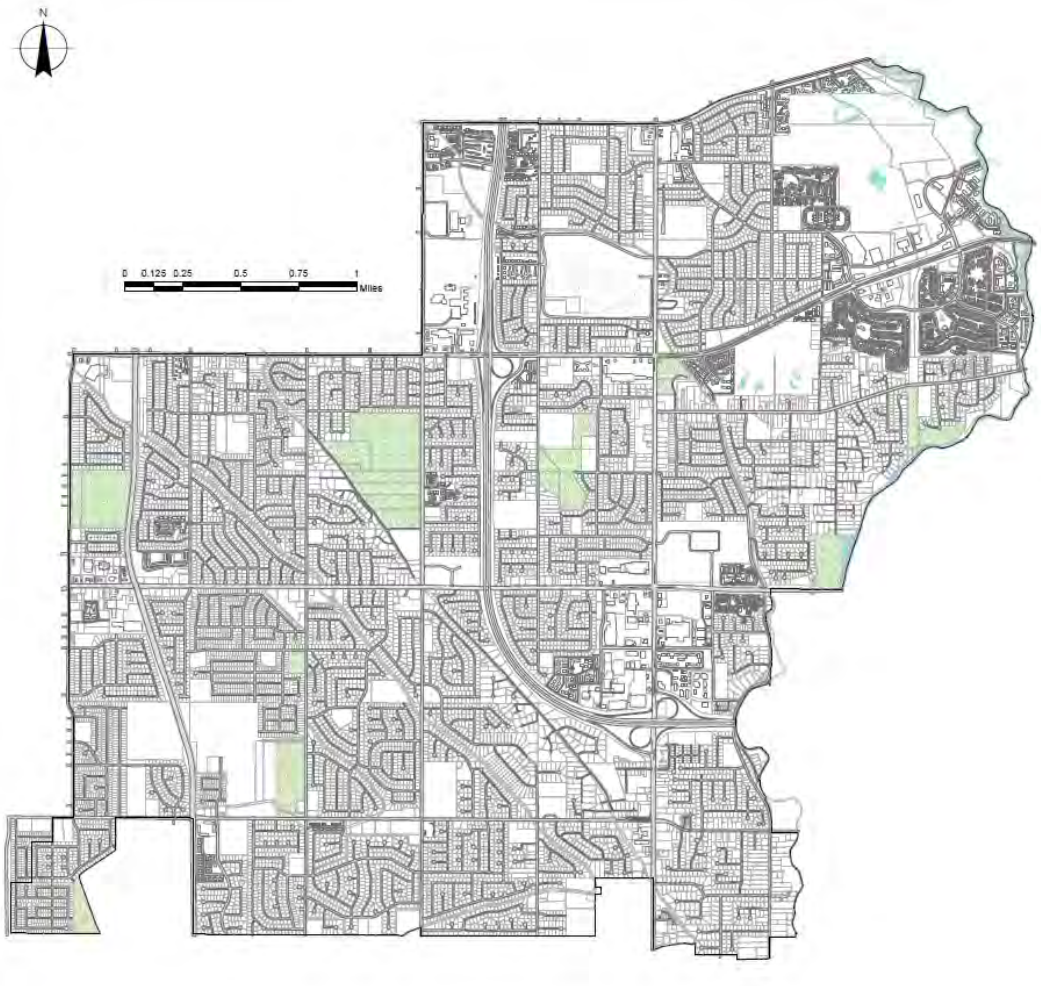


Figure 1. The City of Taylorsville

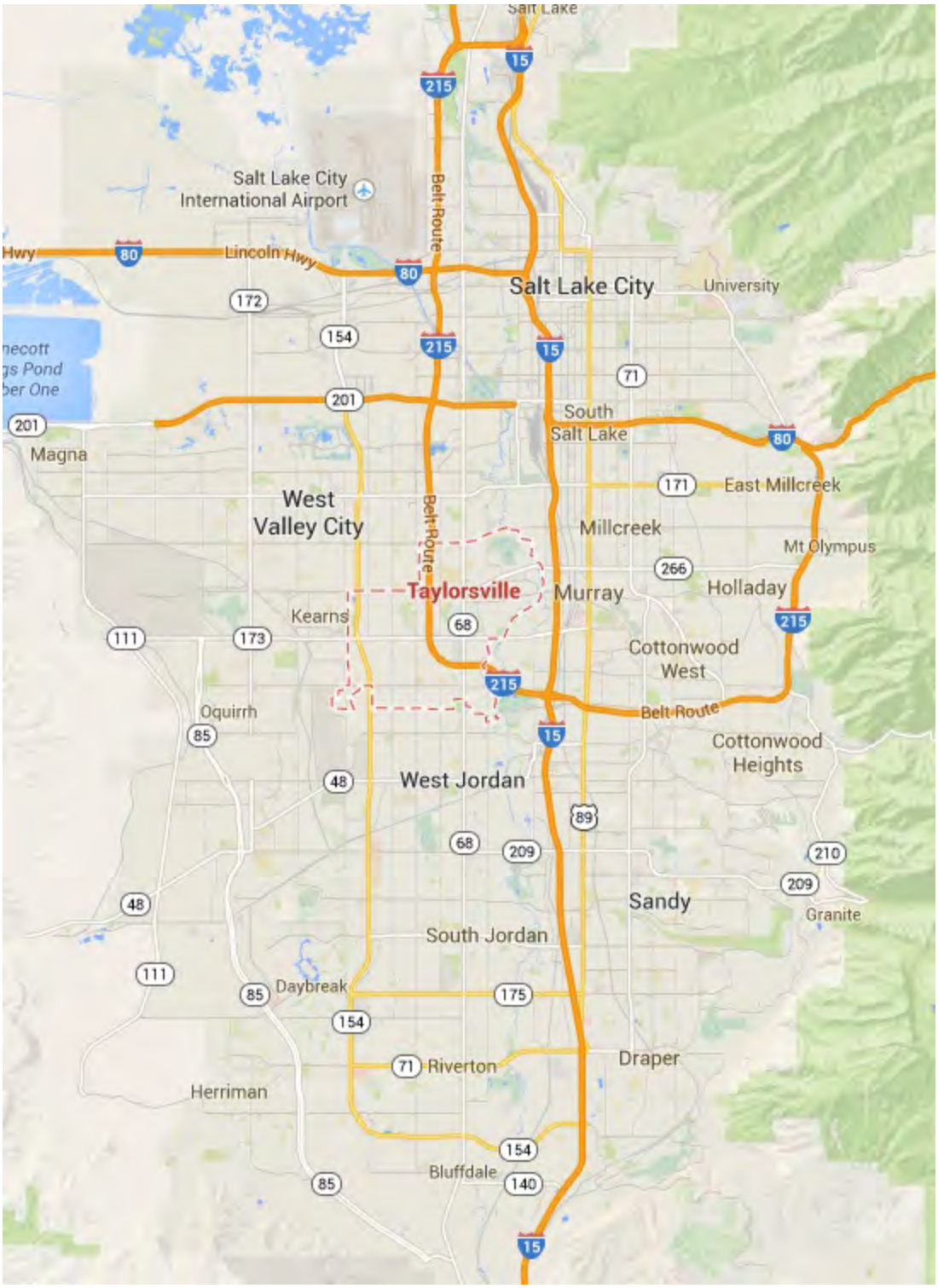


Figure 2. The City of Taylorsville within Salt Lake County

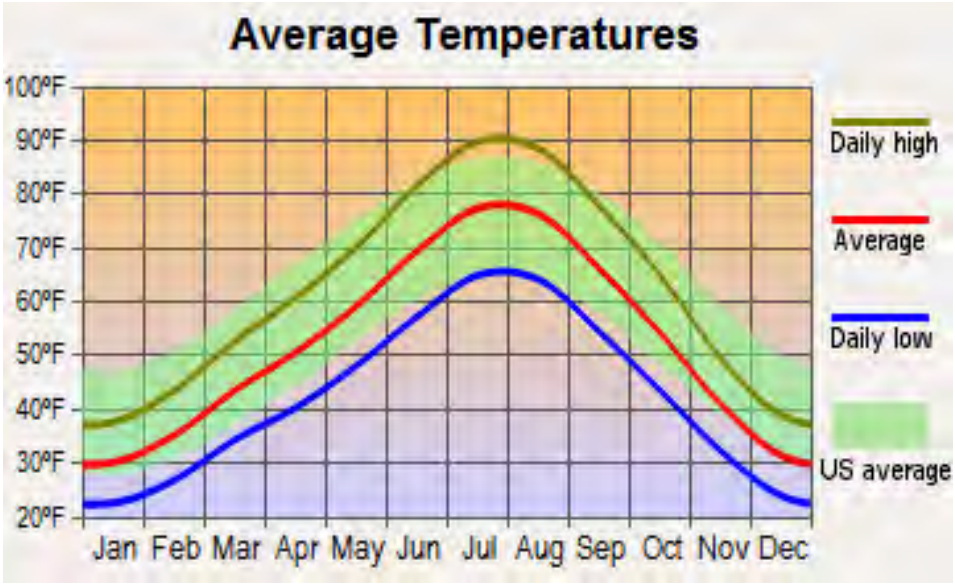


Figure 3. The City of Taylorsville's Average Temperatures

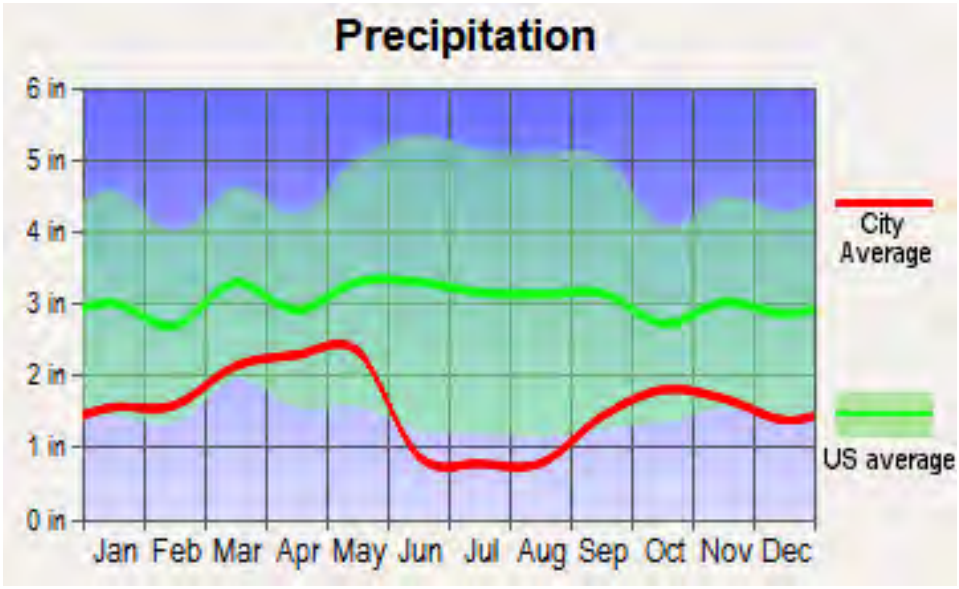


Figure 4. The City of Taylorsville's Average Precipitation

2.2 Community Facts and History

Named after the prominent Utah figure, John Taylor who resided in what would become Taylorsville during the 1880's, the first settlers arrived in Taylorsville in 1848 utilizing the close access to the Jordan River to water their crops. The town slowly grew through the 19th century in areas known as Taylorsville, Bennion and Kearns.

Much of the area was purchased by the federal government for a military training facility during WWII which brought with it much of the infrastructure including water and sewage.

In the 1980's many businesses began to develop in the area of Taylorsville bringing with them larger amounts of residents. Because of the increase in population, residents became concerned for the high growth rates affecting other aspects including public safety. Later in 1995, residents in Taylorsville, Bennion and Kearns voted with a 70% majority to incorporate which was later completed in 1996 during the State of Utah's centennial celebrations making Taylorsville "Utah's Centennial City."

2.3 Population and Demographics

In 2012, the total population for the City of Taylorsville was estimated at 60,227 by the U.S. Census. The City's Median Household Income is $57,400 with just under 20,000 households. The median age is 31 years.

2.4 Economy

Taylorsville is proud to have the head offices of Salt Lake Community College at its Taylorsville Redwood Campus where thousands of students are able to receive their secondary education in many trade and traditional fields. Businesses like American Express, Sorenson Research Park, Utah Department of Transportation, Nelson Laboratories as well as others are all found within the City and provide wonderful employment opportunities to many Taylorsville residents and others in the neighboring communities.

2.5 Land Use and Development

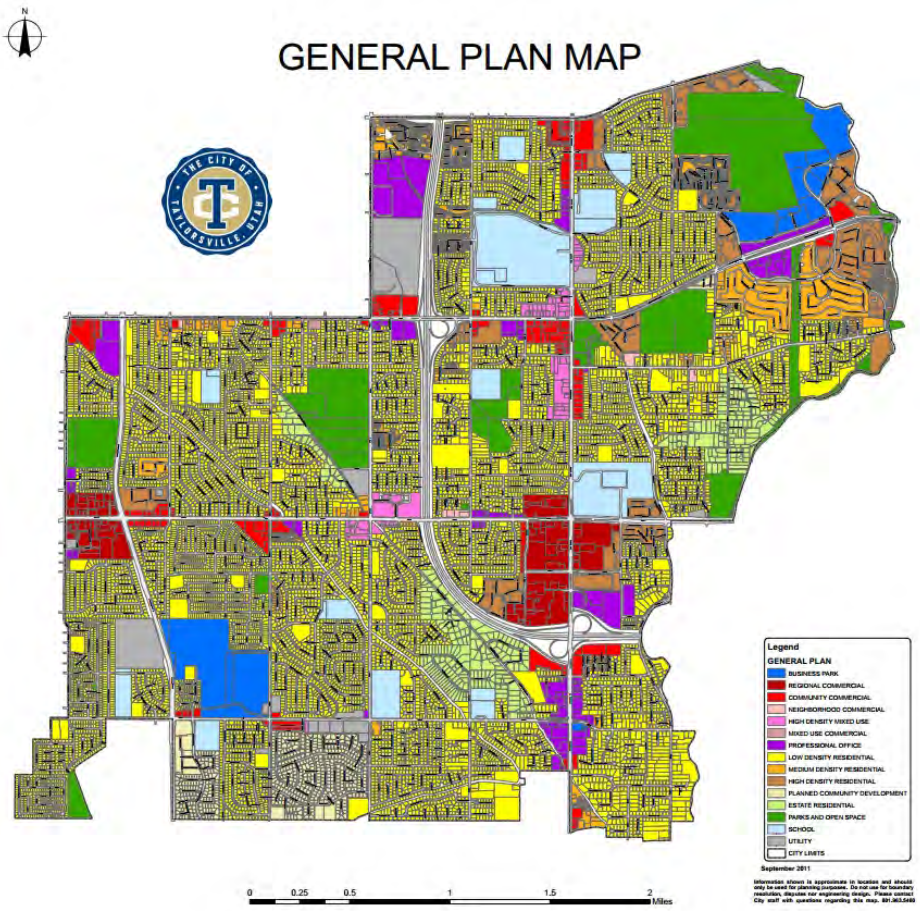


Figure 4. City Land Use Map

2.6 Growth and Development Trends

During a large spread westward, as experienced by many other communities, the population of areas like Taylorsville, Bennion and Kearns all increased at dramatic rates during the 1970's and 1980's. By the 1990's, the growth slowed as available land in the community was filled.
While most of the City's land has already been developed and/or dedicated to a specific purpose, the community has continued to grow. Over the past quarter century, the population has continued to grow at a steady rate, albeit much slower than many western cities in the County.

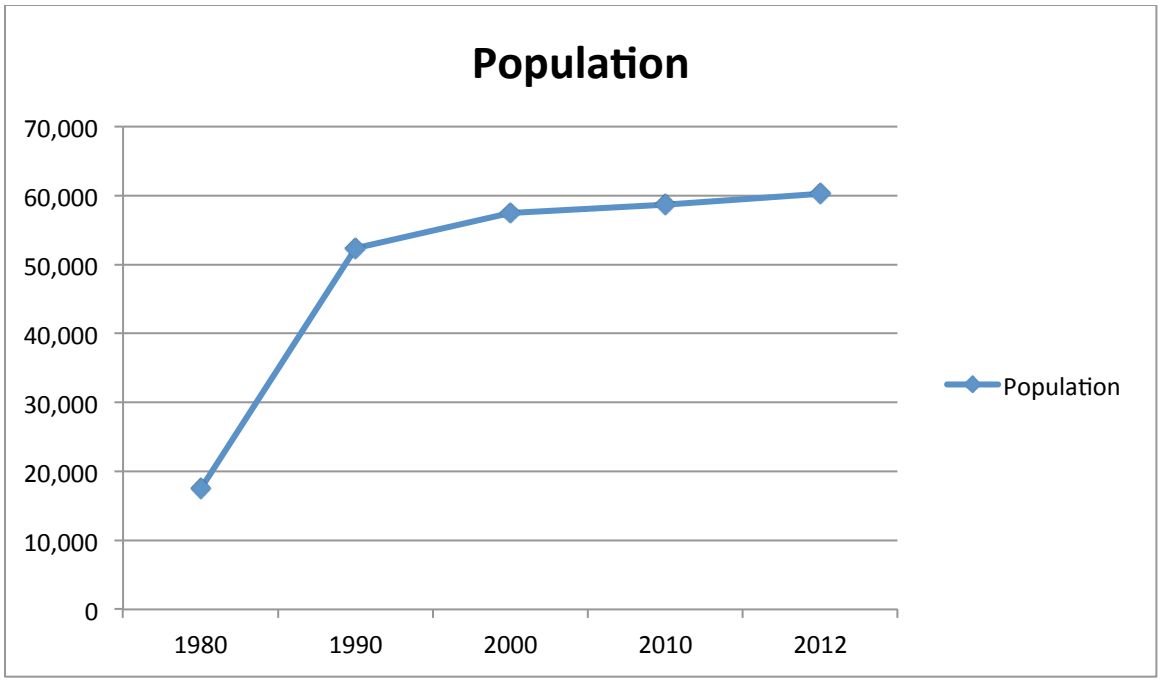


Figure 5. Population Growth

2.7 Data Sources and Limitations

The City of Taylorsville utilized the following sources to provide data for this report:

- City of Taylorsville GIS
- City of Taylorsville Community Development
- City of Taylorsville General Plan
- Salt Lake County
- State of Utah
- US Census Bureau
- National Weather Service

3 Planning Process

3.1 Update Process and Participation Summary

The City of Taylorsville 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 City of Taylorsville Mitigation Planning Team are listed in the table below.

Ben Gustafson	Emergency Manager
John Taylor	City Administrator
Scott Harrington	Assistant City Administrator
Mark McGrath	Community Development Department Director
Steve Porten	Chief Building Inspector
Tiffany Janzen	Public Information Officer
Dirk Andersen	GIS Manager
Lyle Hansen	Public Works Inspector
Michael Meldrum	Principal Planner

3.3 Meetings and Documentation

Members of the City Mitigation Planning Team are in attendance and discuss the Mitigation Plan at the monthly Cabinet Meetings held on the second Tuesday of each month.

3.4 Public and Stakeholder Participation

Members of the community are invited to attend the City's Public Safety Committee meetings that are held monthly. There are several members of the public who attend these meetings and participate in the discussion.

The Mitigation Plan will be presented at a public meeting of the Taylorsville City Council a November 2014 Council Meeting. Members of the public will be invited to comment and make suggestions /additions to the Mitigation Plan.

The City will also post information about the Mitigation Plan on the city's website.

3.5 Multi-Jurisdictional Planning

The City of Taylorsville has been in contact with Salt Lake County and 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.

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.

4 Hazard Identification, Analysis & Summary

4.1 Hazard Analysis

A disaster can occur at any time within City limits. Rather than attempt to prepare for every potential disaster, the intent of the City of Taylorsville 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 the City and surrounding communities. Active fault zones pose the threat of earthquakes, while the Jordan River follows most of the eastern city limits with potential flooding.

The natural hazards identified for the City of Taylorsville in this section are as follows:

- Drought
- Earthquake
- Flood
- Pandemic
- Severe weather

Other natural hazards that may affect neighboring jurisdictions but will not/are incredibly unlikely to occur in the city of Taylorsville are:

- Wildland fire
- Slope failure
- Dam failure
- Avalanche
- Infestation
- Radon
- Problem soils

4.1.1 Drought

The City of Taylorsville can have large variance in the temperature and precipitation from season to season. High heat and low precipitation as seen in the past can cause a shortage of water to the residents and businesses in the area. Businesses and residents are encouraged to be conservative in their landscaping and maintenance of their green spaces particularly in periods of lower water availability.

Month	Temp (min)	Temp (max)	Temp (avg)	Precipitation
January	-2ºF	58ºF	29ºF	1.3”
February	5ºF	66ºF	35ºF	1.1”
March	15ºF	74ºF	43ºF	1.9”
April	21ºF	90ºF	50ºF	2.1”
May	30ºF	93ºF	61ºF	1.3”
June	39ºF	100ºF	70ºF	1.4”
July	54ºF	105ºF	82ºF	0.2”
August	46ºF	103ºF	78ºF	0.5”
September	35ºF	96ºF	66ºF	1.2”
October	27ºF	86ºF	52ºF	1.4”
November	4ºF	75ºF	42ºF	0.9”
December	0ºF	59ºF	29ºF	1.4”

Table 2—City of Taylorsville Average Temperature Table

4.1.2 Earthquake (Seismic Hazard)

With the presence of the Wasatch Fault in the County, the potential for a large earthquake is ever present. 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 Taylorsville and are susceptible to liquefaction-induced ground failure during a large earthquake. Each incident may require a unique response from the City and in the instance of a major earthquake outside assistance will be required.

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)

4.1.3 Flooding

Although located in a semi-arid region, the City of Taylorsville 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.

The Jordan River runs along much of the northeastern border of the City. This poses a threat to many homes and areas built along that stretch.

4.1.3 NFIP

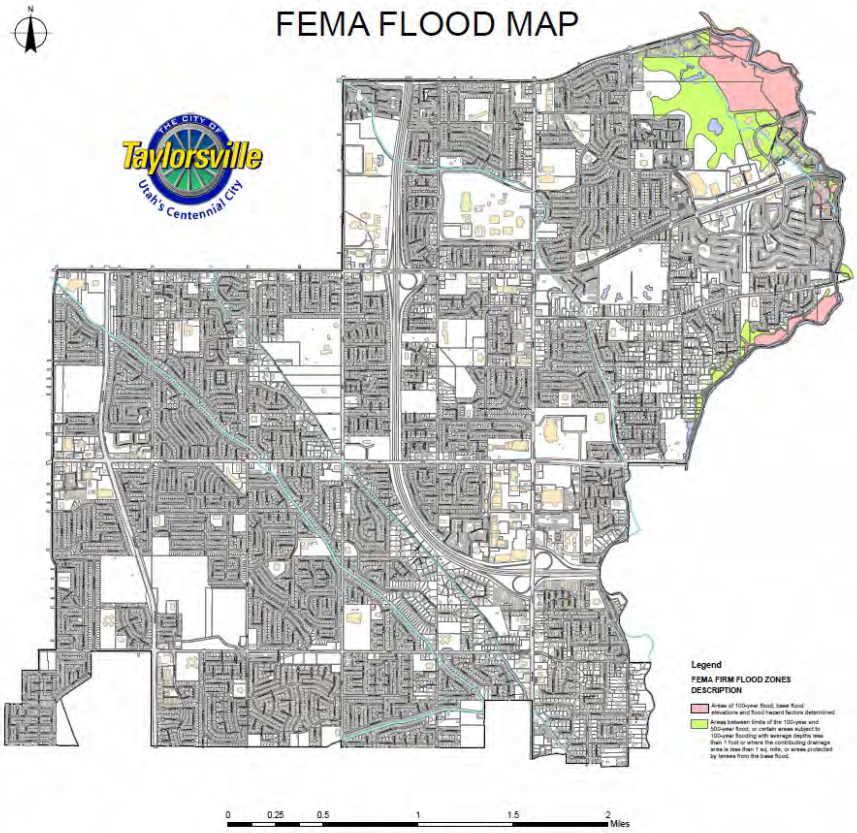
The City of Taylorsville contracts many services to outside organizations as follows:

- Fire and EMS – Unified Fire Authority
- Law enforcement – Unified Police Department
- Public works operations – Salt Lake County Public Works.

Each of these agencies respectfully participate and comply with all NFIP requirements and the City of Taylorsville relies on their plans and mapping.

To date, the City of Taylorsville does not have loss properties.

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.



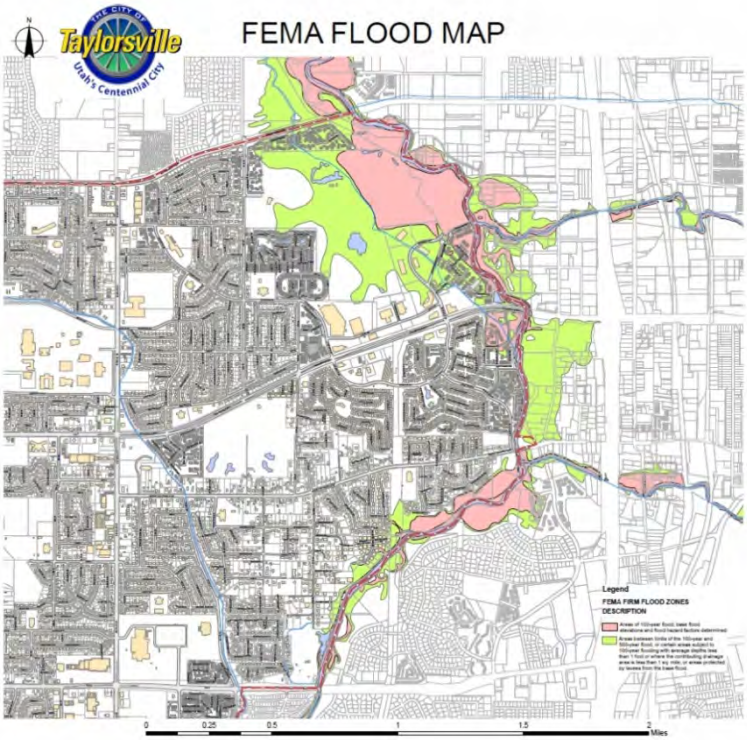


Figure 6. The City of Taylorsville - Flood Zones

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 eastern border of the City of Taylorsville. A flood risk 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
Total	**1**	**$ 11,139**	**58**	**$ 4,075,208**

Table 3. City of Taylorsville – Estimated Flood Loss Information

4.1.4 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 Taylorsville, 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 Mayor and City Administrator will determine the appropriate measure of municipal response. In coordination with the Emergency Manager, the City 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, the City of Taylorsville will incorporate all reasonable strategies to educate its residents and prepare for a measured response in the instance of a public health emergency.

4.1.5 Severe Weather

The potential for severe weather is a reality in the City of Taylorsville 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.

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. Snowfall is particularly influenced by the Great Salt Lake, which can produce localized snow bands or lake effect accumulations several times each winter.

The 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.

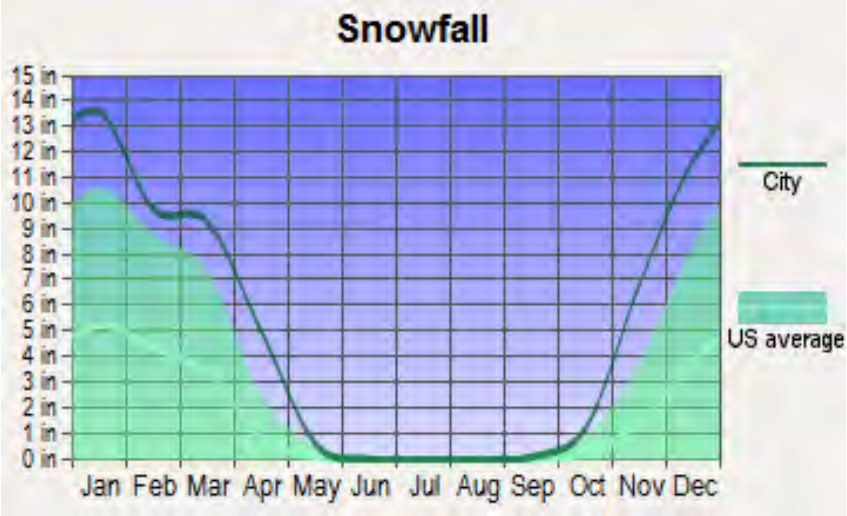


Figure 7. The City of Taylorsville - Average Snowfall

Although rare, Taylorsville 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.

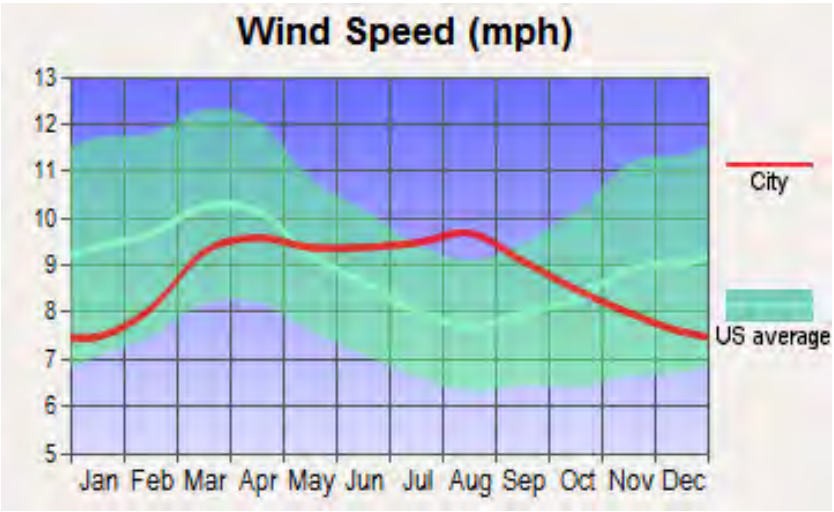


Figure 8. The City of Taylorsville - Average Wind Speed

4.2 Hazard Analysis

Salt Lake County and the City of Taylorsville have conducted an all-hazards assessment of potential vulnerabilities within the City. This assessment assisted with prioritization and outlined a direction for planning efforts. Both entities recognize 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 the City of Taylorsville.

Hazard	Frequency	Warning Lead Times	Consequences	Population/Area at Risk
Air Crash	Medium	Minimal to none	Medium	Site
Civil Disorder	Low	Days to hours	High	Locale
Earthquake	Medium	None	Catastrophic	Countywide
Energy Shortage	Low	Months to weeks	High	Countywide
Epidemic	Low	Weeks to occurrence	Catastrophic	Countywide
Flooding	Medium	24 hours to occurrence	High	Site
Freezes	High	36 to 24 hours	Low	Countywide
Hazardous materials spill	Medium	Occurrence	High	Site
Lightning	High	Occurrence	Low	Site
Nuclear accident	Has not occurred	None	Low	Site
Telecommunications disruptions	Low	Days to hours	High	Countywide
Terrorist attack	Has not occurred	Minimal to none	High	Countywide
Tornado	Medium	Minimal to none	Catastrophic	Countywide
Transportation accidents	High	None	Low	Site
Urban fire	High	None	Medium	Urban areas
Utility	High	None	Medium	Countywide

outages/shortages				
Wildland fire	High	Minimal to none	Medium	Rural areas/urban interface
Winter storms	High	36 to 24 hours	Medium	Countywide

Table 4 The City of Taylorsville - Hazard Analysis Table

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 Taylorsville's assets at risk, including values at risk, critical facilities and infrastructure, economic assets, and growth and development trends.

Values at Risk

Table 5 shows the 2014 assessed property data from the State of Utah for the City of Taylorsville.

City of Taylorsville	Real Property Value	Personal Property Value	Central Assessed Value	Total
TOTAL VALUE	$ 2,352,029,370	$ 128,380,957	$ 50,649,146	$ 2,531,059,473

Table 5. Assessed Property Value Data for the City of Taylorsville

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

Table 6 shows essential facilities that are located within Taylorsville.

Name of Facility	Address	City
Taylorsville City Hall	2600 West Taylorsville Blvd.	Taylorsville
Unified Fire Authority Station 117	4545 South Redwood Road	Taylorsville
Unified Fire Authority Station 118	5317 South 2700 West	Taylorsville
Utah Department of Public Safety	3888 West 5400 South	Taylorsville
Taylorsville-Bennion Improvement District	1800 West 4700 South	Taylorsville
Taylorsville Instacare	3845 West 4700 South	Taylorsville
Salt Lake Community College	4600 South Redwood Road	Taylorsville
Taylorsville High School	5225 South Redwood Road	Taylorsville
Eisenhower Junior High School	4351 South Redwood Road	Taylorsville
Bennion Junior High School	6055 South 2700 West	Taylorsville
Taylorsville Senior Center	4743 Plymouth View Drive	Taylorsville

Table 6. City of Taylorsville - Essential Facilities

High Potential Loss Facilities

High potential loss facilities as identified by FEMA HAZUS-MH are located throughout Taylorsville. The City 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 Taylorsville. I-215 is the major freeway thoroughfare through Taylorsville that runs north to south and bends to run east to west within the City limits.

5.2 Regulatory Mitigation Capabilities

Table 7 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 Taylorsville.

Regulatory Tool	Yes/No
General plan	Yes
Zoning ordinance	Yes
Subdivision ordinance	Yes
Site plan review requirements	Yes
Floodplain ordinance	Yes
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes
Building code	Yes
Fire department ISO rating	Yes
Erosion or sediment control program	Yes
Stormwater management program	Yes
Capital improvements plan	Yes
Economic development plan	Yes
Local emergency operations plan	Yes
Flood Insurance Study or other engineering study for streams	Yes

Table 7. City of Taylorsville - Regulatory Mitigation Capabilities

6 Mitigation Strategy

6.1 Mitigation Actions

The planning team for the City identified and prioritized the following mitigation actions based on the risk assessment. The potential natural hazards identified by the City are drought, earthquake, flood, pandemic, and severe. 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.

6.1.1 Continue to Enforce Building Codes, Development Codes and Zoning Ordinance

Issue/Background: The City requires that construction complies with the adopted building codes and the zoning and development ordinances adopted by the City.

Hazards addressed: Potential natural hazards covered by this mitigation action are earthquake, flood and severe weather.

Other Alternatives: No action

Responsible Office: City of Taylorsville Building Division, City of Taylorsville Community Development Department

Priority (High, Medium, Low): High

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

6.1.2 Continue to Execute Training and Exercise Program

Issue/Background: The City of Taylorsville 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-world emergency or disaster situation. Coordination of operations would be exercised and allow Taylorsville Emergency Management to identify the areas of higher and lower performance and how to best improve their efforts.

Hazards addressed: Potential natural hazards covered by this mitigation action are earthquakes, pandemic, floods and severe weather conditions.

Other Alternatives: No action

Responsible Office: Emergency Management

Priority (High, Medium, Low): High

Cost Estimate: Less than $1,000 annually

Potential Funding: City budget

Benefits (avoided Losses): This will help to prevent the loss of human life and property losses when a major emergency or disaster event occurs.

Schedule: Now and Long term

6.1.3 Educate Residents and Businesses through the Public Information and Events

Issue/Background: The City of Taylorsville takes great care to get the appropriate information out to the residents and businesses in the community. To this measure, the City has started an annual Emergency Preparedness Fair where participants are able to obtain the information that would benefit them in their situation. Further, the City invests a great amount of time and resources to putting out information to the public through traditional and modern methods including social media. These efforts provide the community with the information that is necessary to get assist their preparedness and mitigation efforts.

Hazards addressed: Potential natural hazards covered by this mitigation action are drought, earthquake, flood, pandemic, severe weather conditions and many other emergency situations.

Other Alternatives: No action

Responsible Office: Public Information Officer, Emergency Manager

Priority (High, Medium, Low): High

Cost Estimate: Less than $1,000 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

The planning team for Taylorsville identified and prioritized the following mitigation actions based on the risk assessment. The potential natural hazards identified by Taylorsville 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	Not Relevant
Avalanche				X
Dam Failure				X
Drought			X	
Earthquake	X	X	X	
Flood	X	X	X	
Infestation				X
Landslide				X
Pandemic		X	X	
Problem Soils			X	
Radon			X	
Severe Weather	X	X		
Wildfire				X

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

Taylorsville 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.

6.2 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*, which was adopted by the City of Taylorsville. The following summary highlights the 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	Completed / Ongoing	Taylorsville 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	Taylorsville participates in training and exercises designed to practice using communication tools and equipment.
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	Taylorsville is in the process of entering an MOU with the Taylorsville HAMnet to utilize their services during an emergency.
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	Taylorsville 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	Taylorsville evaluates areas of vulnerability and develops solutions to ensure communication systems or alternate solutions are viable
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	Taylorsville relies on the Valley Emergency Communications Center (VECC) and the Unified Police Dispatch Center for dispatch services. They coordinate with other PSAPS to provide redundancy.

Category	Goal / Objective	Action	Status	Comments
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 Taylorsville 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	Taylorsville 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	Taylorsville 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	Taylorsville 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	Taylorsville 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	Taylorsville 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	Taylorsville has implemented the use of monitoring equipment such as stream gages, seismographs, SNOTEL sites to provide situational awareness and forecasting capabilities

Category	Goal / Objective	Action	Status	Comments
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	Taylorsville has acquired a weather station located at its City Hall to monitor hazardous weather conditions.
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 / Ongoing	As information is acquired, it is tracked by GIS personnel and analyzed for proper use in mitigation efforts.
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 / Ongoing	Taylorsville has identified and monitors the conditions of critical facilities within the jurisdiction.
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	Taylorsville is identifying options and opportunities to address issues.
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	Taylorsville 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	Taylorsville maintains its service providers who implement their mutual aid 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	Taylorsville Emergency Management provides several public education classes for groups to discuss the hazards in the community and what residents can do to be prepared

Category	Goal / Objective	Action	Status	Comments
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	Taylorsville'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	Taylorsville 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	Taylorsville has worked with Be Ready Utah and other programs to make presentations in Taylorsville and will continue to invite them to events and other activities in the community
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	Taylorsville enforces all current ordinances and building codes http://www.sterlingcodifiers.com/codebook/index.php?book_id=540
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 Taylorsville ordinances are available online at: http://www.sterlingcodifiers.com/codebook/index.php?book_id=540
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 / Not Applicable	This is a very low probability event for the City and not applicable

Category	Goal / Objective	Action	Status	Comments
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 / Not Applicable	This is a very low probability event for the City and not applicable
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	Taylorsville coordinates public outreach for water conservation through Taylorsville-Bennion Improvement District who provides water services within the City.
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	Taylorsville coordinates public outreach for water conservation through Taylorsville-Bennion Improvement District who provides water services within the City.
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	Taylorsville coordinates public outreach for water conservation through Taylorsville-Bennion Improvement District who provides water services within the City.
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	Taylorsville is investigating or has already implemented water conserving methods for its facilities including low-water grass for open spaces.
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	Salt Lake County Public Works and Taylorsville-Bennion Improvement District responds immediately to all reports of leaks and performs regular system maintenance, including actively monitoring for leaks, theft of services, etc.

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	Completed / Ongoing	The Taylorsville-Bennion Improvement District, who provides water services within the City, maintains all water systems within the City including hydrant testing, etc.
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	Taylorsville 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	Not Completed	This is not applicable to Taylorsville
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	Taylorsville continues to encourage the development of secondary water, where feasible.
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 / Ongoing	Taylorsville is in the process of identifying which structures are at a particular 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	Taylorsville 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	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 Taylorsville

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	Not Completed	Taylorsville 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 Taylorsville 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	Taylorsville actively participates in the NFIP
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	Taylorsville 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 regularly review the impact of development and the need for flood control infrastructure and make recommendations as needed
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 oversees 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	Taylorsville-Bennion Improvement District continues to maintain and repair all drainage systems in the City

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	Completed / Ongoing	The City Engineering Division in cooperation with Salt Lake County Public Works 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 Salt Lake County Public Works 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	Taylorsville 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	Taylorsville 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	Taylorsville 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	Taylorsville 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	Taylorsville supports the efforts for education and outreach

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	Not Completed	Taylorsville 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	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	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
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

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	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 / 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	2 – Evaluate transportation network and address needed improvements to facilitate evacuation and emergency response	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 2.3 – 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 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 2.3 – Improve addressing system in WUI areas to facilitate emergency response	2 – Incorporate improved addresses in fire-dispatch and other databases	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	1 – Reduce fuels around publically owned structures	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 2.4 – 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	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	4 – Assist communities in developing Community Wildfire Protection Plans or similarA 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 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 Taylorsville 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

The City of Taylorsville 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 the 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 Taylorsville 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 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 City website to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of the 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 the City of Taylorsville that this Hazard Mitigation Plan will be adopted 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.

