

# Unified Fire Authority

Commission on Fire Accreditation, International



Community Risk Assessment

## Standards of Cover

2023

DRAFT

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## Executive Summary

The term Standards of Cover (SOC) is defined as those written and adopted policies and procedures that establish the distribution and concentration of fixed and mobile response forces for fire, emergency medical services, hazardous materials and other specialized technical response. The SOC outlines the type and level of risk within the communities, current response and performance in mitigating those emergencies, and recommendations to improve performance for consideration by the Board of Directors. In essence, it provides clarity on the level of risk that the community is willing to accept.

The collaborative process with creating a SOC requires a thorough examination of potential risks in each of the communities we serve, the current capabilities of the UFA, and a specific set of benchmarks that Board Members and the Fire Chief use to measure success.

The current process has focused on establishing where we are and identifying areas where coverage is adequate to the risk and demand for service (we are not overwhelmed and doing well), as well as gaps or underserved areas.

The SOC process began in 2018/2019. The necessity for accurate data was vital to assessing the current level of service and identifying gaps in service delivery, and also identified gaps within our current deployment models, as several datasets are incomplete or aren't capturing the things that UFA is looking to capture. In the creation of the SOC Workgroup, it was identified that this effort would require members from a broad-base of UFA's organization. Members of Operations, Special Operations, Emergency Management, Information Technology, and Medical were involved in the collation and collaboration in creating the 2021 SOC for UFA.

UFA has also gone to great lengths to identify and acquire technology to assist with accurate data collection and interpretation, Intterra Analytics and Darkhorse. These systems have allowed progress with trustworthy data, albeit there are still areas of improvement.

Once reviewed and adopted by the Board of Directors, the intent is to share the document with all UFA/UFSA municipalities and incorporate recommendations into the Strategic Plan and the annual budget process.

### **Current SOC Goals:**

- Conduct Community Risk Assessment
- Measure Current Deployment and Performance
- Identify and document performance gaps
- Plan for maintaining and improving response capabilities
- Establish goals and benchmarks for our performance
- Reduce overall response time - improve turn-out times
- Resource relocation to improve first-due system performance – dynamic deployment
- Improve coding of calls
- Improve Record Management System/Electronic Patient Care Report data entry
- Versaterm CAD integration – effective response force
- Deliver an effective response force for single dwelling, multiple dwelling and commercial buildings
- Station/resource location in support of new growth (fill the gap)

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## Section One – Introduction

### **Utah and Salt Lake Counties, Utah**

#### **Utah and Salt Lake County History**

Previous to 1847, the Greater Salt Lake Valley was inhabited by various indigenous American Indian Tribes, identified as “Desert Gatherers” or “Fremont Indians”. They were followed by the Shoshone, Paiute, Goshute and Ute Native American Tribes, who were living throughout the Valley when the Mormon pioneers of The Church of Jesus Christ of Latter-day Saints fled religious persecution in the East and initially arrived in Emigration Canyon in 1847.

Those pioneers established a religious settlement and created a “State of Deseret” government. A legislative assembly later created the Great Salt Lake County on January 31, 1850 with over 11,000 residents living within the County. The first formal meeting of the Salt Lake County Government occurred on March 15, 1852, eighteen months after the Utah Territory was established by United States Congress.

In 1896, the Utah Territory was granted statehood and a county commission was created and started providing governmental services to the citizens of Salt Lake County, and Salt Lake County grew steadily. The Salt Lake County Fire Department was formed November 21, 1921 and various other governmental services continued to be formed or modified throughout the 20<sup>th</sup> century.

In the Oquirrh Mountains on the West side of Salt Lake County, the Bingham Canyon Mine, which contains vast deposits of copper and silver, was developed as the most productive of the county's mines. The mine, located in the southwest portion of the county, attracted thousands of workers to the narrow canyon. At its peak, the city of Bingham Canyon contained 20,000 residents, all crowded along the steep walls of the canyon, and natural disasters were a frequent occurrence. By the early 20th century, most of the mines in the county had closed, however, the Bingham Canyon Mine kept on expanding. In the early 21st century, it is among the largest open-pit mines in the world.

During the early 20th century, heavy industry came to the valley as well, diversifying its economy. Local and interurban trolley systems were built covering the more urban northeastern quarter of the valley. The city dismantled the trolley system by 1945, favoring the use of individual cars. Throughout the late 19th and early 20th centuries, the east side of the valley began to be more densely settled.

In the 1990s, the county's areas of rapid growth shifted further south and west. Farm and pasturelands were developed as suburbs. The cities of West Jordan, South Jordan, Riverton, Herriman, and Draper are some of the fastest-growing cities in the state. During the 1990s, Salt Lake City gained population for the first time in 40 years. Salt Lake City's selection as the host of the 2002 Winter Olympics spurred a construction boom in Salt Lake County that continued after the Olympics: slowing only in the 2008 recession.

In 2000, a new Mayor/Council form of government was chosen by the voters to replace the Salt Lake County Commission. The population of the Salt Lake County was 898,387. The County expanded services to include a new jail, more libraries and recreation centers and more programs for its aging population.

In 2020 is a diverse community of 18 cities and 5 metro townships. County government serves almost 1 million residents providing public safety, health services, and cultural and recreation opportunities while also managing property, growth and development issues.<sup>1</sup>

### Salt Lake County Government

Salt Lake County was originally governed from the Salt Lake City and County Building in Downtown Salt Lake City, but now is based at the Salt Lake County Government Center at State Street and 2100 South Street. The county has a Mayor-Council form of government. The position of Mayor is decided in partisan elections; the current mayor (as of January 2021) is Jenny Wilson. The County Council is composed of 3 seats elected at-large and 6 elected by district. District-elected councilors are elected to staggered four-year terms; the at-large councilors are elected to six-year terms.<sup>2</sup>

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<sup>1</sup> Sources: <https://slco.org/county-history/> and [https://en.wikipedia.org/wiki/Salt\\_Lake\\_County%2C\\_Utah](https://en.wikipedia.org/wiki/Salt_Lake_County%2C_Utah)

<sup>2</sup> Source: [https://en.wikipedia.org/wiki/Salt\\_Lake\\_County%2C\\_Utah](https://en.wikipedia.org/wiki/Salt_Lake_County%2C_Utah)

At-large council members

- Laurie Stringham
- Richard Snelgrove
- Jim Bradley

District council members

- 1st District — Arlyn Bradshaw
- 2nd District — David Alvord
- 3rd District — Aimee Winder Newton
- 4th District — Ann Granato
- 5th District — Steve DeBry
- 6th District — Dea Theodore

## Geography

Salt Lake County has a geographic center of 40.67020581°(N), -111.95602902°(W). The Salt Lake Valley is fed by seven streams from the surrounding mountains. All the runoff water eventually ends in the Great Salt Lake, which has no outlet. The mountains rise precipitously from the relatively flat valley surfaces. The county has a total area of 807 square miles, of which 742 square miles is land and 65 square miles is water. It is the fifth-smallest county in Utah by area. The county borders on the Great Salt Lake and is traversed by the north-flowing Jordan River.

The western portion of the county is ringed by the Oquirrh Mountain Range and eastern portion of the county, famous for both summer and winter activities. The Wasatch mountains are administered as part of the Wasatch-Cache National Forest. Salt Lake County has four ski resorts: Snowbird and Alta in Little Cottonwood Canyon and Solitude and Brighton in Big Cottonwood Canyon. The south end of the valley is ringed by the Traverse Mountain Range.<sup>3</sup>

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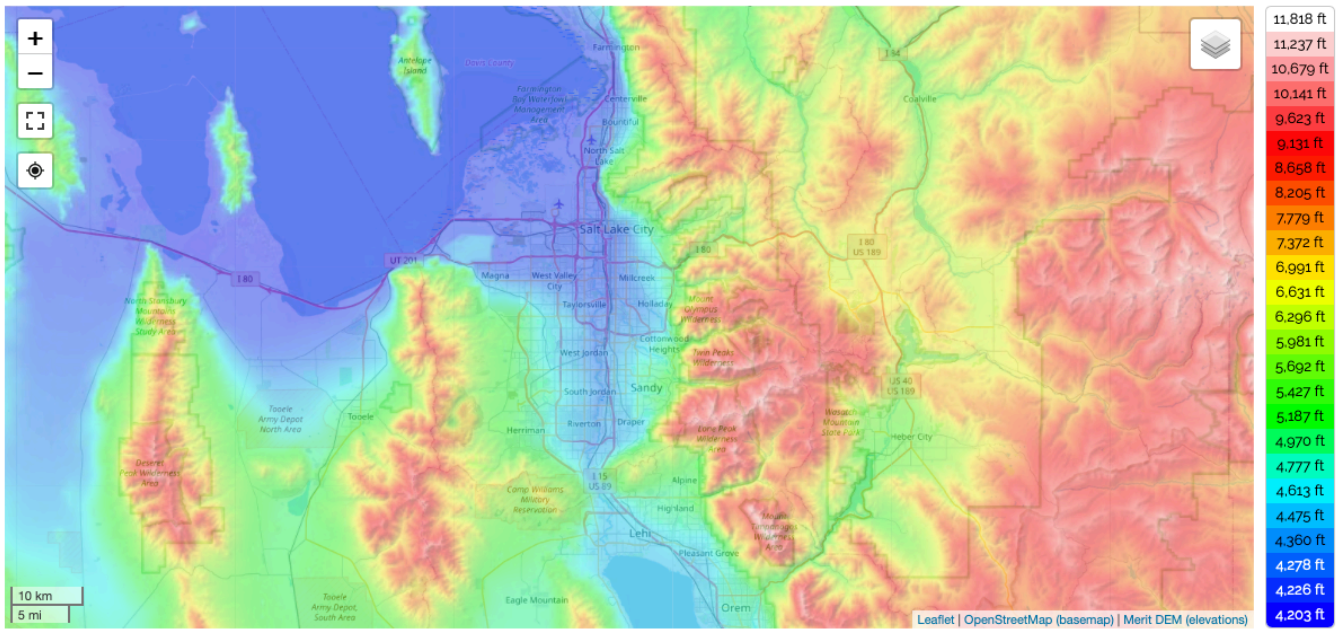
<sup>3</sup> Source: [https://en.wikipedia.org/wiki/Salt\\_Lake\\_County%2C\\_Utah](https://en.wikipedia.org/wiki/Salt_Lake_County%2C_Utah)



Image 1 - View of Salt Lake County Looking from the North

## Topography

The lowest elevation in Salt Lake County is 4,137 feet and the highest elevation is 11,430 feet.



Map 1 - Topography of Salt Lake County

Source: <https://en-gb.topographic-map.com/maps/z5mh/Salt-Lake-County/>

## Climate

The Greater Salt Lake has a semi-arid continental climate with cold snowy winters, hot and dry summers, and modest seasonal rainfall.

The primary source of precipitation in Salt Lake City is massive storms that move in from the Pacific Ocean along the jet stream from October to May. In mid-to-late summer, precipitation mainly comes from afternoon thunderstorms caused by monsoon moisture moving up from the Gulf of California. Although rainfall can be heavy, these storms are usually scattered in coverage and are rarely severe.

