

Davis County, Utah
Pre-Disaster Mitigation Plan
2021 Update

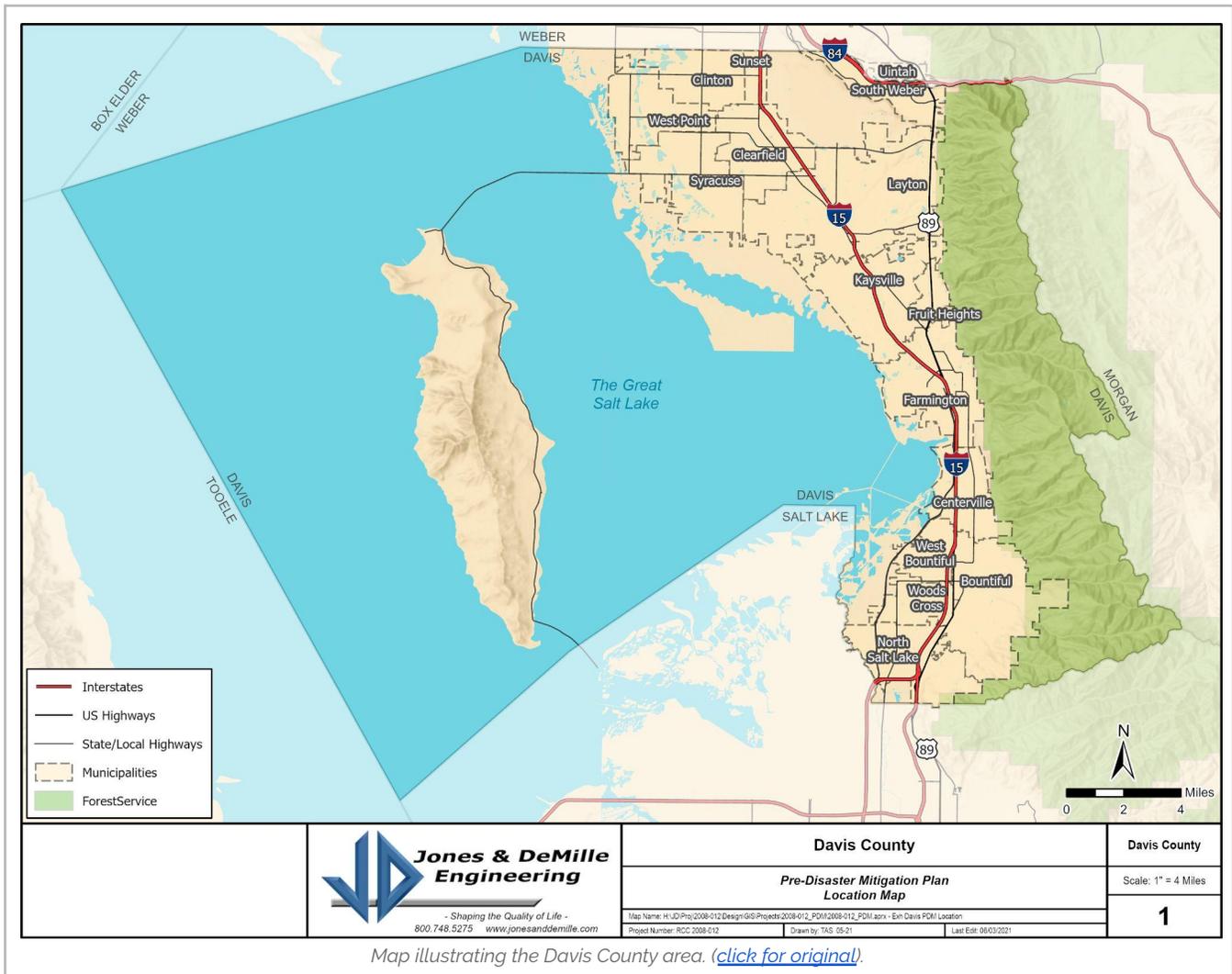


Davis
COUNTY

TABLE OF CONTENTS

Executive Summary	2
1 - Introduction	9
2 - Adoption Process	13
3 - Planning Process	16
4 - County Goals (previous)	25
5 - County Goals (new)	32
6 - Stakeholder Goals	37
7 - Geographic Setting	147
8 - Capability Assessment	163
9 - Risk Assessment	171
10 - Specialized Local Districts	222
11 - Plan Maintenance + Implementation	225
12 - Appendix A: Policy Considerations	232
13 - Appendix B: General Mitigation Strategies	235
14 - Appendix C: Hazard Histories	253
15 - Appendix D: Critical Facilities	255
16 - Appendix E: Glossary of Terms	265
17 - Appendix F: Works Cited	274
18 - Appendix G: Stakeholder Participation.....	282
19 - Appendix H: Stakeholder Support (and resolutions).....	291

EXECUTIVE SUMMARY



Davis County Overview

With a total area of 630 square miles and only 223 square miles of usable land, Davis County is the county with the least amount of land area in Utah. Antelope Island in the Great Salt Lake adds another 42 square miles to the land area with the remaining portion part of the Great Salt Lake. Davis County is the third most populous county in the state with a population density of roughly 933 people per square mile. Morgan County bounds the county to the east, Salt Lake County to the south, Tooele County to the west, and to the north, Weber County. The western half of Davis County consists of the Great Salt Lake, while the eastern edge of the County is the front of the Wasatch Mountains, much of that in the Wasatch National Forest.

Davis County includes 15 municipalities: Bountiful, Centerville, Clearfield, Clinton, Farmington, Fruit Heights, Kaysville, Layton, North Salt Lake, South Weber, Sunset, Syracuse, West Bountiful, West Point, and Woods

Executive Summary - Davis Co PDMP

Cross. Unincorporated areas with significant populations are limited to Hill Air Force Base, the Val Verda area between the communities of North Salt Lake and Bountiful and the Mutton Hollow area between Kaysville and Layton. The percent of land ownership within the county is 10.9% Federal, 12.0% State, 24.9% Private and Local Government, and 52.2% under the Great Salt Lake (also owned by the State).

Most of the early settlers in Davis County were ranchers and farmers. The fertile ground produced sugar beets, tomatoes, alfalfa, grain, corn, potatoes, onions and extensive fruit orchards were developed on the bench areas. Cattle ranching and dairy farming were also leading agricultural activities.

As the county population continued to grow, Davis County developed a commercial and industrial base. The military became an important part of the County economy with the development of the Naval Supply Depot and Hill Air Force Base. The Naval Supply Depot was sold to private developers in the 1960's and it became Freeport Center, which is the largest distribution center in the United States. Hill Air Force Base has been the economic backbone of Davis County for many years and is a fundamental economic component of the community. The current economy has many components including manufacturing, trade, services and government. Some of the largest employers include Hill Air Force Base, Davis County School District, Lifetime Products Inc., Smith's Marketplace, Utility Trailer Manufacturing and Wal-Mart (UDWS 2007b). Davis County's population is large and growing and the housing and community demands are high. Mean household income in 2014 was \$70,388 and the 2014 per capita income was \$26,309.

Hazard History

Within the mitigation planning process, it is important to remember that the past is the key to the future. Identifying past hazard events provides a starting point for predicting where future events could occur. The following historical hazard event statistics were consolidated from the Spatial Hazard Events and Losses Database for the United States (SHELDUS) of the Hazards and Vulnerability Research Institute. This database records reported natural hazard events which cause greater than \$50,000 in damages.

Risk Assessment

The risk assessment process revealed the following for Drought, Earthquake, Flood, Infestation, Landslide/Slope Failure, Severe Weather, and Wildland Fire. Drought, Infestation and Severe Weather are regional hazards and can be found in Part VII. Refer to Part VI for an explanation of the risk assessment methodology. According to this data, there are a total of 130 identified critical facilities within Davis County. For the complete list, refer to Appendix D.

Table Exec.1 - Davis County, Structures with Moderate or Greater Vulnerability, 2020

	TOTAL	Ground Shaking	Liquefaction	Flood	Problem Soils	Wildfire	Soil Failure	Dam Failure
Amateur Radio Repeaters	12	12 (100%)	5 (42%)	2 (17%)	0 (0%)	12 (100%)	1 (8%)	1 (8%)
Public Safety Repeaters	9	9 (100%)	1 (11%)	0 (0%)	0 (0%)	6 (67%)	1 (11%)	0 (0%)
Electric Generation Facilities	1	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)
Emergency Operations Centers	1	1 (100%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)

Executive Summary - Davis Co PDMP

Fire Stations	16	15 (100%)	9 (60%)	1 (7%)	0 (0%)	1 (6%)	0 (0%)	2 (13%)
Hospitals	3	2 (100%)	1 (50%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Oil Facilities	7	7 (100%)	7 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (14%)
Police Stations	14	14 (100%)	12 (86%)	2 (14%)	0 (0%)	0 (0%)	0 (0%)	3 (21%)
Schools	88	88 (100%)	69 (78%)	3 (3%)	0 (0%)	0 (%)	1 (1%)	14 (17%)
Water Treatment Facilities	3	3 (100%)	3 (100%)	1 (33%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Risk Potential

The FEMA National Risk Index identifies Davis County Utah as an area with an overall risk index of 6.92. This is lower than the average for counties in Utah (7.25), and the national average (10.70). However, emergency management is a priority to Davis County because the same matrix identifies Davis County as having a much higher score for “Expected Annual Loss” (23.83) - almost double the average in Utah (12.95) and counties throughout the nation (13.47). One of the main reasons for this is because of the population density and building values in Davis County.

Development Trends

Davis County’s residential growth will continue to infill previous agricultural and industrial fringe. Some of the residential growth is occurring on more sensitive lands such as hillsides and low lying areas towards the Great Salt Lake, and in northern Davis County. The opening of the Legacy Parkway in 2008 provided a much needed alternate north/south transportation expressway through the county. The planned North Davis Highway will further facilitate transportation from Weber, through Davis, to Salt Lake County.

Davis County's population is projected to continue to increase significantly. This will result in housing cost increases greater than the rate of inflation. Higher population densities are projected to be concentrated in currently developed areas with recent development occurring at lower densities in the outlying areas.

Executive Summary - Davis Co PDMP

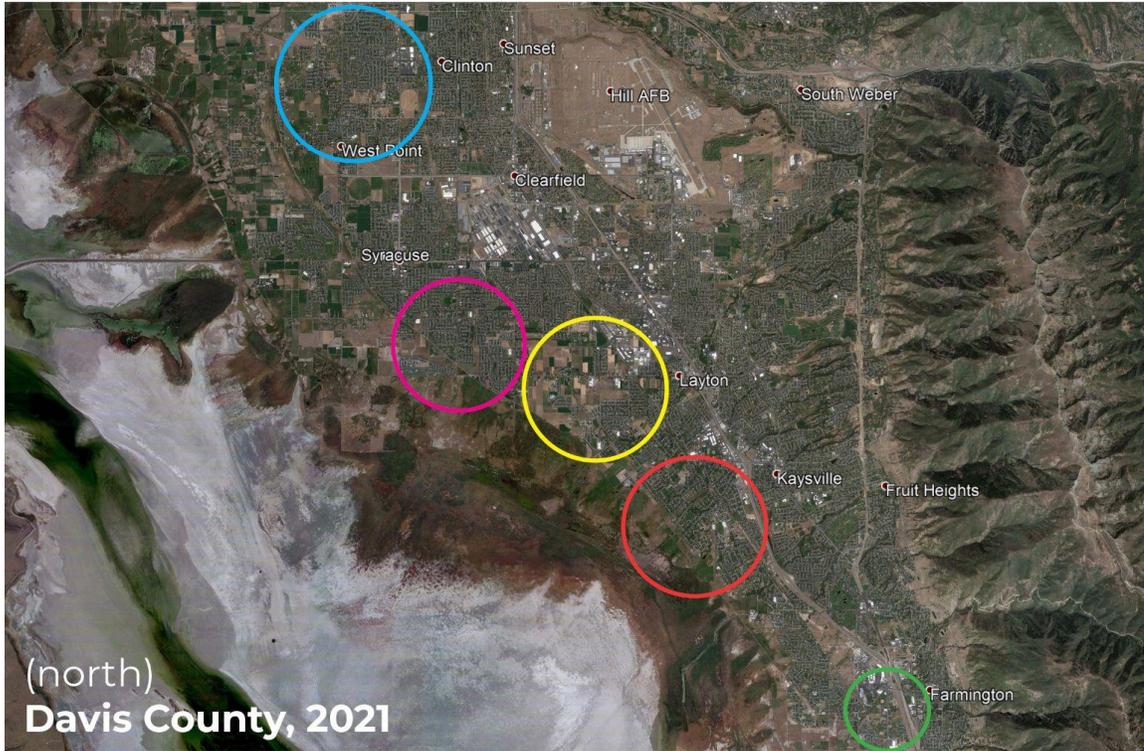


Illustration of areas that are likely to see growth in the next 5 years. (Source: local county and municipal planners).

Plan Mission

Davis County developed this PDM Plan in partnership with the jurisdictions it serves to substantially and permanently reduce the County's 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 County. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention and identifying activities to guide the development of a less vulnerable and more sustainable community.

Plan Update

This Plan represents an update of the PDM Plan that was approved by the cities, county, the State and by FEMA in 2016. All of the demographic data, maps, vulnerability assessments and mitigation strategies have been revised to reflect the constant growth throughout Davis County. Development pressures in hazard areas will continue to increase the risk to residents. The entire plan was reviewed and analyzed by the planning team throughout the planning process and again at the final draft stage before submission to the state and FEMA.

Plan Organization

The Plan was developed and organized within the rules and regulations established under 44 Code of Federal Regulations (CFR), Section 201.6. The Plan contains a discussion on the purpose and methodology used to develop the Plan, a profile on communities within Davis County, as well as a hazard identification study and a vulnerability analysis of eight hazards. To assist in the explanation of the above-identified contents there are several appendices included which provide more detail on specific subjects. This is intended to improve the ability of communities within Davis County to respond to emergencies and disasters. It will also document valuable local knowledge on the most efficient and effective ways to reduce loss.

Plan Funding

The Plan has been funded and developed under the PDM Program provided by the Federal Emergency Management Agency (FEMA) and the Utah Department of Public Safety, Division of Emergency Management (DEM).

Plan Participation

Plan participation was completed as a result of a collaborative effort between Davis County, DEM, city and county emergency managers, fire departments, sheriff's office, public works departments, planning commissions, assessor's office, city and county geographic information systems (GIS) departments, special service districts, school district, elected officials, public employees and citizens of the cities in Davis County.

Interviews were conducted with stakeholders from the communities and workshops were conducted during the Plan development phase. Additionally, through public hearings, workshops and draft Plan displays, ample opportunity was provided for public participation. Any comments, questions and discussions resulting from these activities were given strong consideration in the development of this Plan.

Hazards Identification

The PDM Plan addresses earthquake, flood, landslide, problem soils, wildfire, dam failure, and severe weather. The hazard identification study recognized the following natural hazards as being the most prevalent and posing the most potential risk to Davis County. It is recognized that dam failure is not a natural hazard. However, the impact from a catastrophic dam failure would likely be so severe that it warrants inclusion into the Plan.



Acknowledgements

Davis County would like to extend their appreciation to the following agencies, which assisted in the development of this Plan.

- Utah Division of Emergency Management
- Federal Emergency Management Agency
- National Weather Service
- National Climate Data Center
- Utah Army Corps of Engineers
- Utah Geologic Survey
- Utah Division of Forestry, Fire and State Lands
- Utah Department of Agriculture
- Utah Avalanche Center
- Utah Automated Geographic Resource Center
- University of Utah
- University of Utah Seismic Station
- Utah State University
- Wasatch Front Regional Council (WFRC)
- Associations of Governments
- Davis County
- Bountiful City
- Centerville City
- Clearfield City
- Clinton City
- Farmington City

Executive Summary - Davis Co PDMP

- Fruit Heights City
- Kaysville City
- Layton City
- North Salt Lake City
- South Weber City
- Sunset City
- Syracuse City
- West Bountiful City
- West Point City
- Woods Cross City
- Davis County elected officials
- Davis County Emergency Manager Chad Monroe, Davis County Sheriff's Office
- Rural Community Consultants and Jones & DeMille Engineering, Consultant
- Davis County agencies including;
 - Public Works
 - Local Emergency Planning Committee (LEPC)
 - Fire Departments
 - Davis School District
 - Special Service Districts
 - Weber Basin Water Conservancy District

Part I - INTRODUCTION

Utah is vulnerable to natural and technological (human-caused) hazards that threaten the health, welfare and security of our citizens. The cost of response to and recovery from potential disasters can be substantially reduced when attention is turned to mitigating their impacts and effects before they occur.

Hazard mitigation is defined as 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: first, those that keep the hazard away from people, property and structures; second, those that keep people, property and structures away from the hazard; and third, those that do not address the hazard at all but rather reduce the impact of the hazard on the victims such as insurance. This mitigation Plan has strategies that fall into all three categories.

Hazard mitigation actions must be practical, cost effective, environmentally and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the anticipated damages.

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 that a county or city can implement.

Often, hazard mitigation may be 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. Preparedness for all hazards includes response and recovery plans, training, development, management of resources and the need to mitigate each jurisdictional hazard.

A. Purpose

The purposes of this Plan are (1) identify threats to the community, (2) create mitigation strategies to address those threats, (3) develop long-term mitigation planning goals and objectives, and (4) to fulfill federal, state and local hazard mitigation planning obligations.

Mitigation actions would serve to minimize threats that have an undesirable impact on the citizens, economy, and the environment of Davis County. This Plan is intended to enhance the awareness and to provide mitigation strategies 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.

B. Scope

The Davis County Natural Hazards Pre-Disaster Mitigation (PDM) Plan was developed in accordance with the requirements of the FEMA Section 322 regulations, the Utah Division of Emergency Management (DEM) and

local planning agencies. The goal of this Plan is to assist Davis County in reducing the costs of natural disasters by providing comprehensive hazards identification, risk assessment, vulnerability analysis, mitigation strategy and implementation schedule. Regulations set forth by FEMA were followed during the development of this Plan. All participating jurisdictions are listed. 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.

C. Authority

1. 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.

2. 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 53-2a-101, Disaster Response Recovery Act, 53-2a-201, Executive Order of the Governor 2020-1, and the Emergency Interim Succession Act, 53-2a-801.

3. 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 the cities making up Davis County, the local executives responsible for carrying out plans and policies are the county commissioners and city or 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. All jurisdictions in Davis County participated in the development of this plan.

D. Goals and Objectives

The goals and objectives of the PDM Plan include coordinating with local governments to develop a County planning process that meets each planning component identified in the FEMA Region VIII Crosswalk document,

Utah Division of Emergency Management (DEM) planning expectation and local input. Another goal is to meet the need of reducing risk from natural and technological hazards in Utah through the implementation of and updating of County plans.

1. Short Term Local Goals

The following general goals were used in the development of the PDM Plan. They are shown from highest to lowest priority.

1. Life safety protection.
2. Eliminate and/or reduce property damage.
3. Protect emergency response capabilities (critical infrastructure).
4. Protect/create communication and warning systems.
5. Protect emergency medical services and medical facilities.
6. Ensure mobile resource survivability.
7. Protect critical facilities.
8. Ensure government continuity.
9. Protect developed property, homes, businesses, industry, education opportunities and the cultural fabric of a community. Combine hazard loss reduction efforts with the environmental, social and economic needs of the community.
10. Protect natural resources and the environment.
11. Promote public awareness through education of community hazards and mitigation measures.
12. Preserve and/or restore natural features.

2. 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 platform to enable the community to take advantage of shared goals and resources.

3. 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.

Introduction - Davis Co PDMP

1. Identify persons, agencies or organizations responsible for implementation.
2. Project a time frame for implementation.
3. Explain how the project will be financed including the conditions for financing and implementation (as information is available).
4. Identify alternative measures, should financing not be available.
5. Be consistent with, support, and help implement the goals and objectives or hazard mitigation plans already in place.
6. Projects should significantly reduce potential damages to public and/or private property and/or reduce the cost of state and federal recovery for future disasters.
7. Projects should be practical, cost-effective and environmentally sound after consideration of the options.
8. Projects should address a repetitive problem, or one that has the potential to have a major impact on an area or population.
9. Projects should meet applicable permit requirements.
10. Discourage development in hazardous areas.
11. Projects should contribute to short and long term solutions.
12. Project benefits should outweigh the costs.
13. Projects should have manageable maintenance and modification costs.
14. Projects should accomplish multiple objectives when possible.
15. Projects should be implemented using existing resources, agencies and programs when possible.

Part II - ADOPTION PROCESS + DOCUMENTATION

Participating Jurisdictions

The Davis County Plan was developed as a multi-jurisdictional Plan. Therefore, to meet the requirements of Section 322 of the local hazard planning regulations, the final Plan must be adopted by each of the municipalities as well as the County. This section documents the adoption process of each local government in order to demonstrate compliance with this requirement.

The Plan will be adopted by the County following FEMA Region VIII approval. Table 2-1 identifies the communities and authorities that participated in the planning process and will adopt the Plan. All of these jurisdictions are seeking plan approval. Each of these jurisdictions also participated in and adopted the previous PDM Plan in 2009 and 2016.

A sample of the adoption resolution is given at the end of this section, and links to the individual support and adoption resolutions are available in Appendix H - Stakeholder Support. Also in Appendix H - Stakeholder Support, is a matrix of who attended meetings, completed assignments, etc. A list of invited special service districts, local agencies, non-governmental organizations, etc. and a sample of the invite is available in Appendix G.

Table 2.1: Community Representatives

Jurisdiction	Contact Name and Information	2021 Participation (Yes/No)	Adoption Date
Davis County	Chad Monroe Emergency Manager cmonroe@co.davis.ut.us	Yes	November 16, 2021
Bountiful	Dave Edwards Assistant Chief of Police edwards@bountifulutah.gov	Yes	December 14, 2021
Centerville	Paul Child Chief of Police pechild@centervilleut.com Louisa McDonald Assistant Emergency Manager lmcDonald@centervilleut.com	Yes	November 18, 2021
Clearfield	John Meek Emergency Manager john.meek@clearfieldcity.org	Yes	November 23, 2021
Clinton	Dave Olsen Fire Chief dolsen@clintoncity.com	Yes	November 9, 2021
Farmington	Brigham Mellor Assistant City Manager bmellor@farmington.utah.gov	Yes	November 17, 2021

Adoption Process - Davis Co PDMP

Fruit Heights	Brandon Green City Manager bgreen@fruitheightscity.com	Yes	November 4, 2021
Kaysville	Paul Erickson Fire Chief perickson@kaysvillecity.com	Yes	November 18, 2021
Layton	Doug Bitton Fire Marshal dbitton@laytoncity.org	Yes	November 18, 2021
North Salt Lake	Ken Leetham City Manager, kenl@nslcity.org Ali Avery City Planner, alia@nslcity.org	Yes	November 16, 2021
South Weber	Derek Tolman Fire Chief dtolman@southwebercity.com	Yes	November 16, 2021
Sunset	Jason Monroe Director of Public Works Worksjmonroe@sunset-ut.com	Yes	January 18, 2022
Syracuse	Erin Behm Emergency Management Coordinator ebehm@syracuseut.com	Yes	January 11, 2022
West Bountiful	Jason Meservy Volunteer (Emergency Services) jason.meservy@imail.org	Yes	November 16, 2021
West Point	Ryan Harvey Administrative Services Director rharvey@westpointcity.org	Yes	December 21, 2021
Woods Cross	Sam Christiansen Director of Public Works schristiansen@woodscross.com	Yes	November 16, 2021

Adoption Process - Davis Co PDMP

Sample Resolution of Support

The following language was provided to local emergency managers. They were asked to convert it into the format of their municipal resolutions. Copies of enacted resolutions were sent back to the PDM planning team.

//date//

WHEREAS the health, safety and welfare of the citizens of ___*jurisdiction*___ are matters of paramount importance to the City Council; and

WHEREAS the ___*jurisdiction*___ City Council recognizes the threat that natural hazards pose to people and property within their jurisdiction; and

WHEREAS, the Federal Emergency Management Agency (“FEMA”) has required that municipalities review and revise their local multi-hazard mitigation plan every five years to reflect changes in development, progress in local hazard mitigation efforts, and changes in mitigation priorities and submit their revised multi-hazard mitigation plan for review and approval by FEMA to remain eligible for pre-disaster mitigation grant funding; and

WHEREAS the Emergency Services Division of Davis County has received a grant from FEMA to prepare a multi-jurisdictional hazard mitigation plan in accordance with the requirements of 44.C.F.R. 201.6 and the FEMA “Local Mitigation Planning Handbook”; and

WHEREAS these requirements include obtaining formal resolutions of participation and support from stakeholder jurisdictions.

NOW THEREFORE, BE IT RESOLVED that the City Council of ___*jurisdiction*___ hereby intends to support the Plan update initiative by participating with the committee intended to develop revisions and updates to the Davis County Pre-Disaster Mitigation Plan.

This Resolution shall take effect upon passage.

//s//_____

Part III - PLANNING PROCESS

This updated Plan was prepared by the Davis County Emergency Services staff and consultant Rural Community Consultants, with support from the planning committee, and other local and state personnel. Additional county and municipal agencies that have aided in the planning process include; city and county geographic information systems (GIS) departments, elected officials, local officials, emergency managers, fire, planning departments, public works departments, and local governmental 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 DEM.

The planning process included the following steps:

Step 1: Organize Resources

Davis County received a FEMA Pre-Disaster Mitigation grant to update the Davis County 2016 Mitigation Plan and to develop a 2020 Davis County Pre-Disaster Mitigation Plan under the planning guidelines included in the FEMA guidance materials (published in 2011). The 2009 Wasatch Front Region’s Pre-Disaster Mitigation Plan was the result of a 2006 Pre-Disaster Mitigation grant that the Wasatch Front Region received from FEMA.

Davis County designated a core planning team made up of members outlined in Table 3-1. These members were the main constituents of the planning process from the initiation of the Plan, to the development and coordination, and resolution of the Plan’s adoption. In addition to the core planning team, a planning committee was created to review the 2016 PDM Plan and recommend revisions. The planning team was also instrumental in guiding the Plan’s overall revision process and content. Every jurisdiction in Davis County, plus representatives from special service districts were invited to provide a representative to serve on the planning team. Some jurisdictions were not able to provide a representative; however, relevant input was solicited and obtained from every jurisdiction in the county.

Table 3-1: Core Planning Team

Contact	Organization
Chad Monroe	Davis County Emergency Manager
Alexandra Lindgren	Davis County Emergency Preparedness Planner
Mike Hansen, AICP	Rural Community Consultants

Table 3-2: Planning Committee

Contact Name and Information	Organization
Eric Martineau	Utah Division of Emergency Management
Chad Monroe	Davis County Emergency Manager
Alexandra Lindgren	Davis County Emergency Preparedness Planner

Planning Process - Davis Co PDMP

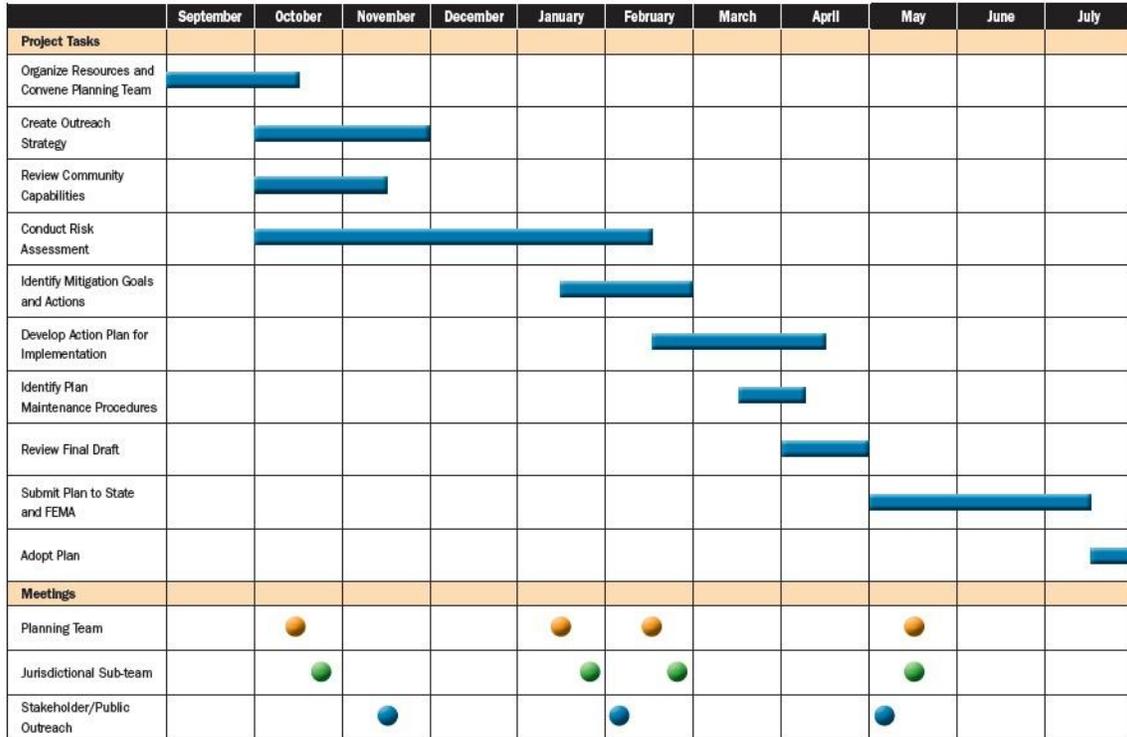
Mike Hansen, AICP	Rural Community Consultants
Kent Anderson	Davis County Community & Economic Devt
Loretta Cole	Davis County Citizens Corps
Cheryl Larsen	Davis County GIS
Paul Child	Centerville City
John Meek	Clearfield City
Derek Tolman	South Weber City
Dave Olsen	Clinton City
Sam Christiansen	Woods Cross City
Jason Meservy	West Bountiful City
Brigham Mellor	Farmington City
Doug Bitton	Layton City
Scott Paxman	Weber Basin Water Conservancy District
Brian Law	Davis Hospital
Tami Timothy	Lakeview Hospital
Kimberly Giles	Utah DEM
Michelle Villegas	Davis Hospital Medical Center
Ryan Perkins	Layton Hospital

Step 2: Planning Process Timeline

To ensure the public and County officials were supportive of the planning process, a series of public meetings were conducted throughout the planning period. Additionally, the Davis County Emergency Manager and/or the project consultant attended and briefed the County Commission on the progress at several Commission meetings. The Davis County Emergency Manager and/or the project consultant also briefed the jurisdiction Mayors and Councils on this process.

The schedule below represents the roadmap that Davis County utilized to develop the 2020 update.

Planning Process - Davis Co PDMP



The chart below provides PDM meetings associated with the planning process. Please see Appendix G: Stakeholder Participation for more detailed information on attendance.

Table 3-3: Planning Process Timeline

Date	Activity	Participants	Purpose
2020.10.20	Presentation to Davis County Council of Governments	Elected officials	Brief introduction to the initiative. Provide handout and explain that formal support is needed.
2020.10.21	Presentation to Davis County Emergency Managers	Planning Committee	Team introduction. Explanation of process and expectations.
2020.11.11	Team meeting	Core Planning Team Members	Walkthrough of initiative website.
2020.11.19	Working meeting with Davis County Emergency Managers	Planning Committee	Provide project update. Explain initial assignments.
2021.01.06	Team meeting	Core Planning Team Members	Provide project update. Discuss information roadblocks.
2021.02.23	Team meeting	Core Planning Team Members	Provide project update. Explain new assignments.

Planning Process - Davis Co PDMP

2021.02.25	Team meeting	Core Planning Team Members	Provide project update. Discuss next steps.
2021.03.05	Team meeting	Core Planning Team Members	Provide project update. Discuss next steps.
2021.03.07	Team meeting	Core Planning Team Members	Discussion of 'assignment 4'.
2021.04.01	Team meeting	Core Planning Team Members	Provide project update. Discuss next steps.
2021.04.27	Team meeting	Core Planning Team Members	Status report.
2021.05.13	Emergency Managers update meeting	Planning Committee	Follow-up on information gathering assignments.
2021.06.17	Working meeting with Davis County Emergency Managers	Planning Committee	Project update and discussion.
2021.07.07	Team meeting	Core Planning Team Members	Provide project update. Discuss next steps.
2021.08.04	Team meeting	Core Planning Team Members + Clinton City	Discussion of responsibilities and potential to leverage the new Clinton EOP to help Davis PDM.
2021.08.26	Team meeting	Core Planning Team Members	Review draft document. Provide project update. Discuss next steps.
2021.09.03	Public marketing campaign and comment period.	Core Planning Team Members	Announce public comment opportunities, connect with Special Districts and other stakeholders.
2021.10.04	Report to Emergency Managers on public survey responses.	Planning Committee	Results are available at: https://tinyurl.com/DavisPDMSurveyResponses
2021.10.05	Information request(s) for details on local goals.	Planning Committee	Respond to State comments on early draft.
2021.11.03	Message to cities re: FEMA approval.	Planning Committee	Encourage local adoption resolutions.

Planning Process - Davis Co PDMP

Step 3: Public Officials Outreach

To ensure the public and their officials were supportive of the Plan, the Davis County Emergency Manager and/or the project consultant attended County Councils of Government meetings. These public meetings have representation from each chief elected official in the County. Additionally, some communities recommended meeting with their city council to better inform the community.

Step 4: Establish Continuity in the Planning Process

To meet the requirements set forth by DMA 2000, Davis County was contracted by DEM to update this multi-jurisdictional PDM Plan.

Step 5: Data Review and Acquisition

The 2016 WFRC PDM Plan was reviewed by the Davis County Working Group and it was determined that all Plan sections would need to be updated and revised. Contact was made with the County GIS technician and/or planning commission staff in cities to assess available data at the local level.

Agreements were made to allow for the exchange of data between the local jurisdictions and Davis County. 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.

Step 6: County Hazard Identification and Profile

These steps were conducted by gathering data on the hazards that threaten the planning region. This information was gathered from 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 personnel 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 comments. These meetings also provided a forum for discussion on the background information that was needed to gain a general understanding of the geography, geology, recreation and natural resources of the planning region.

Step 7: County Vulnerability Assessment

This step was conducted through a review of local base maps, topographical maps, floodplain maps, United States Geological Survey (USGS) and Utah Geological Survey (UGS) maps, Automated Geographic Reference Center (AGRC) maps, FEMA hazard maps and climate maps from the National Climatic Data Center (NCDC). A detailed vulnerability assessment was completed with the use of GIS software for each county within Davis County. The FEMA modeling program Hazards United States – Multi-Hazards (HAZUS-MH) was used to determine vulnerability to earthquakes and floods. Loss estimation methodology was developed by the core planning team, with assistance from the technical team, to determine vulnerability from each identified hazard. Transportation Analysis Zone (TAZ) and Census 2010 data (including the American Community Survey estimates) were used to estimate the number of residents and households that could be affected by the hazard. Utah State sales tax and Equifax Business data were used to find the total number of businesses and annual sales vulnerable to hazards. HAZUS-MH infrastructure data was used to analyze the amount of infrastructure vulnerable to hazards.

Planning Process - Davis Co PDMP

Step 8: Review Existing Local Mitigation Actions

This step was conducted through a review of the governing documents of the county, as well as, conversations, interviews and meetings with interested community leaders and members. This step identified what goals are already established and adopted for the county.

Step 9: Form Local Working Groups

Davis County organized a working group. The working group was composed of individuals with an interest in hazards mitigation, as well as technical experts from the public sector having mitigation expertise. The committee included city planners, city engineers, county and city GIS staff, floodplain managers, sheriff and fire staff, and city and county emergency managers. Each completed section of the updated Plan was reviewed and analyzed for accuracy by the working groups, individual county emergency managers and Davis County staff. Every section of the Plan was updated and revised as part of the planning process.

Step 10: Risk Assessment Review

The working groups were tasked with reviewing county risk assessments for accuracy and completeness and with developing mitigation strategies for all natural hazards threatening the county. Changes or additions were conveyed to the Core Planning Team for revision.

Step 11: Mitigation Strategy Development

Developing the mitigation strategies was a process in which all of the previous steps were taken into account. The County evaluated, identified and profiled the hazards, and vulnerability assessment. Each Mitigation Strategy developed underwent a cost/benefit analysis to determine the best action to take given limited budgets allocated to hazard mitigation efforts at the local level.

Step 12: Prioritization of Identified Mitigation Strategies

DMA 2000 requires state, tribal, and local governments to show how mitigation actions were evaluated and prioritized. The prioritization process was completed by the core planning team, the technical team and the local planning teams over a series of planning meetings. 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 planning teams.

Step 13: State Review

DEM created a formal PDM Plan review committee to ensure local plans met the requirements of DMA 2000. This committee reviewed the Plans during September, 2021 subsequent to submission to FEMA for final review and acceptance.

Step 14: Adoption

The Plan went through a public adoption process from September 2020 to December 31, 2021, and was adopted by the cities and counties listed in Table 2-1 of Part II, Adoption Process and Documentation.

Planning Process - Davis Co PDMP

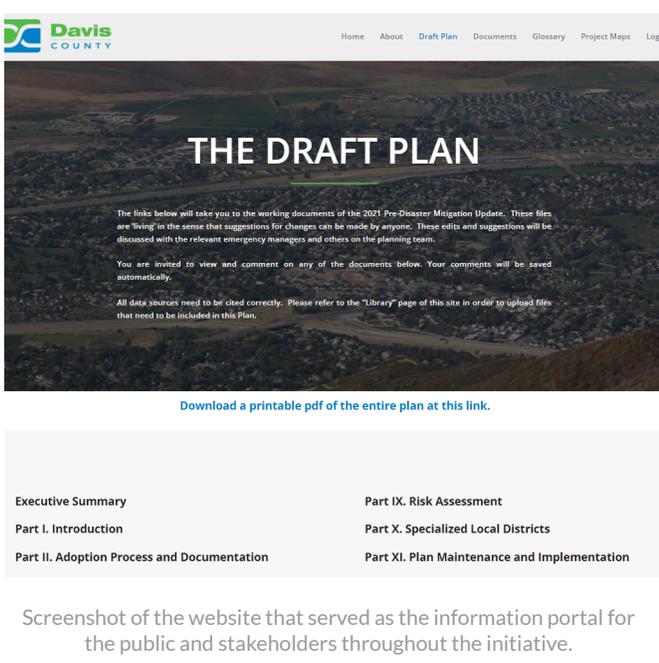
Table 3-4: Adoption Timeline

Date	Adoption Action	Purpose
2021.09.27	Submitted Plan to State DEM for initial review and comment	FEMA requirement
2021.10.07	Submitted refined Plan to State DEM with comments addressed.	FEMA requirement
2021.10.08	State submitted the plan to FEMA for review.	FEMA requirement
2021.11.03	FEMA returned determination of approval (pending local adoption).	FEMA requirement
2021.12.05	Resubmit plan to FEMA with local adoption resolutions included.	FEMA requirement

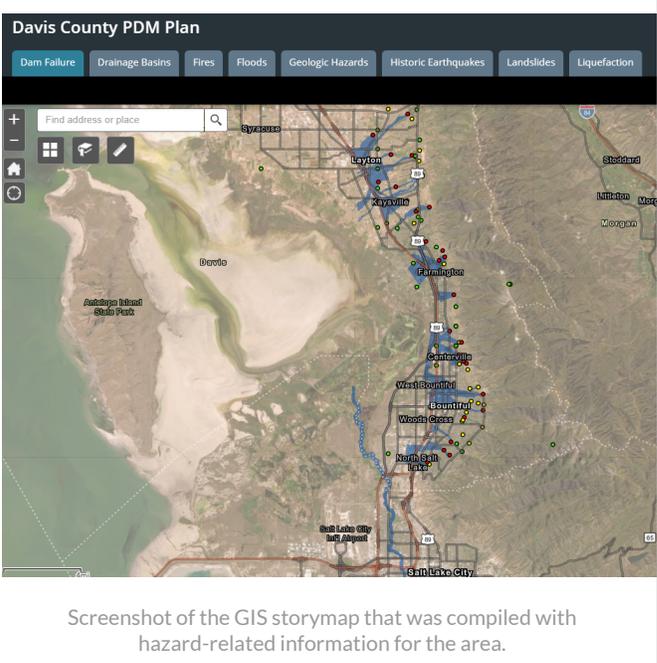
Public Involvement

Public involvement opportunities were available and incorporated throughout the development of this Plan. Such opportunities included a public website (DavisHazardPlan.org), social media campaigns, and public meetings for comment review. The development of this plan was conducted during the 2020-2021 Covid-19 pandemic, so online interaction was the preferred method.

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.



Screenshot of the website that served as the information portal for the public and stakeholders throughout the initiative.



Screenshot of the GIS storymap that was compiled with hazard-related information for the area.

Planning Process - Davis Co PDMP

The draft of this PreDisaster Mitigation Plan was developed publicly on the initiative website and Davis County websites. Once the draft was compiled, a focused advertisement for a public comment and review period was conducted (in September, 2021). The initiative website was visited 1,360 times by residents, and there were 12 public surveys received on that draft of the Plan. Members of the public and elected officials from each jurisdiction were notified of the public comments at county Council of Government meetings.

The screenshot shows the Facebook ad creation interface. On the left, there are sections for 'Stories and Reels, IGTV' (4 Placements), 'Search Results, Instant Articles' (2 Placements), and 'Primary Text' (1 of 5). The primary text reads: 'The Pre-Disaster Mitigation Plan for Davis County has been updated. The plan is now available for a 30-day public comment period ending on October 4, 2021 at 5:00 PM. The plan identifies potential natural hazards, estimates vulnerability to those hazards, and documents mitigation strategies for all participating jurisdictions located within the Davis County area. To view the plan and take the public survey, visit the website at <https://DavisHazardPlan.org/>.' Below this are options to 'Add Options' and 'Add a website URL'. The 'Headline' section (Optional, 1 of 5) contains the text 'Davis County Hazard Plan Survey'. The 'Description' section (Optional) contains the text 'Include additional details'. At the bottom, there is a 'Close' button, a green checkmark indicating 'All edits saved', and a 'Publish' button. On the right, a preview of the ad is shown, featuring a photo of a person in blue pants and black boots walking through muddy water. The ad text is: 'Rural Community Consultants Sponsored · The Pre-Disaster Mitigation Plan for Davis County has been updated. The plan is now available for a 30-day public comment period ending on October 4, 2021 at 5:00 PM. To view the plan and take the public survey, visit the website at <https://DavisHazardPlan.org/>.' The preview also shows the ad's placement in a Facebook feed, including the ad's URL 'DAVISHAZARDPLAN.ORG Davis County Hazard Plan Survey' and a 'LEARN MORE' button. The preview also shows the ad's placement in a 'Feeds' section, a 'Stories and Reels' section, and an 'In-Stream' section.

Information Sources

Background information and data for this Plan was obtained from the sources listed below. From these sources, the Planning Consultant 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.

- 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)

Planning Process - Davis Co PDMP

- Utah Geologic Survey (GIS data, geologic information)
- Utah Division of Forestry Fire and State Lands (fire data)
- Utah Avalanche Center, Snow and Avalanches,
- Utah Department of Transportation (traffic data)
- 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
- Davis County and municipalities (Emergency Operations Plan, histories, mitigation actions, public input, data: GIS, assessor, transportation, property, and infrastructure)
- Earthquake Safety in Utah
- Utah Natural Hazard Handbook
- Utah Statewide Fire Risk Assessment Project
- A Strategic Plan for Earthquake Safety in Utah
- State of Utah Wildfire Plan 2008
- State of Utah Drought Plan 2007

Part IV - 2016 COUNTY GOAL REVIEW

The Davis County Mitigation Strategies Working Group developed the following Mitigation Strategies. The Working Group revised and expanded on strategies implemented in the 2016 PDM Plan.



Earthquake

Earthquake Problem Identification (1): Davis County is located in the heart of the Wasatch Fault between the shores of the Great Salt Lake and the foothills of the Wasatch Mountain Range. The majority of the population lives within 5 miles of the fault. The only major traffic artery runs north and south, and numerous water and petroleum pipelines either cross over or run within ½ mile of the fault. Five moderately sized petroleum refineries located in the southern end of the county are subject to severe damage from ground movement and liquefaction. A major earthquake in the area would result in hundreds of millions of dollars in damage to residential structures, industry, and of critical infrastructure, and likely some loss of life. Several public safety facilities and schools are seismically unsafe throughout the county. The Davis County Historical Courthouse in Farmington continues to house county offices and host other public events. These facilities pose a significant threat to those who regularly work and attend school in them, and are in need of seismic retrofitting.

Goal 1: Provide public education on seismic hazards and mitigation.

Objective 1.1: Conduct community preparedness fairs, community outreach events, and promote resident participation in the annual “ShakeOut” earthquake exercise.

Action A: Provide earthquake public education outreach.

Status (as of 2021): Participated in the South Davis Preparedness Fair in 2018. The bi-annual fair was set to take place again in 2020, but was cancelled due to the COVID-19 Pandemic. The annual “ShakeOut” earthquake exercise has continued to be promoted each year.

Objective 1.2: Improve seismic resilience for public facilities including the Davis County Historical Courthouse.

Action A: Conduct seismic reviews of the Davis County Historical Courthouse and actively seek mitigation project funding to retrofit and/or rebuild this structure.

Status (as of 2021): Completed

Action B: Implement structural engineering recommendations to meet seismic standards.

Status (as of 2021): Currently in process with a projected completion date of March 2022.

Objective 1.3: Increase quality and quantity of available natural hazards data to facilitate better decision-making.

Action A: Revise and update the county emergency operations plan with the updated seismic information and maps.

2016 Goals - Davis Co PDMP

Status (as of 2021): This action has not begun.

Earthquake Problem Identification (2): Communities need to revise and update their Emergency Operations Plans (EOP) and Standard Operating Guidelines (SOG) to reflect these changes.

Goal 2: Update and revise local jurisdictions EOPs and SOGs to enhance emergency response capabilities and critical facilities.

Objective 2.1: Explore ways Davis County can help its jurisdictions comply with the requirements of

Action A: Develop and administer an RFP for help to create a Davis County EOP that may or may not include each municipality as an appendix.

Status (as of 2021): Scoping requirements are being discussed with private sector consultants.



Flooding

Flooding Problem Identification (1): FEMA has, over the past several years, updated and revised flood hazard maps throughout Davis County. As a result, an increased number of residences are currently located in flood plains. Most of these residents are not fully aware of the change in flood hazard. The County needs to reach out to citizens to provide them with this information.

Goal 1: Educate citizens of Davis County about flood hazards.

Objective 1.1: Increase the level of understanding in homeowners, city officials, permit authorities and title companies/realtors.

Action A: Develop and publicize about flood hazards and the National Flood Insurance Program (NFIP) and disseminate information on the County Emergency Management webpage.

Status (as of 2021): This action has not begun.

Flooding Problem Identification (2): Debris basins and other flood control infrastructure require regular inspection and maintenance. Stream channels may also change with heavy flow events. Proper flood control measures should be an ongoing priority.

Goal 2: Reduce flood hazard.

Objective 2.1: Increase the capacity of streams to better handle runoff.

Action A: Clean / maintain stream channels.

Status (as of 2021): Ongoing. (The Flood Control Department continues to clean and maintain streams and channels daily).



Slope Failure

Slope Failure Problem Identification (1): Numerous canyons, large and small, exist along the east bench of Davis County. They were formed over thousands of years by debris flows and mudslides. Now, many hundreds of homes and other structures, pipelines, power lines and roadways have been constructed on top of or through the alluvial fans produced by these events. Nature continues to construct these canyons. Landslides and debris flows will continue to occur over time, thus threatening residents and critical infrastructure.

Goal 1: Improve regulation for new development in areas with potential slope issues.

Objective 1.1: Provide regional leadership by example and precept.

Action A: Continue to encourage cities to adopt a standard of requiring geotechnical studies in identified landslide and debris flow areas.

Status (as of 2021): This action has not begun.

Slope Failure Problem Identification (2): There are a number of canyons that do not currently have debris basins constructed to contain debris flows, and others are insufficient in size. These debris basins need to be built or reconstructed in order to provide protection to residents.

Goal 2: Reduce or eliminate landslide damage due to debris flows.

Objective 2.1: Reduce loss of life and damage to property by providing a means to control debris and water from debris flows.

Action A: Continue to identify and re-evaluate flood hazard areas. Develop additional debris basins and retrofit others that require it.

Status (as of 2021): Identification and re-evaluation of flood hazard areas is ongoing. At this time there are no plans for additional debris basins, but there is intention to create additional sediment basins.



Wildland Fire

Wildland Fire Problem Identification (1): Wildland fire has been a continuing challenge throughout Davis County's history. There are several areas in Davis County where there is an extreme danger of wildland-urban fire. Due to increased development into wildland areas, it is likely that any fire over 100 acres in size would threaten structures. North Salt Lake, Bountiful, Centerville, Farmington, Fruit Heights, Kaysville, Layton, and South Weber, are cities within Davis County that have been classified as “at risk” for wildland fire. These communities are actively participating in the development of Community Wildland Protection Plans (CWPP) in cooperation with the County Fire Warden and the Utah Division of Forestry Fire & State Lands. The safety of the citizens of any community is a shared responsibility between property owners, developers or homeowners

2016 Goals - Davis Co PDMP

associations (HOA), and local, county, state and federal governments. The primary responsibility, however, remains with the property owner and HOA level.

Goal 1: Reduce or eliminate the threat of wildland fire, and the resulting loss of property and/or life.

Objective 1.1: Increase the level of wildfire knowledge for home and business owners by encouraging participation in the Firewise Communities Program, which provides homeowners and businesses with simple steps to reduce wildfire risk by preparing for wildland fire.

Action A: Participate in the “Utah, Let’s Do Our Part” campaign which is the result of an interagency effort to reach the public with fire prevention messages relevant to Davis County. The program goals are wildland fires; campfires, debris burning, and vehicle-caused fires. The goal of the program is to reach specific audiences with fire prevention messages to reduce the number of human-caused fires in the County. For example, many fires are started by unattended campfires left by those out for an evening of fun in the mountains. Even on cold nights, a small breeze can cause a campfire to smolder all night, possibly resulting in a wildfire. The same problem exists with debris burning in the spring and fall.

Vehicles are often the cause of wildland fires. Drivers will pull off the side of the road into the brush to get out of traffic and the heat of the engine is enough to start a fire without the driver ever knowing it. ATVs, trucks, and other vehicles that travel cross country are another major issue as exhaust sparks, dragging metal, hot engines, brake malfunctions, and more cause wildfires. The public will see billboards, flyers, posters, PSAs, news releases, and other products with this campaign logo on them.

Status (as of 2021): The County has supported, and will continue to participate in the program.

Action B: Host an annual community Firewise day.

Status (as of 2021): Events have been held as resources have been available.

Objective 1.2: Maintain fire breaks and provide for better access into wildland fire interface areas.

Action A: Routinely maintain fire breaks and improve wildland access roads.

Status (as of 2021): Ongoing improvement needed. Priority work is to develop proper easements and ongoing funding for maintenance.

Action B: Purchase new wildland fire apparatus.

Status (as of 2021): Ongoing partnerships are working to enhance equipment availability and response capabilities within the county. As funding opportunities and necessities are identified the county and partnering agencies will continue to work together on purchasing and staffing new fire apparatus and required equipment.

Wildland Fire Problem Identification (2): Given that wildland fire is a hazard that can be managed through effective fuel control and the lack of defensible space in one home could threaten other homes nearby in subdivisions, ordinances requiring residents to maintain defensible space around their respective homes would greatly reduce the fire hazard in these areas. Programs could be established to assist residents in performing this requirement or to encourage rebates for property insurance.

Goal 2: Assist homeowners to maintain defensible space around homes and businesses to more effectively mitigate the wildland fire hazard by conducting fuels reduction and chipper days.

Objective 2.1: Provide coordination and support to residents and homeowners associations (HOAs) for fuels reduction and defensible space.

Action A: Regularly conduct fuels reduction and chipper workshops.

Status (as of 2021): This action has not begun.

Action B: Educate citizens about defensible space requirements.

Status (as of 2021): Educational content continues to be disseminated via social media.



Problem Soils

The 2016 Plan did not contain goals specific to problem soil issues.



Dam Failure (Secondary Water System)

Secondary Water Problem Identification: Davis County has several secondary water system delivery systems. The Weber Basin Aqueduct transverses the County north to south, carrying several million gallons of water each day to virtually every community. Additionally, several water impoundment ponds provide for pressurized delivery of this water. The failure of either/or the aqueduct or the impoundments could result in a catastrophic flood event.

Goal 1: Reduce the potential impact of a failure of the Weber Basin aqueduct.

Objective 1.1: Assess the entire length of the aqueduct for potential points of failure.

Action A: The Weber Basin aqueduct is more than 50 years old, and requires regular assessment and maintenance. Weber Basin water is also planning to install emergency shutoff valves throughout the system.

Status (as of 2021): Maintenance has been conducted to the level of resources available.

Action B: Retrofit high risk Weber Basin Water delivery system aqueduct along the east bench of the county. The Weber Basin Water Conservancy District (WBWCD) has been seismically retrofitting a large portion of their water delivery system, including; a Seismic Retrofit of Filter and Flocculation Basins and Seismic Retrofit of Pump Stations along the aqueduct along the east bench of the county. The WBWCD has received FEMA Mitigation Grant Funding for this project. Exact funding amounts are estimated to be \$4 million.

Status (as of 2021): Ongoing maintenance and upgrades continue as personnel and resources are available including seismic retrofitting. Additional funding sources are being explored and obtained for additional upgrades such as auto shut-off system



Drought

The 2016 Plan did not contain goals specific to drought issues.



Severe Weather

Severe Weather Problem Identification (1): Most presidential disaster declarations are the result of severe weather. Davis County is prone to the effects of severe weather, as are many other counties in the state. These are usually thunderstorms and snowstorms. However, we are also prone to extremely severe wind events referred to as “East Winds.” Historically, Davis County has experienced gusts of over 110 mph and sustained winds of 80+ mph. These severe wind events can result in millions of dollars in damage. On average, we experience at least one every 5-10 years. Severe storms result in secondary and tertiary problems mostly dealing with power, heating and travel. Severe weather has resulted and will continue to result in serious travel problems, as well as power and heating difficulties.

Goal 1: Assist residents in protecting themselves from the effects of severe weather and changing global climate.

Objective 1.1: Support programs to prepare residents and elected officials for adverse weather conditions.

Action A: Encourage all cities to participate in the Storm Ready program.

Status (as of 2021): Ongoing effort. Davis County recently became Storm Ready certified. Will encourage cities to participate as well.

Severe Weather Problem Identification (2): Davis County cities near the mountain front are subject to strong easterly canyon winds. These high winds can result in serious disruption of essential public services and communications for emergency responders have been severely hampered in the past by high wind damage to communication infrastructure.

2016 Goals - Davis Co PDMP

Goal 2: Improve public understanding of the potential impact of severe weather in the County.

Objective 2.1: To educate officials and the public on the impact that climate change has had on water supplies.

Action A: Develop and promote an educational outreach for elected officials and the public on the impact that global climate change has had on water supplies in Davis County. Regional weather summit meeting was held in April 2016.

Status (as of 2021): Action has not begun.

Goal 3: Improve emergency notification capabilities in the School District.

Objective 3.1: Provide consistent and timely emergency notification to the schools in the Davis School District.

Action A: In order to better ensure consistent emergency communications during any kind of emergency event, including severe weather, the School District has purchased an emergency alert and notification system that will be used to transmit emergency information via the internet, tablets, cell phones and radios to any of the schools in the District. The County Emergency Manager is also included in the system.

Status (as of 2021): Completed.

Part V - COUNTY MITIGATION STRATEGIES, OBJECTIVES, ACTIONS

Using the findings from the risk assessment and the capabilities assessment as a guide, several mitigation strategies and implementing actions were identified for Davis County. These priorities were reviewed and refined by local emergency managers and were made publicly available for comment as well. The following presents information regarding general priority goals for the county as a whole, including the County's unincorporated areas.



1. Earthquake

Earthquake Problem Identification: Davis County is located along the Wasatch Fault between the shores of the Great Salt Lake and the foothills of the Wasatch Mountain Range, with a majority of its population residing within 5 miles of the fault line. The major traffic infrastructures run north and south, and numerous water and petroleum pipelines either cross over or run within miles of the fault. Five moderately sized petroleum refineries located in the southern end of the county are subject to severe damage from ground movement and liquefaction. A major earthquake in the area would result in severe damage to residential structures, industry, critical infrastructure, and bodily injury and loss of life. With the advent of social media, misinformation on preparation and response to earthquakes has become more prevalent as was seen in the March 2020 earthquake.

Goal 1.1: Improve earthquake public education via credible science and government resources.

Action A: Promote the Utah Seismic Safety Commission via social media outlets.

Action B: Organize a field visit from the Utah Geologic Survey to identify and discuss earthquake hazards.

Action C: Provide education on preparation activities throughout the year but emphasizing them close to the annual “Great Shakeout” drill.

Goal 1.2: Educate property owners of seismic threats.

Action A: Provide online maps of earthquake faults and damage zones to residents.

Action B: Educate homeowners on structural safety techniques to follow during and after an earthquake.

Action C: Educate homeowners about structural and non-structural retrofitting of vulnerable homes and encouraging retrofit.



2. Flooding

Flooding Problem Identification (1): Property owners in Davis County are often unaware that their home or future home may be in a potentially hazardous area. Although federally regulated lending institutions are required to disclose to mortgage and other loan applicants whether a property is on a floodplain, they are only required to do so 10 days prior to closing at which point the applicant may be unable to back out of the purchase due to a myriad of circumstances.

Goal 2.1: Minimize injury, and loss of life and property from flooding through public education and government involvement in the NFIP.

Action A: Create floodplain awareness campaign in collaboration with the state, Davis County cities, NWS, and various Davis County departments. Campaign will include floodplain information dissemination via presentations, seminars, social media, and Davis County presence at public events.

Action B: Create a floodplain committee that includes Davis County Public Works, Davis County Emergency Management, Davis County Economic and Community Development, cities within Davis County, and private sector partners affiliated with property selling/buying that meets annually to discuss best collaborative efforts to bring awareness to floodplain properties.

Action C: Work with Davis County executive staff to continually enforce floodplain management ordinances that meet the minimum NFIP requirements.

Flooding Problem Identification (2): Debris basins and other flood control infrastructure require regular inspection and maintenance. Stream channels may also change with heavy flow events. Proper flood control measures should be an ongoing priority.

Goal 2.2: Implement and/or continue proper flood control measures to minimize injury and loss of life and property from flooding.

Action A: Develop and/or update community-wide stormwater management plan.

Action B: Complete a stormwater drainage study for known problem areas.

Action C: Install/upgrade stormwater pumping stations.

Action D: Perform regular drainage system maintenance including sediment and debris clearance; and detection and prevention of discharges into stormwater and sewer systems from home footing drains, downspouts, or sewer pumps.



3. Wildland Fire

Wildland Fire Problem Identification (1): Wildland fires continue to be a challenge for Davis County and its residents. There are several areas in Davis County where there is an extreme danger of wildland-urban fire. Due to increased development into wildland areas, it is likely that any fire over 100 acres in size would threaten structures. North Salt Lake, Bountiful, Centerville, Farmington, Fruit Heights, Kaysville, Layton, and South Weber, are cities within Davis County that have been classified as “at risk” for wildland fire. The safety of the residents in any community is a shared responsibility between property owners, developers or homeowners’ associations (HOA), and local, county, state and federal governments. The primary responsibility, however, remains with the property owner and HOA level.

Goal 3.1: Further Davis County residents’ knowledge of wildland fire mitigation and preparedness.

Action A: Sponsor Firewise workshops for local officials, developers, civic groups, and neighborhood/homeowners’ associations.

Action B: Work with Davis County fire agencies/departments to organize local fire department tours.

Action C: Work with Davis County cities to inform residents about proper evacuation procedures

Action D: Link wildfire safety with environmental protection strategies.

Action E: Sponsor local “slash and clean-up days” to reduce fuel loads along the wildland-urban interface.

Goal 3.2: Mitigate injury and the loss of life and property by performing wildland fire mitigation activities.

Action A: Create defensible zones around power lines, oil and gas lines, and other infrastructure systems.

Action B: Enhance and develop new water sources in wildfire-prone areas.

Action C: Work with Davis County fire departments/agencies to routinely inspect the functionality of fire hydrants.

Action D: Develop a vegetation management plan.

Action E: Continue the development and maintenance of firebreak road on the east bench in coordination with cities.

Wildland Fire Problem Identification (2): Davis County does not have a county fire department, but there are 9 fire agencies and departments within the county that serve Davis County residents. The responsibility of County Fire Warden lies on the shoulders of the County Emergency Manager. The Davis County Emergency Manager may not have prior fire experience; therefore, they might not be the best qualified to serve as the County Fire Warden.

Goal 3.3: Increase consistent information amongst all fire agencies/departments and the county.

Action A: Continue the development of the Community Wildland Protection Plan (CWPP) in coordination with the Utah Division of Forestry Fire & State Lands.

Action B: Meet with all fire agencies/departments bi-monthly during wildland fire season to share information on hazards, fireworks restrictions, and county and state ordinances and restrictions

Action C: Work with all fire agencies/departments and the Utah Division of Forestry Fire & State Lands to create an up-to-date centralized MOU/MOA file.

Goal 3.4: Ensure that County Fire Warden is experienced in wildland fire mitigation and response.

Action A: Create position (volunteer or paid) within the Davis County Emergency Management program to serve as County Fire Warden and require experience relating to wildland fires

Action B: If Action A cannot be completed, send the current County Fire Warden to extensive training to further their knowledge of wildland fires.



4. Severe Weather

Severe Weather Problem Identification (1): Most presidential disaster declarations are the result of severe weather. Davis County is prone to the effects of severe weather, as are many other counties in the state. These are usually thunderstorms and snowstorms. However, we are also prone to extremely severe wind events referred to as “East Winds.” Historically, Davis County has experienced gusts of over 110 mph and sustained winds of 80+ mph. These severe wind events can result in millions of dollars in damage. On average, Davis County experiences at least one of these severe wind events every 5-10 years. Severe storms result in secondary and tertiary problems mostly dealing with power, heating, and travel. Severe weather has resulted and will continue to result in serious travel problems, power and heating difficulties, and property damage.

Goal 4.1: Increase public awareness of severe weather information and best mitigation and preparedness strategies.

Action A: Work with the Davis County School District to include safety strategies for severe weather in driver education classes and materials.

Action B: Utilize awareness weeks for lightning, severe weather, winter weather, etc.

Action C: Promote community outreach to vulnerable populations that may need assistance if heating and power are impacted by severe weather.

Action D: Educate homeowners on the benefits of retrofitting homes.

Goal 4.2: Retrofit public buildings and critical infrastructures to better withstand severe weather events.

Action A: Anchor roof-mounted heating, ventilation, and air conditioning units.

Action B: Ensure critical facilities, public buildings, and high occupancy buildings have back-up generators.

Action C: Work with utility companies to inspect utility poles to ensure they meet specifications and are wind resistant.

Action D: Direct promotion towards utility companies to upgrade overhead utility lines and/or bury power lines to provide uninterrupted power after severe winds, considering both maintenance and repair issues.

Part VI - CITY MITIGATION STRATEGIES, OBJECTIVES, ACTIONS

Bountiful City

Background

Bountiful City is a picturesque community nestled on the foothills of the Wasatch Range in Davis County. With a population of about 44,000, and approximately 14,000 households, Bountiful offers a variety of housing options from view on the Bountiful Bench, townhomes, to homes with access to I-15 for commuters close to Salt Lake City. The city grew rapidly during the suburb growth of the late 1940s, 1950s, and 1960s and was Davis County's largest city until 1985 when it was surpassed by Layton. Bountiful is currently Utah's 15th largest city.

Although a part of the Ogden-Clearfield Metropolitan Statistical Area, it serves as a bedroom community to Salt Lake City and the surrounding area. However, due to the very narrow entrance into Salt Lake County, roads between the counties often reach near-gridlock traffic during rush hour. The FrontRunner commuter rail has been running since April 2008, and the Legacy Parkway was opened in 2008. These were built to help alleviate the traffic load on Interstate 15 through the Bountiful area.

Bountiful occupies an area of approximately 13.5 square miles. It is a gateway community to Salt Lake County for travelers going south on I-15.

Bountiful operates under a weak mayor form of government, with an elected Mayor and five Council Members. The day-to-day operations and the majority of executive authorities are delegated to a City Manager, who works hand-in-hand with the Mayor to ensure all city operations are well-run. City operations include a 24/7 police department, part-time animal services, a municipal court, water, garbage/recycling, streets, stormwater, snow removal, community development, and parks and recreation programming. Bountiful City is part of the South Davis Fire District which provides fire protection. Emergency management and pre-disaster mitigation responsibilities are coordinated by the Bountiful City Police Department.

Community Buildings and Infrastructure Status

Bountiful City is dedicated to the safety and quality of life for both its citizens and visitors. As part of this mission they actively work to upgrade critical and essential infrastructure. As funding, personnel, and resources become available, Bountiful City strives to maintain 2021 health and safety standards.

City Buildings:

City Hall - Seismic retrofit 2019-2021 Completed

Public Safety - Seismic compliant – completed in 1997

Water Dept - Seismic compliant – completed in 2018

Streets Dept. - Constructed in 1973

Power Department - Seismic compliant - Retrofit and remodel completed 2019

Infrastructure:

City Goals - Davis Co PDMP

Power Dept is municipal and we house materials (poles and wire) to accomplish major emergency repairs

A fiber optic cable ring has been put in place to provide data redundancy across all city buildings

We comply with current building codes re seismic standards

Specific Community Hazards

- **Earthquake.** Bountiful’s proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** Bountiful is located along the Wasatch Mountain Front. During the 1983 declared flooding disaster, City facilities, trails, and homes sustained significant damage.
- **Wildland Fire.** Much of Bountiful City is located in the foothills, increasing the risk for wildland fires.
- **Dam failure.** The secondary water system throughout the community has small storage reservoirs.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Water Treatment Plant	Water contamination	Enhance security
Upper Reservoir	Water contamination, dam breach w/ flooding	Enhance security
Well	Water contamination	Enhance security
Bountiful power generation plant	Power interruption	Enhance security
Water Tanks	Water contamination, flooding from breach	Enhance security
Underground petroleum pipelines	Major Hazardous Materials release to include crude oil	Enhance security Increased protection from vehicles recently added
Irrigation Reservoirs	Water contamination, dam breach w/ flooding	Enhance security
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation

City Goals - Davis Co PDMP

City Offices	Loss of vital city records; communication vehicles; day to day functions	TBD
City Public Works building	Damage and destruction to facilities and vehicles from earthquake	Enhance structural integrity of infrastructure
Police Department	Loss of vital police records; impact to day to day functions	TBD
Public Works Building	Loss/damage to response equipment	N/A
IT Network and Server	Loss of communications	Enhance security
EOC	Loss of operability for EOC	Equip EOC; Complete connection to fiber/analog lines
Main Generator for City Office	Loss of power for critical operations	Enhance security
South Metro Davis Fire - Station #81	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #82	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #83	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #84	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #85	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Multiple storm water retention basins throughout the city	Flooding	Dredge and de-silt
ARTERIAL ROADS		

City Goals - Davis Co PDMP

Corridor	Hazard / Risk	Mitigation
500 South	Destruction, evacuation and response concerns	N/A
Orchard Drive/400 East	Destruction, evacuation and response concerns	N/A
Bountiful Blvd	Destruction, evacuation and response concerns	N/A
500 West	Destruction, evacuation and response concerns	N/A
South Davis Blvd	Destruction, evacuation and response concerns	N/A

Mitigation Efforts Since the 2016 Plan

- Bountiful City is updating the City Emergency Operations Plan (EOP) - estimated completion 2022-23.
- Bountiful City has completed Action 2, having built the culinary reservoir.
- Bountiful City has completed Action 5.
- Investments were made to upgrade the high-pressure gas pipeline at a cost of \$2m (Action 3).
- Bountiful retrofitted its city hall for seismic and communications security at a cost of \$8m.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities do not meet seismic standards.

Goal: Improve building resilience through construction standards and retrofitting.

Objective (Priority MEDIUM): Retrofit facilities to seismic standards.

Action 1: Replace the Mueller Park Culinary Water Treatment Plant equipment with a new treatment system and retrofit the building to bring it into compliance with current seismic code.