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THE CITY OF WEST JORDAN, UTAH

A Municipal Corporation

RESOLUTION NO 14-215

A RESOLUTION SUPPORTING THE STRATEGIES OUTLINED
IN THE WEST JORDAN SECTION OF THE
SALT LAKE COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of West Jordan participates with Salt Lake County and the other cities within Salt Lake County boundaries in the development and adoption of a Multi-hazard Mitigation Plan; and

WHEREAS, the Plan seeks to provide mitigation strategies to lessen the impact to the City and its residents in the event of a natural disaster; and

WHEREAS, a Mitigation Plan must be in place in order to qualify for Federal disaster assistance should an event occur where the City needed financial assistance under the Stafford Act or other Federal disaster programs; and

WHEREAS, the Plan is required by the Federal Emergency Management Agency (FEMA) on a five-year update cycle; and

WHEREAS, the current Salt Lake County Multi-hazard Plan expires at the end of November 2014,

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WEST JORDAN, UTAH, THAT:

Section 1. The City Council of West Jordan approves and supports the Salt Lake County Multi-Hazard Mitigation Plan to provide mitigation strategies lessening the impact to the City and its residents in the event of a natural disaster.

Section 2. This Resolution shall take effect immediately.

Adopted by the City Council of West Jordan, Utah, this 19th day of November 2014

KIM V. ROLFE
Mayor

ATTEST:

MELANIE S. BRIGGS, MMC
City Clerk

CITY OF WEST JORDAN Seal OF UTAH

Res 14-215

Voting by the City Council	"AYE"	"NAY"
Council Member Jeff Haaga	✓	
Council Member Judy Hansen	✓	
Council Member Chris McConnehey	✓	
Council Member Chad Nichols	✓	
Council Member Ben Southworth	✓	
Council Member Justin D. Stoker	✓	
Mayor Kim V. Rolfe	✓	

Hazard Mitigation Plan (2014)

ANNEX P: WEST JORDAN CITY
1 Community Profile

1.1 Growth from Town to City

The City of West Jordan was founded by Mormon settlers around 1849. Since the city lies on the western banks of the Jordan River, the city was named West Jordan. West Jordan incorporated as a town in 1941 and incorporated as a city in 1967. Until about 1973, West Jordan remained largely a rural area.

Since then, population growth has been extraordinary, beginning in the 1970s and continuing unabated since. The population grew from 4,221 in 1970 to 27,192 in 1980. In 1990 it reached 42,892, and in 2000 it was 78,788, an 83.7% increase. Today West Jordan is Utah's fourth largest city, with an estimated population in March of 2014 over 108,000 residents.

The city occupies the west-central portion of the Salt Lake Valley, which is surrounded by the Oquirrh and Wasatch mountains. It shares borders with Taylorsville, Kearns, South Jordan, Sandy, Murray, Midvale, Copperton, West Valley City and unincorporated Salt Lake County. West Jordan is fortunate to have a large share of vacant land left for future growth within Salt Lake County.

Demographics

West Jordan Residents	
Population	109,248 (Dec. 31, 2014)
Median Age	28.2
Population Under 18 Years	34.5%
Population Over 65 Years	4.5%
Average Family Income	$79,490

Miscellaneous Statistics

City Government	
Year of Incorporation	1941
Present Form of Government Adopted	May 26, 1981
Form of Government	Council/City Manager
City Land Area	32 sq. miles

Education

Number of Elementary Schools	17	Number of Charter Schools	4
Number of Middle Schools	4	Number of Technical Schools	1
Number of High Schools	2	Number of Special Needs Schools	1
Community College Campus	1	Private College Campus	1

Culture and Recreation

Acres of Parks, Trails & Open Space	839
Number of Baseball/Softball Fields	20
Number of Soccer Fields	20

1.2 History

A Brief History of West Jordan

(Derived from West Jordan General Plan 2012)

Settlement of the land along the Jordan River in the area that is now West Jordan began in the fall of 1849. Due to the imminent onset of winter and the lack of readily available timber, the first homes were "dugouts" excavated into the hillsides above the river. Most of these dugouts were replaced the following spring as soon as weather permitted the hauling of timber from Bingham Canyon. By 1853, the population of the West Jordan area was 361.

The Jordan River, like the River Jordan in Palestine, flows from a fresh water lake (Utah) to an inland salt sea (the Great Salt Lake). Early settlers recalled the "good old days" when the Jordan River would fill to its banks and create dangerous whirlpools. It is reported in several old histories that the bridge between Midvale and West Jordan washed out every spring. At one time, a ferry provided river crossings until a substantial bridge could be built.

Gardner Mill

Archibald and Robert Gardner built the first saw mill in the area in 1850, powered by a 2 ½ mile long mill race, the first important canal in Utah. Lumber to supply the mill was hauled fourteen miles from the Oquirrh Mountains to the west. In 1854, Archibald added a grist mill to the site which introduced some excellent machinery to the area. The Gardner Mill is still standing at approximately 1050 West 7800 South. The current owners have converted it into Gardner Village, a theme restaurant and retail shops, reminiscent of the days of Archibald Gardner.

The first blacksmith's shop in south Salt Lake County belonged to Alexander Beckstead who settled in West Jordan in 1850. The shop was completed in 1853 and operations consisted of setting wagon ties, repairing wagons and farm implements, sharpening plows, and shoeing.

In 1851, Matthew Gaunt started a woolen mill. In that same year, Samuel Mulliner tanned leather in the first tannery built west of the Mississippi River.

School opened in West Jordan for the first time in 1852. Classes were held in a small log house,

about 14 by 15 feet, situated southwest of the West Jordan Ward Meeting House at 1137 West 7800 South.

In the fall of 1854, a handful of people looking for a place to farm, came to a clear stream of water. This was Bingham Creek, which runs east from the Oquirrh Mountains and winds its way down to the Jordan River. During their explorations, the many signs of Indians convinced the group that they could not live in safety without some means of protection, which led to the construction of Wight's Fort (at about 3600 West on 9000 South). The four walls of the fort, each 12 feet high, were constructed of stones, earth, and logs. When completed, the structure was large enough to enclose and protect seven log houses, and part of the much- valued stream. The fort had two large gates, one on the east and the other on the west. By the spring of 1855, the wives and children of the fort builders had settled in. The families of Wight's Fort lived and prospered there until 1859. Lack of water forced settlers to abandon the site in 1861. For many years after, the only road to Bingham Canyon ran through the fort gates. Today, all that remains of the settlement at Wight's Fort is the Wight's Fort Cemetery located at approximately 3500 West 9000 South.

West Jordan's first post office opened in 1864 in a small adobe house adjacent to the West Jordan Ward Meeting House. In 1900, the Rural Free Delivery of mail (RFD) was begun from Sandy to West Jordan. Carriers delivered mail first by horse and buggy and later by Model T Ford. The current West Jordan Post Office has been renamed to honor Solon Richardson Jr., the first West Jordan Rural Free Delivery mail carrier.

It was in the West Jordan Ward Meeting House that the first mining claim in the Utah Territory (for the Jordan Silver Mining Company) was filed on September 7, 1863, after the discovery of mineral-bearing ore in Bingham Canyon by George B. Ogilvie. The following December, documents were prepared that organized the West Mountain Mining District in the Oquirrh Mountains under the direction of Col. Patrick E. Connor.

Dozens of small mining companies developed underground properties to recover lead, silver, and gold in Bingham Canyon. Copper became the most sought after mineral thanks to the vision of Daniel C. Jackling who organized the Utah Copper Company on June 4, 1903, now part of Rio Tinto (formerly Kennecott Copper Corporation). What was once a 1,500-foot-high hill in Bingham Canyon is now the largest man-made excavation on earth: Kennecott's world-famous Bingham Canyon open pit copper mine.

Utah-Idaho Sugar Factory

In 1891, the first sugar beets were raised in West Jordan. A factory was built in 1916 by the Dyer Construction Company. The work at the factory was seasonal. At its peak, it employed 235 people from mid-October to the end of December. An estimated 285,000 bags of sugar were produced annually in the 1950's. However, in the 1970's, the sugar beet market disappeared, and the factory closed its doors. In January 2011, the Utah-Idaho Sugar Factory was demolished due to structural and safety deficiencies.

Few people are aware of the role West Jordan has had in Utah aviation history. Significant landmark events include what is believed to be the first powered airplane flight in Utah, made by Lagar R. Culver on February 18, 1910. In 1941, Salt Lake City Airport II was authorized and began official operation on June 25, 1943. The airport was constructed by the U.S. Army Corps of Engineers as part of the national defense system, serving during World War II as a military pilot training facility. It was known during World War II as Kearns Army Airfield and provided operational training for personnel and units during the war, and was part of the larger Kearns Army Air Base (later renamed Camp Kearns) which was a major Air Force basic and technical training facility for personnel being reassigned to one of the combat zones overseas. The Army sold the airport in 1945, and it is currently owned and operated by Salt Lake City. In 1977, Salt Lake City Airport II became the location of the Utah National Guard's Aviation Support Facility. It was recently renamed the South Valley Regional Airport and continues to be a vital and significant regional aviation asset.

The first electric lights in West Jordan were installed in 1916. Early homes were equipped with a single clear light globe attached to a cord dangling from the ceiling.

The residents of West Jordan petitioned the County Commission for incorporation as a town in 1941. West Jordan became a third-class city in 1967, and after reaching a population of 104,128 residents, West Jordan officially became a first-class city on December 3, 2007.

Historic Sites

Existing and Potential Historic Sites - Criteria used to determine eligibility of districts or buildings for landmark status have been established at the federal level to evaluate sites that may be eligible for listing on the National Register of Historic Places. Briefly, landmark sites must be at least 50 years old, have maintained a high degree of integrity from the period in which they were built, and have contributed to broad patterns of the city's history. Historic districts must be composed of at least 51% contributing properties, as determined in a professionally conducted survey. Contributing properties are those which are over 50 years old and have retained a high degree of integrity.

There are three sites in the city currently listed on the National Register (see Figure 8.1 below) and several more that are generally acknowledged as meeting the eligibility criteria. Sites with potential for listing on the National Register include Wight's Fort Cemetery and the Welby Townsite.

NATIONAL REGISTER SITES, WEST JORDAN, UTAH						
Row	**STATE**	**COUNTY**	**RESOURCE NAME**	**ADDRESS**	**CITY**	**LISTED**

1	UT	Salt Lake	Gardner Mill	1050 W. 7800 South	West Jordan	9/29/1982
2	UT	Salt Lake	West Jordan Ward Meetinghouse (Pioneer Hall)	1137 W. 7800 South	West Jordan	4/14/1995
3	UT	Salt Lake	Utah-Idaho Sugar Factory	2140 W. Sugar Factory Road	West Jordan	2/13/2009

Figure 1.2.1 - National Register Listings

The Gardner Mill site is privately owned and is currently utilized as a retail/commercial center offering various shops and restaurants for the residents of West Jordan and Salt Lake County.

The West Jordan Ward Meetinghouse (also known as Pioneer Hall or the Old Rock Church) is currently owned by the City of West Jordan and utilized as the home of the local chapter of the Daughters of Utah Pioneers. This facility is maintained and rented to the public for social gatherings, weddings, family reunions, etc. This facility was completely renovated during 2006-2007 with a congressional appropriation.

Utah Century Farms and Ranches - As a part of Utah's centennial celebration in 1996, a program was initiated by the Utah Department of Agriculture and Utah Farm Bureau Federation to recognize and honor family farms and ranches in the State that have been owned by the same family for 100 years or more. All landowners received a special certificate and permanent "Century Farm & Ranch" sign for their property. Five of these farms were located in West Jordan at some point: the Malmstrom Family Farm; Drake Family Farm; Bateman Dairy Farms Inc.; Gardner Heritage Farm; and the Cook Family Farm. Since the "Century Farm and Ranch" program was established, the Bateman Dairy Farm has been developed into a residential development leaving only four active farms in the program.

Historic Surveys - Conducting a historic resource survey, known as a "reconnaissance survey," is the first step in preparing a National Register nomination for an historic district. The survey determines the concentration of contributing versus non-contributing properties and identifies patterns of development that help describe the history of a community. A reconnaissance survey identifies patterns of development that help describe the history of a community. A reconnaissance survey also identifies properties that are worthy of further study, known as an intensive-level survey. Intensive level surveys are also necessary for the preparation of a National Register nomination for a district. There is no record of historic surveys having been done in West Jordan. However, they are a valuable tool in any historic preservation program, and the West Jordan Historic Preservation Commission is currently in the initial stages of developing such a survey for the city.

Incentives for Historic Preservation

Government agencies and nonprofit organizations offer incentives to assist property owners in maintaining and restoring historic properties. The most commonly used sources of funding and information are listed below.

Utah State Historic Preservation Office (SHPO) - The Utah State Historic Preservation Office administers the state and federal tax credit programs. The SHPO also administers federal funding for Certified Local Government programs, which provides communities access to–preservation programs, tools and resources.

State of Utah Certified Local Government Program (CLG) - Once a city or county passes an approved historic preservation ordinance and appoints a historic preservation commission, then that government becomes recognized as a "Certified Local Government." The City of West Jordan has completed this process and is currently eligible for financial and technical assistance under the CLG program.

National Trust for Historic Preservation - Established in 1949, the National Trust has shown how preservation can play an important role in strengthening a sense of community and improving the quality of life. The National Trust offers small planning and design grants for communities with historical buildings.

State and Federal Tax Credits for National Register-Listed Properties - Owners of property listed on the National Register of Historic Places are eligible to obtain a 20% federal income tax credit for rehabilitation of income-producing properties and a 20% state income tax credit for residential properties (this includes residential income producing properties). All work performed on the property must comply with the Secretary of the Interior's *"Standards for Rehabilitation."* The staff of the Utah State Historic Preservation Office reviews and processes these applications.

Utah Heritage Foundation - The Utah Heritage Foundation, a nonprofit statewide preservation advocacy organization, offers loans for purchase and rehabilitation of historic buildings. To qualify, a property must be at least 50 years old and retain its architectural integrity. Approval of loan applications is based on a number of criteria, including the historic appropriateness of the proposed renovation and the availability of loan funds.

1.3 Property/Land Use

(Derived from West Jordan General Plan 2012)

Existing Conditions

Approximately 6,500 acres of land in West Jordan remains vacant or is used for agricultural uses. It is expected that the majority of this unimproved land will be developed within the next 20 to 30 years, at which time, the city will have a build-out population of approximately 160,000 residents. Much of this population growth is projected to be generated internally, where regionally it is projected that the northern Wasatch Front will grow to near 2.7 million residents by 2020.

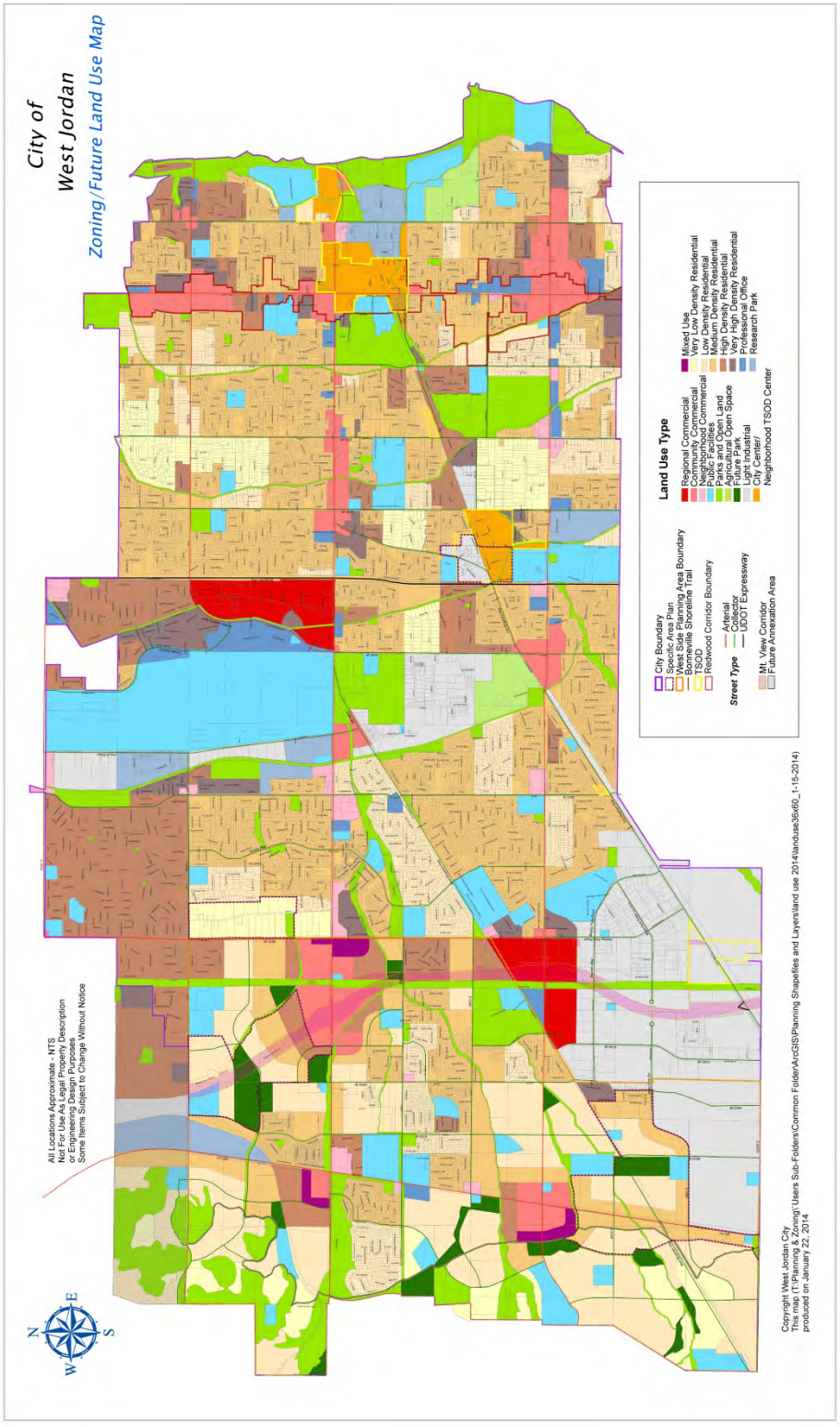
Current Land Use

A survey of current land use in the city was completed in April 2010. Figure 1.3.1 summarizes the percent of the total area of the city that each type of use occupies. As the table indicates, agricultural land and land that is currently vacant and unimproved accounts for the highest percentage (29.97%) of land in the city. Single-family residential is the next largest land use at 29.57%).

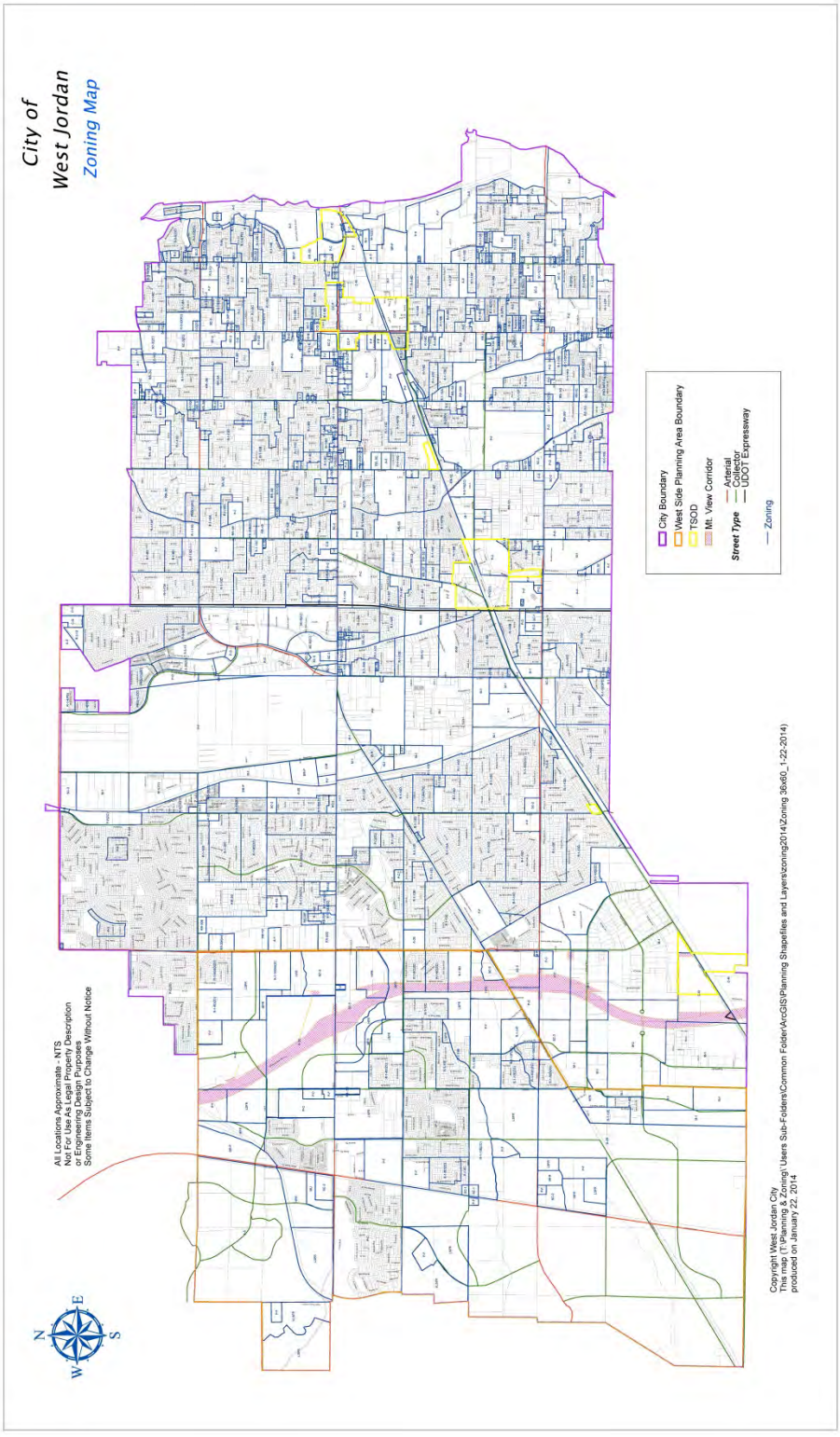
The Current Land Use Map (see map in the appendix and on the City of West Jordan website) brings into sharp focus that the city has a considerable amount of agricultural land, most of which is primarily located west of 5600 West. The eastern portion of the city is essentially developed which means that any future development, or redevelopment, will consist primarily of infill. The western portion of the city is where the majority of growth will occur in the future.

Land Use Type	Land Use Acreage	% of Land
Agriculture/Vacant	6141.39	29.97%
Single Family	6058.8200	29.57%
Streets/Roadways	2657.0000	12.97%
Industry	1548.2700	7.56%
Public Facility	1507.3100	7.36%
Park/Open Space/Common Area	836.2700	4.08%
Commercial/Retail/Service	570.7500	2.79%
School	445.6600	2.17%
Multi-Family	230.7300	1.13%
Religious Institution	230.1800	1.12%
Professional Office	103.1900	0.50%
Group Care Facility	98.4500	0.48%
Medical	52.9900	0.26%
Duplex/Town Home	11.7700	0.06%
Total Acreage	**20492.78**	

Figure 1.3.1 - Historic and Projected Population



Map showing Zoning and Future Land Use.



Map showing West Jordan Zoning.

1.4 Population and Demographics

(Derived from West Jordan General Plan 2012)

Historic Population Growth

West Jordan was incorporated as a town on January 10, 1941. The first U.S. Census taken for West Jordan in 1950 reported a population of 2,107. According to the 2010 U.S. Census, the population of West Jordan has increased over 49 times to 103,712. During the same time period, the population of Salt Lake County increased only threefold. A comparison of West Jordan's growth to Salt Lake County is illustrated in Figures 1.4.1 and 1.4.2.

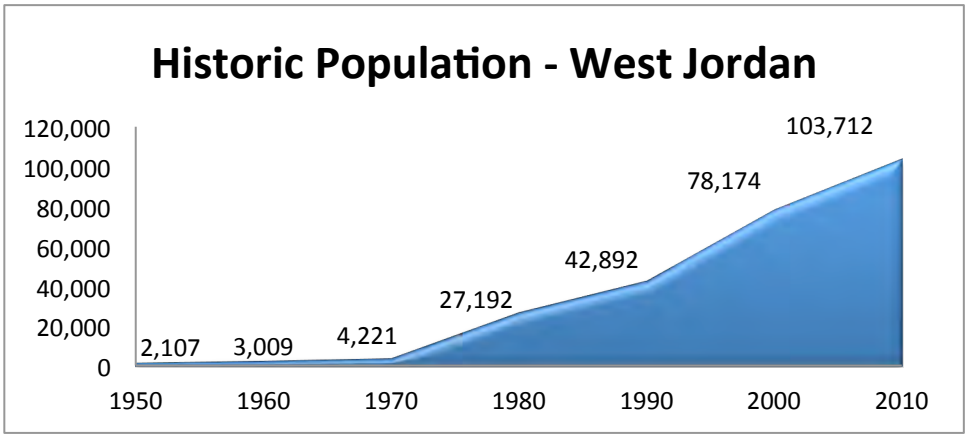


Figure 1.4.1 - Historic Population West Jordan

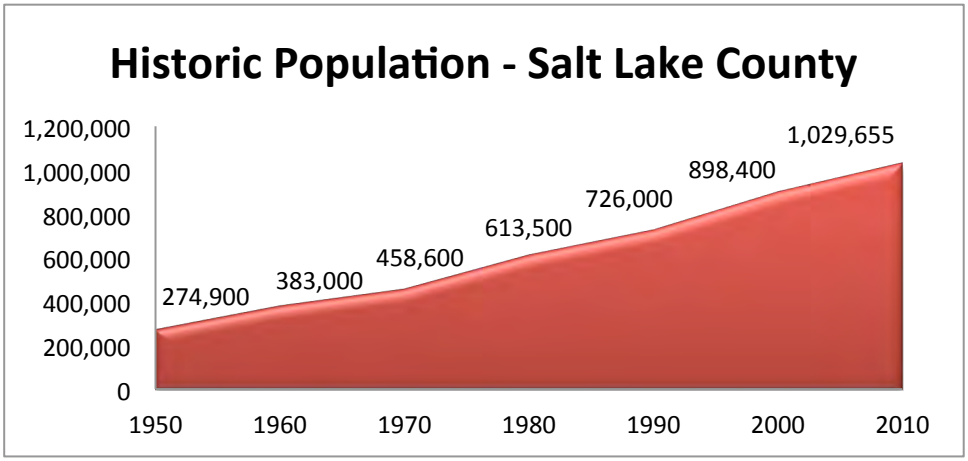


Figure 1.4.2 - Historic Population Salt Lake County

As illustrated in Figure 1.4.3, West Jordan is now the third-largest city in Salt Lake County and, according to state-wide figures, the fourth-largest city in Utah. Since the 1990 Census, West Jordan has seen a population increase of 141%, or an average annual increase of 5.0%. Population growth is attributable to a combination of both annexations and residential development. Continued population growth is expected as housing needs in Salt Lake County create demands on

undeveloped land within the city's boundaries. Population growth will continue to present many challenges to, and opportunities for, improving the quality of life in West Jordan.

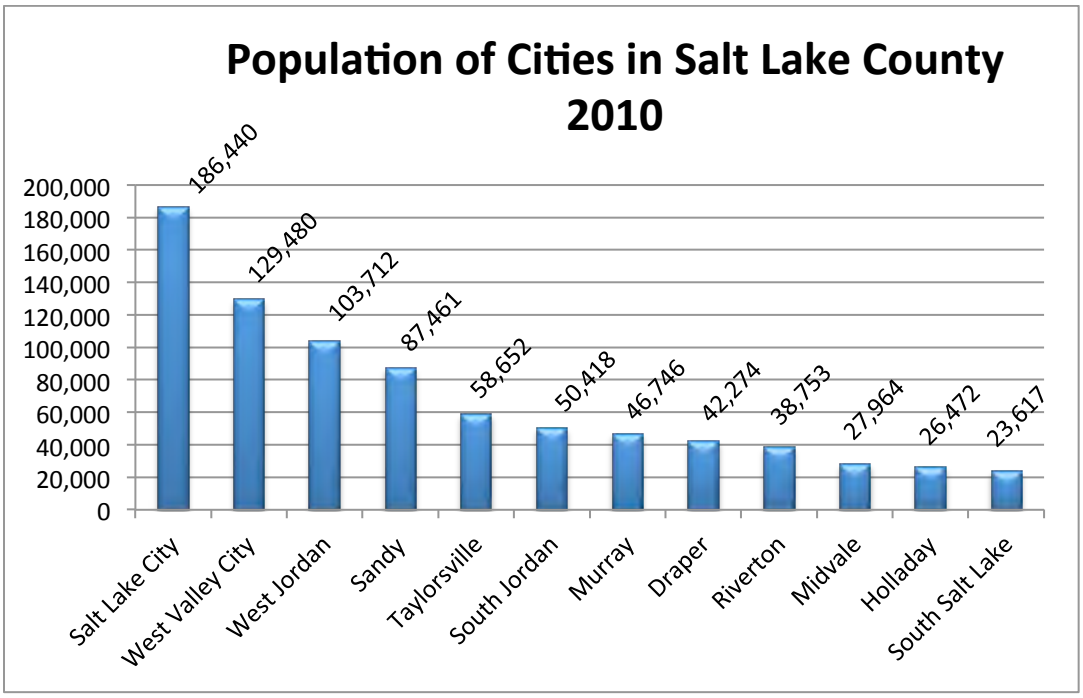


Figure 1.4.3 - Population of Cities in Salt Lake County

Ethnic Distribution

Figure 1.4.4 shows that there has not been significant change in the ethnic composition of West Jordan's population since the 1990 Census. By far, the largest single ethnic group is still White/Caucasian. The greatest increase in the minority population has been in the Hispanic segment of the city's population.

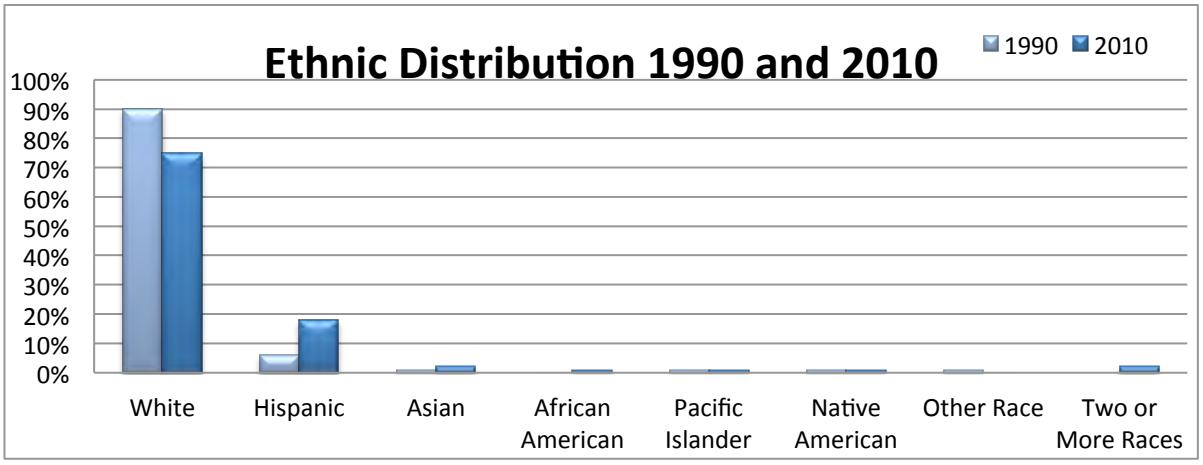


Figure 1.4.4 - Ethnic Distribution

Age and Education

The population of West Jordan is fairly young, as shown by Figure 1.4.5. The median age of a West Jordan resident is 28.2 years old (2010 U.S. Census). According to the U.S. Census Bureau's 2005-2009 American Community Survey, 89.9% of residents over the age of 25 are high school graduates, and 22.4% have received bachelor's degrees (Figure 1.4.6)

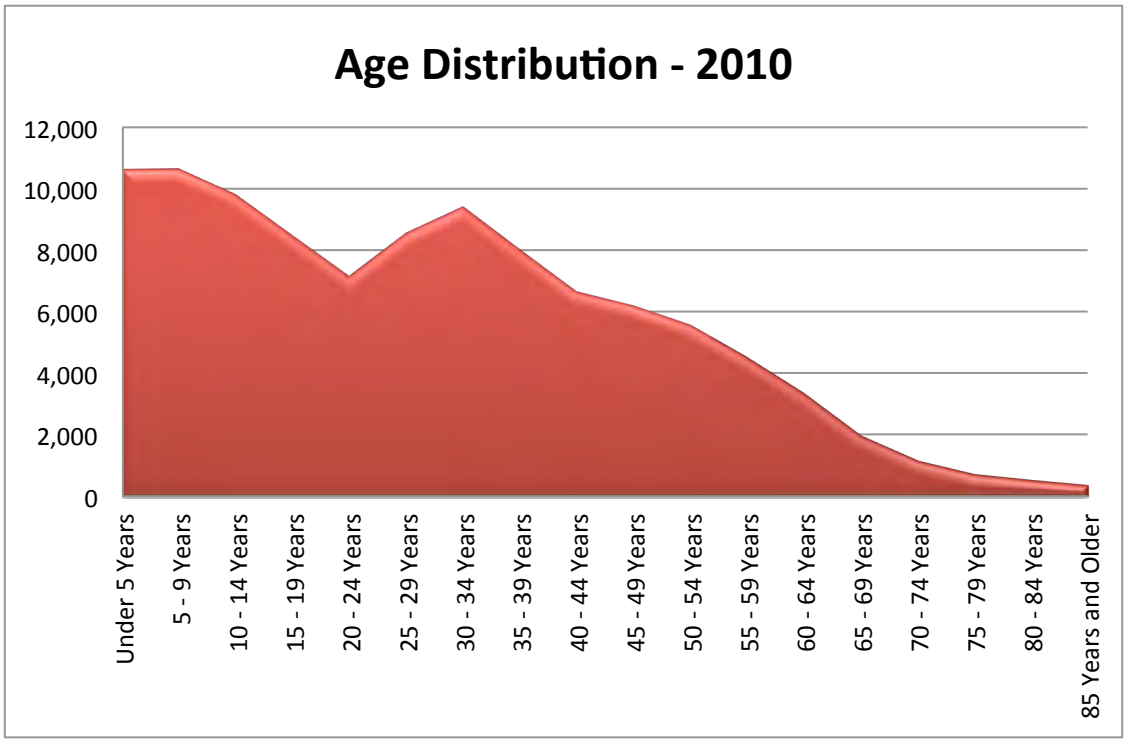


Figure 1.4.5 - Age Distribution

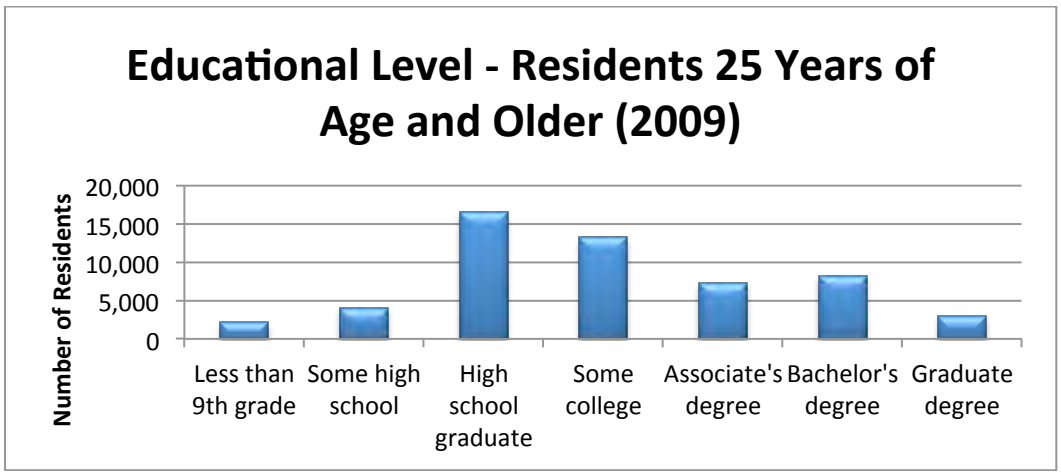


Figure 1.4.6 - Education Level

Household Income

West Jordan families enjoy an income level that is slightly higher than in Salt Lake County as a whole (Figure 1.4.7). According to the U.S. Census Bureau's 2005-2009 American Community

Survey, the median family income in West Jordan is $67,986 compared to $66,413 for all of Salt Lake County. It should be noted, however, that per capita income is lower ($21,333 vs. $24,911). This is attributable to the fact that the average family size in the city is greater than that of Salt Lake County (3.46 vs. 3.58 persons per household).

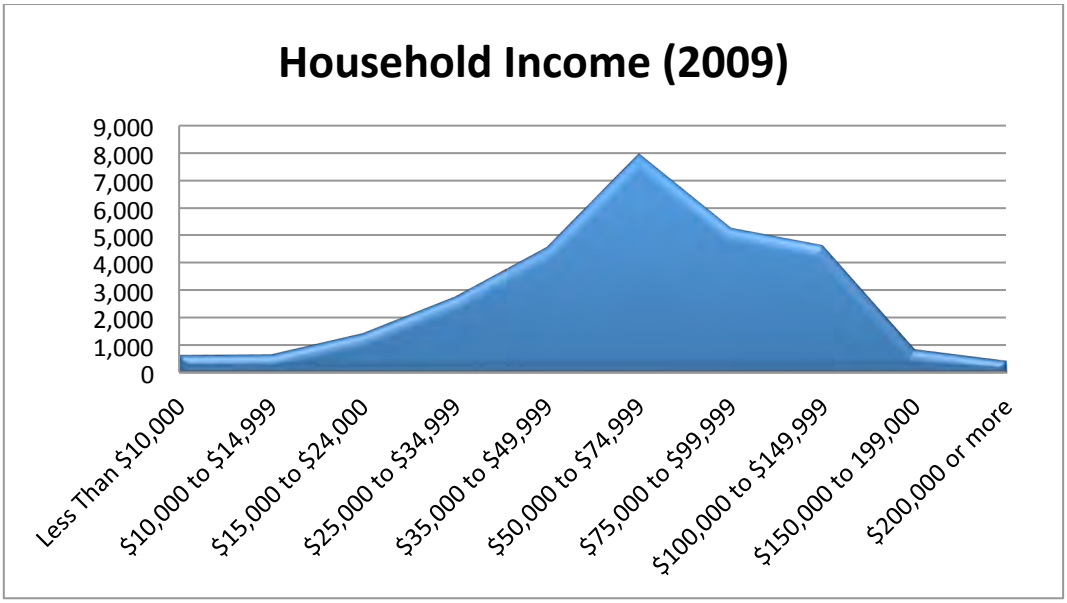


Figure 1.4.7 - Household Income

Population Projections

Population projections are a best guess at what the future holds based on past trends. The city experienced a period of higher than normal residential growth during 2005 and 2006. However, the economic downturn during 2008 and 2009 slowed residential construction and population growth dramatically. The 2010 Census reported West Jordan had a population of 103,712. It is estimated that West Jordan's population will increase to over 155,000 by 2031.

Figure 1.4.8 graphically displays historic population and anticipated population increase for West Jordan through the year 2031.

