



UTAH DIVISION OF EMERGENCY MANAGEMENT

2019 Utah State Hazard Mitigation Plan

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PREPARED BY:

Utah Department Of Public Safety
Division Of Emergency Management

WITH VALUABLE INPUT FROM:

Utah State Hazard Mitigation Team

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CHAPTER 1

Introduction to the Utah State
Hazard Mitigation Plan (SHMP)

Introduction

PURPOSE OF THE PLAN

The Purpose of the State Hazard Mitigation Plan (SHMP) is to identify natural hazards and their impacts on citizens and infrastructure within the state. The SHMP provides updates on the state's progress of building resilience through mitigation.

Mitigation actions are effective in saving lives, property and money. A 2017 report commissioned by FEMA and conducted by the National Institute of Building Sciences (NIBS) found that on average every one dollar spent on mitigation saves six dollars in recovery costs after a disaster. Utah's SHMP provides the basis needed to understand the state's risks and highlights where mitigation priorities should be focused.

VISION AND MISSION

The 2019 SHMP vision for Utah is a safe, resilient state capable of recovering from a natural disaster.

The 2019 SHMP's mission is to improve understanding of the state's risks and vulnerabilities to natural hazards, provide guidance to state and local agencies in utilizing comprehensive mitigation strategies to increase resiliency capabilities and significantly reduce potential casualties, physical damage and limit social, economic and environmental disruptions.

WHAT IS HAZARD MITIGATION?

Hazard mitigation as defined by FEMA is any action taken "to reduce loss of life and property by lessening the impact of disasters." These actions are long-term solutions that protect life and property from hazard events by reducing or eliminating long-term risk.

FEMA REVIEW RESPONSIBILITIES

The FEMA State Mitigation Plan Review Guide, effective March 2016, outlines FEMA's review responsibilities. Utah's SHMP follows this review guide which can be found [here](#).

PLAN OVERVIEW: HOW TO USE THE 2019 SHMP

The SHMP is designed to be used as a reference for a variety of users who have specific interests in some aspect of its content. The plan overview section provides a summary to aid individuals searching for information on a specific items to more easily navigate the SHMP. This section provides an overview of the plan's organization including a table of contents to provide quick access to the section users are interested in reading. The Utah Department of Emergency Management (DEM) also hosts a website that assists users in locating the specific hazard information they are searching for online.

FEDERAL LAWS, INSTITUTIONS AND POLICIES

- Public Law 93-288 as amended
- The Disaster Mitigation Act of 2000 (Public Law 106-390).
- 44 CFR Parts 201 and 206

UTAH LAWS, INSTITUTIONS AND POLICIES

- The Governor’s Emergency Operation Directive
- The Robert T. Stafford Disaster Relief and Emergency Assistance Act, amendments to Public Law 93-288, as amended.
- Title 44, CFR, Federal Emergency Management Agency Regulations, as amended.
- State Emergency Management Act of 1981, Utah Code 53-2, 63-5.
- Disaster Response Recovery Act, 63-5A.
- Executive Order of the Governor, Executive Order 11
- Emergency Interim Succession Act, 63-5B.
- Utah Code 53-2-104

The Utah DEM is the State’s designated coordinating agency for disaster preparedness, emergency response and recovery and hazard mitigation programs. The Utah SHMP is intended to guide and direct the state’s mitigation efforts to reduce or eliminate the impact of identified hazards on life, property and the environment.

The purpose of the SHMP is to identify risks that natural hazards pose throughout the state and promote mitigation strategies to deal with those risks. Additionally, the plan fulfills federal and local hazard mitigation planning responsibilities. This plan update is an aid in informing state officials, agencies and the public on the latest hazard threats to property and life. It also documents mitigation projects, goals and strategies to spotlight what local jurisdictions are doing throughout Utah to prevent or reduce hazard vulnerability and risk.

Overview Of Utah

GEOGRAPHY

Utah is the 13th largest state in the nation. It is home to several mountain ranges and the largest saltwater lake in the western hemisphere, the Great Salt Lake. The Bear River, Wasatch, and Uinta mountain ranges belong to the Rocky Mountain Range.

Most of the population of Utah has settled in the area between the Wasatch Range and the Oquirrh Mountains known as the Salt Lake Valley. The Traverse Mountains separate Salt Lake County and Utah County, an area referred to as the Point of the Mountain. Passageways into the valley are narrow and often congested. The western half of Utah is part of the Great Basin and experiences arid climate. Southeastern Utah is considered part of the Colorado Plateau.

Land cover significantly affects hazard vulnerability. Counties with a large percentage of forest cover are more susceptible to wildfire hazards and invasive species. As urbanization occurs, areas that were once covered with trees and grass are being replaced by impervious surfaces of roads, roofs, and parking lots. This type of urbanization reduces infiltration of rainwater and snowmelt which increases the amount runoff and increases the potential for flash flooding.