Snow falls on average from November to April producing a total average of 60 inches. The nearby Great Salt Lake is a significant contributor to precipitation in the county. The lake effect can enhance rain from summer thunderstorms and produces lake-effect snow approximately 6 to 8 times per year. It is estimated about 10% of the annual precipitation in the city can be attributed to the lake effect.

The Greater Salt Lake features large variations in temperatures between seasons. During summer, there are an average of 56 days per year with temperatures of at least 90 °F, 23 days of at least 95 °F, and 5 days of 100 °F. Winters are quite cold but rarely frigid. While an average of 127 days drop to or below freezing, and 26 days with high temperatures that fail to rise above freezing, the city only averages 2.3 days at or below 0 °F.

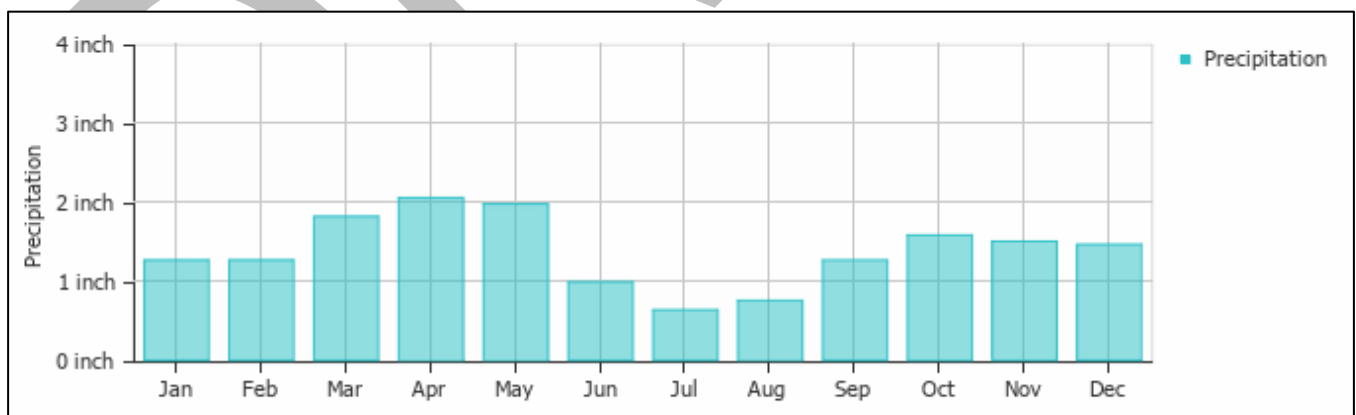


Figure 1 - Average Precipitation of Salt Lake  
Source: [weather-and-climate.com](http://weather-and-climate.com)

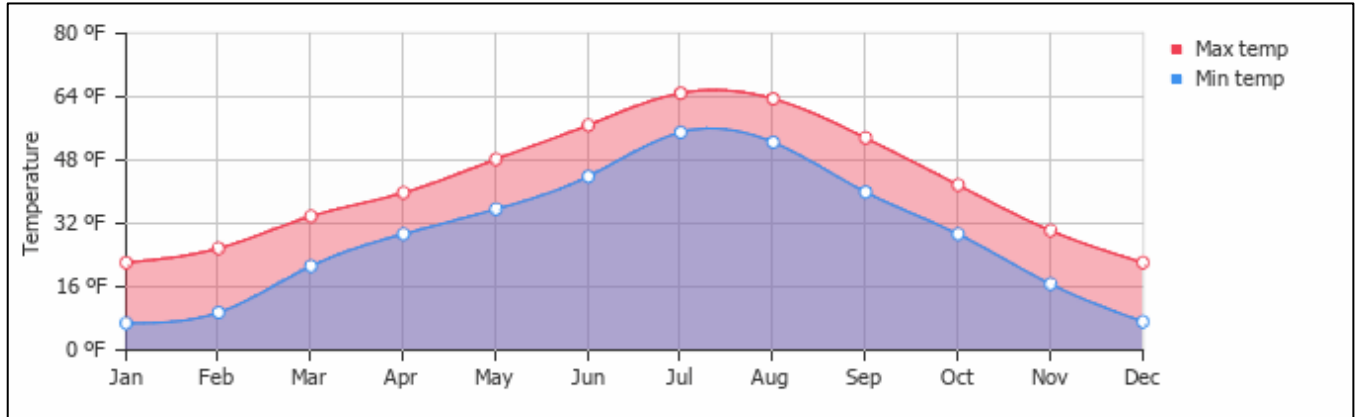


Figure 2 - Average Temperature of Salt Lake  
Source: weather-and-climate.com

### Salt Lake County Population & Demographics

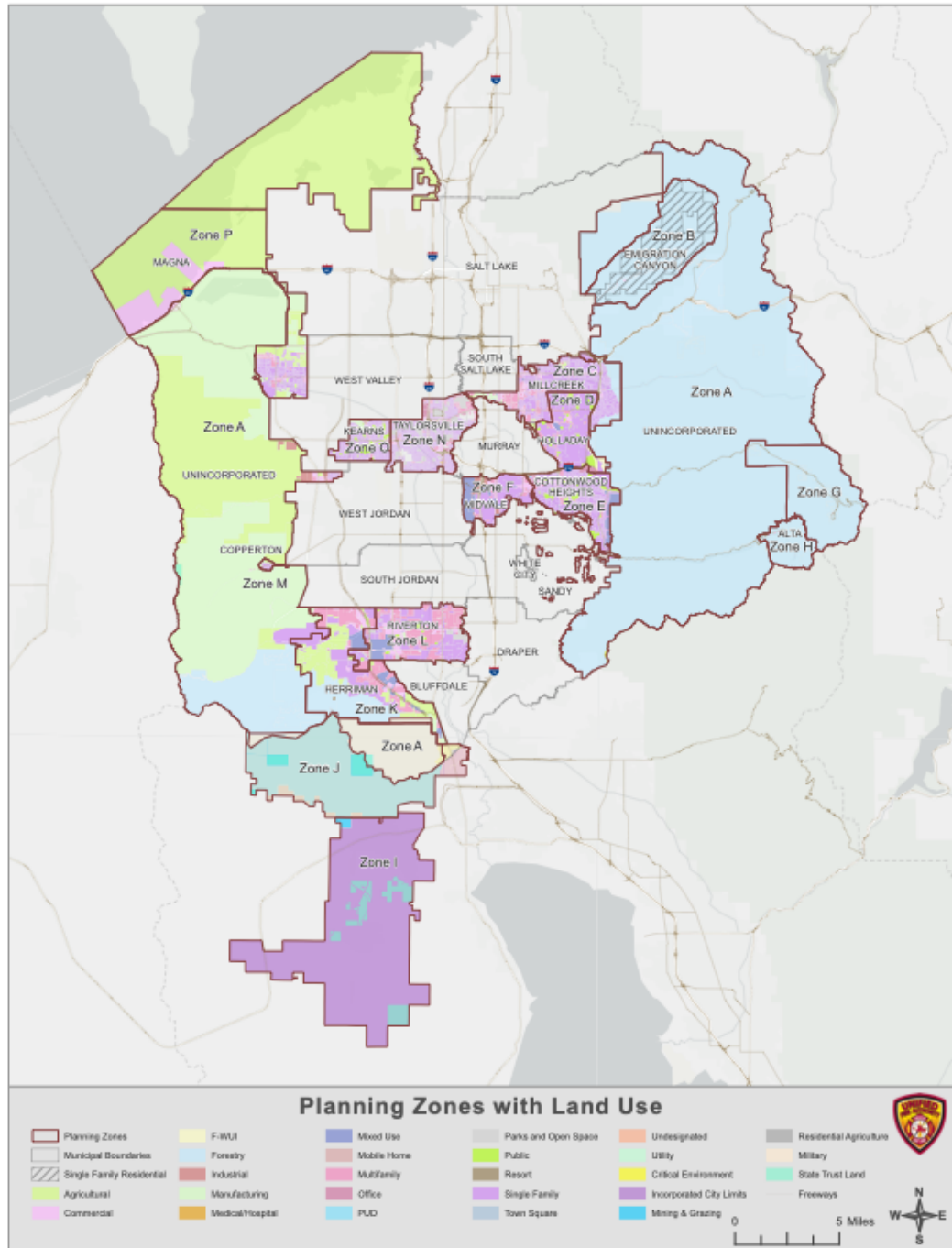
The population of Salt Lake County is 1,160,437 (est July, 2019). The following table is the breakdown of the population of Salt Lake County and the racial demographics. Additional data is identified in the UFA-specific population and demographics section under Section 2.

Salt Lake County Facts	
<b>Population, July 2019 (est)</b>	1,160,437
<b>Population, April, 2010</b>	1,029,590
<b>% Change, 2010-2019</b>	12.7% Increase
<b>&lt; 5 years old</b>	7.2%
<b>&lt; 18 years old</b>	26.6%
<b>&gt; 65 years old</b>	11.2%
<b>Female Persons</b>	49.8%
<b>White Alone</b>	87.1%
<b>Black or African American Alone</b>	2.2%
<b>American Indian and Alaska Native Alone</b>	1.40%
<b>Asian Alone</b>	4.60%
<b>Native Hawaiian And Other Pacific Islander Alone</b>	1.80%
<b>Two Or More Races</b>	2.90%
<b>Hispanic Or Latino</b>	18.80%
<b>White Alone, Not Hispanic or Latino</b>	70.30%

Table 1 - Salt Lake County Population and Demographics

## Occupancy/Zoning

The following map demonstrates the land use breakdown across UFA's planning zones. To see a more detailed breakdown of each area, refer to the UFA profile section per planning zone.