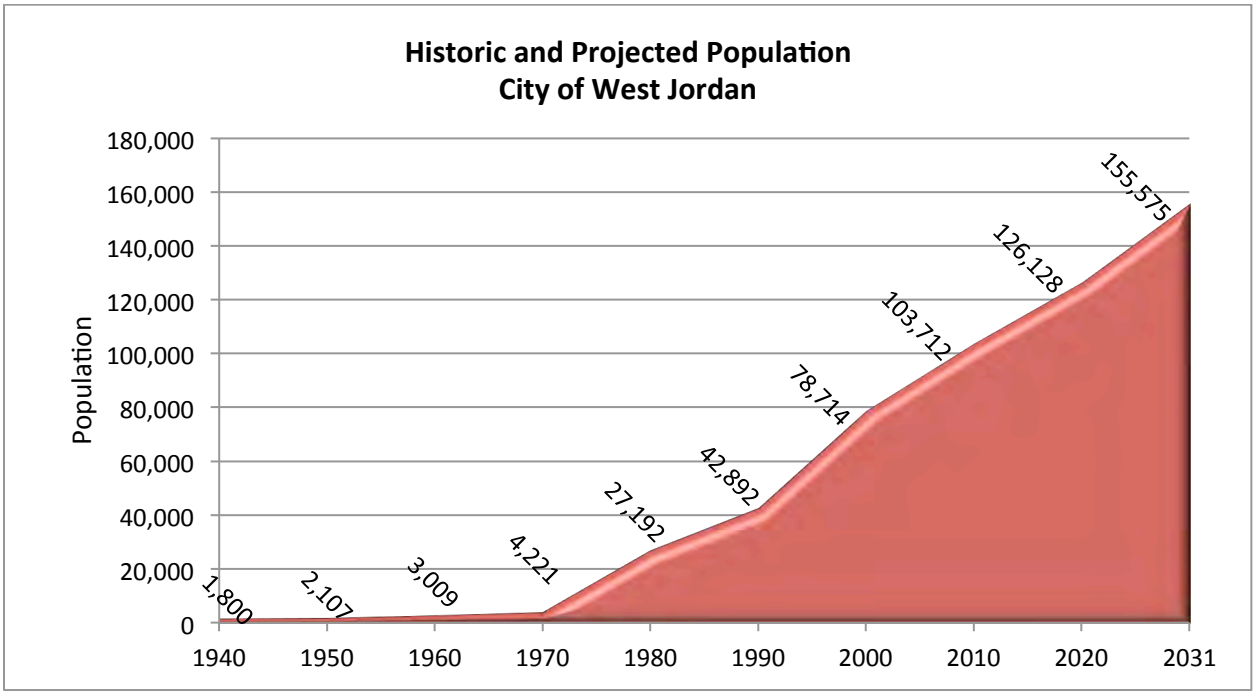


Figure 1.4.8 - Historic and Projected Population

1.5 Employment and Economy

(Derived from West Jordan General Plan 2012)

Introduction

The attraction of new businesses into an economy will increase the tax base, job supply, economic vitality, and diversity of the local economy. The attraction and retention of new and existing commercial, professional, and manufacturing businesses and industries is vital to provide the quality services and jobs that West Jordan and its residents demand. New opportunities for commercial, professional, and manufacturing development are anticipated to occur near transit stations along the TRAX light rail line, along the future Mountain View Corridor, and along U-111, which will further enhance the city's economy.

Employment

Figure 1.5.1 below, which illustrates where West Jordan residents travel to work, shows that nearly 91% of the city's residents who are employed, commute outside the city limits to work. Approximately 25% of these employees work in adjoining communities, including Sandy City, West Valley City, South Jordan, and Taylorsville, while another 25% work in Salt Lake City. Approximately 9% work within the city limits, as shown in Figure 1.5.2, which shows the percentage of workers that are employed in their city of residence along the Wasatch Front. Of the seven largest Utah cities, West Jordan has the smallest percentage of its population which is also employed in their city of residence.

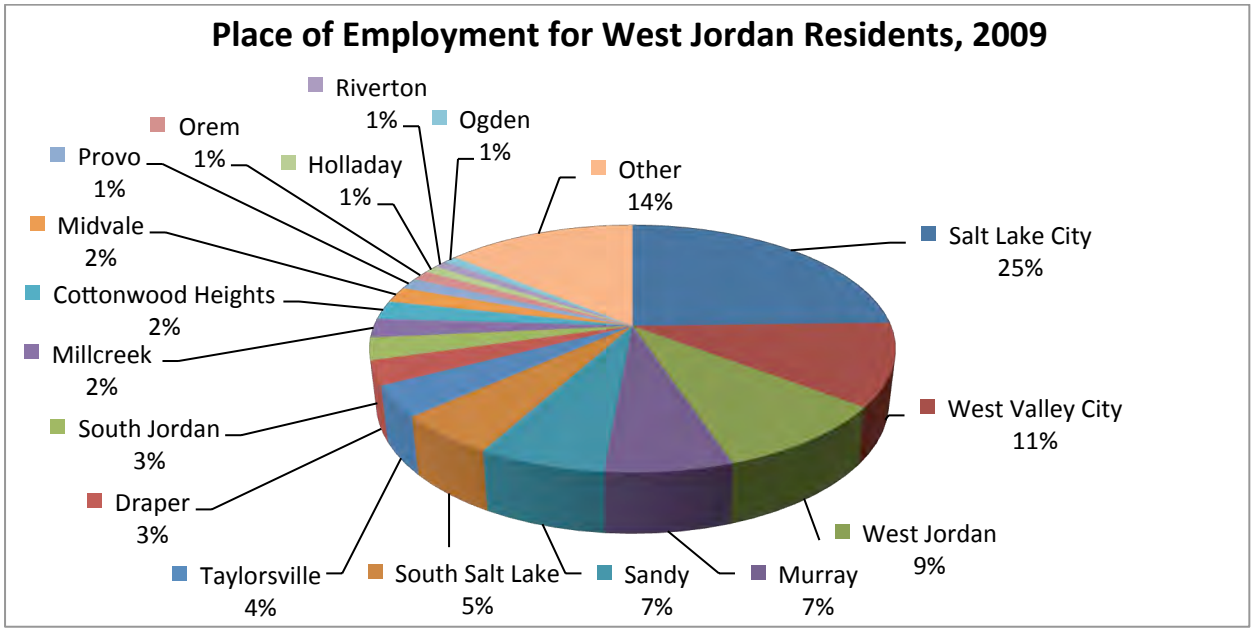


Figure 1.5.1
Source: U.S. Census Bureau, Center for Economic Studies (2009).

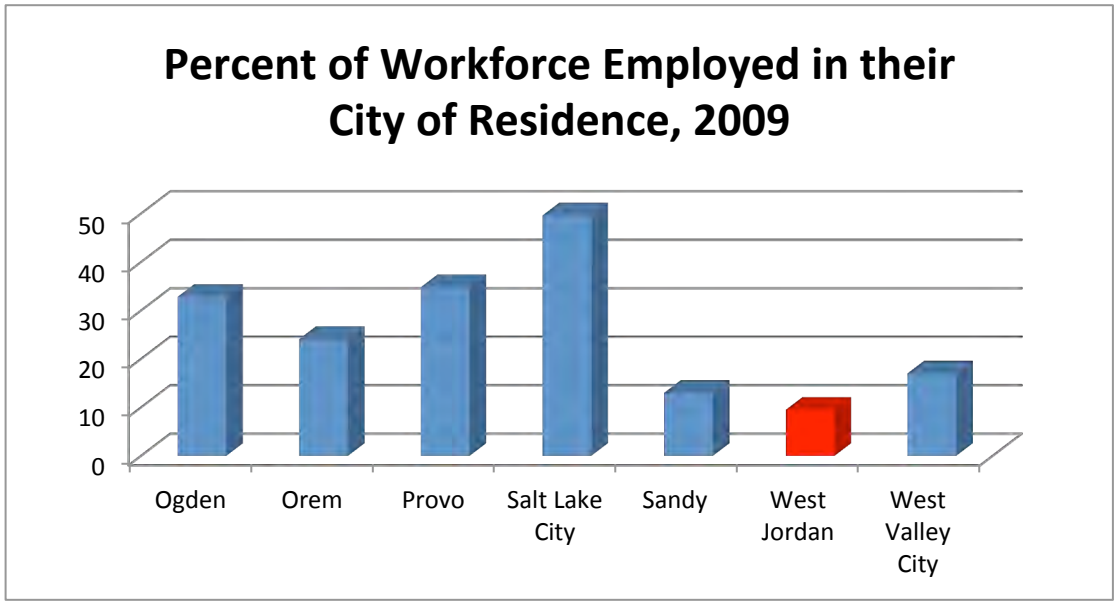


Figure 1.5.2
Source: U.S. Census Bureau, Center for Economic Studies

Figure 1.5.3 below indicates that the majority of employees who work in West Jordan live in Salt Lake County. However, there is a great degree of variation between places of residence of these workers, with no single locality, other than West Jordan, having a share greater than 10%.

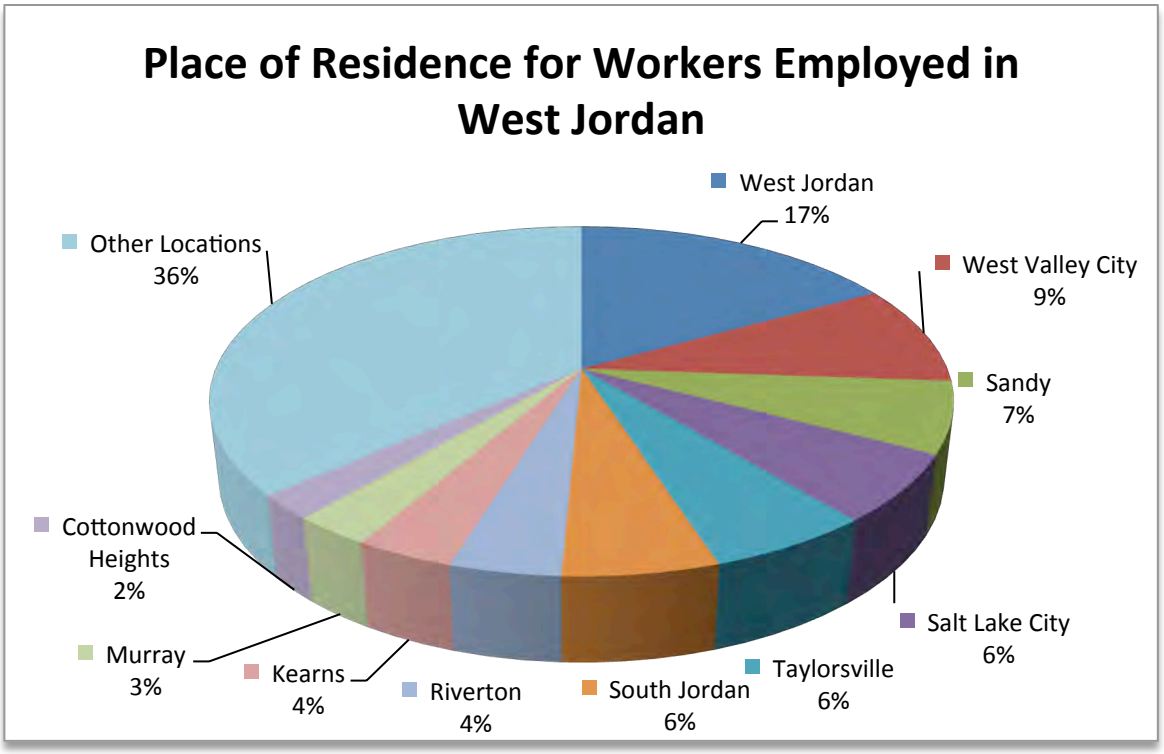


Figure 1.5.3
Source: U.S. Census Bureau, Center for Economic Studies

Figure 1.5.4 shows the historical unemployment rate of West Jordan compared to that of the State of Utah and the United States. The unemployment rate of West Jordan has typically moved in concert with both the national and statewide unemployment rate, although West Jordan has enjoyed overall lower rates of unemployment, with the exception of the 2001 recession, when the municipal, state, and national rates were essentially identical. Figure 1.5.5 shows West Jordan's unemployment rate as compared to other large cities in the state for 2011. Currently, West Jordan enjoys one of the lowest unemployment rates among the largest cities in the state.

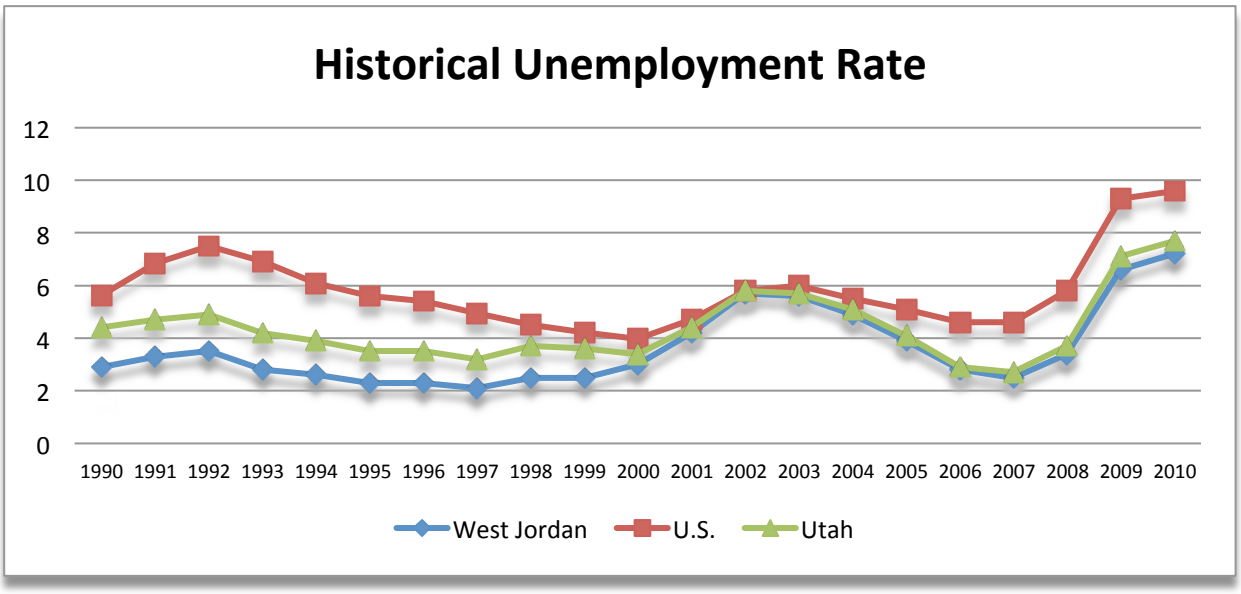


Figure 1.5.4
Source: U.S. Bureau of Labor Statistics (2010)

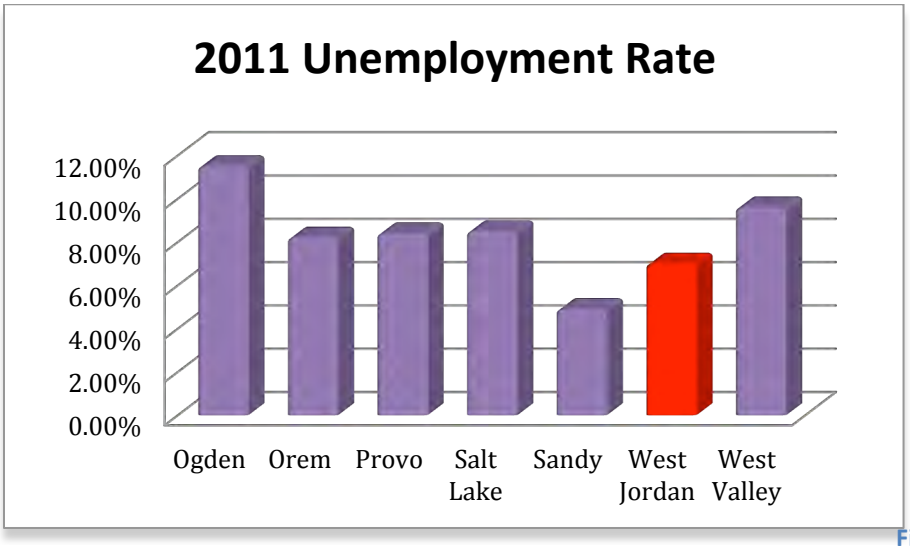


Figure 1.5.5
Source: U.S. Bureau of Labor Statistics (2011)

Jobs to Housing Ratio - West Jordan has historically been considered a "bedroom community" where many people commute outside the city for employment. The jobs to housing ratio is used primarily to illustrate the number of total jobs compared to the residential population of the city. It is an indicator of the number of people who work in the city divided by the number of housing units located in the city. A ratio greater than 1.0 indicates a net in-commute into the city and a ratio less than 1.0 indicates a net out-commute. A ratio of 1.0 indicates a balance. West Jordan currently has a jobs to housing ratio of 0.88 which is indicative of a bedroom community.

Figure 1.5.6 below demonstrates the jobs to housing ratio for the largest cities in the state, with each city having a ratio exceeding 1.0, with West Jordan being the lone exception. As a

consequence of the city's low jobs to housing ratio, the average commute time for residents is the highest among the seven study cities as illustrated in Figure 1.5.7.

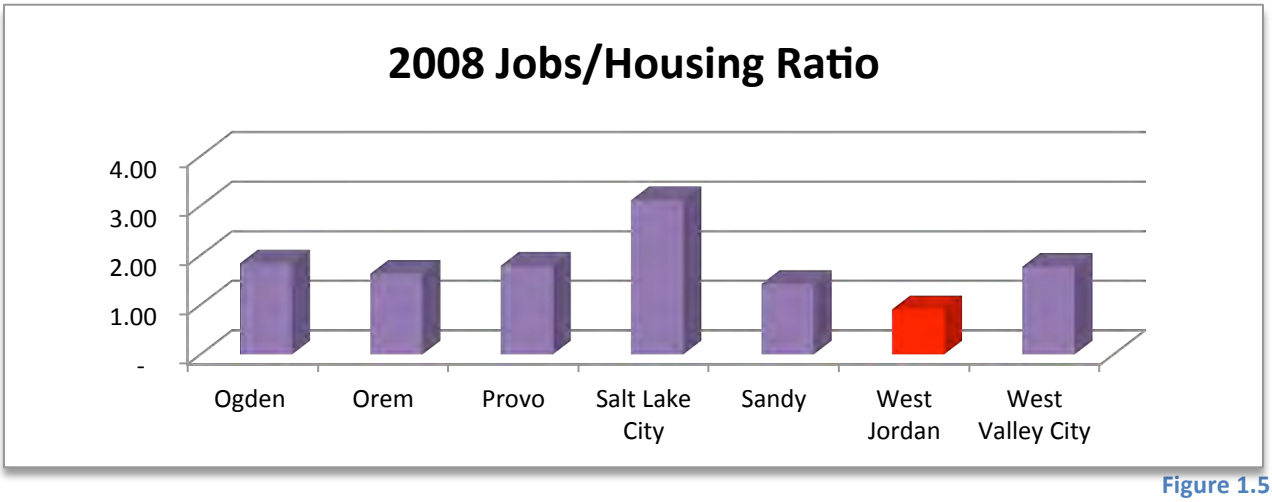


Figure 1.5.6
Source: U.S. Census Bureau; Utah Department of Workforce Services

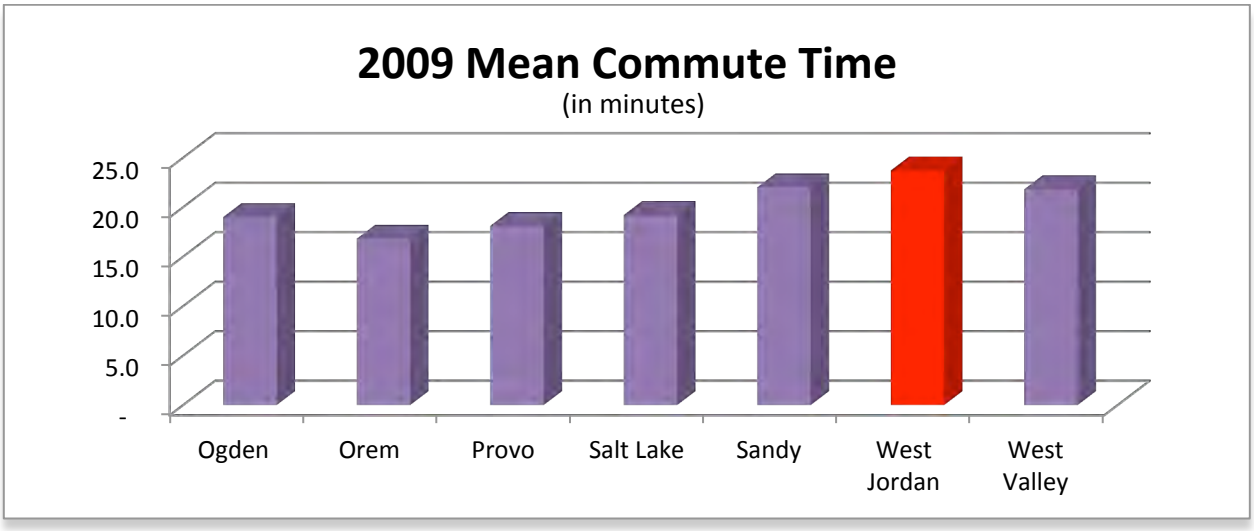


Figure 1.5.7
Source U.S. Census Bureau (2009)

As a means of creating a more economically sustainable community, the City should begin looking at ways to increase the jobs to housing ratio as a way to increase its tax base, its daytime population, and provide more opportunities for people to live and work in the city.

On the City's Future Land Use Map, professional office uses account for 1.41% of the land within the city and 0.5% of the city's new development. Adding office space in areas designated as Mixed-Use and City/Neighborhood Center on the Future Land Use Map increases this number to 4.89%. This number is still quite low considering Light Industrial uses make up 9% of the future land uses in the city and commercial uses (including Mixed-Use and City/Neighborhood Center) make up 8.09%. Given this, the City should consider increasing the area devoted to professional office and other non-residential uses such as education, manufacturing, and general services to increase the jobs to housing ratio and make land use percentages more consistent with other non-

residential land uses. Opportunities for increasing employment in the city are located near transit stations, interchanges along the Mountain View Corridor, Redwood Road, and the South Valley Regional Airport.

Floor Area Ratio - The City should also consider increasing the intensity of office uses as well as the overall acreage designated for such uses. Intensity of land usually describes non-residential uses and takes into consideration general floor area, percentage of lot coverage, and the number of stories a particular development has. Floor Area Ratio (FAR) describes intensity as the relationship between the total square footage of development on a lot and the area of that lot. Floor area does not include the area within parking structures and parking lots. The FAR is determined by dividing the gross floor area of all buildings on a lot by the gross land area of the lot. The current average FAR for existing office development within the city is 0.33. This means that about one-third of the lots used for office are actually developed with buildings, with the remaining two-thirds being used for parking and/or landscaping. By increasing the amount of allowed FAR, the city can increase the floor area of office uses within the city, by increasing the lot coverage and the number of stories allowed within office areas.

As demonstrated in Figure 1.5.8, the existing average FARs for other types of uses are also low. Increasing the FAR in all non-commercial zones would benefit the city by providing a larger daytime population, increasing the tax base, and providing opportunities for residents to both live and work within the city.

Use Type	Existing Average FAR
Office	0.33
Commercial	0.25
Industrial	0.18
Institutional	0.20

Figure 1.5.8 Existing Average FAR (2010)

The available pool of labor for each of the seven largest cities in the state is shown in Figure 1.5.9 below. Generally, the size of each city's labor force matches its ranking in relation to the total residential population.

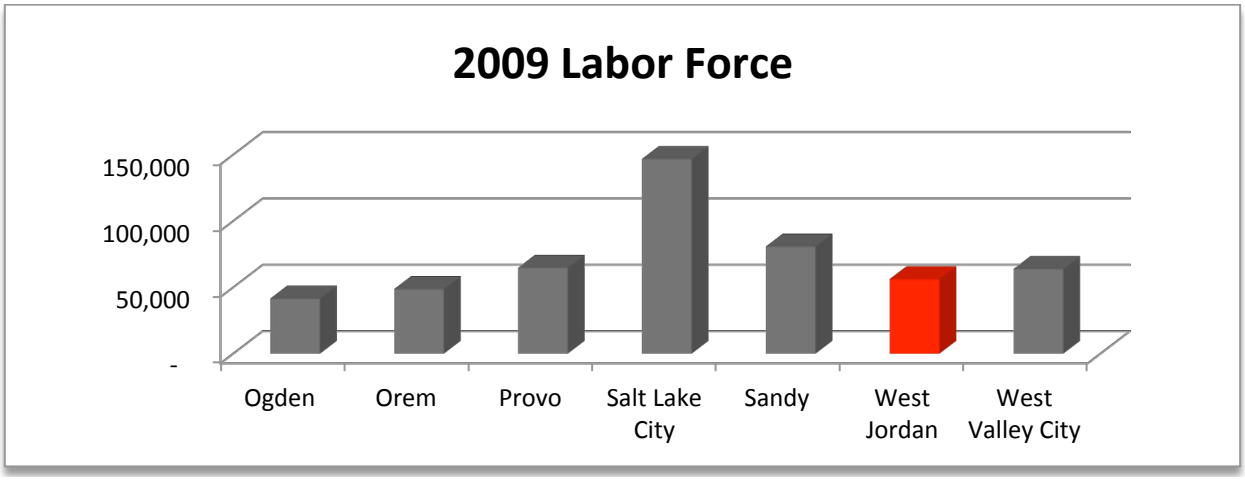


Figure 1.5.9
Source: U.S. Census Bureau (2009)

Figure 1.5.10 shows the projected employment for West Jordan to the year 2030. Estimates for future employment in West Jordan show positive growth, as the number of current jobs is anticipated to nearly double by 2030, when employment will reach approximately 50,000. Total employment is expected to grow at a rate over 1% more annually than the general population, which by 2030 will have increased by approximately one-third. However, the gap between employment and the population grows from approximately 70,000 in 2005 to 80,000 in 2030.

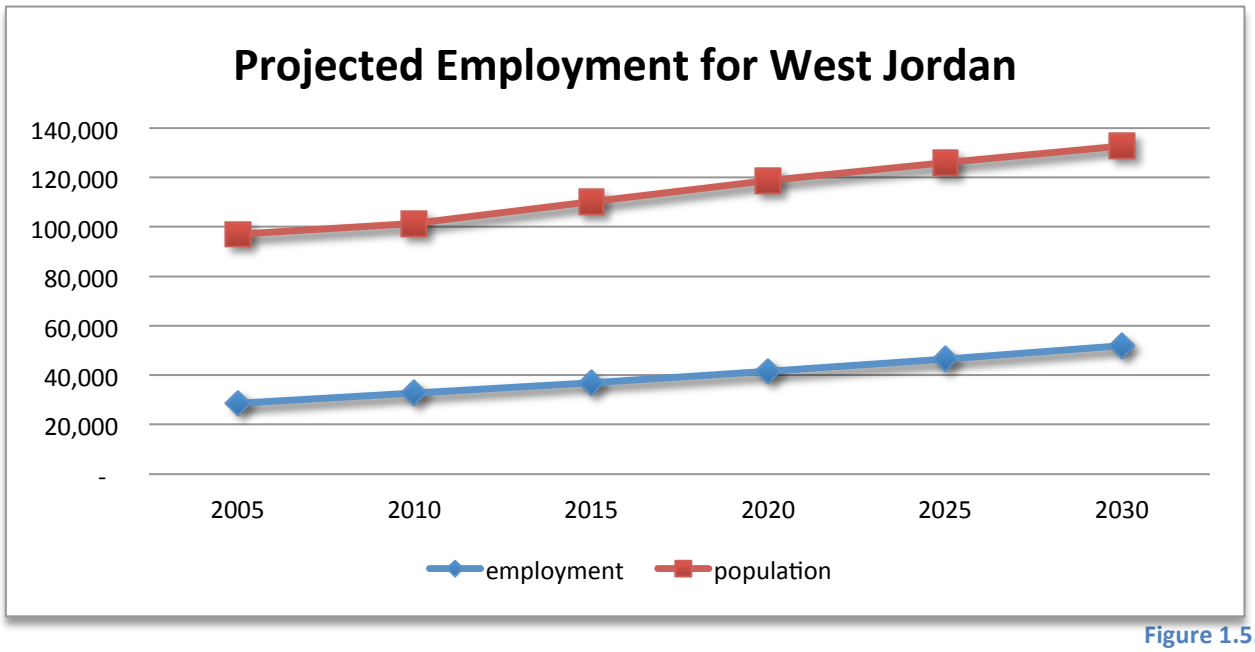


Figure 1.5.10
Source: Wasatch Front Regional Council (2009)

Economy

Gross retail sales for selected cities in 2008 are shown in Figure 1.5.11, and the gross retail sales based on a per capita basis are shown in Figure 1.5.12. In each case, West Jordan is second to last in the amount of gross retail sales. Despite its relatively low overall total, West Jordan's retail growth since 1996 has been very strong, expanding at an average annual rate of 10.3%. This growth has more than tripled the gross retail volume in the 12-year period from 1996 to 2008

Figure 1.5.13). The majority of retail sales within the city are in the retail trade and business investment sectors (Figure 1.5.14).

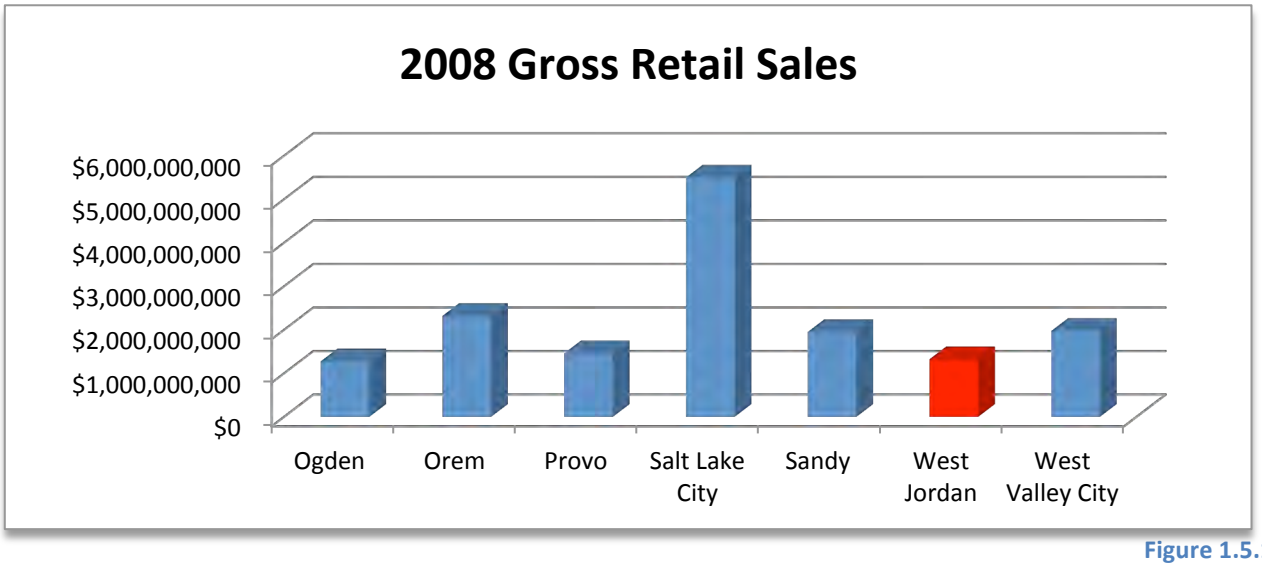


Figure 1.5.11
Source: Utah State Tax Commission, U.S. Census Bureau (2008)

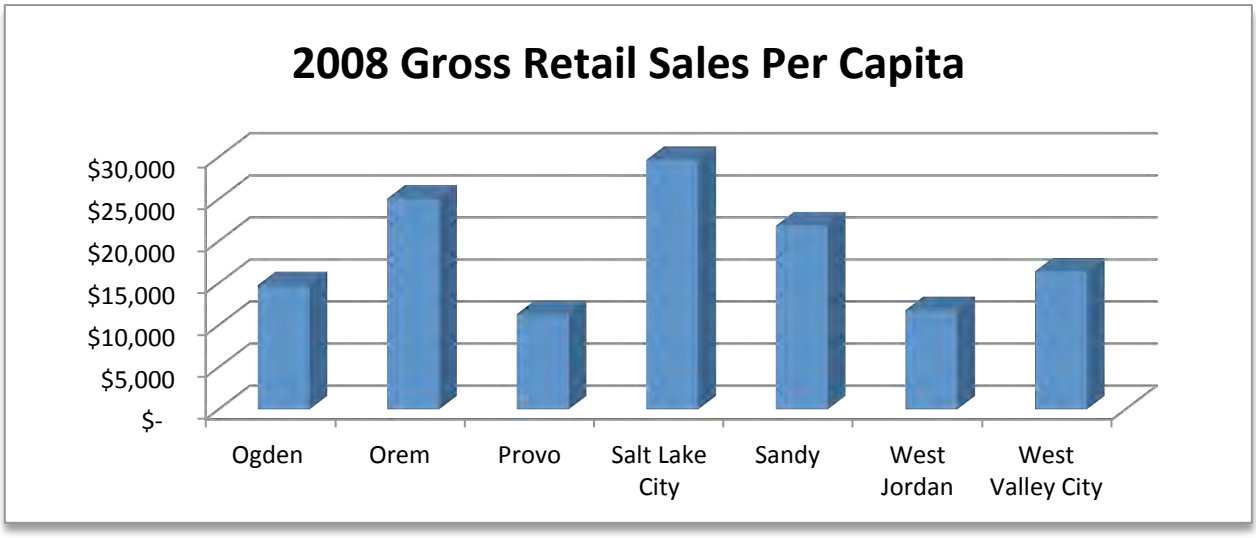


Figure 1.5.12
Source: Utah State Tax Commission (2008)

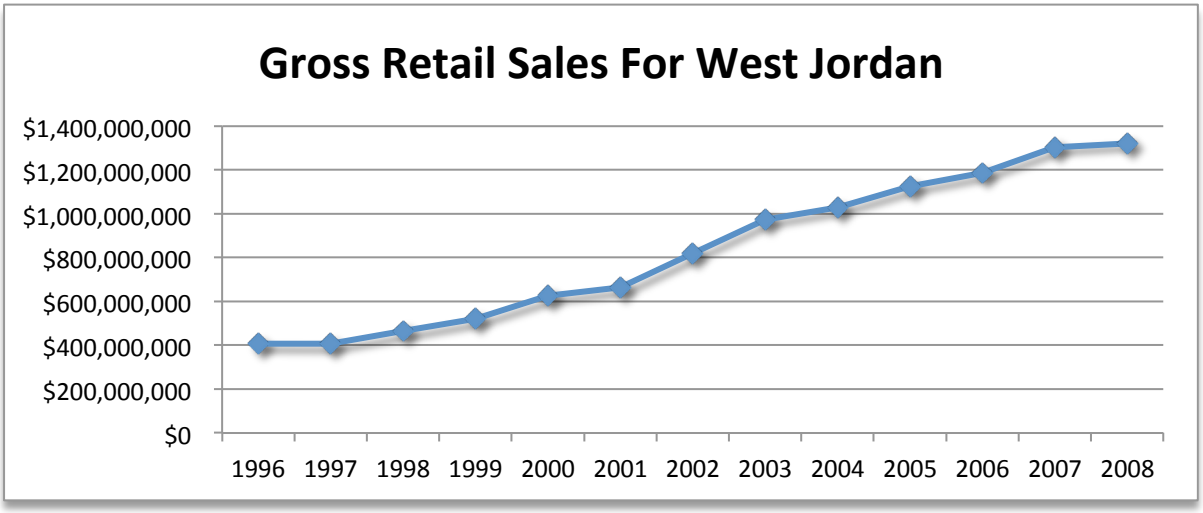


Figure 1.5.13
Source: Utah State Tax Commission (2008)

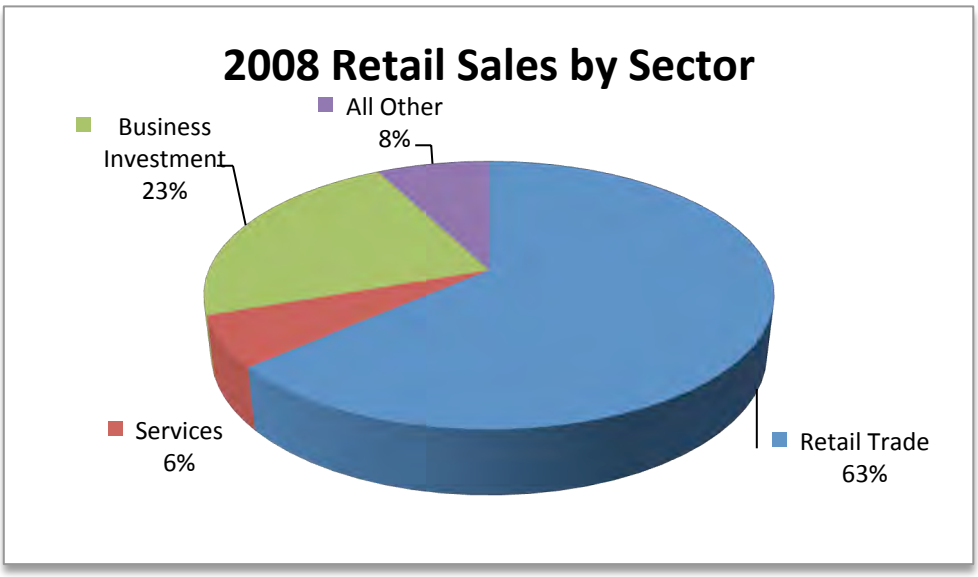


Figure 1.5.14
Source: Utah State Tax Commission (2008)

The largest sales tax payers in the city are shown in Figure 1.5.15, and the largest property tax payers are listed in Figure 1.5.16. While a large majority of the largest sales tax payers are large retail businesses, the composition of the property tax payers is more diverse, and includes industrial, retail, office, and property management companies.

Taxpayer (Listed	Industry

Alphabetically)	
Lowe's	Home Improvement
Macey's	Grocery
Rocky Mountain Power	Utility
Sam's Club	Discount Retail
SME Industries	Construction
Smith's	Grocery
Sysco Foods	Distribution
Target	Discount Retail
The Home Depot	Home Improvement
Wal-Mart Stores	Discount Retail

Figure 1.5.15 Principal Tax Payers
Source: West Jordan Finance Department

Taxpayer	Assessed Valuation	Rank	Percentage of Total Valuation
Jordan Landing LLC	$127,014,300	1	2.41
Masco Cabinet Group LLC	58,806,600	2	1.12
CHC Jordan Valley Inc.	31,026,200	3	0.59
WRI West Jordan LLC	26,616,600	4	0.51
Willowcove International LLC	26,098,710	5	0.50
Mtn. America Credit Union	23,598,800	6	0.45
Dannon Company Inc.	21,647,000	7	0.41
Wal-Mart Stores, Inc.	19,593,300	8	0.37
SYSCO Foods	17,775,100	9	0.34
Grand Central Inc.	16,281,400	10	0.31

Figure 1.5.16 Principal Property Tax Payers
Source: West Jordan Finance Department (2010)

Businesses

Figure 1.5.17 shows the number of businesses in West Jordan compared to other cities along the Wasatch Front. In 2008, 2,168 businesses in West Jordan employed 28,907 persons. West Jordan's largest employers for 2008 and their approximate numbers of employees are shown in Figure 1.5.18. As shown in Figure 1.5.19, which illustrates the major categories of businesses in West Jordan, approximately 70% of the businesses in West Jordan are concentrated in the construction, financial, professional and business services, trade, transportation, and utilities sectors.