WATERSHEDS AND TERRAIN

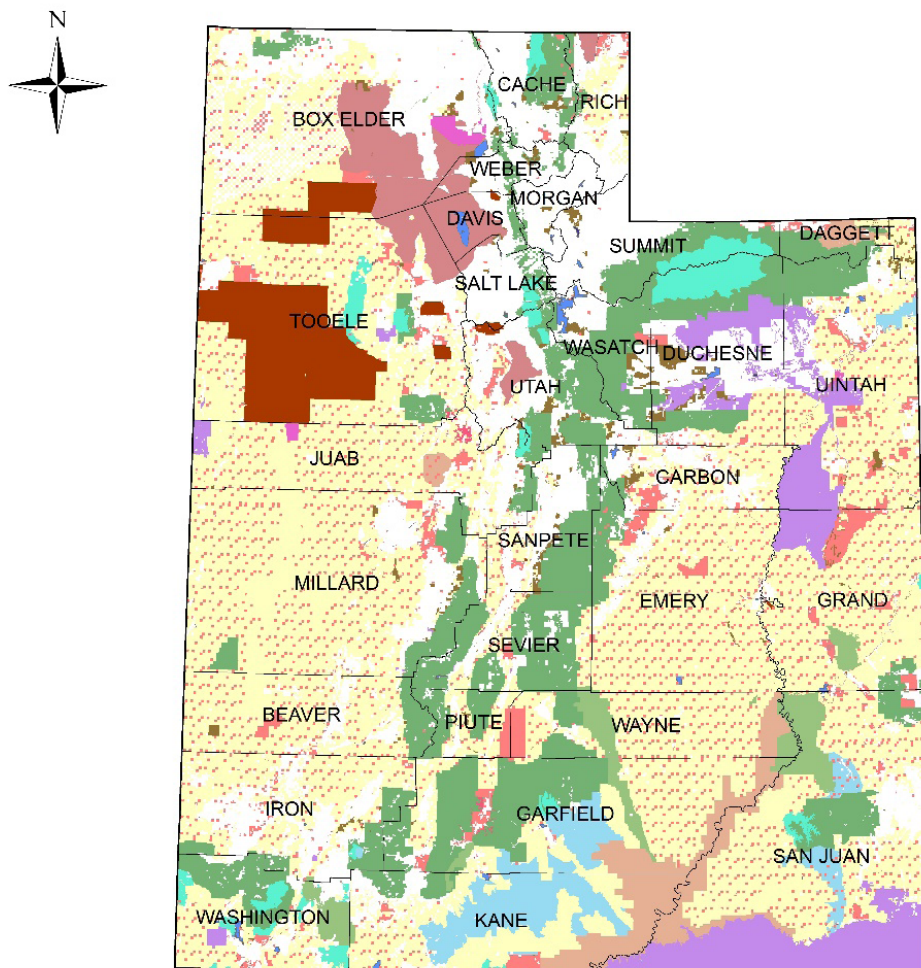
The Great Salt Lake is the largest saltwater lake in the western hemisphere, 75 miles long and 35 miles wide. The lake has no outlet but is fed by the Jordan River which connects to Utah Lake at the South end of the Wasatch Front. The Colorado River cuts through the state's southeast corner forming Lake Powell Reservoir on the Utah-Arizona border. The Green River flows through Utah's eastern counties and joins the Colorado in Canyonlands National Park.

Most of Utah falls within the Great Basin watershed and the Upper Colorado River watershed. Precipitation that falls within the Great Basin watershed flows towards the Great Salt Lake, while water within the Upper Colorado River watershed heads to the Colorado River and eventually the Pacific Ocean. Utah receives an average of 13 inches of precipitation annually, making it the nation's second driest state.

PUBLIC LANDS

Around 42% or 23 million acres of Utah’s land is managed by the Bureau of Land Management (BLM). Other major public land owners include seven million acres of National Forests, three million acres of State Trust Lands and two and a half million acres of Tribal Land. There are about 35 million acres of federally owned land and five and a half million acres of state-owned land across Utah. Coordinating with federal agencies is key in Utah’s disaster planning and recovery efforts.

The federal government owns 66.5% of the land in Utah, so most of the land is out of state and local control to mitigate natural hazards. Many hazards crisscross federal, state and private lands such as wildfire while other hazards such as flood can start on federal land and impact private land. Mitigation projects are possible on federal lands through partnerships and acquiring permits to work on federal land. Over 70% of Utah land is BLM, State Trust Land, or US National Forest, Park, Wilderness or Monument land. Forests cover nearly one-third of Utah but only about one-fifth of the forestland are used commercially.



Public Lands

- | | |
|---|---|
| ■ Bankhead-Jones Land Use Lands | ■ National Wilderness Area |
| ■ Bureau of Land Management | ■ National Wildlife Refuge |
| ■ Bureau of Reclamation | ■ Other Federal |
| ■ Military Reservations and Corps of Engineers | ■ Other State |
| ■ National Forest | ■ State Parks and Recreation |
| ■ National Historic Sites | ■ State Sovereign Land |
| ■ National Monument | ■ State Trust Lands |
| ■ National Parks | ■ State Wildlife Reserve/Management Area |
| ■ National Recreation Area | ■ Tribal Lands |