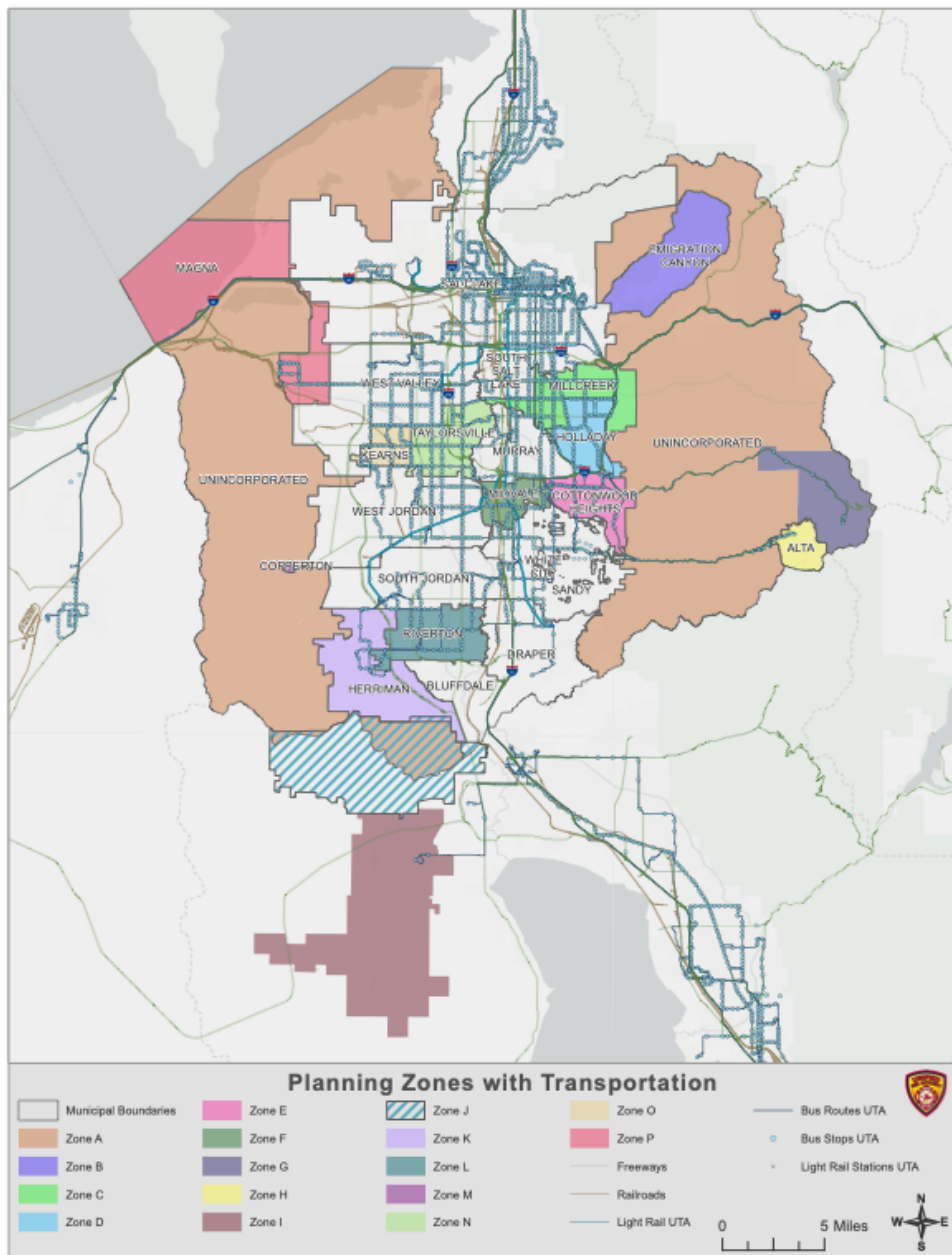


Map 2 - Planning Zones with Occupancy and Land Use

Critical Infrastructure

Infrastructure – Transportation

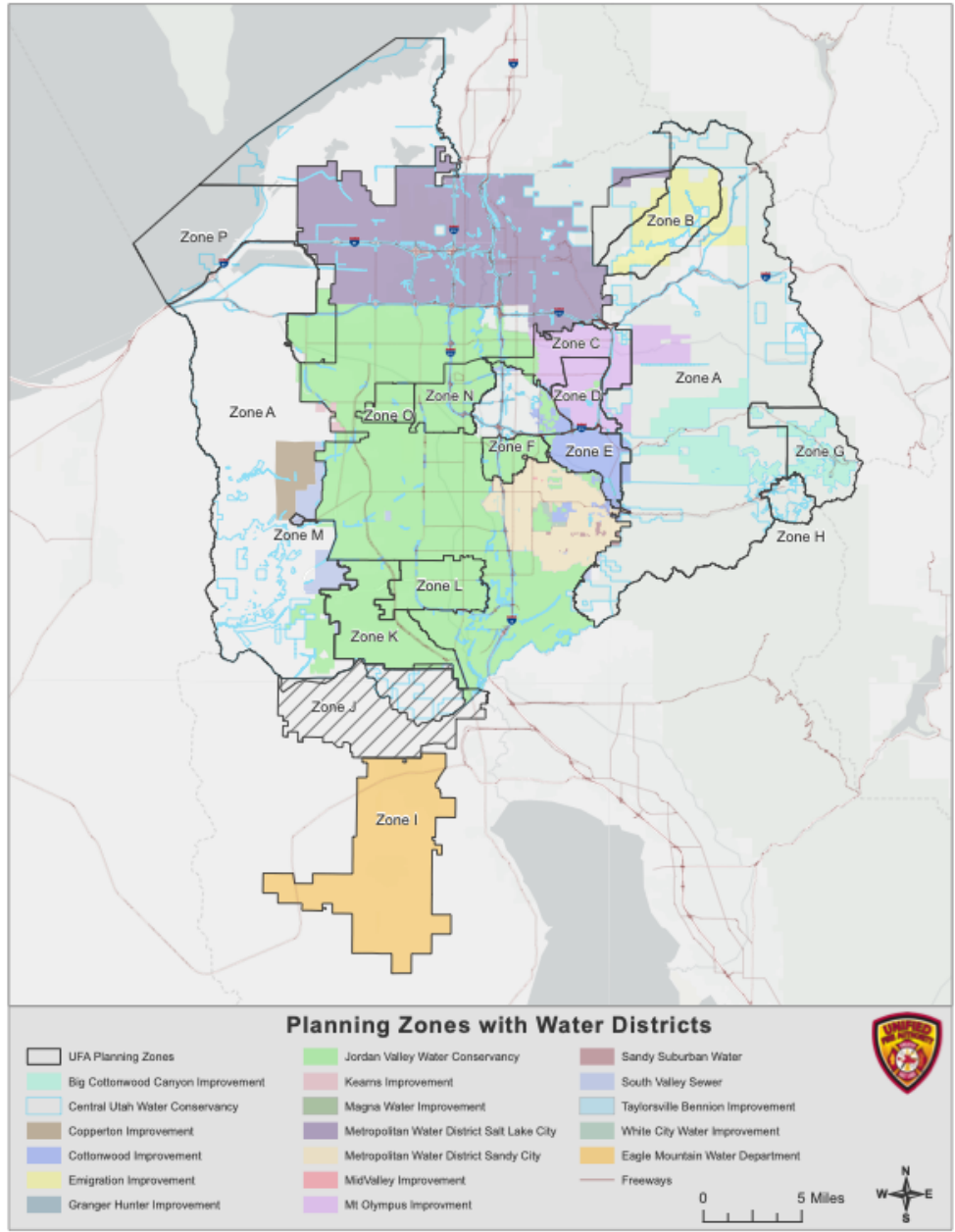
The Utah Transit Authority (UTA) is the primary provider of mass transit within the State of Utah and Salt Lake County. UTA provides commuter rail (FrontRunner), light rail (Transit Express or TRAX), and bus systems. There are also multiple freeways and highways that run through the Salt Lake Valley, and the State of Utah, providing critical transportation corridors with both a primary East/West Interstate (I-80) and a North/South Interstate (I-15).



Map 3 - Planning Zones with Transport Corridors

**Infrastructure – Water Supply**

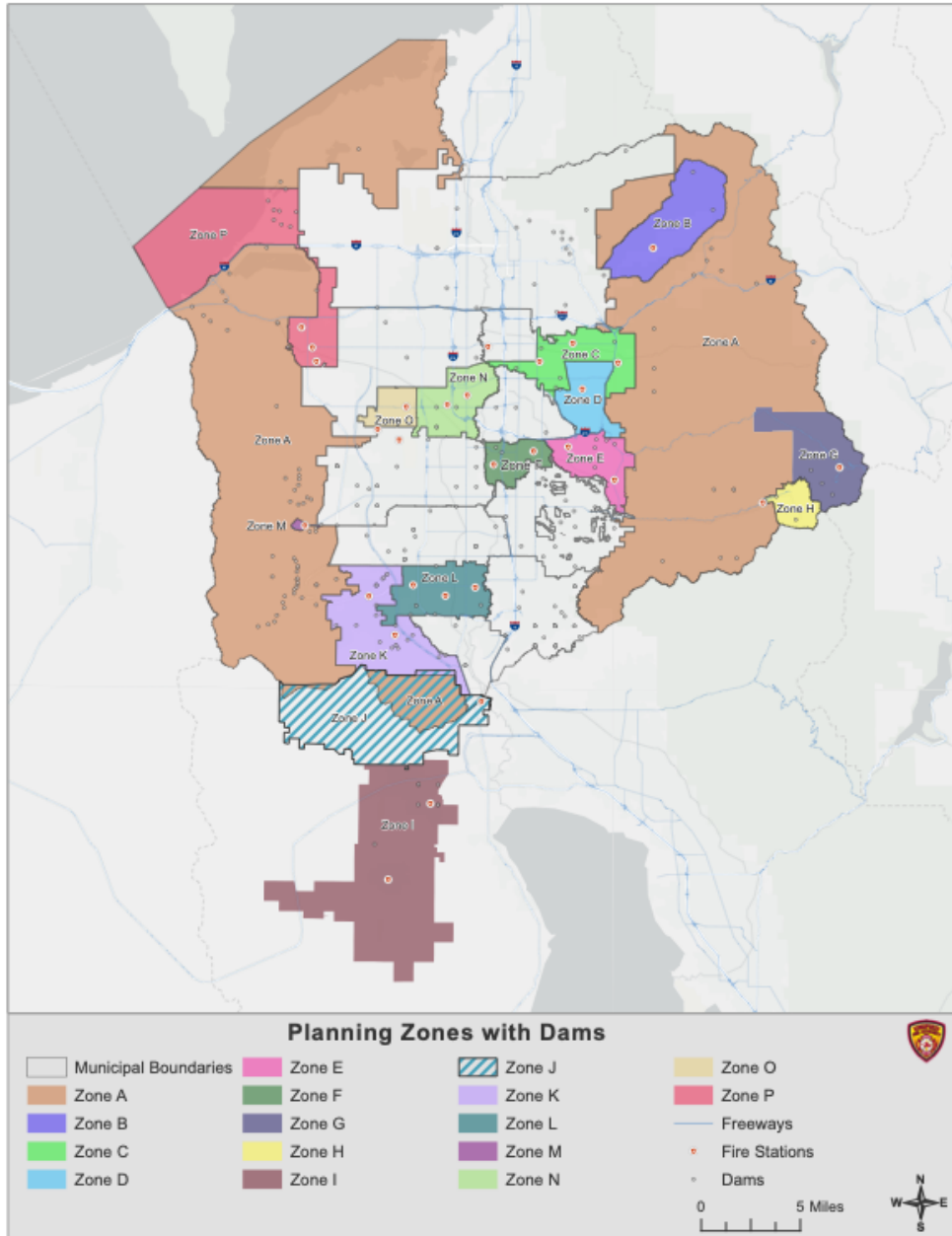
Within the Salt Lake Valley, there are twenty-nine water districts, all either special service districts or municipally-based water districts. Within UFA’s planning zones, there are eighteen water districts.



Map 4 - PZ with Water Districts

### Infrastructure – Dams

Within the Salt Lake Valley, there are 290 dams. Within UFA’s Planning Zones, there are 144 of those dams.