Time Frame: 2023

Funding: City funds + grants

Estimated Cost: \$2 million

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Bountiful City

Action 2: Replace ten aging high pressure gas lines which serve a large portion of Bountiful City (by Questar Gas). These gas lines cross several fault traces, and are subject to failure in the event of fault movement or a reasonably expected seismic event.

City Goals - Davis Co PDMP

Time Frame: 2021-2023

Funding: City funds

Estimated Cost: unknown

Staff: City / Questar Gas

Jurisdictions: Bountiful City

Action 3: Bountiful City has an ongoing, annual program of replacing aging cast iron culinary water pipe, which is very susceptible to earth movement, with flexible PVC pipe, which is better able to withstand earth movement caused by a seismic event.

Time Frame: Ongoing through 2026

Funding: City funds

Estimated Cost: \$900,000/year

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Bountiful City

Action 4: Install critical facilities generators at different locations (i.e. water pumps).

Time Frame: (completion expected in 2021-23)

Funding: Mitigation grants, City funds

Estimated Cost: \$600,000

Staff: City Public Works

Jurisdictions: Bountiful City

Action 5: Seismic retrofit of critical bridge 600s and Davis Blvd.

Time Frame: (completion expected in 2021-23)

Funding: City transportation funds

Estimated Cost: \$1,000,000

Staff: City Public Works

Jurisdictions: Bountiful City

Landslide - Problem Identification: Landslides are the movements of a mass of rock, debris, or earth down a slope by force of gravity. Landslides occur when the slope or soil stability changes from stable to unstable, which may be caused by earthquakes, storms, volcanic eruptions, erosion, fire, or additional human-induced activities. With Bountiful City being located at the foothills of the Wasatch Range in Davis County, landslides are possible.

Goal: Mitigate the effects of landslides.

Objective (Priority LOW): Creating a plan to study areas where landslides may occur.

Action: Discuss using GIS Mapping to determine where landslides may occur.

Time Frame: Unknown, depending on funding

Funding: City funds

City Goals - Davis Co PDMP

Estimated Cost: Minimal

Staff: City Administration, GIS, etc.

Jurisdictions: Bountiful City

Severe Weather - Problem Identification: Severe downslope winds from Wasatch Mountain Range.

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority LOW): Encouraging wind-proofing measures and construction techniques.

Action: Encourage new construction to implement wind-proofing into building plans.

Time Frame: Ongoing

Funding: None

Estimated Cost: None

Staff: Community Development, Building Department, etc.

Jurisdictions: Bountiful City

Flooding - Problem Identification: Bountiful City is traversed by several creeks which may be subject to flooding in severe storm events. These creeks overtopped their banks in the 1983 flood disaster, resulting in thousands of dollars in damages. Significant funding following the 1983 flooding greatly reduced flood vulnerability in those areas. Ongoing maintenance of these floodways by the city will continue to mitigate this threat.

Goal: Mitigate the impact of flooding in high-threat areas.

Objective (Priority HIGH): Maintain identified flood threat areas.

Action: Annually inspect and remove debris in stream channels and debris basins.

Time Frame: Annually, ongoing

Funding: City funds

Estimated Cost: Minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Bountiful City

Objective (Priority MEDIUM): Providing the public with knowledge about the possibility of flooding.

Action: Provide information to citizens about local flood hazard, flood insurance, and flood protection measures.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

City Goals - Davis Co PDMP

Jurisdictions: Bountiful City

Wildland Fire - Problem Identification: A significant portion of Bountiful City is along the foothills creating an urban/wildland interface.

Goal: Mitigate the impact of wildfire in high-threat areas.

Objective #1 (Priority MEDIUM): Fuels mitigation

Action 1: Work in tandem with homeowners to remove fuels and create fire breaks.

Time Frame: Unknown, depending on funding

Funding: Federal, State and Local

Estimated Cost: Unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Bountiful City

Action 2: Create a public service campaign to inform residents about fuels reduction, fire breaks, and other mitigation tactics.

Time Frame: Unknown, depending on funding

Funding: Federal, State and Local

Estimated Cost: Unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Bountiful City

Dam Failure - Problem Identification: The Millcreek City culinary water system reservoir is aging and vulnerable, and is subject to damage/failure/collapse, resulting in flooding downstream neighborhoods.

Goal: Continue to conduct ongoing replacement programs of critical infrastructure.

Objective (Priority HIGH): Enhance the resiliency of Millcreek Reservoir, part of the city culinary water system.

Action: Replace the 60+ year old 3,000,000 gallon culinary water Millcreek Reservoir.

Time Frame: 2024

Funding: City funds/State/Federal grant

Estimated Cost: \$1.9 million

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Bountiful City

Multi-Hazards - Problem Identification: The City does not have an emergency management plan in place and communication networks are vulnerable.

Goal: Maintain an effective operational strategy for hazards.

City Goals - Davis Co PDMP

Objective #1 (Priority HIGH): Improve communications, mitigate the impacts of and be prepared for emergency situations and hazards.

Action 1: Create an Emergency Management Plan

Time Frame: 2022

Funding: Federal and Local

Estimated Cost: Unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Bountiful City

Action 2: Enhance IT Network and Server Security

Time Frame: Unknown, depending on funding

Funding: Local and State

Estimated Cost: Unknown

Staff: City Administration, Public Works

Jurisdictions: Bountiful City

Centerville City

Background

Centerville City is located between Farmington and Bountiful, east of Interstate 15. The city has an estimated population of 17,404 (2024). It is located adjacent to the easternmost part of the Great Salt Lake.

Centerville operates under a weak mayor form of government, with an elected Mayor and five Council Members. The day-to-day operations and most executive authorities are delegated to a City Manager, who works closely with the Mayor to ensure all city operations are well-run. City operations include a full time Police, Fire, and Public Works Departments. Emergency management and pre-disaster mitigation responsibilities are coordinated by the Centerville City Manager.

Community Buildings and Infrastructure Status

Centerville City has spent extensive time and efforts on infrastructure improvements to help protect against earthquakes, wildfires, high wind events, flooding, and other disasters. Centerville City is dedicated to the safety and quality of life of their citizens. Centerville City is continuously exploring new infrastructure projects and maintaining 2021 building standards and safety measures.

Buildings:

City Hall - Built 1991 - Backup generator

Public Works - Built 1990 - Backup generator

Public Works Storage bldg. - Built 2005

Parks & Rec - Built about 2000

Museum (original part) - Built about 1912.

City Goals - Davis Co PDMP

Infrastructure:

Backup generators have been installed at all city well/pump houses of the water system.

Water system isolation valves and hoses to jump across broken lines.

Have access to a solar powered church water well.

Emergency fuel storage for generators and vehicles.

Debris dam and fence in Parish Canyon to catch/slow debris flow/landslide

Redundant storm drain system and Bernard Street Canal at Bernard Creek for heavy run-off/flood

Flood water/landslide detentions at Freedom Hills Park. Flood detention at Community Park, Jennie P Stewart Elementary, Frontage Road Swales, Market Place drive and west of Costa Vida & Centerville Commons Park.

Specific Community Hazards

- **Flooding.** Centerville is traversed by several creeks which may be subject to flooding in severe storm events and spring runoff.
- **Earthquakes.** Centerville’s proximity to a known trace of fault puts it at high risk of earthquake damage.
- **Wildland Fire.** A significant portion of Centerville City is along the foothills creating an urban / wildland interface.
- **Dam Failure.** Centerville houses several dams that could fail causing various levels of damage to the city.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Culinary water storage tanks and secondary water reservoirs	The city has culinary water storage tanks and secondary water storage reservoirs that may experience water contamination, flooding and failure due to earthquakes	Enhance security, upgrade water distribution system.
Water main on Main St.	Improper installation/ground settling	As road construction occurs, or a pipe breaks, they are replaced with better materials, and better bedding (sand).
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation

City Goals - Davis Co PDMP

City Offices/Eoc	Loss of vital city records; communication, vehicles; day to day functions. Loss of operability for EOC	Provide for city office/EOC survivability following an earthquake.
Public Works Building	Loss/damage to response equipment	N/A
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Stormwater detention basins	Flooding: excessive rainfall over filling banks	Downstream protection of property. See Goal 1
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Main Street	Destruction, evacuation and response concerns.	State Road
Frontage Road	Destruction, evacuation and response concerns.	Maintain
400 East	Destruction, evacuation and response concerns.	Maintain
Parrish Lane	Destruction, evacuation and response concerns.	Maintain (Partially State Road)
Pages Lane	Destruction, evacuation and response concerns.	Maintain
Interstate 15	Destruction, evacuation and response concerns.	State Road
Legacy Highway	Destruction, evacuation and response concerns.	State Road

City Goals - Davis Co PDMP

Mitigation Efforts Since the 2016 Plan

- Centerville City has just recently doubled the drainage fees in order to pay for repairs and upgrades to our drainage systems.
- South Davis Metro Fire will tear down and build a new fire station in Centerville.(Completed in 2024).
- Additional repairs and improvements on the firebreak road.
- Implementing a Wildland / Urban Fire Protection Plan.
- Centerville has developed a 45 year master plan to up-grade the water system. Work is currently in progress to make improvements in the system to keep up with this plan.
- Davis County has plans to put an open creek into a culvert along Porter Lane.(in the works)

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Centerville is located on known traces of faults.

Goal: Educating citizens about safety during earthquakes.

Objective (Priority LOW): Making information available to citizens on safety techniques to follow during and after earthquakes.

Action 1: Providing information to citizens when requested.

Time Frame: Ongoing

Funding: City

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Centerville City

Flooding - Problem Identification: Centerville is traversed by several creeks which may be subject to flooding in severe storm events and spring runoff. Significant funding towards a debris flow basin in the Deuel Creek area has greatly reduced flood vulnerability in this area. Ongoing work on upsizing water coverts are taking place under Frontage Road extending under the Freeway and in the area of Bernard Creek.

Goal: Minimize the impact of flood damage in high potential areas.

Objective (Priority HIGH): Maintain identified flood threat areas.

Action 1: Continue upsizing coverts in flood threat areas.

Time Frame: Annually

Funding: City

Estimated Cost: \$600,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Centerville City

City Goals - Davis Co PDMP

Wildland Fire - Problem Identification: A significant portion of Centerville City is along the foothills creating an urban / wildland interface. Prevent Wildfires from coming into the City.

Goal: Minimize the impact of wildfire damage in high potential areas.

Objective (Priority MEDIUM): Fuels Mitigation.

Action 1: Work with homeowners to remove fuels and create defensible spaces and maintain fire break roads.

Time Frame: Ongoing

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Centerville City

Action 2: Create a public service campaign to inform residents about fuels reduction, fire breaks, defensible spaces and other mitigation tactics.

Time Frame: Estimated completion will be the fall of 2022.

Funding: City funds/State/Federal

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Centerville City

Action 3: Participate in the CWPP (Community Wildfire Protection Plan)

Time Frame: Documentation of man hours and community service will be done annually.

Funding: Federal, State, Local, citizen in-kind participation.

Estimated Cost: Unknown

Staff: City Administration, Public Works, Centerville community involvement, State workers

Jurisdiction: Centerville City

Dam Failure - Problem Identification: Multiple water containment systems located throughout Centerville are aging.

Goal: Prevent dam failures.

Objective (Priority LOW): Provide citizens within the flood area of dams with information on flash flooding and hazards associated with dam failure.

Action: Make information available to citizens about flash flooding and other hazards.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: Minimal

City Goals - Davis Co PDMP

Staff: City Administration

Jurisdictions: Centerville City

Severe Weather - Problem Identification: Severe downslope winds from Wasatch Mountain Range.

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging wind-proofing measures in new construction.

Action: Encourage new construction to implement wind-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

Jurisdictions: Centerville City

Landslide - Problem Identification: With Centerville being located at the foothills of the Wasatch Range in Davis County, landslides are possible.

Goal: Mitigate the effects of landslides.

Objective (Priority LOW): Creating a plan to study areas where landslides may occur.

Action: Discuss using GIS Mapping or other means to determine where landslides may occur and taking mitigative actions where necessary.

Time Frame: Unknown, depending on funding

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, GIS, etc.

Jurisdictions: Centerville City

Clearfield City

Background

Clearfield was one of the last communities to be settled in the northern part of Davis County (1877). Hunters and Native American Warriors knew this land before the first white man settled here. They referred to it as the land of wind and sand. But it was the roar of the train's engine that first awakened the area in 1869 and stirred the sleeping Sand Ridge, which it was once known as until the name was later changed to Clearfield in order to attract agricultural settlers

City Goals - Davis Co PDMP

Clearfield City has a total land area of 7.8 square miles, and a population of 30,112 as of the 2010 Census, making it the third largest city in Davis County, behind Layton and Bountiful. Clearfield City has an average elevation of 4,327 feet above sea level. The lowest point within the boundaries of the city is 4,314 feet at the intersection of 1000 West and Antelope Drive on the city's western edge and the highest is 4,711 feet at a point that is within the city's northeast corner, but physically located on Hill Air Force Base property along Constitution Way in their housing area.

The City is in the north central portion of Davis County. The county is surrounded by the Great Salt Lake to the west and the steep Wasatch mountain range on the east, although neither of these notable natural landmarks is physically within the city boundaries. Directly encircling Clearfield are the cities/areas of Sunset City to the north, Clinton City to the northwest, Syracuse City and West Point City to the west, Layton City to the south and east, and Hill Air Force Base military installation to the northeast.

There are no major lakes or rivers within the city. There are a few small ponds, mostly at public parks or on privately owned property. The only significant waterway in the city is the Weber and Davis Canal along the east and northeast edge of the city that extends both north and south of the city boundaries. The Clearfield Canal Trail parallels the canal for a portion of its trip through Clearfield.

Community Buildings and Infrastructure Status

Clearfield City's geographical area holds a dense population. Dedicated to the quality of life for its residents, Clearfield City works in partnership with neighboring communities to better its infrastructure by developing partnerships when needed, exploring funding opportunities, and improving its critical and essential infrastructure, maintaining today's building and safety standards as personnel, funding, and resources allow.

City buildings:

- City Hall – Built 1999 - backup generator, fire suppression system

- Community Arts Center – Built 1969 - backup generator

- Aquatic and Fitness Center – Built 2005 - backup generator, fire suppression system

- Admin/Parks Building – Built 2018 - backup generator, fire suppression system

- Mechanics Building – Built around 1945

- Public Works Utility Building – Build mid1980's

Several buildings have backup generators to run the key components of the building (partial power, servers, dispatch, partial HVAC/boiler, fuel station, etc.). Several more buildings have fire suppression systems. IT systems are backed up regularly, maintenance staff try to upkeep on preventative maintenance. The city is continually working to upgrade and replace major building system components. Food and water supplies are stored at multiple buildings around the area for when the EOC is activated. As the City updates/renovates or constructs new buildings, the goal is to bring them into alignment with current building codes. Clearfield City is currently working to complete the next phase of the MOC to finish the new Mechanic/Public Works Utility building so these buildings are safer and generally, more functional.

City Goals - Davis Co PDMP

Specific Community Hazards

- **Earthquake.** Clearfield is in the portion of Davis County where it is near the low lying areas of the Great Salt Lake where the water table is near the surface and would be susceptible to liquefaction in addition to shaking.
- **Flooding.** Clearfield is located in relative proximity to the Great Salt Lake and has several smaller lakes, ponds, and streams that have the potential to flood during flash flooding or severe amounts of rain.
- **Critical Roads.** Critical Roadways for lifeline infrastructure. A seismic event could separate access routes between east Clearfield and west Clearfield due to failure of overpasses
- **Windstorm.** Severe downslope winds form Wasatch Mountain Range
- **Land Subsidence.** Several structures in the city have experienced various degrees of settlement and require further understanding / mitigation solutions.
- **Multi-Hazards.** The City does not have a detailed emergency management plan in place but it does have a All Hazard EOP and communication networks are vulnerable.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Power & Gas Utilities	Complete loss of utilities	Enhance security
10.5 Million Gallon water tank	Damage and destruction, loss of water supply to city	Inspect and maintain
Main Generator for City Office	Loss of power for critical operations	Enhance security
Water Lines	Damage and destruction, loss of water supply to city	Replacing old 4"Cast iron Pipe with PVC 8-24"
City Public Works building	Damage and destruction to facilities and vehicles from earthquake	Enhance structural integrity of infrastructure
Police Department	Loss of vital police records; impact to day to day functions	TBD
Public Works Building	Loss/damage to response equipment	3 phase New building MOC

City Goals - Davis Co PDMP

IT Network and Server	Loss of communications	Enhance security
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
MOC Maintenance Operation Center	Earthquake collapse	New state of the art building Completed 2020
City Library	Earthquake Collapse	New state of the art Building Complete date Fall 2021
City Office	Loss of vital city records; communication vehicles; day to day functions	Provide for city office/EOC survivability following an earthquake
Public Works Building	Loss/damage to response equipment	N/A
EOC	Loss of operability for EOC	Secondary or replace EOC in MOC
Dispatch center	Loss of power for critical operations and communications	Installed IPU
City Public Works building	Damage and destruction to facilities and vehicles from earthquake	Enhance structural integrity of infrastructure
Police Department	Loss of vital police records; impact to day to day functions	TBD
Public Works Building	Loss/damage to response equipment	3 phase New building MOC
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Stormwater pipes and drains	Flooding	Inspect and maintain
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation

City Goals - Davis Co PDMP

Interstate 15	Destruction, evacuation and response concerns	Maintenance and inspection
Utah state route 193	Destruction, evacuation and response concerns	Maintenance and inspection
State Street	Destruction, evacuation and response concerns	Maintenance and inspection
300 North	Destruction, evacuation and response concerns	Maintenance and inspection
1700 south/Antelope Dr	Destruction, evacuation and response concerns	Maintenance and inspection

Mitigation Efforts Since the 2016 Plan

- Clearfield city added a UPS uninterruptible Power System for our dispatch center and city building \$80K
- We built a new state of the art Maintenance Operations Center(MOC) which is up to code. Phase 1 and 2 Completed 2020 cost \$\$\$
- Clearfield City has updated the City Emergency Operations Plan (EOP)

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Clearfield is in the portion of Davis County where it is near the low-lying areas of the Great Salt Lake where the water table is near the surface and would be susceptible to liquefaction in addition to shaking. Liquefaction is a loss of strength in some saturated granular soil, which can result in slope failure or substantial settlement of structures. Most habitable land in the City is either moderately or highly susceptible to liquefaction. Most of this land is either covered with single or two story residential structures, manufacturing and business buildings that would likely suffer minor to moderate damage due to liquefaction. However, many underground utilities could be severely damaged. Summer flash flooding can cause flooding problems in Clearfield City. The loss of City Building and infrastructure would be likely.

Goal: Third phase to MOC with possible EOC

Objective #1 (Priority HIGH): Earthquake - Problem Identification: Critical facilities do not meet seismic standards.

Goal: Reduce the threat of earthquake damage in the city.

Objective (Priority HIGH): Retrofit facilities to seismic standards.

Action 1: Retrofit, modify and/or Replace the Maintenance Operation Center (MOC) building to bring into compliance with current seismic code. Three phases

City Goals - Davis Co PDMP

Time Frame: 2025

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clearfield city

Time Frame: 2025

Funding: City funds/State/Federal grant

Estimated Cost: \$unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clearfield City

Objective #2 (Priority MEDIUM): Educate the general public about earthquakes and the need to secure the contents of their homes and offices.

Action: Hold an Emergency Preparedness Fair to educate the public on the need to secure the contents of their homes and offices.

Time Frame: 2024

Funding: City funds

Estimated Cost: \$1,500

Staff: Emergency Management

Jurisdictions: Clearfield City

Objective #3 (Priority MEDIUM): Retrofit water lines and storm drain infrastructure to meet seismic standards.

Action 1: Upgrade existing roads and utilities infrastructure where growth has exceeded capacity.

Time Frame: 2021-2025

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clearfield City

Action 2: Design and upgrade culinary water storage tanks for some time over the next 5 to 10 years.

Time Frame: 2021-2025

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clearfield City

City Goals - Davis Co PDMP

Action 3: The City performs continuous maintenance and repair to keep the system in good working order for both fire flow and earthquake resistance.

Time Frame: 2021-2025

Funding: City funds/State/Federal grant

Estimated Cost: \$ Unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clearfield City

Action 4: Clearfield City has an ongoing, annual program of replacing an aging 4” cast iron culinary water pipe, which is very susceptible to earth movement, with 8-24” flexible PVC pipe, which is better able to withstand earth movement caused by a seismic event.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: UNKNOWN

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clearfield City

Flooding - Problem Identification: Clearfield is located in relative proximity to the Great Lakes and has several smaller lakes, ponds, and streams that have the potential to flood during flash flooding or severe amounts of rain.

Goal: Mitigate the impact of flooding in high-threat areas.

Objective (Priority MEDIUM): Providing the public with knowledge about the hazards of flooding.

Action: When requested, providing information to citizens about local flood hazard, flood insurance, and flood protection measures.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Clearfield City

Clinton City

Background

Clinton City is located in the Northwest portion of Davis County, Utah. Clinton City is bordered by Sunset City to the east, Clearfield City to the southeast, and West Point City to the southwest. The northern border of Clinton is the Weber County line, with the city of Hooper to the northwest and Roy City to the north and northeast. Clinton City is part of the Ogden–Clearfield, Utah Metropolitan Statistical Area. Clinton City, then part of Layton City, was settled in the 1870's by James Hill and his family. Early settlers used it to graze their animals but, even though the land was fertile, culinary water had to be hauled in from the Weber River. The area was commonly called The Range, Sand Ridge, The Basin and The Summit. The first school was built in 1885 just south of the cemetery. Clinton would not become an official town until 1936, and its growth was relatively small until the 1960's. Clinton grew rapidly during the 1990s and continues to see rapid growth, with an estimated population of 22,499 in 2024.

Community Buildings and Infrastructure Status

As Clinton City continues to see substantial growth, they have focused much attention on the improvements of critical infrastructure. Clinton City maintains the utmost standards of public safety along with current construction methods and seismically sound structures. The goals of Clinton City moving forward demonstrate their commitment to maintaining essential infrastructure and the safety of its residents well into the future.

City Buildings:

Public Works Building - Built 1996 - addition in 2018

City Building - Built 2008

Police Station - Built 2008

Fire Station - Built 2008

Recreation Building - Built 2008

At the time of construction, all city buildings were designed under current building, fire, and seismic codes. Currently, the fire station is the only building that has emergency backup power. In the future we will be looking at getting emergency generators for the City Building, Police Station. In order to help will better communication capabilities within the city. Clinton City has recently contracted with Connex to run high speed internet fiber throughout the city limits.

Specific Community Hazards

- **Earthquake:** Clinton proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding:** Clinton is susceptible to flooding from storm events and runoff or failure of a critical area infrastructure.
- **Severe Weather:** Clinton City is susceptible to severe weather (rain, snow, wind, lightning, ect.)

City Goals - Davis Co PDMP

- Wildland Fire:** Clinton City has a walking/running/biking trail on the old Denver Rio Grande western Railroad track system. There is approximately 6,000' to 8,000' of trail that is covered with an abundance of natural fuels.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Well Water (1800 N)	Water Contamination	Enhance security
Culinary Water Tanks (HAFB)	Water Contamination	Enhance security
Underground Petroleum Pipelines	Hazardous material release to include crude oil	Enhance security, Education
Rocky Mountain Power Plant Substation	Damage and destruction, loss of power to the city	Maintenance and inspection by Rocky Mountain Power
Dominion Natural Gas Substation (High pressure)	Damage and destruction; loss of natural gas to the city	Maintenance and inspection by Dominion Energy
Water lines	Damage and destruction, loss of water supply to city; flooding	Maintenance and inspections
Sewer lines	Damage and destruction; flooding; groundwater contamination; bacteria and disease potential health risk	Maintenance and inspections
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication vehicles; day to day functions	Add backup power generator
Public Works building	Loss/damage to response equipment	Add additional Fuel storage; Build a 60' x 60' salt storage building to increase the amount of salt storage for snow plowing operations in the winter months.
Fire Department/EOC	Loss of vital fire records; loss/damage to response	Enhance security

City Goals - Davis Co PDMP

	equipment; Loss of operability for EOC	
Police Department	Loss of vital police records; impact to day to day functions	Add backup power generator
IT Network and Server	Loss of communications	Enhance security
Fire Department generator	Loss of power	Enhance security
Sewer lift station	Sewer backup	Maintenance and inspections; Enhance security
Sewer lift station generator	Loss of power; sewer backup	Maintenance and inspections
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Multiple stormwater retention	Flooding	Maintenance and inspections
Stormwater lines	Damage and destruction; flooding	Maintenance and inspections
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
1800 North	Destruction, evacuation and response concerns	State Road
2000 West	Destruction, evacuation and response concerns	State Road
800 North	Destruction, evacuation and response concerns	Maintenance and inspections
1300 North	Destruction, evacuation and response concerns	Maintenance and inspections
2300 North	Destruction, evacuation and response concerns	Maintenance and inspections
3000 West	Destruction, evacuation and	Maintenance and inspections

City Goals - Davis Co PDMP

	response concerns	
1500 West	Destruction, evacuation and response concerns	Maintenance and inspections
1000 West	Destruction, evacuation and response concerns	Maintenance and inspections

Mitigation Efforts Since the 2016 Plan

- The City has maintained a capital improvements program to guide its infrastructure investments every year since 2016. One of core principles that help the city prioritize their projects is the impact to public safety and emergency preparedness.
- Clinton has recently started an initiative to update its EOP.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Davis County contains the highest density of faults in the state, yet no major earthquake has been recorded. According to geologists from the Utah Geological Society, Davis County could experience magnitude 7.0 to 7.5 earthquakes. Ground displacement and liquefaction-induced ground failure that could affect critical infrastructure and structures within our community.

Goal: Work toward becoming more earthquake resilient.

Objective (Priority Medium): Mitigate the effects of earthquakes.

Action 1: Clinton City has an ongoing program of replacing aging cast iron culinary water pipe, which is very susceptible to earth movement, with flexible PVC pipe, which is better able to withstand earth movement caused by a seismic event.

Time Frame: ongoing

Funding: City funds

Estimated Cost: \$5 to 7 million

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clinton City

Action 2: Clinton City is adding a new culinary water reservoir and deep well at 2200 North 730 West. This reservoir and deep well will be within city limits. The city's main culinary water system is currently stored on Hill Air Force Base. This will also give us a secondary culinary water supply if the main culinary water reservoirs or piping fail. This will increase city water storage and help Clinton City become more earthquake resilient. The land for this project has been purchased already by the City.

Time Frame: 2024

Funding: TBD

Estimated Cost: TBD

City Goals - Davis Co PDMP

Staff: City Administration, Emergency Management, Public Works, Engineer, etc.

Jurisdictions: Clinton City

Action 3: Unreinforced Masonry Risk Reduction Program. Evaluate to determine if there are and how many structures in Clinton City were built with unreinforced masonry construction. Such structures can more easily succumb to the movement and shaking during an earthquake.

Time Frame: 2021-2025

Funding: TBD

Estimated Cost: TBD

Staff: City Administration, Emergency Management, Public Works, Engineer

Jurisdictions: Clinton City

Flooding - Problem Identification: Adding an additional storm drain in Cranefield subdivision to help with potential flooding problems in the area. The storm water dumps into the golf course pond and from there into a slough. Bad water flow issues and vegetation going to the slough have caused water backup problems.

Goal: Fix water flow issues and will help with flooding issues in the event of severe weather in that portion of the city.

Objective (Priority Medium): Reduce risk of flooding in major subdivisions.

Action: Conduct infrastructure improvements.

Time Frame: Completed by June 2022

Funding: City funds

Estimated Cost: \$730,000.00

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clinton City

Severe Weather - Problem Identification: Severe Weather: Clinton City is susceptible to severe weather (rain, snow, wind, lightning, ect.)

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

City Goals - Davis Co PDMP

Jurisdictions: Clinton City

Wildfire - Problem Identification: Clinton City has a walking/running/biking trail on the old Denver Rio Grande western Railroad track system. There is approximately 6,000' to 8,000' of trail that is covered with an abundance of natural vegetation and fuels.

Goal: To reduce and maintain the amount of fire load and growth in the area.

Objective (Priority Medium):

Action: Cut, trim, remove, and maintain trees and other natural vegetation in the area. .

Time Frame: ongoing

Funding: City funds

Estimated Cost: \$10,000 every year

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Clinton City

Multi-Hazards - Problem Identification: Update Emergency Operations Plan (EOP) in place and improve communication networks that are vulnerable. Improve communications, mitigate the impacts of and be prepared for emergency situations and hazards.

Goal: Have an updated and comprehensive Emergency Operations Plan (EOP)

Objective (Priority HIGH):

Action 1: Update an Emergency Management Plan.

Time Frame: 2021

Funding: City funds

Estimated Cost: \$10,000

Staff: All Departments etc.

Jurisdictions: Clinton City

Action 2: Enhance IT Network and Server Security.

Time Frame: TBD

Funding: City funds

Estimated Cost: TBD

Staff: City Administration

Jurisdictions: Clinton City

Action 3: Enhance Multi-hazard outreach program through city website, social media, and community training.

Time Frame: On-going

Funding: City funds

City Goals - Davis Co PDMP

Estimated Cost: TBD

Staff: All Departments

Jurisdictions: Clinton City

Farmington City

Background

Farmington City is a picturesque community nestled on the foothills of the Wasatch Range in Davis County. With a population of about 22,500, and approximately 7,000 households, Farmington serves as the county seat and offers a variety of entertainment to include Utah's largest amusement park (Lagoon), Legacy Fairgrounds, Station Park Shopping Center, and various outdoor recreation opportunities to include nearly two-hundred miles of walking and hiking trails. Housing options include farming estates, dense residential communities, care of the aged centers, townhomes and homes with access to Interstate 15, Legacy Highway, and Highway 89 for commuters close to Ogden (to the north) and Salt Lake City (to the south). Farmington was settled in 1847 and remained a bedroom community regardless of being the county seat and location of Utah's largest amusement park. This changed in 2011 when commercial and residential development exploded and continues to expand at the time of this report. Farmington was recently ranked #14 of "Best Places to Live" in a nationwide probe performed by Money Magazine.

Although a part of the Ogden-Clearfield Metropolitan Statistical Area, Farmington serves as a bedroom community to both Ogden City and Salt Lake City. However, due to the very narrow entrance into Salt Lake County, roads between the counties often reach near-gridlock traffic during rush hour. The FrontRunner commuter rail has been running since April 2008, and the Legacy Parkway was opened in 2008. These were built to help alleviate the traffic load on Interstate 15 through the Farmington area. Farmington City occupies an area of approximately 10 square miles; however, provides critical services for surrounding areas of unincorporated Davis County. Farmington is a gateway community to both North and South Davis County and acts as a main arterial pathway for ground and rail transportation.

Farmington operates under a weak mayor form of government, with an elected Mayor and five Council Members. The day-to-day operations and the majority of executive authorities are delegated to a City Manager, who works hand-in-hand with the Mayor to ensure all city operations are well-run. City operations include a 24-7 police department, 24-7 fire and ambulance department, water, garbage/recycling, streets, stormwater, snow removal, community development, parks and recreation programming. Emergency management and pre-disaster mitigation responsibilities are coordinated by the City Manager.

Community Buildings and Infrastructure Status

Over the last decade, Farmington City has exploded with both residential and commercial buildings. As this trend is projected to continue into the future, Farmington City has been focused on improving its infrastructure to protect its essential functions and maintaining critical services for its citizens and visitors. As the community grows, so do the standards of Farmington City in their recognized responsibility to their community. Farmington City is dedicated to upgrading infrastructure when needed and ensuring all new infrastructure meets currency safety, health, and building standards.

City Goals - Davis Co PDMP

Specific Community Hazards

- **Earthquake.** Farmington's proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** Farmington is located along the Wasatch Mountain Front. During 1983, city infrastructure, homes, and trails sustained significant damage from mudslides and flooding.
- **Land Subsidence.** Several structures in the city have experienced various degrees of settlement and require further understanding / mitigation solutions.
- **Wildland Fire.** Much of Farmington City is located against the foothills, increasing the risk (HIGH) for wildland fires. Farmington also provides initial fire and ambulance response to emergencies within and above Farmington Canyon areas that encompass over 30 structures.
- **Dam Failure.** Primary and secondary water systems throughout the community utilize multiple storage reservoirs. Certain components of this delivery and storage systems pose a high failure risk in the event of a seismic incident.
- **Severe Weather.** Severe downslope winds form Wasatch Mountain Range.
- **Chemical Release.** Potential crude oil release, ultra-high volume (52 gallons per second at 200 psi) within the center of Farmington City – Station Park and Legacy Center area. Interstate and heavy rail also passes through Farmington with countless quantities of hazardous materials.
- **Critical Roads.** Critical Roadways for lifeline infrastructure. A seismic event could separate access routes between east Farmington and west Farmington due to failure of overpasses.
- **Multi-Hazards.** The City does not have a detailed emergency management plan in place and communication networks are vulnerable.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Well / Water Treatment Plants	Water contamination	Enhance security
Upper Reservoirs	Water contamination, dam breach w/ flooding	Enhance security
Well	Water contamination	Enhance security
Underground petroleum pipelines	Major Hazardous Materials release to include crude oil within critical city infrastructure and commerce area of town.	Enhance security Increased protection from new and ongoing construction
Irrigation Reservoirs	Water contamination, dam breach w/ flooding	Enhance security
Power & Gas Utilities	Complete loss of utilities	Enhance security

City Goals - Davis Co PDMP

Critical Roadway & Bridges	Loss of emergency access / city split into two by I-15, Legacy Hwy and Hwy 89.	Enhance security
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication vehicles; day to day functions	TBD
City Public Works building	Damage and destruction to facilities and vehicles from earthquake	Enhance structural integrity of infrastructure
Police Department	Loss of vital police records; impact to day to day functions	TBD
Public Works Building	Loss/damage to response equipment	TBD
IT Network and Server	Loss of communications	Enhance security
EOC	Loss of operability for EOC	Equip EOC; Complete connection to fiber/analog lines
Main Generator for City Office	Loss of power for critical operations	Enhance security
Farmington Fire Station #71	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency / perform study
Farmington Fire Apparatus Storage BLD (West Side) #72	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency / perform study
Well Houses	Loss of municipal water supply	Enhance security
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Multiple storm water retention basins throughout the city	Flooding	Dredge and de-silt
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Main Street (North to South)	Destruction, evacuation and response concerns	N/A

City Goals - Davis Co PDMP

Sheppard Lane (West to East)	Destruction, evacuation and response concerns	N/A
200 East (North to South)	Destruction, evacuation and response concerns	N/A
Park Lane (West to East)	Destruction, evacuation and response concerns	N/A
Clark Lane / State Street (East to West)	Destruction, evacuation and response concerns	N/A
Glovers Lane & 1525 West	Destruction, evacuation and response concerns	N/A

Mitigation Efforts Since the 2016 Plan

- Farmington City is updating the City Emergency Operations Plan (EOP).

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities do not meet seismic standards.

Goal: Perform seismic engineering evaluation FY2022

Objective (Priority HIGH): Retrofit facilities to seismic standards.

Action 1: Retrofit Farmington City Fire Station #71 building to bring into compliance with current seismic code.

Time Frame: 2023

Funding: City funds/State/Federal grant

Estimated Cost: \$350,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Action 2: Identify / pre-plan the entire culinary water delivery network and reservoirs city-wide to determine earthquake survivability and modify accordingly.

Time Frame: 2022-2023

Funding: City funds/State/Federal grant

Estimated Cost: \$500,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Action 3: Replace multiple aging high pressure gas lines which serve a large portion of Farmington City (by Dominion Gas). These gas lines cross several fault traces, and are subject to failure in the event of fault movement or a reasonably expected seismic event.

City Goals - Davis Co PDMP

Time Frame: 2022-2026

Funding: utility company, ARPA

Estimated Cost: minimal

Staff: City / Questar Gas.

Jurisdictions: Farmington City

Action 4: Farmington City has an ongoing, annual program of replacing aging cast iron culinary water pipe, which is very susceptible to earth movement, with flexible PVC pipe, which is better able to withstand earth movement caused by a seismic event.

Time Frame: ongoing

Funding: City funds

Estimated Cost: \$900,000/yr

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Flooding - Problem Identification: Farmington City is located just off of the Farmington Bay and has smaller lakes, ponds, and streams that have the potential to flood during flash flooding or heavy rainfall.

Goal: Mitigate the impact of flooding in high-threat areas.

Objective (Priority MEDIUM): Providing the public with knowledge about the possibility of flooding.

Action: When requested, provide information to citizens about local flood hazard, flood insurance, and flood protection measures.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Farmington City

Landslide - Problem Identification: Several homes in the city have experienced substantial settlement.

Goal: Reduce the threat of earthquake damage in the city.

Objective (Priority MEDIUM): Conduct an analysis of why this is occurring and seek to discover mitigation solutions.

Action: Continue with residential inquiries, monitoring and evaluations of existing established benchmarks and boring when indicated.

Time Frame: 2023-2025

Funding: City funds

Estimated Cost: unknown

City Goals - Davis Co PDMP

Staff: Engineer, consultants.

Jurisdictions: Farmington City

Wildland Fire - Problem Identification: A large portion of Farmington City is along the foothills with a significant history of urban/wildland interface fires.

Goal: Reduce the threat of wildfire damage in the city.

Objective (Priority HIGH): Fuels mitigation.

Action 1: Work in tandem with homeowners and government programs, via public education campaigns; such as, FireWise to educate and remove fuels to better facilitate defensible spaces.

Time Frame: unknown

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Action 2: Continue to utilize state and federal resources such as: Federal Excess Personal Property (FEPP) programs to help provide adequate equipment and assets to mitigate wildland / interface fires.

Time Frame: unknown

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Dam Failure - Problem Identification: Multiple water containment systems located throughout Farmington are aging and subject to various stages of decay. Based on assessment findings, these containment vessels will require different levels of repair and possible replacement.

Goal: Continue to conduct ongoing replacement programs of critical infrastructure.

Objective (Priority HIGH): Enhance the resiliency of Farmington city culinary water system.

Action: Repair and/or Replace various culinary water containment reservoirs.

Time Frame: 2024

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

City Goals - Davis Co PDMP

Severe Weather - Problem Identification: Severe downslope winds form Wasatch Mountain Range.

Goal: Reduce the threat of severe weather damage in the city.

Objective (Priority MEDIUM): Structural building integrity improvements.

Action: Review proper building and development codes.

Time Frame: 2024

Funding: City funds/State/Federal grant

Estimated Cost: \$2,500

Staff: Community Development, Building Department

Jurisdictions: Farmington City

Chemical Release - Problem Identification: Potential ultra-high volume crude oil release (52 gallons per second at 200 PSI) within the center of Farmington City – Station Park and Legacy Center area.

Goal: Reduce the threat of chemical release event damage in the city.

Objective (Priority MEDIUM): Continue working with pipeline vendors, ensuring that adequate training for all personnel and specialized equipment remains available.

Action: Ongoing / proper maintenance and training.

Time Frame: annually

Funding: City funds

Estimated Cost: \$5,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Critical Roads - Problem Identification: Critical Roadways for lifeline infrastructure.

Goal: Improve the resiliency of the local road systems.

Objective (Priority MEDIUM): Provide unrestricted access or critical roadways for all lifeline infrastructure.

Action: Identify & map lifeline infrastructure.

Time Frame: 2024

Funding: City funds/State/Federal grant

Estimated Cost: \$10,000

Staff: Public Works, Engineer, etc.

Jurisdictions: Farmington City

Multi-Hazards - Problem Identification: The City does not have a detailed emergency management plan in place and communication networks are vulnerable.

City Goals - Davis Co PDMP

Goal: Develop a functional EOP and communication infrastructure.

Objective (Priority HIGH): Improve communications, mitigate the impacts of and be prepared for emergency situations and hazards.

Action 1: Create a detailed Emergency Management Plan.

Time Frame: 2023

Funding: Federal and Local

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Action 2: Enhance IT Network and Server Security.

Time Frame: 2023

Funding: Federal and Local

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Farmington City

Fruit Heights City

Background

Fruit Heights City is located between Kaysville on the west and Farmington on the south. The community is located on the foothills of the Wasatch Range in Davis County. With an estimated population of 6221 (2024 Census) comprising approximately 1800 households, Fruit Heights is one of the more affluent communities in the state. The city grew rapidly during the 1970-1980's, but is nearing its "build out" stage with few open areas available for development.

Fruit Heights was originally known as Mountain Road. It was the first road between Salt Lake City and Ogden City. For nearly 50 years, Kaysville folks came to the Mountain Road, first to get their mail from Pony Express riders and later from stagecoach drivers. Early pioneer families settled along the Old Mountain Road around 1850.

John Bair had his own saw mill, located about where the Rock Loft is now. The mill furnished most of the wood for the early homes. Over the years settlers changed the area to beautiful farms and orchards. Water was very scarce. Ditches had to be dug. Some families were able to get water from springs in the mountains, but many had to use water from Haight's Creek, Baer Creek and irrigation ditches. It was used for culinary purposes, farm animals and irrigation. This situation continued until 1939.

It was then the people voted to incorporate and become a town, and what was known as the area along the "Old Mountain Road" was named Fruit Heights, because of the fruit industry.

Fruit Heights operates under a weak mayor form of government, with an elected Mayor and five Council Members. The day-to-day operations and the majority of executive authorities are delegated to a City Manager, who works closely with the Mayor to ensure all city operations are well-run. City operations include a full time Public Works Department. Fruit Heights City contracts with Kaysville for Fire and Emergency Medical Services (EMS) and with the Davis County Sheriff's Office for law enforcement and

City Goals - Davis Co PDMP

paramedic response. Emergency management and pre-disaster mitigation responsibilities are coordinated by the Fruit Heights City Manager.

Community Buildings and Infrastructure Status

Given the fact that Fruit Heights is close to the “build out” stage, as heretofore mentioned, much of the improvement strategies have been dedicated to existing infrastructure. Fruit Heights is dedicated to maintaining the quality of life for its citizens, therefore focusing time, funding, resources, and the highest level of standards on infrastructure improvements. These improvements are subject to the availability of funds, personnel and resources.

Specific Community Hazards

- **Earthquake.** Fruit Heights proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** Fruit Heights is located along the Wasatch Mountain Front. During the 1983 declared flooding disaster, City facilities, trails, and homes sustained significant damage.
- **Wildland Fire.** Much of Fruit Heights City is located in the foothills, increasing the risk for wildland fires.
- **Dam failure.** The secondary water system throughout the community has small storage reservoirs.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Culinary water storage tanks	The city has 2 water storage tanks that may experience water contamination, flooding, and failure due to earthquake	Enhance security, and upgrade water distribution system
City's Culinary Water Main	Aging infrastructure, poor or improper installations, and ground settling	As road projects occur or as the water main breaks, they are repaired or replaced with better materials, and better installation methods to protect the piping and extend the life of the pipe.
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices/EOC	Loss of vital city records; communication vehicles; day to day functions. Loss of operability for EOC	Provide for city office/EOC survivability following an earthquake

City Goals - Davis Co PDMP

Public Works Building	Loss/damage to response equipment	N/A
Main Generator for City Office	Loss of power for critical operations	Enhance security
Culinary Water Pump House	Loss of power for critical operations	Enhance security
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Stormwater detention basins	Flooding: excessive rainfall overflowing banks	Downstream protection of property
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Mountain Road	Destruction, evacuation and response concerns	City and State Maintained
Nicholls Road	Destruction, evacuation and response concerns	City Maintained
Green Road	Destruction, evacuation and response concerns	City Maintained
400 North	Destruction, evacuation and response concerns	City & State maintained
Highway 89	Destruction, evacuation and response concerns	State Maintained
Country Lane	Destruction, evacuation and response concerns	City Maintained
Lloyd Road	Destruction, evacuation and response concerns	City Maintained

Mitigation Efforts Since the 2016 Plan

- Fruit Heights City evaluates and updates each year its Stormwater Capital Facilities plan and identifies storm water projects that have been completed or where improvements have been made.
- The Stormwater Facility Fee has had incremental increases over the year to help pay for repairs and upgrades to the system.

City Goals - Davis Co PDMP

- Fruit Heights City’s capital facility plan has identified aging culinary waterlines that need to be repaired. Fruit Heights City continues to replace these aging water lines with major road reconstruction projects.
- Fruit Heights City has adopted a Wildland/Urban Fire Protection Plan.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities do not meet seismic standards.

Goal: Reduce the threat of earthquake damage in the city.

Objective (Priority MEDIUM): Retrofit water lines and storm drain infrastructure to meet seismic standards.

Action 1: Replace culinary water line (Asbestos Cement) and upsize Mountain Road and Nicholls Road to 1000 South Mountain Road to bring into compliance with current seismic code.

Time Frame: 2023

Funding: City funds/State/Federal grant

Estimated Cost: \$420,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Fruit Heights City

Action 2: Loop the 1800 East to Eastoaks Drive water line increasing city water earthquake survivability.

Time Frame: 2023-2024

Funding: City funds/State/Federal grant

Estimated Cost: \$59,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Fruit Heights City

Action 3: Install storm drain and detention basin below Eastoaks Drive to bring into compliance with current seismic code.

Time Frame: 2023-2024

Funding: City funds/State/Federal grant

Estimated Cost: \$189,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Fruit Heights City

Action 4: Install and line the storm drain pipe underneath Green Road to bring into compliance with current seismic code.

Time Frame: 2021-2022

Funding: City funds/State/Federal grant

Estimated Cost: \$120,000

City Goals - Davis Co PDMP

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Fruit Heights City

Action 5: Install a drainpipe in an open ditch along Mahogany Drive to bring into compliance with current seismic code.

Time Frame: 2023-2025

Funding: City funds/State/Federal grant

Estimated Cost: \$35,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Fruit Heights City

Action 6: Upgrade and install a storm drain along South Mountain Road to bring into compliance with current seismic code.

Time Frame: 2023-2025

Funding: City funds/State/Federal grant

Estimated Cost: \$180,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Fruit Heights City

Earthquake - Problem Identification: Fruit Heights City is located on known traces of faults.

Goal: Educating citizens about safety during earthquakes.

Objective (Priority LOW): Making information available to citizens on safety techniques to follow during and after earthquakes.

Action 1: Provide information to citizens about response to earthquakes and protective measures for themselves, families, and property.

Time Frame: Annual

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Fruit Heights City

Flooding - Problem Identification: Fruit Heights is situated between the Great Lakes and the Wasatch Range in Davis County. Fruit Heights City also has several smaller lakes, ponds, and streams that have the potential to flood and runoff from the Wasatch Mountain Range during flash flooding or severe amounts of rainfall.

Goal: Mitigate the impact of flooding in high-threat areas.

Objective (Priority MEDIUM): Providing the public with knowledge about the possibility of flooding.

City Goals - Davis Co PDMP

Action: Provide information to citizens about local flood hazard, flood insurance, and flood protection measures.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Fruit Heights City

Wildland Fire - Problem Identification: A significant portion of Fruit Heights City is along the foothills creating an urban/wildland interface.

Goal: Mitigate the impact of wildfires in high-threat areas.

Objective (Priority MEDIUM): Including considerations of wildfire hazards in land use, public safety, and other elements of the comprehensive plan.

Action 1: In future city plans, encourage the mitigation of wildfires.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, Community Development, Building Department, etc

Jurisdictions: Fruit Heights City

Dam Failure - Problem Identification: There are a few water containment systems like Baer Canyon and Little Canyon located in Fruit Heights, these bring the potential for failure, leading to flooding.

Goal: Mitigate the effects of dam failures.

Objective (Priority LOW): Provide citizens within the flood area of dams with information on flash flooding.

Action: Provide the local population with information on possible flooding.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Fruit Heights City

City Goals - Davis Co PDMP

Severe Weather - Problem Identification: Severe Weather: Fruit Heights City is susceptible to severe weather (rain, snow, wind, lightning, ect.)

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

Jurisdictions: Fruit Heights City

Multi-Hazards - Problem Identification: The city Emergency Operations Plan (EOP) is overdue for an update and revision.

Goal: Maintain an effective EOP.

Objective (Priority MEDIUM):

Action 1: Update the Emergency Operations Plan (EOP).

Time Frame: 2022

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Fruit Heights City

Action 2: Enhance IT Network and Server Security.

Time Frame: 2023-2024

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: Fruit Heights City

Kaysville City

Background

Kaysville is located approximately 20 miles north of Salt Lake City between the Wasatch Mountain Range and the Great Salt Lake. Stream channels with dense vegetation run through the City from the mountains to the lake. The community enjoys panoramic views and the appropriate use of these many features.

City Goals - Davis Co PDMP

Kaysville was originally settled as a farming community and grew to a place of residence between the employment centers of Salt Lake City and Ogden. Steady growth continues today, making Kaysville a destination of choice for a safe residential community with supporting businesses and public facilities.

Kaysville operates under a weak mayor form of government, with an elected Mayor and five Council Members. The day-to-day operations and most executive authorities are delegated to a City Manager, who works closely with the Mayor to ensure all city operations are well-run. City operations include a full time Police, Fire, and Public Works Departments. Emergency management and pre-disaster mitigation responsibilities are coordinated by the Kaysville City Manager.

Community Buildings and Infrastructure Status

Kaysville City maintains the highest level of building standards in their community and focuses much attention on infrastructure development. The goal of providing a safe community for their residents drives them to continually be engaged in and planning for additional critical and essential infrastructure projects.

Specific Community Hazards

- **Earthquake.** Kaysville proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage and liquefaction activity.
- **Flooding.** Kaysville is located along the Wasatch Mountain Front. During the 1983 declared flooding disaster, City facilities, trails, and homes sustained significant damage.
- **Wildland Fire.** Much of Kaysville City is located in the foothills, increasing the risk for wildland fires.
- **Landslide.** Kaysville City has a significant landslide potential, and danger of slides exists from the extreme northern border near the Weber River Basin to the southern end of the county.
- **Dam failure.** The secondary water system throughout the community has small storage reservoirs.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Culinary water storage tanks and secondary water reservoirs	The city has culinary water storage tanks and secondary water storage reservoirs that may experience water contamination, flooding, and failure due to earthquake	Enhance security, and upgrade water distribution system
Main Substation	Loss of power following earthquake	Upgrade infrastructure to current seismic standards
West Substation	Loss of power following earthquake	Upgrade infrastructure to current seismic standards
Burton Substation	Loss of power following earthquake	Upgrade infrastructure to current seismic standards

City Goals - Davis Co PDMP

Schick Substation	Loss of power following earthquake	Upgrade infrastructure to current seismic standards
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices/EOC	Loss of vital city records; communication; vehicles; day to day functions. Loss of operability for EOC	Provide for city office/EOC survivability following an earthquake
Public Works Building	Loss/damage to response equipment	N/A
Kaysville City Power Department	Disruption in electrical service to residents following earthquakes	Upgrade infrastructure to current seismic standards
Main Generator for City Office	Loss of power for critical operations	Enhance security
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Stormwater detention basins	Flooding: excessive rainfall overflowing banks	Downstream protection of property
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Main Street	Destruction, evacuation and response concerns	N/A
200 North	Destruction, evacuation and response concerns	N/A
Angel Street	Destruction, evacuation and response concerns	N/A
Crestwood Drive	Destruction, evacuation and response concerns	N/A
Highway 89	Destruction, evacuation and response concerns	N/A
Interstate 15	Destruction, evacuation and response concerns	N/A

City Goals - Davis Co PDMP

Mitigation Efforts Since the 2016 Plan

- Mutton Hollow water line was upgraded in 2016 to add redundancy to the system and better fire flow.
- Updated City Hall facility.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities do not meet seismic standards.

Goal: Reduce the threat of earthquake damage in the city.

Objective (Priority MEDIUM): Retrofit water lines and storm drain infrastructure to meet seismic standards.

Action 1: Design and upgrade culinary water storage tanks for some time over the next 5 to 10 years, and add a second pump house in the next 1-3 years that will equalize the water in the tanks.

Time Frame: 2022-2027

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 2: The City performs continuous maintenance and repair to keep the system in good working order for both fire flow and earthquake resistance.

Time Frame: 2021-2021

Funding: City funds/State/Federal grant

Estimated Cost: \$10,000/yr

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 3: The City is collaborating with the Utah State University experimental facility to upgrade their ponds to better facilitate storm drain function.

Time Frame: 2021-2022

Funding: City funds/State/Federal grant

Estimated Cost: \$120,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 4: Fill an open ditch with a storm drain pipe along Angel Street.

Time Frame: 2022-2023

Funding: City funds

Estimated Cost: unknown

City Goals - Davis Co PDMP

Staff: City Administration, Public Works, Engineer, USU, etc.

Jurisdictions: Kaysville City

Action 5: Reconstruct water and flood control channel through Barnes Park.

Time Frame: 2014-2015

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 6: Stormwater retention pond construction on Nature Conservancy land.

Time Frame: 2023-2024

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 7: Stormwater retention pond construction on 200 North and Wellington.

Time Frame: 2023-2024

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 8: Storm drain upsize and replacement on 100 North.

Time Frame: 2015-2021

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 9: Storm drain upsize and replacement on 600 East to include new boxes and pipe replacement.

Time Frame: 2015-2021

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

City Goals - Davis Co PDMP

Flooding - Problem Identification: Kaysville is located between Great Salt Lake and the Wasatch Mountain Range, it houses several lakes, ponds, streams and rivers that have the potential to flood during flash flooding and heavy rainfall.

Goal: Mitigate the impact of flooding in high-threat areas.

Objective (Priority MEDIUM): Providing the public with knowledge about the possibility of flooding.

Action: When requested, provide information to citizens about local flood hazard, flood insurance, and flood protection measures.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Kaysville City

Dam Failure - Problem Identification: Multiple dams and water containment systems located throughout Kaysville City. These are prone to aging, which can lead to structural failure.

Goal: Prevent dam failure.

Objective (Priority LOW): Mitigate the effects of dam failure, by educating the public.

Action: Provide the local population with information on flooding.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Kaysville City

Severe Weather - Problem Identification: Severe Weather: Kaysville is susceptible to severe weather (rain, snow, wind, lightning, ect.)

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

City Goals - Davis Co PDMP

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

Jurisdictions: Kaysville

Wildland Fire - Problem Identification: A significant portion of Kaysville City is considered to be in the Urban-Wildland Fire Interface.

Goal: Reduce the threat of wildfire damage in the city.

Objective (Priority HIGH): Decrease wildfire hazard in the Urban-Wildland Fire Interface area of the city due to fireworks use.

Action 1: Develop and support a permanent firework ordinance to restrict use and the Urban-Wildland Fire Interface through City Council adoption.

Time Frame: 2021

Funding: City funds

Estimated Cost: minimal

Staff: Fire Department, Parks Department

Jurisdictions: Kaysville City

Action 2: Complete and adopt Community Wildfire Protection Plan

Time Frame: 2022-2023

Funding: City funds/State

Estimated Cost: unknown

Staff: Fire Department.

Jurisdictions: Kaysville City / County Fire Marshall

Landslide - Problem Identification: With Kaysville being located at the foothills of the Wasatch Range in Davis County, landslides are possible.

Goal: Mitigate the effects of landslides.

Objective (Priority LOW): Creating a plan to study areas where landslides may occur.

Action: Discuss using GIS Mapping or other means to determine where landslides may occur.

Time Frame: Unknown, depending on funding

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, GIS, etc.

Jurisdictions: Kaysville

City Goals - Davis Co PDMP

Multi-Hazards - Problem Identification: The city Emergency Operations Plan (EOP) is overdue for an update and revision.

Goal: Develop and maintain an EOP.

Objective (Priority HIGH): Improve communications, mitigate the impacts of and be prepared for emergency situations and hazards.

Action 1: Update the Emergency Operations Plan (EOP).

Time Frame: 2022

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Kaysville City

Action 2: Enhance IT Network and Server Security.

Time Frame: 2023-2024

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: Kaysville City

Action 3: Kaysville City owns and maintains its own power supply system for city residents. The city performs an annual ongoing system-wide inspection, which includes: Pole inspection, line clearance, tree trimming, voltage upgrades as required, and replacement of poles/equipment on voltage upgrade as needed. All of the above will help prevent loss of power/system damage, enhance reliability from all types of natural hazards.

Time Frame: 2021-2021

Funding: City funds

Estimated Cost: \$15,000/year

Staff: City Administration

Jurisdictions: Kaysville City

Layton City

Background

Layton City is located in Davis County, 25 miles north of Salt Lake City. Layton City has a current estimated population of 81,000 (2020) making it the largest city in Davis County and 9th most populous in the State of Utah. It is located adjacent to Hill Air Force Base to the north, Syracuse to the west, Kaysville to the south, Clearfield to the west/northwest, South Weber to the northeast and the Uintah/Wasatch/Cache National Forest to the east. The City covers approximately 24 square miles.

City Goals - Davis Co PDMP

Layton City continues to experience substantial residential growth in both the single family and multi-family housing market and even more significantly in the retail market. Layton City is home to Weber State University-Davis.

Layton City is an economic hub of the county with a large regional mall, numerous hotels, restaurants, large conference center, and several large business parks. The City is bisected by I-15 and very active rail lines, including the UTA FrontRunner Commuter line. The Union Pacific line handles a large amount of hazardous materials transportation on a daily basis.

Layton City operates with a six-member council form of government. Major city departments include Police, Fire, Public Works, Parks and Recreation, Legal, Finance, Management services, and Community and Economic Development. Emergency management functions are coordinated through the Assistant City Manager, Risk Management and Fire Department with various assigned roles relating to NIMS training, emergency operations plan maintenance, citizen outreach, continuity of operations, and LEPC/State DEM involvement.

Community Buildings and Infrastructure Status

As the largest community in Davis County Layton strives to lead from the front with a standard of excellence. Layton City maintains the highest level of building and infrastructure standards. Layton City is committed to improving its infrastructure and is constantly exploring new sources of funding and resources to better its community. Critical and essential infrastructure is always being improved as funds, personnel, resources, and needs are identified.

Specific Community Hazards

- **Earthquake.** Layton City’s proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** The potential for flooding is mostly related to dam breach, however the west areas of the City could have flooding due to proximity to the Great Salt Lake. Additionally, there is the potential for flooding related to debris flows, following any significant wildfire.
- **Landslide.** There are portions of Layton City deemed ‘sensitive lands’ and the City has experienced destructive landslides in the past decades.
- **Wildland Fire.** Layton City is in the Wasatch Front, increasing the risk for large wildland urban interface fires. Within the City are several trail systems, such as the Kays Creek Trail and Bonneville Shoreline Trail. The existence of trails increases the wildfire potential.
- **Dam failure.** Layton City has three reservoirs with various dam failure potential.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Weber Basin Water Treatment Plant SR193 & HWY89	Water contamination	Enhance security
Hobbs Reservoir 2360 E. Canyon View	Water contamination, dam breach w/ flooding	Enhance security, inspections

City Goals - Davis Co PDMP

Sandridge well boosters	Water contamination	Enhance security Provide redundant power source to ensure transfer of water to tanks system
Power plant substation 3050 N.	Power interruption	Enhance security
Fairfield Well	Water contamination	Enhance security
HAFB runway SR193/Fort Ln.	Flight interruption	Enhance security
Power plant substation Fort Ln. & 1000 N.	Power interruption	Enhance security
Fort Lane Well	Water contamination	Enhance security
City Shop Well	Water contamination	Enhance security
Water Tank Oak Hills & HWY89	Water contamination, flooding from breach	Enhance security
Underground petroleum pipeline valve Tanglewood & HWY89	Major Hazardous Materials release to include crude oil	Enhance security Increased protection from vehicles recently added
Holmes Reservoir 2800 E. Gentile Rd	Water contamination, dam breach w/ flooding	Enhance security
Adams Reservoir 1500 E. 900 N.	Water contamination, dam breach w/ flooding	Enhance security
Questar Natural Gas substation	Hazardous materials release	Enhance security
Power plant substation 600 N. Sugar St.	Power interruption	Enhance security
Power plant substation 3100 W. 1000 N.	Power interruption	Enhance security
Water pump station	Water contamination	Enhance security
Davis Hospital 1600 W. Antelope	Loss of critical medical facilities	Enhance security
Layton Intermountain Hospital 201 W Layton Parkway	Loss of critical medical facilities	Enhance security

City Goals - Davis Co PDMP

Laytona Well	Water contamination	Enhance security
Green Leaf water pump & well	Water contamination	Enhance security
Church Street Well	Water contamination	Enhanced security
Church Street Boosters	Water Contamination	Enhanced security
Valley View Boosters North East Tank Boosters Twin Peaks Boosters Fairfield Boosters Oakridge Boosters Oakridge Tank Valley View Tank	Water Contamination	Enhanced security Provide redundant power source to ensure transfer of water to tanks system
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; day to day functions	Enhance seismic resiliency as needed
Police Department	Loss of vital police records; impact to day to day functions	Enhance seismic resiliency as needed
Public Works Building	Loss/damage to response equipment	Enhance seismic resiliency as needed
IT Network and Server	Loss of communications	Enhance security, redundancy
EOC (Located in Police Department)	Loss of operability for EOC	Ensure communication improvements are made as required; secondary EOC
Main Generator for City Office	Loss of power for critical operations	Enhance security
Fire Station 51 (Alternate EOC)	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency as needed
Fire Station 52	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency as needed

City Goals - Davis Co PDMP

Fire Station 53	Loss/damage to response apparatus/personnel	Enhance structural earthquake resilience as needed (seismic retrofit was done in 2006 with PDMG)
Fire Station 54 (Under Construction)		
Parks Building	Loss/damage to potential response equipment	
Auxiliary Communications Center	Loss/damage to potential response equipment	Enhanced with backup power and redundant radio capabilities.
Layton Emergency Dispatch Center	Loss/damage to potential response equipment	Enhanced with backup power and redundant radio capabilities.
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Multiple storm water retention basins throughout the city	Flooding	Dredge and de-silt
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Highway 193	Destruction, evacuation and response concerns	n/a
Antelope Drive	Destruction, evacuation and response concerns	n/a
Main Street	Destruction, evacuation and response concerns	n/a
Hill Field Road	Destruction, evacuation and response concerns	n/a
Highway 89	Destruction, evacuation and response concerns	n/a
Oak Hills/Gentile	Destruction, evacuation and response concerns	n/a
Interstate 15	Destruction, evacuation and response concerns	n/a
Fairfield Rd	Destruction, evacuation and response concerns	n/a

City Goals - Davis Co PDMP

2200 W.	Destruction, evacuation and response concerns	n/a
Fort Lane Rd	Destruction, evacuation and response concerns	n/a
Church St.	Destruction, evacuation and response concerns	n/a
Layton Parkway	Destruction, evacuation and response concerns	n/a
Gordon Avenue	Destruction, evacuation and response concerns	n/a
Cherry Lane	Destruction, evacuation and response concerns	n/a

Mitigation Efforts Since the 2016 Plan

- Layton City has updated the Emergency Operations Plan (EOP) and City Continuity of Operations Plan (COOP), both are being revised.
- Layton City has worked with the US Forest Service and completed a fuel mitigation project at the fire break road and the Shoreline trail.
- Fuel reduction projects completed at the trail system around Hobbs reservoir with mowing operations by our Parks department.
- Summerwood residential area had volunteer and EM District fuel reductions projects with support of our Public Works Department hauling off debris to the local green waste facility.
- Numerous Wildland Severity Surveys were conducted with potential residential developments within our mapped Wildland Urban Interface areas.
- Continued Wildfire prevention and mitigation education was presented for three faith based groups in the City and all Emergency Management Districts.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Layton City is located along known fault lines.

Goal: Educating citizens about preparing for and safety during earthquakes.

Objective (Priority LOW): Making information available to citizens on preparation for, and safety techniques to follow during and after earthquakes.

Action: When requested, providing information to citizens.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

City Goals - Davis Co PDMP

Staff: City Administration

Jurisdictions: Layton City

Flooding - Problem Identification: Layton City is located in relative proximity to the Great Salt Lake and has several lakes and streams that have the potential to flood during flash flooding or severe amounts of rainfall.

Goal: Mitigate the impact of flooding in high-threat areas.

Objective (Priority MEDIUM): Providing the public with knowledge about the possibility of flooding.

Action: When requested, provide information to citizens about local flood hazard, flood insurance, and flood protection measures.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Layton City

Wildland Fire - Problem Identification: A significant portion of Layton City is considered to be in the wildland urban interface.

Goal: Provide severity study for all potential land use development within the defined Wildland Urban Interface Map. This is subject to all developers being engaged in requesting and receiving this severity study based on the adopted Wildland Urban Interface Code by a member of the Fire Marshal Office prior to the structural permitting process.

Objective 1 (Priority HIGH): Severity Study on private/public land in the Wildland Urban Interface (City).

Action 1: Work with the Developers and landowners to accomplish a severity study in developable areas within the city boundaries or annexed areas.

Time Frame: 2021

Funding: City funds

Estimated Cost: varies

Staff: Fire Department, CED

Jurisdictions: Layton City

Objective 2 (Priority HIGH): Fuels mitigation on public land (City & Federal).

Action 1: Work with the Parks Department to accomplish fuel reduction in city trails, most significantly on the Kay Creek Trail.

City Goals - Davis Co PDMP

Time Frame: 2021

Funding: City funds

Estimated Cost: varies

Staff: Fire Department, Parks Department

Jurisdictions: Layton City

Action 2: Work with the United States Forest Service and other service groups to improve fuel reduction along the Bonneville Shoreline Trail.

Time Frame: 2021

Funding: USFS

Estimated Cost: Minimal. Work will be performed by the Weber Basin Hand Crew as part of their annual assignments and training.

Staff: Fire Department

Jurisdictions: USFS / Layton City

Objective 3 (Priority MEDIUM): Fuels mitigation on private land.

Action 1: Work with private landowners on fuel reduction programs and education.

Time Frame: 2021

Funding: Local (with possible State grant funds). Otherwise costs will be for the Wildland Fire Mitigation & Suppression city assessment per SB122 according to the UWRAP (Utah Wildfire Risk Assessment Portal).

Estimated Cost: varies

Staff: Fire Department, Parks Department

Jurisdictions: Layton City

Action 2: Implement the “Ready, Set, Go!” and “Evacuation Levels plan” for the wildland urban interface education program for citizens in accordance with the adopted “Community Wildfire Protection Plan”.

Time Frame: 2021-2022

Funding: City / State / Federal

Estimated Cost: unknown

Staff: Fire Department

Jurisdictions: USFS / Layton City

Dam Failure - Problem Identification: Multiple water containment systems located throughout Layton are aging and bring the possibility of failure.

Goal: Prevent dam failures.

Objective (Priority Medium): Provide citizens within the flood area of dams with information on flash flooding.

City Goals - Davis Co PDMP

Action: When requested, provide citizens with information on flash flooding.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Layton City

Multi-Hazards - Problem Identification: The Layton City Continuity of Operations Plan (COOP) and Emergency Operations Plan are in need of review and revision.

Goal: Establish review and revisions to 90 percent of the all organizational COOP plans.

Objective (Priority HIGH): Review and update the Layton City Continuity of Operations Plan (COOP).

Action 1: Have each City department review their individual COOP and make revisions as needed.

Time Frame: 2022

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Layton City

Action 2: Have each City Department review and revise its individual department plan and respective roles and assignments within each assigned ESF.

Time Frame: 2022

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: Layton City

Action 3: Fire Department will coordinate the development of a Layton City employee Emergency Response Handbook with action guides for various types of emergencies for use by office staff as a quick reference.

Time Frame: 2022

Funding: City funds

Estimated Cost: \$15,000/year

Staff: City Administration

Jurisdictions: Layton City

City Goals - Davis Co PDMP

Multi-Hazards - Problem Identification: The Layton City has evaluated and has planned with grant assistance to establish fixed site generators at culinary water pump stations to feed elevated tank systems. This need was identified at the September 8, 2020 windstorm event where the electrical grid in the area was impaired and water could not be transferred to the tanks.

Goal: Through grant and other funds means providing fixed site generators and means to transfer culinary water.

Objective (Priority HIGH): BRIC grant and State funding sources proceed with plans to construct fixed site generators and all necessary components.

Action 1: City Engineering establishes grant proposals. First attempt with BRIC funding was denied. Continued to submit or seek other means.

Time Frame: 2022

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Layton City

Action 2: Continued assessment of the project costs and needs and update overall costs.

Time Frame: 2022

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: Layton City

Action 3: Review and establish all needed requirements directed by grant guidelines for this project.

Time Frame: 2022

Funding: City funds

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: Layton City

Severe Weather - Problem Identification: Layton City is susceptible to severe weather (rain, snow, wind, lightning, ect.)