Source: Utah GIS, Land Ownership, 2018

| ECOSYSTEMS

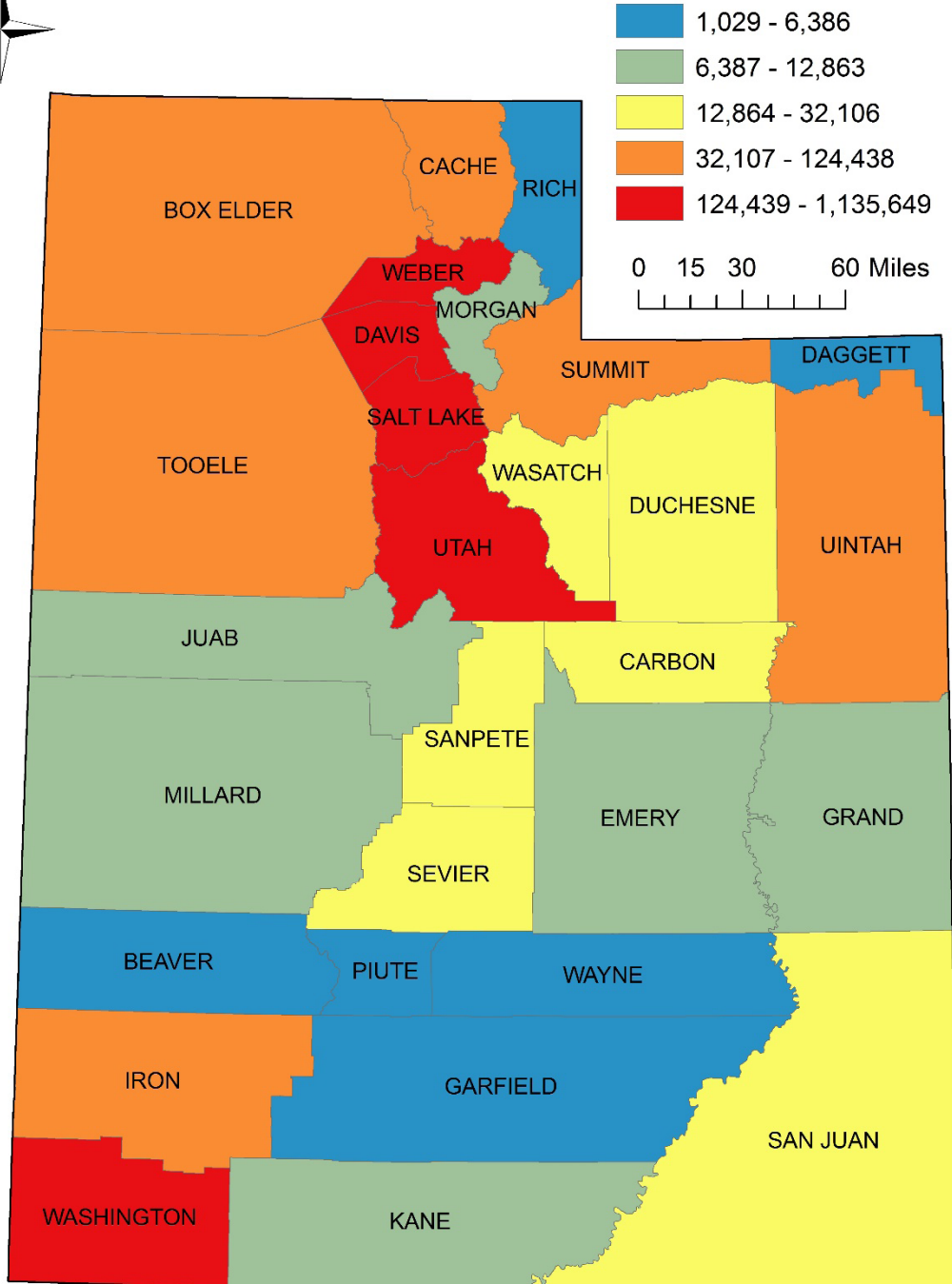
Utah's primary ecosystems are wetland, forest, alpine and desert. Wetlands cover the least land and are found primarily along the edges of lakes, especially the Great Salt Lake. Alpine ecosystems are found in the highest mountains. Desert ecosystems cover the most landmass and are home to the largest human population, followed by forest ecosystems. Utah is home to numerous invertebrates and insects, and more than 600 vertebrate animals. Ten federally-recognized endangered species call Utah home including the Kanab ambersnail, the June sucker and the California condor.

| DEVELOPMENT, POPULATION, ECONOMY, AND INFRASTRUCTURE

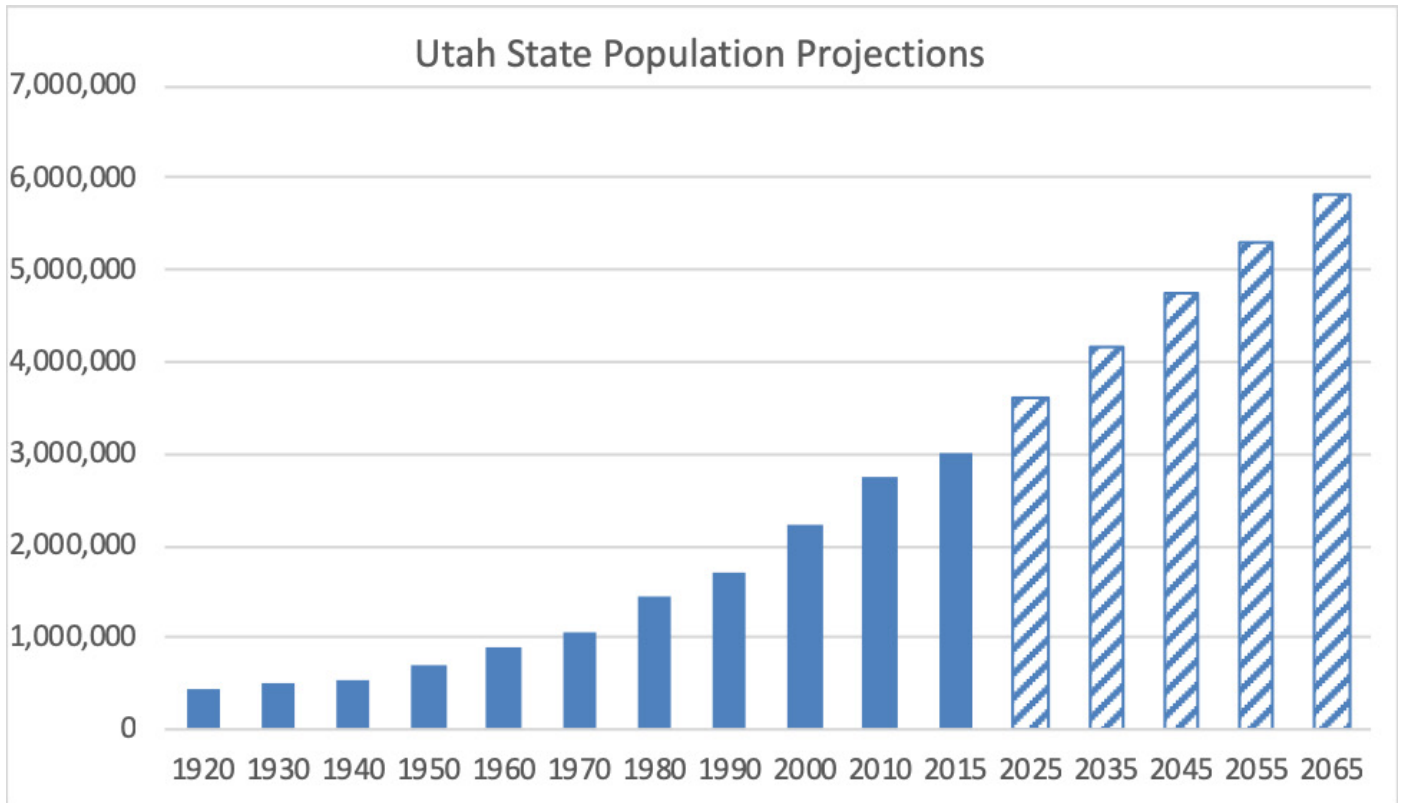
Utah's population was estimated 3,101,833 in July of 2017. It is the third fastest growing state in the country. Although many Utahns believe population growth is due to out of state migration into Utah, the majority of Utah's population growth is due to a high birth rate with an average 2.24 children per woman. This number has experienced slow decline but it is expected to stay well above the national average. According to Utah's Department of Workforce Services, 62% of Utah's population in 2016 was also born in Utah, indicating that most people who are born here will spend a significant portion of their lives in the state.