Map 5 - Dam locations within the Salt Lake Valley

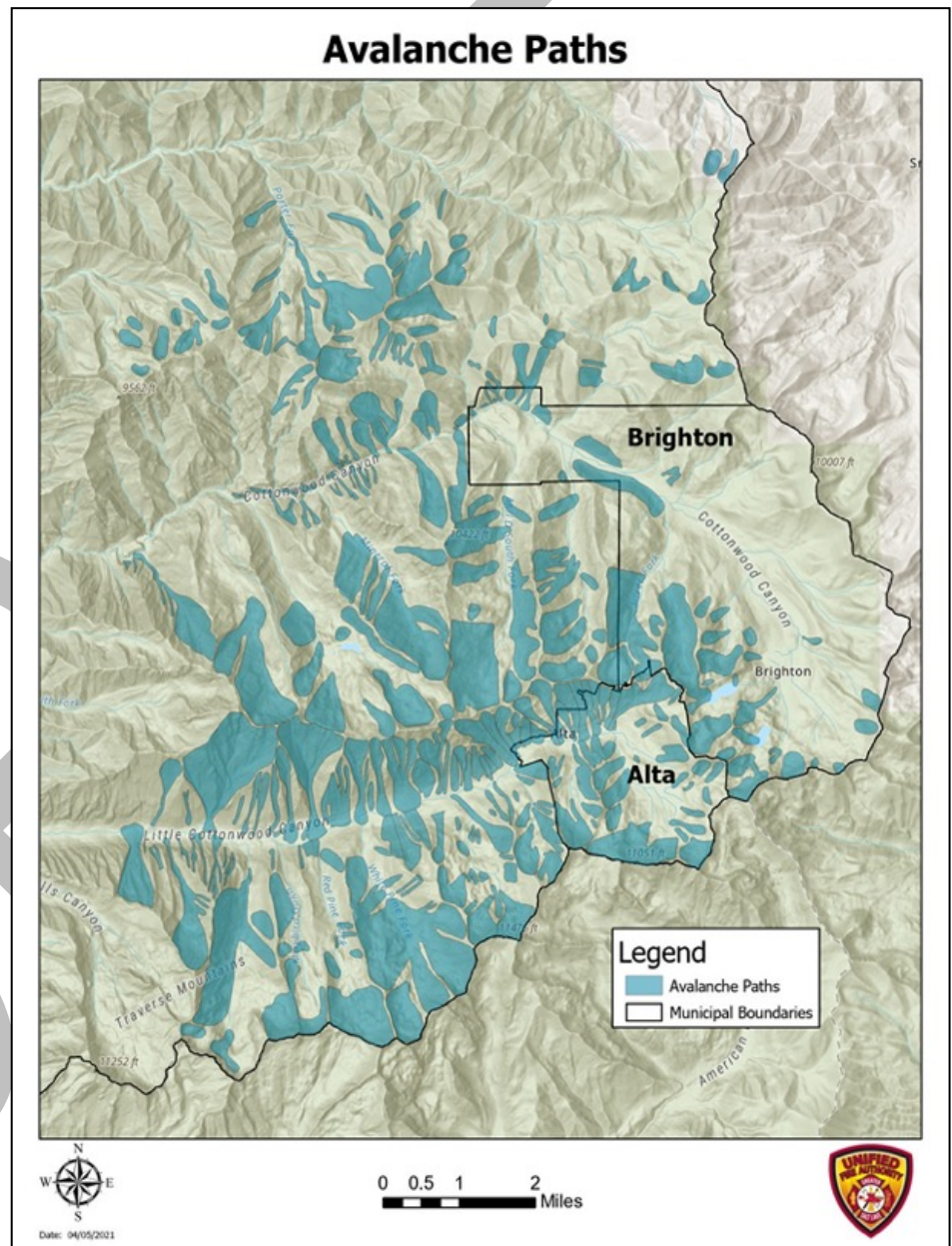
## Salt Lake County Natural Hazards Risks

### Weather – Avalanche

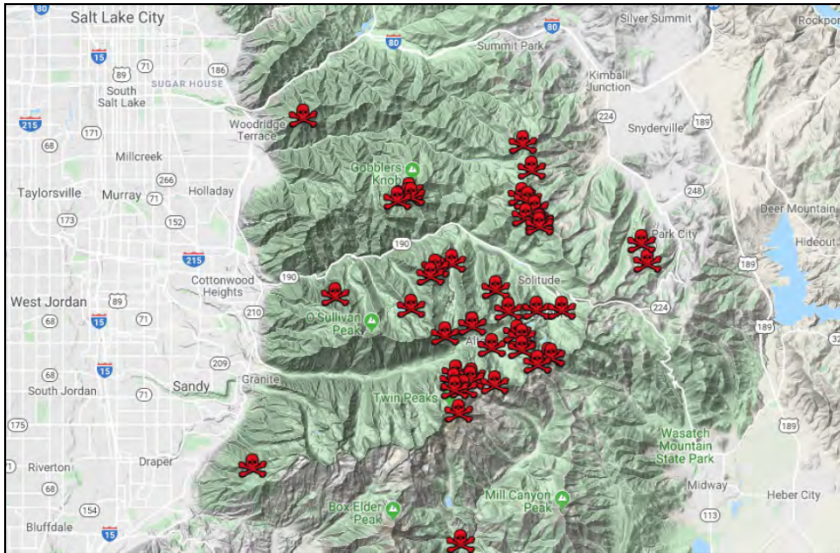
The risk for avalanches exists primarily in the Wasatch Range — due to the high recreation use and increasing development — although they do occur throughout Utah’s mountainous areas. Avalanche paths may not have a serious avalanche for years or even decades, but the potential is there especially during above average snowfall years (UNHH 2008).

In Utah, 100 avalanche deaths have occurred from 1958-2010. Avalanche risk is particularly centered around the Big and Little Cottonwood Canyons as well as Millcreek Canyon. The Town of Alta is especially at risk to the impacts of avalanches.

The following maps from the Utah Avalanche Center shows the locations of all reported avalanche events from 2015 to 2019, as well as the locations of all reported avalanche fatalities in the Salt Lake County Region.



Map 6 - Salt Lake County Region Avalanche Locations  
 Source: <https://utahavalanchecenter.org/avalanches>



Map 7 - Salt Lake County Region Avalanche Fatality Locations:  
Source: <https://utahavalanchecenter.org/avalanches>

Highway 210 (Little Cottonwood Canyon) also has the highest avalanche hazard-rating index of any major roadway in the country. At times when UDOT and Alta agree that conditions are unsafe, the town goes into an Interlodge Alert, meaning all occupants of the town (including both visitors and residents) must

remain indoors until conditions are deemed safe. At times, Interlodge can last days until the storm cycle is over and proper avalanche control work has been performed.

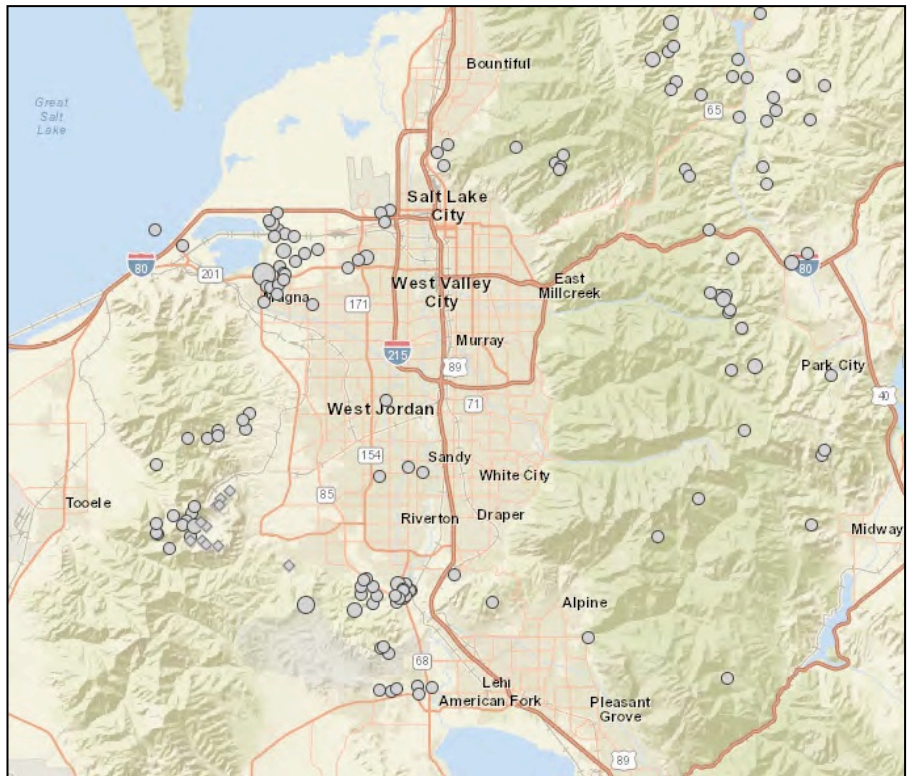
The Town's General Plan (dated November 2005, Updated 2013) covers Highway 210 access and possible mitigation activities to keep this critical road open. It also provides background on the Little Cottonwood Canyon Road Committee, a group consisting of representatives from Alta, Snowbird, Salt Lake County, Unified Fire Authority, UDOT, UTA, and USFS, that meet monthly to discuss access, usage, and safety and security issues related to the canyon road. (SLCoHMP)

### Earthquake

Utah's earthquake hazard is greatest within the Intermountain Seismic Belt (ISB), which extends 800 miles from Montana to Nevada and Arizona, and trends from North to South

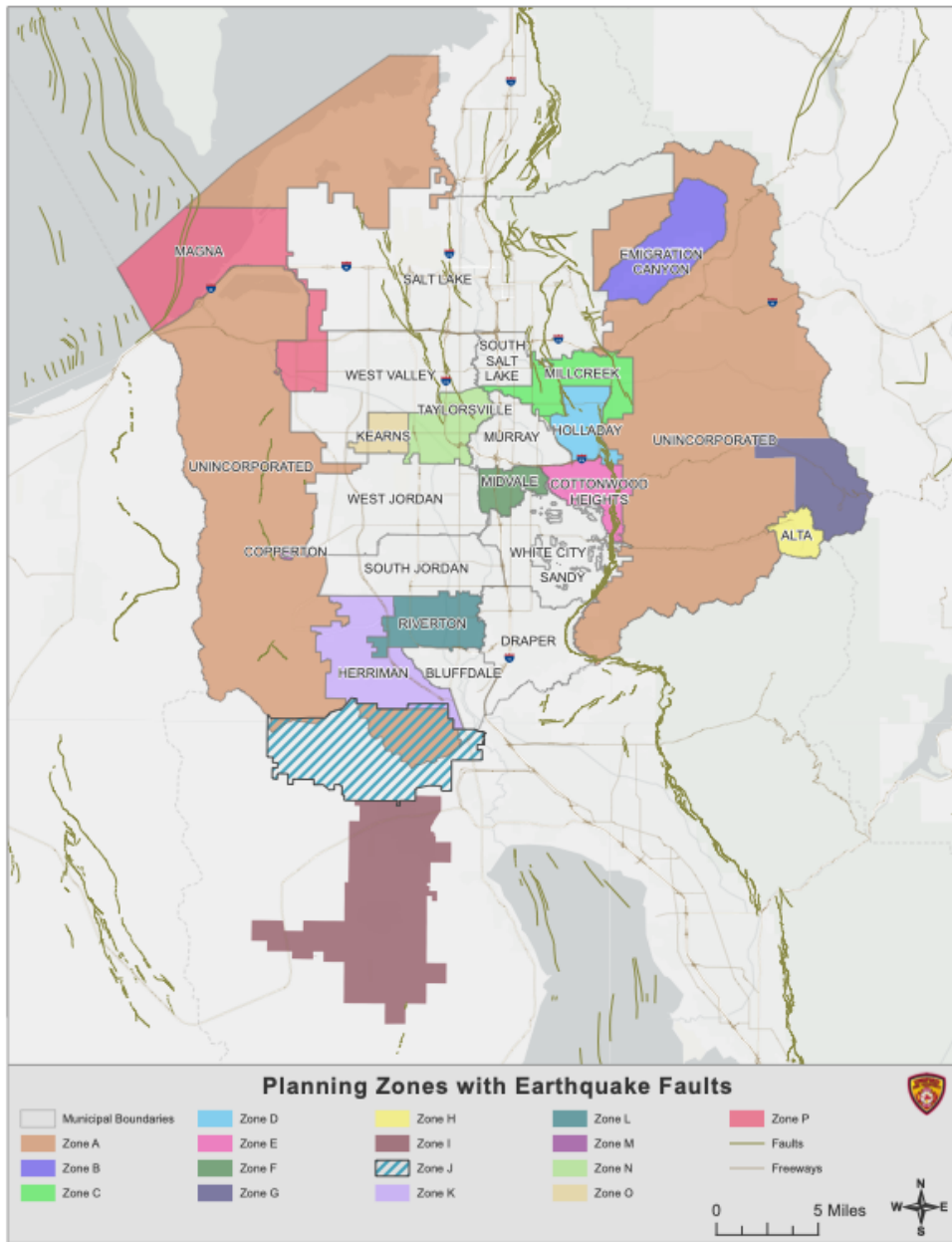
through the center of Utah (The Wasatch Fault, UGS PIS 40). The Wasatch Fault traces along the base of the Wasatch Mountain Range. It is made up of 10 segments that act independently, meaning that a part of the fault ruptures separately as a unit during an earthquake.