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

City Goals - Davis Co PDMP

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

Jurisdictions: Layton City

Landslide - Problem Identification: With a significant part of Layton City being located at the foothills of the Wasatch Range in Davis County, landslides are possible.

Goal: Mitigate the effects of landslides.

Objective (Priority LOW): Creating a plan to study areas where landslides may occur.

Action: Discuss using GIS Mapping or other means to determine where landslides may occur.

Time Frame: Unknown, depending on funding

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, GIS, etc.

Jurisdictions: Layton City

North Salt Lake City

Background

The City of North Salt Lake is in southern Davis County; it is bordered to the north by Woods Cross, to the northeast by Bountiful and unincorporated Davis County, and to the south by Salt Lake City. North Salt Lake has a total area of 8.6 square miles. The city has approximately 23,000 residents.

North Salt Lake operates under a Council-Manager form of government, with an elected Mayor and five Council Members. The day-to-day operations and most executive authorities are delegated to a City Manager, who works closely with the Mayor and City Council to ensure all city operations are well-run. City operations include full time Police and Public Works Departments. Emergency management and pre-disaster mitigation responsibilities are coordinated by the North Salt Lake City Manager.

Community Buildings and Infrastructure Status

The City of North Salt Lake engages in many sources of funding including grants to better their overall infrastructure. Maintaining and providing a safe and healthy place to live is the City of North Salt Lake's top priority. North Salt Lake is always looking for ways to better their infrastructure and is actively engaged in projects year round to achieve these goals.

Specific Community Hazards

- **Earthquake.** North Salt Lake's proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.

City Goals - Davis Co PDMP

- **Flooding.** North Salt Lake is located along the Wasatch Mountain Front. During the 1983 declared flooding disaster, City facilities, trails, and homes sustained significant damage.
- **Landslides.** The hillside, in North Salt Lake, is prone to landslides. Both the Springhill and Eaglepointe Landslides caused significant property damage.
- **Severe Weather.** The City is experiencing an increase in severe storms, particularly wind storms, that are causing power outages, property damage, flooding, etc. The state of Utah has also been experiencing years of extreme drought.
- **Wildland Fire.** Much of North Salt Lake City is located in the foothills abutting U.S. Forest Service property, increasing the risk for wildland fires.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Culinary water storage tanks, pump houses, and secondary water reservoirs	The city has culinary water storage tanks and secondary water storage reservoirs that may experience water contamination, flooding, and failure due to earthquake	Enhance security, and upgrade water distribution system
Water Distribution System	Age of system, risk of failure during earthquake event.	Upgrade infrastructure to current seismic standards
Storm Water Distribution System	Age of system, flooding, risk of failure during earthquake event.	Upgrade infrastructure to current seismic standards
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices/EOC	Loss of vital city records; communication vehicles; day to day functions. Loss of operability for EOC	Provide for city office/EOC survivability following an earthquake
Public Works Building	Loss/damage to response equipment	N/A
South Davis Metro Fire - Station #82	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Davis Metro Fire - Station #85	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
STORMWATER INFRASTRUCTURE		

City Goals - Davis Co PDMP

Facility	Hazard / Risk	Mitigation
Stormwater detention basins	Flooding: excessive rainfall overflowing banks	Downstream protection of property
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Main Street	Destruction, evacuation and response concerns	n/a
Highway 89	Destruction, evacuation and response concerns	n/a
Orchard Drive	Destruction, evacuation and response concerns	n/a
Redwood Road	Destruction, evacuation and response concerns	n/a
Eaglewood Drive	Destruction, evacuation and response concerns	n/a
Interstate 15	Destruction, evacuation and response concerns	n/a
Eagleridge Drive	Destruction, evacuation and response concerns	n/a
Interstate 215	Destruction, evacuation and response concerns	n/a

Mitigation Efforts Since the 2016 Plan

- Continued to provide Emergency Preparedness education and support to our Community.
- Continued monitoring of existing landslide areas and control of nearby development.
- Adopted a Geologic Hazards Ordinance to require extensive geologic studies prior to development on lands designated as sensitive areas.
- Stabilization of the Eaglepointe Landslide.
- Upgraded culinary water and storm drain lines to meet seismic standards.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities do not meet seismic standards.

Goal: Reduce the threat of earthquake damage in the city.

City Goals - Davis Co PDMP

Objective (Priority HIGH): Upgrade culinary water and storm drain infrastructure to meet seismic standards.

Action 1: Upgrade culinary water line on 300 North.

Time Frame: 2021-2022

Funding: City funds

Estimated Cost: \$225,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 2: Upgrade culinary water lines on 75 East, 125 East, and 175 East

Time Frame: 2022-2023

Funding: City funds

Estimated Cost: \$440,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 3: Upgrade culinary water line on Lacey Way (Valley View Dr to Gary Way)

Time Frame: 2022-2023

Funding: City funds, state, federal

Estimated Cost: \$880,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 4: Upgrade culinary water line on 150 North

Time Frame: 2022-2023

Funding: City funds

Estimated Cost: \$165,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 5: Upgrade culinary water line on north Frontage Road (Wilson Road to Cobble Creek Road)

Time Frame: 2022-2023

Funding: City funds

Estimated Cost: \$325,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 6: Upgrade culinary water line on 475 North & Cloverdale Road

City Goals - Davis Co PDMP

Time Frame: 2023-2024

Funding: City funds

Estimated Cost: \$360,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 7: Upgrade culinary water line adjacent to The Pointe at Northridge Apartments

Time Frame: 2023-2024

Funding: City funds, state, federal

Estimated Cost: \$475,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 8: Upgrade culinary water line on 400 West (500 North to 1100 North)

Time Frame: 2023-2024

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdiction: City of North Salt Lake

Action 9: Upgrade culinary water line on Freedom Drive

Time Frame: 2024-2025

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdiction: City of North Salt Lake

Action 10: Upgrade culinary water lines on 850 North, 900 North, 950 North, Madsen Lane, and 400 East

Time Frame: 2025-2026

Funding: City funds

Estimated Cost: \$365,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 11: Upgrade culinary water line on 900 North

Time Frame: 2025-2026

Funding: City funds

Estimated Cost: \$615,000

Staff: City Administration, Public Works, Engineer, etc.

City Goals - Davis Co PDMP

Jurisdictions: City of North Salt Lake

Action 12: Upgrade culinary water line on 400 West

Time Frame: 2026-2027

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 13: Upgrade culinary water lines on Raygene Way and Marialana

Time Frame: 2026-2027

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 14: Upgrade culinary water lines on Liberty Road and Bunker Hill

Time Frame: 2026-2027

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 15: Design and upgrade culinary water storage tanks for some time over the next 5 to 10 years, and add a second pump house in the next 1-3 years that will equalize the water in the tanks.

Time Frame: 2022-2027

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: North Salt Lake City

Action 16: Perform any necessary seismic upgrades to the pump houses and well buildings that support the delivery of culinary water.

Time Frame: 2021-2026

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 17: Perform an analysis of the structural stability of the stormwater detention/retention ponds to prevent downhill flooding in the event of a failure.

City Goals - Davis Co PDMP

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Flooding - Problem Identification: Storm water facilities do not meet flood control standards.

Goal: Reduce the threat of flood damage in the City.

Objective (Priority HIGH): Upgrade stormwater infrastructure to prevent downhill flooding.

Action 1: Construct stormwater detention/retention ponds where needed.

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 2: Perform an analysis of the structural stability of the stormwater detention/retention ponds to prevent downhill flooding in the event of a failure.

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 3: Upgrade storm drain lines at Hole #14 of Eaglewood Golf Course

Time Frame: 2021-2022

Funding: City funds

Estimated Cost: \$90,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 4: Upgrade storm drain lines in the canyon near David and Raygene Way

Time Frame: 2021-2022

Funding: City funds

Estimated Cost: \$350,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 5: Upgrade storm drain lines in the canyon on Constitution Way

City Goals - Davis Co PDMP

Time Frame: 2023-2025

Funding: City funds

Estimated Cost: \$1,000,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 6: Upgrade storm drain line on Freedom Lane

Time Frame: 2024-2025

Funding: City funds

Estimated Cost: \$100,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 7: Upgrade storm drain line at 480 North Cutler Drive and install a silt trap

Time Frame: 2024-2025

Funding: City funds

Estimated Cost: \$230,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 8: Upgrade storm drain line along I-215 ramp south of Center Street

Time Frame: 2025-2026

Funding: City funds

Estimated Cost: \$360,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 9: Perform preventative maintenance on storm water facilities regularly

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: \$150,000 annually

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Landslides - Problem Identification: Roughly half of the City's geographical area is located on hillside areas.

Goal: Reduce the threat of landslide damage in the City.

Objective (Priority MEDIUM): Decrease landslide occurrences on the hillside of the City.

Action 1: Continue to monitor the Springhill and Eaglepointe Landslides for movement.

City Goals - Davis Co PDMP

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: Engineering

Jurisdictions: City of North Salt Lake, UGS

Action 2: Continue to require that all developments, particularly in sensitive areas, meet the requirements of the Geologic Hazards Ordinance

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: Community Development, Engineering

Jurisdictions: City of North Salt Lake

Dam Failure - Problem Identification: Multiple water containment systems located throughout North Salt Lake are aging and have the potential to fail in the future.

Goal: Mitigate against dam failures.

Objective (Priority MEDIUM): Reduce the effects of dam failures, by educating the public

Action: Provide citizens with information on flash flooding.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: North Salt Lake

Severe Weather - Problem Identification: North Salt Lake has experienced increasingly more frequent instances of severe weather causing power outages, drought, property damage from wind, etc.

Goal: Reduce the threat of severe weather in the City.

Objective (Priority HIGH): Protect critical facilities from failure or property damage due to severe weather such as windstorms and drought.

Action 1: Install permanent generators at all wells and pump houses.

Time Frame: 2021-2026

Funding: City funds/State/Federal

Estimated Cost: \$1,630,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

City Goals - Davis Co PDMP

Action 2: Acquire additional water rights for secondary water and make secondary water lines accessible to the entire City.

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 3: Promote water conservation efforts to residents and businesses in the City.

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: City of North Salt Lake

Wildland Fire - Problem Identification: A significant portion of the City of North Salt Lake is considered to be in the Urban-Wildland Fire Interface.

Goal: Reduce the threat of wildfire damage in the city.

Objective (Priority HIGH): Decrease wildfire hazard in the Urban-Wildland Fire Interface area of the city.

Action 1: Establish defensible space around critical facilities.

Time Frame: 2021-2026

Funding: City funds/State/Federal

Estimated Cost: unknown

Staff: Fire, Public Works

Jurisdictions: City of North Salt Lake, South Davis Metro Fire

Action 2: Complete and adopt a Community Wildfire Protection Plan

Time Frame: 2021-2026

Funding: City funds/State

Estimated Cost: unknown

Staff: Fire, Community Development

Jurisdictions: City of North Salt Lake, South Davis Metro Fire

Multi-Hazards - Problem Identification: The city's Emergency Operations Plan (EOP) is overdue for an update and revision.

Goal: Develop and maintain an effective EOP.

City Goals - Davis Co PDMP

Objective (Priority HIGH): Improve communications, mitigate the impacts of and be prepared for emergency situations and hazards.

Action 1: Update the Emergency Operations Plan (EOP).

Time Frame: 2021-2026

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: City of North Salt Lake

Action 2: Enhance IT Network and Server Security.

Time Frame: 2021-2026

Funding: City funds/State/Federal grant

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: City of North Salt Lake

Action 3: Install Wi-Fi hotspots and security cameras at all City parks and facilities

Time Frame: 2021-2026

Funding: City funds

Estimated Cost: unknown

Staff: City Administration, Police, Public Works

Jurisdictions: City of North Salt Lake

South Weber City

Background

The town of South Weber was originally incorporated in 1938 and on March 16, 1971 it became a Third Class City. South Weber City is located in northeast Davis County at the mouth of Weber Canyon, bounded by the Weber River on the north and Layton City on the south. US Highway 89 and Interstate 84 are the two major transportation corridors that pass through the City. The 2010 census determined a population of 6,051 persons.

South Weber operates under a council-manager form of government, with an elected Mayor and five Council Members. The day-to-day operations and the majority of executive authorities are delegated to a City Manager, who works hand-in-hand with the Mayor to ensure all city operations are well-run. City operations include a municipal court, water, streets, storm water, sanitary sewer, snow removal, community development, parks and recreation programming, and a volunteer Fire Department. South Weber contracts for garbage services, animal control services, and law enforcement services.

City Goals - Davis Co PDMP

Community Buildings and Infrastructure Status

South Weber loves its small community and is adamant about keeping the highest standards for the residents. South Weber has a decent amount of building and population growth happening, and is continuously working on improving their critical and essential infrastructure. Maintaining the highest level of safety for its employees and residents is of top priority, and South Weber is continually striving to improve as funding, personnel, and resources are made available.

Specific Community Hazards

- **Earthquake.** South Weber’s proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** South Weber’s northern boundary is located along the Weber River.
- **Wildland Fire.** The southern and eastern city boundaries are located on the foothills and are subject to increased risk of wildland fires.
- **Dam failure.** The City is at the mouth of Weber Canyon which contains several dams including Echo, Rockport and East Canyon.
- **Severe Weather.** South Weber is at the mouth of Weber Canyon, which produces consistent high winds.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Water Tanks	No culinary water	Shut off valve(s)
Pump Stations	No culinary water	Back - up generator
Major sewer trunk lines	Backup/flooding/health	Regular maintenance
Culinary water well	No culinary water	Back - up generator
Sewer lift station (serves 4 homes)	Backup/flooding/health	Regular maintenance and replacement
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication; vehicles; day to day functions	TBD
Public Works Building	Loss/damage to response equipment/supplies/materials	TBD
Fire Station	Loss/damage to response equipment	TBD

City Goals - Davis Co PDMP

IT Network and Server	Loss of communications	Enhance security
EOC	Loss of operability for EOC	TBD
Main Generator for City Office	Loss of power for critical operations	TBD
Family Activity Center	Loss of day to day functions	TBD
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Detention basins	Flooding	Dredge & de-silt / clean outlet control structures
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
South Weber Dr.	Destruction, evacuation and response concerns	Redundancy in connecting street network
Interstate 84/ U.S. 89	Destruction, evacuation and response concerns	Redundancy in connecting street network
475 East	Destruction, evacuation and response concerns	Redundancy in connecting street network
1900 East	Destruction, evacuation and response concerns	Redundancy in connecting street network
2100 East	Destruction, evacuation and response concerns	Redundancy in connecting street network
Deer Run Drive	Destruction, evacuation and response concerns	Redundancy in connecting street network

Mitigation Efforts Since the 2016 Plan

- South Weber City is updating the City Emergency Operations Plan (EOP).
- Replaced old cast iron and led-joint pipe in the water system.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: South Weber’s proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage. The amount of damage, and what infrastructure or facilities would be damaged would depend on the magnitude of the earthquake. As mentioned, there is some potential for flooding from the Weber River due to an earthquake. A second likely risk is damage to the City’s culinary water system. Damage to other utility lines (petroleum, gas, communication, power,

City Goals - Davis Co PDMP

irrigation), roads and homes is also likely to occur in varying degrees due to the magnitude of the earthquake.

Goal: Reduce the threat of earthquake damage in the city.

Objective (Priority MEDIUM): Protect the City water system where feasible.

Action: Replace the waterline at the East Bench Reservoir to Cornia Dr. This line is cast iron and more susceptible to rupture than other lines in the system.

Time Frame: 2023-2024

Funding: City funds

Estimated Cost: \$220,000

Staff: City Administration, Public Works, Private Contractor

Jurisdictions: South Weber City

Flooding - Problem Identification: If the south bank of the Weber River were to rupture at a location adjacent to the Staker & Parson Companies Gravel Pit, it would fill the pit with water. Once the pit was full, the river would flow out of the pit area and run along the south side of I-84 rather than back into the existing river channel. This is due to the elevation of the river channel being higher than the lowest elevations around the pit at that location. The flood waters would run in the lowest lying areas along I-84 (which is higher in elevation than the adjacent property on the south) until it got to Riverdale City and/or a location where it would run back into the existing river channel. This scenario could happen due to an earthquake or high flood waters in the river itself which exceeded the river bank at that location.

Goal: Reduce the threat of flooding damage in the city.

Objective (Priority HIGH): Prevent flooding along the south side of I-84 (in the lower lying areas) from the Stake & Parson Companies Gravel Pit west until the Riverdale City boundary.

Action: Build a berm around the Staker & Parsons Co. gravel pit at an elevation higher than the banks of the river adjacent to the Weber River in that area.

Time Frame: unknown

Funding: City funds/State/Federal grant

Estimated Cost: \$300,000 to \$600,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: South Weber City

Wildland Fire - Problem Identification: A significant portion of South Weber City is considered to be in the wildland urban interface.

Goal: Reduce the threat of wildfire damage in the city.

Objective (Priority MEDIUM): Fuels mitigation.

Action 1: Work in tandem with homeowners to remove fuels and create fire breaks.

Time Frame: unknown

City Goals - Davis Co PDMP

Funding: City funds, private property owners

Estimated Cost: varies

Staff: Fire Department, Parks Department

Jurisdictions: South Weber City

Dam Failure - Problem Identification: If the East Canyon Dam were to break, it may cause flooding in South Weber. The dam is located approximately 28 miles upstream as a feeder into the Weber River. The likelihood that flood waters would overtop the existing banks of the river by the time it reached South Weber is very low. However, the mitigation is the same as for Flooding below because the source of the flooding in both scenarios is the Weber River.

Goal: Reduce the threat of dam failure damage in the city.

Objective (Priority MEDIUM): Prevent flooding along the south side of I-84 (in the lower lying areas) from the Stake & Parson Companies Gravel Pit west until the Riverdale City boundary.

Action: Build a berm around the Staker & Parsons Co. gravel pit at an elevation higher than the banks of the river adjacent to the Weber River in that area.

Time Frame: unknown

Funding: City funds/State/Federal grant

Estimated Cost: \$300,000 to \$600,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: South Weber City

Severe Weather- Problem Identification: The City is at the mouth of Weber Canyon which produces continual moderate winds, but has the potential at times of very high winds. High winds from the east are also possible in general along the whole mountainside area.

Goal: Reduce the threat of severe weather damage in the city.

Objective 1 (Priority MEDIUM): To secure critical infrastructure.

Action: Put an emergency backup generator at Church St. pump station.

Time Frame: 2022-2023

Funding: City funds

Estimated Cost: \$98,000

Staff: Public Works, Engineer, etc.

Jurisdictions: South Weber City

Objective 2 (Priority MEDIUM): To minimize debris and potential compromised access for emergency vehicles due to fallen trees across streets.

Action: Work in tandem with homeowners to trim or remove tall trees that are susceptible to falling over and causing damage to homes, other facilities or across streets.

Time Frame: unknown

City Goals - Davis Co PDMP

Funding: City funds, private property owners

Estimated Cost: minimal

Staff: Public Works

Jurisdictions: South Weber City

Landslide - Problem Identification: With South Weber being located at the foothills of the Wasatch Range in Davis County, landslides are possible.

Goal: Mitigate the effects of landslides.

Objective (Priority LOW): Creating a plan to study areas where landslides may occur.

Action: Discuss using GIS Mapping or other means to determine where landslides may occur.

Time Frame: Unknown, depending on funding

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, GIS, etc.

Jurisdictions: South Weber City

Sunset City

Background

Sunset is a city in Davis County, Utah, United States. It is part of the Ogden–Clearfield, Utah Metropolitan Statistical Area. The population was 5,122 at the 2010 census. Sunset emerged as a distinct place in 1916. Sunset is located in northern Davis County. It is bordered by Hill Air Force Base to the east, Clearfield to the south, Clinton to the west, and Roy in Weber County to the north.

Community Buildings and Infrastructure Status

According to the United States Census Bureau, the city of Sunset has a total area of 1.3 square miles, all of it land. Sunset is the smallest community in Davis County and as such does not often have the financial capabilities of larger communities. Nonetheless, Sunset makes critical and essential infrastructure projects a top priority. These projects are handled as funding, personnel, and resources are available.

Specific Community Hazards

- **Earthquake.** Sunset's proximity to the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** Sunset is susceptible to flooding from runoff and storm events.

CRITICAL AREA FACILITIES + INFRASTRUCTURE

City Goals - Davis Co PDMP

Facility	Hazard / Risk	Mitigation
Pump Stations	No culinary water	Back-up generator
Major sewer trunk lines	Backup/flooding/health	Regular maintenance
Culinary water well	No culinary water	Back-up generator
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication; vehicles; day to day functions	TBD
Public Works Building	Loss/damage to response equipment/supplies/materials	TBD
Fire Station	Loss/damage to response equipment	TBD
IT Network and Server	Loss of communications	Enhance security
EOC	Loss of operability for EOC	TBD
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City-wide detention basin (16.5 acres)	Flooding	Dredge & de-silt / clean outlet control structures
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Highway 126 (Main St)	Destruction, evacuation, and response concerns	Maintain
2300 North	Destruction, evacuation, and response concerns	Maintain
1800 North	Destruction, evacuation, and response concerns	Maintain

City Goals - Davis Co PDMP

800 North	Destruction, evacuation, and response concerns	Maintain
-----------	------------------------------------------------	----------

Mitigation Efforts Since the 2016 Plan

- The City has maintained a capital improvements program to guide its infrastructure investments every year since 2016. One of core principles that help the city prioritize their projects is the impact to public safety and emergency preparedness.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Public facilities may not meet seismic standards due to age of structure.

Goal: Reduce the threat of earthquake damage in the city.

Objective (Priority MEDIUM): Develop critical facilities.

Action 1: Build a new Public Works shop.

Time Frame: 2023-2029

Funding: City funds/State/Federal grant

Estimated Cost: \$1.5 million

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Sunset City

Action 2: Build a new Fire Station.

Time Frame: 2023-2029

Funding: City funds/State/Federal grant

Estimated Cost: \$1.5 million

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Sunset City

Flooding - Problem Identification: 450 W from 2137 N to 2300 N these properties are lower than the roadway. During periods of heavy rains the water will go over the curb and sidewalk towards the homes.

Goal: Reduce the threat of flooding damage in the city.

Objective (Priority HIGH): Install stormwater catch basins to catch the water flow before it has a chance to accumulate to the point of overflow.

Action 1: Engineer the new catch basins to ensure water is taken care of.

Time Frame: 2022

Funding: City funds

Estimated Cost: \$100,000

City Goals - Davis Co PDMP

Staff: Public Works, Engineer

Jurisdictions: Sunset City

Dam Failure - Problem Identification: Multiple water containment systems located throughout Sunset City are aging and present the potential for failure in the future.

Goal: Reduce the threats associated with dam failures.

Objective (Priority MEDIUM): Educate citizens within the possible flood areas of dams with information about flooding and other dam failure hazards.

Action: Provide citizens with information as necessary.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Sunset City

Severe Weather - Problem Identification: Severe weather (rain, snow, wind, lightning, ect.) is a possibility in Sunset City.

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

Jurisdictions: Sunset City

Syracuse City

Background

Syracuse City is located 30 miles north of Salt Lake City, UT. The city footprint covers 9.5 sq. miles.

Since 2000 the city's population has more than tripled with a current population of 31,458. Syracuse has many young working families as well as older native residents. The commercial base continues to develop, with the addition of a new sixty-acre industrial park, and the planned construction of the West Davis Highway..

City Goals - Davis Co PDMP

Due to the growth in Davis County, one new highway project (State Highway 193), has recently been completed, and another (the West Davis Corridor) is in the construction phase with an expected completion in 2023..

Syracuse City proper has all of the amenities of a suburban community, including: City Hall, Syracuse Justice Court, Syracuse Public Safety Department, six elementary grade schools, two Jr. High (secondary) Schools, and Syracuse High School. Syracuse City also offers gas stations, grocery stores, restaurants, office buildings, medical and dental practices, childcare facilities, one of the largest indoor fun centers in the state, and various other types of businesses.

Syracuse City is also home to the North Davis Sewer District which processes sewer for over 200,000 people in Davis County. The sewer district and public utilities like culinary water, natural gas, and electricity distribution, are considered as critical infrastructure within the community.

If impacted by disaster, the loss of this infrastructure would result in significant economic impact, and potentially the loss of life.

Syracuse operates under a six-member council form of government, with an elected Mayor and five Council Members. The day-to-day operations and the majority of executive authorities are delegated to a City Manager, who works closely with the Mayor to ensure a continuous performance of all city operations.

City operations include 24-7 police, fire, and public works departments, a municipal court, water, streets, stormwater evacuation, snow removal, community development, and parks and recreation programming. Emergency management and pre-disaster mitigation responsibilities are coordinated by the Syracuse City Manager.

Specific Community Hazards

- **Earthquake.** Syracuse proximity to the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** Syracuse is located west of the Wasatch Mountain Front, and just East of the Eastern shore of the Great Salt Lake. Flooding from heavy rain that overwhelms storm drainage systems and impacts sewer and water infrastructure is a potential hazard, as well as flooding from rising lake levels or seismic events caused by earthquakes.
- **Severe Weather.** Syracuse City is west of the Wasatch Mountain Range where several downslope and canyon wind events have potential for property damage.
- **Chemical Spill.** Syracuse City is adjacent to the North Davis Wastewater Treatment Facility, which uses extremely hazardous chemicals. These chemicals are routinely delivered by truck to the facility via Syracuse City streets.
- **Water System Contamination.** Syracuse City operates its own culinary water well, and has heavy construction activity as it grows. This growth requires frequent connections into the City’s water system and presents opportunities for error and cross-contamination.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation

City Goals - Davis Co PDMP

Streets / Transportation	Earthquake; Destruction/disruption of system	Regular Maintenance
Culinary Water System	Earthquake; Contamination	Planned Upgrades
Sanitary Sewer	Earthquake	Regular Maintenance
Electrical Grid – (Rocky Mountain Power)	Earthquake / Wind	Back-up Generators for critical infrastructure
Natural Gas Grid – (Dominion Energy Gas)	Earthquake / Flood	Explore Alternative Fuel Sources for critical infrastructure
North Davis Sewer District Major Facilities and Sewer Lines	Earthquake / Chemical Spill	Pre-planning, regular updates
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication vehicles; day to day functions	Explore Back-up of records Off- site
Police Department	Loss of vital police records; impact to day to day functions	Explore Satellite Station Feasibility/Need
Fire Department	Reduced Ability to Respond	Explore Satellite Station Feasibility/Need
Public Works Building	Loss/damage to response equipment	N/A
Community Center	Loss of Sheltering Ability and Volunteer Response	Explore Alternate Sheltering options
IT Network and Server	Loss of communications	Enhance security
EOC (Fire Station)	Loss of operability for EOC	Equip secondary location for use as EOC
Museum	Loss of artifacts	Improve storage
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation

City Goals - Davis Co PDMP

Stormwater Retention Basins	Flooding	Routine maintenance.
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Antelope Drive	Destruction, evacuation and response concerns	State Highway
Highway 193	Destruction, evacuation and response concerns	State Highway
Bluff Road	Destruction, evacuation and response concerns	Maintain
700 South	Destruction, evacuation and response concerns	Maintain
2700 South (Gordon)	Destruction, evacuation and response concerns	Maintain
3700 South (Gentile)	Destruction, evacuation and response concerns	Maintain
1000 West	Destruction, evacuation and response concerns	Maintain
2000 West	Destruction, evacuation and response concerns	State/City Maintain
3000 West	Destruction, evacuation and response concerns	Maintain

Mitigation Efforts Since the 2016 Plan

- Syracuse has updated the City Emergency Operations Plan (EOP), and created an Disaster Preparedness Committee that meets monthly.
- Syracuse has installed back-up generators for all public buildings, including Police, Fire, Public Works, Community Center (shelter), and Administration. This will enable efforts to maintain services during long-term power outages or other infrastructure emergencies.
- Syracuse City has constructed a 3 million gallon water tank to accommodate new growth and better provide culinary water availability.
- Syracuse City has created a part-time Emergency Management Coordinator position to help facilitate EOC training and improvements to City readiness.
- Syracuse City has replaced several miles of older water, sewer, storm drain, and street infrastructure with newer materials with better seismic standards.

City Goals - Davis Co PDMP

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities may not meet seismic standards. Due to geography, liquefaction may occur.

Goal: Maximize resiliency of functions provided by critical facilities

Objective (Priority MEDIUM): Retrofit facilities to seismic standards and provide alternate means to provide functionality where possible.

Action 1: Syracuse City has an ongoing, annual program of replacing aging sewer, water, pipe, which is very susceptible to earth movement, with PVC pipe, which is better able to withstand earth movement caused by a seismic event.

Time Frame: ongoing

Funding: City funds

Estimated Cost: \$250,000/mile

Staff: Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 2: Provide remote working and communication ability for staff, which will be necessary if City buildings are rendered unusable.

Time Frame: ongoing

Funding: City funds/State/Federal grant

Estimated Cost: Unknown, but feasible

Staff: Administration

Jurisdictions: Syracuse City

Goal: Mitigation against effects of earthquakes like loss of life and homes.

Objective (Priority LOW): Making information available to citizens on safety techniques to follow before, during, and after an earthquake.

Action: Provide information to the public about ways to protect themselves and their belongings during an earthquake.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Flooding - Problem Identification: Syracuse City is established in western Davis County near the Bluff of the Great Salt Lake which may be subject to flooding in severe storm events or earthquake-caused wave events. Upstream drainage has potential to exceed capacity, resulting in thousands of dollars in damages. Ongoing maintenance of these drainage canals and pipelines by the City will continue to mitigate this threat.

City Goals - Davis Co PDMP

Goal: Maximize capacity to manage flood events

Objective (Priority MEDIUM): Upgrade and maintain drainage systems.

Action 1: Annually inspect and remove debris in stream channels and detention basins and storm drains.

Time Frame: Annually

Funding: City funds

Estimated Cost: minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 2: Stormwater Master Plan includes design to connect and activate the 4000 West Outfall Project (60-inch diameter storm-water pipeline on the city's South side) that terminates along the Bluff into the Great Salt Lake.

Time Frame: 2025

Funding: City funds

Estimated Cost: \$300,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 3: Coordinate with the State of Utah on the ongoing Great Salt Lake floodplain delineation study.

Time Frame: ongoing

Funding: State and Federal Funds

Estimated Cost: Unknown

Staff: Public Works, Engineer, etc.

Jurisdictions: Syracuse City and State of Utah

Wildland Fire - Problem Identification: A significant portion of Syracuse City meets a natural environment to the west where an urban/wildland interface is created.

Goal: Mitigate the impact of wildfires in high-threat areas.

Objective (Priority MEDIUM): Including considerations of wildfire hazards in land use, public safety, and other elements of the comprehensive plan.

Action: In future city plans, encourage the mitigation of wildfires.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, Community Development, Building Department, etc

City Goals - Davis Co PDMP

Jurisdictions: Syracuse City

Severe Weather - Problem Identification: Syracuse City is down-slope of the Wasatch Mountain Range where seasonally strong winds have caused damage to structures and the urban forest.

Goal: Maximize community resiliency to high-wind events

Objective (Priority MEDIUM): Building Code Enforcement

Action 1: Work in tandem with project developers and homeowners to follow standardized codes and maintain structural integrity of commercial and residential buildings.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 2: Create a public service campaign to inform residents about tree species and varieties that are more likely to endure high wind events without failure, causing damage to utilities, landscape and buildings.

Time Frame: Ongoing

Funding: City funds, local volunteers

Estimated Cost: minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Multi-Hazards - Problem Identification: City-wide communications infrastructure is vulnerable, creating a need to mitigate failure of communications abilities during various types of disasters.

Goal: Maximize ability to communicate during various types of disasters

Objective (Priority MEDIUM): Update and maintain existing communications infrastructure, and mitigate the impacts of damaged communications facilities during various types of disasters.

Action 1: Ensure cellular-based devices are updated

Time Frame: Ongoing

Funding: City funds

Estimated Cost: minimal

Staff: City Administration

Jurisdictions: Syracuse City

Action 2: Update satellite-based communications equipment

Time Frame: 2025

City Goals - Davis Co PDMP

Funding: City funds

Estimated Cost: \$3,000 per year

Staff: Administration

Jurisdictions: Syracuse City

Action 3: Update radio equipment

Time Frame: 2025

Funding: City funds, state/federal grants

Estimated Cost: \$15,000

Staff: Administration, Public Safety

Jurisdictions: Syracuse City

Action 4: Maintain relationships and conduct training with community-based emergency organizations.

Time Frame: Ongoing

Funding: City, state/federal assistance

Estimated Cost: minimal

Staff: Administration

Jurisdictions: Syracuse City

West Bountiful City

Background

West Bountiful was first located in 1848 when pioneers made their way into the territory. It was incorporated as a town on January 28, 1949. The City is located about eight miles north of Salt Lake City and twenty-nine miles south of Ogden.

West Bountiful is a City of the fifth class and operates under a six-council member form of government, with an elected Mayor and five Council Members. The day-to-day operations are delegated to a City Administrator, who works hand-in-hand with the Mayor to ensure all city operations are well-run. City operations include a 24-7 police department, water, garbage/recycling, streets, storm water, snow removal, community development, and an Arts Council. West Bountiful City is part of the South Davis Fire District which provides fire protection. Emergency management and pre-disaster mitigation responsibilities are coordinated by the West Bountiful City Police Department in partnership with local citizens that are appointed to the Emergency Preparedness Advisory Committee (EmPAC). Sanitary Sewer services are provided by the South Davis Sewer District. Animal Care and Control services are provided by Davis County.

Community Buildings and Infrastructure Status

The 5300 residents enjoy a quiet, rural, equestrian lifestyle. Many opportunities for cultural events are provided through a monthly concert series and arts displays. Major events include 4th of July celebration, Founders' Day celebration, and special activities for Halloween, Easter and Christmas. The City benefits

City Goals - Davis Co PDMP

from a vibrant commercial district along 500 West between 400 North and 500 South, with a variety of goods and services from restaurants and deli's to home improvement and savings club businesses. The FrontRunner commuter rail has been running since April 2008, and the Legacy Parkway was opened in 2008. These were built to help alleviate the traffic load on Interstate 15 through the West Bountiful area. West Bountiful is a gateway community to Salt Lake County for travelers going south on I-15 and Legacy Parkway.

Specific Community Hazards

- **Earthquake.** West Bountiful's proximity to the mountains and the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** West Bountiful is located along the Wasatch Mountain Front. City facilities, trails, and homes sustained significant damage during the 1983 flooding disaster.
- **Severe Weather.** West Bountiful is subject to high winds. December, 2011 West Bountiful was subjected to extreme winds that caused significant damage to houses, trees, and other infrastructure.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
500 South Water Tank	Water contamination, flooding, tank failure	New main line connection into tank. New main line from tank into West Bountiful
400 North Water Tank	Water contamination, flooding, tank failure	New main line from tank into West Bountiful
Bountiful Water Connection	Line Failure	
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication vehicles; day to day functions	Transfer paper records to digital and secondary backup off site. Update heavy equipment.
Police Department	Loss of vital police records; impact to day to day functions	Update servers and security.
Public Works Building	Loss/damage to response equipment	Developing plans to construct a new maintenance yard.
IT Network and Server	Loss of communications, Cyber Attacks	Enhance security, Contract with professional IT Services, new servers.

City Goals - Davis Co PDMP

EOC	Loss of operability for EOC	Equip EOC; Preplanned secondary EOC and mobile EOC Trailer with equipment
Main Generator for City Office	Loss of power for critical operations	Enhance security and maintenance.
South Metro Davis Fire - Station #81	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #82	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #83	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #84	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #85	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Storm Water Ditches	Flooding	Dredge and de-silt
Storm Water Lines	Flooding	New lines in many areas of city
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
500 South	Destruction, evacuation and response concerns	N/A
400 North	Destruction, evacuation and response concerns	New road from 800 West to 1100 West
1100 West	Destruction, evacuation and response concerns	Proper maintenance, chip seal etc
800 West	Destruction, evacuation and response concerns	New areas a road and proper maintenance.
Pages Lane	Destruction, evacuation and response concerns	New road, curb and gutter, and below ground infrastructure

City Goals - Davis Co PDMP

Mitigation Efforts Since the 2016 Plan

- West Bountiful City is updating the City Emergency Operations Plan (EOP).
- West Bountiful City created the Emergency Preparedness Advisory Committee (EmPAC). West Bountiful City assigned the city's emergency planning to the police department.
- West Bountiful City purchased a mobile trailer that was converted into a mobile command trailer. West Bountiful City purchased new vehicle and handheld police radios to replace outdated equipment and bring the radios into compliance with projected UCA changes.
- West Bountiful City has purchased secondary radios for police, public works, and CERT. West Bountiful City has started to store water and food supplies for city incident command. West Bountiful City increased emergency preparedness training, eg. Spontaneous Volunteer Management.
- West Bountiful City takes part in emergency drills, eg. The Utah Great Shake-Out.
- West Bountiful's CERT works in conjunction with the city government and has a representative on the EmPAC board.
- West Bountiful City purchased a new backhoe and loader that will be used in the event of a disaster.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities do not meet seismic standards. Water tanks supplying water to the city.

Goal: Reduce the threat of earthquake damage in the city.

Objective (Priority HIGH): Replace main water line from 500 South water tank to city. Replace aging water lines supplying water to the city. Replace Questar gas lines that supply gas to the city.

Action 1: Replace main water line from 500 South water tank to the City.

Time Frame: 2021

Funding: City / Holly Refining

Estimated Cost: \$1.0 million

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: West Bountiful City

Action 2: Replace aging high pressure gas lines which serve a large portion of West Bountiful City (by Questar Gas). These gas lines cross several fault traces, and are subject to failure in the event of fault movement or a reasonably expected seismic event.

Time Frame: ongoing

Funding: City funds

Estimated Cost: unknown

Staff: City / Questar

Jurisdictions: West Bountiful City

City Goals - Davis Co PDMP

Action 3: West Bountiful City has an ongoing, annual program of replacing aging cast iron culinary water pipe, which is very susceptible to earth movement, with flexible PVC pipe, which is better able to withstand earth movement caused by a seismic event.

Time Frame: ongoing

Funding: City funds

Estimated Cost: \$500,000/yr

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: West Bountiful City

Flooding - Problem Identification: West Bountiful City is traversed by several canals which may be subject to flooding in severe storm events. These canals overtopped their banks in the 1983 flood disaster, resulting in thousands of dollars in damages. Significant funding following the 1983 flooding greatly reduced flood vulnerability in those areas. Ongoing maintenance of these floodways by the county will continue to mitigate this threat.

Goal: Reduce the threat of flooding damage in the city.

Objective (Priority HIGH): Maintain identified flood threat areas.

Action: Annually inspect and remove debris in stream channels and debris basins.

Time Frame: annual

Funding: City funds

Estimated Cost: minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: West Bountiful City

Multi-Hazards - Problem Identification: West Bountiful City's emergency operations plan is in the process of being updated.

Goal: Reduce the threat of wildfire damage in the city.

Objective (Priority HIGH): Improve communications, mitigate the impacts of and be prepared for emergency situations and hazards.

Action: Update Emergency Operations Plan.

Time Frame: 2022

Funding: City funds / federal

Estimated Cost: unknown

Staff: City Administration, Police, Public Works, Engineer, EmPAC, etc.

Jurisdictions: West Bountiful City

City Goals - Davis Co PDMP

Wildland Fire - Problem Identification: A significant portion of West Bountiful City meets only a natural environment to the northwest where an urban/wildland interface is created.

Goal: Mitigate the impact of wildfires in high-threat areas.

Objective (Priority LOW): Including considerations of wildfire hazards in land use, public safety, and other elements of the comprehensive plan.

Action: In future city plans, encourage the mitigation of wildfires.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, Community Development, Building Department, etc

Jurisdictions: West Bountiful City

Dam Failure - Problem Identification: Water containment systems located throughout West Bountiful are aging and bring the possibility to fail in the future.

Goal: Mitigate effects of dam failures by the education of the public.

Objective (Priority MEDIUM): Reduce damage to life and property by educating the population on the possible effects of dam failures.

Action: Provide the public with information about flash flooding and dam failures.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: West Bountiful City

Severe Weather - Problem Identification: West Bountiful City is susceptible to severe weather (rain, snow, wind, lightning, ect.)

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

City Goals - Davis Co PDMP

Staff: Community Development, Building Department, etc.

Jurisdictions: West Bountiful City

Holly Frontier Refinery - Problem Identification: Potential Fire, Explosion, Chemical Leak.

Goal: Continue a good working relationship with Holly to include quality communication and collaboration on projects that affect the city.

Objective (Priority HIGH): Mitigate potential fire and explosion damage.

Action: Replace main waterline on 500 South to improve water flow to the refinery in the event of fire or explosion.

Time Frame: 2021

Funding: Holly Refining

Estimated Cost: \$500,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: West Bountiful City

Landslide - Problem Identification: West Bountiful City is located in the foothills, therefore landslides are possible.

Goal: Mitigate the effects of landslides.

Objective (Priority LOW): Creating a plan to study areas where landslides may occur.

Action: Discuss using GIS Mapping or other means to determine where landslides may occur.

Time Frame: Unknown, depending on funding

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, GIS, etc.

Jurisdictions: West Bountiful City

West Point City

Background

West Point is a city in Davis County, Utah, United States. It is part of the Ogden–Clearfield, Utah Metropolitan Statistical Area. The population was 9,511 at the 2010 census, up from 6,033 at the 2000 census. The estimated population in 2014 was 10,204. The city has experienced quick growth centered primarily around single-family residential construction.

City Goals - Davis Co PDMP

West Point is located along the eastern shoreline of the Great Salt Lake, and an extensive network of wetlands is strung along the western boundaries. These areas are essential to migrating birds. The cities of Clinton and Hooper are located to the north, Clearfield is to the east, and the city of Syracuse is to the south.

Community Buildings and Infrastructure Status

West Point is a fast growing community with many newer facilities and homes. The city of West Point has taken great care in ensuring the infrastructure of the city is being constructed safely and using sound practices. Older infrastructure is cared for as needed and newer projects are held to the highest of development standards. West Point is dedicated to the safety and security of its employees, visitors, and residents and will continue to explore resources, partnerships, funding, and personnel to make such projects successful.

Specific Community Hazards

- **Earthquake.** West Point’s proximity to the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** West Point is susceptible to flooding from runoff and storm events.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Water Tanks	No culinary water	Shut off valve(s)
Pump Stations	No culinary water	Back-up generator
Major sewer trunk lines	Backup/flooding/health	Regular maintenance
Culinary water well	No culinary water	Back-up generator
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication; vehicles; day to day functions	TBD
Public Works Building	Loss/damage to response equipment/supplies/materials	TBD
Fire Station	Loss/damage to response equipment	TBD

City Goals - Davis Co PDMP

IT Network and Server	Loss of communications	Enhance security
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Stormwater Ditches	Flooding	Dredge and de-silt
Detention basins	Flooding	Dredge & de-silt / clean outlet control structures
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
West Davis Corridor (proposed)	n/a	n/a
2000 West (SR-108)	Destruction, evacuation and response concerns	Maintain
300 North	Destruction, evacuation and response concerns	Maintain
800 North	Destruction, evacuation and response concerns	Maintain
4500 West	Destruction, evacuation and response concerns	Maintain

Mitigation Efforts Since the 2016 Plan

- The City has maintained a capital improvements program to guide its infrastructure investments every year since 2016. One of core principles that help the city prioritize their projects is the impact to public safety and emergency preparedness.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities may not meet seismic standards. Due to geography, liquefaction may occur.

Goal: Reduce the threat of earthquake damage in the city.

Objective 1 (Priority HIGH): Make sure the City is up-to-date with building codes.

Action: Adopt and enforce updated building code provisions to reduce earthquake damage risk.

Time Frame: 2022

City Goals - Davis Co PDMP

Funding: City funds

Estimated Cost: unknown

Staff: City Inspector

Jurisdictions: West Point City

Objective 2 (Priority HIGH): Know what locations within the City are most vulnerable to seismic events.

Action: Use GIS to map hazard areas, at-risk structures, and associated hazards to assess high-risk areas, and then offer the mapping online for residents and design professionals.

Time Frame: unknown

Funding: unknown

Estimated Cost: unknown

Staff: Public Works, City Engineer

Jurisdictions: West Point City

Objective 3 (Priority HIGH): Have an educated citizenry when it comes to earthquake protocol.

Action: Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses, and educate homeowners on safety techniques to follow during and after an earthquake.

Time Frame: ongoing

Funding: City

Estimated Cost: unknown

Staff: Administration

Jurisdictions: West Point City

Flooding - Problem Identification: The City has many Sewer and Storm Drain Manholes that often get filled with debris which could potentially cause flooding.

Goal: Reduce the threat of flooding damage in the city.

Objective (Priority MEDIUM): Maintain Sewer and Storm Drain Manholes.

Action: Annually inspect and remove debris in city sewer and storm drain manholes.

Time Frame: annual

Funding: City funds

Estimated Cost: minimal

Staff: Public Works

Jurisdictions: West Point City

City Goals - Davis Co PDMP

Severe Weather - Problem Identification: West Point is susceptible to severe weather (rain, snow, wind, lightning, ect.)

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

Jurisdictions: West Point City

Multi-Hazards - Problem Identification: West Point City has had traces of Chloroform in the water in recent months and the Chlorine residuals are perpetually low.

Goal: Position the city to provide better support in multi-hazard situations.

Objective 1 (Priority HIGH): Maintain the City water to State Standards.

Action: Add Chlorine Booster to the Water System.

Time Frame: 2022

Funding: City funds

Estimated Cost: \$30,000

Staff: Public Works, City Engineer

Jurisdictions: West Point City

Objective 2 (Priority HIGH): Have AEDs available in case of emergency in public places.

Action: Acquire seven AEDs, one for each park, the Municipal Building, the Public Works Building, and two portables for the Public Works Director and the Recreation Director.

Time Frame: 2022

Funding: unknown

Estimated Cost: \$14,000

Staff: Public Works Department

Jurisdictions: West Point City

Objective 3 (Priority HIGH): The City has not adopted an emergency management plan. Improve communications, mitigate the impacts of and be prepared for emergency situations and hazards.

Action: Finalize and adopt an Emergency Management Plan.

Time Frame: 2022

City Goals - Davis Co PDMP

Funding: unknown

Estimated Cost: unknown

Staff: City Administration

Jurisdictions: West Point City

Objective 4 (Priority MEDIUM): Maintain City fire hydrants.

Action: Annually inspect all City fire hydrants to ensure proper water pressure.

Time Frame: Annually

Funding: City

Estimated Cost: unknown

Staff: Public Works Department

Jurisdictions: West Point City

Objective 4 (Priority MEDIUM): Reduce hazards by completing risk assessments.

Action: When new construction is being proposed, consider the use of a risk assessment to identify possible hazards, risks, and disasters.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: Public Works, City Engineer

Jurisdictions: West Point City

Woods Cross City

Background

Woods Cross City is a community located in Davis County along the valley of the Wasatch Range. With a population of about 11,500 and approximately 2,800 households, Woods Cross offers a variety of housing options for commercial and industrial businesses with access to I-15 and Legacy Parkway for commuters close to Salt Lake City.

Although a part of the Ogden-Clearfield Metropolitan Statistical Area, it serves as a bedroom community to Salt Lake City and the surrounding area. However, due to the very narrow entrance into Salt Lake County, roads between the foothills and wetlands often reach near-gridlock traffic during rush hour.

The FrontRunner commuter rail has been running since April 2008, and the Legacy Parkway was opened in 2008. These facilities have helped alleviate the traffic load on Interstate 15 through the South Davis County Area. Woods Cross occupies an area of approximately six square miles.

Woods Cross City operates with an elected Mayor and five Council Members. The day-to-day operations and the majority of executive authorities are delegated to a City Administrator, who works

City Goals - Davis Co PDMP

hand-in-hand with the Mayor and Council to ensure all city operations are well-run. City operations include a 24-7 police department, a municipal court, water, garbage/recycling, street, stormwater, snow removal, community development, and parks facilities. Woods Cross City is part of the South Davis Fire District which provides fire protection. Emergency management and pre-disaster mitigation responsibilities are coordinated by the City Administrator. Woods Cross has many 24/7 services including a municipal police department. Fire services are handled by South Davis Metro Fire District.

Community Buildings and Infrastructure Status

Woods Cross takes great pride in its city and residents. Woods Cross focuses a good deal of attention each year to maintaining and upgrading essential services and critical infrastructure. Woods Cross ensures they are utilizing the highest standards of health and safety in these projects bringing their to city the highest of 2021 standards. Woods Cross plans to continue this trend as funding, resources, and personnel allow.

Specific Community Hazards

- **Earthquake:** Woods Cross City’s proximity to the Wasatch Fault puts it at a high risk of earthquake damage.
- **Flooding:** Woods Cross City is located along the eastern edge of the Great Salt Lake wetlands thus making the ground water suitable to many locations.
- **Landslides:** Homes in a specific geographical area experience substantial settlement issues after many years of being constructed.
- **Wildland Fire:** Western portion of Woods Cross City borders a nature preserve scenic by way and trail which has a potential for wildfires.
- **Severe Weather:** Woods Cross City lies on the western edge of the Wasatch from which have severe down slope wind events.
- **Railways:** Two major railroad tracks and an industrial rail track cross through the community.
- **Chemical Release:** Three petroleum facilities reside within Woods Cross City and others in very close proximity make probability of explosions or air contamination.
- **Pipeline:** Woods Cross City has 12 pressure petroleum pipelines that run through the city in roughly one mile wide corridor which encompass the majority of the City.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Wells #3, #4 & #5	Water contamination Low water level Power loss	Proper source protection SCADA Monitoring Standby generators. Complete
Storage reservoirs	Water Contamination Earthquake	Proper security control Design & constructed for earthquake. In process

City Goals - Davis Co PDMP

Treatment Plant	Earthquake Power loss	Designed & constructed for earthquake standby generator. Complete
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication vehicles; day to day functions	Backup of vital records and storage
Police Department	Loss of vital police records; impact to day to day functions	Backup of vital records and storage
Public Works Building	Loss/damage to response equipment	Relocate and construct a new facility to meet earthquake standards.
IT Network and Server	Loss of communication	Enhance security. In process
EOC	Loss of operability for EOC	Complete connection to fiber/analog lines: develop second EOC location Second Location Complete
Standby Generator for City Office and Water system facilities	Loss of power for critical operations	Enhance security; proper maintenance of generators In Process
South Metro Davis Fire - Station #81	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #82	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #83	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #84	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
South Metro Davis Fire - Station #85	Loss/damage to response apparatus/personnel	Enhance structural earthquake resiliency
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
1500 South & 1950 South Detention basins	Flooding: excessive rainfall overflowing banks	Downstream protection of property

City Goals - Davis Co PDMP

ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
1500 South	Destruction, evacuation and response concerns, bridge collapse, train derailment	UDOT rebuilt I-15 bridge in 2014
800 West	Destruction, evacuation and response concerns	
1100 West	Destruction, evacuation and response concerns, train derailment	
Redwood Road	Destruction, evacuation and response concerns	
2600 South	Destruction, evacuation and response concerns, train derailment, bridge collapse	UDOT rebuilt I-15 bridge in 2014

Mitigation Efforts Since the 2016 Plan

- Woods Cross City has updated the City Emergency Operations Plan (EOP)
- Drinking Water Well drilled and equipped with standby power - \$1.5 million
- 3.1 million gallon reservoir designed and constructed for earthquake resilience - \$3 million
- 2,000 gpm Water Treatment Facility - \$5 million
- Upgrade to radio system with additional frequencies for city to district's communication - \$5,000
Air monitoring equipment set up within the City - Business paid approximately \$100,000 to Health Department for implementation
- Woods Cross Public Works Mutual Aid Agreements – UTWARN and UPWEMA

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Public Works facility does not meet seismic standards.

Goal: New Public Works Building Built and completed in 2023

Objective (Priority HIGH): Retrofit facilities to seismic standards.

Action 1: Construct a new Public Works Facility.

Time Frame: 2022-2023

Funding: City funds, utility fees

Estimated Cost: \$6.5 million

Staff: City Administration, Public Works

City Goals - Davis Co PDMP

Jurisdictions: Woods Cross City

Action 2: Replace Aging Waterlines.

Time Frame: annually

Funding: City funds, utility fees

Estimated Cost: \$300,000/yr

Staff: Public Works, Engineering

Jurisdictions: Woods Cross City

Flooding - Problem Identification: Basement flooding.

Goal: City Development ordinance adopted pertaining to water elevations

Objective (Priority HIGH): Determine elevations of high water elevations. Establish benchmarks for surveyor to utility.

Action: Set lowest dwellable elevation and benchmarks.

Time Frame: 2021

Funding: City funds

Estimated Cost: \$10,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Woods Cross City

Wildland Fire - Problem Identification: Fire potential areas are located in the city limits.

Goal: Reduce the threat of wildfire damage in the city.

Objective (Priority LOW): Fuel mitigation.

Action 1: Maintain a reduction of fuel along the trail system.

Time Frame: annually

Funding: City funds

Estimated Cost: \$5,000

Staff: Public Works

Jurisdictions: Woods Cross City

Action 2: Participate with South Davis Metro Fire District on a Community Wildfire Protection Plan.

Time Frame: 2022

Funding: Woods Cross City, South Davis Metro Fire District

Estimated Cost: \$10,000

Staff: City Administration, City Citizen Corp Council, Fire District

City Goals - Davis Co PDMP

Jurisdictions: Woods Cross City, South Davis Metro Fire District

Objective (Priority MEDIUM): Including considerations of wildfire hazards in land use, public safety, and other elements of the comprehensive plan.

Action: In future city plans, encourage the mitigation of wildfires.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, Community Development, Building Department, etc

Jurisdictions: Woods Cross City

Dam Failure - Problem Identification: Many water containment systems are located in the area and they each have the potential to fail, which would affect Woods Cross.

Goal: Prevent dam failures.

Objective (Priority MEDIUM): Provide citizens within the flood area of dams with information on flash flooding.

Action: When requested, provide citizens with information on flash flooding.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Woods Cross City

Landslide - Problem Identification: Several homes in the city have experienced substantial settlement.

Goal: Established CDBG grants to help residents with subsidence. (Ongoing).

Objective (Priority MEDIUM): Conduct an analysis of why this is occurring and seek to discover mitigation solutions.

Action: Continue with residential inquiries, monitoring and evaluations of existing established benchmarks and boring.

Time Frame: 2021-2023

Funding: City funds

Estimated Cost: \$50,000

Staff: City Staff, consultants

Jurisdictions: Woods Cross City

City Goals - Davis Co PDMP

Goal: Mitigate the effects of landslides by conducting studies.

Objective (Priority LOW): Creating a plan to study areas where landslides may occur.

Action: Discuss using GIS Mapping or other means to determine where landslides may occur.

Time Frame: Unknown, depending on funding

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, GIS, etc.

Jurisdictions: Woods Cross City

Multi-Hazards - Problem Identification: Lack of electronic storage and communication equipment that is vulnerable.

Goal: Performed an RFP for IT services and hire ETS to upgrade and secure Servers, computers and phones

Objective (Priority MEDIUM): Improve storage capacity and duplicate critical communication as needed for operations.

Action 1: Develop a team to assess the need and determine critical components.

Time Frame: 2023

Funding: City funds

Estimated Cost: \$1,000

Staff: City Staff

Jurisdictions: Woods Cross City

Action 2: Enhance the storage and communication equipment.

Time Frame: 2024

Funding: City funds

Estimated Cost: \$10,000

Staff: City Staff

Jurisdictions: Woods Cross City

Railways - Problem Identification: Potential for HAZMAT spill.

Goal: Continual

Objective (Priority MEDIUM): Train on hazardous material response.

Action: First responder training.

Time Frame: annually

City Goals - Davis Co PDMP

Funding: state/federal grants

Estimated Cost: unknown

Staff: South Davis Metro Fire

Jurisdictions: Woods Cross City, South Davis Metro Fire

Chemical Release - Problem Identification: Air quality impacts from chemical/petroleum releases.

Goal: Reduce the threat of chemical release damage in the city.

Objective (Priority MEDIUM): Educate the public and maintain existing monitoring equipment installed.

Action 1: Proper maintenance and training.

Time Frame: annually

Funding: Private business, County Health Dept

Estimated Cost: \$5,000

Staff: County Health Department

Jurisdictions: County Health Department

Action 2: Public notification.

Time Frame: annually

Funding: Private business

Estimated Cost: \$500

Staff: Air quality committee

Jurisdictions: Woods Cross City

Pipeline - Problem Identification: Petroleum pipelines that impact the community.

Goal: Continual

Objective (Priority LOW): Support improvements to infrastructure.

Action: Educate community of pipeline awareness.

Time Frame: annually

Funding: Pipeline owners, City

Estimated Cost: \$250

Staff: Pipeline owners, City Staff

Jurisdictions: Pipeline owners, Woods Cross City

Critical Roads - Problem Identification: Critical Roadways for lifeline infrastructure.

Goal: Maintain critical transportation corridor capabilities.

City Goals - Davis Co PDMP

Objective (Priority LOW): Provide unrestricted access or critical roadways for all lifeline infrastructure.

Action: Educate community of pipeline awareness.

Time Frame: 2022-2024

Funding: City

Estimated Cost: \$10,000

Staff: Public Works, Engineering, Community Development

Jurisdictions: Woods Cross City

Davis County (Unincorporated)

Background

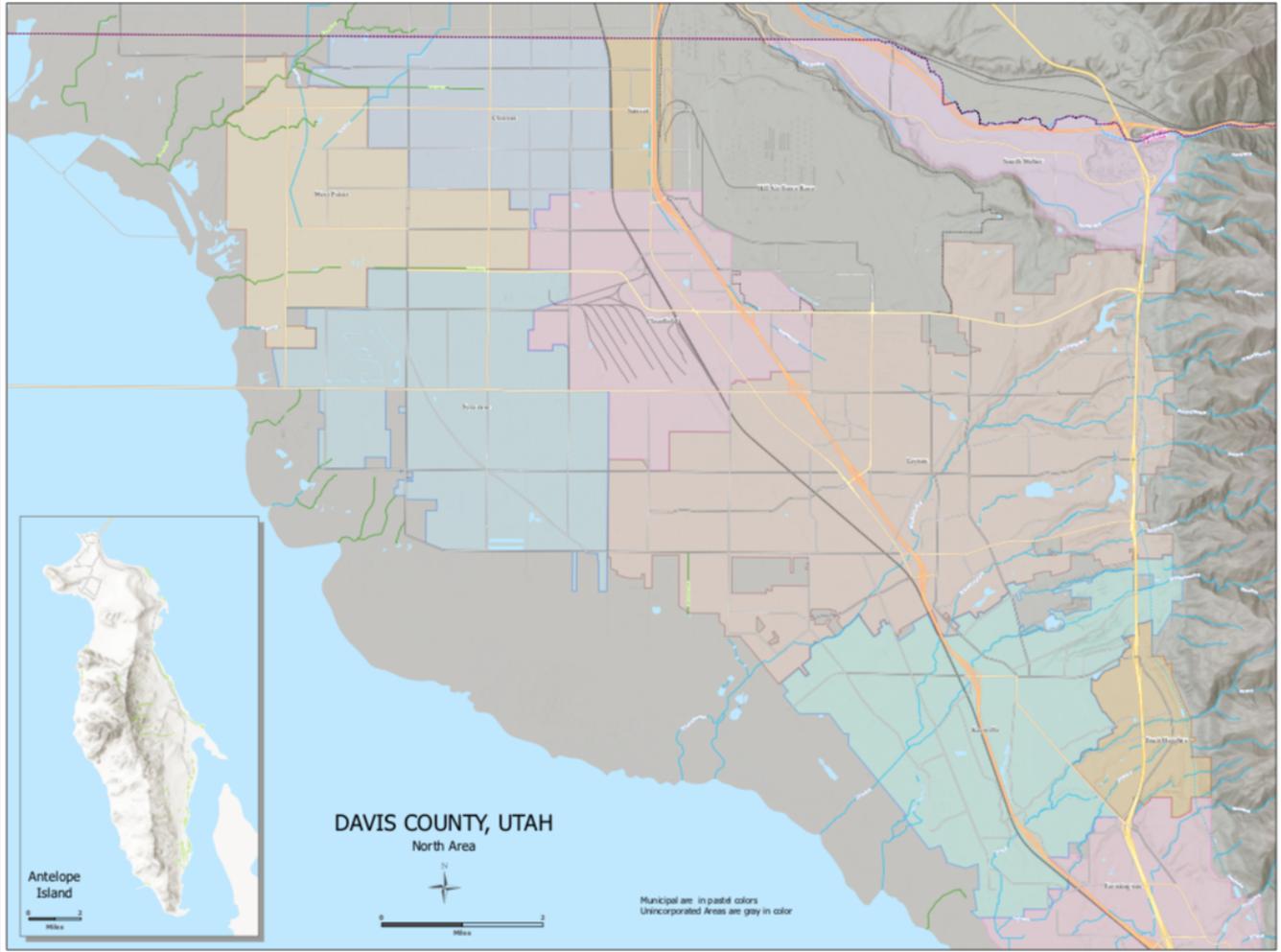
Davis County is Utah's smallest county in land area. It is a narrow strip of land only 223 square miles but is the third largest county in population. The territorial legislature created Davis County in 1852. During its first half-century, Davis County grew slowly. In 1940 the population was barely 16,000. The small family farms and local businesses could support no greater increase. However, the County doubled in population between 1940 and 1950, and doubled again in the next decade. Between 1960 and 1980, the population more than doubled again, from 65,000 to 147,000. By 1990 the population had reached 188,000 and the 2000 census recorded 238,994. Being the fastest growing of the four major urban communities along the Wasatch Front, Davis County is projected to build out with a population near 390,000 by the year 2030.

Accompanying this growth has been a diversification of population and a new prosperity. Davis County now enjoys a wide mix of people representing many ethnic, cultural, and religious backgrounds. The County has moved from its traditional agricultural dependency to an interlocking network of suburban communities around a core of original towns with closeness in proximity to downtown Salt Lake City. The communications age has tied Davis County to the world. Its citizens today are part of an economic and social pattern that reaches far beyond the County's tiny geographical limits.

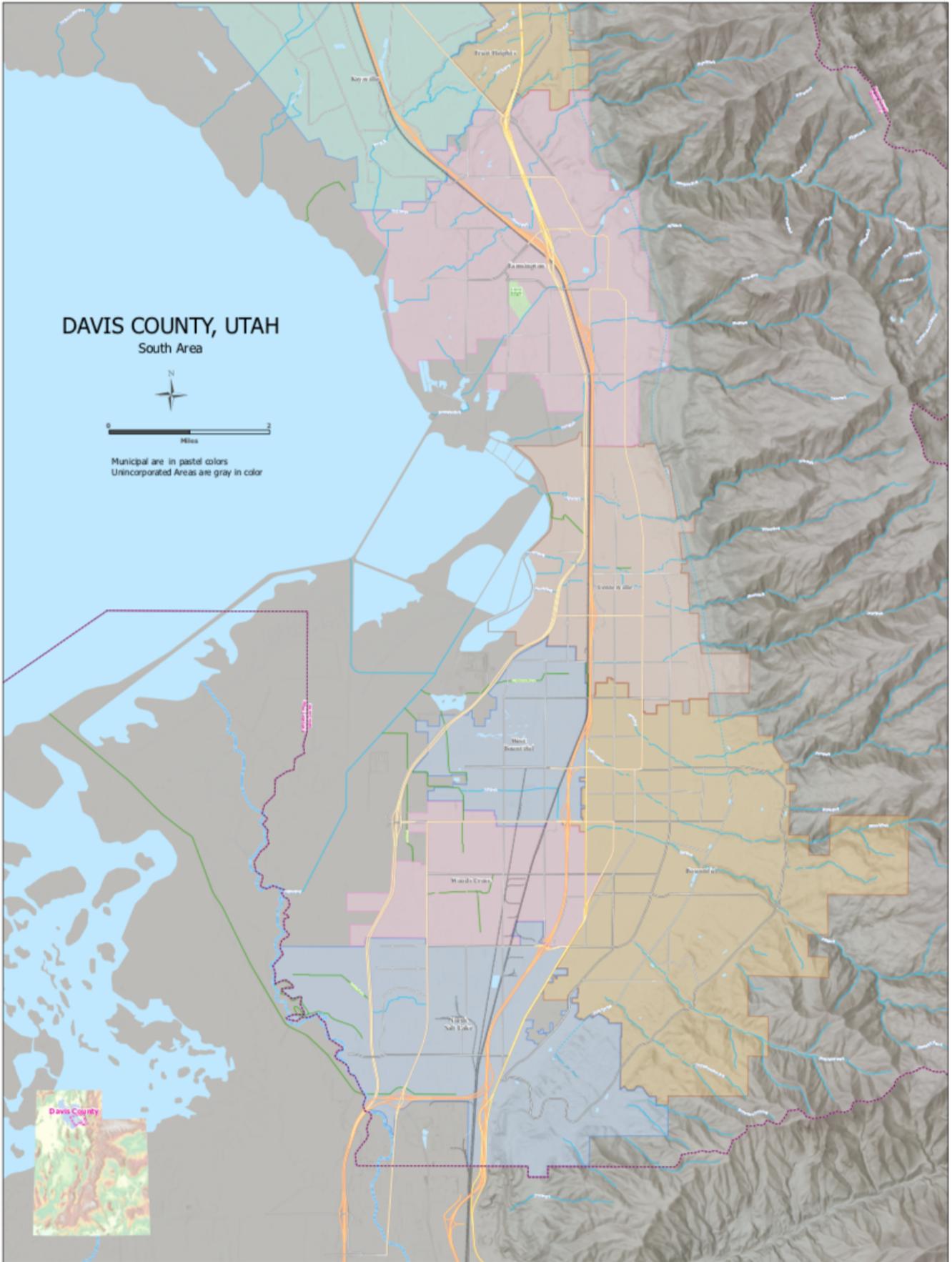
Today, many nationally known commercial, industrial, recreational, and service companies provide diversified employment opportunities for residents of Northern Utah. The Freeport Center is located in Clearfield and is the largest distribution center in the State of Utah with more than seven million square feet of covered storage and five million square feet of open storage occupied by more than 70 renowned companies employing some 7,000 employees.

The County's current general plan (adopted 2006) explains that "*Davis County acknowledges that the main purpose of municipalities is to provide urban services and a public voice in local affairs. The role of the County should be to coordinate and assist the municipalities in addressing issues of regional significance*"(p.1-2). While the unincorporated areas are small and have a limited population, for the purposes of this plan, the goals and strategies that affect the unincorporated areas of the County are incorporated into the neighboring municipal elements (i.e. Val Verda is a small area surrounded by Bountiful City). These unincorporated municipalities appear in the maps below in grey.

City Goals - Davis Co PDMP



City Goals - Davis Co PDMP



Specific Community Hazards

- **Earthquake:** Davis County's proximity to the Wasatch Fault puts it at a high risk of earthquake damage.
- **Flooding:** Davis County is located along the eastern edge of the Great Salt Lake wetlands thus making the ground water suitable to many locations.
- **Dam Failure:** There are several water containment systems within the cities of Davis County, each of these are at various levels of decay. Each of them has the potential to fail.
- **Landslides:** Homes in a specific geographical area experience substantial settlement issues after many years of being constructed.
- **Wildland Fire:** Parts of Davis County borders a nature preserve scenic by way and trail which has a potential for wildfires.
- **Severe Weather:** Davis County lies on the western edge of the Wasatch from which have severe down slope wind events.
- **Chemical Release:** There are several locations and transport systems throughout the county. While these are directed to and around cities, the possibility of a chemical release is possible around Farmington and Syracuse Cities, as well as interstate and heavy rail transits.
- **Railways:** There are three railroad tracks that cross through the community. One of these transports materials, and others are used for commuter transit.
- **Pipeline:** The County has 8 pressure pipelines that run through the areas in the county.

Mitigation Efforts Since the 2016 Plan

- Began conducting community preparedness fairs, community outreach events, and promoting resident participation in the annual "ShakeOut" earthquake exercise. The yearly drill has consistently been promoted through county social media posts and education to county employees.
- Conducted seismic reviews of the Davis County Historical Courthouse and actively sought mitigation project funding to retrofit and/or rebuild this structure. The project is currently underway with restoration and seismic retrofitting already completed. - \$12 Million.
- Implemented structural engineering recommendations to meet seismic standards. Any new construction of county facilities has met or exceeds current seismic standards.
- Retrofitted the Weber Basin Water delivery system aqueduct along the east bench of the county for seismic occurrences. This is a continual project due to the magnitude. Currently retrofitting is taking place along with additional work in seeking funding for auto shutoff valve systems. - \$5 Million.
- Increasing the capacity of streams to better handle runoff. Both natural and man made streams have been enlarged to handle downflow more efficiently.
- Routinely maintain fire breaks and improve wildland access roads. Maintenance continues on this project. Given the length of the fire break roads in the county as well as sharing the space with

City Goals - Davis Co PDMP

private property owners this is a complicated ongoing project. Additionally, a new firebreak road/hiking trail (Bonneville Shoreline Trail) is currently under construction on the east bench of the county.