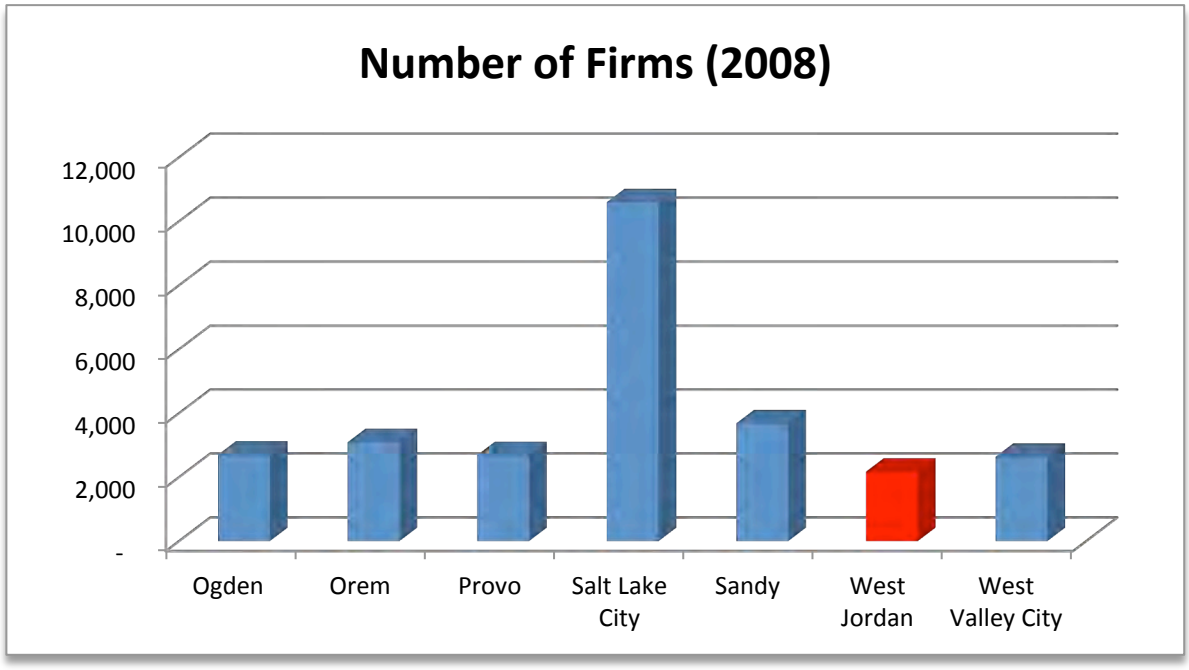


Figure 1.5.17
Source: Utah Department of Workforce Services (2008)

Employer	Industry	Employees
Jordan Valley School District	Government	3,588
Utah Army National Guard	Government	777
Jordan Valley Medical Center	Health Services	656
Wal-Mart Stores	Discount Retail Trade	581
Fairchild Semiconductor	Manufacturing	575
City of West Jordan	Government	564
SYSCO Intermountain Food Services	Distribution	463
SME Industries	Construction	375
Mountain America Credit Union	Financial Services	327
Copper Hills Youth Center	Education	260

Figure 1.5.18 West Jordan's Largest Employers
Source: West Jordan Division of Business Licensing

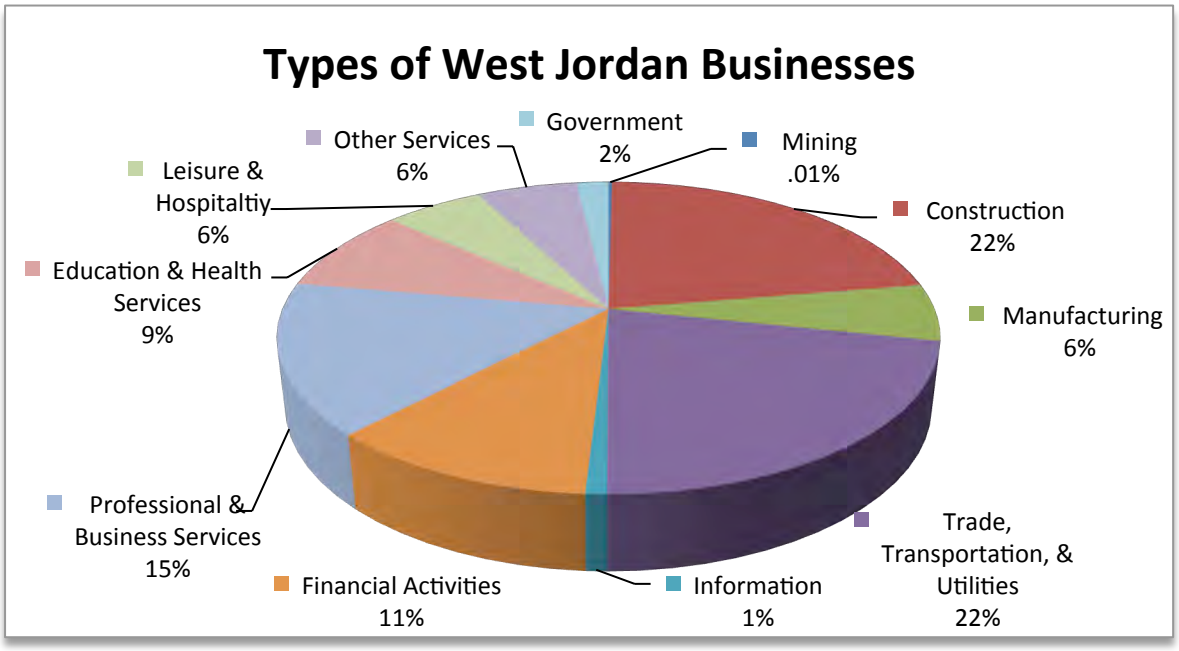


Figure 1.5.19
Source: Utah Department of Workforce Services

The major employment sectors in 2008 were trade, transportation, and utilities, which employed 26% of the workforce; manufacturing, which employed 15%; construction, which employed 12%; education and health services, which employed 12%; and government, which employed 10% of the workforce (see Figure 1.5.20).

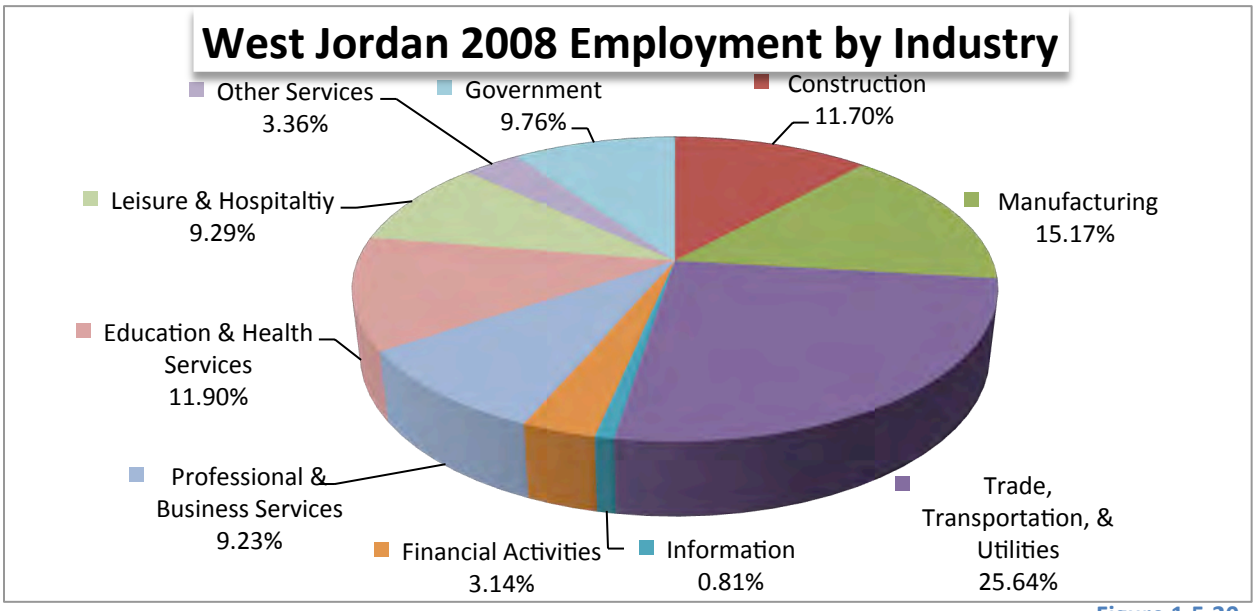


Figure 1.5.20
Source: Utah Department of Workforce Services (2008)

Wages

Total wages paid by employers in various cities are shown in Figure 1.5.21 below. Due to the small number of people employed in the city, West Jordan trails the other cities by a significant amount. However, in examining the average wage, West Jordan is more competitive, although still in last place (See Figure 1.5.22).

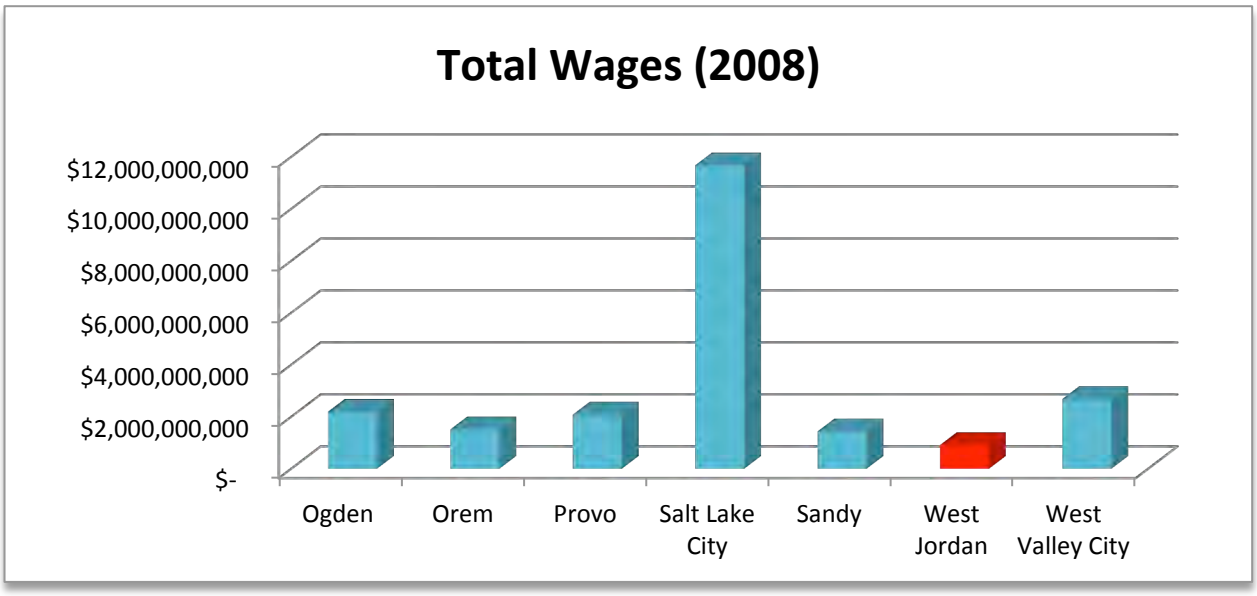


Figure 1.5.21
Source: Utah Department of Workforce Services (2008)

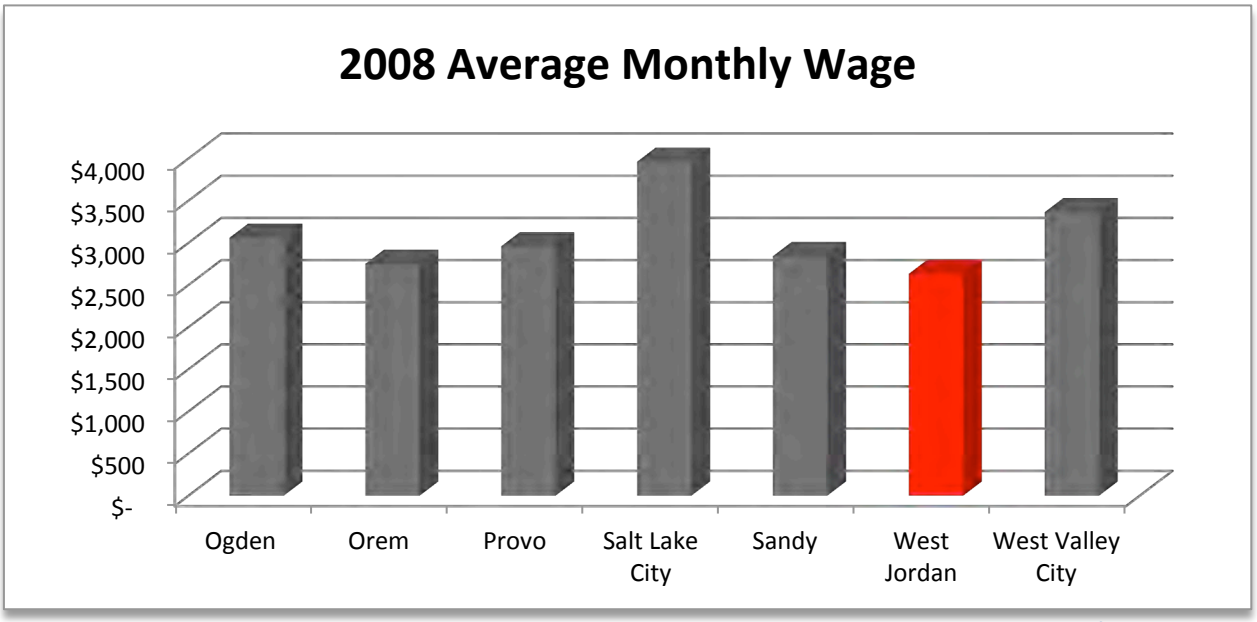


Figure 1.5.22
Source: Utah Department of Workforce Services (2008)

An examination of the monthly wage by industry for West Jordan shows that the most lucrative jobs are in the construction, financial, government, manufacturing, and mining industries. The fields with the lowest average salary include information, and leisure & hospitality (see Figure 1.5.23).

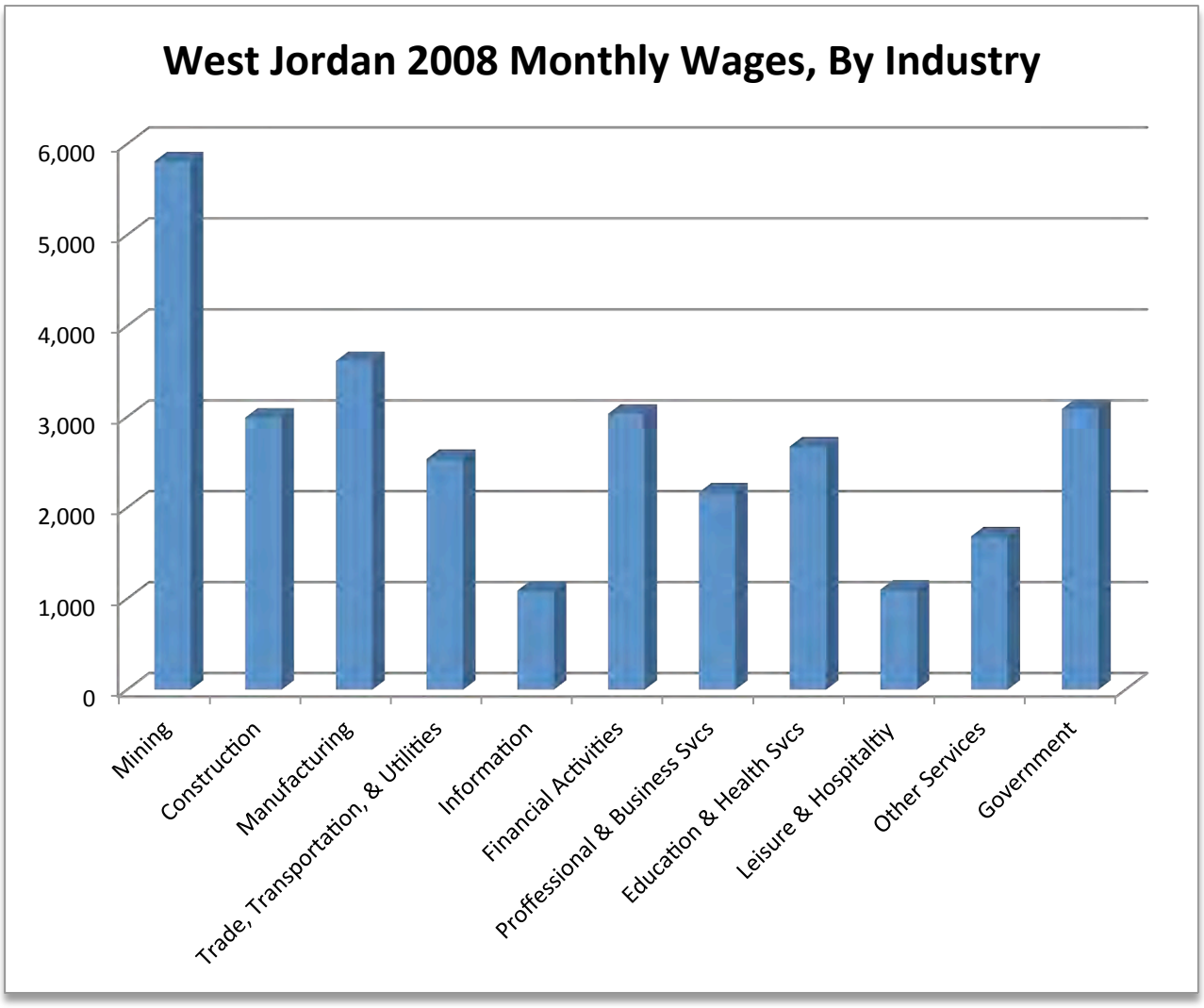


Figure 1.5.23
Source: Utah Department of Workforce Services (2009)

West Jordan enjoys one of the largest median household incomes of the cities listed in Figure 1.5.24. On a per capita basis, West Jordan maintains a high level of income compared to other cities, as evidenced in Figure 1.5.25. Due to this, the overall poverty rate in the city is comparatively lower than most other large cities in Utah (see Figure 1.5.26).

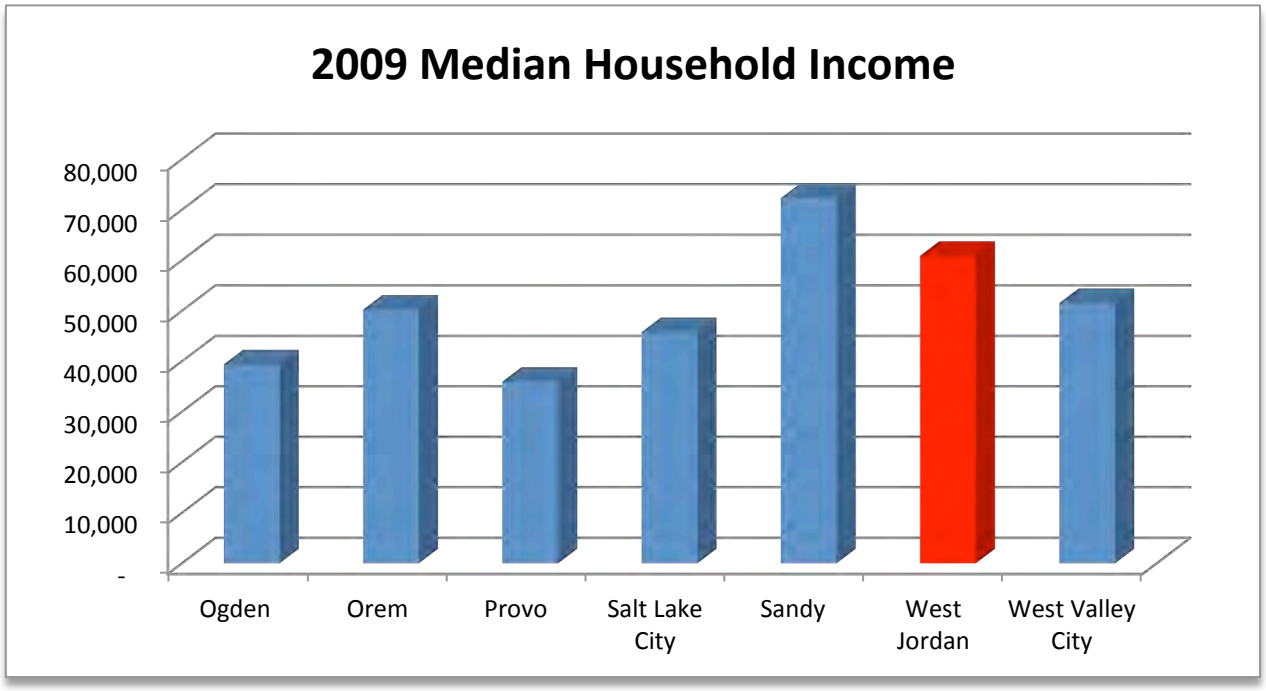


Figure 1.5.24
Source: U.S. Census Bureau (2009)

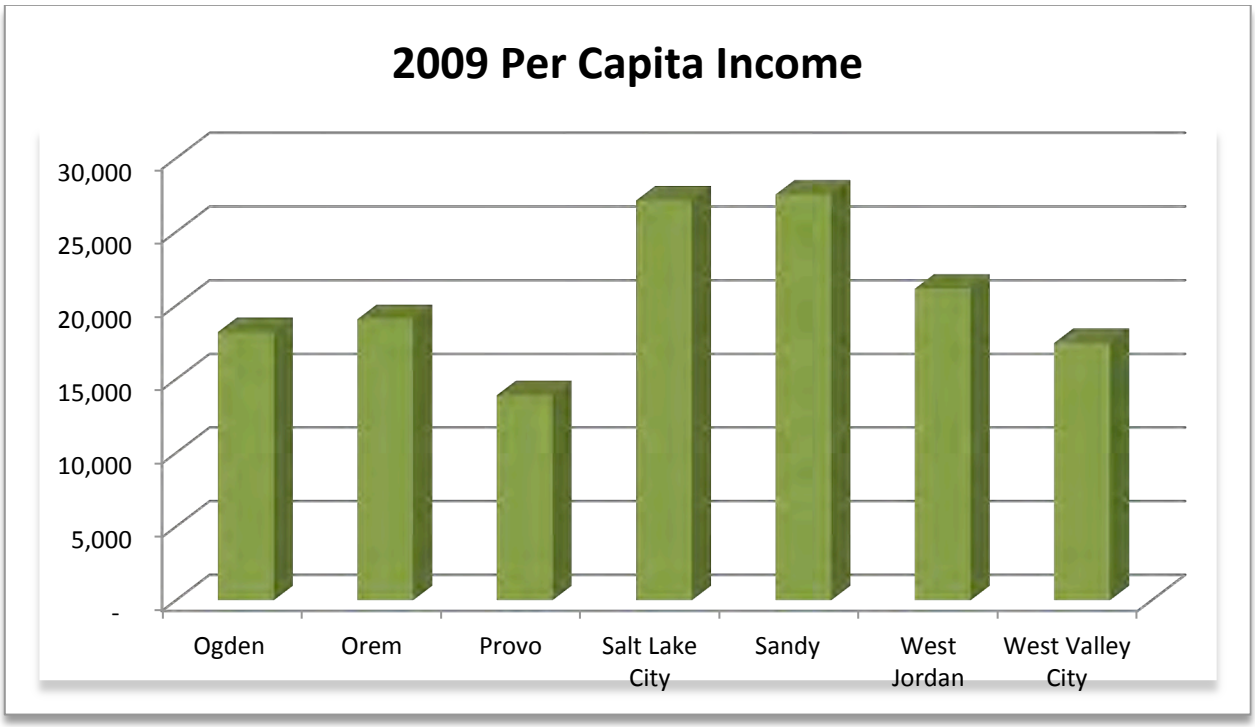


Figure 1.5.25
Source: U.S. Census Bureau (2009)

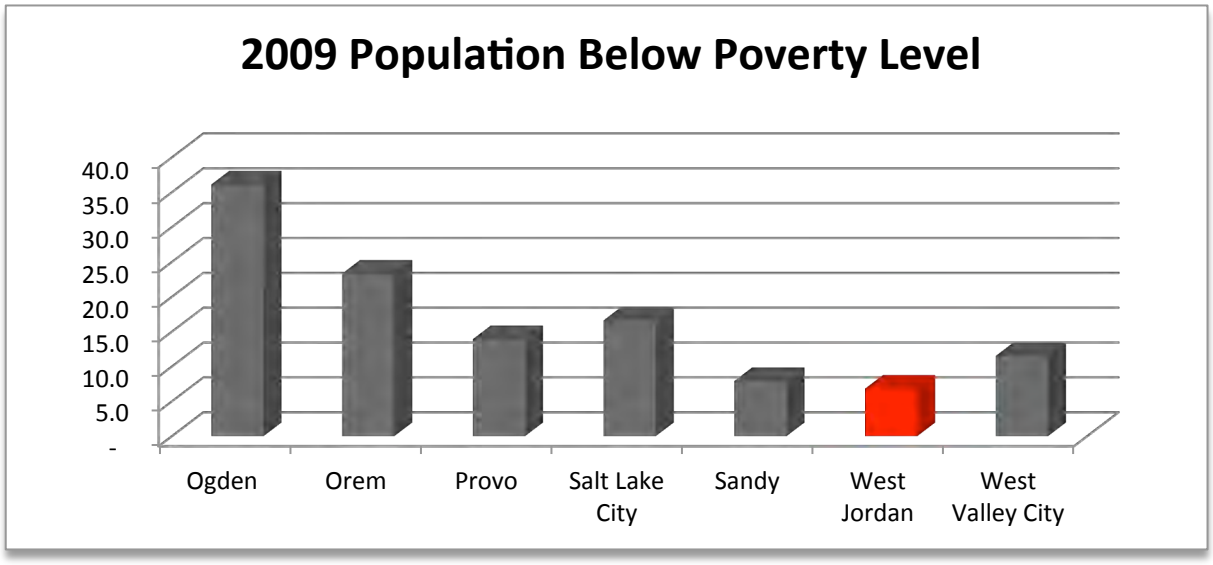


Figure 1.5.26
Source U.S. Census Bureau (2009)

2 Hazard Identification & Summary

2.1 Introduction

Identifying the hazards is the first step in any effort to prepare for, respond to, recovery from and engage in activities to reduce community vulnerability through mitigation. The hazard analysis involves identifying all of the hazards that potentially threaten the community and analyzing them individually to determine the degree of threat that is posed by each. The hazard analysis determines; what hazards can occur, how often they are likely to occur, how severe the situation is likely to get, how these hazards are likely to affect the community, and how vulnerable the community is to the hazard.

This information in this hazard analysis should be used as part of the basis for the development of emergency response and operations plans, mitigation plans, and recovery plans. It indicates which hazards merit special attention, what actions might be necessary to reduce the impact of those hazards, and what resources are likely to be needed.

Hazard analysis and risk assessment includes the completion of five steps:

1. Identifying the hazard.
2. Creating a profile of each hazard.
3. Develop a community profile.
4. Compare and prioritize risk.
5. Create and apply scenarios.

2.2 Hazard Identification

A community hazard analysis considers all types of hazards. Categories of hazards include natural hazards, such as storms and seismological events, and technological or "man-made" hazards, such as an incident at a nuclear power plant, failure of oil or gas pipelines and other accidents at hazardous materials facilities. Some hazards may be the result of civil or political issues such as a neighborhood that has been the scene of rioting or large demonstrations. Cascading emergencies, or situations when one hazard triggers others in a cascading fashion, are also considered. For example, an earthquake that ruptured natural gas pipelines could result in fires and explosions that dramatically escalate the type and magnitude of events.

The following is a list of the hazards that have occurred, or could potentially occur, in the City of West Jordan. Identified hazards in West Jordan include both naturally occurring and "man-made" events:

Natural Hazards

- Floods
- Earthquakes
- Wildfire
- Drought
- Pandemics/Epidemics
- Severe Weather
- Winter Storms
- Thunderstorms
- Tornados
- High winds / Microburst

Technological & "Man Made" Hazards

- Hazardous Materials incidents
- Power Outages
- Fallen Aircraft
- Terrorism / Criminal Acts
- Civil Disturbance
- Dam Failure
- Railway / Transportation

2.3 Hazard Profiles

For each hazard identified in West Jordan, a hazard profile has been created which includes some basic information about the hazard, historic and past occurrences and the following information for each:

- **Frequency of occurrence** - how often it is likely to occur. Frequency has been separated into four categories:

  Highly Likely – nearly 100% probability in the next year.
  Likely - Between 10 and 100% probability in the next one year, or at least one chance in 10 years.
  Possible - Between 1 and 10% probability in the next one year, or at least one chance in 100 years
  Unlikely – Less than 1% probability in the next 100 years.

- **Magnitude and potential intensity** - how bad it can get. Magnitude has been separated into four categories:

  Catastrophic – Affects more than 50% of the community.
  Critical – Affects between 25% and 50% of the community.
  Limited – Affects between 10% and 25% of the community.
  Negligible – Affects less than 10% of the community.

- **Location** - where in the community this hazard is most likely to occur and the probable spatial extent or how large an area it is likely to affect.

- **Duration** - how long the initial event or occurrence can be expected to last.

- **Seasonal pattern** -the time of year during which it is more likely to occur.

- **Speed of onset** -how fast it is likely to occur. Speed of onset has been separated into four categories:

  Minimal or no warning
  6 to 12 hours warning
  12 to 24 hours warning
  More than 24 hours warning

- **Availability of warnings** - how much warning time there is, and whether a warning system exists.

2.3.1 Floods

Floods are one of the most common types of hazards in the world and can occur almost anywhere. Flood effects can be local, impacting a neighborhood or community, or very large, affecting entire river basins over a large area. They are often associated with, or triggered by, other disaster events such as severe weather and dam failures. Flooding is defined as the temporary inundation of normally dry land areas.

Not all floods are the same. Some develop slowly over time, maybe days or weeks, while others occur with little or no warning. Flash floods often have a dangerous wall of roaring water that carries rocks, mud, and other debris and can sweep away most things in its path. Overland flooding occurs outside a defined river or stream, such as when a levee is breached, but still can be destructive. Flooding can also occur when a dam breaks, large pipes, canals, or other infrastructure that contain or convey water for irrigation or culinary purposes fail, producing effects similar to flash floods.

Several different types of flooding are possible and can be expected in South Jordan and include; riverine, flash flood, infrastructure failure including dam failure, urban drainage and subsurface drainage. The Federal Emergency Management Agency in conjunction with the National Flood Insurance Agency has mapped areas of special flood hazards in South Jordan on the Flood Insurance Rate Maps for Salt Lake County. These maps show areas likely to be inundated by the base flood, or "100 year flood".

Frequency of Occurrence:	POSSIBLE. Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	Riverine flooding can be expected along the Jordan River, Bingham Creek and historic wash areas from the Oquirrh Mountains. There are five canals that traverse West Jordan from south to north. One of those terminates in West Jordan. (North Jordan Canal, South Jordan, Canal, Utah and Salt Lake Canal, Utah Lake Distributing Canal and Provo Reservoir Canal.) Localized floods and flash flooding are possible in all areas of the City. Subsurface flooding problems near the Jordan River and eastern portions of the city. See the FEMA Flood Insurance Rate Map for details on other known mapped special flood hazard areas
Duration:	May last hours or days. Extended periods of flooding may last a week or more in some areas.
Seasonal Pattern:	Flooding may occur at any time from infrastructure or dam failure. Flooding caused by rapid snowmelt will most likely will occur in late spring and early summer. Heavy rain or seasonal thunderstorms may occur in the spring and late summer months creating possible riverine or flash flooding.
Speed of Onset:	12 to 24 hours warning; may occur with little or no warning.
Availability of Warnings:	None. Monitoring of conditions may give some advanced notice. The National Weather Service sometimes issues flood watches and warnings.
Historic Events in West Jordan:	
August 2014 –	17 homes were flooded when rainfall runoff overwhelmed storm water capability.

August 2013 -	An apartment complex in the southwest portion of the city sustain a river of mud from accumulate flow across the dry farm areas to the west.

West Jordan City doesn't have any repetitive flood loss claims identified under the National Flood Insurance Program (NFIP).

As stated in 5.2.2

The City Engineer 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 community assistance and monitoring activities. This is part of an integrated development review process that involves the Office of Development Assistance and all supporting departments within the city to include, Engineering, Economic Development, Planning, Building and Safety, and the Fire Marshal.

2.3.2 Earthquakes

An earthquake occurs when there is sudden movement between of blocks of rock along a break in the earth's crust. Utah has a significant risk for earthquakes. There are hundreds of earthquakes each year in Utah. While most of these earthquakes are small events, there are a few large enough quakes each year that are felt by humans (about 2%). Earthquakes with a magnitude 5.5 to 6.5 occur about every 4 to 5 years in Utah and the potential exists along the Wasatch Front for earthquakes with a magnitude of up to 7.0 – 7.5 to occur.

Ground shaking is the most damaging and widespread geologic hazard caused by an earthquake and induces many of the other geologic hazards. All areas of South Jordan are susceptible to the effects of ground shaking. Property damage may occur to man-made structures such as buildings, highways, bridges, dams, utility lines and falling objects may cause injuries.

Besides ground shaking, earthquakes may also trigger other geologic hazards such as liquefaction, surface fault rupture, rock falls, landslides and slope failures and sometimes flooding. Liquefaction occurs when loose, wet soils react to ground shaking from large earthquakes (magnitude 5.0 or greater) and act like a thick liquid and become incapable of supporting buildings or other infrastructure. Areas of high liquefaction are located in South Jordan, especially in the eastern half of the city and near the Jordan River. Surface fault rupture may occur in the area near the fault zone and may range from a few inches to as much as twenty feet. The resulting "crack" may be a few hundred feet to several miles long. Surface fault rupture in South Jordan is not likely based on the distance from the Wasatch Fault Zone. Based on its local geography, rock falls, landslides and slope failures would be rare in South Jordan.

Geologic hazards can occur from an earthquake that occurs from more than 100 miles away. When evaluating the potential risk from earthquake hazards it is important to consider the following;

- The size (or magnitude) of the event and the distance from where it occurs
- The local geology such as the underlying rock type, soil cover and ground water conditions
- Any of the geologic hazards that might result from ground shaking (liquefaction, landslides, etc.)
- The location of, design, and construction methods of man-made structures and utility systems

While no one knows when the next large earthquake in Utah will occur, many researchers and scientists believe that we are "over-due" for a major event based on historic evidence in the geologic record.

Since the mid 1800's, two largest earthquakes in Utah occurred in Hansel Valley in 1934 (magnitude 6.6) and near Richfield in 1901 (magnitude 6.5). The two most damaging events in Utah occurred in 1962 near Richmond in the Cache Valley (magnitude 5.7) and St. George in 1992 (magnitude 5.8).

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is at risk for ground shaking. Certain areas are at risk for liquefaction (see map). It does not appear that there is a significant chance for surface rupture.
Duration:	Initial Ground Shaking may last for a few seconds or nearly a minute or more. The primary event will most likely be followed by aftershocks for hours, days, weeks and possibly months.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None.
Historic Events in West Jordan:	

2.3.3 Wildfire

Wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around.

A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. An urban-wildland interface fire is a wildfire in a

geographical area where structures and other human development meet or intermingle with the wildland or vegetative fuels.

South Jordan does have some urban-wildland interface along the Jordan River and the western portions of the city.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	NEGLIGIBLE - Less than 10%
Location:	Undeveloped areas along the Jordan River where natural vegetation is abundant. Other undeveloped areas, open areas, some agricultural areas. See map for further information.
Duration:	Hours to days.
Seasonal Pattern:	Most likely to occur mid-summer through late fall.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	None. Some factors may be observed that indicate the potential is higher.

Historic Events in West Jordan:

Most events have been small grass and brush fires. No significant events have occurred.

2.3.4 Drought

A drought is defined as "a period of abnormally dry weather sufficiently prolonged for the lack of water to cause serious hydrologic imbalance in the affected area." -Glossary of Meteorology (1959). Simply stated, a drought is a period of unusually persistent dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area.

There are actually four different ways that drought can be defined.

Meteorological	A measure of departure of precipitation from normal. Due to climatic differences, what might be considered a drought in one location of the country may not be a drought in another location.
Agricultural	Refers to a situation where the amount of moisture in the soil no longer meets the needs of a particular crop.
Hydrological	Occurs when surface and subsurface water supplies are below normal.
Socioeconomic	Refers to the situation that occurs when physical water shortages begin to affect people.

Impacts of drought:

Lack of rainfall for an extended period of time can bring farmers and metropolitan areas to their knees. It does not take very long; in some locations of the country, a few rain-free weeks can spread panic and affect crops. Before long, we are told to stop washing our cars, cease watering the grass,

and take other water conservation steps. In this situation, sunny weather is not always the best weather.

Here in the semi-arid desert climate in Utah, a few weeks without rain are not uncommon. However, when the weeks turn to months, serious problems can arise. Because of the fact that much of our drinking water comes from snowmelt, a dry winter can have serious implications in terms of how much water is available for the following summer season. Most locations have sufficient water reservoirs to make it through one dry winter. The real problem becomes back to back dry winter seasons.

Noticeable effects of drought in the area:

Lowered water levels in reservoirs
Lower flows in streams
Fluctuation in levels of the Great Salt Lake
Less water recharge in aquifers
Increased demand for wells

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CRITICAL - 25 – 50 %
Location:	All areas of the community, may especially impact agricultural areas.
Duration:	Multiple years.
Seasonal Pattern:	Likely to occur in 3 to 10 year patterns.
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	The National Weather Service Forecast Office monitors drought conditions around the country and makes forecasts and predictions regarding drought conditions.

Historic Events in West Jordan:

1999 – 2003	Statewide drought conditions
1988 – 1993	Statewide drought conditions
1974 – 1978	Statewide drought conditions
1953 – 1965	Statewide drought conditions
1930 – 1936	Statewide drought conditions
1896 – 1907	Statewide drought conditions

2.3.5 Pandemic

A pandemic is an outbreak of an infectious disease, also known as an epidemic, which spreads across a large region of the world. According to the World health Organization there are three conditions that must be met in order for a pandemic to break out:

- The emergence of a disease new to the population
- The agent infects humans, causing serious illness
- The agent spreads easily and sustainably among humans

The potential for disruption by pandemic is growing larger all the time as more worldwide travel and commerce become common. While it is difficult to predict the magnitude that such an event may have on human activity, there are some scenarios that can be anticipated. Such an event may lead to increased absenteeism for schools and businesses, interruption of services and deliveries, fear, panic, and death.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	CRITICAL - 25 – 50 %
Location:	All areas of the community.
Duration:	Weeks to months.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Could occur at any time. Some events may be likely to occur during the period between late fall and early spring when people are more likely to be indoors and in closer contact with each other.
Speed of Onset:	More than 24 hours warning
Availability of Warnings:	U.S. Center for Disease Control may issue warnings and advisories. Salt Lake Health Department may issue warnings and advisories.

Historic events around the world:

2009-2010	Swine Flu
2002-2003	SARS
1960's	Hong Kong Flu
1950's	Asian Flu
1918	"Spanish Flu" (or avian flu)
1300's	Black Plagued or "Black Death"
165-180 AD	Antonine Plague

2.3.6 Severe Weather

Utah is well known for its rapid and often severe changes in weather. Severe weather includes; winter storms, large scale wind events, thunderstorms, lightning, hail, tornadoes, flooding, and avalanches. While some types of these events can be predicted, others will occur with little or no warning.

2.3.6.1 Winter Storms

Known for some of the greatest snow on earth, Utah can receive from several inches to several feet of snow in a single storm event. Snowfall is often influenced by the Great Salt Lake which produces localized bands of snowfall and can produce some of the area's most severe winter storms.

Severe winter storms can significantly impact transportation routes and pose logistical problems with snow removal during prolonged events. Heavy accumulations of snow can lead to property damage, power outages, and force people to stay in their homes for lengthy periods of time. Air temperatures following the days after a winter storm can become very cold leading to other concerns for people out of power or heat sources.

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years

Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days. Effects of the storms may last up to a week.
Seasonal Pattern:	Most likely to occur from late fall through spring. May occur day or night.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	The National Weather Service issues Watches, Warnings and Advisories.
Historic Events in West Jordan:	

2.3.6.2 Thunderstorms

Thunderstorms occur in South Jordan on an annual basis. Sometimes the intensity of these storms can cause them to be quite destructive to property, create flash floods, and interrupt power services.

Thunderstorms usually affect relatively small areas when compared to other types of disasters. Despite their small size, all thunderstorms are dangerous. They can be the source for other weather related hazards such as tornadoes, lightning, hail, flash floods, and strong winds.

A typical thunderstorm is 15 miles in diameter and lasts about 30 minutes. Of the estimated 100,000 thunderstorms that occur in the United States each year, about 105 are classified as severe. All thunderstorms need three things; moisture to form clouds and rain, unstable air (warm air that can rise rapidly), and something that is capable of lifting air, such as a warm or cold front, mountains or the suns heat.

Frequency of Occurrence:	HIGHLY LIKELY - Near 100% Probability in the next year
Magnitude:	NEGLIGIBLE - Less than 10%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From a few minutes to hours.
Seasonal Pattern:	Most likely to occur from late spring through early fall. Most common during the afternoon and evening hours. Very rare in winter.
Speed of Onset:	6 to12 hours warning
Availability of Warnings:	The National Weather Service issues Watches and Warnings.
Historic Events in West Jordan:	

2.3.6.3 Tornado

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. Tornados are caused by thunderstorms when cold air overrides a layer of warm air, causing the warm air to rise rapidly. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long.