According to USGS records, there have been 152 recorded earthquakes of 2.0 magnitude or greater that occurred in or immediately around Salt Lake County from 1962 through July 2019.



Map 8 - Earthquakes in Salt Lake County >2.0, 1962-July, 2019:  
Source: [www.earthquake.usgs.gov](http://www.earthquake.usgs.gov)

Significant earthquakes have occurred in Salt Lake County within the last 50 years. In 2020, a 5.7 earthquake occurred in Magna. In 1962, a 5.2 Richter magnitude quake also jolted the Magna area. In 1992, a magnitude 4.2 quake shook the southern portion of the County.

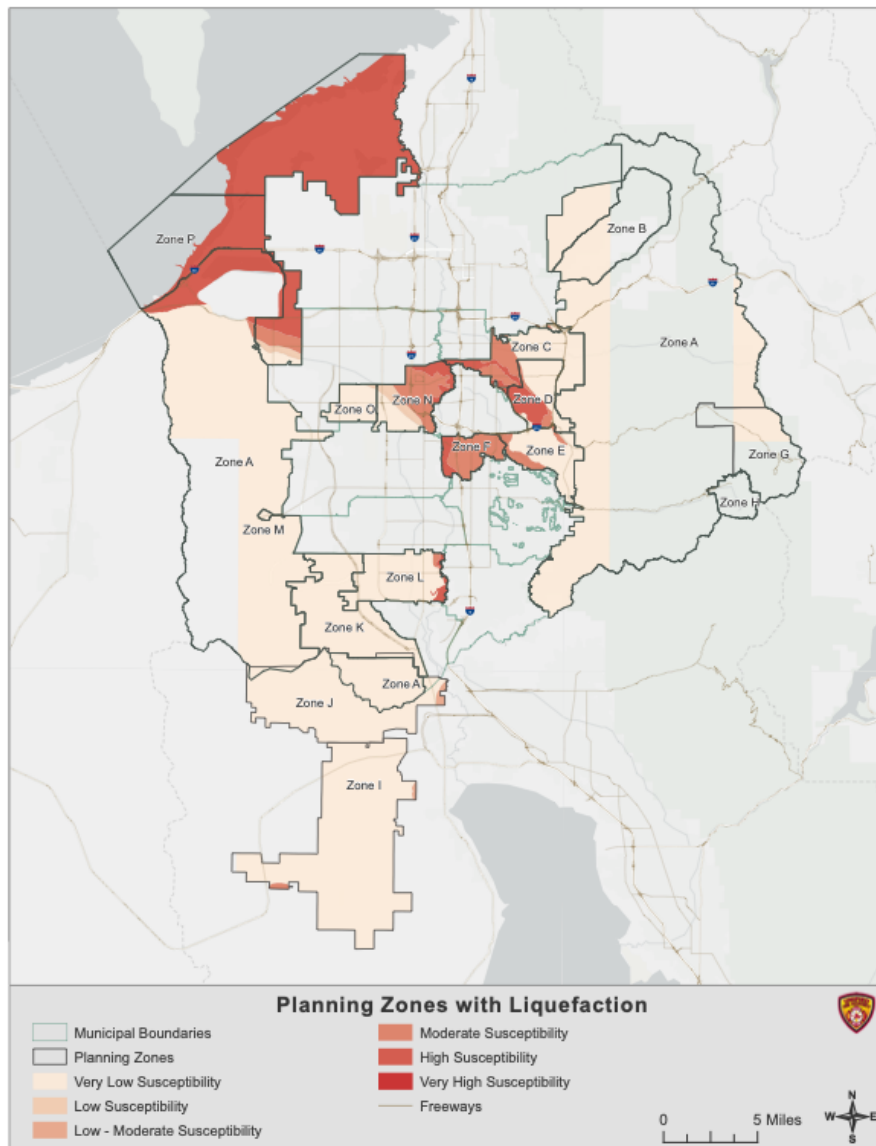


Map 9 - Earthquake Faults in the Salt Lake Valley

The faults illustrated in the above map include the following (see table below).

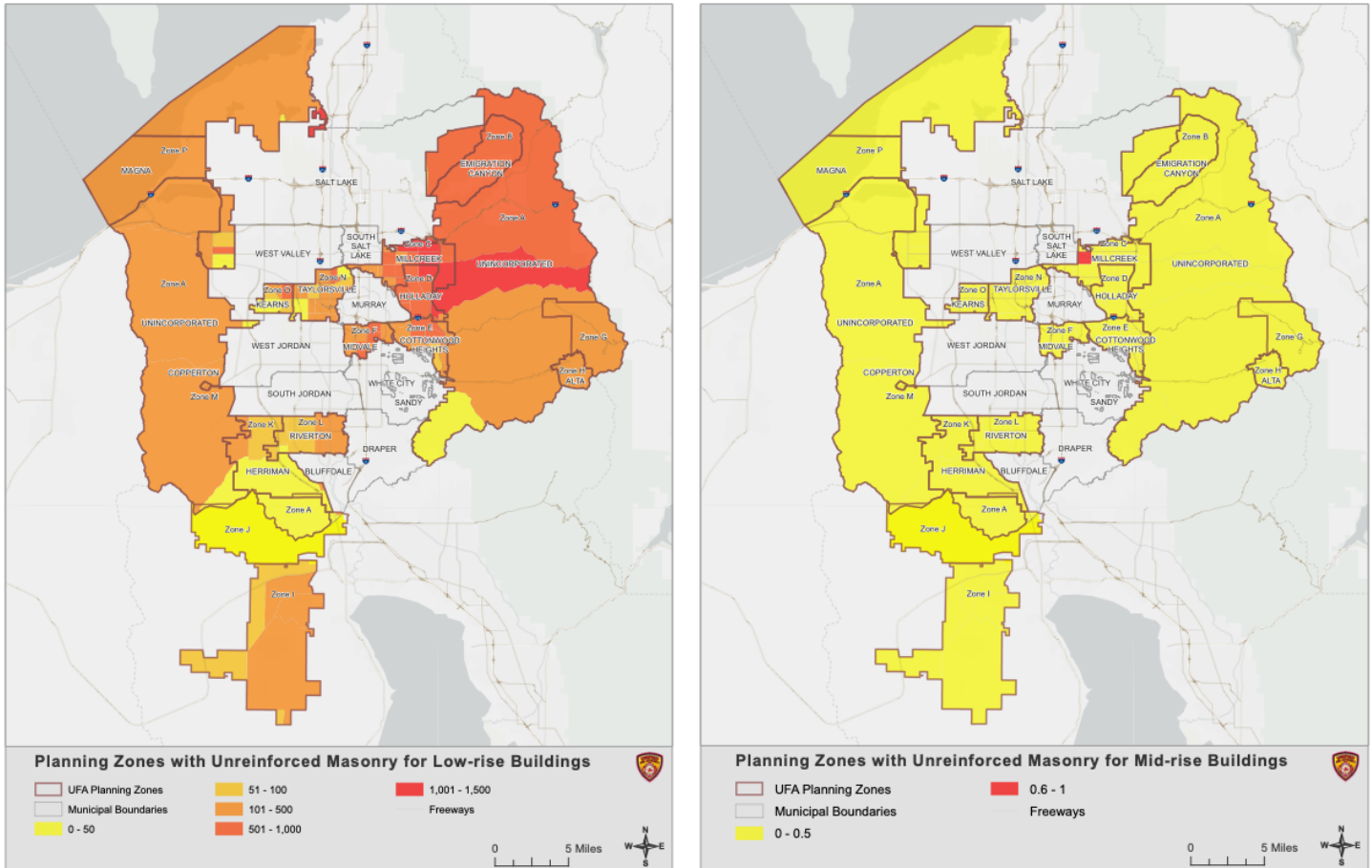
Name	Fault Type	Length (km)	Time of Most Recent Deformation	Recurrence Interval
<b>East Great Salt Lake fault zone, Antelope Island section</b>	Normal	35	586 201/-241 cal yr B.P.	4,200 years
<b>Wasatch fault zone, Salt Lake segment</b>	Normal	43	1,300 ± 650 cal yr B.P.	1,300 years
<b>West Valley fault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

Table 2 - Quaternary Faults, Salt Lake County  
Source: USGS Earthquake Catalogue