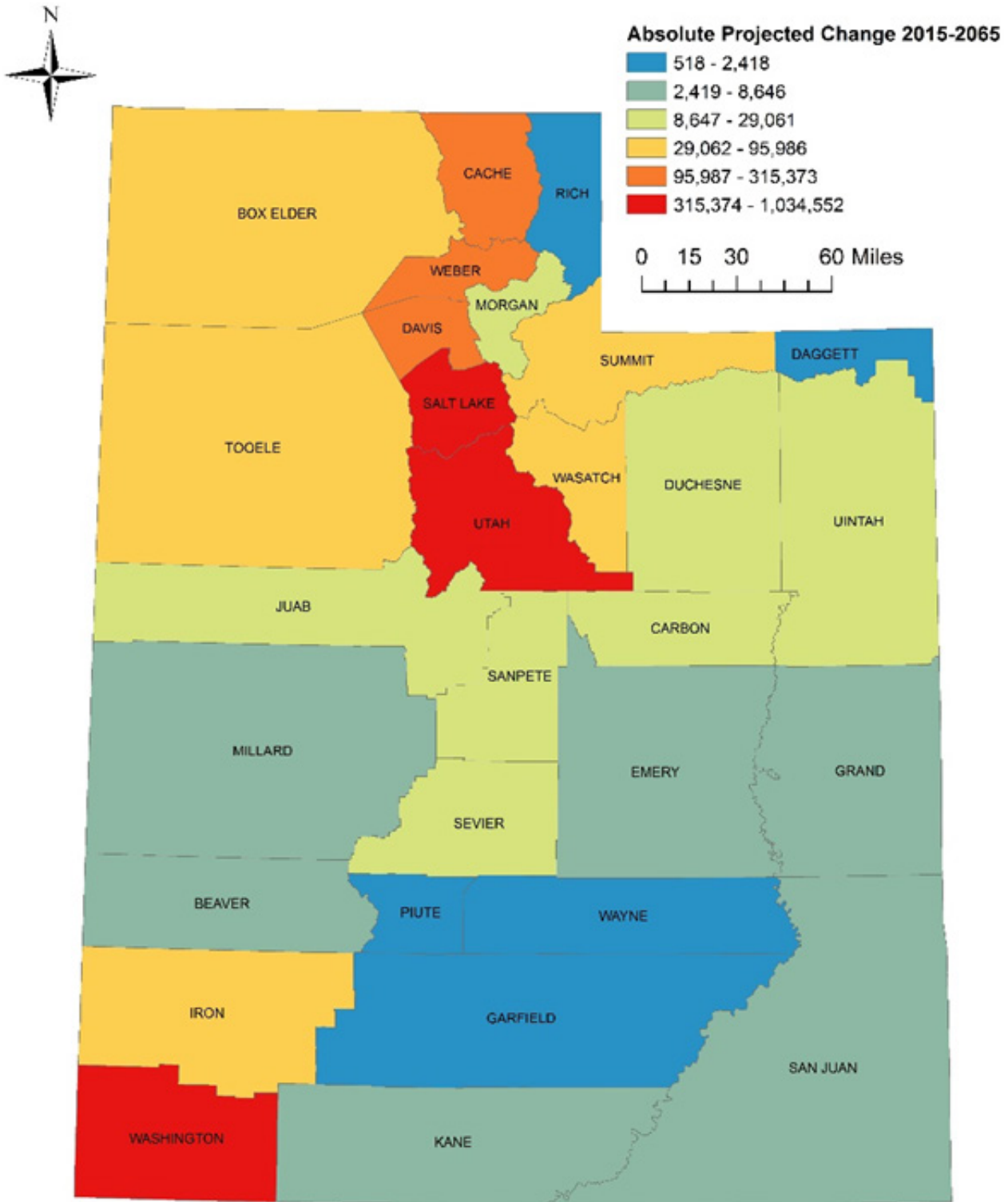
2017 Population by County



Source: Census 2017 Population Estimates
July 2017



Utah has the largest average household size in the nation at 3.19 people per household, and a notably young median age of 30.8 compared to 37.9 nationally. The school age population is expected to fall by 5% to comprise 17.1% of the total population, while people over 65 will double from 10.18% to 20.3% of the total population by 2065.