Tornadoes are among the most unpredictable of weather phenomena. While not very common in Utah, tornadoes have occurred in the Salt Lake valley.

Tornado Statistics for Utah;

Size of Tornados: Funnel diameter is usually 10 to 20 yards wide. Largest reported funnel diameters: 440 yards wide on December 2, 1970; 800 feet wide on September 8, 2002; 200 yards wide on May 30, 1986 and August 30, 1992; 100 to 200 yards wide on August 11, 1999; and 100 yards wide on May 6, 1981 and July 25, 1991.

Duration of Tornados: Usually only a few seconds to a few minutes. Greatest amount of time on the ground: 15 minutes on July 9, 1962, July 25, 1991, August 30, 1992, July 24, 1998 and September 8, 2002.

Color of Tornados: Usual color- gray or brown. Other colors: black on July 9, 1962; red on July 24, 1981; and white on December 2, 1970 and March 29, 1982. Tornado Statistics for Utah: January 1950 to the Present

Since 1950 there have been 123 confirmed tornados in Utah, 15 of those have occurred in Salt Lake County. Stated monetary damage from all 123 tornados is $173,011,200+. Generally these tornados have not been severe, but at least 7 of them have been classified as F2 on the Fujita Intensity Scale, or F-scale, which is used to rate tornado intensity. One tornado, occurring in the Uinta Mountains in August 1993 was classified as a F3.

Tornado occurrence by month in Utah 1950 - 2006:

January	1	July	14
February	1	August	24
March	4	September	21
April	7	October	0
May	29	November	2
June	18	December	2

For more detailed information and statistics see the National Weather Service website at: http://newweb.wrh.noaa.gov/slc/climate/tornado.php (as of 27 Feb 2012)

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	Actual tornado may only be active for a few minutes, but the associated storm may last for hours.
Seasonal Pattern:	Most likely to occur from late spring through early fall. Most common during the afternoon and evening hours. Very rare in winter.
Speed of Onset:	Minimal or no warning
Availability of Warnings:	The National Weather Service issues Watches and Warnings.

Historic Events in the area near South Jordan:

1965 - February 9	A tornado that developed ahead of a cold front in Magna, Salt Lake County.
1968 - August 14	A tornado moved through downtown Salt Lake City.
1986 - September 9	A tornado was spotted in a field in the Kearns area of the Salt Lake Valley. It lasted for a minute and did no damage.
1989 - January 10	A tornado produced a fair amount of damage to a south Sandy neighborhood during the morning hours of January 10, 1989.
1989 - March 2	A tornado touched down near 3699 South and 7500 West.
1989 - July 8	Strong microburst winds and a tornado hit the Midvale area just west of 1-15 at about 7200 South.
1990 - August 16	A tornado was sighted along Interstate 80 in Magna by a motorist. It briefly touched down then dissipated. There were no injuries of damage.
1992 - August 30	On the afternoon of August 30, a tornado was spotted by a number of people in the southwestern part of the valley near Kennecott Mines.
1998 - May 8	At about 4:15 PM, a weak tornado (rated FO) was reported in West Valley City.
1998 - July 24	A tornado touched down over the old Kennecott dumping grounds south of Copperton.
1999 - August 11	Tornado in Salt Lake City, killed 1 person, 100+ persons injured. 300 buildings damaged, 34 homes left uninhabitable. Wide spread power outages, significant debris, estimated costs at over 170 million.
2000 - May 25	A small tornado (F0) was observed in the Holladay area with a funnel cloud and possible touchdown earlier in West Jordan and Murray. Total damage was estimated at about $100,000.
2001 - August 21	A weak (F0) tornado briefly touched down in the Sugarhouse area.

2.3.6.4 Microburst / High Winds

Frequency of Occurrence:	LIKELY - Between 10 and 100% probability in next one year, or at least one chance in ten years
Magnitude:	CATASTROPHIC - More than 50%
Location:	The entire city is subject to this type of event, although its effects and severity may vary from one location to another.
Duration:	From hours to days. Effects of the storms may last up to a week.

Seasonal Pattern:	Most likely to occur from late fall through spring. May occur day or night.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	The National Weather Service issues Watches, Warnings and Advisories.
Historic Events in West Jordan:	
High Wind Event - August 2013	60 large electrical transmission poles were toppled along SR-111

** One weather related phenomenon that occurs that should be noted is that of weather related inversions. These inversions tend to occur most often in the months of December, January and February when pockets of cold air become trapped in the valley between the Oquirrh Mountain range and the Wasatch Mountain range. These temporary inversions can last several days and lead to poor air quality for residents in the valley and restrictions placed on burning some types of fuels.

2.3.7 Dam Failure

The largest dam located in West Jordan is the Bateman Pond dam located at 6800 South 1100 West. Other dams that are listed with the State of Utah are all dams created by the construction of water detention basins that meet individual planning requirements.

Frequency of Occurrence:	POSSIBLE - Between 1 and 10% probability in next year, or at least one chance in the next 100 years
Magnitude:	LIMITED - 10 – 25%
Location:	Area of potential inundation identified in the Oquirrh Lake Dam Emergency Action Plan
Duration:	Hours.
Seasonal Pattern:	There is no seasonal pattern associated with this hazard. Failure could occur at any time.
Speed of Onset:	12 to 24 hours warning
Availability of Warnings:	None.
Historic Events in South Jordan:	
None.	

3 Vulnerability & Risk Assessment

The vulnerability assessment applies the information collected through hazard identification and profiling to our community's assets to summarize the impacts from hazards on the community and its vulnerable structures. These impacts are represented by measures such as population at risk, percent damages, and dollar loss estimation. Information provided by the vulnerability assessment includes the areas of our community that are susceptible to each hazard and the areas where the highest losses could occur. This type of information will provide a factual basis for developing effective mitigation strategies.

The primary objective of the vulnerability assessment is to prioritize hazards of concern for our community so that a framework for mitigation strategy and policy development is established.

3.1 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.

3.1.1 Essential Facilities at Risk (City, County or State Owned)

Facility	Location	Function
City Hall	8000 S. Redwood Road	City Administration
West Jordan Justice Center	8040 S. Redwood Road	Police Department and Justice Court
Fire Station 52	7959 S. Redwood Road	Fire / EMS / Hazmat/Heavy Rescue
Fire Station 53	7602 S. Jordan Landing Boulvard	Fire / EMS / Hazmat/Heavy Rescue/Admin
Fire Station 54	9351 S. 5595 W.	Fire / EMS / Hazmat/Heavy Rescue
Fire Station 55	7750 S. 6400 W.	Fire / EMS / Hazmat/Heavy Rescue
Public Works	8040 S. 4000 W.	Public Works
Animal Shelter	5982 New Bingham Highway	Animal Services
Gene Fullmer Recreation Center	8015 S. 2200 W.	Possible Sheltering Location
West Jordan Senior Center	8025 S. 2200 W.	Possible Sheltering Location

Utah 3rd District Court	8080 S. Redwood Road	State of Utah District Court

3.1.2 Essential Facilities at Risk (Non-City Owned)

Facility	Location	Function
Columbia Elementary	3505 W. 7800 S.	Public School
Copper Canyon Elementary	8917 S. Copperwood Dr. (5600 W.)	Public School
Falcon Ridge Elementary	6111 W. 7000 S.	Public School
Fox Hollow Elementary	6020 W. 8020 S.	Public School
Hayden Peak Elementary	5120 W. Hayden Peak Dr. (7995 S.)	Public School
Heartland Elementary	1451 W. 7000 S.	Public School
Jordan Hills Elementary	8892 S. 4800 W.	Public School
Majestic Elementary	7430 S. Redwood Road (1700 W.)	Public School
Mountain Shadows Elementary	5255 W. 7000 S.	Public School
Oakrest Elementary	8462 S. Hilltop Oak Drive (6620 W.)	Public School
Oquirrh Elementary	7165 S. Paddington Road (3285 W.)	Public School
Riverside Elementary	8737 S. 1220 W.	Public School
Terra Linda Elementary	8400 S. 3400 W.	Public School
West Jordan Elementary	7220 S. 2370 W.	Public School
Westland Elementary	2925 W. 7180 S.	Public School
Westvale Elementary	2300 W. 8660 S.	Public School
Joel P. Jensen Middle	8105 S. 3200 W.	Public School / Shelter
Sunset Ridge Middle	8292 S. Skyline Arch Drive	Public School / Shelter
West Hills Middle	8270 S. Grizzly Road (5400 W.)	Public School / Shelter
West Jordan Middle	7550 S. Redwood Road (1700 W.)	Public School / Shelter
Copper Hills High	5445 W. New B ingham Hwy. (7800 S.)	Public School / Shelter
West Jordan High	8136 S. 2700 W.	Public School / Shelter
South Valley School	8400 S. Redwood Road (1700 W.)	Public Special Needs School
JATC	9301 S. Wights Fort Road (3400 W.)	Public Technical School
SLC Community College Jordan	3491 W. 9000 S.	Public School / Shelter

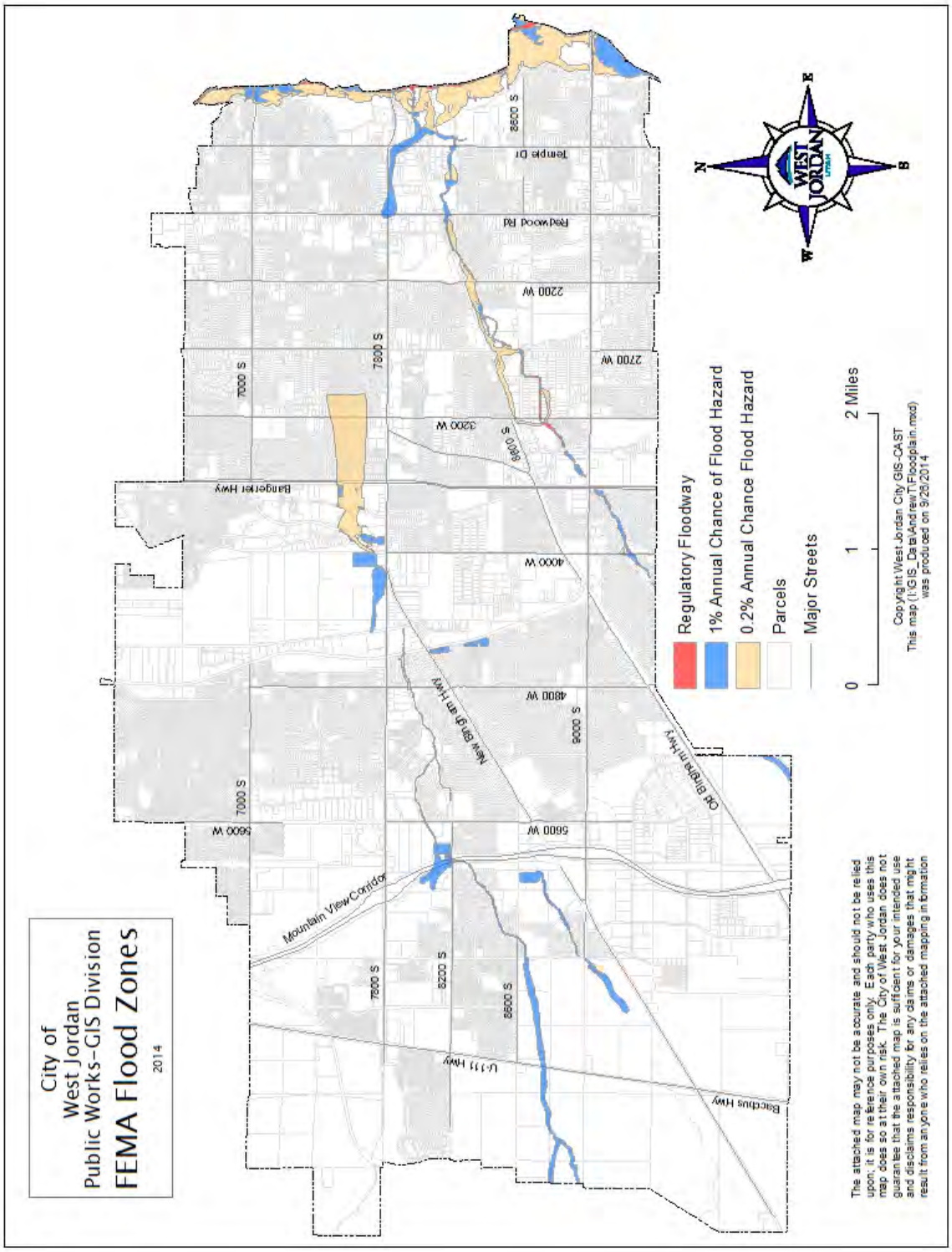
3.1.3 Risk Index Summary

HAZARD	MAGNITUDE	FREQUENCY	WARNING TIME	SEVERITY	SPECIAL CHARACTERISTICS AND PLANNING CONSIDERATIONS	RISK PRIORITY
Agricultural	Negligible	Possible	24 + hours	Limited	Agricultural areas are being reduced as homes	Low

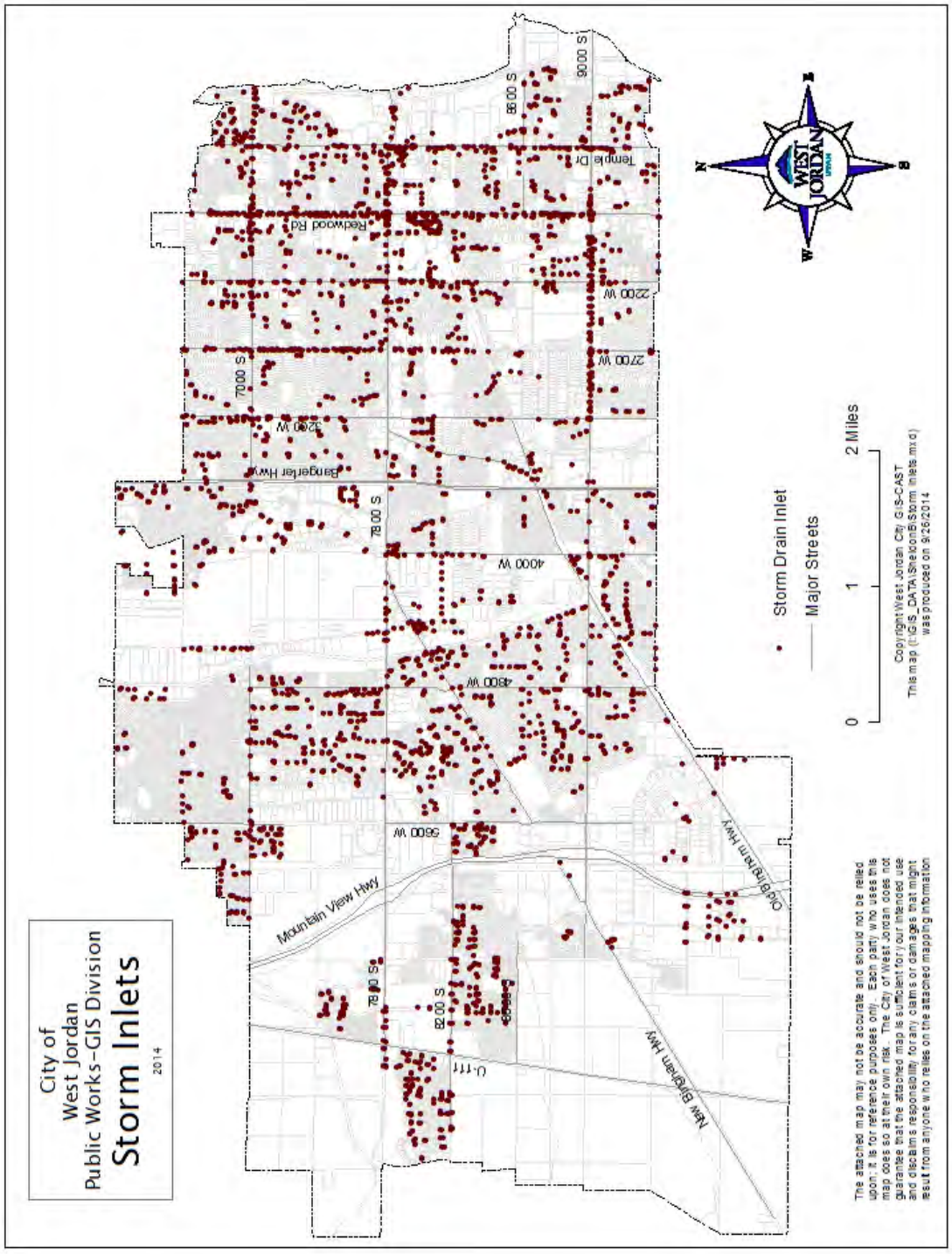
					are being built.	
Civil Disturbance	Negligible	Possible	Minimal	Limited	Most likely to occur at "major event' or as the result of political issues.	Low
Dam Failure	Limited	Possible	12-24 hours	Limited	The lake is still being built. Dam is owned by a private company.	Low
Drought	Likely	Catastrophic	24 + hours	Limited	Cyclic events. Severity and end of event uncertain.	Low
Earthquake	Catastrophic	Possible	None	Critical	Cannot be predicted. Scientists say that we are "overdue" for a large event in this area.	**High**
Fallen Aircraft	Negligible	Possible	Minimal	Negligible	Proximity to airports and flight paths makes this possible.	Low
Floods	Limited	Possible	12-24 hours	Limited	Flooding can occur in any part of the City for a variety of reasons	Low
Hazardous Materials Incident	Critical	Likely	Minimal	Limited	Areas near the interstate, railroad tracks and centers of manufacturing are at greatest risk.	High
Liquefaction	Critical	Possible	Minimal	Limited	Will be a cascading effect of an earthquake. Areas near the Jordan River are most at risk	Medium
Pandemic	Critical	Possible	24 + hours	Catastrophic	Could require restricting travel, commerce, schools, and other social issues	Medium
Power Outage	Catastrophic	Likely	Minimal	Limited	Depending on duration of the event, may cause many problems.	High
Severe Winter Weather	Catastrophic	Likely	12-24 hours	Limited	Occurs almost annually. May cause power outages as a cascading event.	High
Terrorism	Critical	Possible	Minimal	Negligible	There are few "targets" in the City, but it is still possible that malicious acts may occur for other reasons.	Medium
Thunderstorms	Negligible	Highly Likely	6-12 hours	Limited	These events often trigger flooding. Microburst storms have caused many homes to have flooding that are not in a mapped floodplain.	Medium
Tornado	Limited	Possible	Minimal	Limited	Unlikely to occur, but they have been more	Low

					frequent in Utah in recent years	
Wildfire	Negligible	Possible	Minimal	Limited	Will most likely occur near the Jordan River or in the western portions of the City.	Low

3.2 Flood Hazard Maps



Map 3.2 Fema Flood Zones-West Jordan


City of
West Jordan
Public Works-GIS Division
Storm Inlets
2014
Storm Drain Inlet
Major Streets
0
1
2 Miles
Copyright West Jordan City GIS-CAST
This map (I:\GIS_DATA\Sheldon\Storm inlets mxd)
was produced on 9/26/2014
The attached map may not be accurate and should not be relied upon. It is for reference purposes only. Each party who uses this map does so at their own risk. The City of West Jordan does not guarantee that the attached map is sufficient for your intended use and disclaims responsibility for any claims or damages that might result from anyone who relies on the attached mapping information
9000 S
8600 S
7800 S
7000 S
8200 S
Temple Dr
Redwood Rd
Bangerter Hwy
Mountain View Hwy
Old Bingham Hwy
New Bingham Hwy
Jordan River
2200 W
2700 W
3200 W
4000 W
4800 W
5600 W

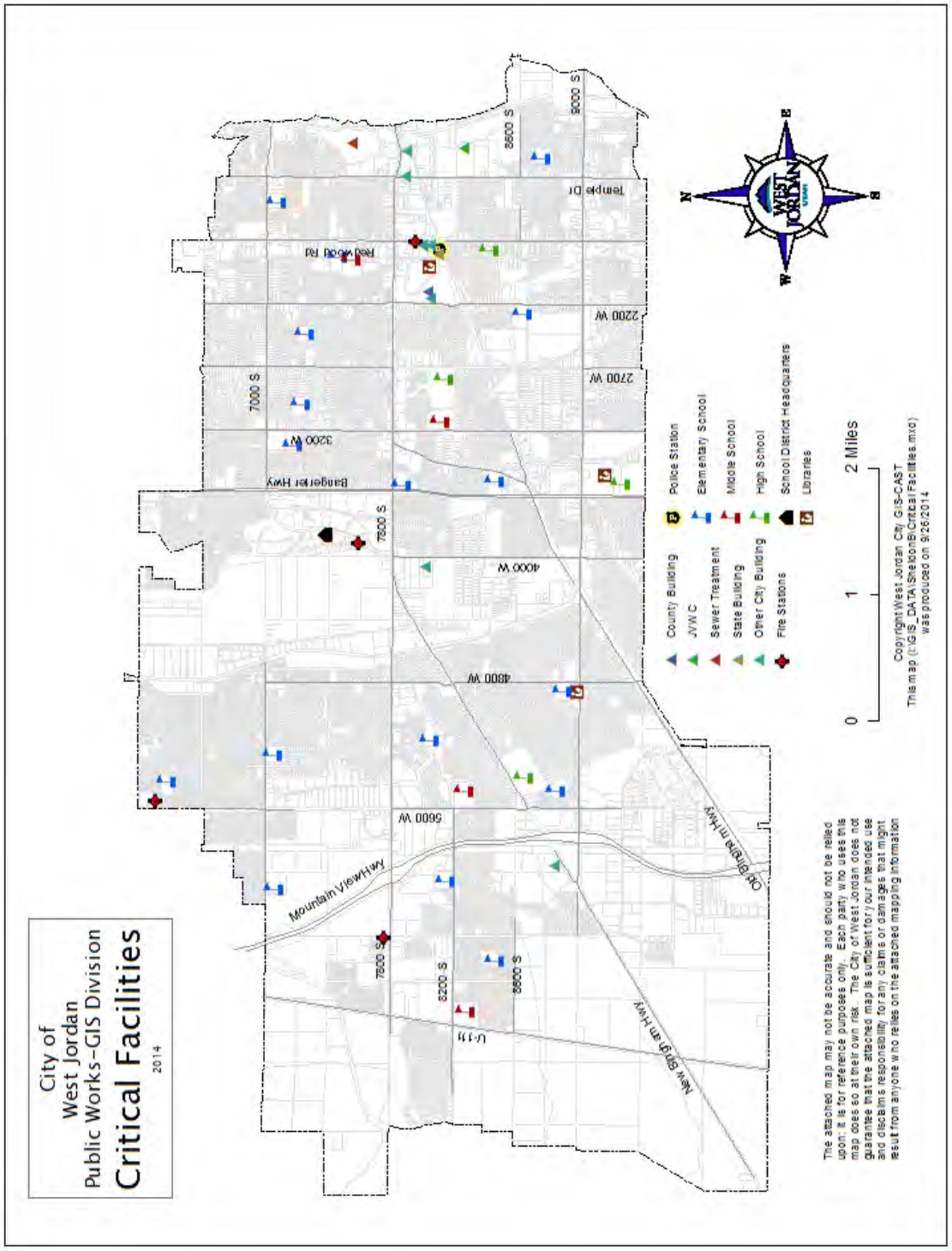


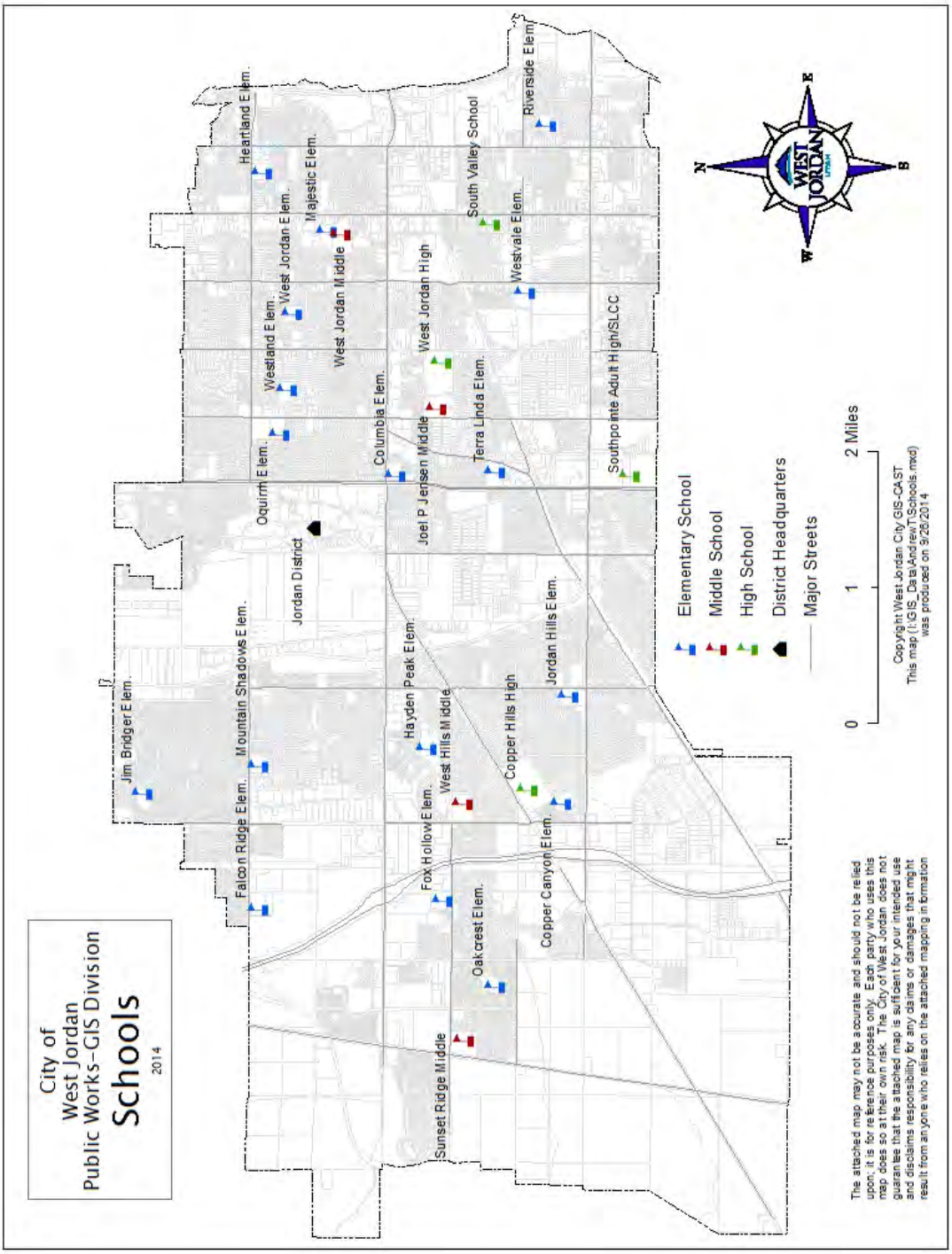
Figure 10 Map showing location of some Critical Facilities.

3.2.1 Government Buildings

Several governmental buildings are located in West Jordan. A portion of these buildings are essential for community service in the event of a large scale disaster or emergency. The buildings that are critical in nature consist of fire stations, police stations, city hall, and public works facilities. Other less than critical buildings include the post office and animal shelter.

3.2.2 Schools/Universities

West Jordan City has multiple schools located in its city limits.



Map showing location of schools and other educational institutions.

4 Capability Assessment

4.1 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. Please complete the tables and questions in the worksheet as completely as possible. Complete one worksheet for each jurisdiction.

Planning Team/Emergency Managers:
Please complete this worksheet in coordination with your jurisdiction's city planners, economic development, building and zoning officials, engineers, floodplain administrators, GIS Analyst or others as appropriate.

Completed By: Reed G. Scharman, Battalion Chief/EPM **Date**: Nov. 13, 2013

Jurisdiction: City of West Jordan

Participants (Name, Title):

Julie Brown, Administrative Assistant, Economic Development

Greg Davenport, Capital Projects Engineer

Reed G. Scharman, Emergency Management

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: International Fire and Building Codes	Yes	Version/Year. Are building codes adequate? 2012 International Code Set Adopted by the State of Utah and City of West Jordan

Site plan review requirements West Jordan Zoning Regulations	 Yes	Do site reviews consider natural hazards? Yes

1. Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces? The West Jordan Municipal Code and the 2012 IFC set standards for construction that includes snow weight capability, wind speed loading and seismic bracing.

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) West Jordan Municipal Code	Yes	The code is inclusive and updated if needed.
Subdivision ordinance(s) West Jordan Municipal Code	Yes	The code is inclusive and updated if needed.
Natural hazard specific ordinances (storm water, steep slope, wildfire) Hillside Protection and Grading Standards	Yes	Municipal Code
Floodplain ordinance Engineering Standards reference FEMA maps	Yes	
Flood insurance rate maps, other floodplain studies		
Policies for acquisition of land for open space and public recreation uses	Yes	West Jordan Parks Master Plan and General Plan
Other		

2. Does the future land-use map clearly identify natural hazard areas? Rivers, creeks, canals and drainages are indicated.

_____

_____

3. Do land-use policies and zoning ordinances discourage development or redevelopment within natural hazard areas? **Perhaps stated differently: Do land-use policies and zoning ordinances encourage the implementation of appropriate mitigation efforts where natural hazards are encountered? Answer, Yes.**

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 2012	
Capital Improvements Plan	Yes 2013	
Economic Development Plan	Yes 2012	
Local Emergency Operations Plan	Yes 2012	
Recovery Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	Yes 2008	
Storm Water Management Plan	Yes 2007	
Community Wildfire Protection Plan	No	Public lands wildfire potential limited to Jordan River trail and west side dry farms.
Other plans or hazard studies (brownfields, redevelopment, disaster recovery, climate change adaptation)	Yes 2006	Culinary Water Master Plan
How can these building codes, planning and zoning ordinances, and other community plans be expanded and improved to reduce risk?		

5. Are goals and policies in the comprehensive plan related to the local hazard mitigation plan? Please specify. **No, there is not a direct reference in the 2012 plan.**

6. Do economic development or redevelopment strategies include provisions for mitigating natural hazards? Specify: **Engineering analysis is required as part of all plan reviews and approvals.**

7. Do subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas? **Yes. Hillside Ordinance and FEMA Flood Plain mapping requirements.**
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? **No**

10. Does the capital improvement or other plan provide funding for hazard mitigation projects? **Yes**
11. Do transportation plans limit access to hazard areas? **No**

12. Are transportation systems designed to function under disaster conditions (e.g. evacuation)? **No. Evacuation routes are not posted.**

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**	**Are staff trained on hazards and mitigation?**
Planning Commission	Yes/PT	Yes
Zoning Administrator	Yes/FT	Yes
Chief Building Official	Yes/FT	Yes
Floodplain Administrator	Yes/FT	Yes, City Engineer
Emergency Manager	Yes/FT	Yes
Community Planner	Yes/FT	Yes
Civil Engineer	Yes/FT	Yes
GIS Coordinator	Yes/FT	Yes
Others with understanding of natural hazards or with technical hazard assessment skills	Yes/FT	Fire Marshal, Building Inspectors, Engineering Inspectors, Staff Engineers, Water System Operators
Administration	**Yes/No**	**Describe capability**

Maintenance programs to reduce risk (tree trimming, clearing drainage systems, etc)	Yes	West Jordan has a full time Urban Forester.
Mutual aid agreements	Yes	Utah WARN, Fire Department Mutual Aid
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	Handled through Valley Emergency Communications Center
Hazard data and information	Yes	Local Emergency Planning Committee was formed.
Grant writing	Yes	The City has a full time grant writer.
HAZUS or other GIS analysis tools	Yes	GIS department trained in the use of Hazus
Other		
How can staff, administration or technical capabilities be expanded or improved to reduce risk?		

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 organizations	Yes	Exchange Club, Rotary Club, West Jordan Chamber of Commerce, LEPC
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness)	Yes	"Ready West Jordan" disaster preparedness program
Natural disaster or safety related school programs	Yes	Fire department assigned fire crew contact with the schools. Police resource officers
StormReady certification	No	
Firewise Community certification	No	
Public-private partnership initiatives addressing disaster-related issues	Yes	

Other	Yes	Water Conservation Program Jordan District Safe Schools Committee
How can public education and outreach capabilities be expanded or improved to reduce risk?		

5 Mitigation Strategy

5.1 Mitigation Goals and Objectives

- Earthquake - Increase the number of residents who are trained to set up and operate an emergency shelter.
- Flood - Increase public awareness and compliance with keeping storm drains and ditches free from debris, particularly green waste.
- Wildland Fire - Increase emphasis in our code enforcement efforts to create defensible space between undeveloped fields and residential and commercial property.
- Slope Failure - Enforce the West Jordan Hillside Ordinance to ensure that new development occurs within the requirement.
- Severe Weather - Use the IPAWS system to provide greater warning for individuals living in areas being impacted by severe weather.
- Dam Failure - Create a patterned inspection program to look for signs of weakness.
- Avalanche - Avalanches are not a hazard in West Jordan.
- Pandemic - Emphasis needs to be placed on the development of a citywide continuity of operations plan.
- Drought - West Jordan is researching the possibility of obtaining water from treated waste water and production water sources.
- Infestation - Continue the annual West Jordan weed abatement program through the Code Enforcement unit of the West Jordan City Attorney's Office.
- Radon - Participate in a public awareness campaign to alert homeowners to the presence of radon gas production from the soil.
- Problem Soils - Continue the current application of West Jordan development standards which require soil sampling as part of the geo-technical reports submitted for property development.

5.2 Actions Taken 2009 Mitigation Goals and Objectives

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 South Jordan'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 South Jordan, 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	West Jordan continues to improve and maintain its communication capabilities. Example: Purchased 3 satellite phones. Added 800 MHz channel for Public Works and Public Safety Backup. Added repeated VHF channel for EOC support.
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	West Jordan participates in training and exercises designed to practice using communication tools and equipment. Example: We participate with Salt Lake County in ongoing radio and phone functional exercises. New mobile command trailer is outfitted with radio and internet capabilities.
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	West Jordan Fire participates in the Salt Lake Valley Mutual and Automatic Aid agreement. This provides access to communications resources as part of our participation.

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	Ongoing	West Jordan continues to work on notification tools and procedures to be in harmony with changing technology and equipment. We are in the process of purchasing a complete phone system for the city that has notification features as well as disaster level system redundancy.
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	West Jordan evaluates areas of vulnerability and develops solutions to ensure communication systems or alternate solutions are viable Example: The development of a Public Works 800 MHz channel to be a backup to the statewide 800 MHz system for Police and Fire.
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	West Jordan 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	The Utah Communications Authority provides the coordination of radio channels throughout the state of Utah.
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	West Jordan has upgraded existing equipment and purchased new equipment to maintain operability

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	West Jordan 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	West Jordan 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	West Jordan 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	West Jordan 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	West Jordan has implemented the use of monitoring equipment such as a weather monitoring station. We also receive email alerts from NOAA directly. These are forwarded to multiple departments as appropriate.
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 West Jordan 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	Ongoing	West Jordan has an ongoing project to GPS locate critical infrastructure and key resources. This includes a dedicated frequency for reporting data to the City.

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	Ongoing	West Jordan Fire Prevention and Emergency Management has an ongoing program to review city facilities for safety and code compliance. We also work with the city's risk manager and insurance company to review city properties for hazards.
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	West Jordan is identifying options and opportunities to address issues identified during the risk assessments.
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	West Jordan has formal agreements for Police, Fire, Public Works and community sheltering.
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	West Jordan 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	West Jordan Emergency Management provides several public education classes. Our Ready West Jordan program and variations of that 2 ½ hour class.
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	West Jordan'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	West Jordan 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	West Jordan has worked with Be Ready Utah and other programs to make presentations in West Jordan and will continue to invite them to events and other activities in the community
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	West Jordan 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 West Jordan ordinances are available online at: http://www.wjordan.com
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	Individual dam plans are created for the detention basins meeting the dam requirements.
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	A copy of the FEMA Flood Plain map is included in the mitigation plan.

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	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	Completed / Ongoing	West Jordan has a staff member who provides outreach material on 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	Completed / Ongoing	West Jordan is a water provider and our engineering staff coordinates 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 – Investigate feasibility of implementing an incentive program to encourage the use of low-flow appliances and fixtures in homes and businesses	Completed / Ongoing	West Jordan has a variety of incentive programs that it offers to its residents related to water conservation. Example: Rebate program for installing low flow toilets
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	West Jordan has implemented several projects including using secondary 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 West Jordan Water Division responds immediately to all reports of leaks and performs regular system maintenance, including actively monitoring for leaks, theft of services, etc. They have an ongoing meter replacement program to keep the system up to date.
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 West Jordan Water Division coordinates all water use, including the testing of hydrants in partnership with the fire 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	7 – Provide information on landscaping alternatives for persons subject to green area requirements	Completed / Ongoing	West Jordan employs an arborist as part of the newly created Parks department. (This was formerly a division of public works.)
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 West Jordan
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	West Jordan has been supportive of Jordan Valley Water Conservancy Districts program to recover and treat ground water at the facility here in West Jordan.
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	West Jordan identified the Sugar Factory Tower and buildings as a hazard and had them razed. Fire Station 54 had seismic concerns and has been torn down and is currently being rebuilt.
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	West Jordan does not have funding to support this type of program. West Jordan does not intend to move this activity forward due to the very limited number of URM structures in the community and the lack of potential funding sources to support it
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	Fire Station 54 is currently being rebuilt from the ground up due in part to seismic concerns.

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	Not Completed	There are very few URM homes and businesses located in West Jordan that would make this activity cost effective for the City to engage in. West Jordan 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 West Jordan 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	West Jordan is a participating community in the NFIP.
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	West Jordan 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
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 were completed on Midas Creek including upsizing culverts, channel stabilization, etc.

Category	Goal / Objective	Action	Status	Comments
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	West Jordan has a Weather Operations Plan for city events and shares this as a best practice with community groups.
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	West Jordan 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	South Jordan participates in briefings provided by NWS representatives on an annual basis at the City County Directors Conference sponsored by the Utah State Division of Emergency Management.

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	West Jordan 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	West Jordan 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	South Jordan has 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	South Jordan 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	Completed	West Jordan 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 West Jordan 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 West Jordan 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 West Jordan 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

5.3 Mitigation Actions

5.3.1 Earthquake

Action:

- Increase the number of residents who are trained to set up and operate an emergency shelter.

Issue/Background:

- West Jordan is located within site of the Wasatch and associated faults. The Wasatch Front has recorded large earthquakes in the past and can be expected to experience large earthquakes in the future.
- Earthquakes can create fire, flooding, hazardous materials incidents, transportation incidents, and communications limitations.
- West Jordan can experience liquefaction along the eastern portion of the city, roughly between Redwood Road and the Jordan River.
- Because a significant portion of West Jordan has been built since 1975, its structures may be in better shape than those in other parts of the valley which could lead to a migration of earthquake refugees to West Jordan.
- West Jordan has a memorandum of understanding with the Jordan School District to use middle and high schools as shelter locations. Other buildings in the city are also on the American Red Cross approved shelter list.

Other Alternatives:

- While it is not possible to avoid the total effect of an earthquake, it is possible to buy earthquake insurance to help mitigate some of the repair cost to individuals.

Responsible Office:

- The West Jordan City Manager serves as the Emergency Manager in a declared state of emergency and a Deputy Chief in the Fire Department is assigned as the Emergency Program Manager for the city. In the event of a declared disaster, city ordinance requires the appointment of a Disaster Recov ery Officer.

Priority (High, Medium, Low):

- High

Cost Estimate:

- $114,000

Potential Funding:

- General Fund expediture to increase Fire Department Staffing for the Prevention and Emergency Management Division to hire two Fire Service Officers to provide public education throughout the community.

Benefits (Avoided Losses):

- Training citizens has an immediate and long term impact. An ongoing training program keeps the need for such training in the forefront and it helps those who will both operate and use a shelter in a time of need.

Schedule:

- Ongoing. Continuation of a program started two years ago as a partnership with the Jordan School District and the American Red Cross. Funds are needed to hire personnel to teach the American Red Cross Community Shelter program.