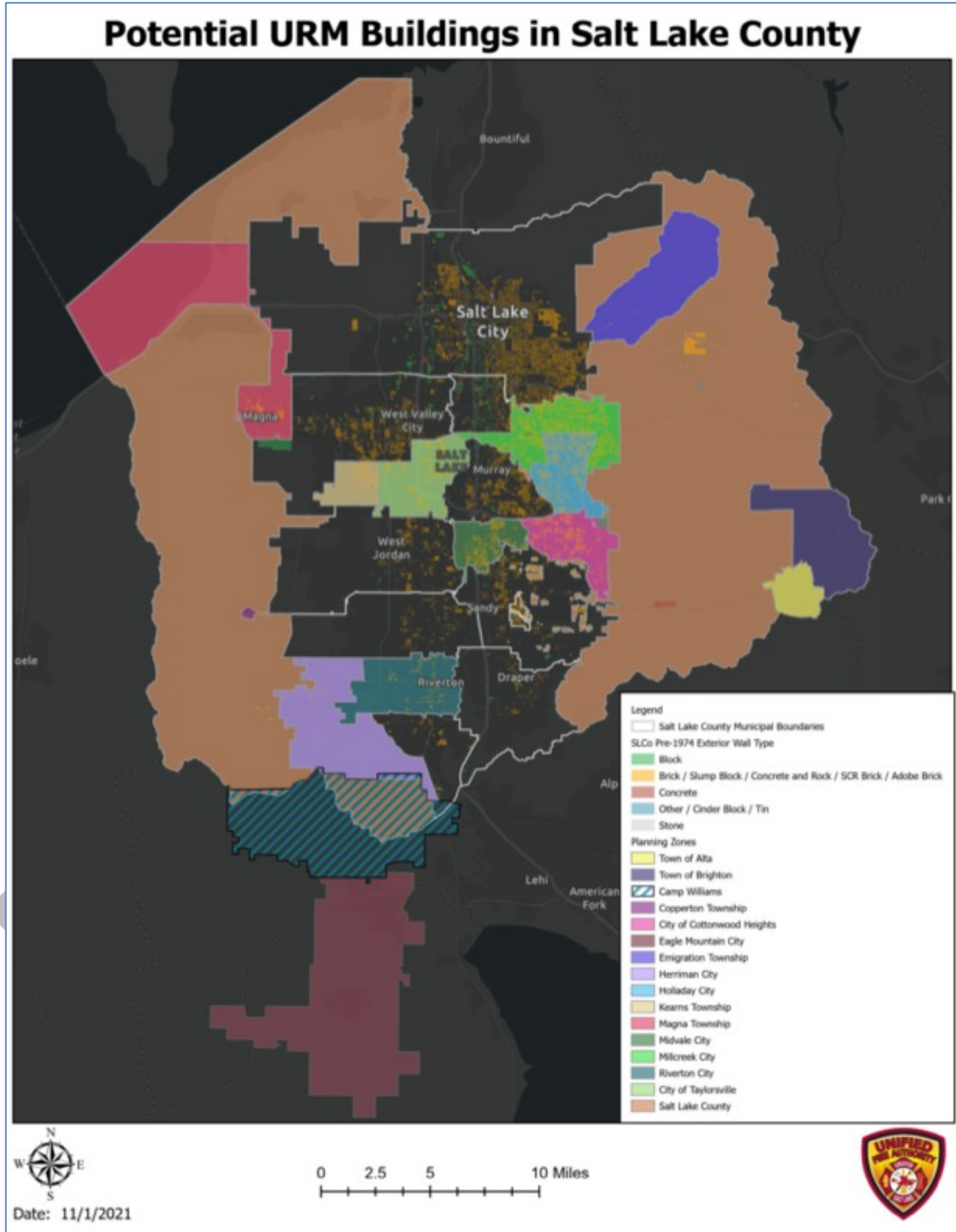
Map 10 - Liquefaction Areas

One of the primary risks that is inherent with any earthquake is the amount of unreinforced masonry (URM) structures in a given area. The associated maps show the primary locations of URM's in UFA's areas for both low and mid-rise buildings. This is based off of FEMA HAZUS data and only shows areas by census tracts.



Map 11 – Unreinforced Masonry Building Locations

The map below shows structures within the planning zones that are most likely URM's based off of FEMA data.



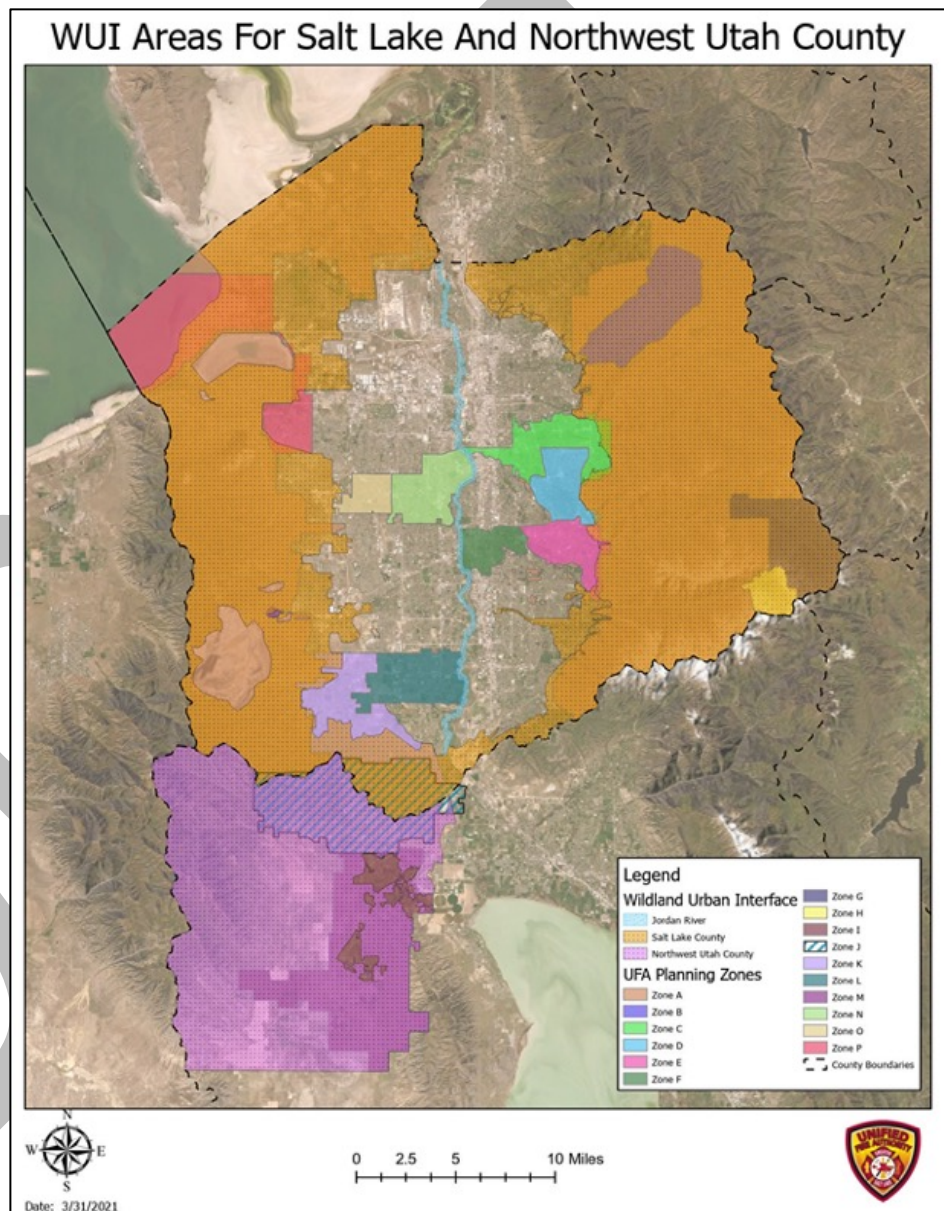
Map 12 - Potential URM Buildings in Salt Lake County

### Wildland Urban Interface (WUI)

Portions of Utah and Salt Lake County could experience a significant amount of destruction due to a wildland fire include the foothills and the bench areas on or near the Wasatch Range, Traverse Mountain and the Oquirrh.

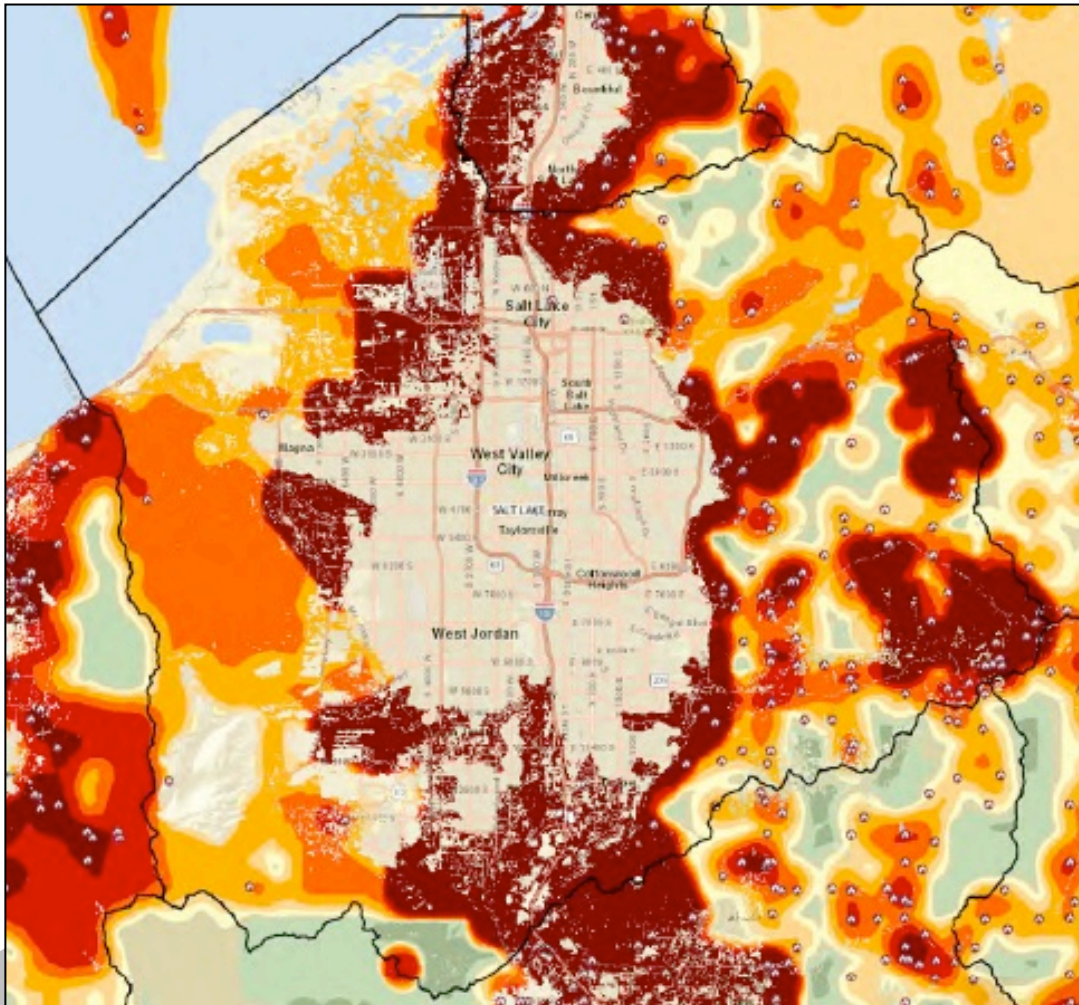
These WUI areas are threatened most because of the number of forested lands and the increasing population growth spreading into the foothills. Another concern is vegetation type in these areas such as sagebrush, mountain scrub oak, cheat grass, pinion and juniper trees, and rural and riparian vegetation.

Sagebrush and mountain shrub burn hot and fast, spreads easily and is found throughout the county. During prime burning conditions (hot, dry and windy) the pinion juniper class will burn. As can be seen in the map below, historical wildfire ignition points have been marked, and



Map 13 - Wildland Urban Interface Areas in Salt Lake County

areas most likely to be the source of ignition based on historical patterns are darkly shaded. (2019 Salt Lake County Multi-Jurisdictional Hazard Mitigation Plan)



*Map 14 - Historical Wildfire Ignition Points, SLCo*

As population growth continues, pressure to develop in WUI areas is likely to increase the threats associated with fire. Mitigation measures will need to be recognized and enforced to reduce these threats. Part of these mitigation efforts are the creation and implementation of Community Wildfire Protection Plans (CWPP) that is a local, community-level approach to code, development review, ordinances and local authorities, enabling communities to address community risk of wildfire with respect to values at risk. Within Salt Lake County, the following communities have current or in-progress CWPPs.