Source: Kem C. Gardner
Utah's Long-Term Demographic and Economic Projections Summary
July 2017

PROJECTED GROWTH TRENDS

Rank	County	2015 Population	2065 Projection	Percent Change
1	Washington	154,602	508,952	229%
2	Wasatch	28,613	82,018	187%
3	Utah	585,694	1,620,246	177%
4	Juab	11,071	30,069	172%
5	Morgan	11,080	24,605	122%
6	Tooele	63,262	134,272	112%
7	Cache	121,855	234,744	93%
8	Iron	49,406	89,599	81%
9	Summit	39,278	70,750	80%
10	Sanpete	29,088	49,590	70%
18	Salt Lake	1,094,650	1,693,513	55%

By 2065, Utah is projected to add nearly three million people to the state’s total population. With 80% of the population concentrated along a 100-mile strip of the Wasatch mountain range, Utah is one of the most urbanized and fastest growing states in the nation. Due to geographic constraints, growth is shifting from Salt Lake County to areas with more developable land like Utah County that is experiencing the fastest growth in northern Utah. Projections also show rapid growth in the counties surrounding the Wasatch Front including Tooele, Juab, Wasatch, Morgan, and Summit and in the Southwest corner of Utah.

In 2018, the Census Bureau identified St. George as the fastest growing metropolitan area in the nation. Unlike other areas of Utah, the primary contributor to growth in Washington County is the relocation of new retirees, students, workers and snowbirds, which has led to a housing boom. Over the next 50 years, the population of Washington County is expected to top 500,000. Uintah and Duchesne Counties have also seen a large percentage increase of population over that last few years due to the natural gas boom as workers have moved to the Uintah Basin for employment in the oil fields. The county currently doesn’t have enough housing for everyone moving into the Basin.

Wasatch and Summit counties continue to show strong growth in population with much of the growth in these counties located in the Wildland Urban Interface (WUI).

The latest U.S. Census numbers report 78.8% of Utahns identified as White (Not Hispanic) which is slightly lower than the 2010 Census. Utah is becoming more diverse with a population that is 13.8% Hispanic, 1.1% Black, 1.0% American Indian or Alaska Native, 2.4% Asian, 1.0% Islander, and 2.0% Two or More Races. State and local disaster recovery plans and emergency recovery publications should be accessible in a variety of languages and locations to accommodate all Utah residents.

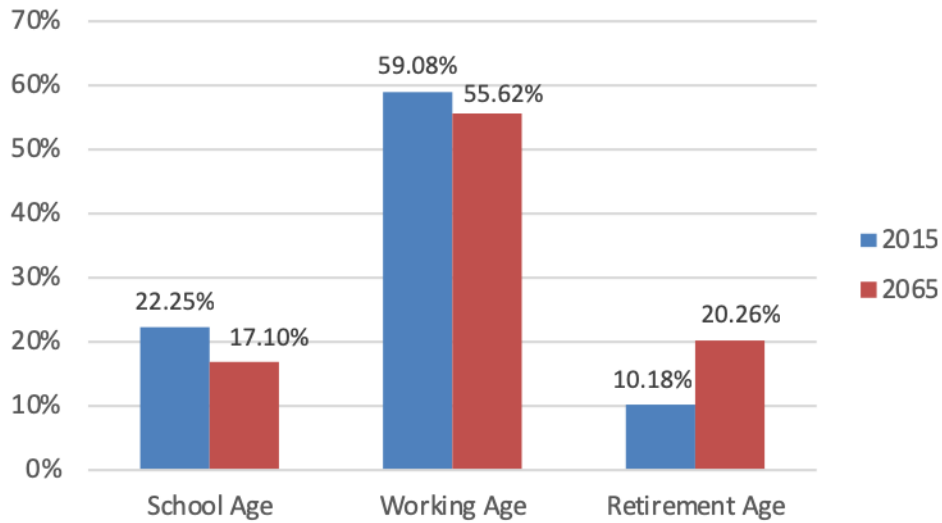
Utah’s elderly and youth populations are extremely vulnerable in the event of a disaster. These demographics face decreased mobility, access challenges and higher fragility that should be addressed with ample evacuation routes and accommodations in state and local recovery plans.

DISABILITY

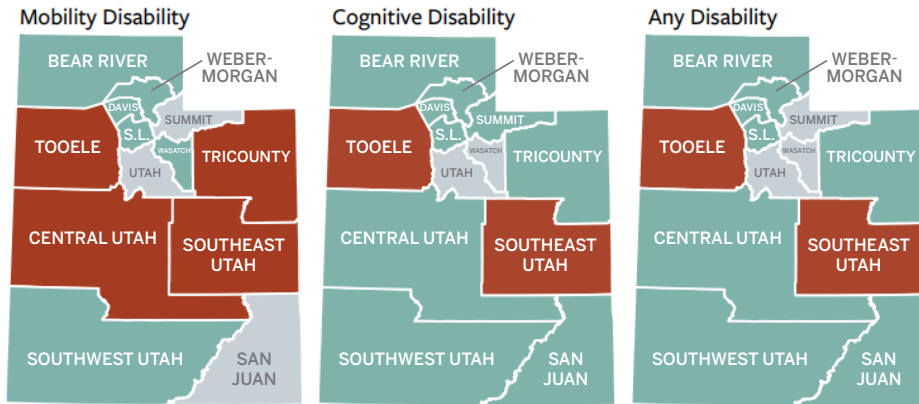
A report by the Utah Department of Health shows that nearly one in five Utahns lives with a disability. People with disabilities may need help evacuating or may require additional medical attention following an evacuation. Individuals with a disability may also not be able to see or hear warning signals alerting the public about a disaster.

Over 40% of those who reported having a disability had an income of less than \$25,000. They are also less likely to have health insurance. Thirty-eight percent of people with a disability reported facing high blood cholesterol, 39.5% reported they suffer from arthritis and 17.7% reported problems with asthma.