5.3.2 Flood

NFIP Participation by West Jordan

The City Engineer 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 community assistance and monitoring activities. This is part of an integrated development review process that involves the Office of Development Assistance and all supporting departments within the city to include, Engineering, Economic Development, Planning, Building and Safety, and the Fire Marshal.

Action:

- Increase public awareness and compliance with keeping storm drains and ditches free from debris, particularly green waste.

Issue/Background:

- Storm water systems are designed to function unimpeded by green waste and other forms of debris.

- Residents who live near ditches and canals have been found to have dumped grass clippings and tree trimmings into these storm water assets.

- West Jordan has developed a stormwater master plan

Other Alternatives:

- Continue to add additional storm drain features to accommodate the loss of capacity due to obstruction.

Responsible Office:

- Public Works Department, Storm Water Manager

Priority (High, Medium, Low):
- High

Cost Estimate:
- $57,000

Potential Funding:
- General Fund expediture to increase Storm Water staffing.

Benefits (Avoided Losses):
- $100,000 in claims made against the city.

Schedule:
- Ongoing

5.3.3 Wildland Fire

Action:
- Increase emphasis in our code enforcement efforts to create defensible space between undeveloped fields and residential and commercial property.

Issue/Background:
- A significant amount of acreage in the city is still used as wheat dry farm. There are also developable plots of land that exceed 5 acres in size.

- A vegetation fire can spread rapidly with preveailing winds and spread to fencing, out buildings and finally to primary structures that my be located along the rural-urban interface.

Other Alternatives:
Responsible Office:
- City Attorney, Code Enforcement

Priority (High, Medium, Low):
- High

Cost Estimate:
- $57,000

Potential Funding:
- General Fund expediture to increase Storm Water staffing.

Benefits (Avoided Losses):
- $1,000,000 in potential fire loss and additional risk to loss of life and injury to firefighters and residents.

Schedule:

- Ongoing

5.3.4 Slope Failure

Action:

- Enforce the West Jordan Hillside Ordinance to ensure that new development occurs within the requirement.

Issue/Background:

- It is possible to construct buildings on slopes that have I high potential for slipping.
- Slopes that are too steep impede the ability of the fire department to respond to an emergency.

Other Alternatives:

- Allow individual property owners to assess their property.

Responsible Office:

- West Jordan City Engineer

Priority (High, Medium, Low):

- Low

Cost Estimate:

- $100,000

Potential Funding:

- General Fund allocation by the City Council to maintain the position of City Engineer.

Benefits (Avoided Losses):

- We avoid developing in a manner that would risk home and business development to long term problems and costs.

Schedule:

- Ongoing

5.3.5 Severe Weather

Action:

- Use the IPAWS system to provide greater warning for individuals living in areas being impacted by severe weather.

Issue/Background:

- West Jordan is large enough that different parts of the city can be impacted by weather events.
- People become less motivated to respond when they receive general warnings and then do not experience an event. Thus targeting the impacted areas with information is more beneficial

Other Alternatives:
Responsible Office:
- West Jordan Emergency Management

Priority (High, Medium, Low):
- High

Cost Estimate:
- $5,000

Potential Funding:
- General Fund expediture to increase Storm Water staffing.

Benefits (Avoided Losses):
- Residents would be able to sandbag in a timely manner and avoid losses from storm runoff.

Schedule:
- Ongoing

5.3.6 Dam Failure

Action:
- Create a patterned inspection program to look for signs of weakness in the dam structure.

Issue/Background:
- Bateman Pond has a dam that stores water year-round.
- Most of our dams are detention basins that serve as park space and are filled falling a significant weather event.

Other Alternatives:
Responsible Office:
- West Jordan Public Works Director

Priority (High, Medium, Low):
- Low

Cost Estimate:

- $25,000

Potential Funding:

- General Fund allotment for waste water utility personnel to inspect the dam annually.

Benefits (Avoided Losses):

- Avoid a failure that could have been avoided through a simple inspection.

Schedule:

- Ongoing

5.3.7 Avalanche

Action:

- Avalanches are not a hazard in West Jordan.

5.3.8 Pandemic

Action:

- Emphasis needs to be placed on the development of a citywide continuity of operations plan.

Issue/Background:

- West Jordan is becoming more densley populated and the potential for rapid transmission of a disease is increased.
- West Jordan also has a young population of small children who are propone to habits of touching and tasting that can spread disease rapidly through schools and daycares.
- We have plans for continuity of command but need to work on the ability to work remotely and to relocate major operations if necessary.

Other Alternatives:

- The potential is to do nothing and risk the reduction or elimination of city services for a period of time until workers are able to return to work.

Responsible Office:

- West Jordan Emergency Program Manager
- West Jordan Facilities Manager

- West Jordan IT Manager

Priority (High, Medium, Low):
- High

Cost Estimate:
- $57,000

Potential Funding:
- General Fund expediture to increase Storm Water staffing.

Benefits (Avoided Losses):
- If the pandemic is unavoidable then the implementation of a continuity of operations plan will reduce the reduction in services to the community.

Schedule:
- This is a 2015 project with anticipated updates as needed.

5.3.9 Drought

Action:
- West Jordan is researching the possibility of obtaining water from treated waste water and post-industrial use water sources.

Issue/Background:
- West Jordan is a water supplier to the community from well sources as well as purchasing water from Jordan Valley Water Conservancy District.

- Increasing population and industry are putting a significant demand on conventional water supplies.

Other Alternatives:
- Impose restrictions on commercial and residential water use.

Responsible Office:
- West Jordan Public Works Director

Priority (High, Medium, Low):
- Medium

Cost Estimate:
- $5,000,000

Potential Funding:
- General Fund expenditure by the City council.

Benefits (Avoided Losses):

- Reuse of water that exists locally may ultimately reduce the ongoing cost of water that will come through increased demand.

Schedule:

- Long term research and development needed.

5.3.10 Infestation

Action:

- Continue the annual West Jordan weed abatement program through the Code Enforcement unit of the West Jordan City Attorney's Office.

Issue/Background:

- West Jordan has developed westward from the Jordan River. The land has been largely dry wheat farms ahead of development.
- Winds aid in the spreading of weeds from open lands to otherwise developed property.

Other Alternatives:

- Rely on individual property owners to maintain their property as they desire.

Responsible Office:

- West Jordan City Attorney and West Jordan Code Enforcement Unit.

Priority (High, Medium, Low):

- High

Cost Estimate:

- $114,000

Potential Funding:

- General Fund expediture to maintain code enforcement officers.
- Revenue from enforcement results in revenue from civil penalties paid by property owners.

Benefits (Avoided Losses):

- The removal of weeds protects important vegetation growth and crop production. It also results in a cleaner looking environment that helps sustain a positive atmosphere.

Schedule:

- Ongoing

5.3.11 Radon

Action:

- Participate in a public awareness campaign to alert homeowners to the presence of radon gas production from the soil.

Issue/Background:

- Salt Lake County is in the process of developing a countywide strategy to address.

Other Alternatives:
Responsible Office:

- West Jordan Emergency Program Manager

Priority (High, Medium, Low):

- Low

Cost Estimate:

- Unable to determine a cost at this time. We have no known reported cases in West Jordan according to the West Jordan City Engineer.

Potential Funding:
Benefits (Avoided Losses):
Schedule:

5.3.12 Problem Soils

Action:

- Continue the current application of West Jordan development standards which require soil sampling as part of the geo-technical reports submitted for property development.

Issue/Background:

- Fire Station 55 had to have extensive measures taken to keep it from sinking.
- Problem soils had to be over-excavated and subsurface drainage systems created for and apartment complex near 1000 West 9000 South.

Other Alternatives:

- Rely on those purchasing property to do their own soil analysis.

Responsible Office:

- City Engineer

Priority (High, Medium, Low):

- Medium

Cost Estimate:

- $0 to the City because it is paid for by the developer.

Potential Funding:

- Geo-technical reports are paid for by the person making application for development in the city.

Benefits (Avoided Losses):

- The benefit occurs for each property that is developed because it is required before construction can take place.

Schedule:

- Ongoing

6 Plan Implementation & Maintenance

6.1 Implementation

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The City of West Jordan will utilize the information in the Hazards Mitigation Plan to prepare for future events and plan accordingly.

6.2 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

The City of West Jordan 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 The City of West Jordan 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 Hazard Mitigation Plan Amendments

The City of West Jordan will amend and update its Hazard Mitigation Plan as needed.

6.4 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 West Jordan 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.

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

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.

7 Hazard Mitigation Plan Adoption

It is the intent of the City of West Jordan 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 The City of West Jordan Recorder's office.

7.1 Integration of Mitigation Strategies

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

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File # 15-082
Ordin. #
Resol. # 15-42
Item #
Other

WEST VALLEY CITY, UTAH

RESOLUTION NO. 15-42

A RESOLUTION ADOPTING THE 2015 WEST VALLEY CITY MITIGATION PLAN AS REQUIRED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

WHEREAS, the Federal Emergency Management Agency requires each state, county and city to adopt a plan for mitigating emergencies; and

WHEREAS, the 2015 West Valley City Mitigation Plan (the "Plan") is a roadmap for disaster preparation services and provides comprehensive hazards identification, risk assessment, vulnerability analysis, mitigation strategies and an implementation schedule to assist in reducing the costs of natural disasters; and

WHEREAS, the Plan is part of a Salt Lake County wide plan; and

WHEREAS, the City Council of West Valley City has determined that it would be in the best interest of the health, safety and welfare of the citizens of West Valley City to adopt the Plan;

NOW, THREFORE, BE IT RESOLVED by the City Council of West Valley City, Utah that the 2015 West Valley City Mitigation Plan is hereby adopted.

PASSED, **APPROVED**, and **MADE EFFECTIVE** this 3rd day of March, 2015.

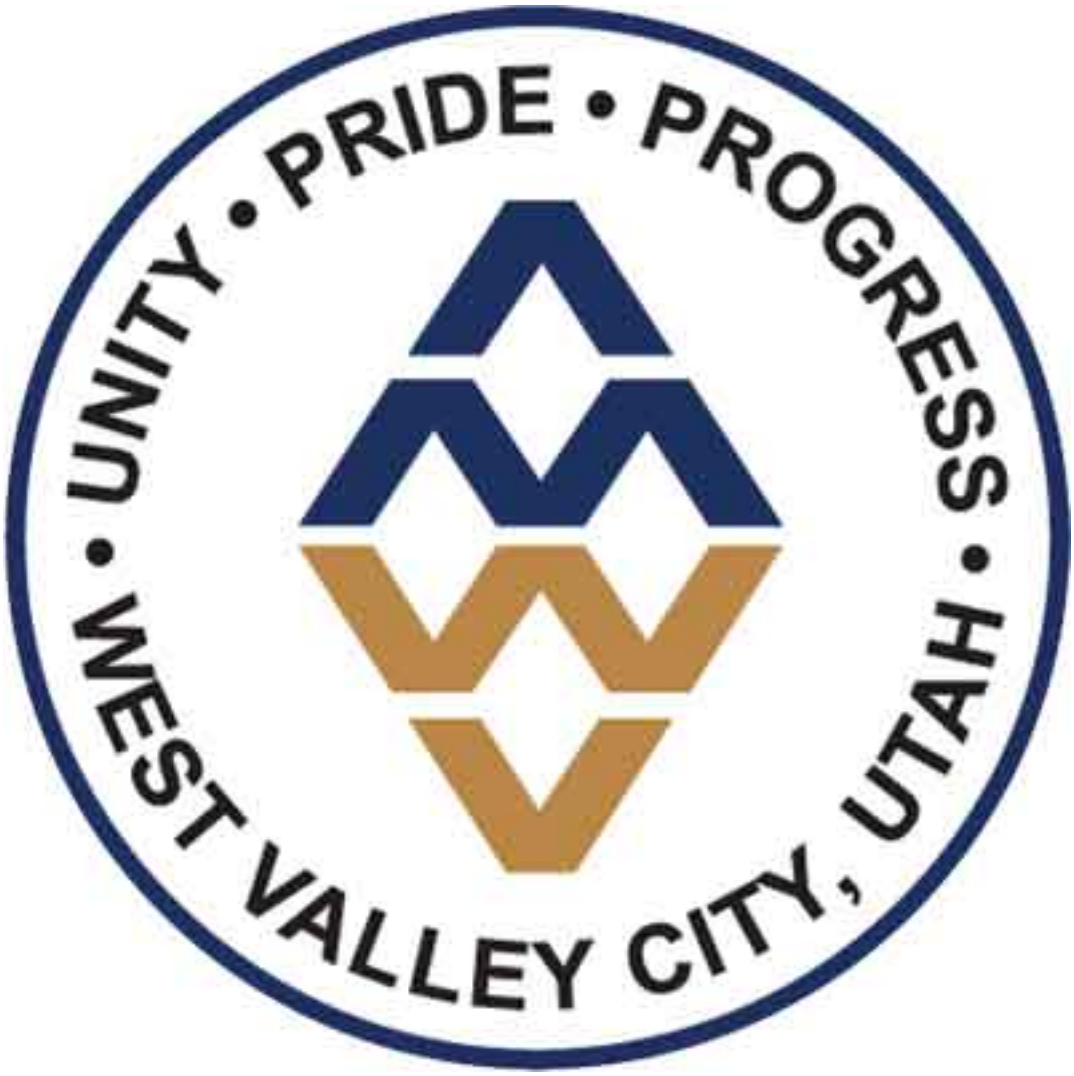
WEST VALLEY CITY

MAYOR

ATTEST:

CITY RECORDER

WEST VALLEY CITY, UTAH
CORPORATE SEAL



Hazard Mitigation Plan (2014)

ANNEX Q: WEST VALLEY CITY
1 Introduction

1.1 Background

This Mitigation Plan is a revision of the Wasatch Front Regional Council Natural Hazard Pre-Disaster Mitigation Plan (WFRC PDM) and crosswalk completed in 2009 with the intent to create a standalone mitigation plan for West Valley City. The goal of this Plan is to 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.

The WFRC plan was reviewed to evaluate its strengths, weakness and utility. The hazards, vulnerabilities and risks were reviewed and revised as to their impact, how hazards may affect the population, and their severity. Updates also describe hazard impacts that have occurred since the last plan revision. The planning team considered previously unidentified hazards to include in the plan update. A capabilities assessment was conducted to identify potential mitigation needs and to further align the mitigation plan with other community planning efforts. The revision process also included a review of proposed mitigation goals, objectives and actions and to determine their validity and how effective they have been/or will be at reducing vulnerability in the county. New priorities have been set to support changes that were identified. The Mitigation Plan was also evaluated to support the State Mitigation Plan goals and objectives, as well as other local planning efforts. Finally, an implementation strategy and timeline will assign the responsibility and schedule for tracking implementation of the identified mitigation actions. The Mitigation Plan will be adopted pursuant to Federal Law and will establish authority and guide all mitigation activities outlined in the plan.

West Valley City is vulnerable to natural and technological (human-caused) hazards that threaten the health, welfare, and security of our citizens. Action taken to reduce or eliminate the long-term risk to human life and property from these hazards is known as mitigation. The losses and life and property, as well as the cost of response to and recovery, from potential disasters can be substantially reduced when attention is turned to mitigation of the impacts and effects before they occur or re-occur.

Hazard mitigation planning is the process of identifying hazard risks and vulnerabilities, and establishing goals, policies, and procedures to implement risk-reducing actions. This plan represents a collaborative effort of many participants in our community with the mission to engage community stakeholders in developing a comprehensive approach to reduce long-term hazard risk by identifying and implementing effective mitigation strategies.

Mitigation planning creates safer communities by reducing loss of life and property damage, and protecting community assets from the negative impacts of hazards. Implementing mitigation strategies can also reduce the cost of disaster response and recovery by:

- Identifying cost-effective actions that reduce risk
- Focusing resources on the greatest vulnerabilities
- Building partnerships between jurisdictions
- Increasing public awareness of hazards and risk
- Communicating planning priorities
- Aligning risk-reduction efforts with other community plans and objectives
- Establishing eligibility for mitigation grant programs.

Hazard mitigation is any cost-effective action that has the effect of reducing, limiting, or preventing vulnerability of people, property and/or the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation actions, which can be used to eliminate or minimize the risk to life and property, fall into three categories:

1. Those that keep the hazard away from people
2. Those that keep people, property, and structures away from the hazard
3. Those that do not address the hazard, but rather reduce the impact of the hazard on the victims, such as insurance.

Local mitigation plans are required to be updated every five years. This plan will be an update to the Wasatch Front Regional Council Natural Hazard Pre-Disaster Mitigation Plan (WFRD PDM) that West Valley City participated in during 2008-2009. The Mitigation Plan is a collaborative effort which will serve all of West Valley City, including each of the 16 cities, as well as special service districts within the county. The revision of this plan supports the State Hazard Mitigation Plan mission which states, “to permanently reduce the regions vulnerability to natural hazards”. The 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 framework of this plan will now serve as a tool to guide, plan, and allocate resources across multi-jurisdictional boundaries. It will assist jurisdictions in making good assessments of their resilience to disasters and disruptions. It will serve as a guide to prioritize mitigation and preparedness efforts, allocate funding, and guide development in innovative ways to effectively utilize and share scarce resources. It is a representation of the West Valley City’s commitment to reduce risks from natural hazards.

1.2 Purpose

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, and (4) and 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 West Valley City and surrounding municipalities. This Plan is intended to enhance the 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 to each jurisdiction. West Valley City prepared this local hazard mitigation plan to guide hazard mitigation planning to better protect the people and property from the effects of hazard events. This plan demonstrates the community'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 West Valley City eligible 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), which could lower flood insurance premiums in CRS communities.

1.3 Scope

The plan utilizes current County, City, and applicable private hazard mitigation, emergency operations plans, census data and available GIS and assessor's data as resources for the planning team. West Valley City Emergency Management staff, planning team members, county, city, and applicable emergency managers/planners, subject matter experts, recruits from other jurisdictions such as other local government units, private sector, non-governmental, academia, airports, military, and the public were also consulted during this planning activity.

The West Valley City Natural Hazards Pre-Disaster Mitigation (PDM) Plan was developed in accordance with the requirements of the FEMA Section 322 regulations, 44 CFR Part 201, the Utah Division of Emergency Management (UDEM) and local planning agencies. Regulations set forth by FEMA were followed during the development of this Plan. Future monitoring, evaluating, updating and implementation will occur annually or following any natural disaster. A major revision will occur every five years. Annual or any interim Plan review, updates and revisions will be the responsibility of each adopting jurisdiction.

Often, hazard mitigation is a neglected aspect within emergency management. When local governments place a low priority on mitigation implementation activities relative to the perceived threat, some important mitigation measures may be neglected in favor of higher priority activities. Mitigation success can be achieved, however, if accurate information is portrayed through complete hazard identification and impact studies, followed by effective mitigation management. Hazard mitigation is the key to greatly reducing long-term risk to people and property from natural hazards and their effects.

As part of the creation of this document, West Valley City agreed that the deliverables would contain:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input, and development of mitigation actions complementary to those goals. A range of actions must be identified specifically for each jurisdiction;

- Demonstration that there has been a proactively offered opportunity for participation in the planning process by all community stakeholders (examples of participation include relevant involvement in an any planning process, attendance at meetings, contributing research, data, other information, commenting on drafts of the plan);
- Documentation of an effective process to maintain and implement the plan;
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdictions' governing body (each jurisdiction must officially adopt the plan), within the timelines designated with the State's FEMA approved Mitigation Plan.

1.4 Authority and Reference

Federal

Public Law (PL) 93-288 as amended, established the basis for federal hazard mitigation activity in 1974. A section of this Act requires the identification, evaluation and mitigation of hazards as a prerequisite for state receipt of future disaster assistance outlays. Since 1974, many additional programs, regulations and laws have expanded on the original legislation to establish hazard mitigation as a priority at all levels of government. When PL 93-288 was amended by the Stafford Act, several additional provisions were added that provide for the availability of significant mitigation measures in the aftermath of Presidential declared disasters. Civil Preparedness Guide 1-3, Chapter 6- Hazard Mitigation Assistance Programs, places emphasis on hazard mitigation planning directed toward hazards with high impact and threat potential.

President Clinton signed the Disaster Mitigation Act of 2000 (DMA 2000) into law on October 30, 2000. Section 322 defines mitigation planning requirements for state, local and tribal governments. Under Section 322, States are eligible for an increase in the federal share of hazard mitigation if they submit a mitigation plan (which is a summary of local and/or regional mitigation plans) that identifies natural hazards, risks, vulnerabilities and actions to mitigate risks.

State

Some examples of legislation enhancing the ability of government and persons to mitigate, respond and recover from natural disasters include the Governor's Emergency Operation Directive, The Robert T. Stafford Disaster Relief and Emergency Assistance Act, amendments to Public Law 93-288, as amended, Title 44, CFR, Federal Emergency Management Agency Regulations, as amended, State Emergency Management Act of 1981, Utah Code 53-2, 63-5, Disaster Response Recovery Act, 63-5A, Executive Order of the Governor 11, and the Emergency Interim Succession Act, 63-5B.

Local

Local governments play an essential role in implementing effective mitigation. For the purposes of this Plan, local governments include not only cities and counties, but also special service districts with elected boards. Each local government 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. In West Valley City, the local executives are responsible for carrying out plans and policies, including the council and city or town mayors and administrators.

Local governments must be 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.

2 Community Profile

2.1 State of the City

Existing Land Uses in West Valley City

West Valley City's land use has changed substantially since 1982 when the City's first land use study was performed. As Figure 1.1 and Table 1-1 indicate, the amount of land in agricultural use has declined considerably, as has vacant, unbuilt land. Accounting for this, in large part, is the increase of land developed for residential land uses.

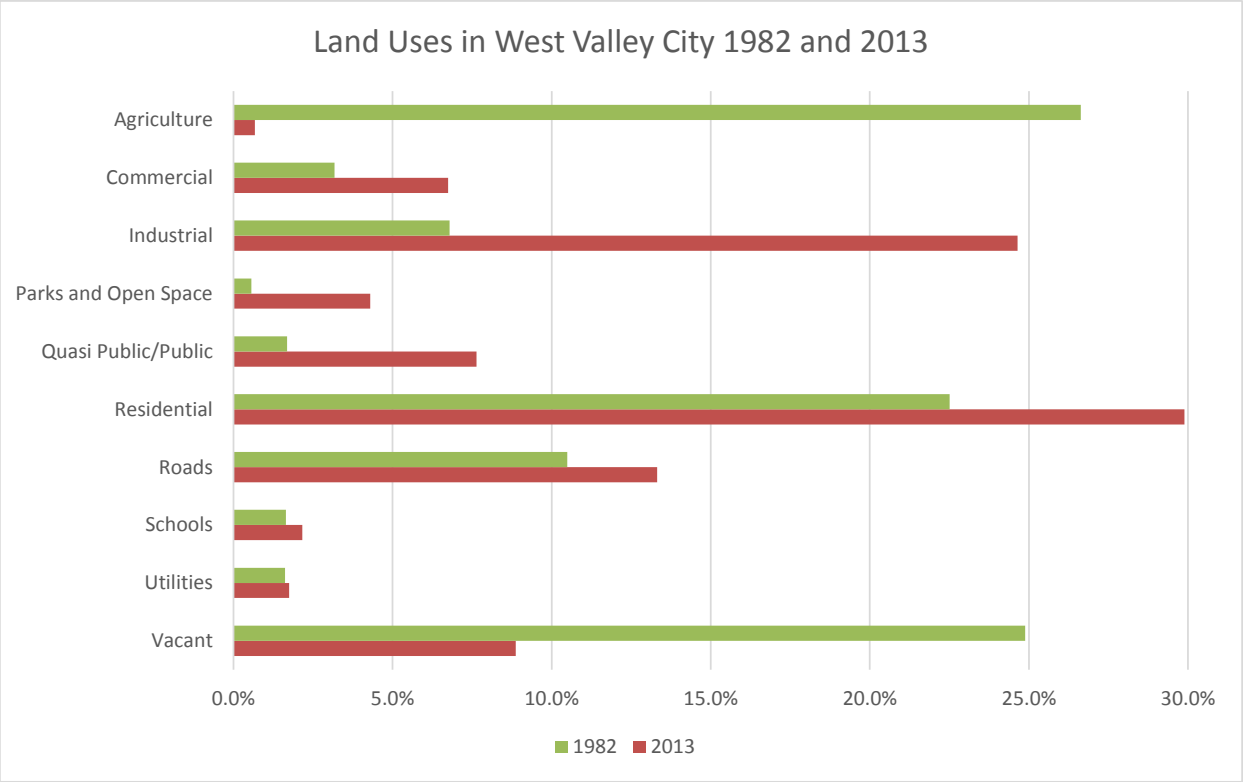


Figure 1.1: Land Use in West Valley City: 1982 and 2013
Source: West Valley City Building Inspection Department.

	1982			2013		
Land Use	Acres	% of City	% of Residential	Acres	% of City	% of Residential
Agriculture	4,605	26.6%		154	0.7%	
Commercial	550	3.2%		1,548	6.8%	
Industrial	1,175	6.8%		5,649	24.6%	
Parks & Open Space	98	0.6%		986	4.3%	
Quasi Public/Public	291	1.7%		1,752	7.6%	
Residential Total	3,892	22.5%		6,855	29.9%	
Single Family	*3,387*	*19.6%*	*87.0%*	*5,774*	*25.2%*	*84.2%*
Duplex	*153*	*0.9%*	*3.9%*	*159*	*0.7%*	*2.3%*
Mobile Home	*211*	*1.2%*	*5.4%*	*327*	*1.4%*	*4.8%*
Multi-Family	*141*	*0.8%*	*3.6%*	*595*	*2.6%*	*8.7%*
Roads	1,815	10.5%		3,055	13.3%	
Schools	285	1.6%		495	2.2%	
Utilities	281	1.6%		402	1.8%	
Vacant/Undeveloped Land	4,303	24.9%		2,033	8.9%	
Totals	**17,294**			**22,930**		

Table 1-1: Land Uses in West Valley City: 1982 and 2013
Source: West Valley City Community & Economic Development

Another noteworthy change shown in Table 1.1 is the 33 percent increase in total City acreage realized through several annexations.

Residential

Since incorporation, the percentage of residential land developed for single family homes has remained fairly constant; single family homes represented 87% of developed residential land in 1982, and that figure has only dropped to 84% by 2013. However, multi-family residential land has increased from 3.6% of all residential land in 1982 to 8.6% in 2013.

Commercial

The percentage of land dedicated to commercial uses has doubled since 1982, and now represents 6.8% of the City. Community shopping centers at 4100 South and 5600 West, 4700 South and 4000 West, and 6200 South and 5600 West provide vital goods and services to the immediate areas. 5600 West north of 3500 South is rapidly developing and has become a regional draw. Commercial properties continue to redevelop along 3500 South and Redwood Road.

Industrial

Industrial land has expanded dramatically from 6.9% in 1982 to 24.6% in 2013. Alliant Techsystems Inc. owns nearly 40 percent of all industrial land in West Valley City. West Ridge, Lake Park Corporate Center, Lake Pointe Corporate Center, Presidential Business Center, trucking companies along the SR-201 frontage road, and the ARA Industrial Business Park are all major industrial centers.

Parks and Open Space

The allocation of land for parks and recreation increased substantially in the early days of the City, from 98 acres in 1982 to 986 in 2013. This growth was fueled by the development of West Ridge

Golf Course, Centennial Park, Stonebridge Golf Course, and several regional and neighborhood parks of varying sizes. Since the last General Plan update, we have lost some acreage due to construction of the Mountain View Corridor and reconfiguration of the West Ridge Golf course.

Agriculture

Agricultural land has given way to development. Over a quarter of the City was in agricultural use in 1982. Through the development of new residential subdivisions, shopping centers and industrial parks, agricultural property now constitutes less than 1% of the City's total area.

Since the last General Plan Update, the City has experienced some significant changes. These changes include major new developments as well as transportation improvements.

Important Development Projects

Since the last General Plan Update, the areas around 5600 West and Fairbourne Station have experienced significant development:

- The Highbury development is well underway. This is a mixed-use project featuring a variety of retail uses along 5600 West, a mix of housing types, schools, and open space with significant water features. Highbury will complement the Lake Park project, a major regional employment center that houses over 13,000 jobs.
- At Fairbourne Station, the Embassy Suites Hotel has been built, the first phase of the Residences at Fairbourne are being completed, and the Plaza and first phase of the Promenade have been built.
- As of 2014, the Valley Fair Mall continues their expansion and renovation plans. Valley Fair Mall has increased their retail square footage from 600,000 to 1,000,000 square feet.
- The City formed the North West Economic Development Area for the ARA Industrial Business Park development, which will bring up to 3.4 million square feet of new warehousing space to the City.

Transportation Improvement Projects

A number of significant transportation and transit projects have also been completed or are underway:

- The reconstruction of 3500 South with dedicated BRT lanes and raised passenger platforms was completed in 2010.
- The West Valley City TRAX Green Line began operating in 2011.
- As of 2014, Phase One of the Mountain View Corridor (two lanes each travel direction with surface intersections) has been built from the south end of the valley to 5400 South. Property acquisition for the entire freeway through West Valley City is well underway.

Housing, Demographics, and Employment

The graphs and table that follow provide a basic picture of the current state of West Valley City with information on employment, housing tenure and household size and other pertinent statistics. The introduction and background sections of each chapter provide more detailed information relevant to the particular chapter. For example, the background section of the Transportation element includes information on traffic volumes on major streets.

As of 2012, West Valley City had an estimated 37,419 housing units with an average household size of 3.49 people. The relatively dramatic increase in the average household size of renter-occupied units has pushed the total average household size up over the past 20 years (2.85 in 1990 to 3.47 in 2012), despite the relatively stable household sizes of owner-occupied units (3.58 in 1990 to 3.51 in 2012). Of all of the states in the nation, Utah has the highest average household size at 3.10 persons per household (the national average is 2.58).

Table 1-2 WVC Housing Tenure & Household Size 2012

	1990	2000	2010	2012
Occupied Housing Units	25,933	32,253	37,139	37,419
Owner-Occupied Housing Units	17,456	23,418	25,975	25,484
Renter-Occupied Housing Units	8,477	8,835	11,164	11,934
Average Household Size of Owner-Occupied Units	3.58	3.48	3.51	3.51
Average Household Size of Renter-Occupied Units	2.85	3.05	3.41	3.47
Total Average Household Size	3.35	3.27	3.48	3.49

Source: U.S. Census Bureau Table DP-1, 2012 ACS DP-04
www.census.gov

Table 1-2: Housing Tenure & Household Size

The residents of West Valley City represent a broad variety of races and ethnic backgrounds, compared to the state as a whole. Approximately half (48.4%) of West Valley City residents identify with a race other than white/Caucasian, while the same is true for only about two in ten (19.9%) Utah residents. Owing mainly to the influence of the Church of Jesus Christ of Latter-Day Saints, West Valley City has the highest share of population who identify as Native Hawaiian or Other Pacific Islander outside of Hawaii and U.S. Territories in the Pacific. West Valley City has 3,909 Native Hawaiian or Other Pacific Islander residents – 3.0 percent of the total population. Similarly, the City has a significant number of residents (34.9 percent) who identify as Hispanic or Latino, a share that has grown tremendously over the past two decades. It is important to note that Hispanics can be of any race. As of 2012, 51.6 percent of West Valley City residents identified as white and non-Hispanic, making West Valley City one of the most diverse cities in a rather homogenous state. As the LDS Church continues to draw people from all over the world to its Utah headquarters and as ethnic and racial minorities continue to establish durable networks and successful communities in West Valley City, this trend toward greater diversity will likely continue.

Table 1-3 Population by Race 2012

	Total Population	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races	Hispanic or Latino
	2,814,910	2,253,438	27,304	28,007	56,384	25,082	3,465	50,837	370,393
Utah	100.00%	80.1%	1.0%	1.0%	2.0%	0.9%	0.1%	1.8%	13.2%
Salt Lake	1,048,261	771,089	15,103	6,945	34,766	15,675	1,927	20,934	181,822
County	100.0%	73.6%	1.4%	70.0%	3.3%	1.5%	0.2%	2.0%	17.3%
West	130,981	67,524	2,971	1,149	6,370	3,909	69	3,265	45,724
Valley City	100.0%	51.6%	2.3%	0.9%	4.9%	3.0%	1.0%	2.5%	34.9%

Source: American Community Survey Table DP-05

Table 1-3: Population by Race and Ethnicity 2012

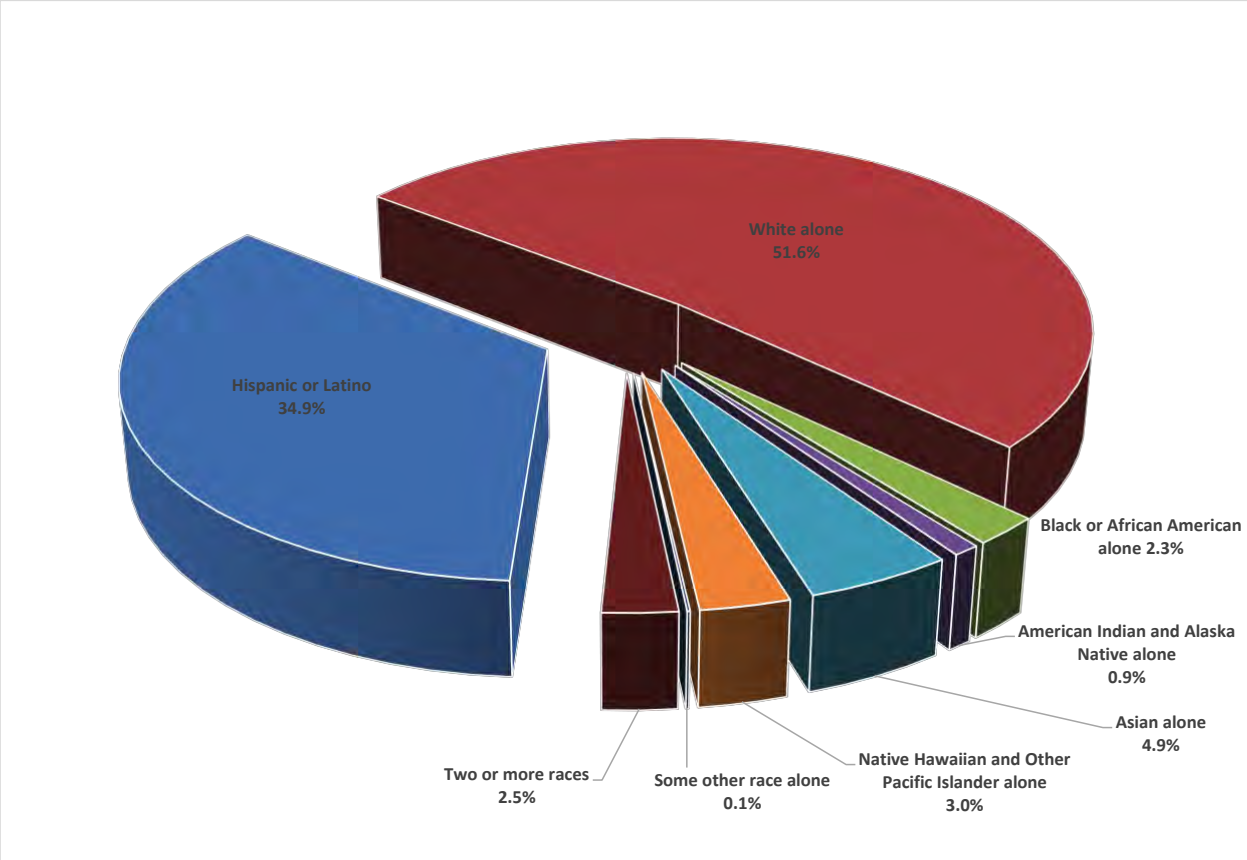


Figure 1-2: Race and Ethnicity in West Valley City in 2012
Source: 2012 ACS DP-05

2.2 Projections

The population of West Valley City, as with the rest of the Wasatch Front, is expected to grow through 2030 and beyond. Internal growth, potential annexation and increases in density in some areas will all impact the overall population of the City. As Salt Lake County expands and fills in, the demand for transportation, transit, retail, and natural resources will also grow regionally. Significant growth is expected in the south valley and the west bench of the Salt Lake valley, which

may mean tremendous impacts to West Valley City as a place of residence, as a destination and as a thoroughfare.

West Valley City had a population of 108,896 in 2000 and 129,480 in 2010. West Valley City's population is expected to grow by almost 24% from 2010 to 160,000 by 2040. Salt Lake County's population was 898,387 in 2000 and 1,029,655 in 2010, and in the same period from 2010 to 2040, Salt Lake County's population is expected to grow by an estimated 47% to 1,507,997 in 2040.

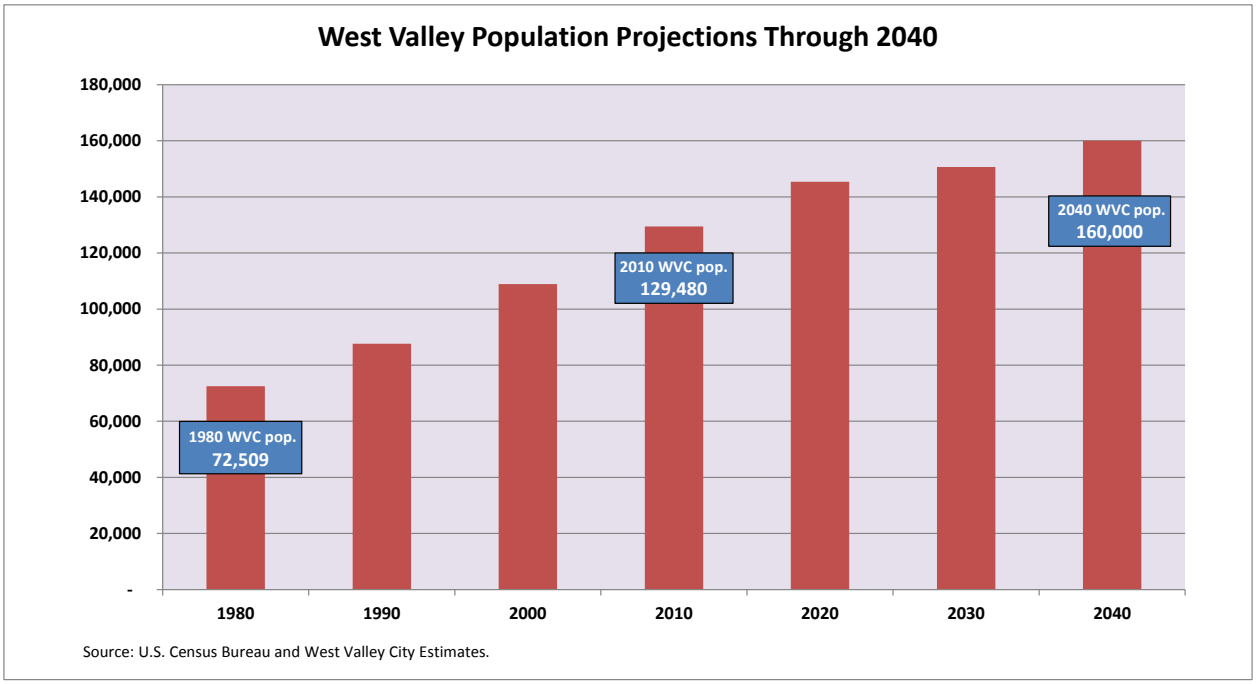


Figure 1-3: Population Estimates and Projections Through 2060

The current and expected future population pyramids show an important countywide transition toward an older population. The median age in Salt Lake County in the year 2000 was just over 27 years of age. In 2010 the median age was 30.8, which is projected to increase to 32 in 2020 and to 33 in 2030. This trend matches that of the State of Utah during the same period. The life expectancy within the State of Utah is expected to increase as well, growing for females from 81.9 years in 2000 to 85.9 years in 2030; and for males, 75.5 years in 2000 to 80.5 years in 2030. The greater life expectancies and transition of the Baby Boomers into retirement age indicate a greater share of older residents in the future. This 'aging' population may have many potential impacts on the county and on West Valley City including increases in needs for senior housing and other services, as well as greater demand for walkability and transit options. In economic development terms, the City could experience more demand for health services, greater retail oriented to older patrons, and demand for recreational services. In regards to housing and transportation, an aging population may demand more walkable neighborhoods, more compact housing without a lot of yard care, and may desire more efficient transit options to fit a fixed income. While we expect to have a greater share of older residents in the future, there will remain a substantial share of young people in West Valley City. This means that while we expand opportunities for older residents we must also pay attention to the sustained demands for support and services aimed at younger populations.