Unified Fire Authority: Community Risk Assessment & Standards of Cover

Community	In Progress/Completed	Expiration	Firewise Community?
<b>Alta*</b>	Completed	2025	No
<b>Big Cottonwood Canyon / Brighton*</b>	Completed	2025	No
<b>Bluffdale</b>	In Progress		No
<b>Cedar Fort / Fairfield</b>	Completed	2025	
<b>Copperton*</b>	Completed	2026	No
<b>Cottonwood Heights*</b>	Completed	2025	No
<b>Eagle Mountain*</b>	Completed	2026	No
<b>Emigration Canyon*</b>	Completed	2026	Yes
<b>Granite</b>	In Progress		No
<b>Hi-Country 1 (Unincorporated SLCo)*</b>	Completed	2025	Yes
<b>Hi-Country 2 (Unincorporated SLCo)*</b>	In Progress		No
<b>Herriman*</b>	Completed	2025	No
<b>Holladay*</b>	Completed	2026	No
<b>Kearns*</b>	Completed	2026	No
<b>Lamb's Canyon / Forest Home*</b>	Completed	2025	Yes
<b>Magna*</b>	Completed	2026	No
<b>Midvale*</b>	In Progress		No
<b>Millcreek*</b>	Completed	2026	No
<b>Mt. Aire*</b>	Completed	2026	No
<b>Olympus Cove*</b>	In Progress		No
<b>Riverton*</b>	In Progress		No
<b>Salt Lake City</b>	Completed	2022	No
<b>Salt Lake County*</b>	Completed	2025	No
<b>Sandy City</b>	Completed	2025	No
<b>South Jordan</b>	Completed	2026	No
<b>Suncrest / Traverse Mtn. (Draper)</b>	Completed	2026	No
<b>White City*</b>	Completed	2026	No

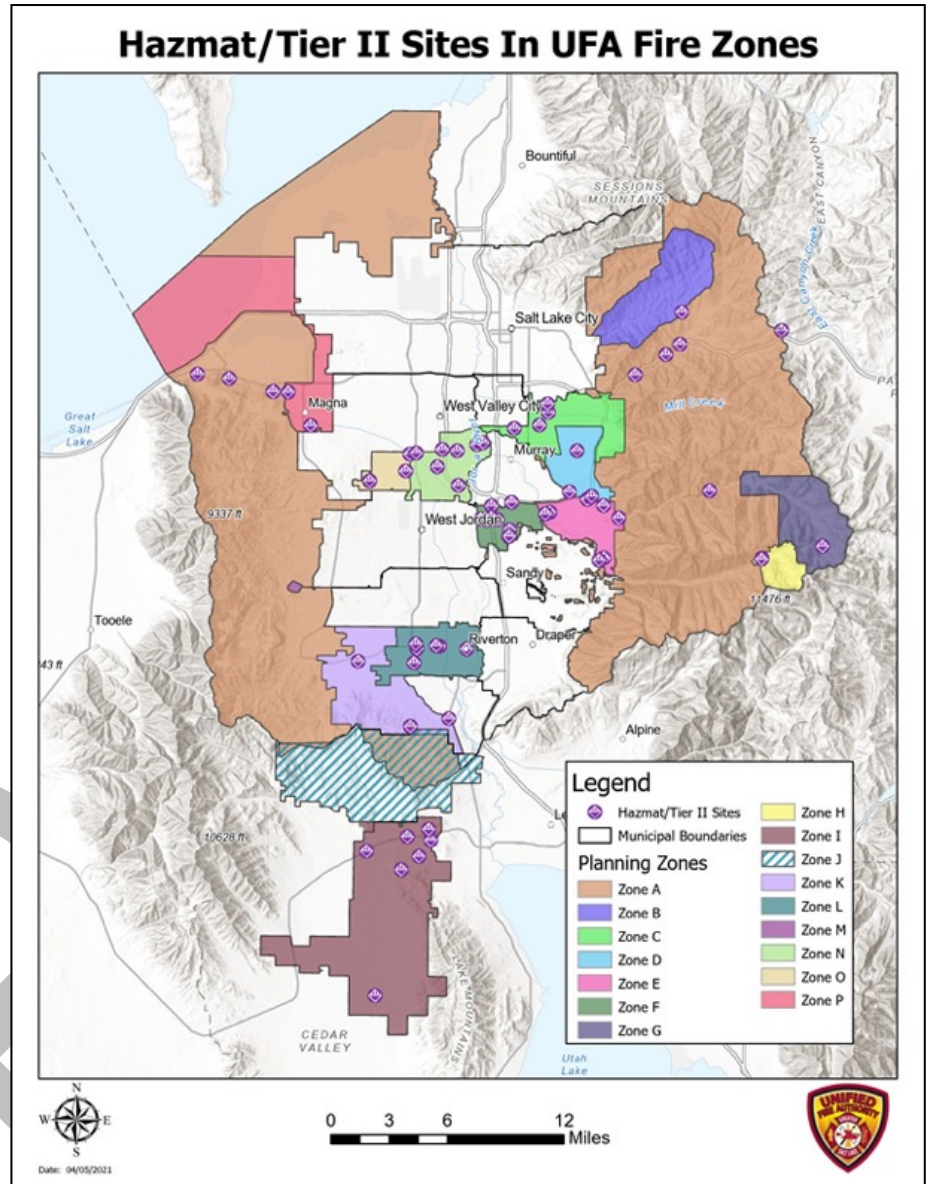
\*Denotes a community protected by UFA

Table 3 - Community Wildfire Protection Plans and Communities

## Hazardous Material

Occupancies which contain hazardous materials potentially pose a risk to the community and can create dangerous environments for first responders when responding to a spill or fire. Specialized equipment, protective clothing and additional training is required to mitigate a HazMat incident.

Unified Fire Authority's Prevention Division conducts over 700 HazMat inspections each year. The associated map shows the location of Tier II sites within the service area.

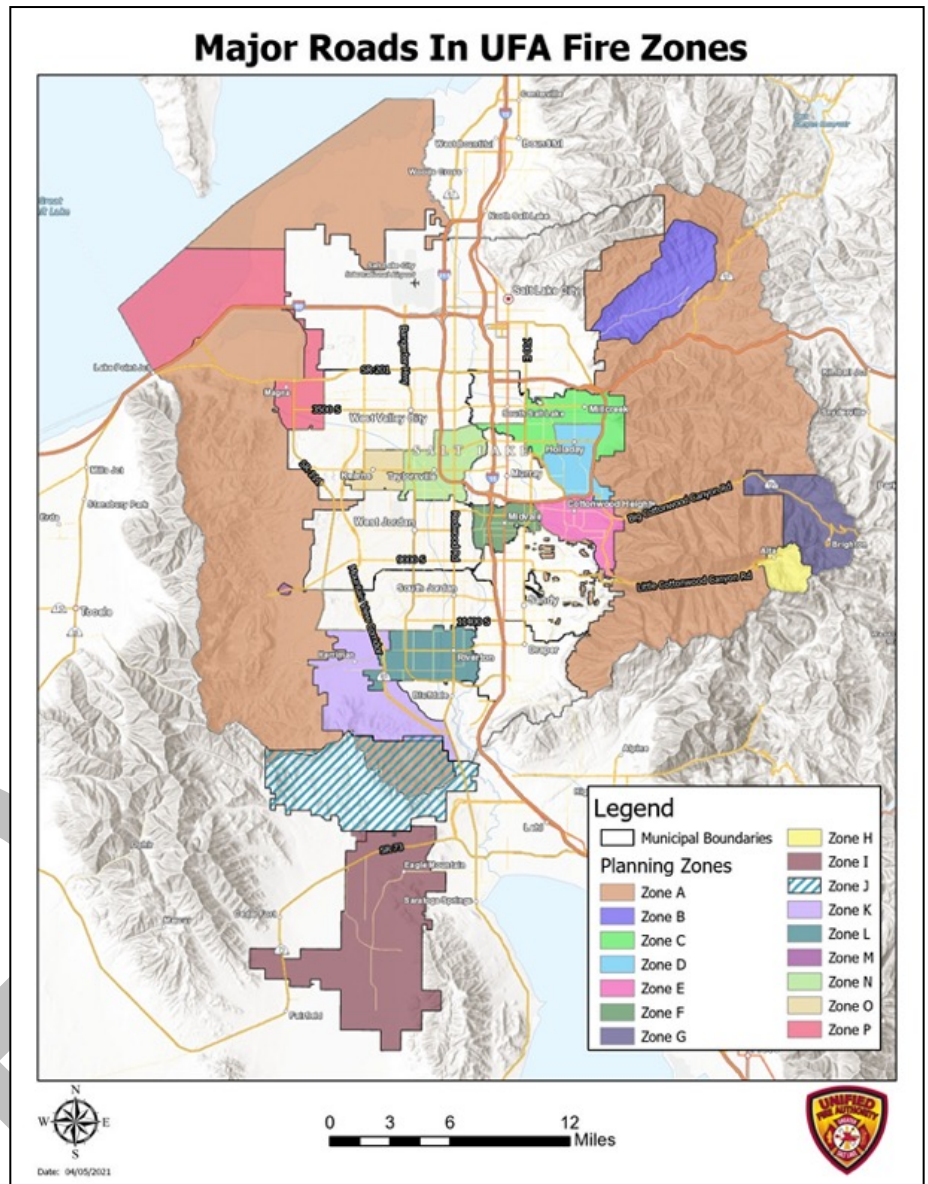


Map 15 - Tier II Sites in UFA Response Areas

## Highways and Roads

The highways and roads within the Service Area are what provide the necessary access and egress for the Authority. These transportation corridors are intertwined and are a mix of surface streets, intersected highways and freeways all within the jurisdiction. Surface streets are most common.

These provide the main travel routes to emergency incidents. Bangerter Highway and Mountain View Corridor are intersected highways that are main routes north and south through the Service Area. The main interstate is I-15, which divides much of the area from east to west, and I-215 which is a belt route that provides access to interior areas of the jurisdiction.