Share of Total Population



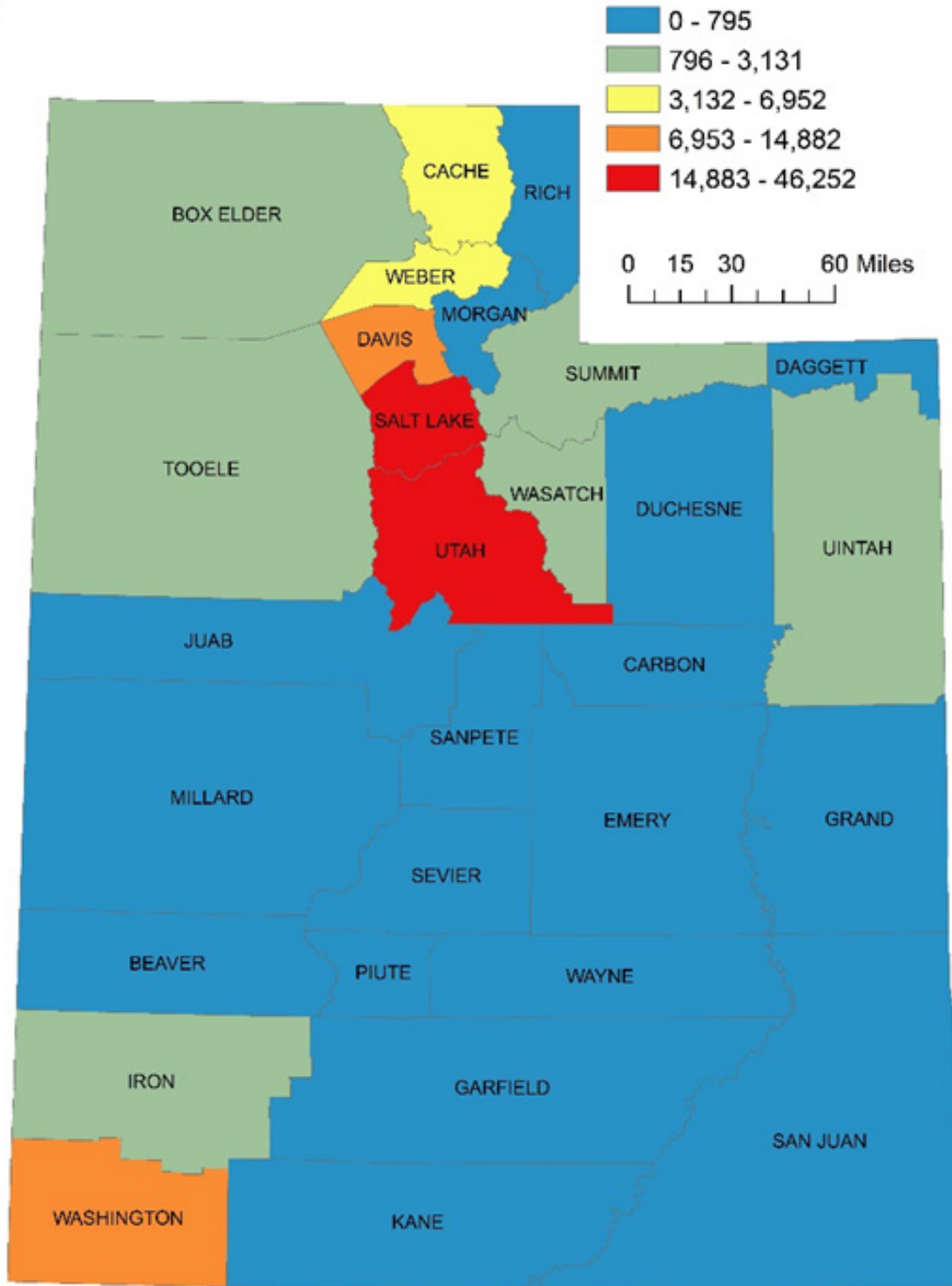
Local health districts with disability rates **higher**, **the same**, and **lower** than the state rate.²



Local Health District	Mobility Disability	Cognitive Disability	Any Disability
Southeast Utah	14.9%	15.1%	28.4%
Tooele County	13.1%	12.7%	23.2%
TriCounty	12.5%	9.9%	21.5%
San Juan	5.2%	11.5%	21.1%
Central Utah	13.0%	9.1%	20.8%
Weber-Morgan	10.4%	10.5%	20.1%
Salt Lake County	9.9%	9.7%	19.0%
Bear River	9.1%	9.6%	17.6%
Davis County	8.3%	8.7%	17.0%
Southwest Utah	9.5%	8.7%	18.0%
Summit County	6.2%	7.2%	14.3%
Utah County	8.4%	7.5%	15.9%
Wasatch County	8.0%	5.6%	14.5%