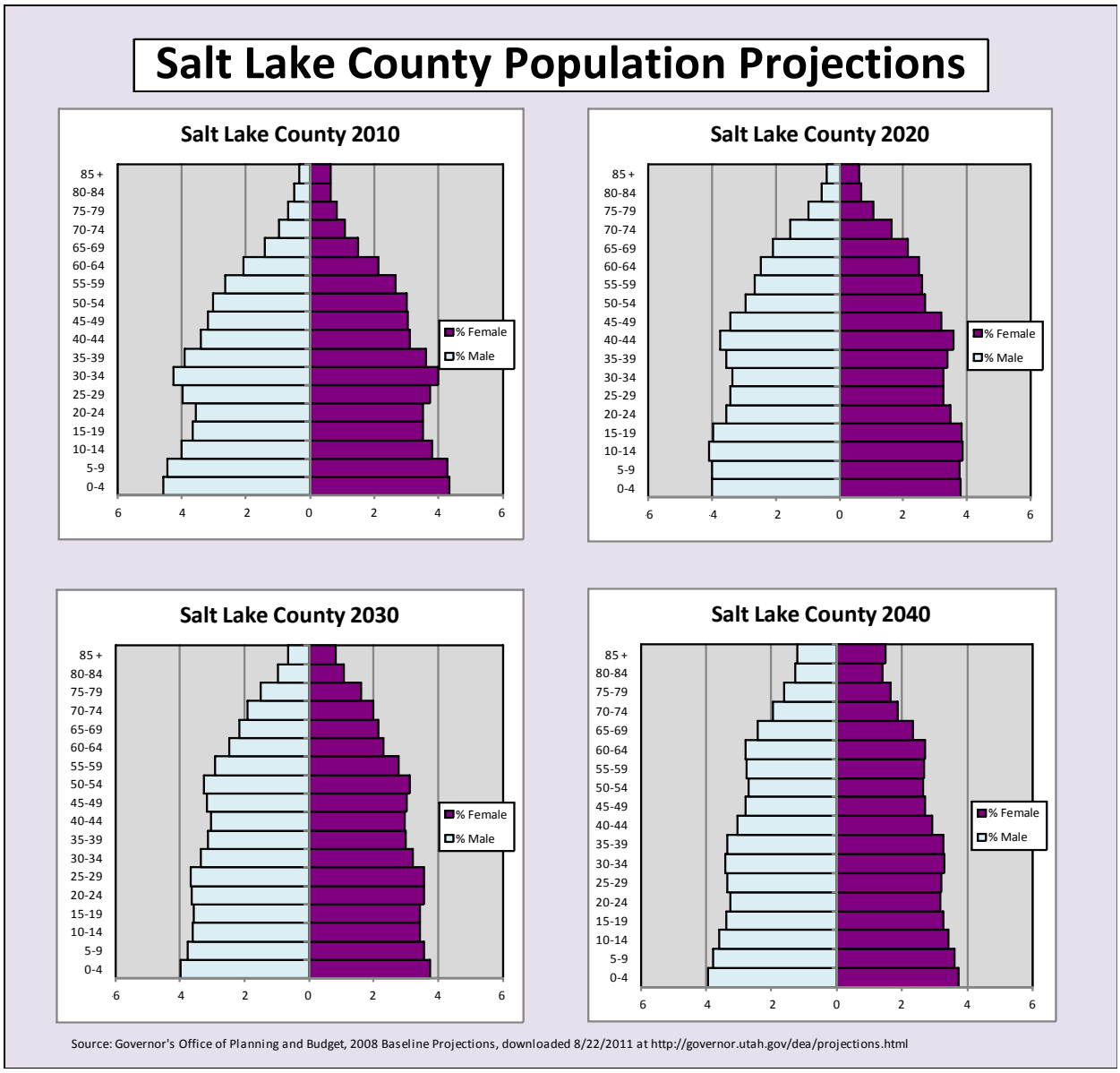


Figure 1-5: Salt Lake County Population Pyramid Projections

In summary, significant growth in population is expected not only in West Valley City, but among all Wasatch Front communities. Rapidly changing demographics and population growth will place different demands on an aging housing stock. As west Valley City is approaching build out in terms of raw land, these changes will raise important questions as to how we grow, what we build, and where we should invest resources and prepare for the future. If the number of people in each household drops, for example, as a result of demographic changes, then more households will be needed to accommodate these residents (beyond that needed to house those added to the overall population), and we must determine the type(s) of housing and living environments that they may desire. From the perspective of this General Plan, this type of housing issue might be addressed through patterns of growth. Where might we make changes to the City to adapt to a growing and changing population? Considering the growing interest in walkable neighborhoods, increasing costs of fuel, greater demand for transit alternatives, and the general desire for equity within our community, a series of principles have been selected to form the basis for this Vision West 2035 General Plan.

3 Planning Process

This West Valley City Mitigation Plan was prepared by Emergency Management staff members John Evans, and Kari Jaramillo. A core Planning Team with representatives from each city department and Salt Lake County provided information included in this plan. Other local and state agencies that have aided in the process include; city and county geographic information system (GIS) departments, elected officials, local officials, emergency managers, fire and law enforcement departments, planning departments, public works/engineering departments and other local government agencies. The planning process was based on Section 322 requirements of the Disaster Mitigation Act of 2000 (DMA 2000) and supporting guidance documents developed by FEMA and the Utah Division of Emergency Management (UDEM).

Planning Meetings

During the planning process input and guides from all of the city departments were obtained. The following are dates for the process:

Date	Meeting
7/14	Review of the initial process
8/14	Meetings with Salt Lake County on the needs for the plan and involvement
8/14	City planning team meeting for initial input
9/14	Planning meeting with city team and Salt Lake County
9/14	Initial plan sent to all of the team
9/14	Plan on website for public comment
10/14	Draft plan to Salt Lake County

Department Agency Involved

West Valley City Fire	John Evans
West Valley City Emergency Management	John Evans
West Valley City Police Department	Lee Russo
West Valley City Administration	Wayne Pyle
West Valley City Public Works	Russ Willardson
West Valley City Community and Economic Development	Nicole Cottle
West Valley Animal Services	Layne Morris
Salt Lake County Emergency Services	Jeff Gravitz

Public Involvement

Public involvement opportunities were available and incorporated throughout the development of this Plan. Such opportunities included a public website and public meetings for comment review. Emergency managers, fire police, public works, and all departments, state and local agencies, business leaders, educators, non-profit organizations, private organizations, and other interested members that could be affected by a hazard within the region or other interested members, were all a part of the planning process.

The current plan will be placed on the West Valley City Website for the input from the public and comments about the plan.

3.1 Information Sources & Revision Process

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

4 Risk Assessment

As defined by FEMA, risk 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 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 into 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 Hazard Identification:** Natural Hazards identifies the natural hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- **Section 4.2 Hazard Profiles** discusses the threat to the planning area and describes previous occurrences of hazard events and the likelihood of future occurrences.
- **Section 4.3 Vulnerability Assessment** assesses the City's total exposure to natural hazards, considering assets at risk, critical facilities, and future development trends.
- **Section 4.4 Capability Assessment** inventories existing mitigation activities and policies, regulations, and plans that pertain to mitigation and can affect net vulnerability.

Note: Neither the examination of human-caused hazards nor the capability assessment are required by FEMA.

This risk assessment covers the entire geographical extent of West Valley City. Since this plan is a multi-jurisdictional plan, the HMPC was required to evaluate how the hazards and risks vary from jurisdiction to jurisdiction. While these differences are noted in this chapter, they are expanded upon in the annexes of the participating jurisdictions. If no additional data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for the entire Fresno County planning area.

Each of the hazards that can affect West Valley City, and the potential impacts, will be described in this section, known as a Hazard Identification and Risk Assessment or HIRA.

4.1 Hazard Identification: Natural Hazards

The West Valley Emergency Management HMPC conducted a hazard identification study to determine the hazards that threaten the planning area.

4.1.1 Methodology and Results

Using existing natural hazards data and input gained through planning meetings, the HMPC agreed upon a list of natural hazards that could affect West Valley City. Hazards data from the Utah State Department of Emergency Management and Mitigation, FEMA, the National Oceanic and Atmospheric Administration, and many other sources were examined to assess the significance of these hazards to the planning area. Significance 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 occurred in the past or have the potential to cause significant human and/or monetary losses in the future. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 4.3 Vulnerability Assessment.

The natural hazards identified and investigated for the West Valley City Multi-Hazard Mitigation Plan include:

- Earthquake
- Flood
- Wildland Fire
- Slope Failure
- Severe Weather
- Dam Failure
- Avalanche
- Pandemic
- Drought
- Infestation
- Radon
- Problem Soils

The HMPC eliminated the natural hazards listed below from further consideration in this risk assessment because they occur rarely or not at all in West Valley City.

- Hurricane

4.2 Hazard Profiles

The hazards identified in Section 4.1 Hazard Identification: Natural Hazards are profiled individually in this section. In general, information provided by planning team members is integrated into this section with information from other data sources, such as those mentioned in Section 4.1. These

profiles set the stage for Section 4.3 Vulnerability Assessment, where the vulnerability is quantified, where possible, for each of the priority hazards.

The following sections provide profiles of the natural hazards that the HMPC identified in Section 4.1 Identifying Hazards

The HIRA was initiated through a series of meetings with the Core Planning Team and subject matter experts from the following organizations:

City and county agencies
Utah Geological Survey
National Weather Service
Utah Division of Water Rights
Utah Forestry, Fire, and State Lands
West Valley City Fire Department
Salt Lake Valley Health Department

Each hazard is profiled in the following format:

- **Hazard/Problem Description**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the Fresno County planning area. Where known, this includes information on the hazard extent, seasonal patterns, speed of onset/duration, and magnitude and/or secondary effects.
- **Past Occurrences**—This section contains information on historical incidents, including impacts where known. The extent or location of the hazard within or near the Fresno County planning area is also included here. Historical incident worksheets were used to capture information from participating jurisdictions on past occurrences.
- **Frequency/Likelihood of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of an event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a drought in any given year). The likelihood of future occurrences is categorized into one of 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.

Hazard Matrix M-1 provides an initial assessment of the profiles and assigns a level of significance to each hazard. Those hazards determined to be of high significance were characterized as priority hazards that required further evaluation in Section 4.3 Vulnerability Assessment. Those hazards

that occur infrequently or have little or no impact on the planning area were determined to be of low significance. Significance was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the planning area; thus enabling the County to focus resources where they are most needed.

The hazards in Table 4 were identified by the Planning Team as having the potential to affecting all or a portion of West Valley City, based on history of occurrences and/or future probability. Each of these were carried over from the 2009 WFRC Pre-Disaster Mitigation Plan, with the addition of Avalanche and Flu Epidemic.

The HIRA process was aided through the use of FEMA How-to Guidance Documents, FEMA Local Mitigation Planning Handbook, Local Mitigation Plan Review Guide, the Utah State Hazard Mitigation Plan, Utah Natural Hazards Handbook 2008, FEMA 386-1,2,3,7, Disaster Mitigation Act of 2000, 44 CFR Parts 201 and 206, Interim Final Rule, and FEMA Region VIII Crosswalk. The risk assessment process also utilized assistance from local GIS departments using the best available data.

Hazard	How Identified	Why Identified
Earthquake	Review of City Emergency Operations Plans Review of past disaster declarations Input from City and County Emergency Operations Managers, USGS, UGS, Utah DEM, and community members	Utah has a 1/5 chance, of experiencing a large earthquake within the next fifty years. Numerous faults throughout Utah including the Intermountain Seismic Zone. Yearly, Utah averages approximately 13 earthquakes having a magnitude 3.0 or greater. Earthquakes can create fire, flooding, hazardous materials incident, transportation, and communication limitations. The Wasatch Front has recorded large earthquakes in the past and can be expected to experience large earthquakes in the future.
Flood	Review of past disaster declarations Input from City and County Emergency Operations Managers, Utah DWS, UGS, Utah Army Corps of Engineers, Utah DEM, and community members Review of Flood Insurance Studies, Floodplain maps, and FIRMs	Several incidents have caused severe damage and loss of life. Many of the rivers and streams are located near neighborhoods. Many neighborhoods are located on floodplains, alluvial fans. Topography and climate lead to cloudburst storms and heavy precipitation can result in flash flooding throughout most of the Wasatch Front.
Wildland Fire	Review of City Emergency Operations Plans Review of Community Wildfire Plans Input from County Emergency Managers, Utah DEM, Utah FFSL, Utah FS, NWS, FEMA, and local community members	Serious threat to life and property. Much of county is at risk Increasing threat due to urban growth in WUI areas. Secondary threat associated with flooding, drought, and earthquake. Additional funding and resources offered by local and state agencies to reduce risk. To increase community awareness.
Slope Failure	Input from City and County Emergency Operations Managers, USGS, UGS, NCDC, Utah DEM, and community members	Have caused damage in the past to residential and commercial infrastructure. Can be life threatening. Generally occur in known historic locations therefore risks exist through-

		out much of the Wasatch Front. To increase community awareness.
Severe Weather	Review of City Emergency Operations Plans Review of past disaster declarations Input from City and County Emergency Operations Managers, Utah Avalanche, Forecast Center, Utah Department of Transportation, and community members	Damage to communities, homes, infrastructure, roads, ski areas, and people. Can cause property damage and loss of life. Results in economic loss. Lightning is number one cause of natural hazard death in Utah. Can be costly to recover from. Affects the young and old more severely.
Dam Failure	Review of City Emergency Operations Plans Input from community members, Utah DWS, Dam Safety Section, Utah DEM Review of inundation maps	Can cause serious damage to life and property and have subsequent effects such as flooding, fire, debris flow, etc.. Many reservoirs located in the county. Threat to downhill communities. Subsequent effects include flooding, fire, and debris flows. To increase community awareness. To incorporate mitigation measures into existing plans to help serve local residents.
Avalanche	Input from community members, previously considered as part of severe weather, now addressed as separate hazard	Canyon residents and tourist populations can become isolated Transportation routes to canyons can be obstructed.
Flu Epidemic	Salt Lake Valley Health Department Input from City and County Emergency Managers Review of County Emergency Operations Plan	Can affect large number of population Disrupt services and result in economic loss Can overwhelm health care providers
Drought	Review of Utah State Water Plan Input from community members, Utah DHLS, NWS, NCC, and NCDC	Affects local economy and residents. Reduces available water in reservoirs impacting culinary, irrigation, and municipal water supplies. Drought periods may extend several years. Secondary threat associated with wildfire. Utah is the nation's second driest state. Can impact farming and ranching operations. Neighboring communities have been affected by culinary and irrigation water shortages
Infestation	Review of Utah Department of Agriculture and Food Annual Insect Report and the Utah Forest Insect and Disease Report Input from community members, UDAF, Utah FFSL, and the Utah State University Extension Service	Consistently affects this region. Declined forest health and agriculture losses. Previous experiences have affected the residents of the Wasatch Front. Results in economic loss. Destruction can be severe and is very costly to mitigate. To better understand mitigation and response techniques.
Radon	UGS Maps Utah Division of Radiation Control Testing Data.	Is odorless and colorless. Can cause lung cancer over time.
Problem Soils	• Review of City Emergency Operations Plans • Input from community members, Utah, DEM, and UGS • Researched historical data	• Related to subsequent effects from earthquakes. • Have affected infrastructure and local economy in the past.

	Avalanche	Dam Failure	Drought	Earthquake	Flood	Infestation	Landslide	Pandemic	Problem Soil	Radon	Severe Weather	Wildfire

West Valley	Low	Low	Low	High	Mod	Low	Low	Mod	Low	Low	High	Low

Hazard Matrix M-1

4.2.1 Earthquake

The Utah Geologic Survey defines an earthquake as the "abrupt, rapid shaking of the Earth caused by sudden breakage of rocks that can no longer withstand the stresses that build up deep beneath the earth's surface". The rocks break along zones of weakness, called faults. Seismic waves are then transmitted outward and also produce ground shaking or vibrations in the earth. (Utah Natural Hazards Handbook. 2008).

The Richter scale measures the magnitude of earthquakes on a seismograph. Generally an earthquake needs to be at least a magnitude 2.0 to be felt by humans, and about magnitude 5.5 before significant damage occurs. The amount of damage that occurs from an earthquake depends on soil type, rock type, ground-water depth and topography. Other factors include the type of construction in an area and the population density.

Secondary Hazards: Associated earthquake hazards include ground shaking, surface fault rupture and tectonic subsidence, soil liquefaction, flooding, avalanches, dam failure, fire, and slope failure.

Ground Shaking: Ground shaking is caused by the passage of seismic waves generated by an earthquake. Shaking can vary in intensity but is the greatest secondary hazard because it affects large areas and stimulates many of the other hazards associated with earthquakes. Moderate to large earthquake events generally produce trembling for about 10 to 30 seconds. Aftershocks can occur erratically for weeks or even months after the main earthquake event.

The waves move the earth's surface laterally and vertically and vary in frequency and amplitude. High frequency, small amplitude waves cause more damage to short, stiff buildings. Low frequency, large amplitude waves have a greater effect on high-rise buildings. The intensity depends on geologic features such as bedrock and rock type, topography, and the location and magnitude of the earthquake. Other significant factors include ground water depth, basin shape, thickness of sediment, and the degree of sediment consolidation. (UNHH 2008)

Surface Fault Rupture and Tectonic Subsidence: Surface fault rupture is the result from relative movement between blocks in the Earth's crust. In Utah, the result is the formation of scarps or steep breaks in the slope. The 1934 Hansel Valley earthquake resulted in a surface displacement of approximately 1.6 feet. Earthquakes having a magnitude of 6.5 or greater could result in surface faulting 16 to 20 feet high and 12 to 44 mile long break segments. Surface displacement generally occurs over a zone of hundreds of feet wide called the zone of deformation and can cause severe damage to building foundations or lifelines (roads, pipelines, communication lines) that cross the fault. Tectonic subsidence, or down dropping and tilting of the valley floor, generally depends on the amount of surface fault rupture, and can cause flooding by tilting lakebeds or dropping ground surface below the water table. The greatest amount of subsidence will be in the fault zone and will gradually diminish out into the valley (UDCEM 1991).

Soil Liquefaction: 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 earthfill dams to liquefy and fail, flooding by ground water in low-lying areas, back up of gravity fed systems, and/or cause 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)

Slope Failure: Ground shaking can cause rock falls and landslides in mountainous or canyon areas. Rock falls are the most common slope failure and can occur up to 50 miles away from a 6.0 magnitude earthquake. Landslides occur along steep slopes and benches in wet, unconsolidated materials. During a 6.0 magnitude earthquake, landslides typically occur within 25 miles of the source. (UNHH 2008)

Flooding: "Flooding can happen due to tectonic subsidence and tilting, dam failure, seiches (waves generated in standing bodies of water) in lakes and reservoirs, surface-water diversion or disruption, and increased ground-water discharge." (UNHH 2008)

Avalanches: Avalanches could be triggered because of the associated ground movement. The most vulnerable areas include those that have steep terrain, high precipitation, high earthquake potential, and high population density, and heavy backcountry use (UNHH 2008).

Sensitive Clays: Sensitive clays are a soil type that loose strength and are subject to collapse when shaken. The resulting type of ground failure is similar to liquefaction (UNHH 2008).

Subsidence: A settling or sinking of loose granular materials such as sand and gravel that do not contain clay. Western Utah is subject to this type of ground settlement (UNHH 2008).

Earthquake Hazard Profile

Potential Magnitude	***X***	**Catastrophic (>50%)**	**Probability**		**Highly Likely**
		Critical (25-50%)		**X**	**Likely**
		Limited (10-25%)			**Possible**
		Negligible (< 10%)			**Unlikely**
Location	Ground shaking will be felt throughout the entire city. Surface fault rupture can be found in areas of known historic fault movements. Liquefaction can be expected in areas of high to moderate liquefaction potential.				
Seasonal Pattern	None.				

Conditions	Liquefaction potential within areas with shallow ground water. Soil that is comprised of old lakebed sediments. Historic movement along faults. Intermountain Seismic Zone, Wasatch Fault.
Duration	Actual ground shaking will be under one minute, aftershocks can occur for weeks or even months.
Secondary Hazards	Fire, landslide, rock falls, avalanche, flooding, hazardous material release, transportation and infrastructure disruptions, essential service disruptions (communications, utilities).
Analysis Used	Review of hazard analysis plans and other information provided by the University of Utah Seismograph Station, UGS, USGS, FEMA, UDEM, AGRC.

Table 5

Location and Extent:

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)

The Wasatch Fault traces along the base of the Wasatch mountain range. It is made up of 10 segments that act independently, meaning that a part of the fault ruptures separately as a unit during an earthquake. The Salt Lake City Segment traverses Salt Lake County from north to south, roughly along the eastern foothills of the Wasatch Mountains. Within the Salt Lake City segment of the Wasatch Fault are three smaller segments from north to south known as Warm Springs Fault, Virginia Street Fault and the East Bench Fault.

Other faults within West Valley City include the West Valley Fault Zone and the East Great Salt Lake Fault Zone. Each of these fault zones has much longer return interval (2,500 years or more) and is not expected to produce a major quake in the near future.

Name	Fault Type	Length (km)	Time of Most Recent Deformation	Recurrence Interval
West Valley fault zone, Granger segment	Normal	16	1,500±200 cal yr B.P.	2,600-6,500 years
West Valley fault zone, Taylorsville segment	Normal	15	2,200±200 cal yr B.P.	6,000-12,000 years

Table 6. Quaternary Faults, Salt Lake County (UGS 2002, UGS 2006) cal yr B.P.=calendar years before present

History:

Although no surface-faulting earthquakes have occurred on the Wasatch fault since settlement in Utah, evidence of numerous prehistoric events exists in the geologic record (The Wasatch Fault, UGS PIS 40) The segments between Brigham City and Nephi have a composite recurrence interval (average time between earthquake events) for large surface-faulting earthquakes (magnitude 7.0-7.5) of 300-400 years. The average repeat time on an individual segment is 1,200-2,600 years. The most recent surface-faulting earthquakes occurred about 500 years ago on the Provo and Weber segments, and about 350 years ago on the Nephi segment. (UNHH 2008)

Utah experiences approximately 700 earthquakes each year, and approximately six of those have a magnitude 3.0 or greater. On average, a moderate, potentially damaging earthquake (magnitude 5.5 to 6.5) occurs every 10 years. Large earthquakes (magnitude 6.5-7.5) occur on average every 50 years (UNHH 2008). The history of seismic activity in Utah and along the Wasatch Front suggests that it is not a matter of "if" but when an earthquake will occur. The probability of a large earthquake occurring along the central segments of the Wasatch Front is 13 percent in 50 years, or 25 percent in 100 years. (The Wasatch Fault, UGS PIS 40)

The two largest measured earthquakes to occur in Utah were the Richfield earthquake of 1901, with a magnitude of 6.5 and the Hansel Valley earthquake of 1934 with a magnitude of 6.6.

"*The Hansel Valley earthquake produced MM intensities of VIII in Salt Lake City, with numerous reports of broken windows, toppled chimneys, and structures twisted on their foundations. A clock mechanism weighing more than 2 tons fell from the main tower of the Salt Lake City County Building and crashed through the building. The only death that occurred during the event was caused when the walls of an excavation collapsed on a public-works employee south of downtown Salt Lake City*." (Lund 2005)

Utah's most damaging earthquake was of a smaller magnitude (5.7), which occurred near Richmond in Cache Valley in 1962. This earthquake damaged over 75 percent of the houses in Richmond, as well as roads and various other structures. The total damage was about $1 million (in 1962 dollars). (UNHH 2008).

Significant earthquakes have occurred in Salt Lake County within the last 50 years. In 1962, a 5.2 Richter magnitude quake jolted the West Valley/Magna area. In 1992, a magnitude 4.2 quake shook the southern portion of the County.

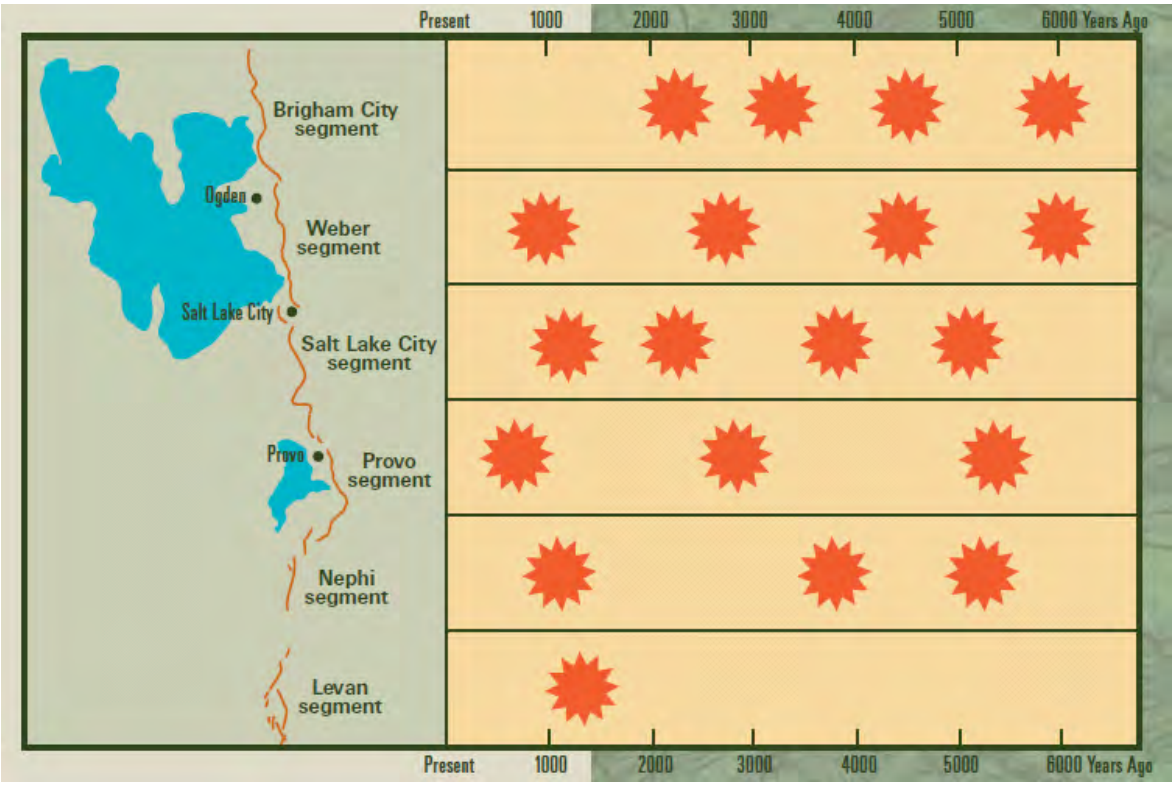


Table 7. Wasatch Fault Segments and Timeline of Major Ruptures ("The Wasatch Fault", Utah Geological Survey Public Information Series 40)

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.

Vulnerability Assessment

Vulnerability of people and infrastructure to earthquake hazards in West Valley City was obtained from the modeling program HAZUS-MH, completed by FEMA Region VIII.

Jurisdiction	*Total Building Economic Loss*	*Loss Ratio*	*Total Debris (tons)*
West Valley City	$ 1,890,864,776	15%	1,280,884

Table 8.

Jurisdiction	*Displaced Households*	*Individuals Seeking Public Shelter*	*Total Casualties*	*Life-Threatening Injuries and Fatalities*	*URM Count*
West Valley City	5,830	4,944	1,686	169	7,143

Table 9.

Jurisdiction	*Life-Threatening Ratio to Total Pop*	*URM Ratio to Total Structures*
West Valley City	0.130%	23%

Table 10.

2009 Vulnerability Assessment

The following values are from the HAZUS analysis performed by WFRC for the 2009 Regional Mitigation Plan. Because no significant changes in the level of risk or the condition of infrastructure, these values are still considered valid estimates of potential impacts to earthquake in Salt Lake County and West Valley areas. They are based on a probabilistic 2500-year event with a Richter magnitude of 7.1 as well as an arbitrary 5.9 event located in close proximity to West Valley's most populated areas. These locations and magnitudes were chosen for their likelihood and proximity respectively. Default HAZUS-MH inventory for all infrastructure was used. (**For a more detailed explanation of the loss estimation methodology of HAZUS-MH MR2, please see Part VI or the HAZUS-MH Technical Manual (Earthquake Model) at www.fema.gov/hazus).

Building Damage

HAZUS-MH classifies building damage into five states: none, slight, moderate, extensive and complete. Table 11 lists the number of buildings by occupancy estimated to sustain moderate to complete levels of damage during an arbitrarily-determined Richter magnitude 5.9 (M5.9) earthquake scenarios or a probabilistic Richter magnitude 7.1 (M7.1) earthquake scenario. Also listed are the estimated monetary losses to structures, contents/inventory, and income.

Category	Number of Structures with > 50% Damage		Category	Estimated Losses	
	Salt Lake M5.9	2500-yr M7.1		Salt Lake M5.9	2500-yr M7.1
Residential	30,342	157,705	Structural Losses	$519,320,000	$3,419,030,470
Commercial	1,896	5,199	Non-Structural Losses	$1,818,647,000	$12,331,504,070
Industrial	495	1,367	Content Losses	$719,709,000	$4,114,455,740
Government	167	475	Inventory Losses	$29,216,000	$175,756,410
Education	51	159	Income and Relocation Losses	$623,140,000	$3,263,449,580
Totals	32,951	164,905	Totals	**$3,710,032,000**	**$23,304,196,270**

Table 11. Building Damage Counts and Estimated Losses using HAZUS MH

Debris Removal

Table 13 shows how much debris would be generated by the earthquake and how many loads it would take to remove the debris, based on 25 tons per load. One truck can likely haul one load per hour. A second debris removal issue is landfill space. Fifty thousand tons at a weight-to-volume ratio of one ton per cubic yard would cover more than ten acres to a depth of three feet.

Category	Salt Lake M5.9	2500-yr M7.1
Brick, Wood & Others	581,000 tons / 23,240 loads	3,356,000 tons / 134,240 loads
Concrete & Steel	1,195,000 tons / 47,800 loads	7,678,000 tons / 307,120 loads

Table 12. Debris Generated/Number of Loads

Fires Following an Earthquake

Multiple ignitions and broken water mains following an earthquake can make firefighting nearly impossible. HAZUS-MH uses estimated building damages, loss of transportation infrastructure and estimated winds to calculate the estimated area that would be burned following an earthquake.

Casualties

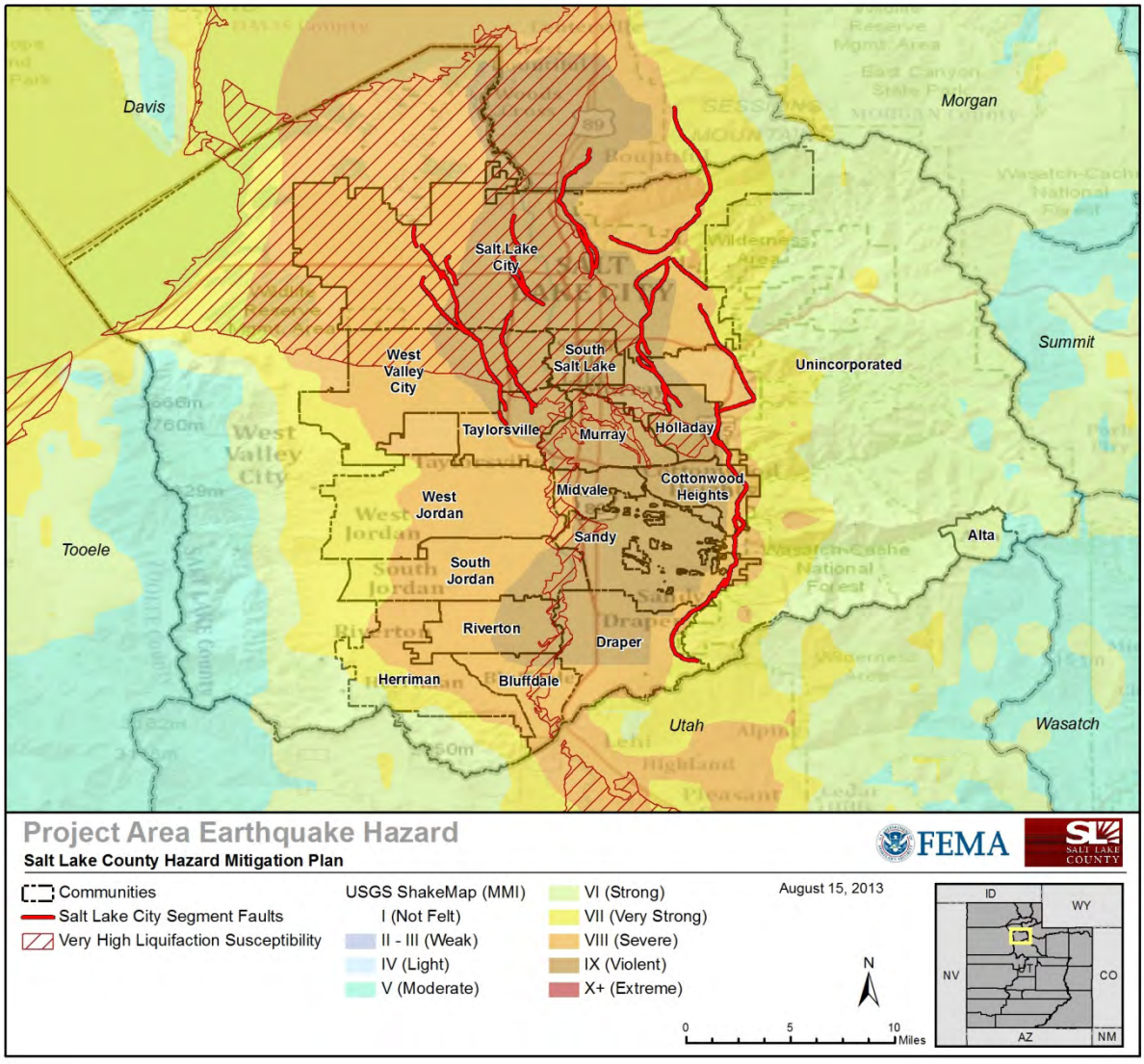
Table 15 estimates casualties likely to occur during each earthquake scenario. The nighttime scenario (2 a.m. local time) assumes a primarily residential concentration of persons, the daytime scenario (2 p.m. local time) a commercial concentration, and the commute scenario (5 pm. local time) a concentration of persons on commuting routes. Categories of casualties include those not requiring hospitalization (minor), those requiring treatment at a medical facility (major), and fatalities.

Night Event	Salt Lake M5.9	2500-yr M7.1	Day Event	Salt Lake M5.9	2500-yr M7.1	Commute Event	Salt Lake M5.9	2500-yr M7.1
Minor	1,024	10,475	**Minor**	1,883	17,110	**Minor**	1,432	13,442
Major	219	3,224	**Major**	502	6,192	**Major**	369	4,688
Fatalities	44	758	**Fatalities**	122	1,742	**Fatalities**	87	1,258

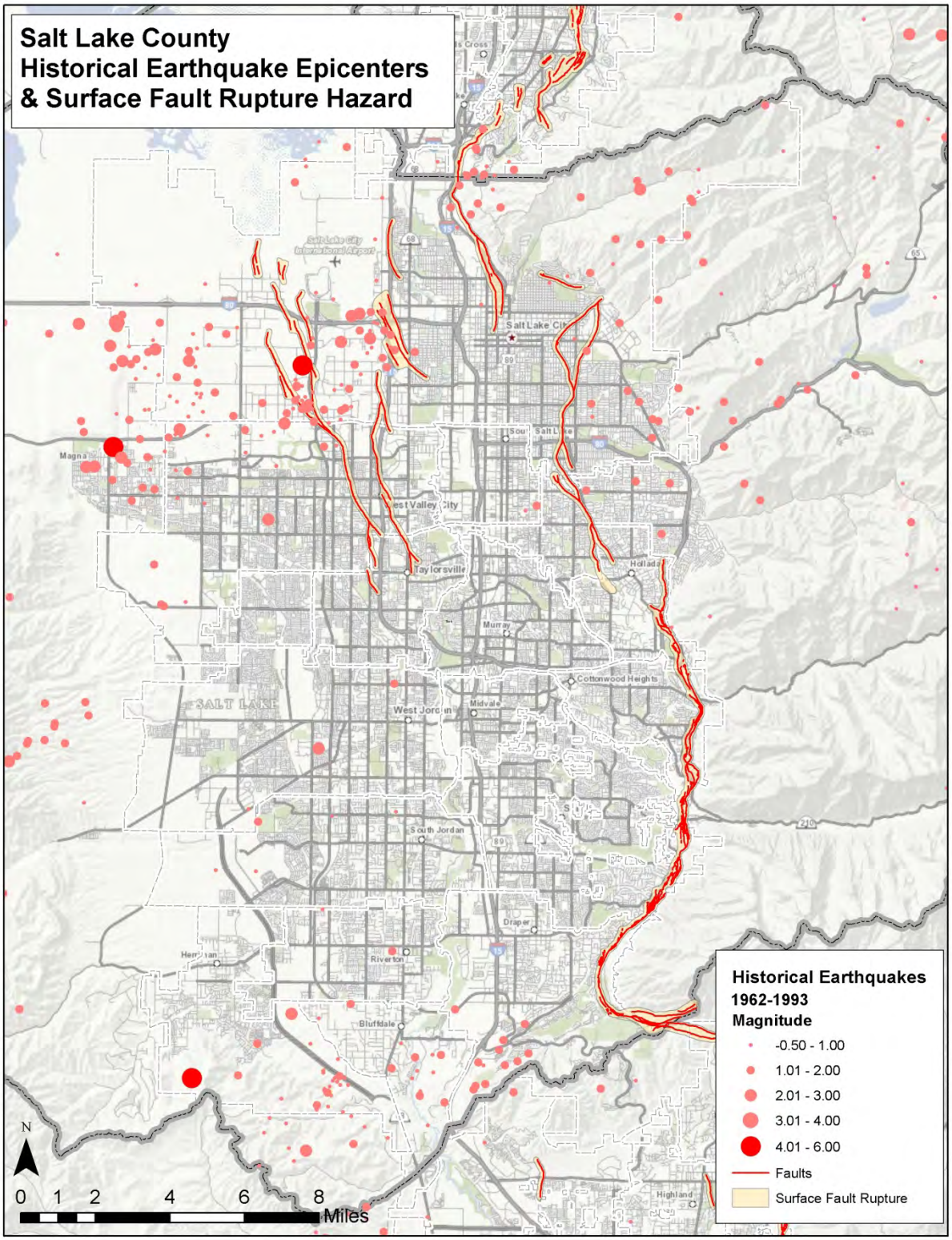
Table 13. Casualties

Community Assets

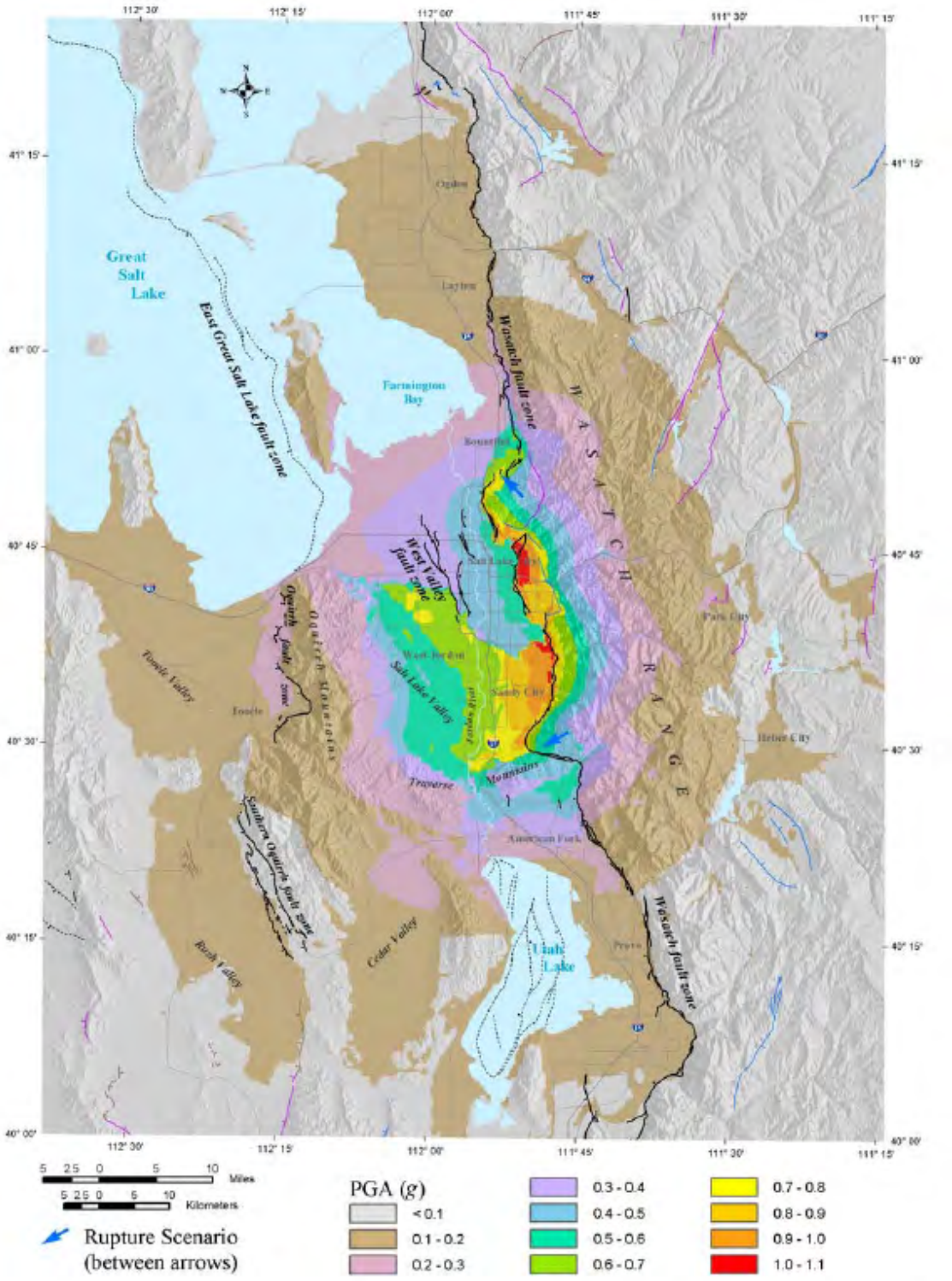
Additional significant community assets with potential impacts by earthquake hazards were identified by the Planning Team. These include areas of particular concern, critical facilities and infrastructure, areas of future development, major employers or economic sectors, cultural or historic facilities, significant populations, or significant natural resources.