- Performed regular drainage system maintenance including sediment and debris clearance; and detection and prevention of discharges into stormwater and sewer systems from home footing drains, downspouts, or sewer pumps. Davis County has increased the size of their culvers therefore increasing their capacity. They also clear vegetation and manage the debris and sediment by conducting routine maintenance.
- Working with Davis County cities to inform residents about proper evacuation procedures. A county wide fire evaluation plan has been developed with color codes. This has been adopted by the county and all fire agencies within the county. A public campaign is moving forward to include the residents including evacuation routes from certain neighborhoods.
- Meeting with all fire agencies/departments bi-monthly during wildland fire season to share information on hazards, fireworks restrictions, and county and state ordinances and restrictions. All fire agencies and the county fire marshal meet on a regular basis, more than bimonthly. New ordinances have been implemented and discussed along with unified decisions made on fireworks, unincorporated area fire services, and equipment availability.
- Work with all fire agencies/departments and the Utah Division of Forestry Fire & State Lands to create an up-to-date centralized MOU/MOA file. Updated contracts for fire related services are currently being explored by county, city, and state officials.
- Hired a County Fire Warden and required experience relating to wildland fires. Sent the County Fire Warden to extensive training to further their knowledge of wildland fires. The county has contracted with Utah State Department of Forestry and Fire for a wildland fire warden position. The county fire marshal as well as all fire chiefs in the county are working together with the warden on project and wildland related matters.
- Continued to promote community outreach to vulnerable populations that may need assistance if heating and power are impacted by severe weather. Mass notification systems have been used in emergency situations to notify the population of possible hazardous situations. Also, county and city partnerships have been used to access as many social media users as possible to educate them on severe weather warnings and help with heat or cold related matters. Davis County is also working to improve their involvement in the 211 (United Way) system and the Special Needs Registry to ensure better education and safety measures.
- Back up generators have been installed in the county health department and main senior center. Backups have also been installed or upgraded in the county administration building, conference center, jail, sheriff's station, and memorial court house. Any new facilities or those under renovation are evaluated for essential functionality and if they require backup power capabilities.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Davis County is located in the heart of the Wasatch Fault between the shores of the Great Salt Lake and the foothills of the Wasatch Mountain Range. The majority of the population lives within 5 miles of the fault. A major traffic artery runs north and south, and numerous

City Goals - Davis Co PDMP

water and petroleum pipelines either cross over or run within 1/2 mile of the fault. Several petroleum refineries are located in the southern end of the county and are subject to severe damage from ground movement and liquefaction. A major earthquake in the area would result in hundreds of millions of dollars in damage to residential structures, industry, and of critical infrastructure, and likely some loss of life. Several public safety facilities and schools are seismically unsafe throughout the county. These facilities pose a significant threat to those who regularly work and attend school in them, and are in need of seismic retrofitting.

Goal: Provide public education on seismic hazards and mitigation.

Objective (Priority HIGH): Conduct community preparedness fairs, community outreach events, and promote resident participation in the annual “ShakeOut” earthquake exercise.

Action 1: Provide earthquake public education outreach.

Time Frame: Ongoing

Funding: County and City Emergency Management

Estimated Cost: Minimal

Staff: County and City Emergency Management

Jurisdictions: Countywide

Action 2: Recommend implementation of structural engineering to meet seismic standards.

Time Frame: Ongoing

Funding: Local, FEMA PDM, State Earthquake Program Grant

Estimated Cost: TBD when solutions are determined

Staff: County operations, County engineer, consulting engineer

Jurisdictions: Davis County/Cities

Flooding - Problem Identification: Problem Identification: FEMA has, over the past several years, updated and revised flood hazard maps throughout Davis County. As a result, an increased number of residences are currently located in flood plains. Most of these residents are not fully aware of the change in flood hazard.

Goal: Educate citizens of Davis County about flood hazard.

Objective (Priority HIGH): Increase the level of understanding in homeowners, city officials, permit authorities and title companies/realtors.

Action: Develop and publicize about flood hazards and the National Flood Insurance Program (NFIP) and disseminate information on the County Emergency Management webpage.

Time Frame: Ongoing

Funding: County

Estimated Cost: Minimal

City Goals - Davis Co PDMP

Staff: County Emergency Management

Jurisdictions: County and Cities

Dam Failure - Problem Identification: Multiple water containment systems located throughout the County are aging and have the potential to fail in the future.

Goal: Prevent dam failures.

Objective (Priority MEDIUM): Provide citizens within the flood area of dams with information on flash flooding.

Action: Provide the population with information and training opportunities about the possibility of and how to respond to flash flooding.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: County Administration

Jurisdictions: Davis County

Landslide - Problem Identification: Numerous canyons and mountains, large and small exist around and in Davis County. Currently, hundreds of buildings, pipelines, power lines and roadways have been constructed on top of or through these natural formations. Nature continues to construct these canyons and mountains. Landslides and debris flows will continue to occur over time, thus threatening residents and critical infrastructure.

Objective (Priority LOW): Reduce the effects of landslides by way of studying these areas and education.

Action: Continue to encourage cities to adopt a standard of requiring geo-technical studies in identified landslide and debris flow areas.

Time Frame: 1-6 years

Funding: County and city funds

Estimated Cost: Minimal

Staff: County/City Emergency Management

Jurisdictions: Countywide

Wildland Fire - Problem Identification: Wildland Fire has been a continuing challenge throughout Davis County's history. There are several areas in Davis County where there is an extreme danger of wildland-urban fire. Davis County has been classified as "at risk" for wildland fire. Various cities are

City Goals - Davis Co PDMP

actively participating in the development of Community Wildland Protection Plans (CWPP) in cooperation with the County Fire Warden and the Utah Division of Forestry Fire & State Lands

Goal #1: Reduce or eliminate the threat of wildland fire, and the resulting loss of property and/or life.

Objective (Priority HIGH): Increase the level of wildfire knowledge for home and business owners by encouraging participation in The “Utah, Let’s Do Our Part” campaign, which provides homeowners and businesses with simple steps to reduce wildfire risk by preparing for wildland fire.

Action: Participate in the “Utah, Let’s Do Our Part” campaign which is the result of an interagency effort to reach the public with fire prevention messages relevant to Davis County. The goal of the program is to reach specific audiences with fire prevention messages to reduce the number of human-caused wildfires in the County.

Time Frame: Ongoing

Funding: County Funds

Estimated Cost: TBD

Staff: County and City Fire Departments, Emergency Management

Jurisdictions: Davis County

Problem Identification: Given that wildland fire is a hazard that can be managed through effective fuel control, ordinances requiring residents to maintain defensible space around their respective homes would greatly reduce the fire hazard in these areas. Programs could be established to assist residents in performing this requirement or to encourage rebates for property insurance.

Goal #2: Assist homeowners to maintain defensible space around homes and businesses to more effectively mitigate the wildland fire hazard by conducting fuels reduction and chipper days.

Objective (Priority HIGH): Provide information to residents and homeowners associations (HOAs) about the importance of fuels reduction and defensible spaces.

Action 1: Regularly conduct fuels reduction and chipper workshops.

Time Frame: Ongoing

Funding: Community Fire Departments

Estimated Cost: Minimal

Staff: Emergency Manager, City/County Fire and Wildland Interface Residents

Jurisdictions: Countywide

Action 2: Educate citizens about defensible space requirements.

Time Frame: Ongoing

Funding: Local

Estimated Cost: Minimal

City Goals - Davis Co PDMP

Staff: Emergency Manager, City/County Fire and Wildland Interface Residents

Jurisdictions: Countywide

Severe Weather - Problem Identification: Most presidential disaster declarations are the result of severe weather. These are usually thunderstorms and snowstorms. However, we are also prone to extremely severe wind events referred to as “East Winds.” Historically, Davis County has experienced gusts of over 110 mph and sustained winds of 80+ mph. These can result in millions of dollars in damage. On average we experience at least one every year. Severe storms result in secondary and tertiary problems mostly dealing with power, heating and travel. Severe weather has resulted and will continue to result in serious travel problems, as well as power and heating difficulties.

Goal: Assist residents protect themselves from the effects of severe weather and changing global climate.

Objective (Priority HIGH): Support programs to prepare residents and elected officials for adverse weather conditions.

Action 1: Encourage all cities to participate in the Storm Ready program.

Time Frame: annually

Funding: County and City Funds

Estimated Cost: Minimal

Staff: County/City Emergency Management

Jurisdictions: Countywide

Action 2: Encourage avalanche preparedness for county backcountry users.

Time Frame: Immediate

Funding: County

Estimated Cost: Minimal

Staff: County Emergency Management

Jurisdictions: Countywide

Problem Identification: Davis County cities near the mountain front are subject to strong easterly canyon winds. These high winds can result in serious disruption of essential public services and communications for emergency responders have been severely hampered in the past by high wind damage to communication infrastructure.

Objective 1.2 (Priority HIGH): To educate officials and the public on the impact that climate change has had on water supplies.

Action: Promote education about the impact of global climate change.

Timeframe: Immediate

Funding: Federal, State and Local grants

Estimated Cost: Minimal

City Goals - Davis Co PDMP

Staff: Emergency Manager and local jurisdiction Emergency Management Directors

Jurisdictions: Countywide

Chemical Release - Problem Identification: Air quality impacts from chemical/petroleum releases.

Goal: Reduce the threat of chemical release damage in the city.

Objective (Priority MEDIUM): Educate the public and maintain existing monitoring equipment.

Action 1: Proper maintenance and training.

Time Frame: annually

Funding: Private businesses, County Health Dept.

Estimated Cost: Minimal

Staff: County Health Department

Jurisdictions: County Health Department

Action 2: Public notification of air quality.

Time Frame: annually

Funding: Private businesses

Estimated Cost: \$1000

Staff: County Emergency Management

Jurisdictions: Countywide

Railways - Problem Identification: Potential for HAZMAT spill.

Goal: Have trained personnel available to respond to a possible HAZMAT spill.

Objective (Priority MEDIUM): Continual training on hazardous material response.

Action: First responder training.

Time Frame: annually

Funding: state/federal grants

Estimated Cost: TBD

Staff: City Fire Departments, Emergency Management

Jurisdictions: Countywide

Pipeline - Problem Identification: Petroleum pipelines that could impact the community if ruptured.

Goal: Support cities in their mitigation and response efforts.

Objective (Priority LOW): Support cities efforts with improvements to infrastructure.

City Goals - Davis Co PDMP

Action: Educate city leadership of pipeline hazards and how to respond if a release occurs.

Time Frame: annually

Funding: Pipeline owners, County

Estimated Cost: Minimal

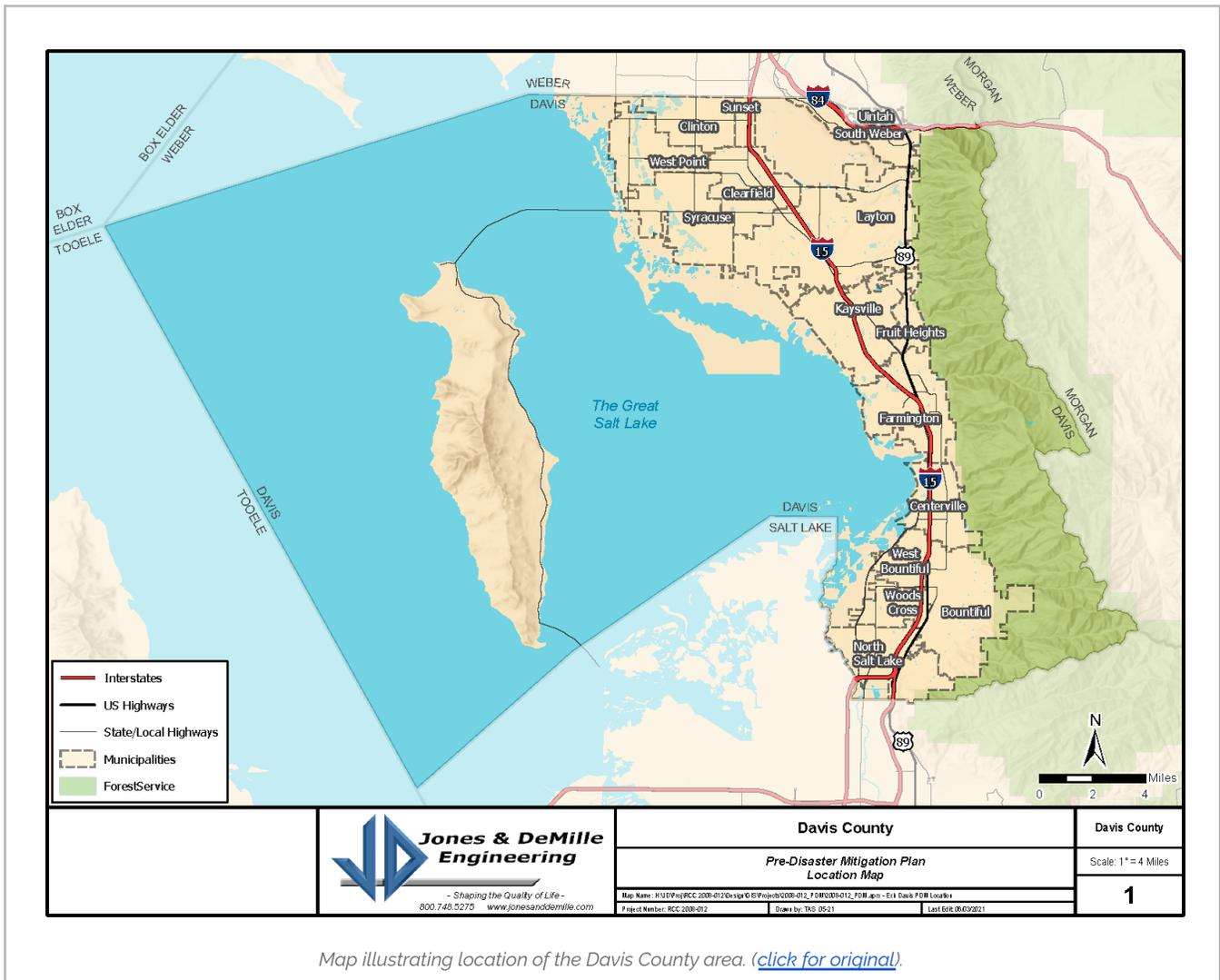
Staff: Pipeline owners, City Staff

Jurisdictions: Pipeline owners, County Emergency Management

Part VII - GEOGRAPHIC SETTING

A. Geographic and Physiographic Background

Davis County is located in northern Utah with an area of approximately 633 square miles. Two thirds of the county is covered by the Great Salt Lake, allowing for only 233 square miles of developable land, much of which is National Forest. The Great Salt Lake is the largest water body within the state and was named due to its high salt content. The elevation ranges from 4,200 feet at the Great Salt Lake to 9,547 feet at Francis Peak. Davis County is bordered by Morgan County to the east, Weber County and the Weber River to the northeast, Tooele County to the west, and Salt Lake County to the south (Davis County 2003).



B. Geology

Davis County is located along the Wasatch Mountain Range. The Wasatch Mountain Range runs north-south and is the eastern border of the valley region of the Great Basin, which is part of the much larger Basin and Range Province.

The geology of this area is a product of Miocene Epoch faulting and folding followed by a period of upheaval. The upheaval raised the valley 3,000 to 5,000 feet in a dome-like manner during the Tertiary Period. This disturbance of the valley floor created tension and a build-up of stress. To accommodate for the change, “block-faulting” occurred that allowed for the uplift of the mountain ranges and depression of the valley floor. This depression extends to the lowest portion of the Wasatch Front Region: the Great Salt Lake. Erosion is now the main geologic process of this area.

The Wasatch Range consists mainly of tertiary lake deposits and tertiary and quaternary volcanic rocks as well as younger Precambrian sedimentary rocks. To the north of Salt Lake City on the Wasatch Front, the hardest, highly altered metamorphosed rocks of schist and gneiss are found and date back about 2.6 billion years. Paleozoic marine sedimentary rocks surround the Precambrian areas of the Range. The Paleozoic sedimentary rocks have a very weak make-up and, in conjunction with Utah’s heavy precipitation during the winter and summer months, many landslides, avalanches, debris flows, and rockfalls occur.

C. Climate

Northern Utah has a cold desert climate. Utah has hot dry summers and cold winters. However, Utah’s climate is variable, wet in some areas of the state and dry in others. This variability is a function of latitude, elevation, topography, and distance from moisture sources. The Davis County region’s climate borders a semi-arid, mid-latitude steppe climate that occurs along the perimeter of the Great Basin Desert, and a humid continental climate found at slightly higher elevations in the Rocky Mountain foothills (Critchfield, 1974).

Northern Utah has four seasons, low annual precipitation, convective and frontal storms, dry summers, low humidity, and large annual and diurnal temperature extremes. The Wasatch Mountain Range brings most of the precipitation to the valley floor. The winter months bring heavy snow accumulation over the mountains that are favorable for winter sport activities.

Spring runoff is at its peak from April through June and can cause flooding along the lower streams. Flash flooding from summer thunderstorms affects smaller more localized areas in the county from summer thunderstorms.

The average annual precipitation in the Wasatch Mountain Range can be more than 40 inches. The average annual precipitation at the Salt Lake International Airport is 15.3 inches, with an average of 58.9 inches of snowfall. Utah is the second driest state in the nation.

The surrounding mountain ranges act as a barrier to the cold continental arctic masses. This also insulates the area during the day and cools the area rapidly at night. On clear nights, the colder air accumulates on the valley floor, while the foothills and benches remain relatively warm.

During the fall and winter months, smoke, haze, and fog can accumulate in the lower levels of stagnant air over the valley floor and can last for several weeks at a time. This is caused by areas of sinking air or high-pressure anticyclones settling over the Great Basin.

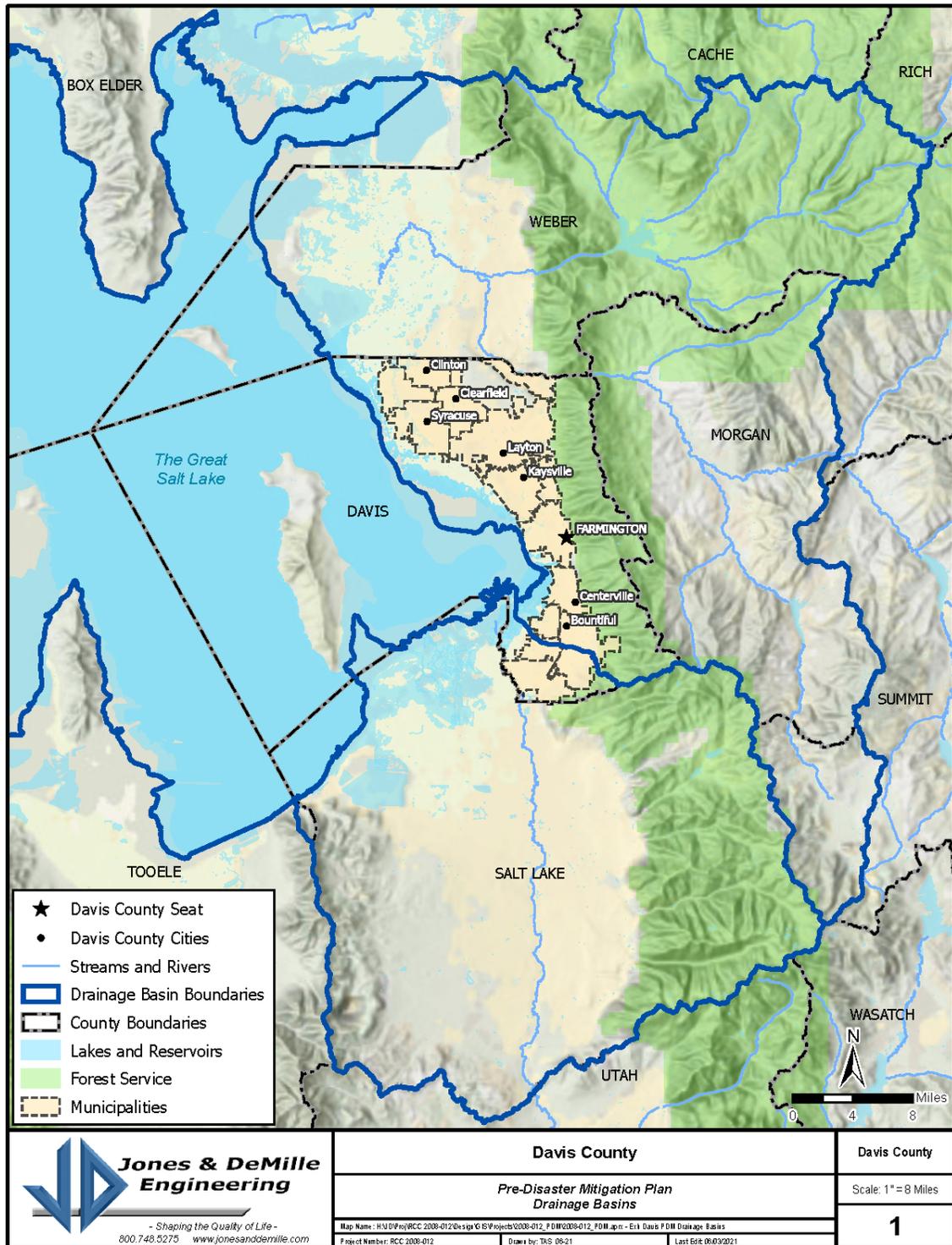
Average wind speeds are usually light to moderate, usually below 20 miles per hour. Strong winds can occur in Davis County, mainly in canyon mouths along the western slopes of the Wasatch Mountains. Tornadoes have occurred in this region but are uncommon. Severe hailstorms have also occurred in the region during the spring and summer months.

D. Major Rivers

Most of Davis County's water is from Wasatch Range snowmelt that occurs during the spring and summer. Larger drainages or river basins are formed from the mountain ravines or depressions that merge into perennial rivers and then meet forming the larger drainages. Davis County has a short stretch of the Weber River Basin.

Agricultural irrigation is the primary use of developed water in Utah, but municipal, industrial, environmental and recreational uses are increasing and this competition will reform the way water is utilized. With the growing population, agricultural land has decreased, with residential and commercial development on the rise. According to the Utah Water Plan, the Weber River Basins is projected to lose a significant amount of agricultural lands over the next few decades.

Geography - Davis Co PDMP



Map illustrating drainage basins in the Davis County area. ([click for original](#)).

E. Water and Drought

Utah is the second driest state in the nation and ranks second in per capita water use of public supplies. According to the Utah Division of Water Resources, Utah experienced drought conditions from 1999 to 2004, and from 2014 to 2015 on a statewide level. Decreased flow from major rivers has led to a decline in most of the reservoir levels and in the Great Salt Lake. The 2015 water year was one of the driest ever recorded (Utah Division of Water Resources 2015).

F. Development Trends

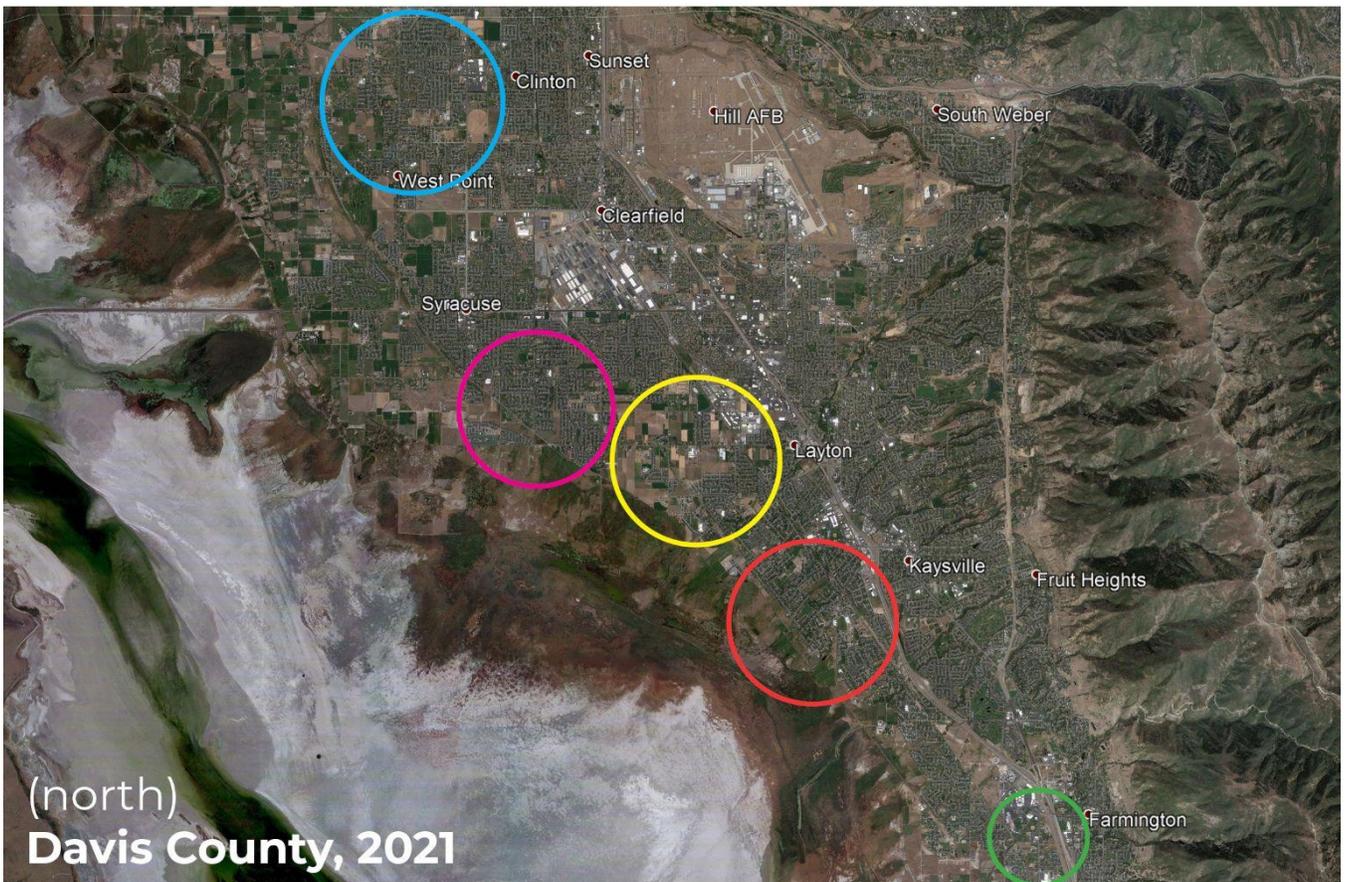
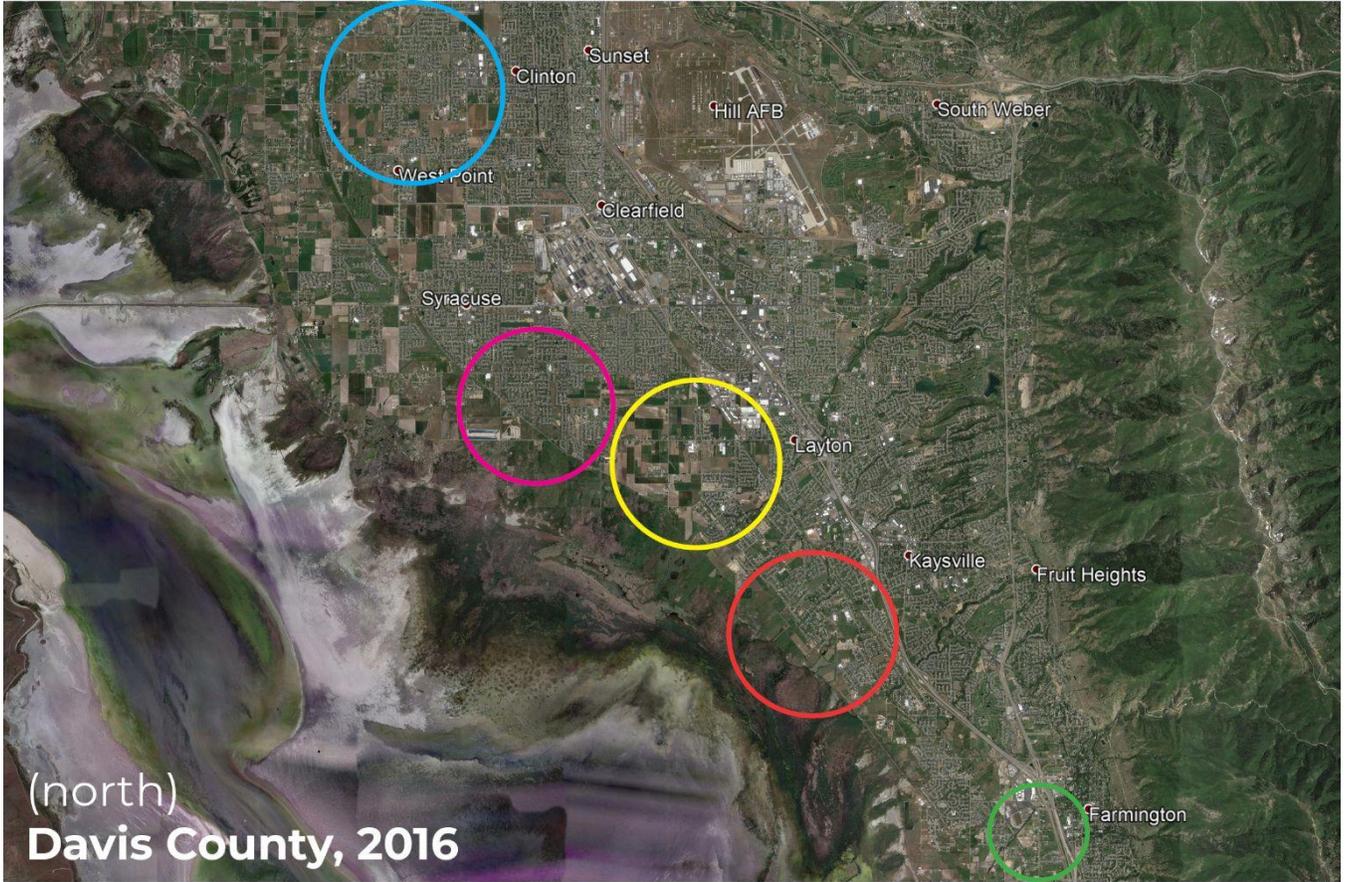
Davis County will continue to grow. Despite nationwide trends, Utah continues to develop. In general, the “developable” areas are in the western portion of the county bounded by the Great Salt Lake.

Davis County is part of the area known as the Urban Core of the Wasatch Front, in conjunction with Salt Lake, and Weber Counties. Over the past several decades, a great deal of growth has occurred in these three counties. Davis County’s residential growth will continue to infill previous agricultural and industrial fringe. Some of the residential growth is occurring on more sensitive lands such as hillsides and low lying areas towards the Great Salt Lake, and in northern Davis County. The opening of the Legacy Parkway in 2008 provided a much needed alternate north/south transportation expressway through the county. The planned North Davis Highway will further facilitate transportation from Weber, through Davis, to Salt Lake County.

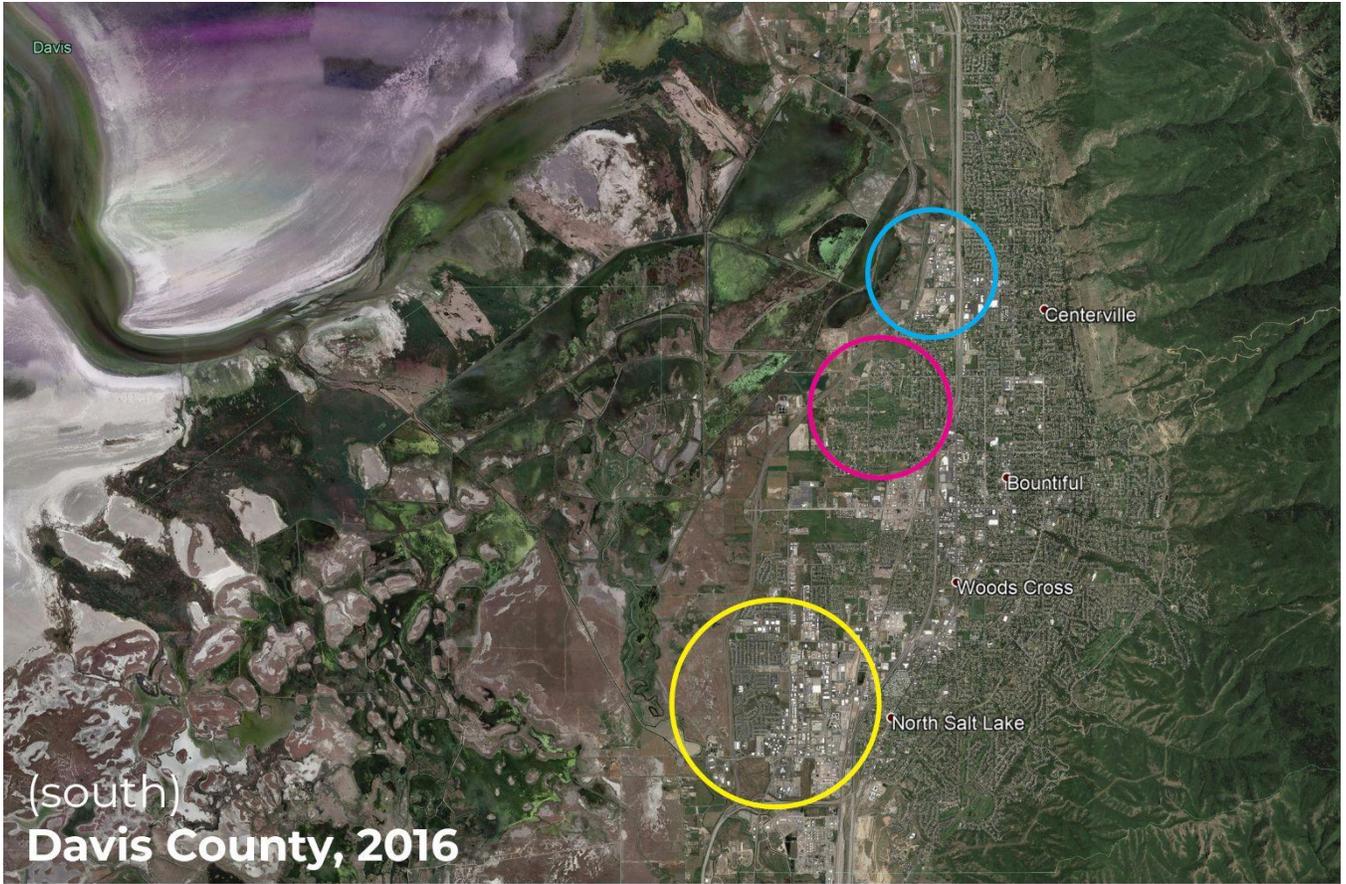
Most population growth in the county is attributed primarily to residents having children. Some residential growth is attributed to in-migration due to the area’s strong job market. Nationally, growth is occurring in the west and in the south.

Davis County's population is projected to continue to increase significantly. This will result in housing cost increases greater than the rate of inflation. Higher population densities are projected to be concentrated in currently developed areas with recent development occurring at lower densities in the outlying areas.

Geography - Davis Co PDMP



Geography - Davis Co PDMP



A large commercial development has occurred at the Station Park project in Farmington. In Clinton, a large commercial development area has experienced major growth at 2000 W. and 1800 N.

G. Development Constraints/Opportunities

Influences on development are many and interrelated. A few are geographic, historic layout, transportation, household size, technology, employment trends and public policy. Development influences can encourage and/or discourage growth. For example, floodplains, wetlands, slopes and faults, sensitive species and transportation influences both attract and detract development.

H. Geographic Constraints

Geographic constraints on the urban area have created a linear region in Davis County that stretches more than 15 miles north to south, from Sunset on the north and south to North Salt Lake. At its widest point, Davis County is only 15 miles from east to west. This unique geographic layout has resulted in the development of a transportation system that is focused on the north-south movement of goods and people.

I. Floodplains

There are a number of identified floodplains in Davis County that pose challenges, command respect and generate appeal for development. Davis County is bisected by the Weber River and numerous streams, which emanate from the mountains and flow westward into the Great Salt Lake. In Davis County, several small creeks, such as Kays, Farmington, Davis, Deuel, North Canyon and others flow from the mountains into the lake. There are other streams too numerous to mention here, but some flow through open channels while sections of others are piped underground. While development is challenged by the floodplain, it is also attracted to it.

J. National Flood Insurance Program Participation

The National Flood Insurance Program was created in 1968 by the Federal Emergency Management Agency (FEMA) to provide homeowners living in the 100-year floodplain an opportunity to purchase flood insurance for their home. In order for individuals to be eligible to purchase flood insurance, their community needs to participate in the National Flood Insurance Program (NFIP). Assistance for community participation in the NFIP is provided by the State Floodplain Manager at DEM. There is also limited funding for flood mitigation projects for communities participating in the NFIP.

National Flood Insurance Program (NFIP) Participation

Community Name	CID	County	Policies	Total Coverage	Total Premium	Total Claims	Total Paid Since 1978	Repetitive Loss
Davis County	490038#	Davis	15	\$4,612,000	\$7,275	22	\$260,349	No
Bountiful	490039#	Davis	61	\$16,983,200	\$59,572	36	\$84,285	No
Centerville	490040#	Davis	31	\$10,645,000	\$14,633	10	\$0	No
Clearfield	490041#	Davis	13	\$3,528,000	\$10,986	0	\$0	No

Geography - Davis Co PDMP

Clinton	490042#	Davis	8	\$2,170,000	\$3,122	3	\$1,878	No
Farmington	490044#	Davis	61	\$19,225,000	\$74,257	11	\$50,798	No
Fruit Heights	490046#	Davis	8	\$2,196,000	\$5,477	1	\$0	No
Kaysville	490045#	Davis	32	\$8,828,300	\$31,435	8	\$17,705	No
Layton	490047#	Davis	60	\$15,675,000	\$25,028	15	\$4,558	No
North Salt Lake	490048#	Davis	30	\$14,549,700	\$32,970	2	\$0	No
South Weber	490049#	Davis	8	\$2,660,000	\$3,997	1	\$1,103	No
Sunset	490050#	Davis	1	\$350,000	\$442	0	\$0	No
Syracuse	490051#	Davis	14	\$4,235,000	\$5,698	1	\$0	No
West Bountiful	490052#	Davis	12	\$4,174,200	\$7,263	4	\$7,670	No
West Point	490053#	Davis	4	\$630,000	\$1,272	0	\$0	No
Woods Cross	490054#	Davis	3	\$735,000	\$1,108	57	\$513,507	No
			361	\$111,196,400	\$284,535	171	\$941,853	

Davis County and all jurisdictions participate in the National Flood Insurance Program (NFIP). Davis County joined in March 1982 and the cities joined on the dates as indicated on the chart above. All jurisdictions are in the Regular Program with their current effective maps dated from 2007. FEMA has recently completed a remapping of Davis County and its cities. FEMA's mapping data was accessed from the FEMA Flood Map Service Center website. The effective dates for various maps ranged from 2014 to 2021. Davis County will update their flood mapping data as new data becomes effective. Currently, Davis County has a total of 385 flood insurance policies, and has had a total of 138 claims since entering the NFIP. Each jurisdiction strives to follow the requirements of the NFIP, and utilize permitting for development in the floodplains. Centerville, Bountiful, and West Bountiful all participate in the Community Rating System (CRS). Their status is 7, 9, and 9 respectively. Additionally, Davis County does not have any repetitive loss structures within its boundaries. The County is supporting the mitigation efforts of entities like the Weber Basin Water Conservancy District and surrounding jurisdictions to help reduce the impact from hazards including flooding.

K. Wetlands

Wetlands are those areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to normally support a prevalence of vegetation typically adapted for life in saturated soil conditions. The greatest and most significant complex of wetlands in the intermountain area can be found adjacent to and surrounding the Great Salt Lake. These wetlands provide important habitat to resident wildlife and are also an internationally significant habitat. As many as one million migratory shorebirds and waterfowl utilize the Great Salt Lake wetlands during annual migrations across North America. A majority of these wetlands are found on the

east side of the lake. The east side of the lake is where the lake receives most of the freshwater and also where development pressures are occurring. Numerous rivers and streams flow into the lake, supplying this area with the fresh water needed to support wetlands, plant, and animal life. Wetlands can also be found adjacent to the streams, particularly in areas where the streams flow through relatively flat topography or low-lying areas.

Wetlands can be categorized according to their quality and type. Jurisdictional wetlands are those wetlands that are within the extent of the U.S. Army Corps of Engineers (USACE) regulatory overview. For an area to be identified as a jurisdictional wetland, the area must exhibit positive indicators of wetland hydrology, hydrophytic vegetation and hydric soils. If wetlands provide a particularly rich habitat for a variety of wildlife species, it is usually considered to be of high quality, or have a high functional value. Also, wetlands can be classified according to their type, including marsh, wet meadow, riparian scrub, playa/mudflat and open water.

L. Farmlands

Over the past several years, many acres of farmland in the area have been developed. There is a limited amount of prime/unique farmland and farmland of statewide importance in western Davis County. Historically, development followed farmland in an agrarian economy.

Farmlands of statewide importance are not as good as prime farmlands, but are nevertheless important to the agricultural base of the area. These farmlands have more limitations than prime farmlands, such as steeper slopes, high water table, and alkali problems. However, these lands can be made just as productive as the prime farmlands with proper management of the land. If farmlands of the type described above are located within incorporated city limits, it is presumed they will be eventually developed into urban type land uses. Currently, a majority of the acreage of these farmlands is being used to grow winter (dry farm) wheat and alfalfa.

M. Slopes and Faults

The steep slopes of the Wasatch Mountain Range were created by the Wasatch Fault, which runs the entire length of the urbanized areas. The Wasatch Fault and other faults in the area highlight the potential for earthquakes in the area and the need to consider their possible impact on infrastructure. As development continues to creep higher on the foothills of the Wasatch Mountains, slope stability, erosion and drainage problems will present engineering challenges in development design.

Development is usually attracted more to the views of slopes and faults than repelled by the higher risk of soil instability.

N. Open Space

Open Space is a large influence to residential and commercial development. Generally, people are attracted to open space. The Wasatch-Cache National Forest comprises the eastern portion of Davis County and includes a relatively large amount of open space. The urbanized area is fortunate to have exceptional public access to this open space to the east of the valley. Francis Peak is a notable Wasatch Range peak just east of Davis County. Numerous nationally recognized winter and summer recreation areas for skiers, hikers and rock climbers are in close proximity. As a consequence, hundreds of thousands of people visit the public lands in the foothills and mountains of the Wasatch annually.

Other open space features in Davis County include Antelope Island in the Great Salt Lake and the Farmington Bay Bird Refuge, which is a freshwater bay created by a dike of the Great Salt Lake. Over the past several years, population growth in the urbanized areas has impacted the open space resources of the Wasatch Range in a variety of ways. Two of these ways are mentioned here. First, there are many more people visiting the popular places in the adjacent mountains. This has jeopardized the environmental quality of the mountains by degrading surface and ground water quality. The Wasatch Range is the major source of water for the adjacent urbanized areas, and water quality degradation can have far-reaching effects.

Secondly, many access points or trail heads to the canyon and other mountain destinations located on public lands that were commonly used in the past have been closed off to the public by private developments. The effect of this is that much of the public open space becomes inaccessible and the opportunity to visit these popular places becomes lost. Remaining access to non-private lands is channeled through an ever-decreasing number of public access points.

Not only can open space resources be found in the mountains of the Wasatch, but private and public open space is also found in the valleys in the form of farms, developed and natural parks, golf courses, water features and vacant land. In many instances, these resources may receive more intensive use than those found in the adjacent mountains. Recently, because of the rapid growth in the area, citizens as well as state and local political leaders have become concerned about the relatively rapid loss of private open space resources, such as farmland and vacant land. Urban growth has put considerable pressure on the farmlands that can still be found in, or adjacent to, the urbanized areas. Some individuals and lawmakers value farmlands and would like to see some of them preserved for future generations.

Management and development of open space has many questions – *how, where, and to what degree will these lands be preserved?*

Some agricultural lands are receiving state designation as farmland preserves through the use of conservation easements and favorable tax treatments. These designations assist farmers in preserving their lands for future agricultural use and provide aesthetically pleasing open space today. However, as development pressure and property values increase, it may become increasingly difficult to keep many agricultural lands in agriculture preserves. Policy decisions relative to open space will affect land use and development patterns, and, as a consequence, will also affect long range plans for the region's transportation systems.

O. Hazardous Waste Sites

Davis County has a few hazardous waste sites, or contaminant sources. Most of these sources are near Hill Air Force Base or in close proximity to industrial areas. Construction through potential contaminant sources may add health and safety concerns and affect construction budget expenditures. The impact of these sites on transportation facilities will need to be addressed during the design and construction phase of each highway or transit project.

There are potentially five types of contaminant sources: underground storage tanks, Title 3 sites, Toxic Release Inventory (TRI) 1990 sites, Resource Conservation and Recovery Act (RCRA) sites and Comprehensive Environmental Response Compensation and Liability Act (CERCLA) sites.

The Comprehensive Environmental Response, Compensation and Liability Inventory System (CERCLIS) database documents hazardous waste sites where a release or potential threatened release has been investigated. These sites are further defined as a location that has been reported to the Environmental Protection Agency and where it is probable that some environmentally hazardous materials are present.

Also, the State of Utah Division of Solid and Hazardous Waste maintains databases for underground storage tank facilities, Leaking Underground Storage Tank (LUST) sites, and RCRA facilities.

P. Sensitive Species

Sensitive species are plants and animals, which are considered threatened or endangered relative to extinction. There are currently 21 species in the Wasatch Front Urban Area that fall into the sensitive species category. The most notable of these are the peregrine falcon, bald eagle, and Ute ladies tresses which are all on the federal list of endangered and threatened species. Both peregrine falcon and bald eagle sightings have been reported over the past few years on a fairly regular basis. Some examples of other less notable sensitive species, which are known to inhabit certain areas of Davis County, include the spotted frog, least chub, western burrowing owl, ferruginous

hawk, white faced ibis, Bonneville cutthroat trout, pocket gopher, and others. The likelihood of these and other sensitive species being present in the region will depend on whether or not suitable habitats exist.

Q. Ground Water

Much of the water flowing in streams and interfluvial areas seeps into the ground. The foothills and the base of the mountains are the locations where much of this water seeps into the ground. These locations are referred to as aquifer recharge areas. Water is stored in aquifers of various types. A considerable amount of the Wasatch Front Region's water resources comes from these aquifers, which can be tapped through wells or natural artesian springs. Davis County receives only about 15 inches of precipitation a year, yet the benches and mountaintops can annually receive 60 to 100 inches of precipitation. This contrast in precipitation can be a challenge in determining best development. Past and present human activities have affected these ground water resources in certain locations. If precautions are not taken, harmful substances found in landfills and mine tailings can be leached by rain and snow and find their way into the ground water resources. One example of this situation includes the plume of contaminated groundwater slowly moving westward near Sunset, caused by the inappropriate disposal of solvents and other chemicals for decades at Hill Air Force Base.

R. Historical Development Layout

Historically, development has occurred according to the "Plat of Zion." Davis County has street layouts based on the "Plat of Zion", implemented by Brigham Young when the Mormon Pioneers permanently settled the area beginning in 1847. This concept is based on a grid of 10-acre blocks with wide streets. While the concept is apparent in central city areas, the suburbs deviate. Historically, the street network and connecting highways served the local areas. Intercity travel was via the Bamberger Railroad, which ran passenger service from Salt Lake City to Ogden from 1891 to 1952. In the 1950's, the federal government instituted the Interstate Highway System. Interstate 15 linked Salt Lake City, Ogden and Provo together with points north and south while Interstate 80 linked the area with points east and west.

Development has also followed along Interstate 15, Highway 89, and major collectors. Interstate 15 continues north through Davis County joining Interstate 84 in Weber County. Other major north-south arteries in Davis County include U.S. Highway 89 and the Legacy Parkway. The North Davis Highway in western Davis County will serve as a major traffic collector for that area. The historic development has followed the geographic constraints particularly in transportation.

S. Transportation

Large employment centers, such as Hill Air Force Base will need to be served with an improved transportation system. In 2014, the Utah Transit Authority (UTA) implemented a shuttle bus program between the Clearfield FrontRunner Station and Hill Air Force Base. This shuttle service has not had a high level of ridership.

The Wasatch Front Regional Council completed a Comprehensive Transportation Plan (RTP) in 2015. The transportation projects included in the 2015-2040 RTP are planned to meet the travel needs and improve quality of life within the Wasatch Front for the next 30 years. WFRC developed project lists with residents, local government stakeholders, and partner agencies by collecting project ideas and testing them against the RTP Goals. To be implemented, the region will need both existing and additional transportation revenues, which are outlined in the phasing and financial assumptions.

In addition to regional road, transit, and bicycle improvements, the 2015-2040 RTP also recommends general policy for transportation systems, enhancements, regional freight movement, safety, preservation and maintenance, and homeland security. The Plan conforms to federal air quality standards, meaning that the vehicle emissions estimated for the year 2040 are within the limits identified in the State Implementation Plan (SIP). [Click here for the Plan's air quality conformity analysis.](#) The plan includes interactive maps containing all of the

highway, transit, and bike projects proposed for the 2015-2040 RTP. (Source: Regional Transportation Plan 2015-2040 Wasatch Front Regional Council 2015)

The growth and distribution of population and employment in Davis County will have a significant impact on the transportation demands in the next 25 years. Transportation accessibility is one of the major, if not the most important determining factor, where people live and work. To a large extent, people will live and work where transportation exists. Future development patterns will influence and be influenced by transportation. It is better planning to first conceptually plan for major transportation requirements.

A significant portion of the population growth is expected to occur in western and southwestern sections of Davis County. Anticipated growth will increase the need for north-south travel in the Region, which is being addressed in part by the ongoing reconstruction of I-15, the Legacy Parkway, and the North Davis Highway. Finally, travel in Davis County will increasingly be affected by the population and employment growth in the Farmington/Layton urban area.

Air quality is an influence on transportation. Greater awareness and concern for the air quality has resulted in tighter air quality standards and decreased transportation emissions. As Davis County continues to grow, the interrelationships among development and transportation will continue to increase.

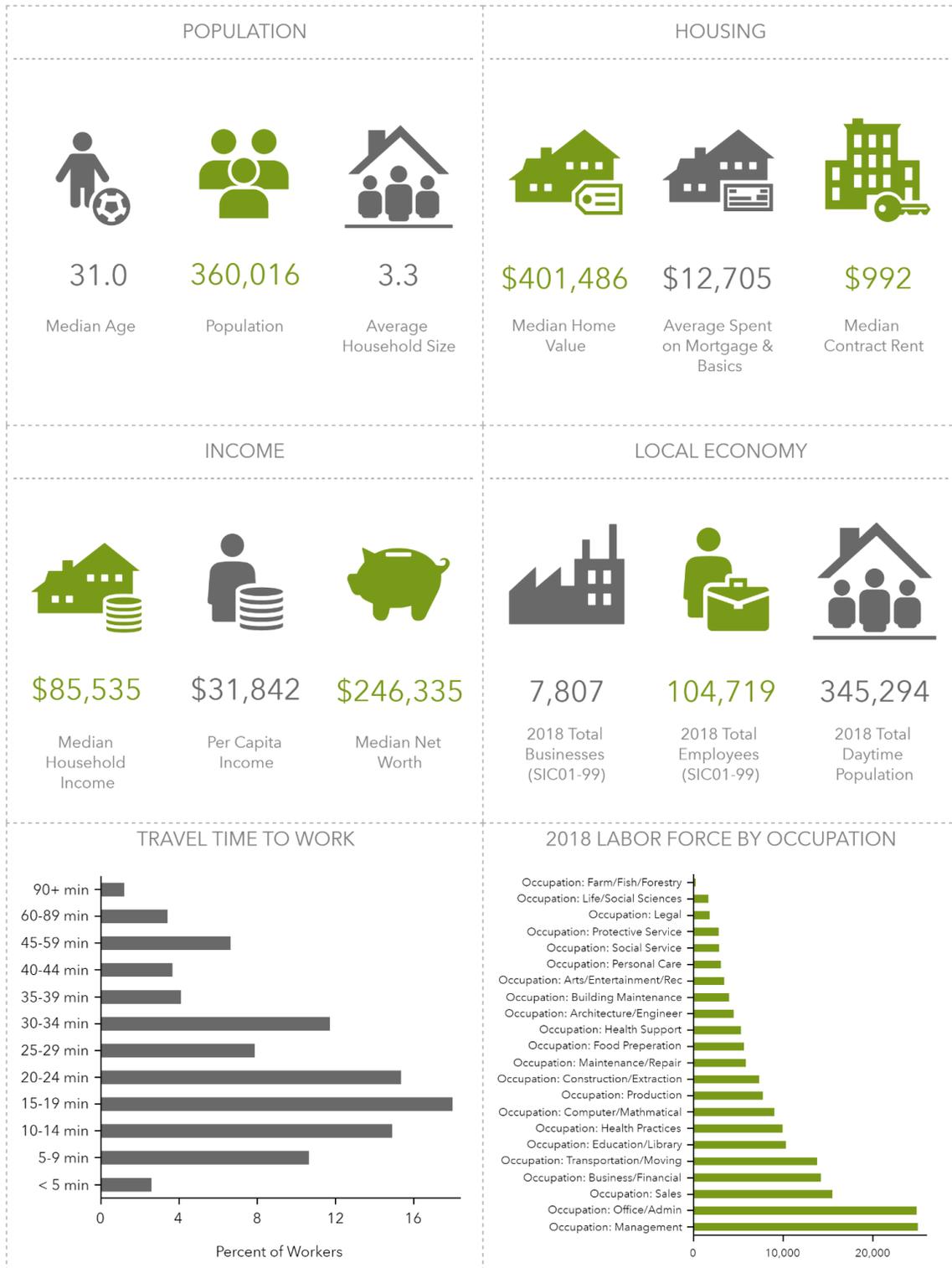
These interrelationships have significant impact on the transportation facilities now and in the future. Davis County's transportation system will need to improve east/west capacity to serve employment centers in suburban locations, such as Clearfield City's Freeport Center. Travel demand will continue to grow in direct proportion to projected population increases. The population and employment growth in Davis County will increasingly affect travel demand in the urbanized area.

The growth and distribution of the Wasatch Front population and employment will continue to have a significant impact on the transportation needs of the future. Increases in regional population and employment translate into a growing demand for travel. In addition, the number of miles driven continues to increase. The amount and distribution of growth provide insights into the type, size and location of new transportation facilities required to meet present and future travel demand, including new highway projects, transit improvements, and transportation facilities for bicycles and pedestrians.

T. Household Size

Even with relatively large families, Utah is following the national downward trend in household size. As the population ages, birth rates fall and the household size decreases. There are areas in the region that will experience a slowing of population growth due to falling household sizes, while others will increase due to neighborhood recycling, where young families with children move into a neighborhood as the aging population dies. Overall, Davis County's population continues to grow and there doesn't appear that this growth will slow down in the foreseeable future.

Geography - Davis Co PDMP



Infographic of socioeconomic indicators for the Davis County area. ([click for original](#))

U. Technology

As technology develops, its influence on community development touches every aspect dramatically. Technological influences are significant. This report will only very briefly mention a few. Technology advances in communications have made it possible for telecommuting, reduced the requirement of a daily commute to a workplace; increased availability of reliable public transportation has changed where people live and work; advances in agriculture have allowed more food to be produced on less land; and technological advances allow developments on marginal sites.

V. Reclamation of Industrial Land

Much public and private land will remain undeveloped because of specific environmental constraints, such as steep slopes, prime wetlands, or hazardous substances. However, other environmentally challenging properties are now developable due to advances in technology. Some areas historically used for industrial or mining activity are planned to be reclaimed for other uses.

W. Employment Trends

In the past 30 years, Davis County's economy has diversified, resulting in more widespread development. The county's economy was once heavily dependent on a limited number of industrial sectors, primarily Hill Air Force Base, and Freeport Center.

No longer dependent on a limited number of sectors, the County's economy is now based on the service sector and other industries, such as health care, education, and local government. Agriculture continues to decline in importance in Davis County as agricultural lands are developed for urban expansion. The distribution of commercial and industrial development will remain much as it is today. Davis County experienced minimal employment changes, up or down, during the past decade. Overall, large employment gains are occurring in suburban areas.

X. Public Policy

Under Utah State law, local cities and counties are responsible for setting land use policy in their areas. Utah State Statute provides for the development of county-level plans under Title 17-27a-401. Components which are required to be addressed within these plans include: land use, transportation, environmental issues, public services and facilities, rehabilitation and redevelopment, economic concerns, recommendations for plan implementation, and "any other elements that the county considers appropriate". In 2015, the Utah Legislature amended Title 17-27a-401 to also require that county general plans include a "resource management plan" to provide a basis for communicating and coordinating with the federal government on land and resource management issues.

Projections for the Wasatch Urban Area Long Range Transportation Plan: 2007-2030 is based on individual city and county land use assumptions. A majority of the region is expected to be developed for residential uses. These local master plans call for relatively low-density residential and non-residential development patterns, with some pockets of denser activity. Large areas of industrial/warehouse development are planned around Hill Air Force Base. High-density office and commercial developments are focused mainly in the Station Park Development, near the Clearfield and Layton Frontrunner Stations with smaller commercial areas located in the Redwood Road area in North Salt Lake. Additional smaller nodes of commercial and retail development are dispersed throughout urban and rural portions of the County.

The Utah Quality Growth Act of 1999 created the Utah Quality Growth Commission to address the challenges and opportunities that growth brings to Utah. In addition, several public and private partnership planning efforts involved in smart growth initiatives have developed land use alternatives and growth scenarios. Envision Utah's outreach presentations provided local public officials and the general public the opportunity to examine the future consequences of various land use decisions. The growth scenarios ranged from the status quo land use planning to

a demonstration of much greater density. These planning exercises and demonstrations proved beneficial in educating participants about development options and their anticipated consequences.

A significant portion of Davis County is currently zoned for low-density residential development. Additional commercial land use nodes are dispersed throughout southern Davis County to serve adjoining residential communities. An extension of the existing transportation network will provide needed highway and transit service to newly developed land. As land use changes, so will the type and size of facilities needed to meet increased travel demand.

Future land use characteristics of the Davis County urban area will play a key role in determining future development trends. Large portions of north Davis County are currently zoned for low-density residential development. Industrial land uses are located at the Falcon Hill development on Hill Air Force Base, and Clearfield's Freeport Center.

Areas for commercial land uses include linear concentrations along major arterial roads including Hill Field Road near the Layton Hills Mall, State Street (Layton and Clearfield) and Main Street (Kaysville, Clearfield and Sunset). Additional commercial nodes are dispersed throughout the Urbanized Area to serve adjoining residential communities.

Public policy is the greatest contributing factor in development. This report has briefly mentioned the general development trends in the region and county as well as the contributing and limiting influences on development. Ultimately, the many development constraints and influences are measured, weighed, compared, and balanced in public policy.

Development public policy is articulated in Master Plans (sometimes referred to as General Plans, Land Use Management Codes, and other planning documents). Master Plans and Land Use Management Codes are formally adopted by city or county councils whereas other planning documents may not receive formal adoption. All Region counties continue to update their Master Plans and Land Use Management Codes. The counties have cooperated in producing the Wasatch Front Regional Open Space Plan. This Plan gives each county guidelines for preserving and developing open space. Davis County has been supportive of Envision Utah. Envision Utah is partially State supported to advocate smart growth. Envision Utah defines "smart growth" as growth that requires minimal infrastructure and maximizes environmental and human benefits.

Part VIII - CAPABILITY ASSESSMENTS

This assessment analyzes current capacity to mitigate the effects of natural hazards and emphasizes the positive capabilities that should be continued. Davis County has elected to conduct a hazard and capabilities analysis.

The following areas were assessed to determine mitigation capabilities:

- A. Staff and Organization
- B. Technical
- C. Fiscal
- D. Policies and Programs
- E. Land Use Management
- F. Legal Authority
- G. Political Willpower

A. Staff and Organization

The assessment found that Davis County has the capability to undertake and complete a limited level of natural hazards mitigation projects. Davis County and its cities are already protecting citizens from natural hazards under one if not several departments within their governmental structure.

City and County Elected Officials

The Davis County Commission consists of three members. Each of the fifteen cities has a mayor and a city council, consisting of five members, which governs the municipality. The elected officials have the responsibility of adopting mitigation policies. Cities and counties receive their legal authority to govern from the State of Utah.

Davis County General Capabilities

Listed below is a general organizational list of county/city governmental administrative areas involved in pre-disaster mitigation:

- Elected officials
- City Managers
- County and City Attorneys
- County Assessors
- County Clerks
- Human Services/Personnel Directors
- County and City Treasurers/ Finance
- Public Works Departments
- County and City Planning/GIS Departments
- County Health Department

Capability Assessment - Davis Co PDMP

- Police and Fire Departments
- Davis County Emergency Management
- Special Improvement Districts

Emergency Management

Davis County has an emergency management director, organized under the sheriff's office. The emergency management director is responsible for natural and man-made hazard mitigation, preparedness, response, and recovery operations.

Local Emergency Planning Committee (LEPC)

The mission of LEPC is to coordinate emergency preparedness for hazardous materials between all public and private emergency task disciplines. Many LEPCs have expanded their mandated hazardous materials function to include all hazards. The Davis County LEPC is composed of elected officials; law enforcement, emergency management, firefighting, emergency medical services, health, local environmental, hospital and transportation personnel; broadcast and print media; community groups; and owners and operators of hazardous chemical facilities that are required by federal law to have hazardous chemical emergency planning. Davis County has an active LEPC.

Fire/Emergency Medical Services

Most of the cities in Davis County have fire departments. Following a national trend, there are two multi-jurisdiction fire districts in Davis County that were formed with the goal to better provide fire and emergency medical services.

Public Works

Divisions within public works often include streets, engineering, water, power, wastewater and sanitation. The Davis County public works department has undertaken a number of mitigation projects in the county. Several municipal public works departments have also participated in hazard mitigation, primarily in the form of stormwater and watershed management projects.

Health Care

Davis County's four hospitals and the county health department provide medical emergency preparedness and response. Davis County Health organizes, coordinates and directs emergency medical and health services. The health department assesses health hazards caused by damage to sewer, water, food supplies or other environmental systems. It also provides safety information, assesses disaster related mental health needs and services, and provides crisis counseling for emergency workers. Short of a pandemic disease outbreak, the health department will likely continue to adequately staff, train and fund its mission.

School District

The Davis School District has more than 70,500 students in 92 schools. District administrators work closely with local public safety officials including law enforcement, fire emergency medical services, and public health to help ensure that schools are well prepared for any kind of emergency.

Special Service Districts

For the purposes of this Plan, Special Service Districts (SSD) are defined as quasi-governmental agencies having taxing authority, providing a specific public service that may include; public transportation, fire, water, wastewater and sewer. These SSD's work closely with local public safety officials to ensure that

Capability Assessment - Davis Co PDMP

these Districts are well prepared for any kind of emergency. In many cases, the districts participate in the county or city emergency preparedness committee for emergency coordination, planning and response.

B. Technical Capability

Throughout the plan update process, Davis County staff consulted with and utilized the technical expertise from a wide variety of resources listed below:

Jurisdiction Technical Expertise

Davis County and all of the cities either employ or contract with planners, emergency managers, building inspectors, housing specialists and engineers on staff.

Geographic Information Systems (GIS)

Davis County has experienced GIS staff capable of providing important data to this planning process. GIS is a geo-referenced set of hardware and software tools that are used to collect, manage and analyze spatial data. (GIS capabilities are often found in other departments such as public works or information technology). GIS is most beneficial when data from all departments and planning jurisdictions is inputted for analysis.

Public Safety Communications (PSC)

Public safety communications networks assure emergency communications through radio, microwave, telephone, satellite, internet, e-mail, fax and amateur radio. One of the most beneficial capabilities of PSC is providing cross communication between equipment and frequencies. PSC coordinates dissemination of emergency information to the media, the public and emergency personnel; activates internal information systems; acts as a liaison to elected officials; assists in the provision of emergency information and documents the impact.

Public Works

Public works departments generally provide engineering, transportation, GIS, water, wastewater, sanitation (in some cases electric power) expertise and capability. As a team, public works personnel identify critical infrastructure and plan and prepare for emergency mitigation.

Utah Division of Emergency Management (Utah DEM)

Utah DEM assists Davis County in providing information on preparing for, responding to, and recovering from emergencies. DEM serves as the liaison between local, state and federal emergency assistance. DEM also educates the public about earthquakes, hazardous materials, floods, communications, leadership, information technology, funding, coordination and supplies.

Utah State University(USU) Cooperative Extension

The USU Extension Service assisted with family and community data in putting research-based knowledge to work. Many of the programs and informational courses improve pre-disaster mitigation.

University of Utah

The University of Utah was utilized as a technical resource for academic mitigation research and demographic data (particularly through the Kem C. Gardner Institute).

C. Fiscal Capability

Davis County has limited fiscal capabilities to implement mitigation strategies. Davis County is one of the top five counties in the state in budgeted expenditures and population. Davis County and most of its jurisdictions have provided some level of matching funds for federal grants in the past.

Utah State Code; Section 17-50-501 classifies counties into six categories based on population. The State of Utah grants graduated autonomy to counties according to class size. Davis County is a Class 2 county with an estimated 2019 population of over 355,000 residents (USCB 2019 Quick Facts).

D. Policies and Programs

Connecting local land use management with natural hazard planning is an effective way to mitigate a community's risk. Many communities have plans, ordinances, agreements, maps, training, warning systems, etc. in place that help them to become more disaster resistant. One of the goals of this Plan is for communities to coordinate existing activities so that individual objectives become part of an overall plan of action.

E. Land Use Management Tools

Ordinances

- Zoning ordinances designate the use of land and structures for the purpose of protecting the health, safety and welfare of residents and businesses. A zoning ordinance divides all land within a jurisdiction into zones or related uses. The zoning ordinance consists of two parts; the text and maps. Specific zones are usually created for residential, commercial, industrial and government uses. The map defines the boundaries of these zones and the text provides the regulations for uses that are permitted to exist in each of the zones.
- Subdivision ordinances regulate all divisions and improvements of property including the division of land involving the dedications of new or changes of existing streets/roads.
- Design controls regulate building and landscaping. Such controls can be tailored to require that new developments meet the specific needs of the area. For example, requiring flame resistant roofs in urban- rural wildland fire interface zones or requiring that trees and vegetation are planted on steep slopes to help mitigate landslide hazards.
- Floodplain ordinances prevent building in special flood hazard areas and provide flood loss reduction measures to new and existing development. Floodplain management ordinances help to provide insurance to homes and businesses through the National Flood Insurance Program (NFIP). The NFIP's Community Rating System was implemented to encourage cities to manage floodplain activities that exceed the minimum NFIP standards. A community participating in the system will receive reductions in insurance premiums.
- National Flood Insurance Program Participation The National Flood Insurance Program was created in 1968 by the Federal Emergency Management Agency (FEMA) to provide homeowners living in the 100-year floodplain an opportunity to purchase flood insurance for their home. In order for individuals to be eligible to purchase flood insurance, their community needs to participate in the National Flood Insurance Program (NFIP). Assistance for community participation in the NFIP is provided by the State Floodplain Manager at DEM. There is also limited funding for flood mitigation projects for communities participating in the NFIP. Davis County and all the cities participate in the NFIP and comply with the minimum standards required by FEMA to be considered participating jurisdictions.
- Building codes require certain standards of practice.

Capability Assessment - Davis Co PDMP

Easements

Easements can be a cost effective way to control development in hazard prone areas. Various land trusts can help secure easements that can then be conserved or preserved.