Total Approved Housing Units 2010-2018



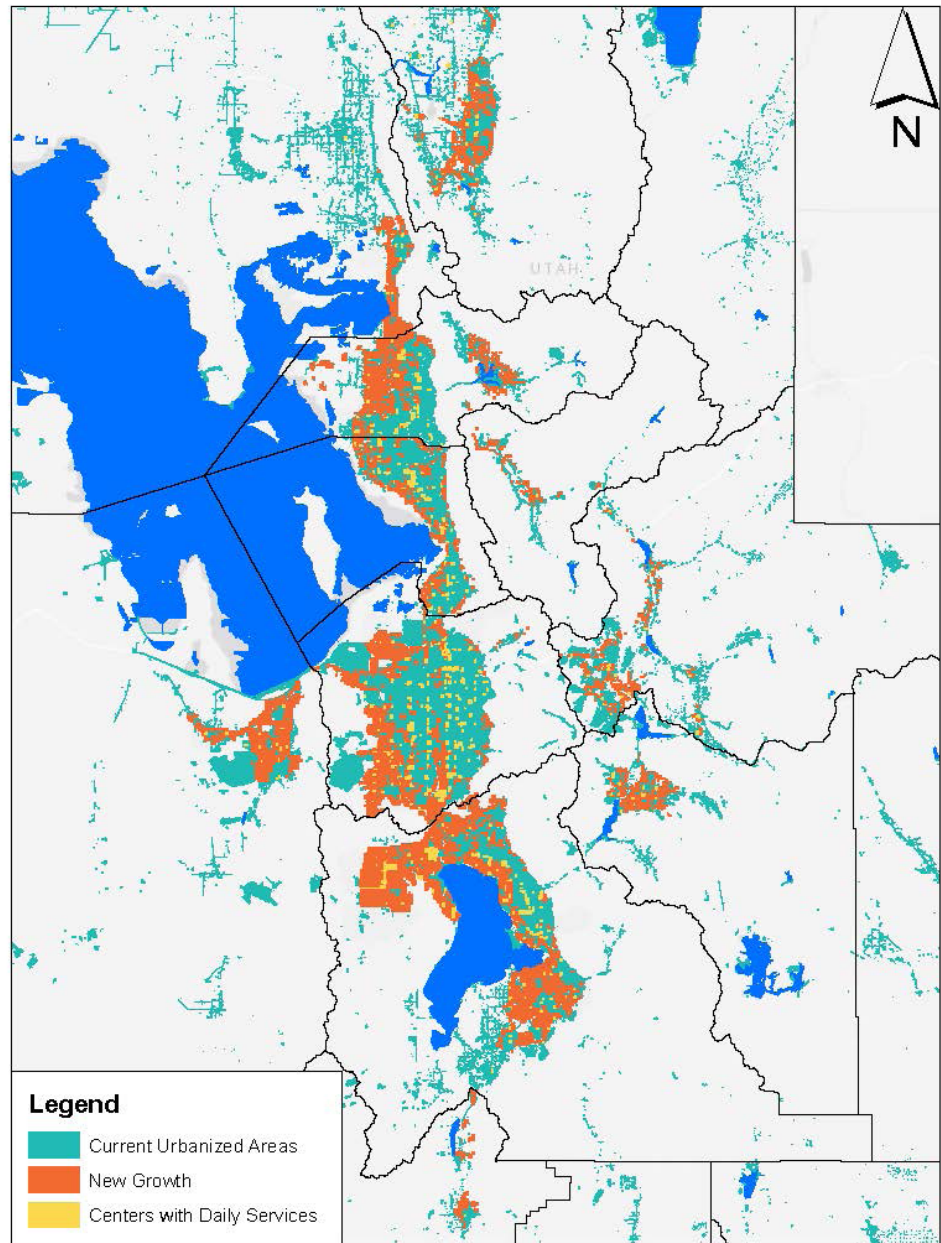
Source: Ivory-Boyer Construction Report and Database

STRATEGIES FOR DIRECTING GROWTH AND RISK

2050 Land Development
Under the Preferred Scenario¹

In a survey done by Envision Utah, 82% of Utah respondents preferred growth that limits the consumption of land with residences built near emergency and other services. This goal can be achieved by building a network of mixed-use centers that provide diverse housing and transportation choices and avoid development in hazardous areas such as on fault lines, in liquefaction zones and in floodplains. Pursuing this development pattern has the potential to reduce the amount of developed land by 91,000 acres between 2014 and 2050. Centers are appearing in regional plans across the state and cities and counties can use a variety of land use policies and regulations to promote centered development.

The Quaking Aspen Scenario incorporates a network of mixed-use centers and was picked by thousands of Utahns during the Your Utah, Your Future statewide visioning process.



COMPARING GROWTH PROJECTIONS WITH DISASTER PATTERNS

The development along the Wasatch Front aligns with past incidents of major earthquakes due to the seismic activity of the Wasatch Fault. About 80% of Utah's population and 75% of the state economy lives within 15 miles of the Wasatch Fault Zone. In addition, many of Utah's older neighborhoods are unreinforced masonry (URM) homes that cannot withstand the shaking of a large earthquake. Utah has about 165,000 URM buildings at risk of being damaged or destroyed which also puts the inhabitants in danger. Moving towards 2050, new development must avoid high risk areas and be designed with earthquake safety in mind. Additionally, steps must be taken to retrofit URM buildings to decrease risk to the population and increase resilience after a disaster. As development spreads on the outskirts of urban areas, homes are developed closer to areas at risk for wildfires. In 2018, the Dollar Ridge Fire destroyed approximately 370 structures, more than the last five years combined. According to a risk assessment by Verisk, over 133,000 Utah homes, or 14%, are at high or extreme risk of wildfire. Another 14% are at moderate risk.

Utah's land use and development is often defined by the state's transportation system. The Salt Lake City International Airport is located just five miles from downtown Salt Lake City, within two hours from half of the nation's population. In 2010, the airport

¹ <https://yourutahyourfuture.org/topics/transportation-and-communities/item/25-your-utah-your-future-scenarios-choices-for-the-future#quaking-aspen-and-sego-lily-scenario>

served over 21 million passengers, making it the 23rd busiest airport in the nation. With over 700 trucking companies based in the state, Utah is a great location for product distribution. I-80 (extending east to New York City and west to San Francisco), I-15 (extending north to Canada and south to Mexico) and I-70 (extending east to Denver) provide the entire state with great accessibility. About 1,400 miles of railroad track stretch throughout Utah; all lines converge in the Salt Lake and Ogden metropolitan areas allowing second morning service to 90% of the western U.S. Salt Lake City is the western-most point from which all west-coast cities can be directly served without backtracking.²

DISASTER RISKS

The most common natural disasters faced by the state are earthquakes, flooding and wildfires. During some seasons, landslides are also a concern. The Wasatch Fault stretches for 240 miles from southern Idaho to central Utah. It lies along the most populated and urbanized areas of Utah and many of these areas also at risk for liquefaction due to the historic lakebed. The central portion of the fault line is estimated to produce a 7.0 earthquake roughly every 300 years, with the last one occurring about 350 years ago. Utah’s climate is primarily arid which means a higher risk for wildfires. It is estimated that there are 800 – 1,000 wildfires every summer in Utah. Long periods of drought increase the length of fire seasons and create dangerous conditions that allow a fire to spread rapidly. In 2017 alone, over 200,000 acres in Utah were consumed by wildfires. The valley is also prone to flooding after large storms, which can be further exacerbated after a wildfire when the ground is less able to absorb water.