Davis
Morgan
Salt Lake City
West Valley City
South Salt Lake
Unincorporated
Summit
Taylorsville
Murray
Holladay
Cottonwood Heights
Midvale
West Jordan
Sandy
Alta
Tooele
South Jordan
Riverton
Draper
Herriman
Bluffdale
Utah
Wasatch
Project Area Earthquake Hazard
Salt Lake County Hazard Mitigation Plan
FEMA
SALT LAKE COUNTY
Communities
Salt Lake City Segment Faults
Very High Liquifaction Susceptibility
USGS ShakeMap (MMI)
I (Not Felt)
II - III (Weak)
IV (Light)
V (Moderate)
VI (Strong)
VII (Very Strong)
VIII (Severe)
IX (Violent)
X+ (Extreme)
August 15, 2013
N
0
5
10
Miles
ID
WY
NV
UT
CO
AZ
NM

Map 1.



Map 2. Salt Lake County Earthquakes, 1962-1993



Map 3 from Earthquake-Hazards Scenario for a M 7 Earthquake on the Salt Lake City Segment of the Wasatch Fault Zone, Utah, Utah Geological Survey Special Study 111, 2004.

4.2.2. Flood

Floods are related to fast snowmelt, heavy rainfall, or failure of natural or engineered impoundments onto river banks and adjacent floodplains. Floodplains are lowland areas near rivers, lakes, reservoirs, oceans and low terrain urban areas that are subject to recurring floods. Stream 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 West Valley City, urban areas are prone to flooding because urban development such as buildings, streets, and parking lots prevent water infiltration into the soil and greatly increase runoff. Undersized piping, manmade drainage channels, or debris that obstructs passageways may further contribute to flooding. Flood damage includes saturation of land and property, erosion, deposition of mud and debris, and fast flowing water. Most injuries and deaths occur from fast moving floodwaters, while most property damage results from inundation by sediment-filled water.

West Valley City has no recurring loss properties identified under the National Flood Insurance Program (NFIP).

Snowmelt floods: These are caused by rapid spring snowmelt of mountain snowpacks. Most times, intense spring rainfall assists the flood scenario, causing additional rapid river rises. These events can last for weeks during the spring (generally April-June) and may result in loss of life and extensive damage affecting property owners and municipalities. More damage is occurring over the years as a result of increased development near the riverbanks of mountain streams (UNHH 2008). Snowmelt risk is greatest when snowpack is at or above normal and/or accompanied by an abrupt warming trend.

Flash-flooding: These are caused by intense thunderstorms and resultant intense rainfall. Intense rainfall may fall on areas of sparse vegetation, steep slopes, and impervious surfaces, and is then channeled into smaller waterways or conduits. Once the large volume of runoff begins to accumulate across the basin, it typically increases in volume and speed in a short time. Events are often short-lived, but very dangerous for those caught in a confined area, such as a canyon, during the time of the flood. (UNHH 2008). Flash flooding has caused 32 fatalities in Utah since 1950 (NOAA, Know Your Risk)

Areas of localized flooding may occur in urban areas not associated with existing waterways. Rain from high intensity thunderstorms may accumulate in low lying areas with no outlet or where storm drains have become overwhelmed. These types of flood and the resulting impacts are difficult to anticipate due to the uncertainty of when and where such storms will occur.

Long-term rainfall events: These rain events occur mostly in the fall or winter months and are produced by large synoptic weather systems originating out of the south, southwest, or west that produce rainfall for an extended period. Some melting of snow may occur as a result of the rainfall. Occur mainly in the southern half of the state (UNHH 2008).

Flooding Hazard Profile

Potential Magnitude			Probability		
		Catastrophic (>50%)			Highly Likely
	X	Critical (25-50%)		X	Likely
		Limited (10-25%)			Possible
		Negligible (< 10%)			Unlikely
Location	Largely in and along floodplains (See Maps 5,6, and 7); debris flows could cause natural damming of water if nearby streams were to become blocked.				
Seasonal Conditions	Spring, heavy rainfall, and spring snowmelt runoff.				
Conditions	Thunderstorms w/heavy rainfall, extended wet periods.				
Duration	Flooding can last anywhere from hours to days and even months.				
Secondary Hazards	Raw sewage/health risk, electrical fires, gas spills.				
Analysis Used	Review of FIS, FIRM, Army Corp of Engineers Flood Study.				

Profile 1.

Location and Extent

Flooding in West Valley City is typically the result of excessive snowmelt runoff and/or heavy rainfall. Snowmelt flooding is usually the result of rapid melting of snowpack and occurs between April through June and occurs along the major existing streams and waterways. Thunderstorms can produce high intensity, short duration heavy rainfall that occurs over a relatively small area in the summer months. However, flooding can also occur from non-thunderstorm rainfall events.

The flows of the Jordan River from Utah Lake into West Valley City are controlled and the flood potential from is somewhat reduced upstream of the major Jordan River tributaries. Parley's Creek has flood storage capacity at Mountain Dell and Little Dell Reservoirs and is routed through a retention basin in Sugarhouse Park. Big and Little Cottonwood Creeks and have a number of smaller flood storage lakes and ponds providing some flood protection, such as Wheeler Historic Farm. In Salt Lake City, Emigration Creek and Red Butte Creek come together at 700 East and 1300 South and can be discharged in or bypass Liberty Park pond. Parley's Creek discharges to the 1300 South drain at State Street.

History:

The following flood events are of notable significance:

- ***2011*** - Large snowpack meant larger resulting spring runoff flows
- ***2010*** - Spring snowmelt combined with heavy rains caused several streams to overtop their banks
- ***1987*** – Great Salt Lake reached its all-time maximum water level (4211.6 feet)
- ***1983*** - Large snowpack was coupled with a rain-on-snow event, (City Creek diverted down State Street)
- ***1983/1984*** - Large snowpack overwhelmed Utah Lake and affected Jordan River downstream
- ***1952*** - Rapid melt of a large snowpack

During the past 149 years, the Great Salt Lake has peaked three times above 4,211 feet above sea level: 4,211.60 feet in June 1873, 4,211.50 feet in June 1986 and 4,211.60 feet in June 1987.

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.

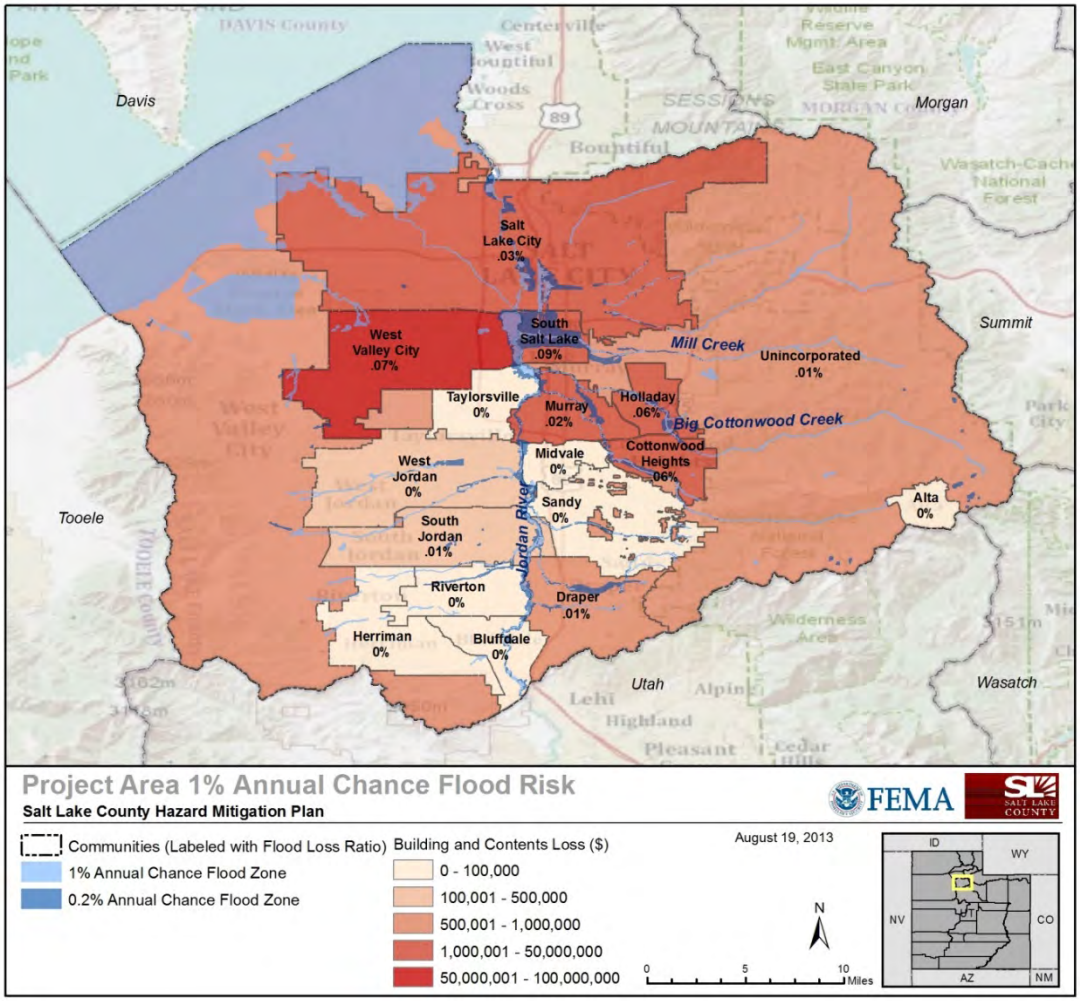
Structure Exposure and Hazus-Generated Losses

	1% Annual Chance			0.2% Annual Chance		
Jurisdiction	Structure Exposure	Building and Contents Loss*	Loss Ratio**	Structure Exposure	Building and Contents Loss	Loss Ratio
West Valley City	399	$ 90,923,943	0.704%	173	$ 4,741,553	0.04%
County Total	**1,533**	**$ 118,217,947**		**6,763**	**$ 320,309,430**	**0.23 %**

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.**

Population Exposure	
1% Annual Chance	7,421
0.2% Annual Chance	23,126


Project Area 1% Annual Chance Flood Risk
Salt Lake County Hazard Mitigation Plan
FEMA
SALT LAKE COUNTY
Communities (Labeled with Flood Loss Ratio)
1% Annual Chance Flood Zone
0.2% Annual Chance Flood Zone
Building and Contents Loss ($)
0 - 100,000
100,001 - 500,000
500,001 - 1,000,000
1,000,001 - 50,000,000
50,000,001 - 100,000,000
August 19, 2013
N
0 5 10 Miles
ID
WY
NV
CO
AZ
NM
Davis
Morgan
Summit
Tooele
Utah
Wasatch
Salt Lake City .03%
West Valley City .07%
South Salt Lake .09%
Mill Creek
Unincorporated .01%
Taylorsville 0%
Murray .02%
Holladay .06%
Big Cottonwood Creek
Cottonwood Heights .06%
Midvale 0%
West Jordan 0%
Sandy 0%
Alta 0%
South Jordan .01%
Jordan River
Riverton 0%
Draper .01%
Herriman 0%
Bluffdale 0%

Map 5.

Agricultural Losses

Agricultural losses are listed in Table 18. Losses are computed according to the number of days in which the crops are inundated with water. All numbers are estimated for a flood occurring near April 15th.

	100-year Losses Day 3	100-year Losses Day 7	500-year Losses Day 3	500-year Losses Day 7
Barley	$45,134	$60,179	$49,078	$65,438
Corn Silage	$565,932	$754,577	$566,310	$820,518

Table 18. Agricultural Losses, April 15th Scenario

Vehicle Losses

Table 19 contains losses for vehicles in floods during both daytime and nighttime scenarios. The scenarios assume ninety percent (90%) of vehicles being removed from hazard areas due to warning.

Category	100-year	500-year
Daytime Scenario	$8,934,176	$12,019,101
Nighttime Scenario	$16,956,505	$21,976,899

Table 19. Vehicle Losses

Debris Removal

Table 20 shows how much debris would be generated by flooding and how many loads it would take to remove the debris, based on a capacity of 25 tons per load. One truck can likely haul one load per hour. A second debris removal issue is landfill space. Fifty thousand tons at a weight-to-volume ratio of one ton per cubic yard would cover more than ten acres to a depth of three feet.

Category	100-year	500-year
Finishes	37,402 tons/1,497 loads	44,481 tons/1,780 loads
Structures	64,725 tons/2,589 loads	69,936 tons/ 2,798 loads
Foundations	61,660 tons/2,467 loads	66,747 tons/2,670 loads
Totals	163,786 tons/6,553 loads	181,164 tons/7,248 loads

Table 20. Debris Generation and Removal

4.2.3. Wildfire

Wildfires are not applicable in West Valley City

4.2.4. Landslide and Slope Failure

Landslides and Slope failure are not applicable in West Valley City.

4.2.5. Severe Weather

Severe Storms: Severe storms can include thunderstorms, lightning, hailstorms, heavy snow or rain. These storms are generally related to high precipitation events during the summer and winter months and can happen anywhere in the region. Damage can be extensive especially for agriculture, farming, and transportation systems; they can also disrupt business due to power outages.

Severe Thunderstorms: Severe thunderstorms are storms that either produce tornadoes, winds 58 mph or greater, wind damage, and/or hail three-quarters of an inch or larger in diameter. Thunderstorms can also lead to flash flooding from heavy rainfall.

Strong, rising air currents bring warm, moist air from the surface into the upper atmosphere where it condenses forming heavy rains, hail, strong winds and lightning. Based on historical evidence thunderstorms can strike anywhere in the region, mainly during the spring and summer months.

Hailstorms: Hailstorms occur when freezing water (in thunderstorm clouds) accumulates in layers around an icy core generally during the warmer months of May through September. Hail causes damage by battering crops, structures and automobiles. When hailstorms are large, damage can be extensive, especially when combined with high winds.

Heavy Precipitation: Heavy amounts of precipitation from rain or snow can result in flash flood events. The Wasatch Front has been susceptible to these types of storms because of close proximity to the mountain ranges. Major winter storms can produce five to ten times the amount of snow in the mountains than in the valley locations. Heavy snow can cause a secondary hazard in avalanches.

Tornado: (Map 8-5) A tornado is a “violently rotating column of air extending from a thunderstorm to the ground”. Some tornadoes can have wind speeds greater than 250 mph with a damage zone 50 miles long and greater than a mile wide. Although they are less common in the Intermountain Region, an average of 3 tornadoes per year occurs in Utah. Examples are the Salt Lake City tornado August 11, 1999 and the Manti tornado in 2002. Most tornadoes in Utah typically have winds less than 110 mph (F2 or smaller), and no wider than 60 feet and are on the ground no longer than a few minutes.

Historically, atmospheric conditions have not been favorable for tornado development in Utah due to a dry climate and mountainous terrain. Utah is one of the lowest ranked in the nation for incidences of tornadoes with only one F2 or stronger tornado every seven years. Utah averages about two tornados per year which typically occur between May and August.

Despite this fact, interactions of the relatively cool air of the Great Salt Lake and relatively warm air of urban areas could create situations more favorable for tornado development. This phenomenon possibly contributed to the formation of the August 1999 Salt Lake City tornado (Dunn and Vasiloff 2001). The $170 million in damages caused by this tornado make it the costliest disaster in Salt Lake County history.

Tornado distribution for the region (Map 13) suggests many tornadoes are funnel clouds aloft coming into contact with the increasing elevation of the region's foothills and mountains.

Lightning: Lightning is the electric discharge between clouds or from a cloud to the earth. Lightning casualties occur most frequently during the summer monsoonal flow in July and August. Lightning is consistently one of the top three causes of weather-related deaths in the country, claiming more lives on average than tornadoes. In the U.S., an average of 400 individuals are struck by lightning per year, and an average 67 lives are lost per year.

In Utah, lightning causes the highest number of weather-related fatalities (NWS 2008). Lightning has claimed 65 (61 according to UHMP, +42 injuries) lives in Utah since 1950, more than any other thunderstorm-related hazard. 8 of those fatalities were within Salt Lake County.

Lightning is also the primary cause of wildland fires in Utah (NWS 2008), which could cause casualties or be disruptive to the economy. $4-5 billion is lost each year due to structural and wildland fire ignitions, and an additional $2 billion in costs to airline operations and passenger delays (UNHH 2008).

High winds: High winds can occur with or without the presence of a storm and are unpredictable in regards to time and place. West Valley City has experienced high winds in the past, and can expect future events.

Straight-line winds produced by thunderstorms are any winds not associated with the rotation of a tornado. Straight-line winds are responsible for most thunderstorm wind damage, and speeds can exceed 125 mph. Other damaging winds originating from thunderstorms include downbursts and microbursts. Utah has also experienced down slope wind events, which occur when wind generated as a deep layer of air is forced over a barrier. Winds accelerate down mountain slopes and generate high winds in a wave region formed at the base of the terrain. A down slope windstorm in December 2011 generated numerous reports of 60-80 mph winds, and maximum gusts of 80-100 mph in the Bountiful/Centerville area, resulting in loss of power and significant damage in the region (NWS 2012, Definitions for Severe Weather
Canyon winds can bring wind gusts greater than 100 mph through the canyon mouths into the populated areas of the Wasatch Front. Winds are usually strongest near the mouths of canyons and have resulted in the loss of power and the inability to heat homes and businesses. Winds have also damaged roofs, destroyed and knocked down large trees and fences, overturned tractor trailers and railroad cars, and downed small airplanes.

Winter Storms: Winter storms can pose a significant threat due to vehicle traffic accidents on icy roads, prolonged exposure to cold, damage to electrical, telephone or communication systems from ice or heavy snow accumulation, and indirectly related health threats such as individuals

suffering heart attacks while shoveling snow. Prolonged exposure to cold can cause frostbite or hypothermia and can become life threatening. Winter weather can also have significant economic costs associated with snow removal, revenue and wage losses from road and airport delays or closures, flooding damage from rapid snowmelt, and agricultural and timber losses from frost and ice (UNHH 2008).

Fog: Temperature inversions often occur during the winter months as a result of high pressure trapping cold air in the valley. These inversions keep cold, moist air trapped on the Wasatch Front valley floor forming super-cooled fog. This fog can cause visibility restrictions and icy surfaces. Wind is needed to clear the inversion and fog. The Great Salt Lake has been shown to affect the prevalence of fog, especially when lake levels are high (Hill 1987).

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 county. 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.

Profile 4.

4.2.6. Dam Failure

Dam Failures are not applicable in West Valley City.

4.2.7. Avalanche

Snow avalanche are not applicable in West Valley City.

4.2.8. Public Health Epidemic/Pandemic

A pandemic is a worldwide disease outbreak. 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		**Catastrophic (>50%)**	**Probability**		**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.

Profile 7

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. Many problems will come from having children dismissed from schools and childcare programs. There are 546,000 children less than 18 years old currently in school in Utah, accounting for 21.8% of the population. An additional 205,000 residents (8.2%) are enrolled in college. 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. Additionally 156,000 (17.9%) of Utah residents live alone; 30.1% are 65 years of age and older. 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 of	20-40	20-40	20-40	20-40	20-40

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

4.2.9. 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).

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 8-2) (NDMC 2006).

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	Countywide.				
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.				

Profile 8

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.

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).

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)

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 were 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.

4.2.10. Infestation

Infestations are not applicable in West Valley City.

4.2.11. 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.

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.				

Profile 11

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."
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.

Capability Assessment Survey

Jurisdiction: *West Valley City* Point of Contact/Title: *Chief John Evans*

Phone: 801-963-3337 E-mail: john.evans@wvc-ut.gov

1.Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Supports, Neutral or Hinders) with the appropriate symbol and also indicate if there has been a change in the ability of the tool/program to result in loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool/Program	***Status***			***Dept. / Agency Responsible***	***Comments:***
	In Place	***Date Adopted or Updated***	***Under Develop-ment***		
Hazard Mitigation Plan					
Emergency Operations Plan	**X**	**05/2012**		**EM**	
Disaster Recovery Plan	**X**	**05/2012**		**EM**	
Evacuation Plan	**X**		**X**	**EM**	
Continuity of Operations Plan	**X**	**07/2013**		**EM**	
NFIP					
NFIP-CRS					
Floodplain Regulations	**X**	**10/2009**		**Public Works**	
Floodplain Management Plan			**X**	**Public Works**	

Zoning Regulations	X	On-Going		CED	

Tool/Program	Status			Dept. / Agency Responsible	Comments:
	In Place	Date Adopted or Updated	Under Develop-ment		
Subdivision Regulations	X	On-Going		CED	
Comprehensive Land Use Plan (or General, Master or Growth Mgmt.	X	On-Going		CED	
Open Space Management Plan (or Parks/Rec or	X	On-Going		CED Parks/Rec	
Stormwater Management Plan /	X	1/2014		Public Works	
Natural Resource			X	Public Works	
Capital Improvement Plan	X	Every Budget		Administration	
Economic Development Plan	X		X		
Historic Preservation Plan			X	Public Works	
Farmland Preservation			X	Public Works	
Building Code	X				Current Code
Fire Code	X				Current Code
Other					

2.Administrative and Technical Capability: Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an "X" in the appropriate box. Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff/Personnel Resources	*Yes*	*No*	*Department / Agency*	*Comments*
Planners (with land use / land development knowledge)	X		CED	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		CED Public Works	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building	X		CED	
Emergency manager	X		Fire	
Floodplain manager	X		Public Works	
Land surveyors	X		Public Works	
Scientists or staff familiar with the hazards of the community		X		
Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program	X		MIS	
Grant writers or fiscal staff to handle large/complex grants	X		Finance	
Other				

3. Financial Capability: Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources ***for hazard mitigation purposes*** (including as match funds for State of Federal mitigation grant funds). Then, identify the

primary department or agency responsible for its administration or allocation and provide any other comments you may have in the space provided or with attachment

Financial Resources	Yes	No	Department / Agency	Comments
Capital improvement programming	X		Finance	
Community Development Block Grants (CDBG)	X		Administration	
Special purpose taxes	X		Finance	
Gas / electric utility fees		X		
Water / sewer fees		X		Separate Districts
Stormwater utility fees	X		Public Works	
Development impact fees	X		All Departments	
General obligation, revenue, and/or special tax bonds	X		Finance	
Partnering arrangements or intergovernmental agreements		___		
Other		___		

4.Education and Outreach: West Valley City will provide education to citizens with religious group, community fairs, school programs, and CERT. We will provide specific training as requested.

Program/Organization	Yes	No	Department / Agency	Comments
Firewise Communities Certification		X		
StormReady certification		X		
Natural disaster or safety related school programs		X		
Ongoing public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	X		Fire EM Police	
Public-private partnership initiatives addressing disaster-related issues	X		EM	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	X		EM	
Other				

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory			X
Administrative and Technical			X
Financial			X
Education and Outreach		X	

6 Mitigation Strategy

6.1 West Valley City progress 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*, which was adopted by the West Valley City on October 6, 2009. The following summary highlights the West Valley City 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 West Valley 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	In Process	Currently we have upgraded radio and comms systems. Inventory of all local assests 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	In process	We have trained all personnel working in emergency operations
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	In process	Working with Salt Lake County
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	Done	Worked with Dispatch and reverse 911 for our system
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 process	Looking at each emergency to see weakness

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	2 – Establish redundancy for dispatch centers and other critical communications	In process	VECC is working with all local centers for redundant 911
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 process	Working with City comms group for this
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	In process	Budget issue upgrading as we can with current budgets
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	In process	Looking at hazards with mapping and GIS
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	We are continually looking at evaluations of all hazards
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	In process	Done update to our plan and facilites
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 process	Completing pre incident plans on major facilities
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.	No Progress	Funding and personnel

Category	Goal / Objective	Action	Status	Comments
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.	No Progress	Funding and personnel
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	In progress	Continual mapping of hazards and risks
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	Done	Have completed this for city owned facilities
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	Done	completed this for city owned facilities
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 process	Completed all fire and ems. Working with Public works and police now
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	Fire is completed working with other disciplines
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	In process	Currently working on our web page for citizens

Category	Goal / Objective	Action	Status	Comments
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	In process	Working with city to have continual education
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	In process	We have completed adult programs now working on a elementary school 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	In process	Working with county
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.	Done	All of our programs work with the groups listed
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	Done	City building uses latest codes
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	Done	Codes available at city hall
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	Dam's not hazard in this city
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	Dam's not hazard in this city

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	1 – Continue to encourage water conservation utilizing and promoting outreach material from all water districts in the County	In Process	City public works and water districts have education program but will always be 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	In Process	Working with water companies and County on issue
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	NA	City does not own water system
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	In process	City facilities are changing over fixtures for conservation in city owned buildings
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.		City does not own water system
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		City does not own water system
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	In process	Water companies do public education
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		City does not own water system

Category	Goal / Objective	Action	Status	Comments
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		City does not own water system
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	In process	Working on an inventory system of facilities
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	No Progress	Funding issues
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	No Progress	Funding issues
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	Done	Provide information at all events. This will always be 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.	None	Funding issues
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		Advise citizens and businesses of program
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		Provide education to citizens in EM programs

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	1 – Determine potential flood impacts and identify areas in need of additional flood control structures	In process	Public works continually plans and as money is available corrects
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		Public works has completed but will always be ongoing
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		Public works has completed but will always be ongoing
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		Provide education to citizens in EM programs
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		Provide education to citizens in EM programs
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	Done	Emergency plan information
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		Work always on plans with NWS
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	Done	Meeting on plans but will always be 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	In Process	As a city we have departments look at this
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	N/A	No Avalanches
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	In process	We are making plans for venues and weather evacuation plans
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	N/A	
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	N/A	
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	N/A	
Wildland Fire	1 – Community education on wildfire hazard 1.1 – Reduce risk from wildfire through education programs	1 – Increase public awareness through “Firewise” program	N/A	No wildland in City
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	N/A	No wildland in City

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	N/A	No wildland in City
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	N/A	No wildland in City
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	N/A	No wildland in City
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	N/A	No wildland in City
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	N/A	No wildland in City
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	N/A	No wildland in City

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	N/A	No wildland in City
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	N/A	No wildland in City
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	N/A	No wildland in 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	N/A	No wildland in City
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	N/A	No wildland in City
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	N/A	No wildland in City

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. This mitigation strategy applies to all listed hazards.

Objective 1.1 (Priority HIGH): Improve communications capabilities

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

Time Frame: Ongoing
Estimated Cost: 0
Staff: Fire
Jurisdictions: West Valley: currently switching to the new digital technology and have a completed inventory of all comms devices

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

Time Frame: Ongoing
Estimated Cost: minimal
Staff: Fire/EM
West Valley completes monthly tests

Action 3: Establish notification capabilities and procedures for emergency personnel.

Time Frame: Ongoing
Estimated Cost: minimal
Staff: Fire/EM - Dispatch
West Valley uses the VECC callback system for personnel

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

Action 1: Time Frame: Ongoing
Estimated Cost: Minimal
Staff: MIS
West Valley City

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

Time Frame: Ongoing
Estimated Cost: $600,000
Staff: MIS
West Valley has this with VECC and also our own 800mhz radio repeater system

Objective 1.3 (Priority HIGH): Conduct Communications Strategic Planning

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

Time Frame: Complete
Funding: N/A
Estimated Cost: N/A
Staff: N/A

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

Time Frame: Ongoing
Estimated Cost: $500,000
Staff: Fire/EMS
West Valley City (New Radio Systems).

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. This mitigation strategy applies to all listed 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.

Time Frame: Ongoing
Estimated Cost: Minimal
Staff: CED/MIS
West Valley GIS is always updating the maps

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

Time Frame: Ongoing
Estimated Cost: $10,000
Staff: Municipal
West Valley City (working on Gap Analysis)

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

Time Frame: Ongoing
Estimated Cost: $10,000
Staff: Fire/EM
West Valley not currently done but has some items within the Digital Sandbox

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

Time Frame: Ongoing
Estimated Cost: Minimal
Staff: GIS
West Valley (working with GIS Department).

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.

Time Frame: Ongoing
Estimated Cost: $4,000
Staff: Municipal
West Valley City looking at weather strand

Action 2: Identify and implement additional hazard monitoring capabilities.

Time Frame: 2017
Funding: Municipal
Estimated Cost: Unknown
Staff: Municipal

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. This mitigation strategy applies to all listed hazards.

Objective 3.1 (Priority HIGH): Prevent damage to critical facilities and infrastructure.

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

Time Frame: Ongoing
Estimated Cost: $5,000
Staff: MIS

West Valley still identifying and listing in GIS

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

Time Frame: 2016
Funding: Municipal
Estimated Cost: $25,000
Education Strategy

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. This mitigation strategy applies to all listed hazards.

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.

Time Frame: Complete
Funding: Municipal
Estimated Cost: Minimal
Staff: West Valley

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

Time Frame: 2017
Funding: Municipal
Estimated Cost: $5,000
Staff: All
West Valley Fire and Police are done working on other departments

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. This mitigation strategy applies to all listed hazards.

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.

Time Frame: 2017
Estimated Cost: Minimal
Staff: EM
West Valley CERT

Action 2: Develop education programs to target specific groups including homeowners, developers, schools and people with special needs.

Time Frame: Complete
Funding: N/A
Estimated Cost: N/A
Staff: N/A
West Valley Cert Training and safety fairs

Action 3: Utilize maps and similar products on City EM website and other media to educate public on areas at risk to hazards.

Time Frame: 2016
Estimated Cost: $5,000
Staff: MIS

Action 4: Coordinate with existing public education programs such as the American Red Cross, Utah Living with Fire, Be Ready Utah, the National Weather Service, etc.

Time Frame: Complete
Funding: N/A
Estimated Cost: N/A
Staff: N/A

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. This mitigation strategy applies to all listed hazards.

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.

Time Frame: Complete
Funding: N/A
Estimated Cost: N/A
Staff: N/A
West Valley current codes

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

Time Frame: Complete
Funding: N/A
Estimated Cost: N/A
Staff: N/A

6.1.1 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.

Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal
Staff: Water Districts

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

Time Frame: 2017
Estimated Cost: Minimal
Staff: Public Works
West Valley Education

6.1.2 Earthquake

Problem Identification: Numerous geologic hazards exist in the West Valley 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.

Time Frame: 2016
Estimated Cost: $5,000
Staff: EM
West Valley HAZUS

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

Time Frame: On-going
Estimated Cost: High Unknown
Staff: EM
West Valley Planning Process

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

Time Frame: Unknown
Funding: Municipal
Estimated Cost: $17,000,000
Staff: Municipal
West Valley City working plan

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.

Time Frame: 2016
Funding: Municipal
Estimated Cost: 10,000
Staff: EM

6.1.3 Flooding

Problem Identification: Although located in a semi-arid region, West Valley City is subject to flash flooding due to heavy rainfall and rapid snowmelt, the Jordan River could flood. Our 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.

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.

Time Frame: Ongoing
Funding: Municipal
Estimated Cost: Minimal
Staff: Public Works
West Valley Planning

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

Time Frame: Ongoing
Funding: Municipal
Estimated Cost: $1,000,000
Staff: Public Works
West Valley – Continual with all developments and up- grades to storm water drains near Jordan River.

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.

Time Frame: Ongoing
Estimated Cost: $75,000 yearly
Staff: Public Works
West Valley City on-going maintenance

6.1.4 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.

Time Frame: Ongoing
Estimated Cost: Minimal
Staff: EM
Work on Storm Wise Program

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.

Time Frame: Complete
Funding: N/A
Estimated Cost: N/A
Staff: N/A
West Valley

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

Time Frame: 2016
Estimated Cost: 0
Staff: Staff
West Valley *Advise citizens on website

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

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

Time Frame: Ongoing
Estimated Cost: $10,000

Staff: EM
West Valley to develop a plan with event areas

7 Plan Maintenance

7.1 Implementation

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

7.2 Maintenance

7.2.1 Maintenance Schedule

Periodic monitoring and updates of this Plan are required to ensure that the goals and objectives for the Region 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.

Annual Review Procedures

West Valley 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 county organizing a 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. Each emergency manager will regularly monitor the Plan and is responsible to make revisions and updates. If the participating jurisdictions or UDEM determines that a modification of the Plan is warranted, an amendment to the Plan may be initiated as described below.

Five Year Plan Review

The entire Plan including any background studies and analysis shall be revised and updated every five years by the participating jurisdictions to determine if there have been any significant changes in the region 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.

The Natural Hazard Pre-Disaster Mitigation Planning Team, with a potential membership representing every jurisdiction in Salt Lake County, will be reconstituted for the five year review/update process. Typically, the same process that was used to create the original Plan will be used to prepare the update.

7.2.2 Plan Amendments

The Utah DEM State Hazard Mitigation Officer, Local Mitigation Committee, or City Manager of West Valley City, will initiate amendments and updates to the Plan.

Upon initiation of an amendment to the Plan, UDEM will forward information on the proposed amendment to all interested parties including, but not limited to, all affected city or county departments, residents and businesses. Depending on the magnitude of the amendment, the full planning committee may be reconstituted.

At a minimum, the information will be made available through public notice on the West Valley City website www.wvc-ut.gov. The review and comment period for the proposed Plan amendment will last for not less than forty-five (45) days.

At the end of the comment period, the proposed amendment and all review comments will be forwarded to Salt Lake County for consideration. If no comments are received from the reviewing parties within the specified review period, such will be noted accordingly. UDEM will review the proposed amendment along with comments received from other parties and submit a recommendation to FEMA within sixty (60) days.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered:

- There are errors or omissions made in the identification of issues or needs during the preparation of the Plan; and/or
- New issues or needs have been identified which were not adequately addressed in the Plan; and/or
- There has been a change in information, data or assumptions from those on which the Plan was based.
- The nature or magnitude of risks has changed.
- There are implementation problems, such as technical, political, legal or coordination issues with other agencies.

Upon receiving the recommendation of UDEM, a public hearing will be held. UDEM will review the recommendation (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, UDEM will take one of the following actions:

1. Adopt the proposed amendment as presented.
2. Adopt the proposed amendment with modifications.
3. Defer the amendment request for further consideration and/or hearing.
4. Reject the amendment request.

Implementation through Existing Programs (Including NFIP)

Once the Plan is promulgated, West Valley City will be able to include this Plans information in existing programs and plans. These could include the General or Master Plan, Capital Improvements Plan, Emergency Operations Plan, State Mitigation Plan, City Mitigation Plans.

Many of the mitigation actions developed by the cities and counties have elements of mitigation implementation including the National Flood Insurance Program (NFIP), the Utah Wildland-Urban Interface Code, the Building Code Effectiveness Grading System (BCEGS), and Community Rating System (CRS), all of which have been implemented.
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 are also handled by the Community Developer Director.

7.2.3 Maintenance Evaluation Process

It will be the responsibility of the City Manager, 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 WFRC jurisdictions shall continue to seek outside funding assistance for mitigation projects in both the pre- and post-disaster environment. This portion of the Plan identifies the primary Federal and State grant programs for participating jurisdictions to consider, and also briefly discusses local and non-governmental 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.

7.2.4 Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Plan and its updates. The Plan will be available on the West Valley City website, to provide opportunities for public participation and comment. The Plan will also be available for review at the offices of West Valley City.

Salt Lake County Emergency Management has been designated as the lead agency in preparing and submitting the Salt Lake County Natural Hazards Pre-Disaster Mitigation Plan, which includes coverage for all incorporated cities and counties within Salt Lake County. With limited resources, however, it becomes difficult to both identify and to individually contact the broad range of potential agencies that may stand to benefit from the Plan. This being the case, we have established the following course of action

STEP 1. SLCOEM will publicly advertise all hearings, requests for input and meetings directly related to the Natural Hazard Pre-Disaster Mitigation Planning process. Meetings of the Mitigation Planning Team where Plan items are discussed and where actions are taken will not receive special notifications as they are already advertised according to set standards. All interested parties are welcome and invited to attend such meetings and hearings, as they are public and open to all.

STEP 2. The AOG has established a mailing list of many local agencies and individuals that may have an interest in the Natural Hazard Pre-Disaster Mitigation Plan. Each identified agency or person will be mailed a notice of the hearings and open houses.

STEP 3. Comments, both oral and written, will be solicited and accepted from any interested party. Comments, as far as possible, will be included in the final draft of the Plan; however, SLCOEM reserves the right to limit comments that are excessively long due to the size of the Plan.

STEP 4. Specific to risk assessment and hazard mitigation, needs analysis, and capital investment strategies, SLCOEM will make initial contact and solicitation for input from each incorporated jurisdiction within the region. All input is voluntary. Staff time and resources do not allow personal contact with other agencies or groups, however, comments and strategies are welcomed as input to the planning process from any party via regular mail, FAX, e-mail, phone call, etc. In addition, every public jurisdiction advertises and conducts public hearings on their planning, budget, etc. where most of these mitigation projects are initiated. Input can be received from these prime sources by the region as well.

STEP 5. The following policies will guide SLCOEM staff in making access and input to the Natural Hazard Pre-Disaster Mitigation Plan as open and convenient as possible:

Participation
All citizens of the region are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. SLCOEM will take whatever actions possible to accommodate special needs of individuals including the impaired, non-English speaking, persons of limited mobility, etc.

Access to Meetings

Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.

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

West Valley City 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.

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,

and/or any other documents prepared for distribution by SLCOEM that may be adopted as part of the Plan by reference. SLCOEM may charge a nominal fee for printing of documents that are longer than three pages.

Technical Assistance

Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects. SLCOEM staff will assist to the extent practical, however, limited staff time and resources may prohibit staff from giving all the assistance requested. SLCOEM will be the sole determiner of the amount of assistance given all requests.

Public Hearings

The AOG will plan and conduct public hearings according to the following priorities:
Hearings will be conveniently timed for people who might benefit most from mitigation programs.
Hearings will be accessible to people with disabilities (accommodations must be requested in advance according to previously established policy).
Hearings will be adequately publicized. Hearings 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 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.

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