Planning

- **General plans** serve as a guide for decision-making on rezoning and other planning proposals and as the goals and policies of municipalities attempting to guide land use in local jurisdictions. Each plan is recommended to include land use, transportation, environment, public service and facilities, rehabilitation, redevelopment, conservation, and economics. Also recommended are implementing recommendations including the use of zoning ordinances, subdivision ordinances, capital improvement plans, and other suitable actions that the municipality deems appropriate. General plans articulate the jurisdiction’s vision while land use management codes implement that vision. General plans and land use management codes are being consulted, reviewed, and changed as necessary.
- **Emergency Operations Plans (EOPs)** identify specific emergency actions undertaken by a jurisdiction to mitigate the loss of lives and property immediately before, during, and following an emergency. The Davis County Emergency Operations Plan EOP was reviewed as part of this planning process.
- **Floodplain Management Plans** identify steps and implementation strategies to effectively deal with floodplains. FEMA uses a scoring system that is used to rate communities. Those with higher scores will receive higher discounts (in 5% increments) on flood insurance.
- **Stormwater Management Plans** identify water policies for an entire watershed. Such policies can include: preservation of habitats, water quality and supply, open space development, land preservation, pollution prevention and construction regulations.
- **Environmental Reviews** explain how development affects the land and its resources.
- **Capital Improvement Plans.** Cities plan for costs related to infrastructure, public facilities, and public safety. These plans identify projects, prioritize them and identify ways of funding them. Such plans can include disaster reduction costs or mitigation measures in flood-prone areas or retrofitting buildings for seismic strengthening.

The jurisdictions that make-up this region have incorporated various mitigation measures. The following tables identify, by county, existing land use ordinances, management practices and plans currently in place.

Table 8.1 - Natural Hazard and Environmental Planning, Davis County

	Bountiful	Centerville	Clearfield	Clinton	Farmington	Fruit Heights	Kaysville	Layton	North Salt Lake	South Weber	Sunset	Syracuse	West Bountiful	West Point
Emergency Ops Plan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Stormwater Plan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Annexation Policy Plan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Capability Assessment - Davis Co PDMP

General Plan: Land Use	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
General Plan: Transportation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
General Plan: Housing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Regional Transportation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wildfire Plan (CWPP)	Y	Y	N	N	Y	Y	Y	Y	N	Y	N	N	N	N

Table 8.2 - Natural Hazard & Environmental Quality Ordinances, Davis County

	Bountiful	Centerville	Clearfield	Clinton	Farmington	Fruit Heights	Kaysville	Layton	North Salt Lake	South Weber	Sunset	Syracuse	West Bountiful	West Point
Avalanches	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Earthquakes, Faults, Geologic Hazards	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y
Floodplains	Y	Y	Y	n/a	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Foothills & Canyons	Y	Y	N	n/a	Y	Y	Y	Y	N	Y	n/a	N	N	n/a
Groundwater	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y
Habitat	N	N	N	N	N	N	N	Y	N	Y	Y	N	N	Y
Lakes, Streams, Riparian	Y	Y	N	N	Y	Y	N	Y	N	Y	Y	N	Y	Y
Landslides	Y	Y	N	n/a	Y	Y	Y	Y	Y	Y	n/a	N	N	n/a
Mountains & Forest Zones	Y	N	N	n/a	N	Y	N	N	N	Y	n/a	N	N	n/a
Pollution & Air Quality (General Plan)	N	N	N	N	N	N	N	Y	N	Y	N	N	Y	N
Prime Agricultural Lands	N	N	N	Y	Y	N	N	Y	N	Y	N	N	N	N
Ridgelines	Y	N	N	n/a	N	N	N	N	N	Y	n/a	N	N	n/a
Sensitive Lands	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y

Capability Assessment - Davis Co PDMP

Steep Slopes	Y	Y	N	N	Y	Y	Y	Y	Y	Y	n/a	N	N	n/a
Watersheds	Y	N	N	N	Y	Y	Y	Y	N	Y	N	N	Y	N
Wetlands (Army Corps)	N	Y	N	Y	Y	Y	Y	Y	N	Y	N	N	N	N
Wildland Fire (WUI)	Y	N	N	N	Y	Y	N	Y	N	N	N	N	N	N

Building Codes

International and national building codes have been adopted by all jurisdictions in the county. These codes are constantly in review for reasonable mitigation for disasters. Locally, building officials lobby for additions or exceptions to international and/or national building codes according to local conditions. Most insurance policies rely on the international and national building code standards for assurance.

The Insurance Services Office, Inc. manages the Building Code Effectiveness Grading Schedule (BCEGS). This program was implemented in 1995 and assesses the building codes in effect in a particular community as well as how well the community enforces its building codes. The BCEGS program assigns each municipality a BCEGS grade of 1 to 10 with 1 showing exemplary commitment to building code enforcement. Insurance Services Inc (ISO) developed advisory rating credits that apply to ranges of BCEGS classifications 1-3, 4-7, 8-9, 10. ISO gives insurers BCEGS classifications, BCEGS advisory credits, and related underwriting information.

Communities with effective, well-enforced building codes should sustain less damage in the event of a natural disaster, and insurance rates can reflect that. The prospect of lessening natural hazard related damage and ultimately lowering insurance costs provides an incentive for communities to enforce their building codes rigorously. FEMA also uses these scores in their competitive grant programs, giving a higher ranking to those projects with lower scores. The following table highlights the BCEGS scores for Davis County jurisdictions.

Table 8.3 - Building Code Effectiveness Grading Reports, Davis County

BCEGS Classification	Residential	Commercial	Date
Bountiful	3	3	2006
Centerville	3	3	2004
Clearfield	3	3	2004
Clinton	4	2	2005
Davis County	4	4	2006
Farmington	3	3	2005
Fruit Heights	3	4	2006
Kaysville	3	2	2004
Layton	3	3	2004
North Salt Lake	4	4	2003

Capability Assessment - Davis Co PDMP

South Weber	4	4	2004
Syracuse	4	3	2006
West Bountiful	99	99	2006
West Point	99	99	2003
Woods Cross	99	99	2006

F. Legal Authority

Local governments play an essential role in implementing effective mitigation. 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 Davis County the local executive responsible for carrying out plans and policies are the county commissioners and for local jurisdictions it is the city mayors/city managers. Local governments must be prepared to participate in the post-disaster Hazard Mitigation Team process and the pre-mitigation planning as outlined in this document. The cities and counties of Utah have the authority, through policing, to protect the health, welfare, and safety of their residents.

G. Political Willpower

Davis County region public officials have shown support for pre-disaster planning in the following ways:

Community Development Documents

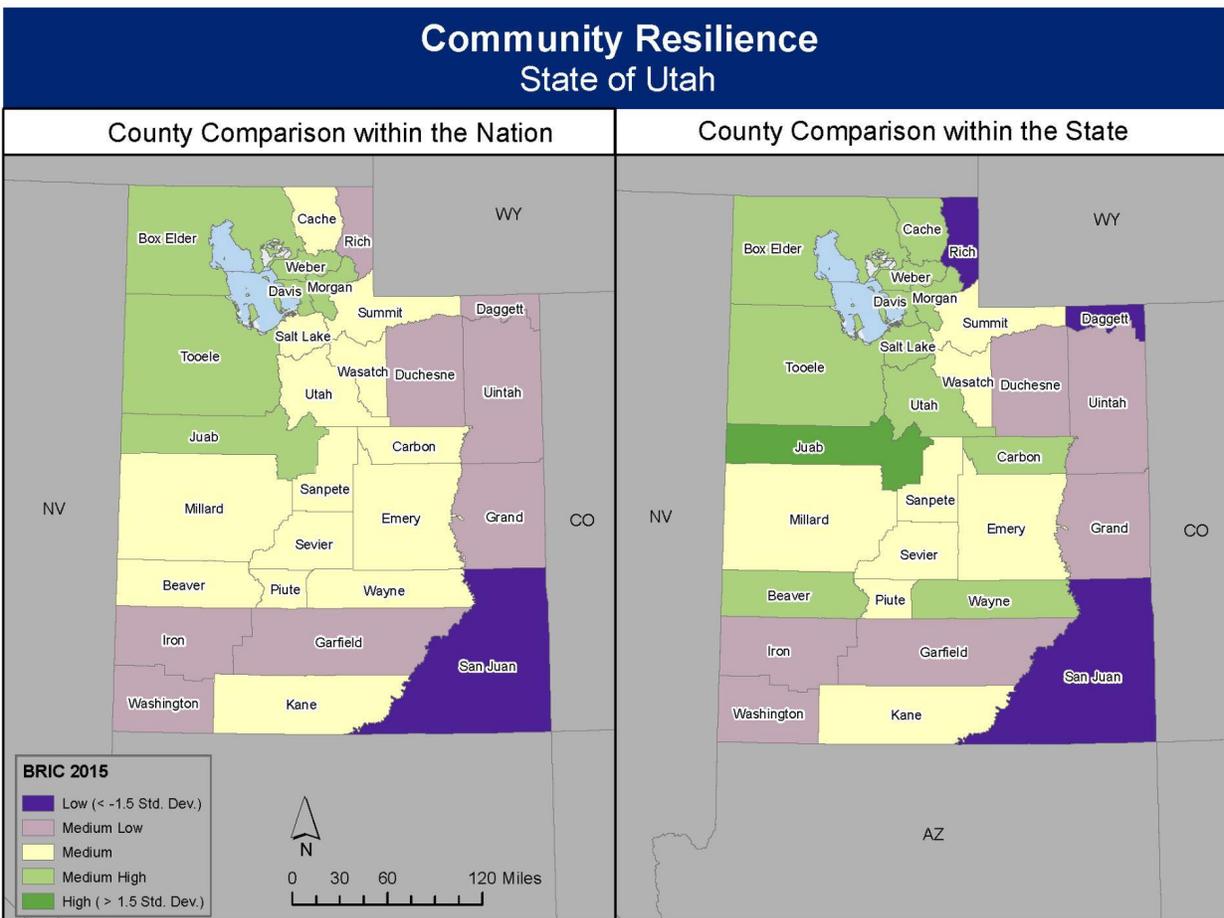
Elected officials have adopted updated community development documents to reduce the risk of emergencies and disasters. Each county and most cities have updated Emergency Operation Plans, Land Use Management Codes, International Building Codes, and General Plans that include pre-disaster planning. In addition, there is support from residents. Davis County recently adopted an Open Space Plan. In the Davis County Open Space Plan, property with higher probability for natural hazards is recommended for open space or lower intensity uses.

Emergency Planning Training Courses

Davis County's residents have supported emergency planning training sponsored by Utah DEM and local governments such as: CERT (Community Emergency Response Team), Local Emergency Planning Committees (LEPC), Hazardous Materials (HAZMAT), Site Plans and Ordinances, Real Estate Requirements, and Hazard Mitigation.

Part IX - RISK ASSESSMENT

The FEMA National Risk Index identifies Davis County Utah as an area with an overall risk index of 6.92. This is lower than the average for counties in Utah (7.25), and the national average (10.70). However, emergency management is a priority to Davis County because the same matrix identifies Davis County as having a much higher score for “Expected Annual Loss” (23.83) - almost double the average in Utah (12.95) and counties throughout the nation (13.47). One of the main reasons for this is because of the population density and building values in Davis County. Fortunately, through careful management efforts, Davis County is a community with a relatively high potential for resilience.



Baseline Resilience Indicators for Communities (BRIC) 2015



A. Hazard Identification

The first step in risk assessment is identifying the hazards that could affect Davis County. Hazard identification addresses the geographic extent, the intensity/magnitude of a hazard and the probability of its occurrence. Hazard identification was initiated through an extensive process that utilized the following:

- Core Planning Team

Risk Assessment - Davis Co PDMP

- Local Working Group
- Subject Matter Experts
- Community and Public individuals
- Elected Officials
- City and County Agencies
- Utah Division of Emergency Management
- Utah Geological Survey
- Utah Automated Geographic Reference Center

The natural hazards in Table 9.1 below have the potential of impacting Davis County. The identification process for Davis County utilized those natural hazards that consistently impacted the county prior to and during the planning process based on history of occurrences, future probability, and risk. Table 9.2 identifies those natural hazards for easy reference.

Davis County created maps that identified the location of critical facilities and the municipalities affected by each identified hazard. Initial data from this study was also used to determine hazards that presented the greatest risk to the county. The geographic extent of each hazard is identified through maps. County hazard intensity/magnitude and probability profiles are also outlined.

Davis County conducted and updated risk assessment analyses for each identified hazard.

Table 9.1 - Local Hazards Identification

EARTHQUAKE	
How Identified	Why Identified
Review of County Emergency Operations Plan 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 incidents, 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.
LANDSLIDE	
How Identified	Why Identified
Input from City and County Emergency Operations	Have caused damage in the past to residential and

Risk Assessment - Davis Co PDMP

<p>Managers, USGS, UGS, NCDC, Utah DEM, and community members</p>	<p>commercial infrastructure. Can be life threatening. Generally occur in known historic locations therefore risks exist throughout much of Davis County. To increase community awareness.</p>
WILDLAND FIRE	
How Identified	Why Identified
<p>Review of County Emergency Operations Plan Review of Community Wildland Protection Plans (CWPP) Input from County Emergency Managers, Utah DEM, Utah FFSL, Utah FS, NWS, FEMA, and local community members</p>	<p>Serious threat to life and property. Increasing threat due to urban growth in WUI areas. Secondary threat associated with flooding, drought, and earthquake. Much of the mountain front portion of Davis County is at risk. Additional funding and resources offered by local and state agencies to reduce risk. To increase community awareness.</p>
PROBLEM SOILS	
How Identified	Why Identified
<p>Review of County Emergency Operations Plan Input from community members, Utah, DEM, and UGS Researched historical data</p>	<p>Related to subsequent effects from earthquakes. Have affected infrastructure and the local economy in the past.</p>
DAM FAILURE	
How Identified	Why Identified
<p>Review of County Emergency Operations Plan Input from community members, Utah DWS, Dam Safety Section, Utah DEM Review of inundation maps</p>	<p>Can cause serious damage to life and property and have subsequent effects such as flooding, fire, debris flow, etc. Davis County has several irrigation reservoirs. Threat to downhill communities. Subsequent effects include flooding, and debris flows. To increase community awareness. To incorporate mitigation measures into existing plans to help serve local residents.</p>
FLOOD	

Risk Assessment - Davis Co PDMP

How Identified	Why Identified
<p>Review of past disaster declarations</p> <p>Input from City and County Emergency Operations Managers, Utah DWS, UGS, Utah Army Corps of Engineers, Utah DEM, and community members</p> <p>Review of Flood Insurance Studies, Floodplain maps, and Flood Insurance Rate Maps</p>	<p>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.</p> <p>Topography and climate lead to cloudburst storms and heavy precipitation can result in flash flooding throughout Davis County.</p>
SEVERE WEATHER	
How Identified	Why Identified
<p>Review of County Emergency Operations Plan</p> <p>Review of past disaster declarations</p> <p>Input from City and County Emergency Managers, Utah Avalanche, Forecast Center, Utah Department of Transportation, and community members</p>	<p>Damage to communities, homes, infrastructure, roads, and residents.</p> <p>Can cause property damage and loss of life. Results in economic loss.</p> <p>Lightning is the number one cause of natural hazard death in Utah. Can be costly to recover from.</p>
CLIMATE CHANGE	
How Identified	Why Identified
<p>Review of Utah State Hazard Mitigation Plan</p>	<p>Long-term climate change has the potential to result in a wide range of impacts across the region and in many sectors of the economy.</p>

The hazard identification process was aided through the use of FEMA How to Guidance documents, FEMA 386-1,2,3,7 FEMA Post Disaster Hazard Mitigation Planning Guidance DAP-12, 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 Davis County GIS using the best available data.

Table 9.2 - County Natural Hazards	
Earthquake	X
Landslide	X
Wildland Fire	X
Problem Soils	X
Dam Failure	X

Risk Assessment - Davis Co PDMP

Flood	X
Drought	X
Severe Weather	X

B. Hazard Profile

This section describes the causes and characteristics of each identified hazard, including its severity or magnitude (as it relates to the percentage of the jurisdiction that can be affected), probability, conditions that make the area prone to the hazard, hazard history, and maps of the hazard’s geographic location or extent. The hazards were profiled based on history of occurrence, local input, county emergency operations plans, and county master or general plans, scientific reports, historical evidence, and hazard analysis plans. A risk assessment “Hazard Profile” table was created that highlights the above mentioned materials in each of the county portions of the plan introducing each identified hazard. The probability of a hazard event was determined through the amount of risk to the county. The probability or likelihood of an occurrence is categorized into four categories: Highly Likely, Likely, Possible, and Unlikely.

In determining hazard magnitude a scale was used to identify the level of damage on a countywide basis from Catastrophic to Negligible. (See table below)

Table 9.3 - Hazard Profile

Damage Level	Jurisdiction Affected	Risk
Catastrophic	More than 50%	Extreme or High
Critical	25-50 %	Moderate
Limited	10-25%	Moderate
Negligible	Less than 10%	Low

The probability of a hazard event was determined through the amount of risk to the county. The probability or likelihood of an occurrence is categorized into four categories: Highly Likely, Likely, Possible, and Unlikely.

The geographical extent or location of the community that would be affected has been identified in the mapping portion of each county where geographic data was available. Hazard histories are provided for each county. These histories were taken from the Spatial Hazard Events and Losses Database for the United States (SHELDUS). Histories for each county were condensed into charts, tables and graphs in each county hazard profile section.

Maps were created using GIS software to identify the location and extent of each identified hazard area. Hazard maps were created for every identified natural hazard within the county. The following risk assessment maps were created for Davis County:

- Historic earthquakes
- Geologic hazards
- Liquefaction potential
- Flood history
- Drainage basins

- Landslide susceptibility
- Fire hazard potential
- Dam failure potential

C. Vulnerability Analysis

The vulnerability analysis is based on asset identification and potential loss estimates for those jurisdictions located within identified hazard areas.

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 buildings, roads, and critical facilities that can be damaged or affected by the hazard events. Critical facilities are of particular concern because of the essential products and services to the general public they provide. These critical facilities can also fulfill important public safety, emergency response, and/or disaster recovery functions. The critical 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 county, the locations of assets were identified and overlaid with the mapped hazards using GIS software.

Potential Loss Estimates

Potential dollar loss estimates were identified using this same method; therefore estimates 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 the state with a common framework in which to measure the effects of hazards on assets. Future planned development was not analyzed due to the lack of data available in GIS format.

The core planning team and local planning team members estimated potential losses for the identified hazards by using the methodology explained in the FEMA document titled, *Understanding Your Risks: Identifying Hazards and Estimating Losses*, Utah DEM historical data and GIS data.

The information sources used to complete the vulnerability assessment portion of this Plan include; Utah DEM, County GIS department, county Assessor's Office, 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 in GIS form.

D. Methodology

Geographic Information System (GIS) software was used as the basic analysis tool to complete the hazard analysis for the Davis County Natural Hazards Pre-Disaster Mitigation Plan. For most hazards a comparison was made between digital hazard data and Transportation Analysis Zone (TAZ) demographic information.

Statewide digital data was obtained from Utah Automated Geographic Reference Center (AGRC) for problem soils only. The vulnerability assessment for the county estimates the number of homes, business, infrastructure and population vulnerable to each hazard and assigns a replacement dollar value to residential structures and infrastructure in each hazard area. All the analysis takes place within the spatial context of a GIS. With the

information available in spatial form, it is a simple task to overlay the natural hazards with census data to extract the desired information.

The methodology used to determine vulnerability for all hazards was identical. The number of households and population vulnerable to each hazard was determined using WFRC Transportation Analysis Zone (TAZ) data and Block Data from the 2010 Census data. The Block Data from the 2010 Census database, or TAZ data, was intersected with each of the mapped hazard layers in order to determine the number and location of residential housing units and population at risk from hazards. The methodology used assumes an even distribution of residential housing units and population across each census block. Point data from HAZUS-MH was used to determine the number of businesses, and the annual sales of each business in each hazard area.

The number of acres for all hazards was determined for each city and the unincorporated county. Once an acre total was identified it was overlaid on the Census Block data or TAZ data to determine the total number of homes impacted. The number of homes impacted was then multiplied by the average housing value to determine the total value of potential loss. 2010 average house values from the U.S. Census Bureau were used for Davis County. Content values are not included, which would raise the potential loss numbers for housing by approximately 50%.

In addition to the above methodology, earthquake risk was profiled using HAZUS-MH, which is shorthand for Hazards United States - Multihazards. The data used in this report is from a model that was run in 2009. A new model has been requested from the State of Utah, and its findings will be incorporated into this PDM when they are available.

The HAZUS-MH Earthquake Model is designed to produce loss estimates for use by federal, state, regional and local governments in planning for earthquake risk mitigation, emergency preparedness, response and recovery. The methodology deals with nearly all aspects of the built environment and a wide range of different types of losses.

Extensive national databases are embedded within HAZUS-MH, containing information such as demographic aspects of the population in a study region, square footage for different occupancies of buildings, and numbers and locations of bridges. Embedded parameters have been included as needed. Using this information, users can carry out general loss estimates for a region. The HAZUS-MH methodology and software are flexible enough that locally developed inventories and other data that more accurately reflect the local environment can be substituted, resulting in increased accuracy. TAZ data from 2010 was aggregated to census blocks to update population data within HAZUS-MH.

Uncertainties are inherent in any loss estimation methodology. They arise in part from incomplete scientific knowledge concerning earthquakes and their effects upon buildings and facilities. They also result from the approximations and simplifications that are necessary for comprehensive analyses.

Incomplete or inaccurate inventories of the built environment, demographics and economic parameters add to the uncertainty. These factors can result in a range of uncertainty in loss estimates produced by the HAZUS-MH Earthquake Model, possibly at best a factor of two or more.

The methodology has been tested against the judgment of experts and, to the extent possible, against records from several past earthquakes. However, limited and incomplete data about actual earthquake damage precludes complete calibration of the methodology. Nevertheless, when used with embedded inventories and parameters, the HAZUS-MH Earthquake Model has provided a credible estimate of such aggregated losses as the total cost of damage and numbers of casualties. The Earthquake Model has done less well in estimating more detailed results - such as the number of buildings or bridges experiencing different degrees of damage.

Such results depend heavily upon accurate inventories. The Earthquake Model assumes the same soil condition for all locations, and this has proved satisfactory for estimating regional losses. Of course, the geographic distribution of damage may be influenced markedly by local soil conditions. In the few instances where the

Earthquake Model has been partially tested using actual inventories of structures plus correct soils maps, it has performed reasonably well.

The HAZUS Model estimates building losses, numbers of shelters required for displaced households, amounts of debris generated, and numbers of casualties. A HAZUS report was completed for each of the counties covered in this Plan.

The potential impact of natural hazards on transportation and utilities was determined in a similar method as described above. Roads and utilities were overlaid on the hazard areas and the impacted utility and road segments were inventoried. Once the length of vulnerable infrastructure was determined it was multiplied by cost estimate information from HAZUS-MH.

In addition to the linear features, point data for critical facilities, dams, care facilities, schools, power generation facilities and substations were analyzed to determine if the feature was within a hazard area.

Limited availability of digital data presented a problem in completing the vulnerability assessment. Potential loss numbers were only determined for earthquakes, flood, landslides, dam failure, problem soils and wildfires in this Plan. Additional limitations to the above described analysis method include:

- Assuming random distribution
- Limited data sets for water, gas, electrical, resulting in incomplete numbers for these features
- Lack of digital parcels data for Morgan and Tooele Counties
- Relied on state wide data not intended for manipulation at the scale it was used
- Data was not field checked, resulting in an analysis wholly dependent on accuracy of data
- Metadata was lacking on some of the used data sets

In this document, simple maps were created to provide a graphical illustration of location. These maps are done at a scale, which allows them to fit on a standard letter sized page. Data manipulation and maps were created as a planning tool, to be used by interested persons within Davis County. This information should not take the place of accurate field verified mapping from which ordinances need to be based.

Effort to analyze hazards related to potential future development areas was also addressed where applicable. This proved to be a very difficult exercise and at best can only identify areas which need additional research before development should be allowed. No viable source of data exists for this study area to facilitate analysis of future development. Limited zoning data was available, but this data does not necessarily indicate which areas will be developed and which will not.

E. Mitigation Strategies, Objectives, Actions

Using the findings from the risk assessment and the capabilities assessment as a guide, several mitigation strategies and implementing actions were identified that would benefit each jurisdiction. Each action has been formalized and placed into this Plan in each of the county mitigation sections. These actions were identified in the planning group meetings which included input from the core planning team, local planning team, state and local agencies, county government, and city and county residents. Goals and objectives were developed in a working session between the above-mentioned groups with a period provided for comment and revision.

Each of the jurisdictions identified mitigation actions based on the identified goals and objectives. These actions are included in each county section of this Plan. The mitigation actions identify the responsible agency, the funding source, timeline, background, and their priority. Actions were selected using the information obtained from the capabilities assessment, which identified existing programs and shortfalls related to mitigation activities.

The actions were prioritized based on the Social, Technical, Administrative, Political, Legal, Economic, Environmental (STAPLEE) method identified in the FEMA How-To Guides. The STAPLEE method of prioritization emphasizes the effectiveness of the actions with respect to their cost, as well as their social, technical, administrative, political, legal, environmental, and economic effects. Each action is judged and ranked against these criteria and assigned the priority of High, Medium, or Low.

F. Hazard Description + Profile

Each of the natural hazards that could affect the County has been described. These are general descriptions about each hazard to give an idea of what, why, when, and how the hazards occur.

1. Earthquake



Earthquake Overview + Profile

The Utah Geologic Survey defines an earthquake as the result of “...sudden breakage of rocks that can no longer withstand the stresses that build up deep beneath the earth’s surface” (DEM 2008). The energy that is released is abrupt shaking, trembling or sudden motion in the earth and rocks that break along faults or zones of weakness along which the rocks slip. Seismic waves are then transmitted outward and also produce ground shaking or vibrations in the earth. The Richter scale measures the magnitude of earthquakes on a seismograph. A Richter magnitude 6 earthquake is 30 times more powerful than a Richter magnitude 5. A Richter magnitude 7 is 1000 times more powerful than a Richter magnitude 5.

Utah experiences approximately 700 earthquakes each year, and approximately six of those have a magnitude 3.0 or greater (Table, this page). On average, a magnitude 5.5 or greater earthquake occurs in Utah every 10 years.

Generally, in order for humans to feel an earthquake it needs to be at least a magnitude 2.0. In order for significant damage to occur, an earthquake needs to be at least a magnitude of 5.5 or greater. 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.

Table 9.4 - Earthquake Hazard Summary Profile

Changes since 2016	Over the last ten years, the population of Davis County has grown by approximately 30%. The number of buildings in the area have grown as well. In 2010, the estimated total building value in Davis County was over \$14billion (HAZUS-MH).			
	In recent years, the market value of buildings in the area have increased significantly. It is expected that any major earthquake event would affect most buildings in the area.			
Potential Magnitude	X	Catastrophic (>50%)		Highly Likely
		Critical (25-50%)	Probability	X Likely

Risk Assessment - Davis Co PDMP

	Limited (10-25%)		Possible
	Negligible (<10%)		Unlikely
Location	Eastern areas of Bountiful, Centerville, Farmington, Kaysville, Kaysville, and Layton along the western portion of the Intermountain Seismic Belt. Ground shaking will be felt throughout the entire County. Surface fault ruptures will be found along and near the current fault trace. Liquefaction can be expected in areas of deep sediment and shallow groundwater, from the foothills to the western portion of the county near the Great Salt Lake.		
Extent	Events are expected to be up to 7.0 (Richter).		
Prior Occurrences	Refer to table 9.5 and 9.6.		
Seasonal Pattern	There is no seasonal pattern for earthquakes, they can occur at any time of the year or day during any or all weather conditions.		
Conditions	Liquefaction Potential is greatest near the Great Salt Lake along the low lying areas of the county, in soils that are composed of old lakebed sediments. Historic movement along faults: Intermountain Seismic Zone, and the Wasatch Fault Zone.		
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.		
Climate Change	Climate change is not expected to impact earthquake risk directly, but it could exacerbate hazards Utah already experiences.		
Analysis Used	Review of hazard analysis plans and other information provided by the University of Utah Seismograph Station, UGS, USGS, DEM, AGRC.		

Locations and Activity:

Faulting can be evident on the earth's surface or not evident at all, therefore earthquakes are believed to be able to occur anywhere in Utah.

The earthquake history of the Wasatch Fault is complicated by the fact that there has not been a large earthquake since the first pioneers first arrived in the valley in 1847. The Utah Geological Survey estimates that the last major earthquake in the Wasatch Front was approximately 1,350 years before present. Yet, when looking at the Wasatch Fault Zone, the potential for a large earthquake exists considering that "since 1850 at least 16 earthquakes (excluding aftershocks) of magnitude 6.0 or greater have occurred within the Intermountain Seismic Belt (ISB)" (DEM 2008). The greatest earthquake hazard is considered to be in the areas surrounding the Wasatch, East Cache, East Bear Lake, Bear River, Hansel Valley, Northern Oquirrh, West Valley, and East Great Salt Lake fault zones. On the Wasatch fault, the segments between Brigham City and Nephi, the "composite recurrence interval for large surface-faulting earthquakes (magnitude 7.0 to 7.5) is 395±60 years. The most recent surface-faulting earthquake on the Wasatch fault occurred 400 years ago on the Nephi segment" (DEM 2008).

Risk Assessment - Davis Co PDMP

According to Earthquake.usgs.gov, more recently there was a magnitude 2.8 on November 5th, 2010, 4 kilometers WSW of Morgan City, Utah. There was also a seismic event that occurred in Magna on March 18th, 2020 that was a 5.7 (U of U Seismograph Station Annual Report 2020). These are the more violent examples, as presented in the data below, Davis County is much more likely to experience smaller, more localized earthquakes that come with minimal damage.

Table 9.5 - Average Earthquake Frequency

Magnitude	Wasatch Front Frequency	Utah Frequency
≥3.0	3 per year	6 per year
≥4.0	1 every 2 years	1 per year
≥5.0	1 every 10 years	1 every 4 years
≥5.5	1 every 20 years	1 every 10 years
≥6.0	1 every 50 years	1 every 20 years
≥6.5	1 every 120 years	1 every 50 years
≥7.0	1 every 330 years	1 every 150 years
<i>Source: UUSS unpublished data in UGS PI-38 1996. Excludes foreshocks, aftershocks and human-triggered seismic events.</i>		

Table 9.6 - Davis County Quaternary Faults

Name + Type	Length	Time of Most Recent Deformation	Recurrence Interval
Fremont Island section, EGSLFZ (Normal type)	30km	3150 +235/-211 cal yr B.P.	4200 years
Antelope Island section, EGSLFZ (Normal type)	35km	586 +201/-241 cal yr B.P.	4200 years
Salt Lake segment, WFZ (Normal type)	43km	1300 ±650 cal yr B.P.	1300 years
Weber segment, WFZ (Normal type)	56km	950 ±450 cal yr B.P.	1400 years
<i>Source: UGS 2002, Lund 2005) (EGSLFZ=East Great Salt Lake Fault Zone, WFZ=Wasatch Fault Zone, cal yr B.P.=calendar years before present)</i>			

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.

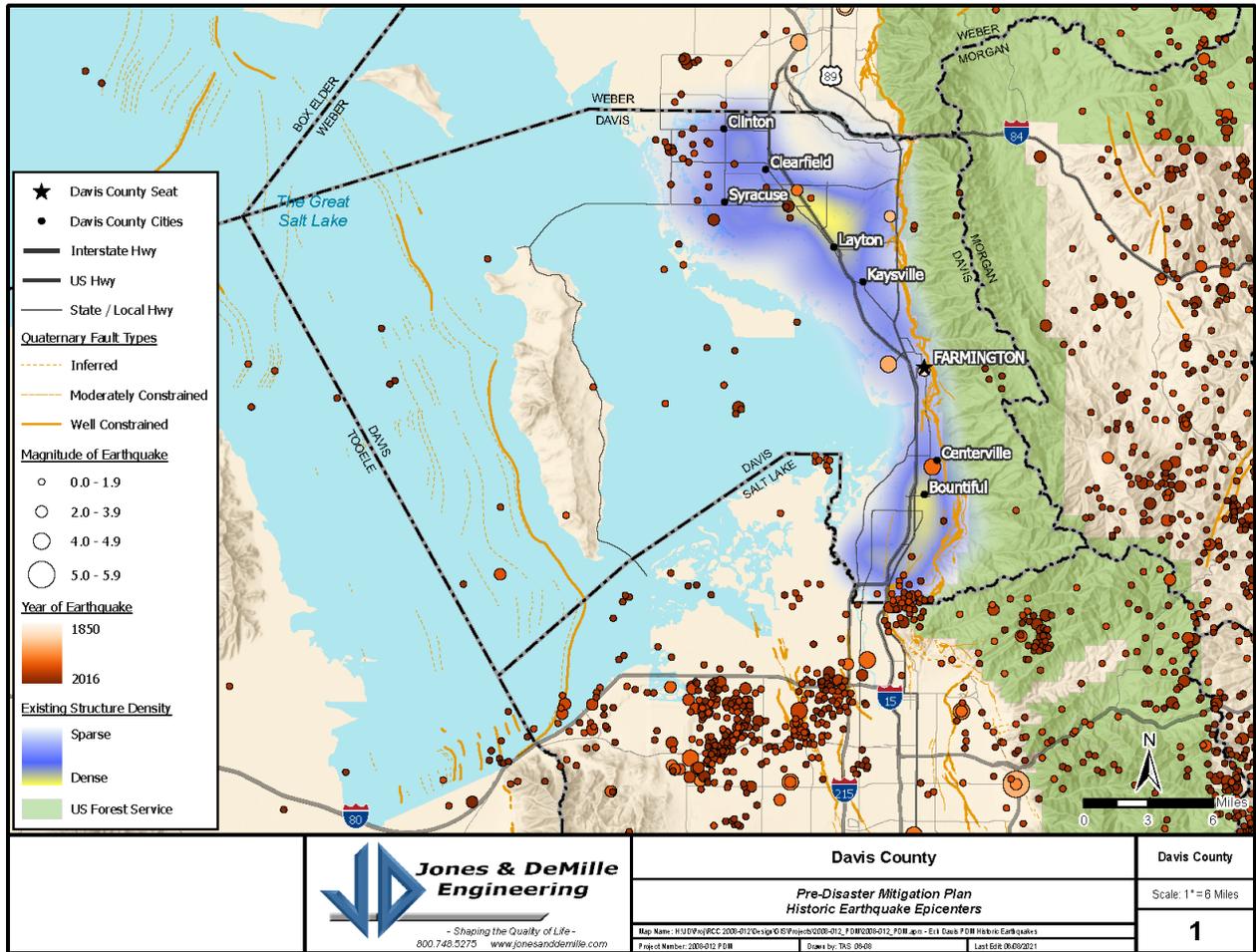
“The Hansel Valley earthquake produced MM intensities of VIII in Salt Lake City, with numerous reports of broken windows, toppled chimneys, and structures twisted on their foundations. A clock mechanism weighing more than 2 tons fell from the main tower of the Salt Lake City County Building and crashed 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 in 1962 dollars was about one million dollars.

“Earthquakes in 1909, 1914, and 1943 produced MM intensities in Salt Lake City of up to VI, and earthquakes in 1910, 1949, and 1962 had MM intensities of VII in Salt Lake City. Damage produced by these events included broken windows, cracked walls, fallen plaster, toppled chimneys, and buildings shifted on their foundations. The 1949 earthquake also ruptured a water main causing loss of water to a portion of the city.” (Lund 2005)

On average, Utah experiences a moderate, potentially damaging earthquake (magnitude 5.5 to 6.5) every 7 years. 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 most recent took place on the morning of March 18, 2020, northern Utah experienced a magnitude 5.7 earthquake with an epicenter just north of Magna, Utah. The shock was felt across the Wasatch Front and aftershocks were felt for weeks following.

“No major injuries were reported from the mainshock or aftershocks. Damages occurred throughout the valley with the most severe damage in Magna. HAZUS, software used by the state to estimate potential losses, shows that there could be upwards of \$62 million in building-related damages, contributing to \$629 million in total economic losses related to buildings. This does not include damages to public infrastructure.” (2020 Magna Quake, 2020)



Map illustrating historic earthquake epicenters in the Davis County area. ([click for original](#)).

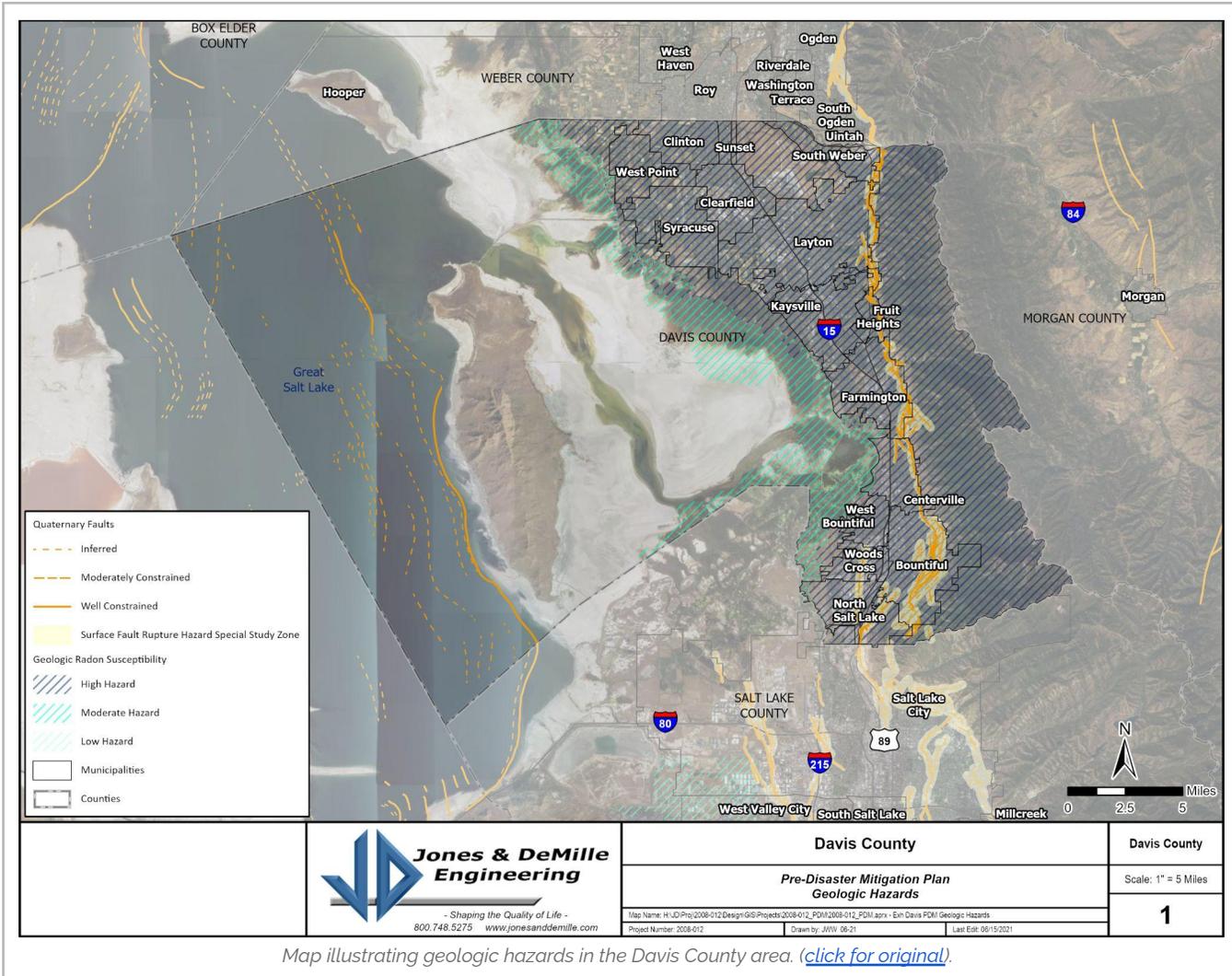
Secondary Hazards:

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

Table 9.7 - Fire Following Event, Population Exposed, and Building Stock Exposed

Category	Number of Structures	
	Davis M5.9	2,500-yr M7.1
Ignitions	11	12
Persons Exposed	261	447
Value Exposed	\$13,663,000	\$28,594,000
<i>Source: HAZUS-MH</i>		

Risk Assessment - Davis Co PDMP



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. The waves move the earth's surface laterally and horizontally 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 groundwater depth, basin shape, thickness of sediment, and the degree of sediment consolidation. 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. (DEM 2008)

Surface Fault Rupture and Tectonic Subsidence:

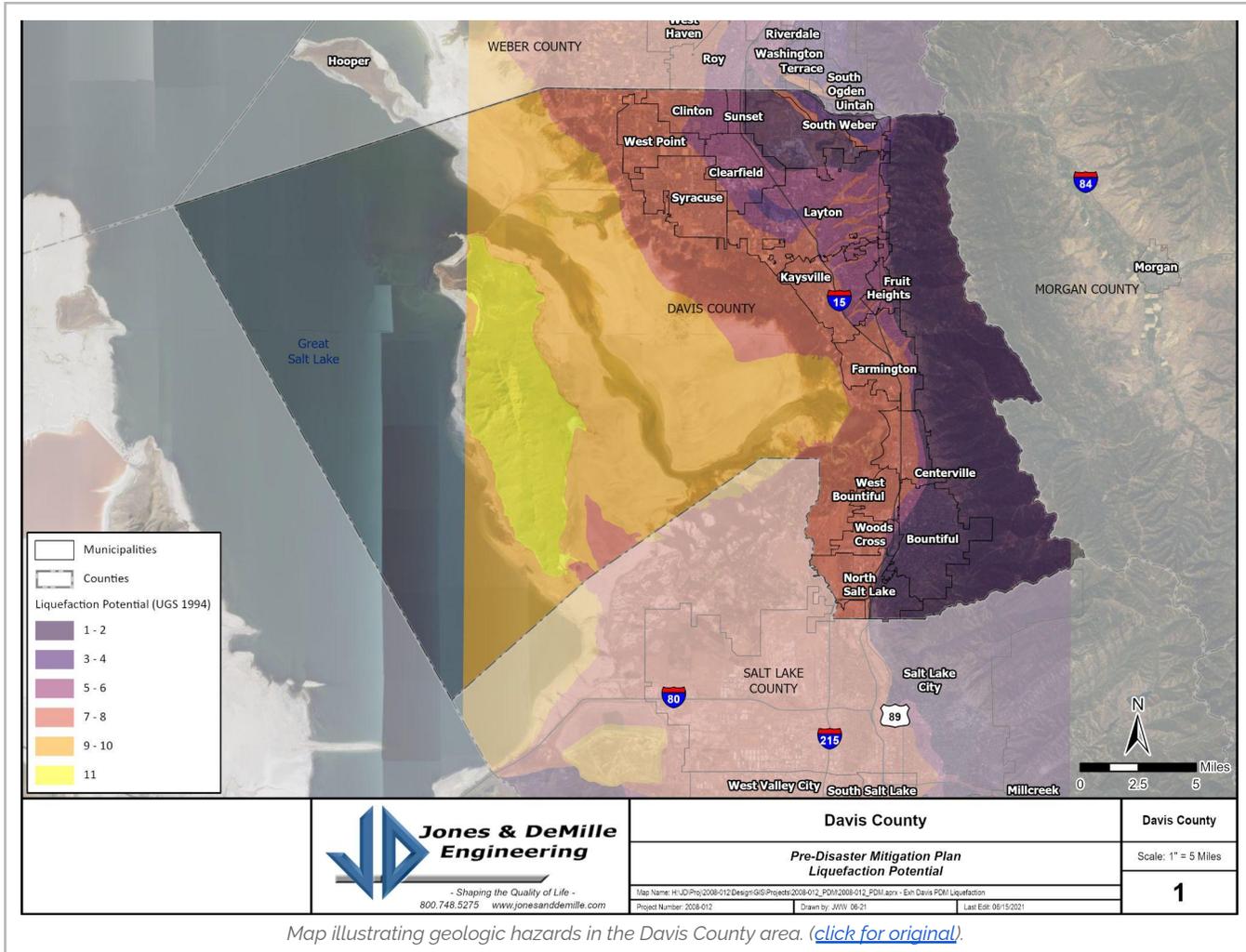
Surface fault rupture or down dropping and tilting associated with tectonic subsidence can rupture the ground surface and in Utah the result is the formation of scarps or steep breaks in the slope. The 1934 Hansel Valley earthquake resulted in a surface displacement of approximately 1.6 feet. The highest potential for surface faulting exists in the central segments of the Wasatch fault.

Also, earthquakes having a magnitude of 6.5 or greater could result in surface faulting of 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. Tectonic subsidence generally depends on the amount of surface fault displacement. The greatest amount of subsidence will be in the fault zone and will gradually diminish out into the valley (DEM 2008).

Soil Liquefaction:

Liquefaction occurs when there is a sudden large decrease in shear strength of sandy soils. It is caused by the collapse of the soil structure in which the soil loses its bearing capacity, and also by a temporary increase in pore-water pressure, or water saturation during earthquake ground shaking. Liquefaction is common in areas of shallow ground water and sandy or silty sediments. Two conditions must be met in order for soils to liquefy; first, the soils must be susceptible to liquefaction (sandy, loose, water-saturated, soils typically between 0 and 30 feet below the ground surface) and second, ground shaking must be strong enough to cause susceptible soils to liquefy (UGS 2015). The result is soils that will flow even on the gentlest of slopes.

Risk Assessment - Davis Co PDMP



Lateral Spreading:

Lateral spreading is a type of failure that results in surficial soil layers breaking up and moving, up to 3 feet or more, independently over the liquefied layer. On slopes more than 5 percent, flow failures can move several miles at speeds up to 10s of miles per hour. On slopes less than 0.5 percent the bearing capacity will lessen and can cause buildings to settle or tip. No matter the slope percent, ground cracking and differential settlement will occur. Liquefaction can also cause foundation materials to liquefy and fail 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. (DEM 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 benches in wet unconsolidated materials. During a 6.0 magnitude earthquake, landslides may happen within 25 miles of the source. (DEM 2008)

Flooding:

Risk Assessment - Davis Co PDMP

“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.” (DEM 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. In winter or spring months with a snowpack, avalanches may be expected anywhere along the Wasatch Front following an earthquake. (DEM 2008).

Sensitive Clays:

Sensitive clays are a soil type that lose strength when disturbed and result in liquefaction or collapse. The resulting type of ground failure is similar to liquefaction (DEM 2008).

Subsidence:

A settling or sinking of the earth’s crust in loose granular materials such as gravel that do not contain clay. Western Utah is subject to this type of ground settlement (DEM 2008).

Vulnerability Analysis:

Vulnerability to earthquake in Davis County was obtained from the modeling program Hazards United States – Multihazards (HAZUS-MH). The following numbers were 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.

Table 9.8 - Building Damage Counts and Estimated Losses

	Number of Structures with >50% Damage			Estimated Losses	
	Davis M5.9	2500-yr M7.1		Davis M5.9	2500-yr M7.1
Residential	7,618	41,310	Structural Losses	\$96,362,000	\$751,502,550
Commercial	282	954	Non-Structural Losses	\$345,379,000	\$2,646,616,900
Industrial	91	294	Content Losses	\$131,812,000	\$844,568,670
Government	15	49	Inventory Losses	\$4,504,000	\$38,314,060
Education	11	38	Income + Relocation Losses	\$90,090,000	\$3,983,479,080
Totals	8,017	42,645	Totals	\$668,147,000	\$8,264,481,260

Source: HAZUS-MH

Table 9.9 - Damage to Transportation and Utilities

	At Least Moderate Damage (>50%)			Estimated Losses	
	Total	Davis M5.9	2500-yr M7.1	Davis M5.9	2500-yr M7.1

Risk Assessment - Davis Co PDMP

Wastewater Facilities	3	1	3	\$21,559,000	\$77,769,000
Wastewater Pipelines	1,242 km	203 leaks/breaks	4,455 leaks/breaks	\$730,000	\$16,039,000
Potable Water Pipelines	2,069 miles	256 leaks/breaks	5,633 leaks/breaks	\$923,000	\$20,279,000
Natural Gas Pipelines	828 km	216 leaks/breaks	4,775 leaks/breaks	\$780,000	\$17,145,000
Electrical Power Facilities	1	0	1	\$11,375,000	\$51,503,000
Communication Facilities	5	0	4	\$46,000	\$220,000
Highway Bridges	130	0	81	\$3,359,000	\$61,530,000
Railway Facilities	2	0	2	\$712,000	\$2,169,000
Airport Facilities	4	0	4	\$2,569,000	\$9,719,000
Totals				\$42,053,000	\$256,373,000
<i>Source: HAZUS-MH</i>					

Table 9.10 - Debris Generated/Number of Loads

Category	Number of Structures	
	Davis M5.9	2,500-yr M7.1
Brick, Wood & Others	111,000 tons / 4,440 loads	758,000 tons / 30,320 loads
Concrete & Steel	197,000 tons / 7,880 loads	1,603,000 tons / 64,120 loads
<i>Source: HAZUS-MH</i>		

Table 9.11 - Potential Casualties

	Night Event		Day Event		Commute Event	
	Davis M5.9	2,500-yr M7.1	Davis M5.9	2,500-yr M7.1	Davis M5.9	2,500-yr M7.1
Minor	223	2,589	250	3,039	227	2,700
Major	46	792	62	1,086	59	924
Fatalities	9	186	14	302	13	243
<i>Source: HAZUS-MH</i>						

2. Flood



Flooding Overview + Profile

Flooding is a natural event for rivers and streams. Flood is determined to be the overflow of water onto land that is normally dry. Floods are related to an excess of snowmelt, rainfall, or failure of natural or engineered impoundments onto the banks and adjacent floodplains. Floodplains are lowland areas near rivers, lakes, reservoirs, and low terrain urban areas that are subject to recurring floods. Flooding occurs when the peak discharge, or rate of flow in cubic feet per second, is larger than the channel of the river or the storm sewer capacity in a city. The peak discharge for a stream is associated with a probability of occurrence. The probability of occurrence can be stated in terms of recurrence intervals or return periods. For example, a probability of occurrence of 10 percent would be a flood expected to occur once in 10 years or 10 times in a 100 years. Flooding damage includes saturation of land and property, erosion from water, deposition of mud and debris, and the fast flowing waters from the flood itself. Most injuries and deaths occur from the fast moving floodwaters and most of the property damage results from the inundation by sediment-filled water. Flash flood conditions result from intense rainfall over a short period of time (DEM 2008).

Table 9.12 - Flooding Hazard Profile

Changes since 2016	Local jurisdictions have been updating their floodplain development ordinances in areas with flooding potential.				
Potential Magnitude		Catastrophic (>50%)	Probability	Highly Likely	
	X	Critical (25-50%)		Likely	
		Limited (10-25%)		X	Possible
		Negligible (<10%)			Unlikely
Location	Weber River; many creeks along Wasatch Front.				
Extent	See map (below).				
Prior Occurrences	The NOAA’s flood event database doesn’t record prior events since 2016, but minor flooding has occurred in different locations throughout the County.				
Seasonal Pattern	Spring, late summer.				
Conditions	Cloudburst storms and heavy snowfall runoff.				
Duration	Flooding can last anywhere from hours to days and even months.				
Secondary Hazards	Raw sewage/health risk, electrical fires, gas spills.				
Climate Change	The increase in flood risk will occur in two ways. One, warmer temperatures will increase the risk of rain-on-snow events. Two, climate change will increase the				

Risk Assessment - Davis Co PDMP

	incidence of extreme precipitation events and likely lead to an increase in flash flooding.
Analysis Used	Review of FIS, FIRM, HAZUS-MH.

Location and Extent:

The greatest flood risk within Davis County has been associated with cloudburst storms that generally result in flash flooding in localized areas. Heavy rain and rapid snowpack melt can also result in unusually heavy water, and/or mud and debris flows. Davis County's precipitation is associated with the Wasatch Mountain Range, which is where most of the County's surface water originates. All of the streams originate in canyons and pass along alluvial fans, across the eastern portion of the County into the Great Salt Lake.

The major river that poses a flood threat is the Weber River. The Weber River flowing through South Weber, acts as a partial northern county boundary. Many small creeks flow out of the Wasatch Mountain Front in Layton, Kaysville, Kaysville, Centerville, Bountiful, and North Salt Lake. These streams have flooded in the past and also pose a future flood threat, many of which are mapped through the NFIP. Many channels within the county can pose a threat due to channel constrictions from debris and could result in residential flooding. All of the alluvial fans in the county have been developed or are being developed, and therefore, residential and commercial flooding is probable. Floods can also pose a threat to the agricultural lands that are in the lower portions of the alluvial fans.

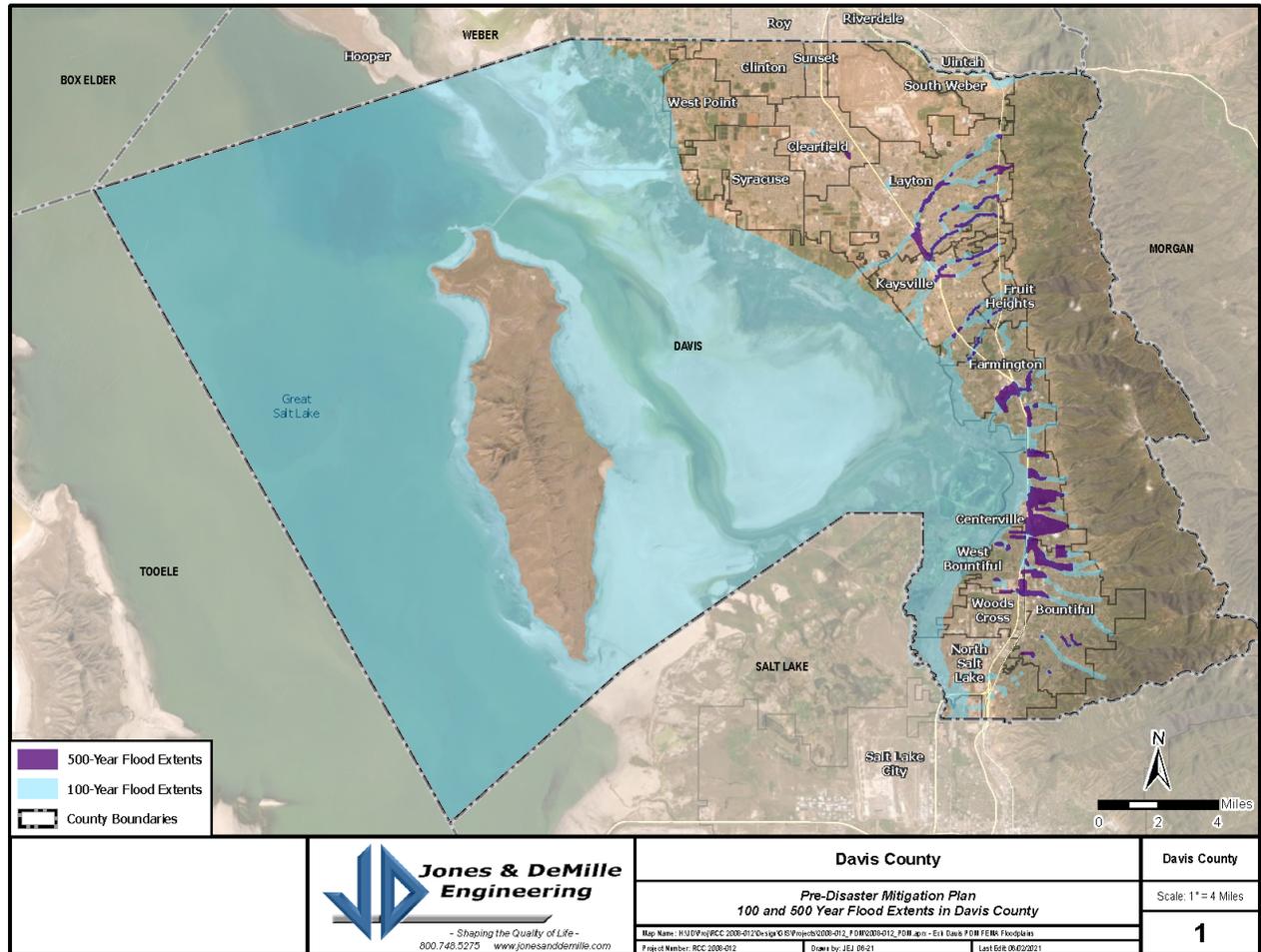
A little more than 50% of Davis County is under the Great Salt Lake. This results in a very high ground water table in those areas near the lake, threatening shorelines and, in some cases, agricultural lands and roads. Flooding in wetlands areas, along the shores of the Great Salt Lake, also threatens urban development.

High stream flows and velocity can affect the residential, commercial and recreational development on Farmington Creek, Kays Creek, Ricks Creek and Steeds Creek. Roads can be affected from high stream flows on Barton Creek and Holmes Creek. Primary threatened utilities are power substations and water treatment plants located on Stone Creek, Farmington Creek, Holmes Creek and Millcreek.

One of the more recent examples happened in 2004. Due to intense thunderstorms and heavy rainfall, flooding began in areas around Farmington and Shepard Canyons. Several factors contributed to this occurrence including: heavy rainfall, burned hillsides, steep slopes, ample sediment, and runoff previously caused by wet soil from snowmelt.

Most damage occurred in subdivisions. Floodwaters and sediment deposition were mostly restricted to streets and yards, but damage also occurred to some vehicles, garages, and homes. Erosion by floodwaters threatened a section of a Weber Basin Water Conservancy District aqueduct running along the mountain front. Although emergency watershed protection measures were completed the fall following the fire, they are designed to reduce flooding and associated hazards, they do not eliminate them and are not permanent. (Giraud & McDonald, 2021)

Risk Assessment - Davis Co PDMP



Map illustrating FEMA flood extents in the Davis County area. ([click for original](#)).

Snowmelt:

Snowmelt floods occur from the rapid snowmelt in the mountains. These floods generally happen in April, May and June. Warm air masses with mostly sunny skies melt the mountain watershed snowpack. The large accumulations of water generally last several days and the magnitude depends on the amount of snowpack and the warm weather. Snowmelt flood risk is reduced when the snowpack is below normal and/or the weather changes from winter to spring and summer gradually without an abrupt warming trend (DEM 2008).

Rainfall:

Rainfall floods result from large amounts of precipitation. Short duration local storms such as cloudburst or thunderstorms with a high intensity rainfall as well as the general storms that last several days with a less intense rainfall can produce a flooding event (DEM 2008).

Areas prone to flooding, according to the Utah Natural Hazards Handbook, include lake and reservoir shorelines which may flood when the flow of water into the lakes or reservoirs is greater than the outflow capacity. The Great Basin has several terminal lakes, such as the Great Salt Lake and Sevier Lake, which

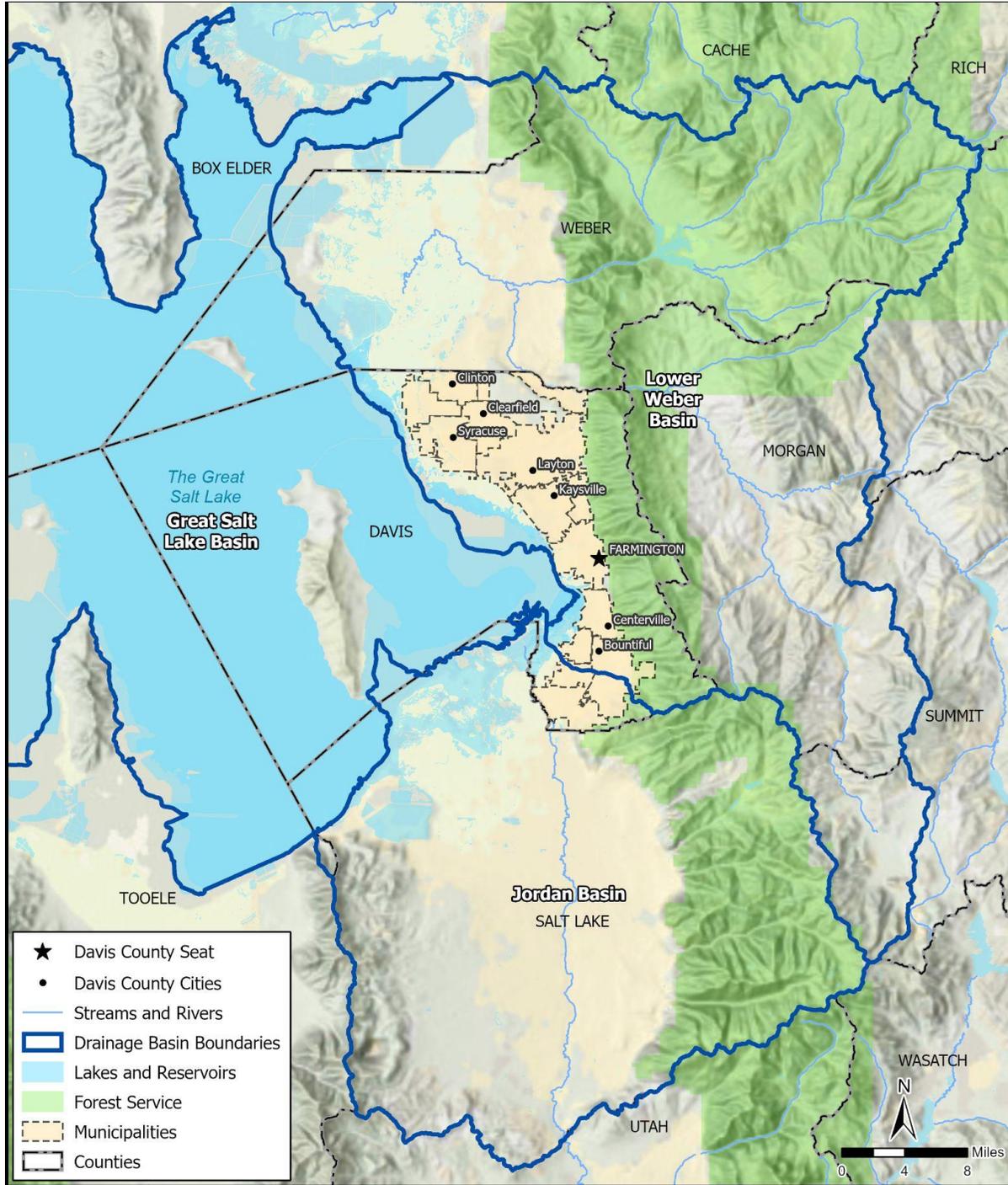
mean there is no outlet to the sea. These types of lakes are subject to considerable variations in water levels because the only outflow is by evaporation. Successive wet or dry periods lasting several years can result in a large change in size of terminal lakes. Development near this type of lake during a dry period is risky and certain to get flooded during wet periods (DEM 2008).

In 2016, the Great Salt Lake was reduced to only 4,206' due to a nine year period of excessive drought in the Salt Lake Valley. The historic low elevation for the lake was 4,191' in 1963.

River and creek floodplain areas range from narrow zones to extensive lowlands extending great distances from a natural drainage area. Construction in floodplains is also dangerous because of the high flood risk.

Urban areas are also prone to flooding because of the decrease in vegetation of the natural watershed. Houses, driveways, parking lots, buildings, and streets are all replacing the vegetative cover that is so important in lessening the potential for flood. This type of development prevents water infiltration into the soil and greatly increases the runoff. In some areas undersized piping and channels are used which may cause flooding. Man-made drainage channels can also play a role in flooding. Trash and debris can obstruct passageways (DEM 2008).

Risk Assessment - Davis Co PDMP



- ★ Davis County Seat
- Davis County Cities
- Streams and Rivers
- ▭ Drainage Basin Boundaries
- ▭ Lakes and Reservoirs
- ▭ Forest Service
- ▭ Municipalities
- ▭ Counties



 <p>Jones & DeMille Engineering - Shaping the Quality of Life - 800 748 5375 www.jonesanddemille.com</p>	Davis County	Davis County
	<i>Pre-Disaster Mitigation Plan Drainage Basins</i>	
	Scale: 1" = 8 Miles	
<small>Map Name: H:\JD\Proj\2008-012\Design\GIS\Projects\2008-012_PDM\2008-012_PDM.aprx - Ext Davis PDM Drainage Basins</small>		1

Map illustrating drainage basins in the Davis County area. ([click for original](#)).

Risk Assessment - Davis Co PDMP

Vulnerability Analysis:

Assessing flood in Davis County was obtained from the modeling program Hazards United States – Multihazards (HAZUS-MH), for both 100-year (NFIP Zone A) and 500-year (NFIP Zone B or Zone X (shaded)) flood events. Analysis was completed using Flood Insurance Rate Maps (FIRM) or Digital Flood Insurance Rate Maps (DFIRM). Only streams which contained detailed flood cross-section data could be evaluated. Flooding from the Great Salt Lake was not included. Consequently, the results should be considered conservative. Total monetary losses include structures, contents and business interruption.

Table 9.13 - Number of Structures in Floodplains

	Acres Flooded	Population Displaced	Residential Units Total Losses	Commercial/Industrial Units Total Losses
100-year Flood	683	2,311	245	3
			\$37,810,000	\$18,370,000
500-year Flood	1,155	2,492	266	3
			\$43,430,000	\$23,210,000
<i>Source: HAZUS-MH</i>				

Table 9.14 - Agricultural Losses, June 15 Scenario

	100-year Losses Day 3	100-year Losses Day 7	500-year Losses Day 3	500-year Losses Day 7
Barley	\$14,749	\$19,665	\$15,899	\$21,198
Corn Silage	\$151,723	\$202,297	\$163,549	\$218,066
<i>Source: HAZUS-MH</i>				

Table 9.15 - Vehicle Losses

	100-year	500-year
Daytime Scenario	\$1,535,794	\$1,603,936
Nighttime Scenario	\$2,533,427	\$2,751,553
<i>Source: HAZUS-MH</i>		

Table 9.16 - Debris Generation and Removal

	100-year	500-year
Finishes	3,563 tons/143 loads	4,145 tons/166 loads
Structures	3,637 tons/146 loads	4,289 tons/ 172 loads
Foundations	3,771 tons/151 loads	4,461 tons/179 loads
Totals	10,970 tons/440 loads	12,895 tons/517 loads
<i>Source: HAZUS-MH</i>		

3. Landslide



Landslide Overview + Profile

Utah ranked third in the nation in terms of largest total landslide damage cost and cost per person between 1973 and 1983. Utah’s landslide hazard rating is “severe”, the highest level of five hazard classes given by the U. S. Geological Survey. The three main contributing factors to slope failure include areas with moderate to steep slopes, conducive geology, and high precipitation. The main elements that cause slope failure include precipitation events, topography and vegetation (DEM 2008). Landslide distribution in Utah is associated with topography and physiographic provinces. The two physiographic regions that are conducive to landslides in Utah are the Middle Rocky Mountains province and the High Plateaus subdivision of the Colorado Plateau physiographic province. Landslides are also known as slope failure and are classified according to the type of movement and the material involved. The five types of movement include falls, topples, slides, lateral spreads, and flows. The types of materials include rocks, debris (course-grained soil), and earth (fine-grained soil). Slope failure types are identified as rock falls, rock topples, rock slides, debris flows, debris topples, debris slides, slumps, and earth flows (DEM 2008). North Salt Lake experienced the Spring Hill landslide in 2014 which destroyed one home, damaged another home, and also damaged a tennis club. An agreement was reached in 2015 by the developer, the city, and the property owners to begin remediation of this slide.

Table 9.17 - Landslide Hazard Profile

Changes since 2016	County and municipal planners have continued to see demand for hillside residential development. However, the lessons learned from the 2013 Parkway Drive landslide in North Salt Lake have improved political support for resilience efforts.				
Potential Magnitude		Catastrophic (>50%)	Probability	Highly Likely	
	X	Critical (25-50%)		X	Likely
		Limited (10-25%)			Possible
		Negligible (<10%)			Unlikely
Location	Generally occur in canyon mouths and foothill areas.				
Extent	The HAZUS models identify the potential impact of landslides to be most significant in the Farmington area and on the southern end of the County.				
Prior Occurrences	2013 Parkway Drive landslide in North Salt Lake				
Seasonal Pattern	Spring and Summer; after heavy or long-duration precipitation				
Conditions	Usually caused by the stress release of over-weighted soils, shallow groundwater in certain soils, or loosening of rock and debris.				
Duration	Hours to years.				

Risk Assessment - Davis Co PDMP

Secondary Hazards	Flooding (natural dams), traffic accidents.
Climate Change	Warmer, future winter temperatures will create a scenario where landslides may be more likely. Warmer winter temperatures mean it is less likely that soils are frozen, even if snowpack exists.
Analysis Used	Information and maps provided by UGS, DEM.