ECONOMY

Utah has been ranked in the top three best states to do business since 2010, capturing the number one spot six times total during this period. The annual overall employment growth rate is the second highest in the country at a steady 3.1%. The state is projected to add 1.8 million jobs by 2065. Salt Lake County will experience the greatest change but Utah County is projected to have the highest percent of growth over the next 50 years. This is largely due to the rise of Silicon Slopes, a tech and startup community spanning across Utah, but focused in Utah and Southern Salt Lake County. This burgeoning technology sector has brought companies like Adobe, Ancestry, eBay, Microsoft, and Pluralsight to the area. Utah County is ranked number six in the nation for employment growth among large counties, a number that is expected to increase as the area develops.

Healthcare, education and government entities continue to compose the largest employment sectors in the state. The largest employers are Intermountain Healthcare, the University of Utah and the State of Utah. Developing residential and commercial areas have resulted in a construction boom and the state’s growing tourism industry has caused an increase in leisure and hospitality jobs. Utah’s economic wellbeing relies heavily on the tourism industry with about 12% of the state’s private employment in leisure and hospitality. According to the U.S. Travel Association, travelers spent over \$8 billion in Utah in the 2015 calendar year. The ski industry alone contributes \$1.3 billion to the economy and 18,500 jobs. Following a disaster, reinstating tourist-attracting facilities will be important for maintaining jobs and keeping revenue flowing into Utah.

Rank	County	2015 Employment	2065 Employment	Percent Change
1	Utah	311,650	887,896	185%
2	Washington	85,410	216,247	153%
3	Wasatch	14,111	29,967	112%
4	Morgan	4,456	9,079	104%
5	Summit	39,799	76,693	93%
6	Davis	172,614	328,512	90%
7	Juab	5,112	9,398	84%
8	Cache	73,119	134,247	84%
9	Wayne	1,763	3,204	82%
10	Tooele	21,331	38,583	81%

Utah’s unemployment rate has been below four percent since 2014, but the latest numbers show 10.2% of Utahns lived below the

² “Utah at a Glance” -UT EDC 2012

poverty rate. There were approximately 3,000 homeless people in Utah at last count in January 2018 and an increasing number of these individuals are unsheltered. The homeless and impoverished represent another highly vulnerable population in a disaster. Designated shelters should be adequate, accessible and disaster-proof.

CURRENT ECONOMIC OVERVIEW

Utah typically grows more rapidly than the nation after recessions and this pattern is holding true in the current recovery. The best way to analyze development trends is through building data and economic growth. The information for Utah's Economic Development Corporation (EDC) and the University of Utah's Bureau of Economic and Business Research show increasing economic and building growth in Utah.

INFRASTRUCTURE

Utah's transportation, energy, information and service infrastructure may be threatened by a variety of natural disasters such as earthquakes, severe weather and fires. Interstate 15 runs for 400 miles through central Utah entering the state in the south western corner passing through St. George and continuing through Utah and Salt Lake Valleys and the Ogden-Clearfield metropolitan area north to Idaho. It is one of the only ways to travel through the Point of the Mountain region. Similarly, Interstate 80 passes through the northern part of Utah and follows the Great Salt Lake before crossing through Salt Lake City and entering the Wasatch Mountains continuing north to Wyoming. The Utah Transit Authority (UTA) is responsible for the commuter rail running for 89 miles from Pleasant View in Weber County to Provo in Utah County. UTA also operates 484 buses on 108 routes and nearly 60 miles of light rail transit.

The largest airport in Utah is the Salt Lake International airport with over 500 employees assisting 24 million passengers annually. The Provo Municipal Airport located in Utah County is the second busiest airport in the state. Salt Lake City is the headquarters of the Church of Jesus Christ of Latter-day Saints and Temple Square a popular tourism destination in downtown Salt Lake City. Utah has an array of higher education institutions including both public and private universities, colleges and technical schools. The state is also home to five national parks, eight national monuments, two national recreation areas and seven national forests. In the mountain ranges Utah boasts world class ski resorts that draw in tourism from around the globe.

- Tourism - <http://gardner.utah.edu/wp-content/uploads/TravelandTourismRepFinal2017.pdf>
- Disabilities - https://health.utah.gov/wp-content/uploads/Disabilities_Health_Report_2017.pdf
- Population/Employment - http://gardner.utah.edu/wp-content/uploads/UtahAtAGlance_20180207.pdf
- Wildfire Risk - <https://www.utahwildfirerisk.com/Map/Public>
- Migration - <https://jobs.utah.gov/wi/data/library/other/migration.html>
- Ski Industry - <http://gardner.utah.edu/wp-content/uploads/Ski-Indust-2018-Fact-Sheet.pdf>
- Wildfires - <https://www.deseretnews.com/article/900028664/utah-2018-wildfires-destroy-the-most-structures-in-past-15-years.html>
- Verisk - <https://www.verisk.com/siteassets/media/campaigns/gated/underwriting/fireline-state-risk-report/utah.pdf>

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