Future landslide areas are usually located in the areas of historical landslides, which are well defined and localized. Landslides have been one of the most reoccurring hazards within Davis County along the canyon benches. The homes in these areas have the greatest vulnerability to rockfalls, debris flows, landslides and other types of slope failure.

Locations and Activity:

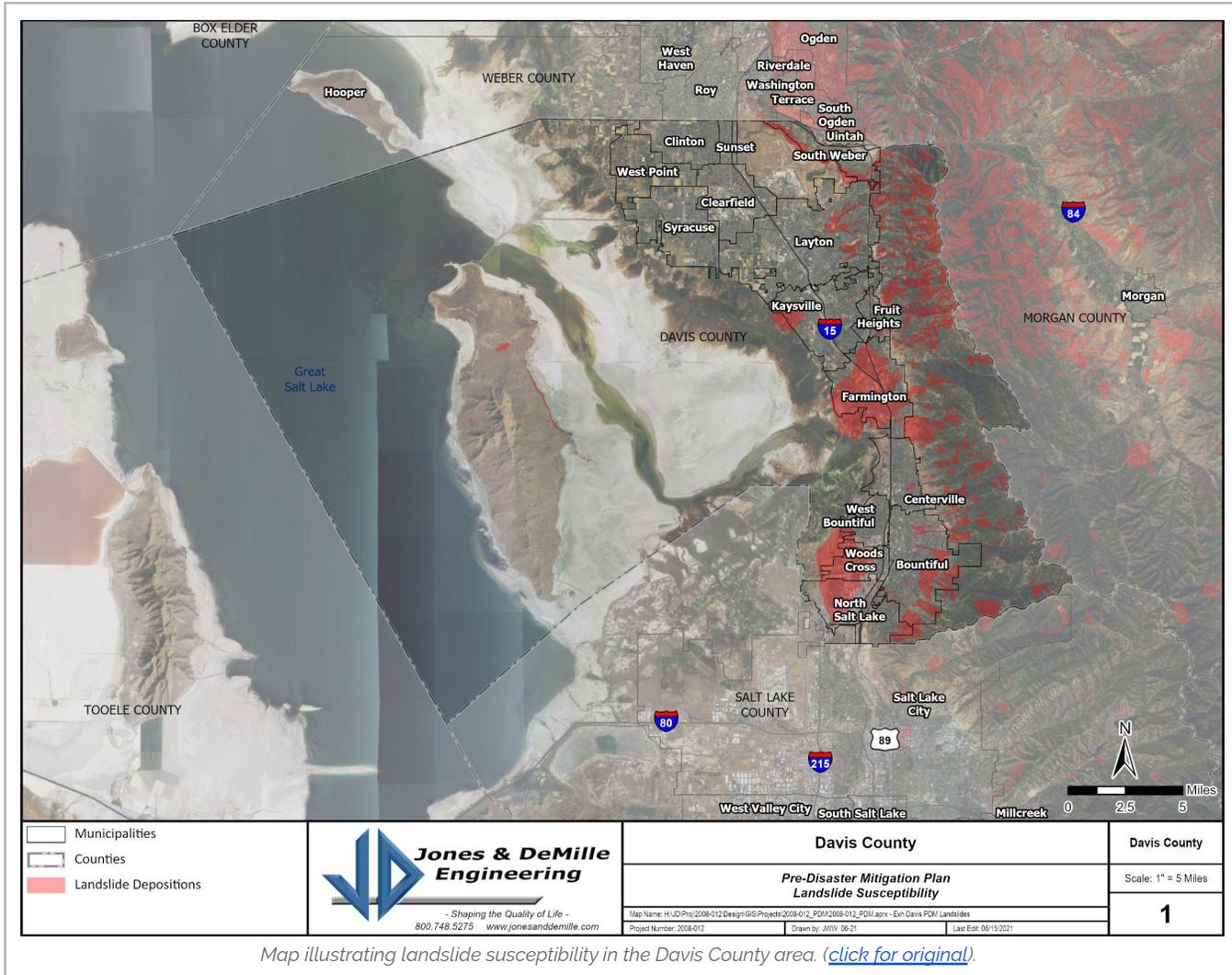
Based on the Threat Analysis below, landslides are likely in about half of Davis County's land area. The August 2001 Heather Drive landslide in Layton damaged six houses, forcing homeowners to evacuate them.

Three houses were saved and moved off the landslide, but the other three were so severely damaged they had to be demolished. Landslide movement also severed underground utility service to the houses. Estimates of homeowner equity loss, mortgage company loss, utility company costs, and Layton City costs exceed \$1 million. The Heather Drive landslide is on a north facing slope above South Fork Kays Creek. The landslide is a partial reactivation of a prehistoric landslide in silt and clay sediments of ancient Lake Bonneville. Lake Bonneville sediments in the Layton area are prone to landsliding. In fact, several other landslides within one mile of Heather Drive reactivated recently, including the South Fork Kays Creek (1998), Hillsboro Drive (1998), Sunset Drive (1998 and 2006), and Beechwood Drive (2006) landslides. (Elliott, 2001)

On April 15, 2006, another instance occurred, homeowners recognized that the Sunset Drive landslide in Layton had reactivated. No injuries and only minor damage occurred in this example, however there is potential for worse in the future.

The landslide is in a northwest-facing slope above the broad valley of the North Fork of Kays Creek. Landslide movement directly impacts two houses and the backyard landscaping at four other lots along the slope crest. The upper part of the landslide has been modified by the placement of fill for farming and subdivision development. The area of landsliding is about 650 to 700 feet wide and 550 feet long. The landslide has a vertical drop of about 160 feet and an average slope of 30%. Instruments indicate the sliding surface of the 2006 landslide movement is 30 to 38 feet below the ground surface near mid-slope and likely deeper near the slope crest. The Utah Geological Survey assisted Layton City in monitoring landslide movement and measuring ground-water levels, and Layton City building inspectors predicted potential damage to the two houses directly threatened by the landslide. Much of northern Utah was experiencing a wet year, following the year 2005 when the UGS recorded over 100 landslides across the state. (Giraud et al., 2021)

Risk Assessment - Davis Co PDMP



Rock Falls and Rock Topples:

These occur when loosened blocks or boulders from an area of bedrock move down slope. Rock falls and topples generally occur along steep canyons, cliffs, and steep road cuts. Rock fall damage usually affects roads, railroad tracks, and utilities. In Davis County, Farmington Canyon road has been frequently damaged or blocked by rock falls from the steep terrain above the road. In the spring of 2015, boulders the size of automobiles blocked the road for several days until the debris could be cleared by the Forest Service.

Debris Slides and Debris Flows:

Slides and flows generally occur in mountainous areas and involve the relatively rapid, viscous flow of coarse-grained soil, rock, and other surficial materials. Debris flows generally occur in mountainous areas and are considered a flow rather than a slide because of the high water content coupled with the debris. Debris flows are typically more dangerous because of the high speeds under which they form and travel. Debris flows generally remain in stream channels but can flow out from canyon mouths for a

considerable distance. Debris flows and slides can damage anything in their path including buildings, roads, railroad tracks, life lines/utilities, and reservoirs. Davis County has experienced numerous debris flows over the years. Significant debris flows occurred in 1983 as floods occurred in Farmington and Centerville. In order to mitigate this hazard, several debris basins have been constructed in the mouths of the canyons along the Front.

Slumps:

Slumps are common along road embankments and river terraces. They slip or slide along a curved failure plane away from the upper part of a slope leaving a scarp (a relatively steeper slope separating two more gentle slopes). Slumps generally do not move very far from the source area.

Earth Flows:

Earth flows are slumps with the addition of water that slump away from the top or upper part of a slope, leaving a scarp. These can range in size from very small to flows involving hundreds of tons of material and result in a bulging toe that can block streams and cause flooding, and damage buildings or other structures.

Causes of landslides are the result of hillside instability. Slope makeup, slope gradient, and slope weight all play a role. Other important factors of slope instability include rock type and structure, topography, water content, vegetative cover, and slope aspect. Debris flows, for example, occur when these elements are modified by natural processes or by human created processes.

Natural Processes:

Natural processes that can induce slope failure include ground shaking, wind and water weathering and erosion.

Human Causes:

Human created processes such as lawn watering and irrigation may place excess water on already unstable ground by adding water weight to the material and raise the pore pressure, leading to a loss of shear strength. Water can also change the consistency of the slope material reducing cohesion leading to an unstable mixture.

Rock types containing clay, mudstone, shale, or weakly cemented units, which are strongly affected by weathering and erosion, are particularly prone to landsliding because of expansive and lubricating properties. Other processes include the removal or addition of slope materials during construction.

Vegetation is very important in the stabilization of slopes because it prevents rainfall from impacting the soil directly and helps protect from erosion by retaining water and decreasing surface runoff. The roots systems serve as slope-stabilizing elements by binding the soil together or binding the soil to the bedrock. Increases in slope gradient such as placing heavy loads at the top of a slope and /or the removal of material at the toe of a slope all affect the equilibrium and result in slope failure because of slope instability.

Vulnerability Analysis:

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 9.18 - Infrastructure Vulnerable to Landslides, Davis County

Risk Assessment - Davis Co PDMP

	Length (Miles) or Number of Unit	Replacement Cost
Highways/Interstates	1.39 miles	\$9,581,012
Highway Bridges	11 bridges	\$17,140,206
Railway Segments	.26 miles	\$295,634
Railway Bridges	0 bridges	\$0
Water Distribution Lines	235.50 miles	\$7,579,602
Gas Lines	94.14 miles	\$3,031,846
Sewer Lines	141.42 miles	\$4,547,764
Totals		\$42,176,064
<i>Source: HAZUS-MH</i>		

Table 9.19 - Vulnerability Assessment for Landslides, Davis County

	Acres Affected	Population Affected	Residential Structures	Commercial Structures
Bountiful	2,477	15,575	4,678	248
Centerville	327	3,600	738	18
Clearfield	0	0	0	0
Clinton	0	0	0	0
Farmington	723	4,752	1,011	16
Kaysville	247	1,669	422	1
Kaysville	131	1,282	340	2
Layton	1,518	7,792	2,199	38
North Salt Lake	1,018	4,287	1,362	31
South Weber	808	2,418	674	9
Sunset	0	0	0	0
Syracuse	0	0	0	0
West Bountiful	0	0	0	0
West Point	0	0	0	0
Woods Cross	0	0	0	0
Unincorporated Areas				
Hill AFB	115	0	0	0
Mutton Hollow	23	135	40	0
Val Verda	2	34	12	0
<i>Source: HAZUS-MH</i>				

4. Wildfire



Wildfire Overview + Profile

The Wildland-Urban Interface (WUI) area is where residential areas meet wildland areas. It is known as the interface zone and presents a serious fire threat to people and property.

Table 9.20 - Wildfire Hazard Profile

Changes since 2016	Potential wildfire hazard within Davis County is growing as population growth is spreading into wildland areas known as the Wildland-Urban Interface (WUI) where the threat is most severe. Over the past 30 years, suburban development has encroached upon forested foothill areas and wildland areas.			
Potential Magnitude		Catastrophic (>50%)	Probability	X Highly Likely
	X	Critical (25-50%)		Likely
		Limited (10-25%)		Possible
		Negligible (<10%)		Unlikely
Location	Wildland-Urban Interface (WUI) areas near the foothills and in forested areas in South Weber, Layton, Kaysville, Kaysville, Farmington, Centerville, Bountiful, and North Salt Lake.			
Extent	The potential magnitude of wildfire in Davis County is relative to the amount of fuels on the eastern foothills and canyons. There is also a wildfire potential in Antelope Island. See the tables that follow.			
Prior Occurrences	There have been three major wildfire events in Davis County in recent years (July 16', August 16', and September 17'). Fortunately, there have been no deaths or injuries associated with them.			
Seasonal Pattern	Summer			
Conditions	Areas affected by drought and/or heavily overgrown dry brush and debris. Common triggers: lightning and humans.			
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, erosion, traffic accidents, air pollution.			
Climate Change	Prolonged increases in temperature will increase the risk of wildfire occurrence in Utah because of the potential for extensive changes to both the length and severity of the fire season.			

Analysis Used

Review of plans and data provided by US Forest Service, National Climatic Data Center, FEMA, AGRC, County Hazard Analysis Plans, and DEM.

The urban aspect includes homes, schools, storage areas, recreational facilities, transmission lines and commercial buildings. Wildland refers to unincorporated areas including hills, benches, plateaus, and forests. Homes are built on the benches adjacent to wildland areas. Wildfires remove vegetation which results in slope failure, erosion, water runoff and depletion of wildlife resources. The three conditions that affect fire behavior are topography, vegetation and weather (DEM 2008).

Topography includes such factors as slope, aspect, and elevation. Fires spread faster upslope because the fuels are closer to the flames on the upslope. The heat from a fire moves uphill and dries fuels in front of the fire allowing for easier ignition. The aspect of slope dictates moisture content. In short, the sun dries out fuels on south and west facing slopes more than on north and east facing slopes. Elevation and weather are interrelated because, generally, higher elevations result in cooler temperatures and a higher relative humidity. Elevation also determines the types of vegetation present (DEM 2008).

Vegetation plays a major role in the speed of a fire. Light grasses burn rapidly and heavy dense fuels burn slowly but with a greater intensity. The five major fuel types in Utah's vegetation include grass/sagebrush, pinion-juniper, mountain bush, hardwoods, and softwoods. The grass/sagebrush area poses a serious threat because people underestimate the danger of wildfires in this area.

These fires burn across thousands of acres rapidly and pose a serious threat to not only property but also life. Pinion-juniper fuel will contribute to the fire hazard when conditions are hot, dry, and windy. When a fire does occur here, it will burn intensely and spread rapidly. Mountain brush is commonly found in Utah's foothills and if moderate to extreme fire conditions are present, this type of fuel will burn hot and fast. Hardwood-forest and softwood (deciduous) fuel types are generally less risky (DEM 2008).

Size, continuity, and compactness all affect the fuel's rate of spread. Large fuels do not burn as readily as smaller fuels and need more heat to ignite. Small fuels on the other hand ignite easier, and a fire will spread more rapidly through them. Continuity is described by how fuel is arranged horizontally. Fuels that are broken up burn unevenly and slower than uniform fuels. Compactness is how fuel is arranged vertically. Tall, deep fuels have more oxygen available so they burn more rapidly. Less oxygen is available to compact fuels such as leaf litter and stacked logs, therefore they burn slower (DEM 2008).

Weather factors include temperature, humidity, precipitation, and wind. Weather affects the ease with which a fuel ignites, the intensity at which it burns, and how easy or difficult fire control may be.

High temperatures increase fire danger because it heats fuels and reduces water content, which increases flammability. Humidity influences fuel ignition and how intensely fuel burns. A decrease in relative humidity causes fuels to dry, promoting easier ignition and more intense burning. Wind speed can increase burning intensity and the direction that the fire moves. Wind carries 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 well ahead of the main fires starting spot fires (DEM 2008).

Fire protection in these areas is difficult because the tactics used for wildland fire suppression cannot be used for structure protection and suppression. The energy that is emitted from a wildland fire is very dangerous to firefighters and homeowners and makes protection of homes almost impossible. One third of all firefighter deaths occur fighting wildfires. Many believe that WUI areas increase the risks to firefighters significantly. Legally, federal wildland protection agencies seldom have the responsibility to protect structures. The legal responsibility for protecting structures on non-federal wildlands varies widely among state forestry agencies (DEM 2008).

Locations and Activity:

Potential wildfire hazard within Davis County is growing as population growth is spreading into wildland areas where the threat is most severe. Over the past 30 years, urban growth has encroached upon forested foothill areas and wildland areas.

The wildfire threat in Davis County has had a significant effect on watersheds, including landslide, debris flow, and other forms of erosion. Federal, state and local agencies have worked together to enforce ordinances and other programs such as re-vegetation zones to protect watersheds.

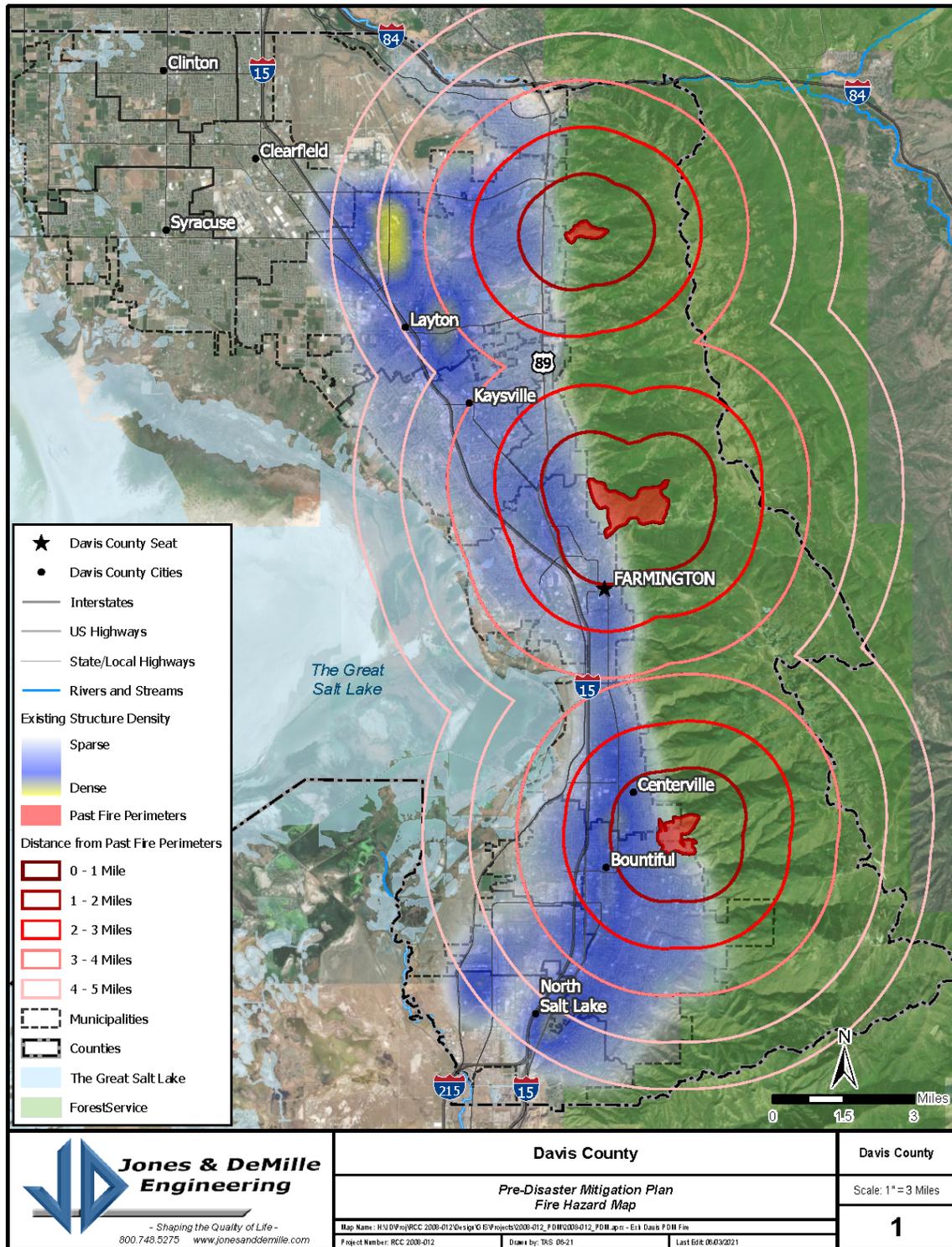
The Snow Canyon Fire of September 2006 is, unfortunately, not an uncommon occurrence. People are often the cause of wildfires, whether accidentally like in this case or purposefully. On September 14, 2006 a woman was attempting to burn a brush pile and started a fire that quickly became uncontrolled and forced the evacuation of more than 20 homes just outside Layton City. The Snow Canyon Fire grew quickly because of a high winds storm that ended up providing enough rain to keep the fire away from the threatened homes, greatly diminishing its impact.

A reverse-911 system was initiated and residents along Valley View Drive were informed and told to leave their homes. They were temporarily housed at a church nearby, where the Red Cross was available to assist with food, water and other necessities. U.S. 89 was closed between Kaysville and South Weber, creating mild congestion on I-15. Several schools in the area were unable to bus students home because of the road closure. The evacuation order was lifted after a 4 p.m. rainstorm aided firefighters. Residents were allowed back at 6 p.m. Departments from several jurisdictions assisted in the firefighting efforts, as well as air support. The fire burned over 400 acres. No structures were touched by the flames, including a building housing several restored vehicles. There were also no reported injuries. (Leonard, 2006)

However, not all wildfires are human-caused, like the following example are started naturally by varying conditions. Lightning is believed to be the cause of the West Antelope fire of July 2016, which began in the Utah State Park northwest of Salt Lake City.

The fire grew from a few hundred acres to around 8,000 acres in less than 48 hours. Meanwhile, several Bureau of Land Management Engines, a dozer, a helicopter and two Single Engine Air Tankers helped crews contain the blaze. Officials eventually requested a larger airtanker to help contain the flames. Officials from the Utah Department of Natural Resources published an alert to warn area residents to watch for updates. In this case, no one was injured and the damage was only to the natural environment, no infrastructure was damaged. (Handy, 2016)

Risk Assessment - Davis Co PDMP



Map illustrating wildfire risk in the Davis County area. ([click for original](#)).

Vulnerability Assessment

Risk Assessment - Davis Co PDMP

Provided are the number of units or total length of infrastructure vulnerable to wildfire events and the estimated replacement costs as provided by HAZUS-MH lost estimation software.

Table 9.21 - Infrastructure Vulnerable to Wildland Fire

	Length (Miles) or Number of Unit	Replacement Cost
Highways/Interstates	4.9 miles	\$24,200,027
Highway Bridges	10 bridges	\$15,469,072
Railway Segments	3.4 miles	\$1,682,730
Railway Bridges	0 bridges	\$0
Water Distribution Lines	N/A	N/A
Gas Lines	N/A	N/A
Sewer Lines	N/A	N/A
Total Estimated Infrastructure Replacement Costs		\$41,351,829
<i>Source: HAZUS-MH</i>		

Table 9.22 - Vulnerability Assessment for Wildland Fire, Davis County

	Acres Affected	Population Affected	Residential Structures (Replacement Value)	Commercial Structures (Annual Sales)
Bountiful	8,450	3,146	1,538 \$341,889,000	163 \$136,290,000
Centerville	3,808	277	87 \$18,206,298	8 \$4,400,000
Clearfield	4,897	0	0	0
Clinton	3,809	0	0	0
Farmington	6,356	680	297 \$45,245,145	3 \$250,000
Kaysville	1,465	126	34 \$9,055,820	4 \$18,000,000
Kaysville	6,615	215	72 \$11,938,498	1 \$150,000
Layton	14,036	1,726	366 \$64,019,439	60 \$86,680,000
North Salt Lake	5,474	3,750	1,364 \$273,551,328	44 \$23,160,000
South Weber	3,091	80	25 \$2,343,726	7 \$60,000,000
Sunset	930	0	0	0
Syracuse	5,833	0	0	0
West Bountiful	1,908	0	0	0
West Point	4,455	0	0	0
Woods Cross	2,432	0	0	0
Unincorporated Areas				

Risk Assessment - Davis Co PDMP

Hill AFB	6,919	0	0	0
Mutton Hollow	911	345	108 \$19,249,600	0 0
Val Verda	259	459	136 \$18,640,300	0 0
<i>Source: HAZUS-MH</i>				

5. Problem Soils



Problem Soils Overview + Profile

Soil-related risks and hazards that may not be readily apparent. Locating facilities in areas with excessive risks contributes to loss of life, health, and property.

Table 9.23 - Problem Soils Hazard Profile

Changes since 2016	New developments in areas near the Great Salt Lake have increased the awareness of problem soils mitigation.			
Potential Magnitude	Catastrophic (>50%)	Probability		Highly Likely
	Critical (25-50%)			Likely
	Limited (10-25%)		X	Possible
	X Negligible (<10%)			Unlikely
Location	Region-wide			
Extent	Low hazard potential (see commentary below).			
Prior Occurrences	N/A			
Seasonal Pattern	Anytime			
Conditions	Conditions vary by geologic formation.			
Duration	Minutes to years.			
Secondary Hazards	Flooding (broken water pipes), fire (broken gas pipes).			
Climate Change	N/A			

Analysis Used

Utah Geological Survey.

Locations and Activity:

Problem soils are soils that present problems for buildings and other engineered structures. Three types of problems soils are present in Davis County – oolitic sands, limestone and peat bogs. Oolitic sands are found on the northwest shore of Antelope Island. Limestone karst structures are found in the Mueller Park area in the far southeastern portion of the county. Finally, peat bogs are found along the shores of the Great Salt Lake in Farmington Bay. All of these areas are thinly populated and pose little danger.

The oolitic sands on Antelope Island are on a public beach. Periods of flooding on the Great Salt Lake have eroded away much of the sands. The sands pose little threat to buildings, but can cover nearby roads at times.

Limestone karst structures are easily eroded by water and therefore often form caverns and crevices. If these caverns become large enough, the overlying ground can give way causing sinkholes and other forms of subsidence. Structures directly over the karst structure have a high potential for collapse.

Groundwater contamination is also possible (Mulvey 1992). Fortunately, the karst structures in Davis County are located in remote areas.

Peat bogs are collections of dead and dying plants. Areas of this problem soil can experience subsidence and can be compressed easily (Mulvey 1992). Furthermore, these bogs can produce methane which is highly flammable.

Except for radon gas, no deaths have been reported in Utah from other problem soil and rock hazards; however, they have caused an undetermined, but significant amount of infrastructure damage and economic impact.

Vulnerability Assessment

Widespread problem soils were found not to affect any population or infrastructure in Davis County. Therefore, no significant vulnerability exists.

6. Dam Failure



Dam Failure Overview + Profile

Dams and associated water delivery systems serve various functions and are built by different agencies and entities including; the Bureau of Reclamation, Army Corps of Engineers, Soil Conservation Service, cities, counties, and private irrigation companies. Dams are built for hydroelectric power generation, flood control, recreation, water storage for irrigation, as well as municipal and industrial uses. Utah’s dry climate makes it critical for the storage of the winter snowmelt runoff for uses all year round. Federal dams impound more than 84% of Utah’s stored water. The 650 non-federal dams store more than 1.2 million acre-feet of water. Dam placement is important and needs to be in an area where it can collect and distribute the greatest amount of water.

Risk Assessment - Davis Co PDMP

Dam sites with strong impermeable bedrock are the best in terms of strength. Davis County does not have any federal dams; however, a significant portion of the water utilized in Davis County is received from federal dams located in Morgan and Summit Counties. Upstream from Davis County are several large impoundments, including Echo, Wanship, East Canyon, and Lost Creek reservoirs. A failure of any of these dams would likely impact residents in the South Weber community of Davis County.

Table 9.24 - Dam Failure Hazard Profile

Changes since 2016	No new dams were created in recent years, and inspections of existing dams continue. Local jurisdictions have been updating their floodplain development ordinances in areas with flooding potential.			
Potential Magnitude	X	Catastrophic (>50%)	Probability	Highly Likely
		Critical (25-50%)		Likely
		Limited (10-25%)		X Possible
		Negligible (<10%)		Unlikely
Location	Region-wide			
Extent	See map (below)			
Prior Occurrences	None in the last five years			
Seasonal Pattern	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 happens with no warning at all usually from sudden structural failure.			
Duration	Hours to days.			
Secondary Hazards	Flooding, raw sewage/health risk, electrical fires, gas spills.			
Climate Change	Changes in weather patterns and incidence of extreme precipitation will increase the risk of dam failure in Utah.			
Analysis Used	Review of BOR inundation maps and plans, FIS, Utah Division of Water Rights.			

Locations and Activity:

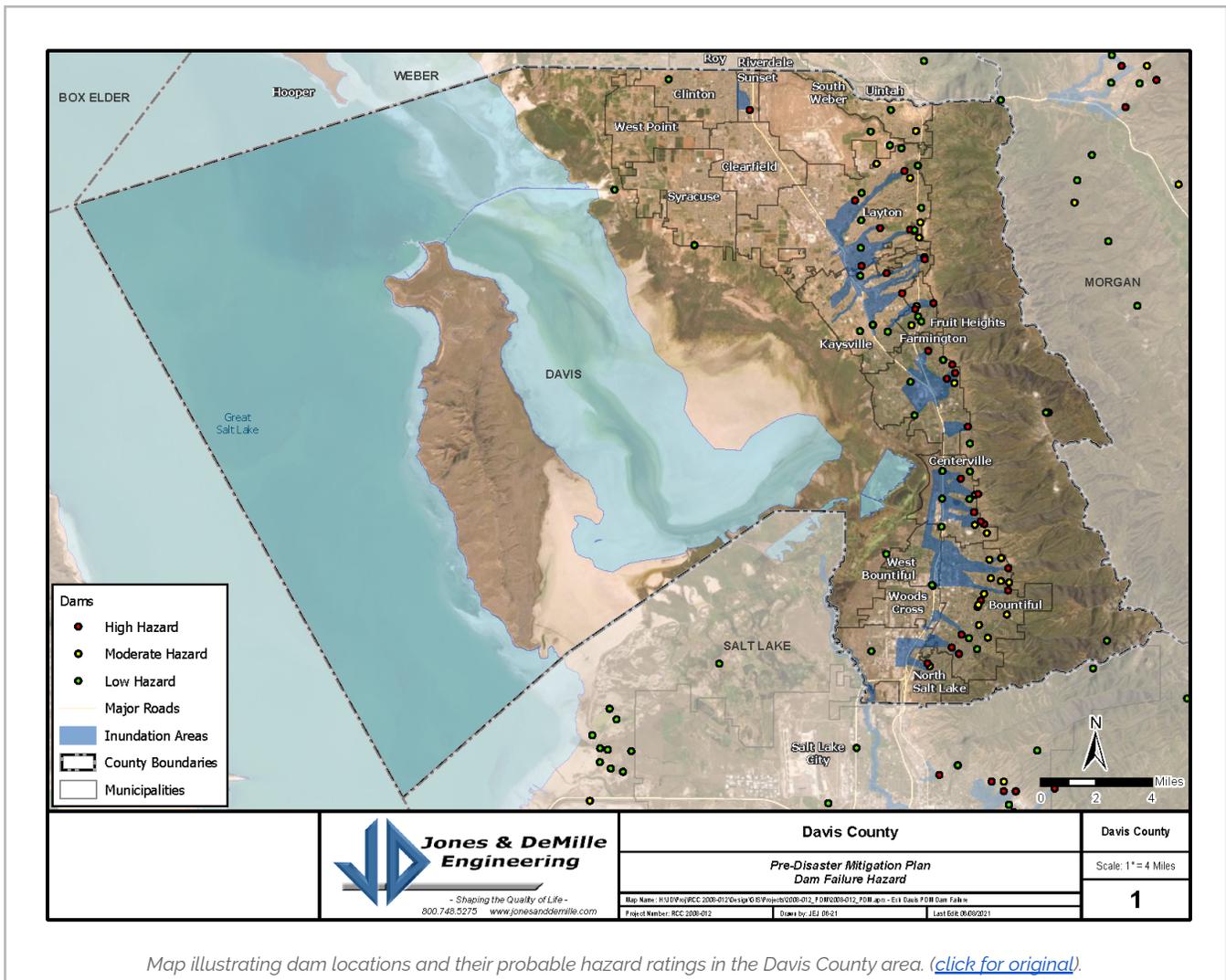
Over ninety dams and irrigation impoundments are located in Davis County. Twenty-six of these are listed as high hazard; meaning if they fail, they have a high probability of causing loss of life and extensive economic loss. Twenty-three dams have a moderate hazard threat; if they fail, they have a low probability of causing loss of life. Both threats would cause appreciable property damage. Mitigation efforts should be developed and pursued. Thirty-two dams have a low hazard threat, if they were to fail there would be a minimal threat to life and economic losses would be minor. Damage would be limited to

Risk Assessment - Davis Co PDMP

the owner of the dam. However, they should still be monitored. No hazard rating is provided for nine dams. These dams have yet to be inspected.

While no dams have failed within Davis County, dam failures occur all over the country some examples include: Laub Detention Dam Failure, Quail Creek, and Little Deer Creek

Little Deer Creek dam failed on its first filling on June 16, 1963, due to extensive foundation seepage. The catastrophic failure resulted in Utah's first dam failure, killing Bradley Galen Brown, a four-year-old boy. Quail Creek dam failed on New Year's Day (January 1) 1988, due to extensive foundation seepage. Failure caused approximately \$12 million in damage and cost approximately \$8 million to rebuild. No lives were lost. Laub Detention Dam failed on September 11, 2012. A severe storm with heavy rainfall occurred prior to the failure. Numerous homes, businesses and roads were damaged. No lives were lost. A Presidential Disaster Declaration was declared for Washington County on November 3, 2012. The Dam was rebuilt in 2013 and was renamed "Tuacahn Wash Lower Detention Basin."



Map illustrating dam locations and their probable hazard ratings in the Davis County area. ([click for original](#)).

Rainy Day Failures:

“Rainy day failures occur when floodwaters overstress the dam, spillway, and outlet capacities. The flood water flows over the top of the dam and eventually erodes the structure from the top down. At this point the floodwater meets with the floodwaters from the rainstorm and a very destructive, powerful flood is created” (DEM 2008).

Sunny Day Dam Failures:

Sunny day dam failures are the most dangerous because they happen without warning. Downstream residents or inhabitants have little or no time to prepare or even evacuate the area; the results may be catastrophic. Sunny day failures occur from seepage or erosion inside the dam. This erosion removes fine materials creating a large void that can cause the dam to collapse, or overtop and wash away.

Earthquake ground shaking or liquefaction can also create structure problems. Ground shaking will cause the dam to start piping, slumping, settling, or experience a slope failure similar to a landslide. The dam then fails internally or overtops and washes away.

Other sunny day failures occur when vegetation or rodents get into a dam and leave holes or tunnels that can lead to failure. Not all dam failures are catastrophic; sometimes a dam can fail and be drained and repaired without a damaging flow of floodwaters (DEM 2008).

“Hazard ratings are determined by downstream uses, size, height, volume and incremental risk/damage assessments. The hazard ratings are: Low- insignificant property loss; Moderate- significant property loss; and High- possible loss of life” (DEM 2008). While Davis County does not have any identified high-hazard dams, the federal dams upstream are listed as high-hazard. Over two hundred Utah dams are rated as high-hazard.

Vulnerability Assessment:

Provided are the number of units or total length of infrastructure vulnerable and the estimated replacement costs as provided by HAZUS-MH loss estimation software.

Table 9.25 - High and Moderate Hazard Dams, Davis County

High-Hazard Dams	Moderate-Hazard Dams
Adams	BOR 1.9 Equalizing Reservoir
BOR Farmington Equalizing Reservoir	BOR 17.2 Equalizing Reservoir
Bountiful – North Canyon (SDID#2)	BOR 17.8 Equalizing Reservoir
Bountiful – Oakridge (SDID #1)	BOR 18.0 Equalizing Reservoir
Centerville – Barnard Creek (Lower) DB	BOR 18.0 Upper Equalizing Reservoir
Davis County – Barton Creek DB	BOR 18.5 Equalizing Reservoir
Davis County – Farmington Pond	BOR 18.8 Equalizing Reservoir
Davis County – Holmes Creek DB	BOR 18.9 Equalizing Reservoir

Risk Assessment - Davis Co PDMP

Davis County – Hooper Draw DB	BOR 19.5 Lower Equalizing Reservoir
Davis County – Mutton Hollow DB	BOR 19.5 Upper Equalizing Reservoir
Davis County – Parrish Creek DB	BOR 2.6 Equalizing Reservoir
Davis County – Ricks Creek DB	BOR 4.3 Equalizing Reservoir
Davis County – Shepherd Creek DB	BOR 5.0 Equalizing Reservoir
Davis County – Stone Creek DB	Bountiful City – Eagle Ridge
Davis/Weber County Canal Co. –	Bountiful City – Millcreek DB #3
Davis/Weber County Canal Co. – Layton	Centerville City Erosion Dike
Davis/Weber County Canal Co. – Sunset	Centerville City – Deuel Creek DB
Deuel Creek (Former BOR Regulating)	Davis County – Barnard Creek (Lower)
Benchland Irrigation – Reservoir B	Farmington City – Rudd Creek DB
Benchland Irrigation – Reservoir C	Kaysville – Dry Hollow DB
Hights Creek (Lower)	Hights Creek (Middle)
Hights Creek (Upper)	Lower (Dennis)
Hobbs	Valleyview #2(SDID#3 Upper)
Holmes	
Kaysville	
Valleyview #1(SDID#4 Lower)	
<i>Source: Utah Division of Water Rights 2007</i>	

Table 9.26 - Infrastructure Vulnerable to Dam Failure, Davis County

	Length (Miles) or Number of Unit	Replacement Cost
Highways/Interstates	12.85 miles	\$105,801,968
Highway Bridges	38 bridges	\$71,093,046
Railway Segments	14.57 miles	\$16,733,995
Railway Bridges	0 bridges	\$0
Water Distribution Lines	N/A	N/A
Gas Lines	N/A	N/A

Risk Assessment - Davis Co PDMP

Sewer Lines	N/A	N/A
Totals		\$193,629,009
<i>Source: HAZUS-MH</i>		

7. Drought



Drought Overview + Profile

According to the National Drought Mitigation Center, drought originates from a shortage of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. “Drought could be considered relative to some long-term average condition of balance between precipitation and evapotranspiration in a particular area” (NDMC 2006). Drought is also related to the timing and effectiveness of precipitation. Drought is a normal, recurrent feature of weather and climate but is a particular concern to all affected because of its devastating outcome. It occurs in almost all climatic zones with varying characteristics. “Drought is a temporary aberration and differs from aridity since aridity is restricted to low rainfall regions and is a permanent feature of climate”. Drought is a dry progression through the winter, spring, and summer months that could end in a year or last for many years. The number of dry years correlates with that impact. Usually, a one to two year drought affects only agriculture, while a three-year drought may significantly impact culinary water in the local areas and communities.

Table 9.27 - Drought Hazard Profile

Changes since 2016	<p>The recent drought conditions have increased awareness of the potential impact of drought in the County.</p> <p>Much of the new subdivision development in the County has led to the conversion of agricultural land to suburban. The majority of irrigated acres in those converted areas were done via flood irrigation.</p> <p>Davis County planners have utilized the new compilation of water-related land use data (https://dwre-utahdnr.opendata.arcgis.com/pages/wrlu).</p>				
Potential Magnitude	X	Catastrophic (>50%)	Probability	X	Highly Likely
		Critical (25-50%)			Likely

Risk Assessment - Davis Co PDMP

	Limited (10-25%)		Possible
	Negligible (<10%)		Unlikely
Location	Region-wide		
Extent	Davis County's potential for drought impact is high. It is currently experiencing a "D4" event.		
Prior Occurrences	The USDA and NOAA report that Davis County has experienced drought conditions at different levels almost continually since 2016.		
Seasonal Pattern	Winter: reduction of snowpack and water supplies Spring: reduction of crop production and/or increased crop water demand Summer: increased water demand, impeded crop production Fall: reduction in soil moisture could reduce snowmelt runoff		
Conditions	Agricultural impact: impeded crop production. Impeded range land. Hydrologic impact: threat to water quality and quantity. Socioeconomic impact: lack of water to support the population. Economic impact to agriculture and water-based tourism.		
Duration	Months, Years		
Secondary Hazards	Wildfire, dust storms, air quality.		
Climate Change	Climate change will increase the incidence of extreme precipitation events and change weather patterns. Extreme, or heavy snowfall events will increase the risk of avalanches. Also, changes in climate will likely cause an increase in drought hazard in Utah (which is one of the driest states in the US).		
Analysis Used	National Weather Service, Utah Climate Center, Utah Division of Water Resources, Newspapers, Local input.		

The most severe drought period in recorded history for the Northern Mountains region 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 (Utah Division of Water Resources 2007a).

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.

Conceptual definitions of drought help people understand the idea of a drought. Operational definitions define the process of drought. This is usually done by comparing the current situation to the historical average, often based on a 30-year period of record. It is hard to develop a singular operational definition of drought because of the striking differences throughout the world (NDMC 2006).

Meteorological drought is defined by the degree of dryness in comparison to an average amount and the duration of the dry period. Meteorological drought must be considered as region specific since the

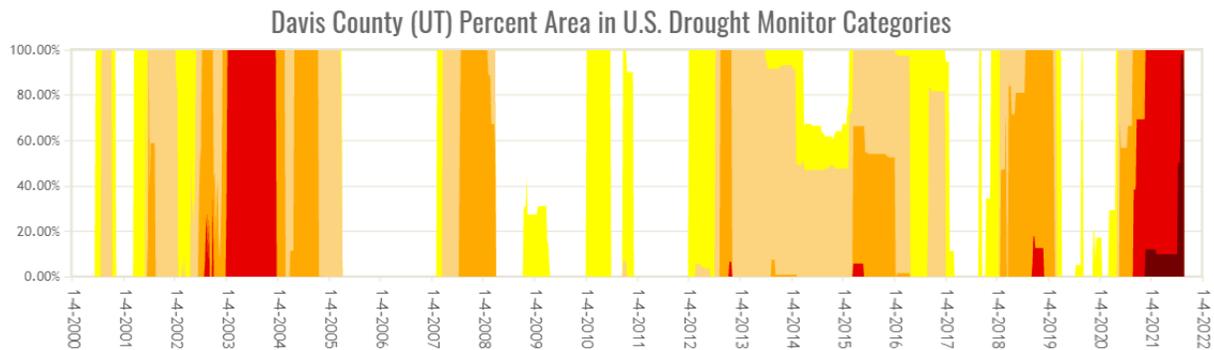
Risk Assessment - Davis Co PDMP

atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region (NDMC 2006).

Hydrological drought refers to the precipitation decline in the surface and subsurface water supply. The frequency and severity of hydrological drought is often defined on a watershed or river basin scale (NDMC 2006).

Agricultural drought occurs when there is not enough water available for a crop to grow. This drought links various characteristics of meteorological or hydrological drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, and reduced groundwater or reservoir levels (NDMC 2006).

Socioeconomic drought occurs when the physical water shortage begins to affect people (NDMC 2006). When drought begins, the agricultural sector is usually the first to be affected because of its heavy dependence on stored soil water. If precipitation deficiencies continue, then people dependent on other sources of water will begin to feel the effects of the shortage. Those who rely on surface and subsurface water are usually the last to be affected. Groundwater users are often the last to be affected by drought during its onset but may be the last to experience a return to normal water levels. The length of the recovery period is a function of the intensity of the drought, its duration, and the quantity of precipitation received as the episode terminates (NDMC 2006).



Locations and Activity:

Palmer Drought Severity Index (PDSI):

Developed in 1965, the PDSI is a soil moisture algorithm calibrated for relatively homogeneous regions used by government agencies and states to trigger drought relief programs. The PDSI provides a measurement of moisture conditions that were “standardized” so that comparisons using the index could be made between locations and between months. This is the oldest index for measuring drought and is less well suited for mountainous land or areas of frequent climatic extremes and does not include man-made changes. The PDSI is calculated based on precipitation and temperature data as well as local available water content of the soil. This scale is given as monthly values and is the most effective in determining long-term drought. The index ranges from -4 to 4 with negative values denoting dry spells and positive values indicating wet spells. The values 0 to -0.5 equal normal, -0.5 to -1.0 equal incipient drought, -1.0 to -2.0 equal mild drought, -2.0 to -3.0 equal moderate drought, -3.0 to -4.0 equal severe drought, greater than -4.0 equals extreme drought. The wet spells use the same adjectives in the positive values (NDMC 2006).

Beginning in 1987 a drought produced some of the hottest years and driest years on record. Statewide reservoir capacity plunged below 50% at times and farmers and ranchers struggled to continue operations.

Risk Assessment - Davis Co PDMP

However, there were a couple wet years mixed in between for some of the climate divisions, but overall drought conditions prevailed and in 2018 were severe. For the first time in about ten years Utah’s drought conditions reached a threshold that triggered the State’s statutory responsibility to convene Utah’s Drought Review and Reporting Committee. The committee gathered on Sept. 10, 2018 under the direction of the state’s Drought Coordinator, Mike Styler, executive director of the Utah Department of Natural Resources (DNR). On October 15, 2018 Governor Herbert issued an executive order declaring a State of Emergency due to statewide drought conditions. The Drought Review and Reporting Committee is required to hold this meeting by state code, UCA 53-2a, and Utah’s Drought Response, which requires the state to prepare for, respond to and recover from emergencies or disasters with the primary objectives to save lives and protect public health and property. Drought conditions have developed to the degree that several areas within the state are likely to receive severe impacts to various sectors of their economies.

Table 9.28 - Palmer Drought Severity Index

High-Hazard Dams	Moderate-Hazard Dams
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
<i>Source: NDMC 2006</i>	

Surface Water Supply Index (SWSI):

Developed in 1982, the SWSI index uses the same basic classifications as the Palmer Drought Index and is designed to complement the Palmer Index in the western states. The SWSI is more of an indicator of surface water conditions and is described as “mountain water dependent”, in which mountain snowpack is a major component; calculated by river basin, based on snowpack, stream flow, precipitation, and reservoir storage. The objective of the SWSI was to incorporate both hydrological and climatological features into a single standardized index value. The pros and cons of the SWSI is that the index is unique to each basin. The SWSI is centered on 0 and has a range between –4.2 (extremely dry) and 4.2 (abundant

supply). The index is calculated by combining pre-runoff reservoir storage with forecasts of spring and summer stream flow that is based on hydrologic variables (NDMC 2006).

Standardized Precipitation Index (SPI):

T.B. McKee, N.J. Doesken, and J. Kleist of the Colorado State University, Colorado Climate Center, formulated the SPI in 1993. The Standardized Precipitation Index was designed to quantify the precipitation deficit for multiple time scales; basically, the SPI is an index based on the probability of precipitation for any time scale. It assigns a single numeric value to the precipitation that can be compared across regions with different climates. The SPI is calculated by taking the difference of the precipitation from the mean for a particular time scale and dividing by the standard deviation.

The SPI is normalized and so the wetter and drier climates can be represented in the same way. The SPI can provide early warning of drought and help assess drought severity, yet the values based on preliminary data may change. The SPI values indicate an extremely wet period value at 2.0+, very wet equals 1.5 to 1.99, moderately wet is 1.0 to 1.49, -.99 to .99 is near normal, -1.0 to -1.49 moderately dry, -1.5 to -1.99 is severely dry, -2 and less is extremely dry. The time scales were originally calculated for 3-, 6-, 12-, 24-, and 48- months (NDMC 2006).

A drought analysis review of 33 gauging stations data in Utah indicated that a localized drought has occurred on at least one stream every year since 1924. The duration of drought lasts longer in basins where runoff is mainly from snowmelt. The frequency of occurrence is greater for areas in the Wasatch Range than in the Wasatch Plateau, the mountains of southwestern Utah, or the Uinta Mountain range. It is widely held that because Utah relies on surface water supplies, about 81% of the population relies on off-stream water use and 35% of the population relies on surface water supplies, drought severely affects the people and industry of the whole state.

8. Severe Weather



Severe Weather Overview + Profile

Severe storms can include thunderstorms, lightning, hailstorms, heavy snow or rain, extreme cold and avalanche. 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.

Table 9.29 - Severe Weather Hazard Profile

Changes since 2016	In recent years, winds in excess of 100 mph toppled thousands of trees and tore roofs and siding off of hundreds of buildings. Significant winter storms have also continued to draw attention to the need to prepare for potential hazard events.				
Potential Magnitude		Catastrophic (>50%)	Probability	X	Highly Likely
		Critical (25-50%)			Likely
	X	Limited (10-25%)			Possible

Risk Assessment - Davis Co PDMP

	Negligible (<10%)	Unlikely
Location	Occur in localized areas throughout the region. 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.	
Extent	Davis County has the potential to experience a number of severe weather events. The most likely are heavy winter storms and canyon winds.	
Prior Occurrences	NOAA has recorded 25 different major storms in Davis County since 2016. None of them resulted in reported deaths or injuries.	
Seasonal Pattern	Year-round	
Conditions	Varies based on latitude, elevation, aspect and landforms.	
Duration	Severe weather hazards generally last hours and can persist for days.	
Secondary Hazards	Wildfire, flooding	
Climate Change	Winter drought increases avalanche risk.	
Analysis Used	National Climate Data Center, National Weather Service, Utah Avalanche Center, Utah DEM, local input, and review of historic events and scientific records.	

Locations and Activity:

Extreme Temperatures:

Temperatures in Utah can reach the extreme ends of the thermometer. Winter months often experience temperatures below zero degrees. Summer temperatures regularly reach into the nineties with many days above 100 degrees. Drastic temperature changes also occur, even in a 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. 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 not only causes discomfort, but can lead to heat exhaustion or heat stroke. Extreme heat also places severe strain on electrical systems due to the widespread use of evaporative coolers and air conditioners. This strain can lead to brownouts or blackouts leaving many without electrical power.

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.

Winter Storms:

Winter storms gain energy from the collisions of two air masses. In North America, a winter storm is usually generated when a cold air mass from dry Canadian air moves south and interacts with a northward moving warm moist air mass from the Gulf of Mexico. The position where a warm and a cold air mass meet is called a front. If cold air is advancing and pushing away the warm air, the front is known as a cold front. If warm air is advancing, it will ride up over the cold air mass and the front is known as a warm front. A winter storm will typically begin under what is known as a stationary front. A stationary front is when neither air mass is advancing.

The atmosphere will try to even out the pressure difference by generating an area of lower pressure; this creates wind that blows from high pressure towards a low-pressure area. As the air travels toward the center of the low-pressure area, it is pushed up into the colder regions of the upper atmosphere because it has nowhere else to go. This causes the water vapor to condense as snow in the northern areas because of the colder temperatures. In the south, if the temperatures are warm enough the water vapor will fall as heavy rain in thunderstorms. Because of the easterlies in Northern America, the winter storm moves quickly over the area and generally does not last longer than a day in one area. However, in Utah, because of the Great Salt Lake “lake-effect”, snowstorms can last for many days. This is because of the amount of moisture from an unfrozen body of water. When a strong cold wind blows over a larger area of water, the air can attain a substantial amount of moisture; this moisture turns into heavy snow when it reaches land causing a lake effect snowstorm (Scholastic 2008).

While the majority of Utah residents are no longer isolated, they are still vulnerable to the extreme conditions caused by the winter storms. Heavy snow can paralyze a city, stranding motorists, stopping the flow of supplies, disrupting emergency services, and halting classes at area schools. Heavy accumulations of snow can cause buildings to collapse and knock down trees and utility lines. The resulting danger of prolonged utility outages can become critical, during cold temperatures, which often coincide with these storms, especially to the elderly and very young. Cost of snow removal, repairing damage, and loss of business can place a large economic burden on cities. Many of the deaths due to this kind of disaster are often indirectly related, such as heart attacks from shoveling snow, and traffic accidents caused by icy roads.

Ice Storms:

Ice storms are rare in Utah, but may occur when rain falls through a temperature inversion and the air near the ground is below freezing. The rain freezes on contact with everything it touches and can bring down electrical wires, telephone poles and lines, trees, and communication towers. Ice also freezes on contact with roads and highways resulting in extreme hazards to motorists and pedestrians. Bridges and overpasses are likely to freeze first. (NWS 2001)

Heavy Snow:

Heavy snow has occasionally immobilized Davis County stranding commuters, stopping the flow of commerce, disrupting emergency services, closing infrastructure and services. When heavy snow occurs with high winds, blowing snow or blizzard conditions may exist. (NWS 2001)

Avalanche:

Utah DEM defines an avalanche as a mass of snow sliding down a mountainside. Avalanches occur when stresses (driving forces), such as the pulling of snow downhill by gravity, exceeds the strength (resisting forces) such as the bonds between snow grains. Four ingredients are needed to produce an avalanche:

1. Snow
2. Weak layer in the snow cover

3. Steep slope
4. A trigger

About 90% of all avalanches start on slopes of 30 - 45 degrees; about 98% of all avalanches occur on slopes of 25 - 50 degrees. Avalanches release most often on slopes above timberline that face away from prevailing winds (leeward slopes collect snow blowing from the windward sides of ridges.) Avalanches can run, however, on small slopes well below timberline, such as gullies, road cuts, and small openings in the trees. Very dense trees can anchor the snow to steep slopes and prevent avalanches from starting; however, avalanches can release and travel through a moderately dense forest.

Avalanche victims are primarily backcountry recreationists: snowmobilers, climbers, snowboarders, skiers, and hikers. In 90% of avalanche incidents, the victim or someone in the victim's party triggers the avalanche. (UDEM 2015)

An avalanche consists of a starting zone, a track, and a runout zone. The starting zone is where the ice or snow breaks loose and starts to slide; this zone can be triggered by human and/ or natural activities.

Human induced avalanches can result from snowmobilers, backcountry skiers, or other outdoor recreationalists causing ground shaking. The two main natural factors that affect avalanche activity include weather and terrain and large, frequent storms combined with steep slopes. Other factors that contribute to the stability of the snowpack include the amount of snow, rate of accumulation, moisture content, snow crystal types and the wind speed and direction. The track is the grade or channel down which an avalanche travels. The runout zone is where an avalanche stops and deposits the snow. For large avalanches, the runout zone can include a powder, or windblast zone that extends far beyond the area of snow deposition. In Utah, avalanches annually kill more people than any other natural hazard, and ironically, are often triggered by the victim. Each winter an average of four people die in Utah due to avalanche activity (UDEM 2015).

Weather and terrain conditions affect avalanche conditions. The weather controls the durations and the extent of an avalanche while terrain is the element that determines where, why, and how an avalanche occurred. In Utah, the months of January through April pose the greatest avalanche potential.

Weather related aspects that affect the snowpack stability include rate of accumulation, amount of snowfall, moisture content, wind speed and direction, and snow crystal type. Wind can deposit snow 10 times faster than snow falling from a storm without accompanying wind.

This affects avalanche potential because the underlying weak layer of snow cannot adjust to the new load. Rain and the melting of snow can almost instantly cause an avalanche because of the added weight (UDEM 2015).

Terrain includes such variables as slope, aspect, elevation, roughness and angle. The slope is important in understanding where an avalanche will occur. Slopes greater than 45 degrees are too steep because the snow continually sluffs off; however slopes greater than 20 degrees can produce avalanches.

Optimum slope degree is between 30 to 45 degrees, which is also the optimum angle for backcountry skiers. This slope angle is where approximately 99.9 percent of avalanches occur. The slope aspect and elevation affect the snow depth, temperature, and moisture characteristics of the snowpack. Slope aspect, such as north facing or shady slopes usually produce more avalanches and more persistent avalanche hazards occur during mid-winter months. In the spring, the strong sun on south facing slopes produce more wet avalanches (UAC 2015).

Slope shape and roughness correlate with snowpack stability. Roughness identifies boulders, shrubs, and trees that can help slow, or reduce avalanche speed and impact. A bowl shaped slope is more prone to an avalanche than a ridge or cliff.

Dry-slab avalanche is when a cohesive slab of snow that fractures as a unit slides on top of weaker snow and breaks apart as it slides. Dry-slab avalanches occur usually because too much additional weight has been added too quickly, which overloads the buried weak layer. Even the weight of a person can add a tremendous stress to a buried weak layer. Dry-slab avalanches usually travel between 60-80 miles per hour within 5 seconds of the fracture and are the deadliest form of avalanche (UAC 2015).

Wet-slab avalanches occur for the opposite reason of dry avalanches; percolating water dissolves the bonds between the snow grains on the pre-existing snow, which decrease the strength of the buried weak layer. Strong sun or warm temperatures can melt the snow and create wet avalanches. Wet avalanches usually travel about 20 miles per hour (UAC 2015).

Avalanches can result in loss of life as well as economic losses. At risk are some communities, individual structures, roads, ski areas, snowmobilers, backcountry skiers, snowshoers, snowboarders, and climbers. One of the major consequences of avalanches is the burial of structures, roads, vehicles, and people in the runout zone where tens of feet of debris and snow can be deposited (UAC 2015).

Between 1958 and 2015, there was one avalanche fatality listed on the Utah Avalanche Center website. In 1996, a snowmobiler was killed in the Bountiful Peak area. (UAC 2015)

Lightning:

Lightning is the electric discharge between clouds or from a cloud to the earth. In Utah, lightning causes the highest number of weather-related fatalities (NWS 2008). Lightning casualties occur most frequently during the summer monsoonal flow in July and August. See Table 8-1 for the number of casualties caused by lightning. Lightning is also the primary cause of wildland fires in Utah (NWS 2008), which could cause casualties or be disruptive to the economy. Between 2006 and 2015, Utah had 6 lightning caused deaths, none of these occurred in Davis County.

Deaths directly related to severe weather occur, such is the case with lightning. Over 40 million lightning strikes occur each year in the United States. Since 1950 there have been 51 deaths and 131 injuries, in Utah, due to lightning. Lightning is Utah's second deadliest natural hazard, trailing only avalanches, when comparing the figures from 1951 to the present. Most lightning strikes, in Utah, occur during the summer months of May, June, July, and August, when large consecutive storms come.

Severe Thunderstorms usually last around 30 minutes and are typically only 15 miles in diameter (NWS 1999), but all produce lightning, the “number one weather-related killer” in Utah (NWS 2008). Thunderstorms can also lead to flash flooding from heavy rainfall, strong winds, hail and tornadoes or waterspouts (NWS 1999).

There are approximately 25 million recorded lightning strikes in the US and 200,000 cloud-to-ground lightning flashes in Utah annually. Although most lightning occurs in the summer, lightning can strike at any time of year. Lightning kills an average of 47 people in the US each year and hundreds more are severely injured. Additionally, lightning causes billions of dollars in associated losses by igniting fires and disrupting utility, aviation and transportation services.

Tornado:

Tornadoes are defined as “a violently rotating column of air extending from a thunderstorm to the ground” (NWS 2015), and is often on the edge of the updraft or next to the air coming down from the thunderstorm. A tornado's vortex is a low-pressure area and as air rushes into the vortex, its pressure lowers and cools the air. This cooler air condenses into water vapor in the funnel cloud, known as the vortex, and doesn't touch the ground. The swirling winds of the tornado pick up dust, dirt, and debris from the ground, which turns the funnel cloud darker. Some tornadoes can have wind speeds greater than 250 miles per hour with a damage zone of 50 miles long and greater than 1 mile wide (NWS 2015). Most

Risk Assessment - Davis Co PDMP

tornadoes in Utah typically have winds less than 110 miles per hour, are no wider than 60 feet and are on the ground longer than “a few minutes” (Brough, et al. 2007).

A change in wind direction and an increase in wind speed along with increasing height create a horizontal spinning effect in the lower atmosphere form a tornado while the rising air within the thunderstorm updraft tilts the rotating air vertically resulting in what we call a tornado. The area of rotation is generally 2-6 miles wide and extends through much of the storm (NWS 2015).

Scale: Tornadoes are classified by the National Weather Service using the Fujita Scale, which relates wind speed to damage to determine tornado intensity. The scale uses numbers from 0 through 5 with the ratings based on the amount and type of wind damage (SPC 2007). This scale has recently been modified and is now referred to as the Enhanced Fujita Scale. The Enhanced Fujita Scale classifications are listed below:

Enhanced Fujita Scale

EF-0: 65-85 mph, Light damage, downed tree branches, chimney damage

EF-1: Winds 86-110 mph, Moderate damage, mobile home damage

EF-2: Winds 111-135 mph, Considerable damage, mobile home demolished, trees uprooted

EF-3: Winds 136-165 mph, severe damage, roofs and walls torn down, trains overturned, cars thrown

EF-4: Winds 166-200 mph, Devastating damage, well-constructed walls leveled

EF-5: Winds over 200 mph, incredible damage, homes lifted off foundation and carried, autos thrown as far as 100 feet. (SPC 2014)

Tornadoes are rare in Davis County but have been reported, occurring mostly in the west part of the county and around the Great Salt Lake. In August of 2005 a tornado was photographed over Antelope Island.

Waterspouts are weak tornadoes that form over warm water, and in Utah generally occur with cold, late fall or late winter storms (Brough, et al. 2007).

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 tornadoes 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) which was the costliest disaster in Salt Lake County history causing over \$170 million in damages.

The list below shows Utah’s Strongest Tornadoes several of which occurred in Davis County and the surrounding areas. (Category based on old Fujita Scale, see below)

- F2 January 22, 1943 Young Ward
- F2 June 16, 1955 Sanpete County
- **F2 June 3, 1963 Bountiful**
- **F2 February 9, 1965 Salt Lake County**
- F2 November 2, 1967 Emery
- **F2 August 14, 1968 West Weber**
- F2 June 10, 1970 Grand County
- F2 May 29, 1987 Lewiston

- F3 August 11, 1993 Uinta Mountains
- **F2 August 11, 1999 Salt Lake City**
- F2 September 8, 2002 Manti

High Winds:

High winds can occur with or without the presence of a storm and are unpredictable in regards to time and place. Each of the five counties that make-up the Wasatch Front has experienced high winds in the past (see Map 8-2 page 96), and can expect regional high wind future events.

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. Davis County has experienced numerous high wind episodes resulting in several million dollars of property damage. In December 2011 winds in excess of 100 mph toppled thousands of trees and tore roofs and siding off of hundreds of buildings. Davis County received a Presidential Disaster Declaration for Public Assistance to help reimburse the cost of the cleanup.

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).

Thunderstorms:

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).

In January 2005 a Southwest flow ahead of a Pacific storm system brought mid-level moisture from the subtropics into northern Utah. Clouds cleared out long enough on the evening of the 26th to allow for sufficient radiational cooling to take place. Several areas along the northern and central Wasatch front observed freezing rain. The ice accumulated to about one-half of an inch along the Ogden and Salt Lake Valley areas. The Ogden Bench, Sandy, and West Haven all reported ice

On January 24, 2013 a rare freezing rain event occurred in Utah. Very cold air was trapped in valley locations due to a persistent inversion when a weather disturbance brought precipitation to the area causing freezing rain and widespread travel difficulties.

Part X - SPECIALIZED LOCAL DISTRICTS

Utah State Code, Annotated, Section 17B-1-102, defines Specialized Local Districts (SLD) as a local district that is a cemetery maintenance district, a drainage district, a fire protection district, an improvement district, an irrigation district, a metropolitan water district, a mosquito abatement district, a public transit district, a service area or a water conservancy district. An SLD is a body corporate with perpetual succession, a quasi-municipal corporation, and is a political subdivision of the state.

SLD's may be created to provide services consisting of: airport operations; cemetery operations; fire, paramedic, and emergency services; garbage collection and disposal; health care including health department or hospital service; library operations; abatement or control of mosquitoes and other insects; park or recreation facilities or services; sewage system operations; street lighting; construction and maintenance of curb, gutter and sidewalk; transportation, including public transit and providing streets and roads; water system operations, including the collection, storage, retention, control, conservation, treatment, supplying, distribution, or reclamation of water, including storm, flood, sewage, irrigation, and culinary water, whether the system is operated on a wholesale or retail level or both.

Because SLD's are defined as quasi-municipal, they may be eligible for FEMA disaster funding reimbursement under the Stafford Act. Most of the SLD's have jurisdictional boundaries within a specific county. Others, such as the Utah Transit Authority (UTA), have jurisdictional boundaries that include multiple counties.

Specialized local districts identified in Davis County are listed below. There may be others not identified here which will be included as they adopt this plan.

Benchland Water District
485 E Shepherd Lane Kaysville, UT 84037
(801) 451-2105

138 W 1300 N
Sunset, UT 84015
(801) 774-6373

Bountiful Water Sub-Conservancy District
385 W 500 S
Bountiful, UT 84010
(801) 295-5573

Davis School District
P.O. Box 588 Farmington, UT 84025
(801) 397-8400

Central Davis Sewer District
2200 S Sunset Dr
Kaysville, UT 84037
(801) 451-2190

Echo Creek Ranches Special Service District
670 N 900 E
Bountiful, UT 84010
(801) 298-7422

Clinton City Sanitary Sewer Special Service District
2267 N 1500 W
Clinton, UT 84015
(801) 614-0700

Hights Creek Irrigation District
820 E 200 N
Kaysville, UT 84037
(801) 546-4242

Davis County Mosquito Abatement District
85 North 600 West
Kaysville, UT 84037
(801) 544-3736

Mutton Hollow Improvement District
1272 W 2700 S
Syracuse, UT 84075
(801) 614-0405

Davis and Weber Counties Canal Company

North Davis Fire District
381 N 3150 W

Specialized Local Districts - Davis Co PDMP

Clearfield, UT 84015
(801) 525-2850

North Davis Sewer District
4252 W 2200 S
Syracuse, UT 84075
(801) 825-0712

Rocky Mountain Power
1407 W North Temple
Salt Lake City, UT 84116
(877) 508-5088

South Davis Metro Fire Service Area
255 S 100 W
Bountiful, UT 84010
(801) 677-2400

South Davis Recreation District
550 N 200 W
Bountiful, UT 84010
(801) 298-6220

South Davis Sewer Improvement District
1800 W 1200 N
West Bountiful, UT 84087
(801) 295-3469

South Davis Water Improvement District
407 W 3100 S
Bountiful, UT 84010
(801) 295-4468

Utah Transit Authority
3600 S 700 W
Salt Lake City, UT 84119
(801) 262-5626

Wasatch Front Regional Council (WFRC)
41 N Rio Grande St
Salt Lake City, UT 84101
(801) 363-4250

Weber Basin Water Conservancy District
2837 E Highway 193
Layton, UT 84040
(801) 771-1677

Specialized Local Districts (SLD) are subject to the same hazards as the local jurisdictions in which they are located. The following general mitigation objectives have been developed for SLD's.

Problem Identification 1: Infrastructure Vulnerability (Special Local Districts)

Objective A: Assess the vulnerability of critical facilities owned outside Davis County that can impact service delivery inside the county.

Objective B: Retrofit or replace critical lifeline facilities and or their backup facilities that are shown to be vulnerable to damage in natural disasters.

Objective C: Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical buildings from being functional after major natural disasters.

Objective D: Develop and maintain a system of interoperable communications for first responders from cities, counties, special service districts, local school districts, state and federal agencies.

Objective E: Identify and undertake cost effective retrofit measures on critical facilities when these buildings undergo major renovations.

Objective F: Engage in, support and or encourage research by others on measures to further strengthen transportation, water, sewer, and power systems so that they are less vulnerable to damage in natural disasters.

Objective G: Encourage a higher priority for funding seismic retrofit of existing transportation and infrastructure systems, such as UTA.

Problem Identification 2: Vulnerability of critical educational facilities

Objective A: Retrofit or replace critical education facilities that are shown to be vulnerable to damage in natural disasters.

Objective B: Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical buildings from being functional after major natural disasters.

Objective C: Identify and undertake cost effective retrofit measures on critical facilities when these buildings undergo major renovations.

Objective D: Develop and maintain a system of interoperable communications for first responders from cities, counties, special service districts, local school districts, state and federal agencies.

Objective E: As a secondary focus, assess the vulnerability of non-critical educational facilities to damage in natural disasters based on occupancy and structural type, make recommendations on priorities for structural improvements or occupancy reductions, and identify potential funding mechanisms.

Part XI - PLAN MAINTENANCE + IMPLEMENTATION

Monitoring, Evaluating and 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.

Annual Review Procedures

Local jurisdictions shall annually review this Plan, or as situations dictate such as following a disaster declaration. If the participating jurisdictions or DEM determines that a modification of the Plan is warranted, an amendment to the Plan may be initiated.

Revisions and Updates

Each county emergency manager will regularly monitor and annually review the Plan and is responsible to make revisions and updates. The annual review is required to ensure that the goals and objectives for the Region are kept current. More importantly, revisions may be necessary to ensure the Plan is in full compliance with Federal regulations and State statutes. This portion of the Plan outlines the procedures for completing such revisions and updates. The Plan will also be revised to reflect lessons learned or to address specific hazard incidents arising out of a disaster.

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 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 Committee and Local Working Group, with a potential membership representing every jurisdiction in Davis 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.

If the participating jurisdictions or DEM determine that the recommendations warrant modification to the Plan, an amendment may be initiated as described below.

Plan Amendments

The Utah DEM State Hazard Mitigation Officer, Local Mitigation Committee, or Mayor/City Manager of an affected community, will initiate amendments and updates to the Plan.

Upon initiation of an amendment to the Plan, DEM 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 in a newspaper of general circulation or on the DEM website at dem.utah.gov. The review and comment period for the proposed Plan amendment will last for not less than 45 days.

At the end of the comment period, the proposed amendment and all review comments will be forwarded to participating jurisdictions for consideration. If no comments are received from the reviewing parties within the

Plan Maintenance + Implementation - Davis Co PDMP

specified review period, such will be noted accordingly. DEM will review the proposed amendment along with comments received from other parties and submit a recommendation to FEMA within 60 days.

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

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

Upon receiving the recommendation of DEM, a public hearing will be held. DEM will review the recommendation (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, DEM 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

Once the Plan is promulgated, participating cities and counties will be able to include this Plan's 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.

Process

It will be the responsibility of the Mayor/Council/Commissioner(s) of each jurisdiction, as they see 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).

Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. Davis County 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 Davis County 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:

Plan Maintenance + Implementation - Davis Co PDMP

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 Assistance 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

Plan Maintenance + Implementation - Davis Co PDMP

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

Plan Maintenance + Implementation - Davis Co PDMP

- 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.

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 Davis County and Utah DEM website's to provide opportunities for public participation and comment.

The Davis County Sheriff's Office has been designated as the lead agency in preparing and submitting the Davis County Natural Hazards Pre-Disaster Mitigation Plan, which includes coverage for all incorporated cities and unincorporated county. The strategy of the county in preparing the Plan is to use available resources and manpower in the most efficient and cost effective manner to allow cities continued access to data, technical planning assistance and FEMA eligibility. In addition, the county will reach out to non-profits, public agencies, special needs organizations, groups and individuals in allowing them input

Plan Maintenance + Implementation - Davis Co PDMP

and access to the Plan. With limited resources, however, it becomes difficult to both identify and to individually contact the broad range of potential clients that may stand to benefit from the Plan. This being the case, we have established the following course of action:

STEP 1. The county will publicly advertise all hearings, requests for input and meetings directly related to the Natural Hazard Pre-Disaster Mitigation Planning process. Davis County meetings 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.

Advertisement will be done according to the pattern set in previous years, i.e. the county will advertise each hearing and request for input at least 7 days in advance of the activity and will publish notices of the event in local newspapers. The notices will advertise both the hearing and the means of providing input outside the hearing if an interested person is unable to attend.

STEP 2. Davis County 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, the county 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, the county 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 county staff in making access and input to the Natural Hazard Pre-Disaster Mitigation Plan as open and convenient as possible:

A. Participation

All citizens of the region are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. The county will take whatever actions possible to accommodate special needs of individuals including the impaired, non-English speaking, persons of limited mobility, etc.

B. Access to Meetings

Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.

C. 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 the county that may be adopted as part of the Plan by reference. The county may charge a nominal fee for printing of documents that are longer than three pages. The intent of the County is to maintain the DavisHazardPlan.org website as a public-facing information resource.

D. Technical Assistance

Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects. County staff will assist to the extent practical, however, limited staff time and resources may prohibit staff from giving all the assistance requested. The County will be the sole determiner of the amount of assistance given all requests.

E. Public Hearings

The county will plan and conduct public hearings according to the following priorities:

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

F. Future Revisions

Future revisions of the Plan shall include:

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

Appendix A - POLICY CONSIDERATIONS

Natural disasters are naturally occurring phenomena. They play an integral part in maintaining balance in our world. Meteorological, geological, or hydrological processes have shaped Utah for millions of years and will continue to shape the valley for millions more. These unique phenomena only cause disasters when they affect humans and their structure. Modern engineering has made it possible to mitigate damage from natural hazards. However, the economic and environmental costs can be rather high. Tampering with natural systems can also create an imbalance in the natural environment. Nature provides its own mitigation and measures that need to be identified, protected and/or strengthened. To ensure that our environment is not harmed through mitigation measures, all applicable city/county ordinances and state/federal laws pertaining to the environment must be followed. The majority of the proposed mitigation programs in this Plan will be funded through federal programs, and thus tied to federal funding.

“44 CFR 10.8(d)(2)(iii) excludes this rule from the preparation of an environmental assessment or environmental impact statement, where the rule relates to actions that qualify for categorical exclusions under 44 CFR 10.8(d)(2)(iii), such as the development of plans under this section” (United States 2002).

The following acts will be taken into consideration and will be incorporated when needed while organizing and implementing the PDM Plan: Clean Air Act, Clean Water Act, Endangered Species Act, Floodplain Management, National Historic Preservation Act.

Clean Air Act (CAA) 1970

The Clean Air Act is the comprehensive Federal Law that covers the entire country under the Environmental Policy Act regulating air emissions from area, stationary, and mobile sources. This law sets limits or National Ambient Air Quality Standards (NAAQS), on how much of a pollutant can be in the air anywhere in the United States and the emissions of air pollutants. These limits ensure that all Americans have the same basic health and environmental protections. Maximum pollutant standards were set, though states may have stronger pollution controls than the national standards. Each state explains how it will do its job under the Clean Air Act by developing a mandated “state implementation plan” (SIP) that must be approved by the Environmental Protection Agency (EPA). The 1977 amendment set new dates for areas of the country that failed to meet the initial deadlines for achieving NAAQS. The 1990 amendments addressed problems such as acid rain, ground-level ozone, stratospheric ozone depletion, and air toxins. This act required facilities with large amounts of certain hazardous chemicals to have a special emergency planning requirement. Based on a facilities potential threat or risk from chemical spills, fires, explosions, etc., facilities prepare a Risk Management Plan (RMP) that includes hazard identification, assessments, design and maintenance of a safe facility, necessary steps to prevent releases and ways to minimize the consequences from an accidental release (United States 1970).

Clean Water Act (CWA)

The Federal Water Pollution Control Act Amendments of 1972 came about because of the growing awareness for the need to control water pollution. As amended in 1977, this law became known as the Clean Water Act, whose mission is to establish the basic structure for regulating discharges of pollutants into the waters of the United States, and to reduce and maintain the chemical, biological, and physical veracity. The act gave the EPA the authority to set wastewater standards for industry. The act also requires that each state adopt water quality standards, act to protect wetlands, and limit industrial and municipal discharges into navigable waters unless permitted. It funded the construction of wastewater treatment plants for nearly every city in the United States

Policy Considerations - Davis Co PDMP

through construction grant programs from the EPA and recognized the need for planning for future threats from nonpoint source pollution. (United States 1977a)

Clean Water Act, Section 404 – Wetland Preservation

This section regulates activities in wetland areas and authorizes the EPA to restrict or prohibit the use of an area as a disposal site for dredged or fill material if the discharge will have adverse effects on municipal water supplies, shellfish beds and fishery areas, wildlife or recreational areas. A permit must be issued that is based on regulatory guidelines developed in conjunction with the U.S. Army Corps of Engineers and the EPA. (United States 1977a)

Endangered Species Act of 1973

This act provides a plan for the protection of threatened or endangered plants and animals and the habitats in which they are found. Congress declared that various species of fish, wildlife, and plants in the United States have been caused to become extinct, or are so depleted in numbers they are in danger of becoming extinct as a result of economic development and expansion without adequate concern for conservation. Aesthetic, ecological, educational, historical, recreational, and scientific importance come from these species and are a value to our nation and its people. The U.S. will conserve, to a practicable extent, the species that face extinction and will encourage the States through federal assistance to develop and maintain conservation programs. The reason for the Act is to provide a means by which ecosystems with endangered and threatened species will be conserved. It is also declared that all state and local agencies resolve water resource issues in connection with conservation of endangered species (United States 1973).

Floodplain Management Policy

The main points of this policy are to reduce the loss of life and property and the disruption of societal and economic pursuits caused by flooding or facility operations as well as to restore, sustain and enhance the natural resources, ecosystems and other functions of the floodplains. Activities will search for a balance between the sometimes competing uses of floodplains in a way that provides the most benefit to society. Activities will pursue and encourage the appropriate use of floodplains, avoid long and short term negative impacts associated with the development and modification of floodplains, and avoid direct and indirect support of floodplain development whenever there is a practicable alternative. “Functions of floodplains include natural moderation of floods; fish, wildlife, and plant resources and habitat; groundwater recharge; and water quality maintenance. Uses of floodplains include stormwater management, erosion control, open space, natural beauty, opportunity for scientific study, outdoor education, recreation, and cultural preservation, and compatible economic utilization of floodplain resources by human society.” (United States 1977b).

National Historic Preservation Act of 1966 (NHPA)

This act was enacted by Congress because “the spirit and direction of the Nation are founded upon and reflected in its historic heritage...the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people.” Another main point of the act mandates the awareness of historic properties that are being lost or substantially altered. The preservation will continue a legacy of cultural, educational, aesthetic, inspirational, economic and energy benefits for future generations. The knowledge of historic resources and the encouragement of their preservations will improve the planning and execution of Federal and federally-assisted projects and will assist economic growth and development. The act uses measures that will foster conditions in which historic resources can exist in productive harmony with present and future generations (United States 2000).

Section 106 of NHPA “requires all Federal agencies to take into account the effects of their actions on historic properties, and provide ACHP with a reasonable opportunity to comment on those actions and the manner in

Policy Considerations - Davis Co PDMP

which Federal agencies are taking historic properties into account in their decisions” beginning at the early stages of planning to mitigate any adverse effects on historic properties (United States 2000).

Appendix B - GENERAL MITIGATION STRATEGIES

For the purpose of this mitigation Plan, mitigation strategies will be divided into one of five categories according to how they accomplish mitigation. The six categories include:

- Emergency Services
- Natural Resource Protection
- Mitigation
- Property Protection
- Public Information and Involvement
- Structural Protection

Emergency Service

Emergency Services mitigate bodily injury and the loss of life of humans during and after a disaster. Examples include:

- Mutual aid agreements
- Protection of critical facilities
- Health and safety maintenances
- Inventory of assets
- EMS/Police/Fire response and skill

Natural Resource Protection

Natural Resource Protection includes strategies that preserve or restore natural areas or the natural function that an area provides. Examples include:

- Wetlands protection
- Pollution reduction
- Erosion and sediment control
- Fuels reduction
- Watershed maintenance

Prevention

Prevention measures are intended to prevent the problem from occurring and/or keep it from getting worse. Examples include:

- Planning, zoning, and ordinance regulations
- Open space preservation
- Floodplain and wetland development regulations
- Stormwater management

- Minimum set back requirements
- Evacuation plans

Property Protection

Property protection measures are used to modify residential and commercial property within high-risk areas in an attempt to reduce damage. For the most part, property protection measures do not affect a building's appearance or use, making them less expensive and particularly suitable for historical sites and landmarks. Examples include:

- Utility relocation
- Burying or flood proofing
- Structural and non-structural earthquake mitigation
- Backup protections
- Insurance and other financial loss minimization actions
- Technical evaluations and mapping

Public Information and Involvement

Public information and involvement activities are intended to advise property owners, potential property owners, and visitors about the particular hazards associated with a property and ways to protect people and property from these hazards. Examples include:

- Public Education
- NFIP
- URWIN areas
- Hazard Identification and mapping
- Informational mailings
- Workshops
- Real estate disclosures for natural hazards
- Real estate insurance

Structural Protection/Projects

These are man-made structures, which prevent damage from impacting property. Examples include:

- Detention/retention basins
- Larger culverts
- Elevated seismic design
- Floodwalls
- Debris basins
- Landslide stabilization and levees



Earthquake Mitigation

Below is a list of common earthquake mitigation strategies pertaining to secondary threats often associated with earthquakes.

Generic Ground Shaking Mitigation:

- Understand peak horizontal acceleration and recurrence interval
- Design appropriately
- Zoning ordinances and building codes

Generic Liquefaction Mitigation:

- Move soil out
- Densify soils in place
- Remove ground water
- Structural design

Generic Surface Fault Rupture Mitigation:

- Avoidance
- Zoning ordinances
- Earthquake resistant building design codes
- Retrofitting of critical facilities and supporting equipment
- Retrofitting under-designed buildings
- Annual warning of risk/info on how to protect property and lives
- Projects to seismically upgrade critical public facilities/utilities and shelters
- Gather hazard and risk data/information
- Protection of roads and bridges
- General infrastructure protection
- Development of improved mitigation techniques
- Education of local officials, developers, and citizens

A. Emergency Services

Emergency Operations Planning:

Maintain an earthquake response plan to account for secondary problems, such as fire and hazardous material spills.

Critical Facilities Protection:

Protecting critical facilities are vital as the facilities play an important role in coordinating response and recovery following an earthquake. For this reason, listed below are vital facilities and facilities with the potential of causing a secondary disaster if destroyed.

- Facilities or locations vital to earthquake response efforts
- Emergency operations centers
- Police and fire stations
- Hospitals
- Highway garages
- Selected roads and bridges
- Evacuation routes

Facilities and locations, which if destroyed would create a secondary disaster:

- Facilities housing hazardous materials
- Wastewater treatment plants
- Schools
- Nursing homes

B. Natural Resource Protection

- Design of pipelines
- Land-use planning
- Community master plans and zoning ordinances

C. Prevention

While earthquakes are not preventable, proper planning, zoning, and building codes can prevent much of the damage common with earthquakes. Planning, zoning, and building codes should address minimum setbacks, critical facility locations, steep slopes, areas with liquefiable soils, and ensure a high factor of safety ratings for critical facilities. Community master plans and zoning ordinances define hazard areas and require developers to show that any existing hazards have been investigated and new construction will not be exposed to unacceptable risk.

D. Property Protection

Nonstructural Mitigation:

Nonstructural mitigation consists of mitigation measures that don't affect the overall look or purpose of the building yet prevent damage to no structural aspects and reduce the loss of life. In addition buildings with non-structural mitigation are frequently usable after an event.

- Tie downs
- Flexible utility connections

- Mylar film on windows to prevent the glass from shattering
- Added bracing

Retrofitting:

Retrofitting upgrades the seismic safety of a building through structural and nonstructural mitigation techniques.

Insurance:

Above and beyond standard homeowners insurance, there is other coverage a homeowner can purchase to protect against earthquake hazard, something not covered under most homeowner's insurance plans. Although this doesn't mitigate the problem it does allow the homeowner to shift the financial loss/risk onto another party.

E. Public Information and Involvement

Public information and involvement for earthquakes is similar to the mitigation strategies outlined in the flood and riverine section mentioned above.

Real Estate Disclosure:

Disclosure of information regarding earthquakes and hazard prone properties are important if potential buyers are in a position to mitigate damage. Unlike floodplains there are no federal laws, which require disclosure of earthquakes.

F. Structural Protection/Projects

Mitigation measures can be any type of activity that reduces the likelihood or modifies what is at risk from the hazard. Earthquake mitigation can be accomplished through building codes that ensure safe and adequate construction including earthquake resistant designs and construction. Older buildings should be retrofitted to comply with the codes.



Flood/ Riverine Mitigation

The following are generic mitigation strategies appropriate for addressing the hazard of flooding. Many of these strategies are expanded upon in the text that follows.

- Avoidance, land-use planning and zoning ordinances
- Better flood routing through communities
- Annual warning of risk information on how to protect property and lives
- Flood insurance awareness, emphasis, and marketing
- Projects such as levees/dams

General Mitigation Strategies - Davis Co PDMP

- Funding by a storm water tax in cooperation with Federal and State programs
- Additional SNOTEL sites and enhanced instrumentation
- Protection of roads and bridges
- Greater reservoir capacities
- Curtail development in flood-prone areas
- General infrastructure protection
- Develop river corridor parkways
- Protection of wastewater treatment facilities from excessive inflows
- Protection of drinking water supply systems
- Gather hazard and risk data/information
- Development of improved mitigation techniques
- Education of local officials, developers, and citizens
- Protecting natural floodplain resources
- Good watershed management

A. Emergency Services

Flood Warning:

Warning systems designed to alert residents of rising floodwaters. Warning systems can disseminate the information through a number of means such as sirens, radio, television, mobile public address system, emergency notification system, or door-to-door contact. Multiple or redundant warning systems are most effective, giving people more than one opportunity to be warned.

Flood Response:

Flood response refers to the actions that are taken to prevent or reduce damage once a flood starts. An example of flood response is the turning Salt Lake City's State Street into a river during the 1983 flood event. Many of the below actions should be part of an Emergency Operations Plan (EOP) developed in coordination with the agencies that share responsibilities. The EOP once developed should be exercised and continually evaluated so when the Plan is needed key players know what to do.

Flood response actions might include:

- Activation of the emergency operations center
- Sandbagging designated areas
- Closing streets and bridges
- Shutting off power to threatened areas
- Protective actions for children in schools
- Ordering an evacuation
- Opening evacuation shelters

Critical Facilities Protection:

General Mitigation Strategies - Davis Co PDMP

Protecting critical facilities is vital, yet this protection draws workers and resources away from protecting other parts of a town or county. For this reason listed below are vital facilities and facilities with the potential of causing a secondary disaster if destroyed. It is important to keep these locations in mind when considering potential mitigation projects.

Facilities or locations vital to flood response efforts:

- Emergency operations centers
- Police and fire stations
- Hospitals
- Highway garages
- Selected roads and bridges
- Evacuation routes

Facilities and locations which, if flooded would create a secondary disaster:

- Facilities housing hazardous materials
- Wastewater treatment plants
- Schools
- Nursing homes

Health and Safety Maintenance:

Response to floods or other natural disasters should include measures to prevent damage to health and safety such as:

- Patrolling evacuated areas to prevent looting
- Providing safe drinking water
- Vaccinating residents for tetanus
- Clearing streets
- Cleaning up debris

Many of these recommendations should be integrated into a public information program to educate citizens on the benefits of health and safety precautions.

B. Natural Resource Protection

Wetlands Protection:

Wetlands are capable of storing large amounts of floodwater, slowing and reducing downstream flows, and filtering the water. Any development that is proposed in a wetland is regulated by either federal and/or state agencies. Mitigation techniques are often employed, which might consist of creating a wetland on another site to replace what would be lost through the development. This is not an ideal practice, however, since it takes many years for a new wetland to achieve the same level of quality as an existing one.

Erosion and Sedimentation Control:

Controlling erosion and sediment runoff during construction and on farmland is important, since eroding soil will typically end up in downstream waterways. Sediment tends to settle where the water flow is

slower. It will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters. Sediment and erosion control have two principal components: minimize erosion with vegetation and capture sediment before it leaves the site. Slowing runoff increases infiltration into the soil, thereby controlling the loss of topsoil from erosion and the resulting sedimentation. Runoff and erosion control can be done through vegetation, terraces, contour strip farming, no-till farm practices, and impoundments.

C. Prevention Measures

Planning and Zoning:

Land use plans are put in place to guide future development, recommending where development should or should not take place. Sensitive and vulnerable lands can be designated for uses that would be compatible with occasional flood events. Zoning ordinances can regulate development in these sensitive areas by limiting or preventing some or all development.

Open Space Preservation:

Preserving open space is the best way to prevent flooding and flood damage. Open space preservation should not be limited to the flood plain. Other areas within the watershed may contribute to controlling the runoff that exacerbates flooding.

Floodplain Development Regulations:

Floodplain development regulations typically do not prohibit development in the special flood hazard areas, but they do impose construction standards on what is built there. The intent is to protect roads and structures from flood damage and to prevent the development from aggravating the flood potential. Floodplain development regulations are generally incorporated into subdivision regulations, building codes, and/or floodplain ordinances.

Subdivision Regulations:

These regulations govern how land will be divided into separate lots or sites. In some Utah cities these are known as Site Based Ordinances.

Building Codes:

Standards can be incorporated into building codes that address flood proofing all new improved or repaired buildings.

Floodplain Ordinances:

Communities that participate in the National Flood Insurance Program (NFIP) are required to adopt the minimum floodplain management regulations, as developed by FEMA. The regulations set minimum standards for subdivision regulations and building codes. Communities may adopt more stringent standards than those set forth by FEMA.

Stormwater Management:

Development outside of a floodplain can contribute significantly to flooding by covering impervious surfaces, which increase storm water runoff. Stormwater management is usually addressed in subdivision regulations. Developers are typically required to build retention or detention basins to minimize any increase in runoff caused by new or expanded impervious surfaces, or new drainage systems. Most large cities and counties within Utah enforce an ordinance prohibiting storm water from leaving a site at a rate higher than it did before the development.

Drainage System Maintenance:

General Mitigation Strategies - Davis Co PDMP

Ongoing maintenance of channel and detention basins is necessary if these facilities are to function effectively and efficiently over time. A maintenance program should include regulations that prevent dumping in or altering watercourses or storage basins; grading and filling should also be regulated.

D. Property Protection

Relocation:

Moving structures out of the floodplain is the surest and safest way to protect against damage. Relocation is expensive, so this approach will probably not be used except in extreme circumstances.

Acquisition:

Acquisition by governmental entities of land in a floodplain serves two main purposes: it ensures that the problem structure is addressed; and it has the potential to convert problem areas into community assets.

Building Elevation:

Elevation of a building above the base flood elevation is the best on-site protection strategy. The building could be raised to allow water to run underneath it, or fill could be brought in to elevate the site on which the building sits.

Insurance:

Above and beyond standard homeowners insurance, there is other coverage a homeowner can purchase to protect against flood hazard. Although this doesn't mitigate the problem it does allow the homeowner to shift the financial loss/risk to another party. Two of the most common insurances offered against flood loss are:

National Flood Insurance: When a community participates in the NFIP, any local insurance agent is able to sell separate flood insurance policies under rules and rates set by FEMA. Rates do not change after claims are paid because they are set on a national basis.

Basement Backup Insurance: National Flood Insurance offers an additional deductible for seepage and sewer backup, provided there is a general condition of flooding in the area that was the proximate cause of the basement getting wet.

E. Public Information and Involvement

Outreach Programs: Outreach projects are proactive; giving the public information even if they have not asked for it. Outreach projects should be designed to encourage people to seek out more information and take steps to protect themselves and their properties.

Examples include:

- Mass mailing or newsletters to all residents
- Notices directed to high risk area residents
- Displays in public buildings
- Newspaper articles and special sections
- Radio and TV news releases and interviews
- A detailed property owners handbook tailored for local conditions
- Presentations at public meetings and neighborhood groups

Real Estate Disclosure:

Disclosure of information regarding flood or hazard prone properties is important if potential buyers are to be in a position to mitigate damage. Federally regulated lending institutions are required to advise applicants that a property is in the floodplain. However, this requirement needs to be met only five days prior to closing, and by that time the applicant is typically committed to the purchase. This only includes flood prone areas, at the exclusion of other hazards.

Map Information:

Flood plain maps developed by FEMA outline the boundaries of the flood hazard areas. These maps can be used by anyone interested in a particular property to determine if it is in the floodplain. These maps are available from FEMA, the Utah Division of Emergency Management (DEM), and at many city and county planning offices. In addition the Utah Geologic Survey creates and maintains maps illustrating geologic hazards. These maps are available for sale at the Division of Natural Resources books store.

F. Structural Projects

The intent behind structural projects for flood mitigation is to prevent floodwaters from reaching properties. The shortcomings of almost all structural mitigation projects are that:

- They can be very expensive.
- They disturb the land, disrupt natural water flows, and destroy natural habitats.
- They are built to an anticipated flood event, and may be exceeded by a greater than expected flood.
- They can create a false sense of security.

Reservoirs:

Reservoirs control flooding by holding water behind dams or in storage basins. After a flood peaks, water is released or pumped out slowly at a rate the river downstream can handle. Reservoirs are expensive to build, occupy large tracts of land, require maintenance, and, if they fail, often result in greater downstream flooding than would occur during a natural flooding event.

Levees/Floodwalls:

One of the best-known structural flood control measures, levees and floodwalls are earthen, steel or concrete structures placed between the watercourse and the land.

Diversions:

A diversion is simply a new channel that sends floodwaters to a different location, thereby reducing flooding along an existing watercourse. Diversion structures can consist of surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel but during flooding events floodwaters spill over into the diversion channel.

Channel Modifications:

Channel modifications include making a channel wider, deeper, smoother, or straighter. Common channel modifications include:

Dredging: Dredging is often cost-prohibitive because the dredged material must be disposed of somewhere else, and dredged streams usually fill back in with sediment.

Drainage Modifications: These include man-made ditches and storm sewers that help drain areas where the surface drainage system is inadequate or where underground drainage ways may be safer or more attractive.

Stormwater Management:

Mitigation techniques for managing stormwater include installing storm water systems, enlarging pipes, and street improvements in existing storm water systems.



Landslide Mitigation

A. Generic Mitigation

- Avoidance
- Recognize landslide area
- Zoning ordinances
- Remove landslide materials
- Drain subsurface materials
- Install surface drains
- Remove materials for the head of the landslide
- Re-grade
- Build buttress or retaining wall at the toe of the slope
- Install soil nails and rock anchors
- Maintain natural vegetation
- Improved geologic mapping to identify potential landslide problems
- Zoning ordinances prohibiting construction in or adjacent to areas with high landslide potential
- Soil moisture sensors at SNOTEL sites
- Gather hazard and risk data/information
- Protection of roads and bridges
- Development of improved mitigation techniques
- Education of local officials, developers, and citizens
- Protection of drinking water supply systems
- Generic Rock Fall Mitigation
- Avoidance
- Stabilize rocks
- Prerelease

General Mitigation Strategies - Davis Co PDMP

- Build berms or benches
- Build structures to stop rocks

B. Emergency Services

- Warning systems
- Hazard identification and areas at risk

C. Prevention

- Land use planning ordinances
- Identify old landslides
 - Old landslides: irregular or subdued hill-like topography
 - Younger or more recently occurring landslides: hummocky terrain, scarps, inclined trees, ground cracks, sharp vegetation differences, and numerous depressions or ponds
- Identify unstable slopes
- Identify areas that could be affected by slope failures
 - Potential rock falls: steep cliff areas or where bedrock crops out onto mountain slopes

D. Property Protection

- Good land-use practices
- Avoid slope-irrigation, undercutting, and over-steepening

E. Public Information and Involvement

- Communications systems
- Proper property assessments of slope conditions

F. Structural Protection/Projects

- Proper assessments of slope conditions
- Grading or removing the material from the top and placing it at the toe of a slope can lessen the slope gradient
- Subsurface drainage control used to dewater and stabilize slopes
- Retaining structures (concrete block walls or large masses of compacted earth)
- Constructing debris basins
- Building deflection walls upslope of structures
- Avoiding ground level windows that face upslope
- Catchment fences
- Tieback walls
- Rock bolts
- Cut benches and berms



Wildfire Mitigation

A. General Wildfire Mitigation Strategies

- Avoidance
- Define, create, and maintain a defensible space
- Plant drought and fire resistant vegetation
- Ordinances
- Modification of fuel loading in high hazard interface areas
- Wildland fire training and experience for fire department personnel
- Public education effort for people living in the interface
- Additional suppression equipment needs of fire departments and the Utah Division of Forestry, Fire, and State Lands
- Fuel modification in moderate hazard interface areas
- Protection of roads and bridges
- Annual warning of risk/info on how to protect life and property
- Gather hazard and risk data/information
- General infrastructure protection
- Development of improved mitigation techniques
- Education of local officials, developers, and citizens
- Protection of drinking water supply systems

B. Emergency Service

- Fire fighting

C. Natural Resource Protection

- Prohibit development in high-risk areas
- Vegetation control

D. Prevention

- Zoning ordinances to reflect fire risk zones
- Planning and zoning to restrict development in areas near fire protection and water resources

General Mitigation Strategies - Davis Co PDMP

- Requiring new subdivisions to space buildings, provide firebreaks, on-site water storage, wide roads and multiple accesses
- Building code standards for roof materials, spark arrestors
- Maintenance programs to clear dead and dry bush trees
- Regulations on open fires

E. Property Protection

- Retrofitting of roofs and adding spark arrestors
- Landscaping to keep bushes and trees away from structures
- Insurance rates based on distance from fire protection
- Planning how to deal with WUI fires before they occur
- Good visibility

F. Public Information and Involvement

- Educating homeowners and future homeowners about risk
- Planning how to deal with WUI fires before they occur
- Emergency warning system, action plan
- Communication tree between fire departments and homeowners
- Community actions
- Adequate water supply and systems

G. Structural Protection/Projects

- Building and property assessments
- Use appropriate construction materials
- Adequate access to buildings



Problem Soils Mitigation

A. General Problem Soil Mitigation

- Avoidance
- Presoak and compact
- Remove problem soil

General Mitigation Strategies - Davis Co PDMP

- Landscape so that runoff moves away from foundations

B. Natural Resource Protection

- Soil type awareness

C. Prevention

- Landscaping with vegetation that does not concentrate or draw large amounts of water from the soil near foundations
- Insulating floors or walls near heating or cooling units to prevent evaporation that could cause local changes in soil moisture
- Avoid areas underlain by limestone and dolomite to prevent groundwater contamination and foundation problems in karst terrain
- Use soil tests to find gypsum; do not plant high level of water plants near the house
- Reduce piping damage by limiting construction that disturbs natural drainage
- Peat deposits should be removed or avoided at construction sites
- Avoid abandoned mine areas
- Sands, and calcareous loamy soils are highly erodible

D. Property Protection

- Special foundation designs
- Installing gutters and downspouts that direct water at least 10 feet away from foundation slabs
- Landscape with vegetation that does not concentrate or draw large amounts of water from the soil near foundations

E. Public Information and Involvement

- Establish a public information portal that allows the public to easily search information about soil risk in the area.

G. Structural Protection

- Special foundation designs
- Installing gutters and downspouts
- Proper drainage along roads and around structures



Dam Failure Mitigation

A. General Dam Failure Mitigation

- Proper floodplain maps, including dam breach flood potential
- Public knowledge of floodplains for the general public and emergency managers
- Updated Emergency Operation Plans (EOP) integration with GIS Systems
- Maintain proper floodplain/ wetland geometry and vegetation for flood routing
- Floodplain usage compatible with floodplain needs
- More debris dams; they help to maintain flooding, debris, and mud
- Flood control pool in existing dams
- Protection of roads and bridges
- General infrastructure protection
- More authority to help with snowmelt floods/runoff- releases, better forecasting
- Gather hazard and risk data/information
- Development of improved mitigation techniques
- Education of local officials, developers, and citizens

B. Emergency Service

- Good emergency management and emergency action plans
- Dam conditioning monitoring
- Warning system and monitoring
- Understand standard operating procedures

C. Natural Resource Protection

- Zoning of downstream usage
- Risk assessment
- Good watershed management

D. Prevention

- Dam failure inundation maps
- Planning/zoning/open space preservation to keep downs stream areas clear
- Building codes with flood elevations based on dam failure
- Dam safety inspections
- Draining the reservoir when conditions appear unsafe

E. Property Protection

- Acquisition of building in the path of a dam breach flood

- Flood insurance

F. Public Information and Involvement

- Communication and education of dam owners
- Communication and education with the public
- Evacuation procedures

G. Structural Protection/Projects

- Dam improvements
- Spillway enlargements
- Remove unsafe dams
- Design and construction review
- Direction for consulting engineers
- Instrumentations and monitoring of dams
- Remedial repair procedures
- Incremental damage assessment



Drought Mitigation

A. Emergency Service

- Provide low interest loans or private assistance for farmers and ranchers

B. Natural Resource Protection

- Manage wildlife during drought periods
- Incorporate wildfire hazard mitigation planning
- Integrate financial assistance for transportation or water hauling for livestock

C. Prevention

- Implement cloud seeding during drought years to enhance precipitation
- Protect culinary water systems and/or provide culinary water to people or systems
- Incorporate a drought management plan
- Introduce more water resources such as wells, ponds, reservoirs, and reservoir capacity

D. Public Information and Involvement

- Create or join water conservation programs that are designed to reduce water consumption
- Incorporate a drought management plan
- Drought resource coordination



Severe Weather Mitigation

A. Emergency Services

- Early warning systems
- Communication systems

B. Prevention

- Building code standards for light frame construction
- Ordinances that include weather resistant designs

C. Public Information and Involvement

- Listen to a weather radio
- Watch and listen to weather forecasts and warnings
- Develop a plan so you know where to take your family for shelter
- Understand risk and identify ways of reducing the impacts

D. Structural Protection/Projects

- Strengthen un-reinforced masonry

Appendix C - HAZARD HISTORIES

Note that much of the hazard historical data is incorporated into the Part 9 - Risk Assessment.

Table C.1 - Major Disaster Statistics by Type 1962-2005
(2005 dollars, HVRI) Davis County

	Injuries	Pct of Total Injuries	Fatalities	Pct of Total Fatalities	Property Damage	Pct Total Property Damage	Crop Damage	Pct Total Crop Damage
Avalanche	1.63	2.3%	1.25	22.8%	\$0	0.0%	\$0	0.0%
Extreme Cold	0.17	0.2%	0.03	0.5%	\$537,791	2.0%	\$1,457,399	20.8%
Flooding	0.24	0.3%	0.68	12.4%	\$4,901,262	17.9%	\$4,901,262	69.9%
Fog	13.8	19.2%	0.4	7.3%	\$159,947	0.6%	\$0	0.0%
Hail	6.07	8.4%	0.02	0.4%	\$444,374	1.6%	\$189,368	2.7%
Heavy Snow	38.69	53.8%	2.32	42.3%	\$5,169,331	18.9%	\$64,299	0.9%
Ice	5	7.0%	0	0.0%	\$101,575	0.4%	\$0	0.0%
Landslide	0	0.0%	0.17	3.0%	\$82,029	0.3%	\$0	0.0%
Lightning	0.24	0.3%	0.02	0.4%	\$446,492	1.6%	\$690	0.0%
Tornado	0	0.0%	0	0.0%	\$199,629	0.7%	\$2,994	0.0%
Wind	6.04	8.4%	0.6	2.5%	\$15,269,889	55.9%	\$398,328	5.7%
TOTAL	71.87	100.00%	5.49	91.50%	\$27,312,318	100.00%	\$7,014,340	100.00%

Table C.2 - Major Disaster Statistics by Decade 1960-2010
(2007 dollars, HVRI) Davis County

	Injuries	Pct of Total Injuries	Fatalities	Pct of Total Fatalities	Property Damage	Pct Total Property Damage	Crop Damage	Pct Total Crop Damage
1960s	1.9	3.0%	0.07	1.0%	\$2,111,058	7.0%	\$114,743	2.0%
1970s	15.7	21.0%	1.12	20.0%	\$3,415,339	12.0%	\$1,920,583	27.0%
1980s	0	0.0%	0.57	10.0%	\$8,080,463	29.0%	\$4,668,534	67.0%
1990s	38.2	51.0%	3.09	56.0%	\$13,170,387	47.0%	\$224,746	3.0%
2000s	19	25.0%	0.64	12.0%	\$1,497,915	5.0%	\$85,734	1.0%
2010s								
TOTAL	74.8	100.00%	5.49	99.00%	\$28,275,162	100.00%	\$7,014,340	100.00%

Hazard Histories - Davis Co PDMP

Table C.2 - Major Disaster Statistics by Event 1962-2005
(2005 dollars, HVRI) Davis County

	Number of Events	Events Per Year	Injuries Per Event	Fatalities Per Event	Property Damage Per Event	Crop Damage Per Event	Total Damages Per Event	Total Annualized Losses
Avalanche	6	0.10	0.27	0.21	\$0	\$0	\$0	\$0
Extreme Cold	9	0.20	0.02	0.00	\$59,755	\$161,933	\$221,688	\$44,338
Flooding	21	0.50	0.01	0.03	\$233,393	\$233,393	\$466,787	\$217,834
Fog	3	0.10	4.6	0.13	\$53,316	\$0	\$53,316	\$3,554
Hail	4	0.10	1.52	0.01	\$111,094	\$47,342	\$158,436	\$14,083
Heavy Snow	94	2.10	0.41	0.02	\$54,993	\$684	\$55,677	\$116,303
Ice	2	0.00	2.5	0.00	\$50,787	\$0	\$50,787	\$2,257
Landslide	3	0.10	0	0.06	\$27,343	\$0	\$27,343	\$1,823
Lightning	7	0.20	0.03	0.00	\$63,785	\$99	\$63,883	\$9,937
Tornado	4	0.10	0	0.00	\$49,907	\$749	\$50,656	\$4,503
Wind	64	1.40	0.09	0.01	\$238,592	\$6,224	\$244,816	\$348,183
TOTAL	217	4.90	9.45	0.47	\$27,312,318	\$450,424	\$7,014,340	\$762,815

Appendix D - CRITICAL FACILITIES

The following identifies an inventory of all the critical facilities within Davis County. Critical facilities are of particular concern because of the essential products and services to the general public they provide. These critical facilities can also fulfill important public safety, emergency response, and/or disaster recovery functions. The critical facilities identified in this Plan include amateur radio repeaters, emergency operations centers, electric and oil facilities, hospitals, fire and police stations, schools, water and wastewater treatment plants. (“*Mod*” = *Moderate*).

Table D.1 - Davis County, Amateur Radio Resources, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
AI7J (Layton, 440)	Low	Low	High	Low	High	Low	Low	Low	Low
K0NOD (Clearfield, 440)	Low	Low	High	Low	Mod	Low	Low	Low	Low
K7CEM (Salt Lake, 2000)	Low	Low	High	Mod	Low	Low	Mod	High	Low
K7DAV (Antelope Island, 144)	Low	Low	High	Mod	Low	Low	Low	High	Low
K7DAV (Antelope Island, 440)	Low	Low	High	Mod	Low	Low	Low	High	Low
K7DAV (Bountiful, 440)	High	Low	High	Mod	Low	Low	Low	Low	Low
N7CRG (Clearfield, 440)	Low	Low	High	Low	High	Low	Low	Low	Low
N7TDT (Bountiful, 440)	Low	Low	High	Mod	Low	Low	Low	Low	Low
NJ7J (Clearfield, 440)	Low	Low	High	Low	Mod	Low	Low	Low	Low
NJ7J (Syracuse, 220)	Low	Low	High	Low	High	Low	Low	Low	Low
W7CWK (Bountiful, 144)	Low	Mod	High	Mod	Low	Low	Low	Low	Low
W7CWK (Bountiful, 440)	Low	Mod	High	Mod	Low	Low	Low	Low	Low

Critical Facilities - Davis Co PDMP

Table D.2 - Davis County, Electric Generation Facility Vulnerability, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
Bountiful City Light & Power	Low	Low	Low	High	Mod	Low	Low	Low	High

Table D.3 - Davis County, Emergency Operations Centers Vulnerability, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
Davis County EOC (DCSO)	Low	Low	Mod	High	High	Low	Low	Low	High

Table D.4 - Davis County, Oil Refining Facility Vulnerability, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
Big West Oil	Low	Low	Mod	High	High	Low	Low	Low	High
Chevron USA Products-SLC Refinery	Low	Low	Mod	High	High	Low	Low	Low	High
Crown Asphalt (Cowboy Terminal)	Low	Low	Mod	High	High	Low	Low	Low	High
Holly Refining & Marketing (WC)	Low	Low	Mod	High	High	Low	Low	Low	High
Silver Eagle Refining (WC)	Low	Low	Mod	High	High	Low	Low	Low	High

Table D.5 - Davis County, Fire Station Vulnerability, 2021

Critical Facilities - Davis Co PDMP

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
North Davis Fire District Clearfield Fire Station #42	Low	Low	Mod	High	Mod	Low	Low	Low	High
North Davis Fire District West Point Fire Station #41	Low	Low	Mod	High	High	Low	Low	Low	High
Clinton City Fire Station #21	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Kaysville Fire Station #61	Low	Mod	Mod	High	Mod	Low	Mod	Low	High
Farmington Fire Station #71	Low	Low	Mod	High	High	Low	Low	Low	High
Hill AFB Fire - Station 1	Low	Low	Mod	High	Low	Low	Low	Low	High
Hill AFB Fire - Station 2	Low	Low	Mod	High	Low	Low	Low	Low	High
Hill AFB Station 3	Low	Low	Low	High	Low	Low	Low	Low	High
Layton Fire Station #51	Low	Low	Mod	High	Mod	Low	Low	Low	High
Layton Fire Station #52	Low	Low	Mod	High	Mod	Low	Low	Low	Mod
Layton Fire Station #53	Low	Low	Mod	High	Mod	Low	Low	Low	Low
South Metro Davis Fire - Station #81	Low	Low	Mod	High	Low	Low	Low	Low	High
South Metro Davis Fire - Station #82	Low	Low	Mod	High	Low	Low	Low	Low	High
South Metro Davis Fire - Station #83	Low	Low	Mod	High	High	Low	Low	Low	High
South Metro Davis Fire - Station #84	Low	Low	Mod	High	Low	Low	Low	Low	High
South Metro Davis Fire - Station #85	Low	Low	Mod	High	High	Low	Low	Low	High
South Weber Fire Station	High	Mod	Mod	High	Low	Low	Low	Low	High

Critical Facilities - Davis Co PDMP

Sunset Fire Station #11	Low	Low	Mod	High	Mod	Low	Low	Low	High
Syracuse Fire Station #31	Low	Low	Mod	High	High	Low	Low	Low	High

Table D.6 - Davis County, Hospital Vulnerability, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
Davis Hospital and Medical Center	Low	Low	Mod	High	Mod	Low	Low	Low	Mod
South Davis Community Hospital	Low	Low	Mod	High	Low	Low	Low	Low	High
Lakeview Hospital	Low	Low	Mod	High	Low	Low	Low	Low	High
University of Utah Medical Center Farmington	Low	Low	Mod	High	Mod	Low	Low	Low	High
Intermountain Healthcare Layton Hospital	Low	Low	Mod	High	Low	Low	Low	Low	Mod

Table D.7 - Davis County, Law Enforcement Facility Vulnerability, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
Bountiful Police	Low	Low	Mod	High	Low	Low	Low	Low	Mod
Centerville Police	Low	Low	Mod	High	High	Low	Low	Low	High
Clearfield Police	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Clinton Police	Low	Low	Mod	High	High	Low	Low	Low	Low
Davis County Sheriff	Low	Low	Mod	High	Mod	Low	Low	Low	High
Farmington Police	Low	Low	Mod	High	High	Low	Low	Low	High
Kaysville Police	Low	Low	Mod	High	Mod	Low	Low	Low	High
Layton Police	Low	Low	Mod	High	Mod	Low	Low	Low	Mod
North SLC Police	Low	Low	Mod	High	Low	Low	Low	Low	Mod
Sunset Police	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Syracuse Police	Low	Low	Mod	High	High	Low	Low	Low	Low

Critical Facilities - Davis Co PDMP

West Bountiful Police	Low	Low	Mod	High	High	Low	Low	Low	Low
West Point Police	Low	Low	Mod	High	High	Low	Low	Low	Low
Woods Cross Police	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Utah Highway Patrol Farmington Office	High	Mod	Mod	High	Mod	Low	Low	Low	High

Table D.8 - Davis County, School Facility Vulnerability, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
High School Facilities									
Bountiful High	Low	Low	Mod	High	Low	Low	Low	Low	High
Clearfield High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Davis High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Layton High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Northridge High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Syracuse High	Low	Low	Mod	High	High	Low	Low	Low	Low
Viewmont High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Woods Cross High	Low	Low	Mod	High	Low	Low	Low	Low	High
Junior High School Facilities									
Bountiful Junior High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Centennial Junior High	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Centerville Junior High	Low	Low	Mod	High	High	Low	Low	Low	High
Central Davis Junior High	Low	Low	Mod	High	High	Low	Low	Low	High
Fairfield Junior High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Farmington Junior High	Low	Low	Mod	High	High	Low	Low	Low	High

Critical Facilities - Davis Co PDMP

Kaysville Junior High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Legacy Junior High	Low	Low	Mod	High	High	Low	Low	Low	Low
Millcreek Junior High	Low	Low	Mod	High	Low	Low	Low	Low	High
Mueller Park Junior High	Low	Low	Mod	High	Low	Low	High	Low	High
North Davis Junior High	Low	Low	Mod	High	Mod	Low	Low	Low	High
North Layton Junior High	Low	Low	Mod	High	Mod	Low	Low	Low	High
South Davis Junior High	Low	Low	Mod	High	Low	Low	Low	Low	High
Sunset Junior High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Syracuse Junior High	Low	Low	Mod	High	High	Low	Low	Low	Low
West Point Junior High	Low	Low	Mod	High	High	Low	Low	Low	Low
Elementary School Facilities									
Adams Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Adelaide Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Antelope Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Bluff Ridge Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Boulton Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Bountiful Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Buffalo Point Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Burton Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Canyon Creek Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Centerville Elementary	Low	Low	Mod	High	High	Low	Low	Low	High
Clinton Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Columbia Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High

Critical Facilities - Davis Co PDMP

Cook Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Creskide Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Crestview Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Doxey Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Eagle Bay Elementary	Low	Low	Mod	High	High	Low	Low	Low	High
East Layton Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Ellison Park Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	Mod
Endeavor Elementary	Low	Low	Mod	High	High	Low	Low	Low	Mod
Farmington Elementary	Low	Low	Mod	High	High	Low	Low	Low	High
Foxboro Elementary	Low	Low	Mod	High	High	Low	Low	Low	Mod
Fremont Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	Mod
Heritage Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Hill Field Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Holbrook Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Holt Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	Mod
Kays Creek Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Kaysville Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
King Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Knowlton Elementary	Low	Low	Mod	High	High	Low	Low	Low	High
Lakeside Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Layton Elementary	Low	Low	Mod	High	High	Low	Low	Low	Mod
Lincoln Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Meadowbrook Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Morgan Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High

Critical Facilities - Davis Co PDMP

Mountain View Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Muir Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Oak Hills Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Odyssey Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Orchard Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Parkside Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Reading Elementary	Low	Low	Mod	High	High	Low	Low	Low	High
Sand Springs Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Snow Horse Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
South Clearfield Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
South Weber Elementary	High	Mod	Mod	High	Low	Low	Low	Low	High
Stewart Elementary	Mod	Low	Mod	High	High	Low	Low	Low	High
Sunset Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Syracuse Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Taylor Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Tolman Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Vae View Elementary	Low	Low	Mod	High	Low	Low	Low	Low	Mod
Valley View Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
Wasatch Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Washington Elementary	Low	Low	Mod	High	Low	Low	Low	Low	High
West Bountiful Elementary	Low	Low	Mod	High	High	Low	Low	Low	Mod
West Clinton Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low

Critical Facilities - Davis Co PDMP

West Point Elementary	Low	Low	Mod	High	High	Low	Low	Low	Low
Whitesides Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Windridge Elementary	Low	Low	Mod	High	High	Low	Low	Low	High
Woods Cross Elementary	Low	Low	Mod	High	Mod	Low	Low	Low	High
Charter School Facilities									
Ascent Academy	Low	Low	Mod	High	Mod	Low	Low	Low	High
Highmark Charter	High	Low	Mod	High	Mod	Low	Low	Low	High
Jefferson Academy	Low	Low	Mod	High	Mod	Low	Low	Low	Low
Leadership Learning Academy	Low	Low	Mod	High	Mod	Low	Low	Low	Mod
Legacy Prep. Academy	Low	Low	Mod	High	High	Low	Low	Low	High
Northern Utah Academy for Math, Engineering, and Science (NUAMES)	Low	Low	Mod	High	Low	Low	Low	Low	Mod
North Davis Prep. Academy	Low	Low	Mod	High	Mod	Low	Low	Low	High
Northern Utah Academy	Low	Low	Mod	High	Mod	Low	Low	Low	High
Spectrum Academy	Low	Low	Mod	High	High	Low	Low	Low	High
Syracuse Arts Acad.	Low	Low	Mod	High	High	Low	Low	Low	Low
Wasatch Peak Academy	Low	Low	Mod	High	High	Low	Low	Low	Mod
Voyage Academy	Low	Low	Mod	High	High	Low	Low	Low	Low
Alternative School Facilities									
Canyon Heights High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Early Learning Center	Low	Low	Mod	High	Mod	Low	Low	Low	High

Critical Facilities - Davis Co PDMP

Mountain High	Low	Low	Mod	High	Mod	Low	Low	Low	High
Renaissance Academy	Low	Low	Mod	High	Low	Low	Low	Low	High
Vista Education Campus	Low	Low	Mod	High	Mod	Low	Low	Low	High

Table D.9 - Davis County, Water + Wastewater Facility Vulnerability, 2021

	Dam Failure	Flood	Ground Shaking	Severe Weather	Liquefaction	Problem Soils	Soil Failure	Wildfire	East Canyon Wind
Central Davis County Sewer District	Low	Mod	Mod	High	High	Low	Low	Low	High
North Davis County Sewer District	Low	Mod	Mod	High	High	Low	Low	Low	High
South Davis Sewer Improvement District	Low	Mod	Mod	High	High	Low	Low	Low	High
WBWCD Davis Aqueduct	Low	Mod	High	High	Mod	Low	High	Low	Low
WBWCD Davis North Water Treatment Plant	Low	Low	Mod	High	Low	Low	Low	Low	High
WBWCD Davis South Water Treatment Plant	Low	Low	Mod	High	Low	Low	Low	Low	High
WBWCD Wells	Low	Low	Mod	High	Mod	Low	Low	Low	High

Appendix E - GLOSSARY OF TERMS

Glossary

Abutment (dam) – the valley side against which a dam is constructed.

Acre-foot of Water – approximately 326,000 gallons of water, or approximately a football field covered by one foot of water.

Active Faults – An active fault is defined as a fault displaying evidence of displacement along one or more of its traces during Holocene time (about the last 11,000 years).

Aftershocks – earthquakes during the seconds, hours, days to months following a larger earthquake (main shock) in the same general region.

Alluvial Fan – a cone-shaped deposit of stream sediments, generally deposited at the base of a mountain where a stream encounters flatter terrain.

Amplitude (seismic waves) - the maximum height of a wave crest or depth of a trough. The amount of ground moves as a seismic wave passes, as measured from a seismogram.

Avalanche Path – the area in which a snow avalanche runs; generally divided into starting zone, track, and runout zone.

Basin and Range Physiographic Province – consists of north-south-trending mountain ranges separated by valleys, bounded by the Rocky Mountains and the Colorado Plateau to the east and the Sierra-Cascade Mountains to the west (includes western Utah).

Bearing Capacity – the load per unit area, which the ground can safely support without excessive yield.

Bedrock – solid in-place rock, sometimes exposed and sometimes concealed beneath the soil.

Block Faulting – *see normal fault*

Collapsible Soil (hydrocompaction) – loose, dry, low-density soil that decreases in volume or collapses when saturated for the first time following deposition.

Critical Areas – Environmentally sensitive areas which include wetlands, fish and wildlife habitat conservation areas; geologically hazardous areas; areas with a critical recharging effect on aquifers used for potable water; and frequently flooded areas. Critical areas have measurable characteristics which, when combined, create a value for or potential risk to public health, safety and welfare.

Critical/Essential Facilities – Structures meeting one or more of the following criteria:

- Fire stations, police stations, storage facilities for vehicles/equipment needed after a hazard event, and emergency operation centers.
- Hospitals, nursing homes, and housing which are likely to contain occupants who may not be sufficiently mobile to avoid injury or death as a result of a hazardous event.
- Public and private utility facilities, which are vital to maintaining or restoring normal services to damaged areas after a hazardous event.
- Structures or facilities that produce, store, or use highly flammable, explosive, volatile, toxic and/or water reactive materials.

Glossary of Terms - Davis Co PDMP

Debris Flow – involves the relatively rapid, viscous flow of surficial material that is predominantly coarse grained.

Debris Slide – involves predominantly coarse-grained material moving mainly along a planar surface.

Drought (Agricultural) – lack of water for crop production in a given area.

Drought (Hydrologic) – lack of water in the entire water supply for a given area.

Drought (Meteorological) – lack of precipitation compared to an area's normal.

Drought (Socioeconomic) – lack of water sufficient to support an area's population.

Earth Flow – Involves fine-grained material that slumps away from the top or upper part of a slope, leaving a scarp, and flows down to form a bulging toe.

Earthquake – a sudden motion or trembling in the earth as fracture and movement of rocks along a fault release stored elastic energy.

Earthquake Fault Zone – earthquake fault zones are regulatory zones around active faults. The zones are used to prohibit the location of critical facilities and structures designed for human occupancy from being built astride an active fault. Earthquake Fault Zones are plotted on topographic maps at a scale of 1-inch equals 2,000 feet. The zones vary in width, but average about one-quarter mile wide.

Earthquake-induced Seiche – Earthquake generated water waves causing inundation around shores or lakes and reservoirs.

Epicenter – the point on the earth's surface directly above the focus of an earthquake.

Epoch – geologic time unit lasting more than an age but shorter than a period (Epoch 2008).

Erosion – the removal of earth or rock material by many types of processes, for example, water, wind, or ice action.

Expansive Soil and Rock – soil and rock which contain clay minerals that expand and contract with changes in moisture content.

Fault – a break in the earth along which movement occurs.

Fault Segment – section of a fault that behaves independently from adjacent sections.

Fault Zone – an area containing numerous faults.

Federal Emergency Management Agency (FEMA) – authorized under Section 404 of the Stanford Act. Provides funding for hazard mitigation projects that are cost-effective and comply with existing post-disaster mitigation programs and activities. These projects cannot be funded through other programs to be eligible.

Fill – material used to raise the surface of the land generally in a low area.

Fire-resistant Vegetation – plants that do not readily ignite and burn when subjected to fire because of inherent physiological characteristics of the species such as moisture content, fuel loading, and fuel arrangement.

Floodplain – an area adjoining a body of water or natural stream that has been or may be covered by floodwater.

Floodplain (100-year/500-year) – Floodplains that have the potential to flood once every 100 or 500 years or that has a 1% (100-year) or 0.2% (500-year) chance of flooding equal to or in excess of that in any given year.

Floodway – An area of land immediately adjacent to a stream or river channel that, in times of flooding, becomes an enlarged stream or river channel and carries the floodwater with the highest velocity.

Fluvial – concerning or pertaining to rivers or streams.

Glossary of Terms - Davis Co PDMP

Focus – the point of origin of an earthquake within the earth, and the origin of the earthquake's seismic waves.

Formation (geologic) – a mappable rock unit consisting of distinctive features/rock types separate from units above and below.

Frequency (seismic waves) – the number of complete cycles of a seismic wave passing a point during one second.

Fuel (fire) – vegetation, building material, debris, and other substances that will support combustion.

Fuel Break – a change in fuel continuity, type of fuel, or degree of flammability of fuel in a strategically-located strip of land to reduce or hinder the rate of fire spread.

Fuel Type – a category of vegetation used to indicate the predominant cover of an area.

Glacial Moraine – debris (sand to boulders) transported and deposited by glacial ice along a glacier's sides or terminus.

Graben – a block of earth dropped between two faults.

Gradient (slope) – a measure of the slope of the land surface.

Ground Failure – a general term referring to any type of ground cracking or subsidence, including landslides and liquefaction-induced cracks.

Ground Shaking – the shaking or vibration of the ground during an earthquake.

Ground Water – that portion of subsurface water which is in the zone of saturation.

Gypsiferous Deposits – soil or rock containing gypsum, which can be subject to dissolution.

Gypsum – a mineral composed of hydrated calcium sulfate. A common mineral of evaporites.

Hazard Mitigation Plan – The Plan resulting from a systematic evaluation of the nature and extent of vulnerabilities posed by a hazard present in society that includes the strategies needed to minimize future vulnerability to hazards.

Hazard Mitigation – Any action taken to reduce or permanently eliminate the long-term risk to human life and property and the environment posed by a hazard.

HAZUS-MH – Hazards United States – Multihazards; Earthquake loss estimation software using GIS databases developed by FEMA.

Head (landslide) – the upper parts of the slide material along the contact between the disturbed material and the main scarp.

Holocene – geologic epoch covering the last 10,000 years (after the last Ice Age).

Igneous Rocks – rocks formed by cooling and hardening of hot liquid material (magma), including rocks cooled within the earth (for example, granite) and those that cooled at the ground surface as lavas (such as basalt).

Impermeable – materials having a texture that does not permit water to move through.

Interfluve – land between two streams in the same drainage basin (Interfluve 2004).

Intermountain Seismic Belt (ISB) – zone of pronounced seismicity, up to 120 miles wide and 800 miles long, extending from Arizona through central Utah to northwestern Montana.

Lacustrine – concerning or pertaining to lakes.

Glossary of Terms - Davis Co PDMP

Lake Bonneville – a large, ancient lake that existed 30,000 to 12,000 years ago and covered nearly 20,000 square miles in Utah, Idaho, and Nevada. The lake covered many of Utah's valleys, and was almost 1,000 feet deep in the area of the present Great Salt Lake.

Lake Bonneville Sediments – sediments deposited by Lake Bonneville, found in the valleys, which range from gravels and sands to clays.

Landslide – a general term for a mass of earth or rock, which moves down slope by flowing, spreading, sliding, toppling, or falling (see slope failure).

Lateral Spread – lateral down slope displacement of soil layers, generally several feet or more, above a liquefied layer.

Levee (flood) – a berm or dike used to contain or direct water, usually without an outlet or spillway.

Liquefaction – sudden large decrease in shear strength of a cohesionless soil (generally sand or silt) caused by collapse of soil structure and temporary increase in pore-water pressure during earthquake ground shaking.

Magnitude (earthquake) – a quantity characteristic of the amplitude of the ground motion of an earthquake. The most commonly used measurement is the Richter magnitude scale; a logarithmic scale based on the motion that would be measured by a standard type of seismograph 60 miles from the earthquake's epicenter.

Metamorphic Rocks – rocks formed by high temperatures and/or pressures (for example, quartzite formed from sandstone).

Mitigation – the act of reducing or preventing hazards which affect society or those things deemed important to society

Modified Mercalli Intensity (MMI) – the most commonly used intensity scale in the U.S.; it is a measure of the severity of earthquake shaking at a particular site as determined from its effect on the earth's surface, man, and man's structures.

Montmorillonite – a clay mineral characterized by expansion upon wetting and shrinking upon drying.

Natural Vegetation – native plant life existing on a piece of land before any form of development.

Normal Fault (block faulting) – fault caused by crustal extension in which relative movement on opposite sides is primarily vertical; for example, the Wasatch Fault.

Oolite – spherical grains of carbonate sand with a brine shrimp fecal pellet nucleus.

Outlet (dam) - a conduit through which controlled releases can be made from the reservoir.

Palmer Drought Severity Index (PDSI) – developed by Wayne Palmer in 1965; measures drought severity using temperature, precipitation and soil moisture (Utah Division of Water Resources 2007).

Peat – unconsolidated surficial deposit of partially decomposed plant remains.

Period (geologic) – a standard (world-wide) geologic time unit.

Permeability – the capacity of a porous rock or soil for transmitting a fluid.

Physiographic Province – a region whose pattern of relief features or landforms differs significantly from that of adjacent regions.

Piping (problem soil and rock) – a weak incoherent layer in unconsolidated deposits that acts as a channel directing the movement of water. As the layer becomes saturated it conducts water to a free face (cliff or stream bank for example) that intersects the layer, and material exits out a "pipe" formed in the free face. Piping can occur in a dam as the result of progressive development of internal erosion by seepage.

Glossary of Terms - Davis Co PDMP

Pore Space – the open spaces in a rock or soil between solid grains. The spaces may be filled with gas (usually air) or liquid (usually water).

Porosity – the ratio of the volume of pore space in rock or soil to the volume of its mass, expressed as percentage.

Probable Maximum Flood (PMF) – a flood that would result from the most severe combination of critical meteorological and hydrologic conditions possible in a region.

Probable Maximum Precipitation (PMP) – the maximum amount and duration of precipitation that can be expected to occur on a drainage basin.

Problem Soil and Rock – geologic materials that are susceptible to volumetric changes, collapse, subsidence, or other engineering geologic problems.

Project Impact – An initiative of the Federal Emergency Management Agency intended to modify the way in which the United States handles natural disasters. The Goal of Project Impact from a Federal Government perspective is to reduce the personal and economic costs of hazard events by bringing together the private and public sector to better enable the citizens of a community to protect themselves from natural hazards.

Quaternary – a geologic time period covering the last 1.6 million years.

Recurrence Interval – the length of time between occurrences of a particular event (an earthquake, for example).

Rock Fall – abrupt free fall or down slope movement, such as rolling or sliding, of loosened blocks or boulders from an area of bedrock. The rock-fall runout zone is the area below a rock-fall source which is at risk from falling rocks.

Rock Topple – forward rotation movement of a rock unit(s) about some pivot point.

Runout Zone (avalanche) – where a snow avalanche slows down and comes to rest (deposition zone). For large avalanches, the runout zone can include a powder- or wind-blast zone that extends far beyond the area of snow deposition.

Sand Blow (earthquake) – deposit of sandy sediment ejected as water and sand to the surface, formed when ground shaking has caused liquefaction at depth.

Scarp – a relatively steeper slope separating two more gentle slopes. Scarps can form as a result of earthquake faulting.

Sediment – material that is in suspension, is being transported, or has been moved from its site of origin by water, ice, or wind, and has come to rest on the earth's surface either above or below the sea level.

Sedimentary Rocks – rocks formed from loose sediment such as sand, mud, or gravel deposited by water, ice, or wind, and then hardened into rock (for example, sandstone); or formed by dissolved minerals precipitating out of solution to form rock (for example, tufa).

Seiche – a standing wave generated in a closed body of water such as a lake or reservoir. Ground shaking, tectonic tilting, sub aqueous fault rupture, or landsliding into water can all generate a seiche.

Seismic Waves – vibrations in the earth produced during earthquakes.

Seismicity – seismic or earthquake activity.

Sensitive Clay – clay soil that experiences a particularly large loss of strength when disturbed. Deposits of sensitive clay are subject to failure during earthquake ground shaking.

Shear Strength – the internal resistance that tends to prevent adjacent parts of a solid from "shearing" or sliding past one another parallel to the plane of contact. It is measured by the maximum shear stress that can be sustained without failure.

Glossary of Terms - Davis Co PDMP

Shear Stress - a stress causing adjacent parts of a solid to slide past one another parallel to the plane of contact.

Slope Failure – a general term referring to any type of natural ground movement on a sloping surface (see landslide).

Slump – a slope failure that slides along a concave rupture surface. Generally slumps do not move very far from the source area.

Snow Avalanche – a rapid downslope movement of a mass of snow, ice, and debris.

Spectral Acceleration – measurement for approximate horizontal force experienced in a model earthquake. Measurements are specific to the frequency of shaking found to affect buildings during an earthquake. A 0.2-second period affects primarily one- and two-story buildings while 1.0-second period of spectral acceleration affects buildings approximately 10 stories in height.

Stafford Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23 1988: amended the Disaster Relief Act of 1974, PL 93-288.

Starting Zone (avalanche) – where the unstable snow or ice breaks loose and starts to slide.

Subsidence – a settling or sinking of the earth's crust.

Sunny-Day Failure – the failure of a dam with the water level at the normal pool elevation and no rainfall.

Surface fault rupture (surface faulting) – propagation of an earthquake-generated fault rupture to the ground surface, displacing the surface and forming a scarp.

Tectonic Subsidence – subsidence (down dropping) and tilting of a basin on the down dropped side of a fault during an earthquake.

Toe (landslide) – the margin of disturbed material most distant from the main scarp.

Track (avalanche) – the slope or channel down which a snow avalanche moves at a fairly uniform speed.

Unconsolidated Basin Fill – un-cemented and non-indurated sediment, chiefly clay, silt, sand, and gravel, deposited in basins.

Urban Area – a geographical area, usually of incorporated land, covered predominately by engineered structures including homes, schools, commercial buildings, service facilities, and recreational facilities.

Velocity (ground motion) – the rate of displacement of an earth particle caused by passage of a seismic wave.

Wasatch Fault – a normal fault that extends over 200 miles from Malad City, Idaho to Fayette, Utah, and trends along the western front of the Wasatch Range.

Watershed – the area of land above a reference point on a stream or river, which contributes runoff to that stream.

Weathering – a group of processes (such as the chemical action of air, rain water, plants, and bacteria and the mechanical action of temperature changes) whereby rocks on exposure to the weather change in character, decay, and finally crumble into soil.

Wildfire – uncontrolled fire burning in vegetation.

Wildland Area – a geographical area of unincorporated land covered predominately by natural vegetation.

Wildland Urban Interface (WUI) – Wildland vegetation and forested areas adjacent to or intermingled with residential developments.

Zone of Deformation (earthquake) – the width of the area of surface faulting over which earth materials have been disturbed by fault rupture, tilting, or subsidence.

List of Acronyms and Recognized Abbreviations

AARC - Average Annual Rate of Change

AGRC - Automated Geographic Reference Center

APHIS - Animal and Plant Health Inspection Service

BCEGS - Building Code Effectiveness Grading System

BOR - Bureau of Reclamation

CDBG - Community Development Block Grant

CERCLA - Comprehensive Environmental Response Compensation and Liability Act

CERT - Community Emergency Response Team

CFR - Code of Federal Regulations

CFS - Cubic Feet per Second

CRS - Community Rating System

DB - Detention Basin

DFIRM - Digital Flood Insurance Rate Map

DEM - Division of Emergency Management

DMA 2000 - Disaster Mitigation Act of 2000

EAP - Emergency Action Plan

EM - Emergency Management

EOC - Emergency Operations Center

EOP - Emergency Operations Plan

FEMA - Federal Emergency Management Agency

FIRM - Flood Insurance Rate Map

FIS - Flood Insurance Study

FMA - Flood Mitigation Assistance

G - Gravity

GIS - Geographic Information Systems

GOMB - Governor's Office of Management and Budget

GPS - Geographic Positioning System

GSL - Great Salt Lake

HAM - Handheld Amateur Radio

HAZMAT - Hazardous Materials

HAZUS-MH Hazards United States – Multi-Hazards

Glossary of Terms - Davis Co PDMP

HMGP - Hazard Mitigation Grant Program
LEPC - Local Emergency Planning Committee
LUST - Leaking Underground Storage Tank
M - Magnitude
MSL - Mean Sea Level
MOU - Memorandum of Understanding
NCDC - National Climatic Data Center
NFIP - National Flood Insurance Program
NIMS - National Incident Management System
NWS - National Weather Service
PDM - Pre-Disaster Mitigation
PDSI - Palmer Drought Severity Index
piC/L - picoCuries per Liter
PL - Public Law
PSC - Public Safety Communications
RCRA - Resource Conservation and Recovery Act
SA - Spectral Acceleration
SBA - Small Business Administration
SHELDUS - Spatial Hazard Events and Losses Database for the United States
SLC - Salt Lake City
SPI - Standardized Precipitation Index
SR - State Route
STAPLEE - Social, Technical, Administrative, Political, Legal, Economic, Environmental
SWSI - Surface Water Supply Index
TAZ - Transportation Analysis Zone
TRAX - Transit Express
TRI - Toxic Release Inventory
UCAN - Utah Communication Agency Networks
UDAF - Utah Department of Agriculture and Food
UDOT - Utah Department of Transportation
UEDV - Utah Economic Data Viewer
UFFSL - Utah Division of Forestry, Fire, and State Lands
UGS - Utah Geological Survey
USGS - United States Geological Survey

Glossary of Terms - Davis Co PDMP

USACE - United States Army Corps of Engineers

USC - United States Code

USDA - United States Department of Agriculture

USFS - United States Forestry Service

USU - Utah State University

UUSS - University of Utah Seismic Stations

WFZ - Wasatch Fault Zone

WUI - Wildland-Urban Interface

Appendix F - WORKS CITED

Black, Bill. 1993. *Radon Hazard Potential Map of Utah*. Map 149. Salt Lake City: Utah Geological Survey. <http://geology.utah.gov/maps/geohazmap/pdf/m-149.pdf> (Accessed 16 April 2008).

Brough, Clayton, Dan Brown, David James, Dan Pope and Steve Summy, eds. 2007. *Utah's Tornado's and Waterspouts – 1847 to Present*. National Weather Service – Salt Lake City Weather Forecast Office, National Weather Service, National Oceanic and Atmospheric Administration, Salt Lake City, UT. <http://www.wrh.noaa.gov/slc/climate/tornado.php> (Accessed 16 April 2008)

Bureau of Economic Analysis (BEA). 2007. Personal Income and Per Capita Personal Income by County for Utah 2003-2005. U.S. Department of Commerce. <http://www.bea.gov/beat/regional/reis/scb.cfm> (Accessed 16 April 2008).

Bureau of Economic and Business Research (BEBR). 2007. Utah Construction Information Database. <http://www.bebr.utah.edu/CIDB.html> (Accessed 16 April 2008).

Christenson, Gary, and Lucas Shaw. 2008. *Geographic Information Database Showing Geologic- Hazards Special-Study Areas, Wasatch Front, Utah*. Circular 106. Salt Lake City: Utah Geological Survey.

Critchfield, Howard. 1974. *General Climatology*. 3rd edition. Englewood Cliffs, NJ: Prentice Hall.

Dai, Aiguo, Kevin E. Trenberth, and Taotao Qian. 2004. A global data set of Palmer Drought Severity Index for 1870-2002: Relationship with soil moisture and effects of surface warming. *Journal of Hydrometeorology* 5:1117-1130. Dai Palmer Drought Severity Index data provided by the NOAA Earth System Research Laboratory at <http://www.cdc.noaa.gov/>.

Davis County 2015. *Davis County Emergency Operations Plan*. Davis County, UT.

Dinter, D. A., and J. C. Pechmann. 2005. Segmentation and Holocene displacement history of the Great Salt Lake fault, Utah, in Proceedings Volume, *Basin and Range Province Seismic Hazards Summit II*, W.L. Lund, ed., Utah Geological Survey, Misc. Publication 05-2.

Dunn, Lawrence B., and Steven V. Vasiloff. 2001. Tornadogenesis and operational

Works Cited - Davis Co PDMP

considerations of the 11 August 1999 Salt Lake City tornado as seen from two different Doppler radars. *Weather Forecasting* 16:377–398.

Elliot, Ashley. 2007a. *The 2001 Heather Drive Landslide, Layton, Davis County, Utah*. Public Information Series 88. Salt Lake City: Utah Geological Survey.

<http://www.geology.utah.gov/online/pi/pi-88.pdf> (Accessed 16 April 2008).

. 2007b. *The 2005-06 Creekside Drive Area Landslides – Mountain Green, Morgan County, Utah*. Public Information Series 91. Salt Lake City: Utah Geological Survey.

<http://geology.utah.gov/online/pi/pi-91.pdf> (Accessed 16 April 2008).

Environmental Protection Agency (EPA). 2006. *Excessive Heat Events Guidebook*. http://www.epa.gov/heatisland/about/pdf/EHEguide_final.pdf (Accessed 16 April 2008).

Epoch. Merriam-Webster.com. 2008. *Merriam-Webster Online Dictionary*.

Merriam-Webster, Inc. <http://www.merriam-webster.com/info/copyright.htm> (Accessed 16 April 2008).

Federal Emergency Management Agency. 1995. *Seismic Considerations for Communities at Risk*. FEMA Publication 83. Washington, D.C.: Building Seismic Safety Council.

_____. 2002. *State and Local Mitigation Planning, How to Guide: Understanding you Risks*. FEMA 386-1. Washington, D.C.: Federal Emergency Management Agency.

_____. 2006. *Multi-Jurisdictional Mitigation Planning*. FEMA 386-8. Washington, D.C.: Federal Emergency Management Agency.

<http://www.fema.gov/library/viewRecord.do?id=1905> (Accessed 16 April 2008).

Federal Insurance and Mitigation Administration (FIMA). 2002. Digital Flood Insurance Map Database, Salt Lake County, Utah. Washington, D.C.: Federal Emergency Management.

_____. 2005. Digital Flood Insurance Map Database, Weber County, Utah. Washington, D.C.: Federal Emergency Management.

_____. 2007. Digital Flood Insurance Map Database, Davis County, Utah (and Incorporated Areas). Washington, D.C.: Federal Emergency Management.

Forest Health Protection (FHP). 2008. Aerial Detection Survey-GIS. U.S. Department of Agriculture Forest Service. <http://www.fs.fed.us/r1-r4/spf/fhp/aerial/gisdata.html> (Accessed 16 April 2008).

Works Cited - Davis Co PDMP

- Giraud, Richard, and Lucas Shaw. 2007. Landslide Susceptibility Map of Utah. Utah Geological Survey Map 228DM. <http://geology.utah.gov/online/m/m-228.pdf> (Accessed 16 April 2008).
- Hazards & Vulnerability Research Institute (HVRI). 2007. The Spatial Hazard Events and Losses Database for the United States, Version 5.1. Columbia, SC: University of South Carolina. <http://www.cas.sc.edu/geog/hri/sheldus.html> (Accessed 16 April 2008)
- Hecker, Suzanne. 1993. *Quaternary tectonics of Utah with emphasis on earthquake-hazard characterization*. Utah Geological Survey, Bulletin 127, 257
- Hill, Geoffrey E. 1987. Fog Effect of the Great Salt Lake. *Journal of Applied Meteorology* 27:778-783.
- Hydrometeorological Design Studies Center (HDSC). 2007. NOAA Atlas 14 Precipitation Frequency Estimates in GIS Compatible Formats. National Weather Service. http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_gis.html (Accessed 11 November 2007).
- Interfluve. Dictionary.com. 2004. *The American Heritage® Dictionary of the English Language, Fourth Edition*. Houghton Mifflin Company. <http://dictionary.reference.com/browse/Interfluve> (Accessed: 16 April 2008).
- Kaliser, B.N. 1972. *Geologic Hazards in Morgan County with Applications to Planning*. Bulletin 93. Salt Lake City: Utah Geological and Mineralogical Survey.
- Lips, Elliot. Personal Communication. 1999. Lund, William R. 2005. *Consensus Preferred Recurrence- Interval and Vertical Slip-Rate Estimates – Review of Utah Paleoseismic-Trenching Data*. Utah Geological Survey, Bulletin 134, Utah Quaternary Fault Parameters Working Group.
- Matthews, K., V. DeBlander, L. Pederson, P. Mocettini and D. Halsey, eds. 2005. United States Department of Agriculture, United States Forest Service and Utah Division of Forestry, fire and State Lands. <http://www.fs.fed.us/r1-r4/spf/fhp/conditions/2002-2004%20UTcondrpt.pdf> (Accessed 16 April 2008).
- McCalpin, J.P., and S.P. Nishenko. 1996. Holocene probability, temporal clustering, and probabilities of future large (M>7) earthquakes on the Wasatch fault zone, Utah. *Journal of Geophysical Research*, 101:6233-6253.

Works Cited - Davis Co PDMP

Mulvey, W.E. 1992. *Soil and Rock Causing Engineering Problems in Utah*. Utah Geological Survey Special Study 80. <http://geology.utah.gov/maps/geohazmap/pdf/probsoils.pdf> (Accessed 16 April 2008).

National Climatic Data Center (NCDC). 2005. Climate Atlas of the Contiguous United States. National Oceanic and Atmospheric Administration. <http://cdo.ncdc.noaa.gov/cgi-bin/climaps/climaps.pl> (Accessed 16 April 2008).

National Drought Mitigation Center (NDMC). 2006. What is Drought? 15 April 2008. <http://drought.unl.edu/whatis/what.htm>.

National Flood Insurance Program (NFIP). 1990a. Flood Insurance Rate Map, Morgan County, Utah (and Unincorporated Areas). Washington, D.C.: Federal Emergency Management Agency.

_____. 1990b. Flood Insurance Rate Map, Tooele County, Utah (and Unincorporated Areas). Washington, D.C.: Federal Emergency Management Agency.

National Seismic Hazard Mapping Program (NSHMP). 2002. 2002 NSHMP Hazard Mapping. U.S. Geological Survey, Earthquake Hazards Program. http://earthquake.usgs.gov/research/hazmaps/interactive/cmmaps/custom2002_2006.php (Accessed 16 April 2008).

National Weather Service (NWS). 1999. *Thunderstorms...Tornadoes...Lightning...Natures Most Violent Storms*. National Oceanic and Atmospheric Administration Public Awareness Brochure 99050. <http://www.nws.noaa.gov/om/brochures/ttl.pdf> (Accessed 16 April 2008)

_____. 2001. *Winter Storms – The Deceptive Killers*. National Oceanic and Atmospheric Administration Public Awareness Brochure 200160. <http://www.weather.gov/om/winterstorm/winterstorms.pdf> (Accessed 16 April 2008)

_____. 2008. Utah's Most Dangerous Weather! Salt Lake City Weather Forecast Office, National Weather Service, National Oceanic and Atmospheric Administration, Salt Lake City, UT. <http://www.wrh.noaa.gov/slc/climate/DangerousWeather.php> (Accessed 16 April 2008)

Peterson, Kristina J. 2005. Recovery by Design: The Ongoing Challenges Presented by Katrina and Rita. *Natural Hazards Observer*, vol. 30, 2:10-11.

Scholastic Inc. 2008. All About Winter Storms. <http://teacher.scholastic.com/activities/wwatch/winter/index.htm> (Accessed 16 April 2008).

Works Cited - Davis Co PDMP

Solomon, Barry, Neil Storey, Ivan Wong, Walter Silva, Nick Gregor, Douglas Wright, and Greg McDonald. 2004. *Earthquake-Hazards Scenario for a M7 Earthquake on the Salt Lake City Segment of the Wasatch Fault Zone, Utah*. Special Study 111 DM. Salt Lake City: Utah Geological Survey.

Storm Prediction Center. 2007b. The Enhanced Fujita Scale (EF Scale). National Weather Service, National Oceanic and Atmospheric Administration.
<http://www.spc.noaa.gov/efscale/> (Accessed 16 April 2008).

_____. 2007b. Severe Weather Database Files (1950-2006). National Weather Service. <http://www.spc.noaa.gov/wcm/> (Accessed 11 November 2007).

United States. 1970. *Clean Air Act*. 42 United States Code. s/s 7401 et seq. 1970. http://www.access.gpo.gov/uscode/title42/chapter85_.html. (Accessed 16 April 2008)

_____. 1973. *Endangered Species Act*. 16 United States Code 1531. http://www.access.gpo.gov/uscode/title16/chapter35_.html (Accessed 16 April 2008).

_____. 1977a. *Clean Water Act*. 33 USC s/s 121 et seq. 1977. Public Law 95-217. http://www.access.gpo.gov/uscode/title33/chapter26_.html (Accessed 16 April 2008).

. 1977b. *Floodplain Management Executive Order No. 11988*. 42 Code of Federal Regulations 26951. <http://www.fema.gov/plan/ehp/ehplaws/attachments-laws/eo11988.pdf> (Accessed 15 April 2008).

_____. 2000. *National Historic Preservation Act of 1966*. Amended 2000 [with annotations]. Pub. L. 89-665; 16 United States Code 470 et seq. http://www.access.gpo.gov/uscode/title16/chapter1a_subchapterii_.html (Accessed 16 April 2008).

_____. 2000. *Disaster Mitigation Act of 2000*. Public Law 106-390; 42 USC 5121 note. <http://www.fema.gov/library/viewRecord.do?id=1935> (Accessed 16 April 2008)

Works Cited - Davis Co PDMP

_____. 2002. *Hazard Mitigation Planning and Hazard Mitigation Grant Program*. 44 Code of Federal Regulations. Parts 201 and 206. , Federal Register Interim Final Rule. Federal Emergency Management Agency. 26 February 2002.

United States Census Bureau (USCB). 2004. Residence County to Workplace County Flows for Utah. <http://www.census.gov/population/www/cen2000/commuting.html#UT> (Accessed 16 April 2008).

United States Geological Survey (USGS). 1999. Geologic Time: Major Divisions of Geologic Time. <http://pubs.usgs.gov/gip/geotime/divisions.html> (Accessed 16 April 2008).

_____. 2006. Utah Interactive State Basins Map. <http://ut.water.usgs.gov/Basins/index.html> (Accessed 16 April 2008).

University of Utah Seismograph Stations (UJSS). 2007. Utah Region Earthquake Listings, 1962- Present. <http://www.quake.utah.edu/EQCENTER/LISTINGS/utahregion.htm> (Accessed 16 April 2008).

Utah Avalanche Center (UAC). 2008. Frequently Asked Questions. U.S. Forestry Service. <http://www.avalanche.org/~uac/ed-faq.htm> (Accessed 15 April 2008).

Utah Department of Agriculture and Food (UDAF). 2007a. 2007 _____ *Insect Report*. <http://ag.utah.gov/plantind/2007InsectReport.pdf> (Accessed 16 April 2008).

Utah Department of Transportation (UDOT). 2006. Traffic Volume Maps - Traffic Maps for 2005. Utah Department of Transportation: Data _____ Analysis Unit. <http://www.udot.utah.gov/main/f?p=100:pg:4873862879722483966:::1:TV:1616>, (Accessed 16 April 2008).

Utah Department of Workforce Services (UDWS). 2006. Utah Economic Data Viewer – County and Statewide Information. <http://jobs.utah.gov/jsp/wi/utalmis/gotoCounties.do> (Accessed 16 April 2008).

_____. 2007a. Davis County Largest Employers – Annual Average 2006. Workforce Information. <http://jobs.utah.gov/opencms/wi/regions/northern/davis/davisme.pdf> (Accessed 16 April 2008).

Works Cited - Davis Co PDMP

Utah Division of Emergency Management (DEM). 2008. *Utah Natural Hazards Handbook*, October 2008. Utah Division of Forestry, Fire and State Lands (UDFFSL). 2003. *Forest Health in Utah*. Utah

Department of Natural Resources, June 2003. <http://www.ffsl.utah.gov/foresthealth/fhgov4a.pdf> (Accessed 16 April 2008).

_____. 2007. Northern Utah Regional Wildfire Protection Plan. http://www.utahfireinfo.gov/CWPP/northernutah/FINAL_Northern_UT%20RWPP.pdf (Accessed 16 April 2008)

Utah Division of Radiation Control (UDRC). 2006. Test Results by ZIP code – Long Term Results by ZIP Code. http://www.radon.utah.gov/test_results.htm (Accessed 16 April 2008).

Utah Division of Water Resources. 2007. *Drought in Utah: Learning from the Past – Preparing for the Future*. Utah State Water Plan. April 2007.

_____. 2007b. Great Salt Lake Pumping Project. <http://www.water.utah.gov/construction/gsl/gslpage.htm> (Accessed 16 April 2008).

Utah Division of Water Rights. 2007. WRDAMS - Point Shapefile of Dam database. <http://utstnrwrt6.waterrights.utah.gov/Downloads/wrdams.exe> (Accessed 16 April 2008)

Utah Geological Survey (UGS). 1996. *The Wasatch Fault*. Public Information Series 40. <http://geology.utah.gov/online/pdf/pi-40.pdf> (Accessed 16 April 2008).

_____. 2002. Utah Quaternary Fault and Fold Map – 2002. <http://geology.utah.gov/maps/geohazmap/qfaults/imagemap2/> (Accessed 16 April 2008)

_____. 2008. Earthquake Ground Shaking Levels for the Wasatch Front. <http://ugs.utah.gov/utahgeo/hazards/eqfault/ibcshake/index.htm> (Accessed 16 April 2008).

Utah Population Estimates Committee (UPEC). 2007. Demographics – Population Estimates, The State of Utah and Counties 1940-2007. Utah Governor’s Office of Planning and Budget. <http://governor.utah.gov/dea/UPEC/AllUPECData071115.xls>

Works Cited - Davis Co PDMP

(Accessed 16 April 2008).

_____. 2008. Demographic and Economic Projections – 2008 Baseline Projections. <http://governor.utah.gov/dea/ERG/ERG2008/2008ERGProjectionsTables.xls> (Accessed 16 April 2008).

Utah Transit Authority (UTA). 2007. *Comprehensive Annual Financial Report for Fiscal Year Ended December 31, 2006*. <http://www.rideuta.com/files/CAFR2006.pdf> (Accessed 16 April 2008).

Vaisala, Inc. 2006. 1996-2005 Flash Density Map. National Weather Service. http://www.lightningsafety.noaa.gov/pdfs/Vaisala_96-05_Flash_Map.pdf (Accessed 16 April 2008).

Davis County. 2007. Population Estimates, July 1, 2006. <http://wfrc.org/resources/sedata/Surv06.xls> (Accessed 15 April 2008).

Watson, Kris. 2007. *2007 Utah Cooperative Gypsy Moth Program Report*. Salt Lake City: Utah Department of Agriculture and Food.

Appendix G - STAKEHOLDER PARTICIPATION

Invited Partners / Entities

One of the critical elements of the Davis PDM update was to invite participation from a number of stakeholders including jurisdictions, businesses, agencies, nongovernmental organizations, etc. (A sample invitation letter is shown below). The tables that follow show each invited stakeholder with contact information and how/if they responded.



Stakeholder Participation - Davis Co PDMP

Table G.1 : Invited Jurisdictions and Local Operators

Jurisdiction / Entity	Contact Name and Information (if available)	2021 Participation (Yes/Invited-No)
Bountiful	Dave Edwards, Assistant Chief of Police edwards@bountifulutah.gov	Yes
Centerville	Paul Child, Chief of Police pechild@centervilleut.com	Yes
	Louisa McDonald, Assistant Emergency Manager lmcdonald@centervilleut.com	
Clearfield	John Meek, Emergency Manager john.meek@clearfieldcity.org	Yes
Clinton	Dave Olsen, Fire Chief dolsen@clintoncity.com	Yes
Davis County	Chad Monroe, Emergency Manager cmonroe@co.davis.ut.us	Yes
Davis County Animal Care and Control	Tracy Roddom, Assistant Director troddom@daviscountyutah.gov	Invited - No Response
Farmington	Brigham Mellor, Assistant City Manager bmellor@farmington.utah.gov	Yes
Fruit Heights	Brandon Green, City Manager bgreen@fruitheightscity.com	Yes
Kaysville	Paul Erickson, Fire Chief perickson@kaysvillecity.com	Yes
Layton	Doug Bitton, Fire Marshal dbitton@laytoncity.org	Yes
Morgan County (EM)	Austin Turner	Invited - No Response
North Salt Lake	Ken Leetham, City Manager kenl@nslcity.org	Yes
	Ali Avery, City Planner alia@nslcity.org	
Salt Lake City	bereadyslc@slcgov.com	Invited - No Response
Salt Lake County (EM)	Clint Mecham, Emergency Manager cmecham@unifiedfire.org	Invited - No Response

Stakeholder Participation - Davis Co PDMP

Skypark Airport	skyparkairportfbo@gmail.com (Woods Cross, Utah)	Invited - No Response
South Weber	Derek Tolman, Fire Chief dtolman@southwebercity.com	Yes
Sunset	Jason Monroe, Director of Public Works Worksjmonroe@sunset-ut.com	Yes
Syracuse	Erin Behm, Emergency Mgt Coordinator ebehm@syracuseut.com	Yes
Tooele County (EM)	Bucky Whitehouse	Invited - No Response
Utah Department of Transportation	contactudot@utah.gov	Invited - No Response
Wasatch Front Regional Council (WFRC)	Miranda Cox, Public Information Officer wfrc@wfrc.org	Invited - No Response
Weber County (EM)	Lance Peterson, Director lpeterso@co.weber.ut.us	Invited - No Response
West Bountiful	Jason Meservy, Emergency Manager jason.meservy@imail.org	Yes
West Point	Ryan Harvey, Administrative Services Dir rharvey@westpointcity.org	Yes
Woods Cross	Sam Christiansen, Director of Public Works schristiansen@woodscross.com	Yes

Table G.2: Invited Specialized Local Districts

Specialized Local District	Representative Name, Title, Contact Information	2020 Participation (Yes/No/Invited)
Benchland Water Improvement District	Jennifer Holbrook, Clerk jenniferh@benchlandwater.com	Invited - No Response
Central Davis Sewer District	Susan Holmes, Board Chair cdsewer@gmail.com	Invited - No Response
Davis School District	Craig Carter, Assistant Superintendent ccarter@dsdmail.net	Invited - No Response
Davis and Weber Counties Canal Company	Scott Paxman, President office@davisweber.org	Invited - No Response

Stakeholder Participation - Davis Co PDMP

Hill Air Force Base	Barbara Fisher, Public Information Officer barbara.fisher.1@us.af.mil	Invited - No
North Davis Fire District	Misty Rogers, Clerk mrogers@nofires.org	Invited - No Response
North Davis Sewer District	M. Andy Dawson, Board Chair IT@NDSO.org	Invited - No Response
South Davis Metro Fire	Dane Stone, Fire Chief dstone@sdmetrofire.org	Invited - No Response
South Davis Sewer District	Susanne Monsen sm@sdsd.us	Invited - No Response
Utah Transit Authority (UTA)	Kerry Koane, Planning Manager kdoane@rideuta.com	Invited - No Response
Weber Basin Water Conservancy District	Sherrie Mobley, Clerk smobley@weberbasin.com	Invited - No Response

Table G.3: Invited Nongovernmental Organizations

Specialized Local District	Representative Name, Title, Contact Information	2020 Participation (Yes/No/Invited)
American Red Cross - Utah	Kristy Denlein kristy.denlein@redcross.org	Invited - No Response
Davis Chamber of Commerce	info@davischamberofcommerce.com	Invited - No Response
Davis Hospital and Medical Center	DHMC.Media@steward.org	Invited - No Response
Dominion Energy	Corporate.communications@dominionenergy.com	Invited - No Response
Intermountain Layton Hospital	contactus@imail.org	Invited - No Response
Lakeview Hospital	William Jensen, Public Information Officer William.Jensen@Mountainstarhealth.com	Invited - No Response
Rocky Mountain Power	CCCom2@pacificorp.com	Invited - No Response

Stakeholder Participation - Davis Co PDMP

South Davis Community Hospital	info@sdch.com	Invited - No Response
--------------------------------	---------------	-----------------------

Stakeholder Engagement Tools

As mentioned in Part III, the development of this plan was conducted during the 2020-2021 Covid-19 pandemic, so online interaction was the preferred method. In order to compensate for this, the initiative website was modified in a way that helped ensure that all jurisdictions had access to the information that was being requested and generated. Each jurisdiction was given a specified place to get and submit information. This ensured that each stakeholder had the same access to the information presented during meetings, even if they were unable to attend in-person meetings.

The screenshot shows a web interface for stakeholder participation. At the top, there is a navigation bar with the Davis County logo and links for Home, About, Draft Plan, Documents, Glossary, Project Maps, and Login. Below this is the Clearfield City logo with the tagline 'we've got it made'. The main content area is divided into two assignment cards. The first card, titled 'ASSIGNMENT 6 - due by May 14: UPLOAD LOCAL DOCUMENTS', provides instructions on uploading local documents and lists various types of documents to upload, such as capital improvements, infrastructure studies, and emergency response plans. A 'Document Upload Portal' link is provided. The second card, titled 'ASSIGNMENT 5 - due by May 14: IDENTIFY ANTICIPATED DEVELOPMENT', asks stakeholders to identify general areas for development and provides an 'Email Mike Hansen (consultant)' link and an 'Example of level-of-detail needed' link. A caption below the screenshot explains that these are screen captures of the assignment pages on a secured website section.

Communication was also facilitated with the use of shared Google Docs (see example below). Each part of the plan was digitized into this format, and links were shared with stakeholders who were able to make tracked comments directly into the text. These comments were reviewed and incorporated by the core

Stakeholder Participation - Davis Co PDMP

planning team throughout the initiative. The public was also given access to do the same during the public comment period.

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

- **Severe Weather Storms.** The City is experiencing ~~seeing~~ an increase in severe storms, particularly wind storms, that are causing power outages, property damage, flooding, etc. The state of Utah has also been experiencing years ~~instances~~ of extreme drought.
- **Wildland Fire.** Much of North Salt Lake City is located in the foothills abutting U.S. Forest Service property, increasing the risk for wildland fires.
- **Dam failure.** The secondary water system throughout the community has ~~small storage reservoirs~~.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Culinary water storage tanks, <u>pump houses</u> , and secondary water reservoirs	The city has culinary water storage tanks and secondary water storage reservoirs that may experience water contamination, flooding, and failure due to earthquake	Enhance security, and upgrade water distribution system
Water Distribution System	Age of system, risk of failure during earthquake event.	Upgrade infrastructure to current seismic standards
Storm Water Distribution System	Age of system, flooding, risk of failure during earthquake event.	Upgrade infrastructure to current seismic standards
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices/EOC	Loss of vital city records; communication vehicles; day to day functions. Loss of operability for EOC	Provide for city office/EOC survivability following an earthquake
Public Works Building	Loss/damage to resources	N/A

Screenshot of typical edits provided by stakeholders and captured by the document (before committee acceptance).

Typical Meeting Agenda for Core Planning Team

The Core Planning Team consists of Davis County Emergency Management and Rural Community Consultants to discuss updates and plans for future assignments (e.g. goals, timelines/ deadlines, etc). Due to the fact that the plan was ongoing with many stakeholders working to move forward, the agenda for these items remained relatively unchanged throughout the process. Listed are dates of the Core Planning Team meetings along with an example of the running agenda:

- Progress reports
 - Assignment from last meeting

Stakeholder Participation - Davis Co PDMP

- Engagement from stakeholders
- New mapping and current hazard identification
- Research, how to complete assignments to FEMA standards
- Goals (county and city both current plan related and updates from 2016 plan and progress)
- Public involvement + website development
 - Upcoming timelines and deadlines
 - Upcoming action items for stakeholders

Table G.4 : Dates and Agenda of Core Planning Team Meetings

Date	Unique Agenda Items
2020.11.11	Design stakeholder assignments #1 and #2.
2021.01.06	n/a
2021.02.23	Feedback on draft to-date (parts 1-4).
2021.03.05	Design stakeholder assignment #3.
2021.03.07	Review stakeholder assignment #4.
2021.04.01	Outline stakeholder assignment #5.
2021.04.27	Design stakeholder assignment #6.
2021.05.26	n/a
2021.07.07	Lessons learned from BRAG PDM.
2021.08.04	Requirements for updated story map content.
2021.08.26	n/a
2021.09.13	Review comments on Part 9.
2021.09.30	Discuss State feedback.
2021.10.01	Progress of State Comment Revisions
2021.10.04	Progress of State Comment Revisions
2021.10.05	Progress of State Comment Revisions
2021.10.06	Progress of State Comment Revisions
2021.10.07	Final meeting before Resubmission

Stakeholder Participation - Davis Co PDMP

Stakeholder Meeting Attendance

Due to the disruptive nature of the pandemic, in-person attendance was difficult. The following information illustrates the major contact points related to the meetings and assignments related to the PDM project.

One-on-One Meetings

In order to help maintain the project and to keep communities engaged, one on one meetings were held between Davis County Emergency Management and various cities. During these meetings, we discussed various aspects of the Planning Process, including progress on tasks, goals, deadlines, ideas to incorporate, etc.

Table G.5 : Dates and Participants of One-on-One Meetings

Date	Participants
2021.01.11	Clearfield / Davis County EM
2021.01.26	Fruit Heights / Davis County EM
2021.02.01	Farmington / Davis County EM
2021.04.20	Davis, Weber, and Morgan County
2021.06.23	Bountiful, Centerfield, Kaysville, West Bountiful, Woods Cross / Davis County EM
2021.06.24	Clear Field, Layton, NSL, South Weber, Sunset, Syracuse/ Davis County EM
2021.10.06	Bountiful, Centerfield, Clearfield, Clinton, Farmington, Fruit Heights, Kaysville, Layton, North Salt Lake, South Weber, Sunset Syracuse, West Bountiful, West Point, Woods Cross / Davis County EM

Stakeholder Participation Log

Meetings + Assignments

D	B	C	C	C	F	F	K	L	N.	S	S	S	W.	W
A	O	E	L	L	A	R	A	A	S	O	S	S	B	W
V	U	N	E	E	R	R	S	S	A	O	S	S	O	O
I	N	T	R	A	M	H	K	L	L	T	W	S	U	C
S	T	V	F	R	I	E	A	L	A	E	B	S	N	R
C	I	I	I	I	N	I	S	L	L	E	E	S	T	O
O	F	L	L	L	G	G	V	L	A	A	S	S	I	C
U	L	L	L	L	T	H	I	L	L	K	S	S	F	R
N	L	L	L	L	O	T	L	L	E	E	E	S	P	O
T	L	L	L	L	N	S	L	L	K	R	S	U	O	S

APPENDIX H - STAKEHOLDER SUPPORT

Participating Jurisdictions

As mentioned previously in Part II, those municipalities with staff resources provided support for the Davis County Pre-Disaster Mitigation initiative in 2020-2021. The following links will provide the locally-adopted resolutions of support for the project as well as their concurrence of the final.

Table H.1: Resolution of Support from Participating Communities

Municipality	2021 Participation	Support Resolution Date (+ link)	Adoption Resolution Date (+ link)
Bountiful	Yes	March 23, 2021	December 14, 2021
Centerville	Yes	February 17, 2021	November 18, 2021
Clearfield	Yes	March 23, 2021	November 23, 2021
Clinton	Yes	March 9, 2021	November 9, 2021
Farmington	Yes	-	November 17, 2021
Fruit Heights	Yes	March 2, 2021	November 4, 2021
Kaysville	Yes	February 18, 2021	November 18, 2021
Layton	Yes	-	November 18, 2021
North Salt Lake	Yes	March 21, 2021	November 16, 2021
South Weber	Yes	-	November 16, 2021
Sunset	Yes	-	January 18, 2022
Syracuse	Yes	March 23, 2021	January 11, 2022
West Bountiful	Yes	-	November 16, 2021
West Point	Yes	-	December 21, 2021
Woods Cross	Yes	February 16, 2021	November 16, 2021

Sample Resolution of Support for the Initiative

The following language was provided to local emergency managers. They were asked to convert it into the format of their municipal resolutions. Copies of enacted resolutions were sent back to the PDM planning team.

//date//

WHEREAS the health, safety and welfare of the citizens of ___*jurisdiction*___ are matters of paramount importance to the City Council; and

WHEREAS the ___*jurisdiction*___ City Council recognizes the threat that natural hazards pose to people and property within their jurisdiction; and

WHEREAS, the Federal Emergency Management Agency (“FEMA”) has required that municipalities review and revise their local multi-hazard mitigation plan every five years to reflect changes in development, progress in local hazard mitigation efforts, and changes in mitigation priorities and submit their revised multi-hazard mitigation plan for review and approval by FEMA to remain eligible for pre-disaster mitigation grant funding; and

WHEREAS the Emergency Services Division of Davis County has received a grant from FEMA to prepare a multi-jurisdictional hazard mitigation plan in accordance with the requirements of 44.C.F.R. 201.6 and the FEMA “Local Mitigation Planning Handbook”; and

WHEREAS these requirements include obtaining formal resolutions of participation and support from stakeholder jurisdictions.

NOW THEREFORE, BE IT RESOLVED that the City Council of ___*jurisdiction*___ hereby intends to support the Plan update initiative by participating with the committee intended to develop revisions and updates to the Davis County Pre-Disaster Mitigation Plan.

This Resolution shall take effect upon passage.

//s//

Adoption Process - Davis Co PDMP

Sample Resolution of Support for Adoption of the 2021 PDM

The following language was provided to local emergency managers. They were asked to convert it into the format of their municipal resolutions. Copies of enacted resolutions were sent back to the PDM planning team.

RESOLUTION NO. _____

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, AS REQUIRED BY THE FEDERAL DISASTER MITIGATION AND COST REDUCTION ACT OF 2000.

(Name of Jurisdiction)

(Governing Body)

(Address) _____

WHEREAS, President William J. Clinton signed H.R. 707, the Disaster Mitigation and Cost Reduction Act of 2000, into law on October 30, 2000; and,

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan to be eligible for Federal Emergency Management Agency post-disaster funds; and,

WHEREAS, the *Natural Hazard Pre-Disaster Mitigation Plan* has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, **the City** is within Davis County and participated in the update of the multi-jurisdictional Plan, the *Natural Hazard Pre-Disaster Mitigation Plan*; and,

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

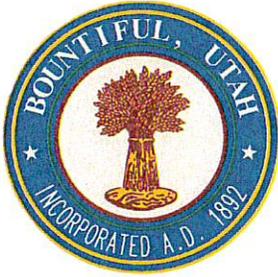
WHEREAS, **the City** is concerned about mitigating potential losses and has determined that it would be in the best interest of the community to adopt the *Natural Hazard Pre-Disaster Mitigation Plan*;

NOW THEREFORE, BE IT RESOLVED by **the City Council** that **the City adopts** the *2021 Davis County Natural Hazard Pre-Disaster Mitigation Plan Update* as this jurisdiction's Multi-Hazard Mitigation Plan.

ADOPTED this **XX day of XX, 2021** at the meeting of **the City Council**.

Signed: (Chief Elected Official)

(City Council)



BOUNTIFUL

BOUNTIFUL CITY, UTAH RESOLUTION NO. 2021-23

MAYOR
Randy C. Lewis
CITY COUNCIL
Kate Bradshaw
Millie Segura Bahr
Kendalyn Harris
Richard Higginson
Chris R. Simonsen

CITY MANAGER
Garv R. Hill

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, 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; and,

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan to be eligible for Federal Emergency Management Agency post-disaster funds; and,

WHEREAS, the Natural Hazard Pre-Disaster Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

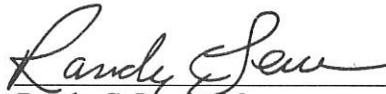
WHEREAS, Bountiful City is within Davis County and participated in the update of the multi-jurisdictional Plan, the Natural Hazard Pre-Disaster Mitigation Plan; and,

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

WHEREAS, Bountiful City is concerned about mitigating potential losses and has determined that it is in the best interest of the community to adopt the Natural Hazard Pre-Disaster Mitigation Plan;

NOW THEREFORE, BE IT RESOLVED by Bountiful City Council that Bountiful City adopts the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan.

**APPROVED, PASSED AND ADOPTED BY THE BOUNTIFUL CITY COUNCIL THIS
14TH DAY OF DECEMBER 2021.**


Randy C. Lewis, Mayor

ATTEST:


Shawna Andrus, City Recorder



RESOLUTION NO. 2021-27

A RESOLUTION ADOPTING THE DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE 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; and

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan in order to be eligible for Federal Emergency Management Agency (FEMA) post-disaster funds; and

WHEREAS, the City Council of Centerville City recognizes the threat that natural hazards pose to people and property within the City and Davis County, Utah; and

WHEREAS, Centerville City has participated with Davis County to prepare an update to their multi-hazard mitigation plan, hereby known as the Davis County Pre-Disaster Mitigation Plan 2021 Update, in accordance with the Disaster Mitigation Act of 2000 and FEMA requirements found in 44 C.F.R. 201.6; and

WHEREAS, the Davis County Pre-Disaster Mitigation Plan 2021 Update identifies mitigation goals and actions to reduce or eliminate long-term risks to people and property in the City and County from the impacts of future hazards and disasters; and

WHEREAS, the City has afforded its citizens an opportunity to comment and provide input on the Plan and has determined that it is in the best interest of the community to adopt the Davis County Pre-Disaster Mitigation Plan 2021 Update.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF CENTERVILLE CITY, STATE OF UTAH, AS FOLLOWS:

Section 1. Adoption of Davis County Pre-Disaster Mitigation Plan Update. The City Council hereby adopts the Davis County Pre-Disaster Mitigation Plan 2021 Update attached hereto as Exhibit A and incorporated herein by reference as the City's Multi-Hazard Mitigation Plan.

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

Section 3. Effective Date. This Resolution shall become effective immediately upon its passage.

PASSED AND ADOPTED BY THE CITY COUNCIL OF CENTERVILLE CITY, STATE OF UTAH, ON THIS 7th DAY OF DECEMBER, 2021.

ATTEST:

CENTERVILLE CITY

Jennifer Hansen
Jennifer Hansen, City Recorder

By: Clark A. Wilkinson
Mayor Clark A. Wilkinson

CERTIFICATE OF PASSAGE AND EFFECTIVE DATE

According to the provisions of the U.C.A. § 10-3-719, as amended, resolutions may become effective without publication or posting and may take effect on passage or at a later date as the governing body may determine; provided, resolutions may not become effective more than three months from the date of passage. I, the municipal recorder of Centerville City, hereby certify that foregoing resolution was duly passed by the City Council and became effective upon passage or a later date as the governing body directed as more particularly set forth below.

Jennifer Hansen
JENNIFER HANSEN, City Recorder

DATE: 11-18-2021

EFFECTIVE DATE: 18th day of November, 2021.



CLEARFIELD CITY RESOLUTION 2021R-21

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, 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; and,

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan to be eligible for Federal Emergency Management Agency post-disaster funds; and,

WHEREAS, the Natural Hazard Pre-Disaster Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, Clearfield City is within Davis County and participated in the update of the multi-jurisdictional Plan, the Natural Hazard Pre-Disaster Mitigation Plan; and,

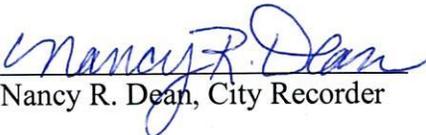
WHEREAS, Clearfield City is a local unit of government that has afforded its citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and,

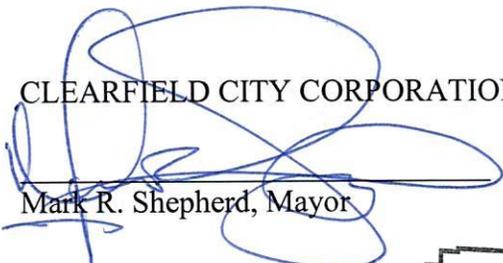
WHEREAS, Clearfield City is concerned about mitigating potential losses and has determined that it would be in the best interest of the community to adopt the Natural Hazard Pre-Disaster Mitigation Plan;

NOW THEREFORE, BE IT RESOLVED by the City Council that the City adopts the 2021 Davis County Natural Hazard Pre-Disaster Mitigation Plan Update as this jurisdiction's Multi-Hazard Mitigation Plan.

Passed and adopted by the City Council at its regular meeting on the 23rd day of November, 2021.

ATTEST


Nancy R. Dean, City Recorder

CLEARFIELD CITY CORPORATION

Mark R. Shepherd, Mayor

VOTE OF THE COUNCIL

AYE: Councilmembers Bush, Peterson, Phipps, Roper

NAY: None.

EXCUSED: Councilmember Thompson



RESOLUTION NO. 31-21

~~A RESOLUTION OF CLINTON CITY, UTAH ADOPTING THE DAVIS COUNTY, UTAH PRE-DISASTER MITIGATION PLAN 2021 UPDATE~~

WHEREAS Clinton City recognizes the threat that natural hazards pose to people and property within Clinton City; and

WHEREAS Clinton City has participated in the creation of a multi-hazard mitigation plan, hereby known as the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Clinton City from the impacts of future hazards and disasters; and

WHEREAS adoption by Clinton City demonstrates their commitment to hazard mitigation and achieving the goals outlined in the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

NOW THEREFORE, BE IT RESOLVED BY CLINTON CITY, Utah, THAT:

The Clinton City Council adopts the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

This resolution shall be effective on the date it is adopted.

DATED this the 9th day of November, 2021.

ATTEST


Lisa Titensor, Recorder


L. Mitch Adams, Mayor

DAVIS COUNTY, UTAH
RESOLUTION NO. 2021-576

A RESOLUTION OF DAVIS COUNTY, UTAH ADOPTING THE
DAVIS COUNTY, UTAH PRE-DISASTER MITIGATION PLAN 2021 UPDATE

WHEREAS, Davis County, Utah, a body corporate and politic, legal subdivision, and political subdivision of the State of Utah ("Davis County"), recognizes the threat that natural hazards pose to people and property within Davis County, Utah; and

WHEREAS, Davis County has participated in the creation of a multi-hazard mitigation plan, hereby known as the Davis County, Utah Pre-Disaster Mitigation Plan 2021 (the "Plan 2021 Update") in accordance with the Disaster Mitigation Act of 2000, which Plan 2021 Update is attached hereto as Exhibit A and incorporated herein by this reference; and

WHEREAS, Davis County has afforded its citizens an opportunity to participate and provide input in the Plan 2021 Update and the actions in the Plan 2021 Update; and

WHEREAS, Davis County is concerned about mitigating potential losses to people and property in Davis County, Utah from the impacts of future hazards and disasters; and

WHEREAS, the Plan 2021 Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Davis County, Utah from the impacts of future hazards and disasters; and

WHEREAS, adoption of the Plan 2021 Update by Davis County demonstrates Davis County's commitment to hazard mitigation and achieving the goals outlined in the Plain 2021 Update.

NOW, THEREFORE, BE IT RESOLVED by the legislative body of Davis County, Utah, as follows:

1. The Plan 2021 Update, attached hereto as Exhibit A and incorporated herein by this reference is adopted by Davis County; and
2. This resolution shall be effective on the date it is adopted.

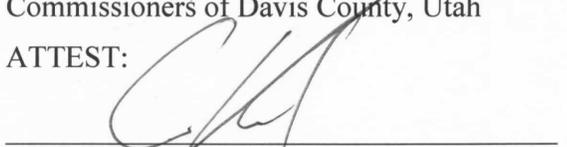
This Resolution was duly PASSED, ADOPTED, and/or APPROVED this 16th day of November, 2021, with Commissioners Bob J Stevenson aye, Randy B. Elliott aye, and Lorene Miner Kamalu aye, all voting as documented herein.

DAVIS COUNTY



Bob J Stevenson, Chairman, Board of County
Commissioners of Davis County, Utah

ATTEST:


Curtis Koch,
Davis County Clerk/Auditor

2021-576

(FARMINGTON CITY)

Utah

RESOLUTION NO. _____

A RESOLUTION OF (FARMINGTON CITY) ADOPTING THE DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE

WHEREAS (local governing body) recognizes the threat that natural hazards pose to people and property within (Farmington City); and

WHEREAS (Farmington City) has participated in the creation of a multi-hazard mitigation plan, hereby known as the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (Farmington City) from the impacts of future hazards and disasters; and

WHEREAS adoption by (local governing body) demonstrates their commitment to hazard mitigation and achieving the goals outlined in the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

NOW THEREFORE, BE IT RESOLVED BY (FARMINGTON CITY), Utah, THAT:

In accordance with (local rule for adopting resolutions), (City Council) adopts the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

This resolution shall be effective on the date it is adopted.

DATED this 17th day of November, 2021.



Signed

H. JAMES TALBOT

Mayor

Farmington City



ATTEST



City Recorder

Name/Title

RESOLUTION NO. 2021-004

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, AS REQUIRED BY THE FEDERAL DISASTER MITIGATION AND COST REDUCTION ACT OF 2000.

WHEREAS Fruit Heights City recognizes the threat that natural hazards pose to people and property within Fruit Heights; and

WHEREAS Fruit Heights has participated in the creation of a multi-hazard mitigation plan, hereby known as the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Fruit Heights from the impacts of future hazards and disasters; and

WHEREAS adoption by the Fruit Heights City Council demonstrates their commitment to hazard mitigation and achieving the goals outlined in the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

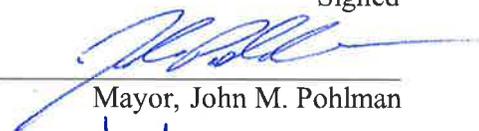
NOW THEREFORE, BE IT RESOLVED BY FRUIT HEIGHTS CITY, UTAH, THAT:

In accordance with Local and State Laws, Fruit Heights City adopts the **DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE**.

This resolution shall be effective on the date that it is adopted.

DATED this 4TH day of November 2021.

Signed



Mayor, John M. Pohlman

11/4/21
Date Fruit Heights City



Brandon Green, City Manager

11/4/21

RESOLUTION 21-11-04

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, 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; and

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan in order to be eligible for Federal Emergency Management Agency (FEMA) post-disaster funds; and

WHEREAS, the Kaysville City Council recognizes the threat that natural hazards pose to people and property within the City and Davis County, Utah; and

WHEREAS, Kaysville has participated with Davis County to prepare an update to their multi-hazard mitigation plan, hereby known as the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan Update, in accordance with the Disaster Mitigation Act of 2000 and FEMA requirements found in 44 C.F.R. 201.6; and

WHEREAS, the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan Update identified mitigation goals and actions to reduce or eliminate long-term risks to people and property in the City and County from the impacts of future hazards and disasters; and

WHEREAS, the City has determined that it is in the best interest of the community to adopt the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan Update.

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

SECTION I: The City Council hereby adopts the 2021 Davis County Natural Hazard Pre-Disaster Mitigation Plan Update, attached hereto as Exhibit 'A', as the jurisdiction's Multi-Hazard Mitigation Plan.

PASSED AND ADOPTED by the City Council of Kaysville, Utah, this **18th day of November, 2021.**



Katie Witt, Mayor

ATTEST:



Annemarie Plaizier, City Recorder



RESOLUTION 21-46

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, 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; and

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan in order to be eligible for Federal Emergency Management Agency (FEMA) post-disaster funds; and

WHEREAS, the City Council of Layton City recognizes the threat that natural hazards pose to people and property within the City and Davis County, Utah; and

WHEREAS, Layton City has participated with Davis County in preparing an update to the County's multi-hazard mitigation plan, known as the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan Update, in accordance with Disaster Mitigation Act of 2000 and FEMA requirements found in 44 C.F.R.201.6; and

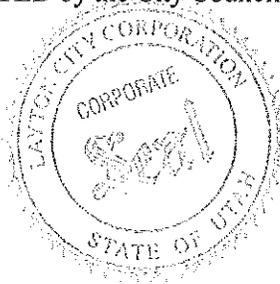
WHEREAS, the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan Update identifies mitigation goals and actions to reduce or eliminate long-term risks to people and property in the City and County from the impacts of future hazards and disasters; and

WHEREAS, the City has determined that it is in the best interest of the community to adopt the current draft of the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan Update.

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

That Layton City adopt and approve the current draft of the Davis County 2021 Natural Hazard Pre-Disaster Mitigation Plan Update, which is attached hereto and incorporated herein by this reference.

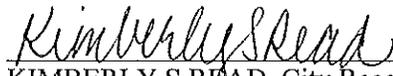
PASSED AND ADOPTED by the City Council of Layton, Utah, this 18th day of November 2021.





JOY PETRO, Mayor

ATTEST:



KIMBERLY S READ, City Recorder

RESOLUTION NO. 2021-44R

A RESOLUTION ADOPTING THE DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE, AS REQUIRED BY THE FEDERAL DISASTER MITIGATION AND COST REDUCTION ACT OF 2000.

WHEREAS, the City of North Salt Lake recognizes the threat that natural hazards pose to people and property within North Salt Lake; and

WHEREAS, the City of North Salt Lake has participated in the creation of a multi-hazard mitigation plan, hereby known as the Davis County Pre-Disaster Mitigation Plan 2021 Update in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Disaster Mitigation and Cost Reduction Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan to be eligible for Federal Emergency Management Agency post-disaster funds; and

WHEREAS, the Davis County Pre-Disaster Mitigation Plan 2021 Update identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of North Salt Lake from the impacts of future hazards and disasters; and

WHEREAS, adoption by the City Council demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Davis County Pre-Disaster Mitigation Plan 2021 Update.

NOW, THEREFORE BE IT RESOLVED by the City Council of North Salt Lake, Utah that the City of North Salt Lake adopts the Davis County Pre-Disaster Mitigation Plan 2021 Update as this jurisdiction's Multi-Hazard Mitigation Plan.

APPROVED AND ADOPTED by the City Council of the City of North Salt Lake this 16th day of November, 2021.

CITY OF NORTH SALT LAKE:


Leonard K. Arave, Mayor

Attest:


Linda D. Horrocks, City Recorder



City Council Vote as Recorded:

<u>Name</u>	<u>Vote</u>
Lisa Baskin	<u>aye</u>
Natalie Gordon	<u>excused</u>
Brian Horrocks	<u>aye</u>
Ryan Mumford	<u>aye</u>
Stan Porter	<u>aye</u>

RESOLUTION 21-49

A RESOLUTION OF THE SOUTH WEBER CITY COUNCIL ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, 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; and,

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan to be eligible for Federal Emergency Management Agency post-disaster funds; and,

WHEREAS, the *Natural Hazard Pre-Disaster Mitigation Plan* has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, South Weber is within Davis County and participated in the update of the multi-jurisdictional Plan, the *Natural Hazard Pre-Disaster Mitigation Plan*; and,

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

WHEREAS, South Weber is concerned about mitigating potential losses and has determined that it would be in the best interest of the community to adopt the *Natural Hazard Pre-Disaster Mitigation Plan*;

NOW THEREFORE, BE IT RESOLVED by the Council of South Weber, Davis County, State of Utah, as follows:

Section 1. Adoption: The 2021 Davis County Natural Hazard Pre-Disaster Mitigation Plan Update attached as Exhibit 1 as this jurisdiction's Multi-Hazard Mitigation Plan.

Section 2: Repealer Clause: All ordinances or resolutions or parts thereof, which are in conflict herewith, are hereby repealed.

PASSED AND ADOPTED by South Weber Council of South Weber, Davis County, on the 16th day of November 2021.

Roll call vote is as follows:		
Council Member Winsor	(FOR)	AGAINST
Council Member Petty	(FOR)	AGAINST
Council Member Soderquist	(FOR)	AGAINST
Council Member Alberts	(FOR)	AGAINST
Council Member Halverson	(FOR)	AGAINST


Jo Sjoblom, Mayor




Attest: Lisa Smith, Recorder

RESOLUTION NO. 2022-07

A RESOLUTION ADOPTING THE DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE

Whereas, Sunset City, Utah recognizes the threat that natural hazards pose to people and property within Sunset City, Utah; and

Whereas, Sunset City, Utah has participated in the creation of a multi-hazard mitigation plan, hereby known as the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE in accordance with the Disaster Mitigation Act of 2000; and

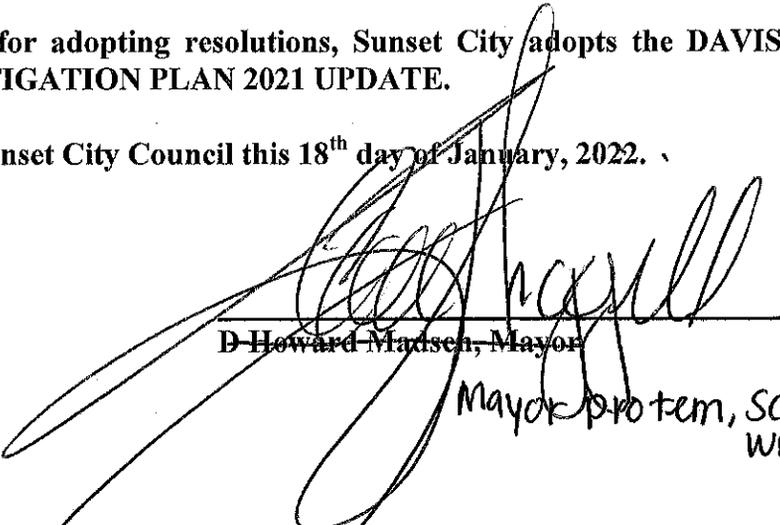
Whereas, the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Sunset City, Utah from the impacts of future hazards and disasters; and

Whereas, adoption by Sunset City Council demonstrates their commitment to hazard mitigation and achieving the goals outlined in the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

Now, Therefore, be it resolved by the City Council of Sunset, Utah that:

In accordance with local rules for adopting resolutions, Sunset City adopts the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

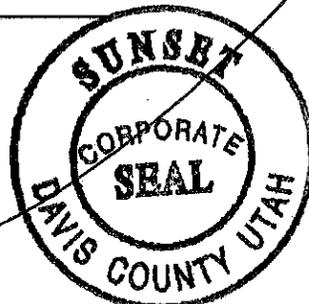
Approved and adopted by the Sunset City Council this 18th day of January, 2022.


D. Howard Madsen, Mayor

Mayor Pro Tem, Scott Wiggill

Attest:


Nicole Supp, Recorder



RESOLUTION R22-01

A RESOLUTION OF THE SYRACUSE CITY COUNCIL ADOPTING THE DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

WHEREAS, the Syracuse City Governing Body recognizes the threat that natural hazards pose to people and property within Syracuse City; and

WHEREAS, Syracuse City has participated in the creation of a multi-hazard mitigation plan, hereby known as the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Syracuse City from the impacts of future hazards and disasters; and

WHEREAS, adoption by the Syracuse City Governing Body demonstrates their commitment to hazard mitigation and achieving the goals outlined in the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF SYRACUSE, DAVIS COUNTY, STATE OF UTAH, AS FOLLOWS:

SECTION 1: Adoption. The Syracuse City Council hereby adopts the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE. The Plan is attached hereto as Exhibit A.

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

SECTION 3. Effective Date. This Resolution shall become effective immediately upon its passage.

PASSED AND ADOPTED BY THE CITY COUNCIL OF SYRACUSE CITY, STATE OF UTAH, THIS 11th DAY OF JANUARY, 2022.

SYRACUSE CITY

ATTEST:


Cassie Z. Brown, City Recorder



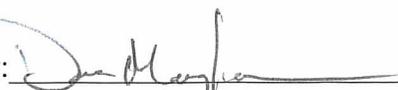
By: 
Dave Maughan, Mayor

EXHIBIT A

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

Objective (Priority MEDIUM): Educate citizens within the possible flood areas of dams with information about flooding and other dam failure hazards.

Action: Provide citizens with information as necessary.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Jurisdictions: Sunset City

Severe Weather - Problem Identification: Severe weather (rain, snow, wind, lightning, ect.) is a possibility in Sunset City.

Goal: Reduce the threat of severe weather damage to infrastructure.

Objective (Priority MEDIUM): Encouraging weather-proofing measures in new construction.

Action: Encourage new construction to implement weather-proofing into building plans.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: Community Development, Building Department, etc.

Jurisdictions: Sunset City

Syracuse City

Background

Syracuse City is located 30 miles north of Salt Lake City, UT. The city footprint covers 9.5 sq. miles.

Since 2000 the city's population has more than tripled with a current population of 31,458. Syracuse has many young working families as well as older native residents. The commercial base continues to develop, with the addition of a new sixty-acre industrial park, and the planned construction of the West Davis Highway..

Due to the growth in Davis County, one new highway project (State Highway 193), has recently been completed, and another (the West Davis Corridor) is in the construction phase with an expected completion in 2023..

Syracuse City proper has all of the amenities of a suburban community, including: City Hall, Syracuse Justice Court, Syracuse Public Safety Department, six elementary grade schools, two Jr. High (secondary) Schools, and Syracuse High School. Syracuse City also offers gas stations, grocery stores, restaurants,

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

office buildings, medical and dental practices, childcare facilities, one of the largest indoor fun centers in the state, and various other types of businesses.

Syracuse City is also home to the North Davis Sewer District which processes sewer for over 200,000 people in Davis County. The sewer district and public utilities like culinary water, natural gas, and electricity distribution, are considered as critical infrastructure within the community.

If impacted by disaster, the loss of this infrastructure would result in significant economic impact, and potentially the loss of life.

Syracuse operates under a six-member council form of government, with an elected Mayor and five Council Members. The day-to-day operations and the majority of executive authorities are delegated to a City Manager, who works closely with the Mayor to ensure a continuous performance of all city operations.

City operations include 24-7 police, fire, and public works departments, a municipal court, water, streets, stormwater evacuation, snow removal, community development, and parks and recreation programming. Emergency management and pre-disaster mitigation responsibilities are coordinated by the Syracuse City Manager.

Specific Community Hazards

- **Earthquake.** Syracuse proximity to the Wasatch Fault puts it at high risk of earthquake damage.
- **Flooding.** Syracuse is located west of the Wasatch Mountain Front, and just East of the Eastern shore of the Great Salt Lake. Flooding from heavy rain that overwhelms storm drainage systems and impacts sewer and water infrastructure is a potential hazard, as well as flooding from rising lake levels or seismic events caused by earthquakes.
- **Severe Weather.** Syracuse City is west of the Wasatch Mountain Range where several downslope and canyon wind events have potential for property damage.
- **Chemical Spill.** Syracuse City is adjacent to the North Davis Wastewater Treatment Facility, which uses extremely hazardous chemicals. These chemicals are routinely delivered by truck to the facility via Syracuse City streets.
- **Water System Contamination.** Syracuse City operates its own culinary water well, and has heavy construction activity as it grows. This growth requires frequent connections into the City's water system and presents opportunities for error and cross-contamination.

CRITICAL AREA FACILITIES + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
Streets / Transportation	Earthquake; Destruction/disruption of system	Regular Maintenance
Culinary Water System	Earthquake; Contamination	Planned Upgrades
Sanitary Sewer	Earthquake;	Regular Maintenance

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

Electrical Grid – (Rocky Mountain Power)	Earthquake / Wind	Back-up Generators for critical infrastructure
Natural Gas Grid – (Dominion Energy Gas)	Earthquake / Flood	Explore Alternative Fuel Sources for critical infrastructure
North Davis Sewer District Major Facilities and Sewer Lines	Earthquake/Chemical Spill	Pre-planning, regular updates
MUNICIPAL BUILDINGS + INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
City Offices	Loss of vital city records; communication vehicles; day to day functions	Explore Back-up of records Off- site
Police Department	Loss of vital police records; impact to day to day functions	Explore Satellite Station Feasibility/Need
Fire Department	Reduced Ability to Respond	Explore Satellite Station Feasibility/Need
Public Works Building	Loss/damage to response equipment	N/A
Community Center	Loss of Sheltering Ability and Volunteer Response	Explore Alternate Sheltering options
IT Network and Server	Loss of communications	Enhance security
EOC (Fire Station)	Loss of operability for EOC	Equip secondary location for use as EOC
Museum	Loss of artifacts	Improve storage
STORMWATER INFRASTRUCTURE		
Facility	Hazard / Risk	Mitigation
StormWater Retention Basins	Flooding	Routine maintenance.
ARTERIAL ROADS		
Corridor	Hazard / Risk	Mitigation
Antelope Drive	Destruction, evacuation and	State Highway

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

	response concerns	
Highway 193	Destruction, evacuation and response concerns	State Highway
Bluff Road	Destruction, evacuation and response concerns	Maintain
700 South	Destruction, evacuation and response concerns	Maintain
2700 South (Gordon)	Destruction, evacuation and response concerns	Maintain
3700 South (Gentile)	Destruction, evacuation and response concerns	Maintain
1000 West	Destruction, evacuation and response concerns	Maintain
2000 West	Destruction, evacuation and response concerns	State/City Maintain
3000 West	Destruction, evacuation and response concerns	Maintain

Mitigation Efforts Since the 2016 Plan

- Syracuse has updated the City Emergency Operations Plan (EOP), and created an Disaster Preparedness Committee that meets monthly.
- Syracuse has installed back-up generators for all public buildings, including Police, Fire, Public Works, Community Center (shelter), and Administration. This will enable efforts to maintain services during long-term power outages or other infrastructure emergencies.
- Syracuse City has constructed a 3 million gallon water tank to accommodate new growth and better provide culinary water availability.
- Syracuse City has created a part-time Emergency Management Coordinator position to help facilitate EOC training and improvements to City readiness.
- Syracuse City has replaced several miles of older water, sewer, storm drain, and street infrastructure with newer materials with better seismic standards.

Mitigation Strategies (2021-2026)

Earthquake - Problem Identification: Critical facilities may not meet seismic standards. Due to geography, liquefaction may occur.

Goal: Maximize resiliency of functions provided by critical facilities

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

Objective (Priority MEDIUM): Retrofit facilities to seismic standards and provide alternate means to provide functionality where possible.

Action 1: Syracuse City has an ongoing, annual program of replacing aging sewer, water, pipe, which is very susceptible to earth movement, with PVC pipe, which is better able to withstand earth movement caused by a seismic event.

Time Frame: ongoing

Funding: City funds

Estimated Cost: \$250,000/mile

Staff: Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 2: Provide remote working and communication ability for staff, which will be necessary if City buildings are rendered unusable.

Time Frame: ongoing

Funding: City funds/State/Federal grant

Estimated Cost: Unknown, but feasible

Staff: Administration

Jurisdictions: Syracuse City

Goal: Mitigation against effects of earthquakes like loss of life and homes.

Objective (Priority LOW): Making information available to citizens on safety techniques to follow before, during, and after an earthquake.

Action: Provide information to the public about ways to protect themselves and their belongings during an earthquake.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration

Flooding - Problem Identification: Syracuse City is established in western Davis County near the Bluff of the Great Salt Lake which may be subject to flooding in severe storm events or earthquake-caused wave events. Upstream drainage has potential to exceed capacity, resulting in thousands of dollars in damages. Ongoing maintenance of these drainage canals and pipelines by the City will continue to mitigate this threat.

Goal: Maximize capacity to manage flood events

Objective (Priority MEDIUM): Upgrade and maintain drainage systems.

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

Action 1: Annually inspect and remove debris in stream channels and detention basins and storm drains.

Time Frame: Annually

Funding: City funds

Estimated Cost: minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 2: Stormwater Master Plan includes design to connect and activate the 4000 West Outfall Project (60-inch diameter storm-water pipeline on the city's South side) that terminates along the Bluff into the Great Salt Lake.

Time Frame: 2025

Funding: City funds

Estimated Cost: \$300,000

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 3: Coordinate with the State of Utah on the ongoing Great Salt Lake floodplain delineation study.

Time Frame: ongoing

Funding: State and Federal Funds

Estimated Cost: Unknown

Staff: Public Works, Engineer, etc.

Jurisdictions: Syracuse City and State of Utah

Wildland Fire - Problem Identification: A significant portion of Syracuse City meets a natural environment to the west where an urban/wildland interface is created.

Goal: Mitigate the impact of wildfires in high-threat areas.

Objective (Priority MEDIUM): Including considerations of wildfire hazards in land use, public safety, and other elements of the comprehensive plan.

Action: In future city plans, encourage the mitigation of wildfires.

Time Frame: Ongoing

Funding: City Funds

Estimated Cost: Minimal

Staff: City Administration, Community Development, Building Department, etc

Jurisdictions: Syracuse City

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

Severe Weather - Problem Identification: Syracuse City is down-slope of the Wasatch Mountain Range where seasonally strong winds have caused damage to structures and the urban forest.

Goal: Maximize community resiliency to high-wind events

Objective (Priority MEDIUM): Building Code Enforcement

Action 1: Work in tandem with project developers and homeowners to follow standardized codes and maintain structural integrity of commercial and residential buildings.

Time Frame: Ongoing

Funding: City funds

Estimated Cost: minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Action 2: Create a public service campaign to inform residents about tree species and varieties that are more likely to endure high wind events without failure, causing damage to utilities, landscape and buildings.

Time Frame: Ongoing

Funding: City funds, local volunteers

Estimated Cost: minimal

Staff: City Administration, Public Works, Engineer, etc.

Jurisdictions: Syracuse City

Multi-Hazards - Problem Identification: City-wide communications infrastructure is vulnerable, creating a need to mitigate failure of communications abilities during various types of disasters.

Goal: Maximize ability to communicate during various types of disasters

Objective (Priority MEDIUM): Update and maintain existing communications infrastructure, and mitigate the impacts of damaged communications facilities during various types of disasters.

Action 1: Ensure cellular-based devices are updated

Time Frame: Ongoing

Funding: City funds

Estimated Cost: minimal

Staff: City Administration

Jurisdictions: Syracuse City

Action 2: Update satellite-based communications equipment

Time Frame: 2025

City Goals - Davis Co PDMP

Please add comments by typing directly into the document. Your changes will be saved automatically.

Funding: City funds

Estimated Cost: \$3,000 per year

Staff: Administration

Jurisdictions: Syracuse City

Action 3: Update radio equipment

Time Frame: 2025

Funding: City funds, state/federal grants

Estimated Cost: \$15,000

Staff: Administration, Public Safety

Jurisdictions: Syracuse City

Action 4: Maintain relationships and conduct training with community-based emergency organizations.

Time Frame: Ongoing

Funding: City, state/federal assistance

Estimated Cost: minimal

Staff: Administration

Jurisdictions: Syracuse City

West Bountiful City

Background

West Bountiful was first located in 1848 when pioneers made their way into the territory. It was incorporated as a town on January 28, 1949. The City is located about eight miles north of Salt Lake City and twenty-nine miles south of Ogden.

West Bountiful is a City of the fifth class and operates under a six-council member form of government, with an elected Mayor and five Council Members. The day-to-day operations are delegated to a City Administrator, who works hand-in-hand with the Mayor to ensure all city operations are well-run. City operations include a 24-7 police department, water, garbage/recycling, streets, storm water, snow removal, community development, and an Arts Council. West Bountiful City is part of the South Davis Fire District which provides fire protection. Emergency management and pre-disaster mitigation responsibilities are coordinated by the West Bountiful City Police Department in partnership with local citizens that are appointed to the Emergency Preparedness Advisory Committee (EmPAC). Sanitary Sewer services are provided by the South Davis Sewer District. Animal Care and Control services are provided by Davis County.

Community Buildings and Infrastructure Status

The 5300 residents enjoy a quiet, rural, equestrian lifestyle. Many opportunities for cultural events are provided through a monthly concert series and arts displays. Major events include 4th of July celebration,

WEST BOUNTIFUL CITY

RESOLUTION #507-21

A RESOLUTION ADOPTING THE DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE

WHEREAS, West Bountiful City recognizes the threat that natural hazards pose to people and property within West Bountiful; and

WHEREAS, West Bountiful City has participated in the creation of a multi-hazard mitigation plan, hereby known as the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in West Bountiful City from the impacts of future hazards and disasters; and

WHEREAS, adoption by the West Bountiful City Council demonstrates their commitment to hazard mitigation and achieving the goals outlined in the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE.

NOW THEREFORE, BE IT RESOLVED by the City Council of West Bountiful that the DAVIS COUNTY PRE-DISASTER MITIGATION PLAN 2021 UPDATE be adopted.

EFFECTIVE DATE. This resolution shall take effect on the date it is adopted.

Passed and approved by the City Council of West Bountiful City this 16th day of November 2021.


Ken Romney, Mayor

<u>Voting by the City Council:</u>	<u>Aye</u>	<u>Nay</u>
Councilmember Ahlstrom	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Councilmember Bruhn	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Councilmember Enquist	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Councilmember Preece	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Councilmember Wood	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ATTEST:


Cathy Brightwell, City Recorder



RESOLUTION NO. 12-21-2021A

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, 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; and,

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan to be eligible for Federal Emergency Management Agency post-disaster funds; and,

WHEREAS, the *Natural Hazard Pre-Disaster Mitigation Plan* has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, West Point City is within Davis County and participated in the update of the multi-jurisdictional Plan, the *Natural Hazard Pre-Disaster Mitigation Plan*; and,

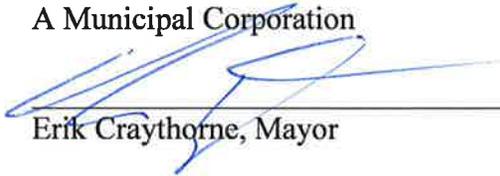
WHEREAS, West Point City is a local unit of government that has supported the County's efforts to afford its citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and,

WHEREAS, West Point City is concerned about mitigating potential losses and has determined that it would be in the best interest of the community to adopt the *Natural Hazard Pre-Disaster Mitigation Plan*;

NOW, THEREFORE, BE IT RESOLVED by West Point City Council that West Point City adopts the *2021 Davis County Natural Hazard Pre-Disaster Mitigation Plan Update* as this jurisdiction's Multi-Hazard Mitigation Plan.

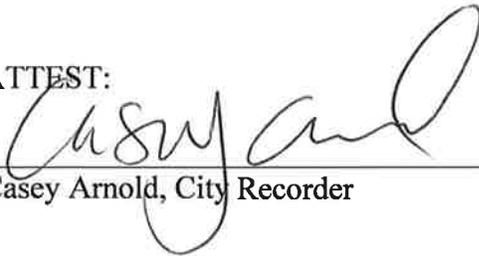
PASSED AND ADOPTED by the City Council of West Point City, Utah this 21st day of December, 2021.

WEST POINT CITY
A Municipal Corporation



Erik Craythorne, Mayor

ATTEST:



Casey Arnold, City Recorder



RESOLUTION NO. 2021- 746

A RESOLUTION ADOPTING THE DAVIS COUNTY 2021 NATURAL HAZARD PRE-DISASTER MITIGATION PLAN UPDATE, 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; and,

WHEREAS, the Disaster Mitigation Act of 2000 requires all jurisdictions to be covered by a Pre-Disaster Hazard Mitigation Plan to be eligible for Federal Emergency Management Agency post-disaster funds; and,

WHEREAS, the *Natural Hazard Pre-Disaster Mitigation Plan* has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, is within Davis County and participated in the update of the multi-jurisdictional Plan, the *Natural Hazard Pre-Disaster Mitigation Plan*; and,

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

WHEREAS, Woods Cross City is concerned about mitigating potential losses and has determined that it would be in the best interest of the community to adopt the *Natural Hazard Pre-Disaster Mitigation Plan*;

NOW THEREFORE, BE IT RESOLVED by Woods Cross City Council that Woods Cross City adopts the *2021 Davis County Natural Hazard Pre-Disaster Mitigation Plan Update* as this jurisdiction's Multi-Hazard Mitigation Plan.

ADOPTED this 16th day of November 2021 at the meeting of Woods Cross City Council.

By: 
Rick Earnshaw, Mayor

Woods Cross City
1555 S 800 W
Woods Cross, UT 84087