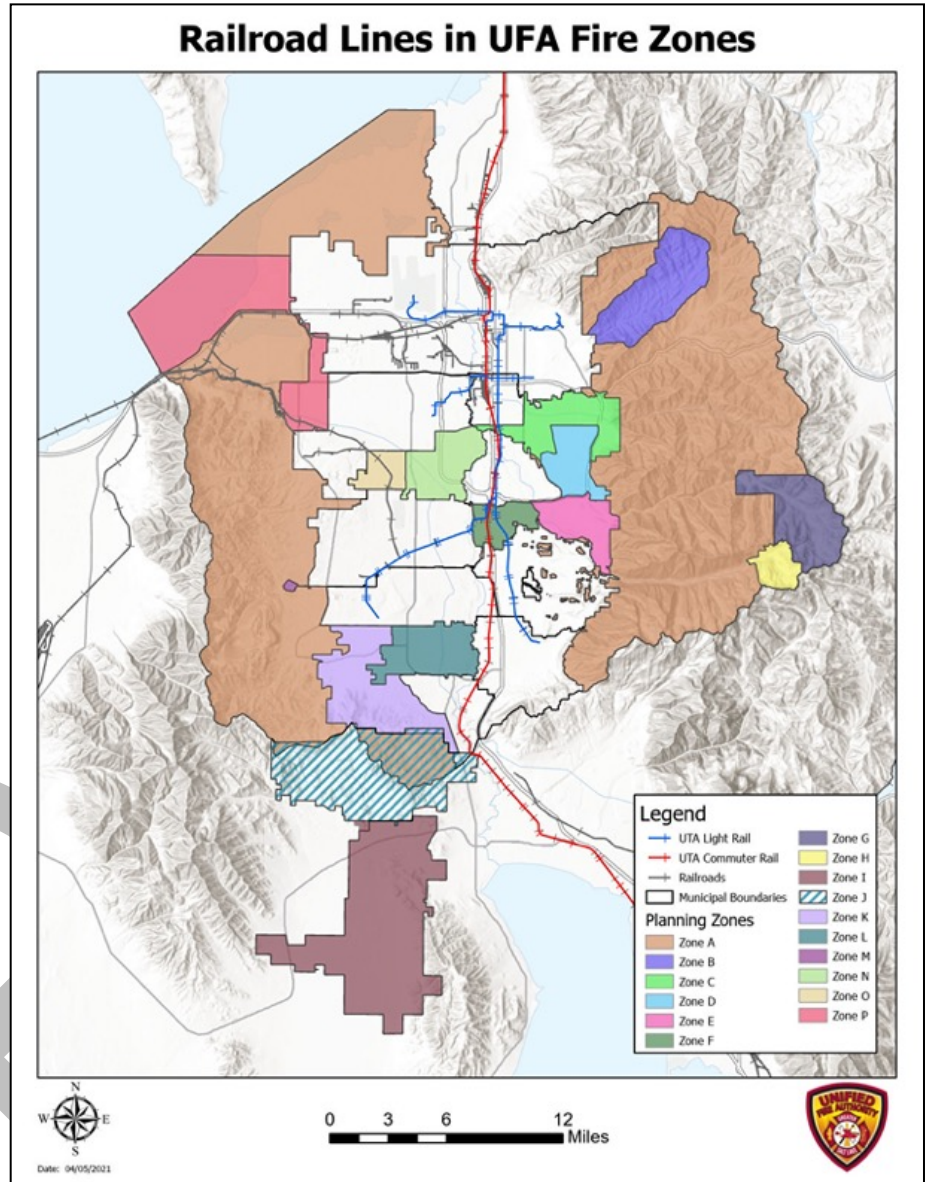
Map 16 - Location of Major Freeways/Highways Within the Service Area

## Railroads

Several railroad lines traverse through Salt Lake County and the lines run through portions of the Unified Fire Authority service area.

The major rail lines carry various commodities which include hazardous materials and other dangerous cargo. One major rail yard operated by Union Pacific (Roper Yard) is located in Salt Lake County, just outside of the service area. Passenger rail which includes Amtrak and commuter rail from UTA also runs through the jurisdiction.

Several spur lines operated solely for industrial use are operated in the western section of the service area by the Bingham Canyon Mine (Rio Tinto).

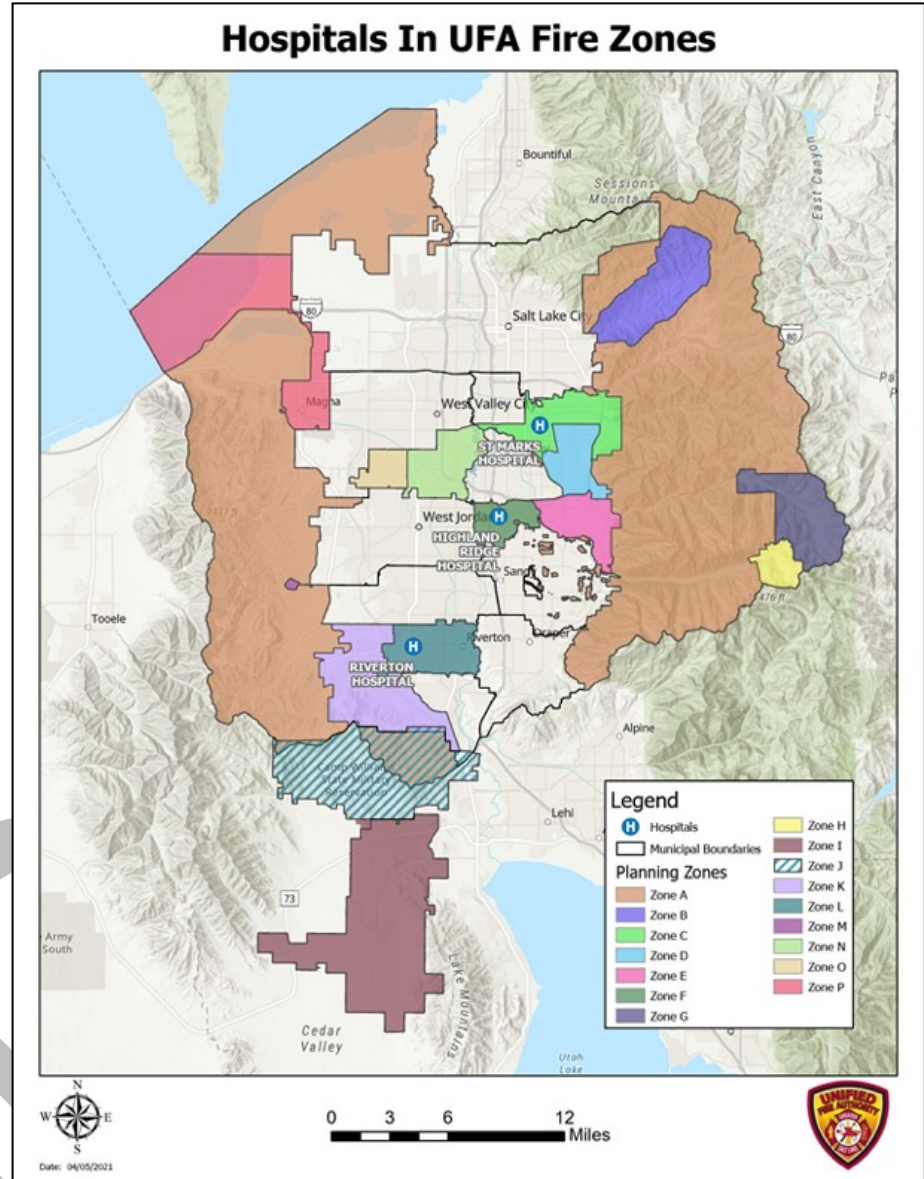


Map 17 - Location of All Rail Lines Within the Service Area

## Hospitals

Hospitals provide a critical service to injured, sick and vulnerable populations. These facilities are usually constructed of highly fire resistive construction with built in fire protection.

Emergencies which include but are not limited to fire incidents, may require emergency personnel to facilitate the rapid movement of patients away from the hazard.

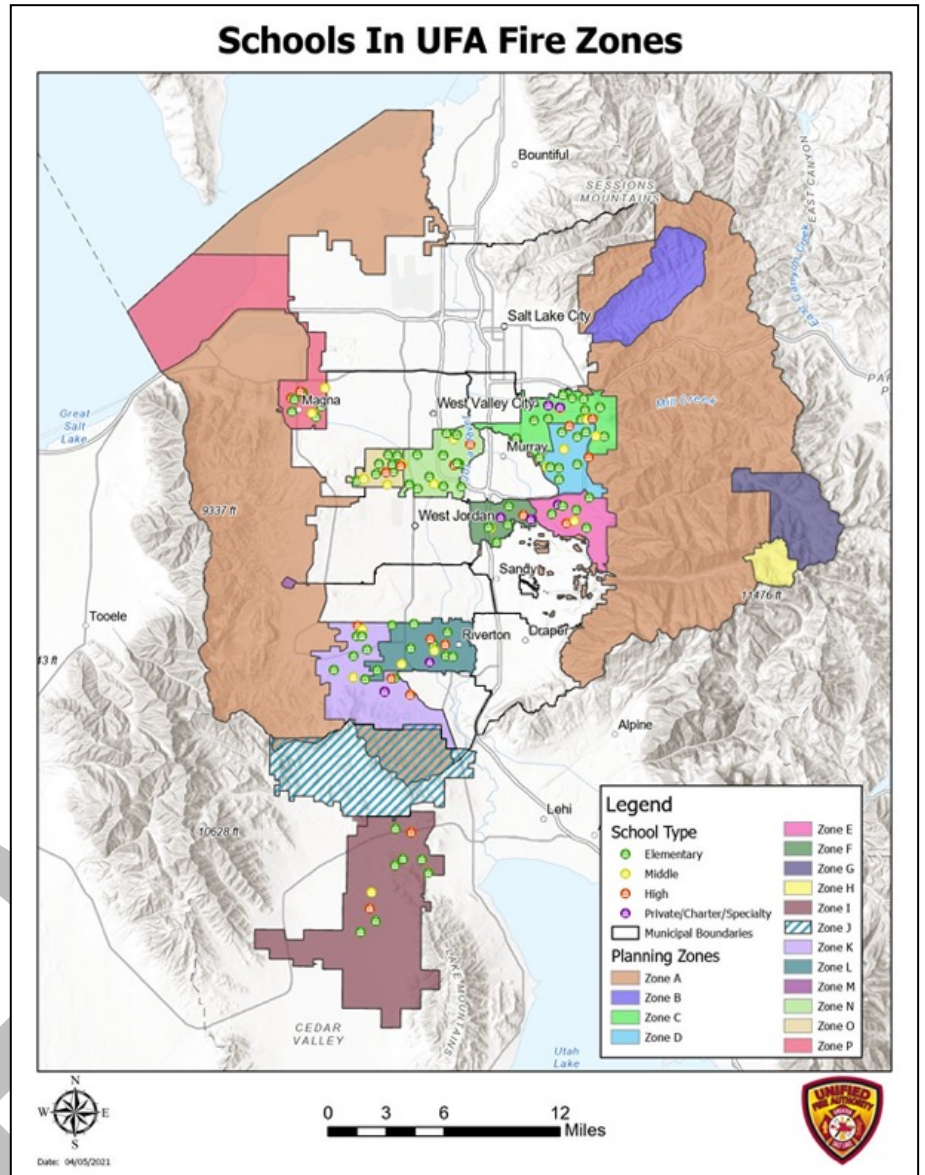


Map 18 - Location of All Hospitals Within the Service Area

### Schools (Public/Private)

Multiple school districts and private educational institutions operate within the service area. Unified Fire Authority provides protection to 62 elementary schools, 17 middle/junior high schools and 12 high schools. There are also 25 charter/private schools within the jurisdiction. This does not include the multitude of private and public pre-schools and day cares.

The number of school aged children protected is over 84,000.



Map 19 - Location of All Schools Within the Service Area

## Large Square Footage Buildings

Larger buildings such as warehouses, mall, big box stores present several risks to response. These buildings which are over 100,000 square feet of space will require more water, apparatus, and personnel to effectively control fires.

Within Unified Fire Authority there are 169 buildings which meet the definition of a large square footage building.

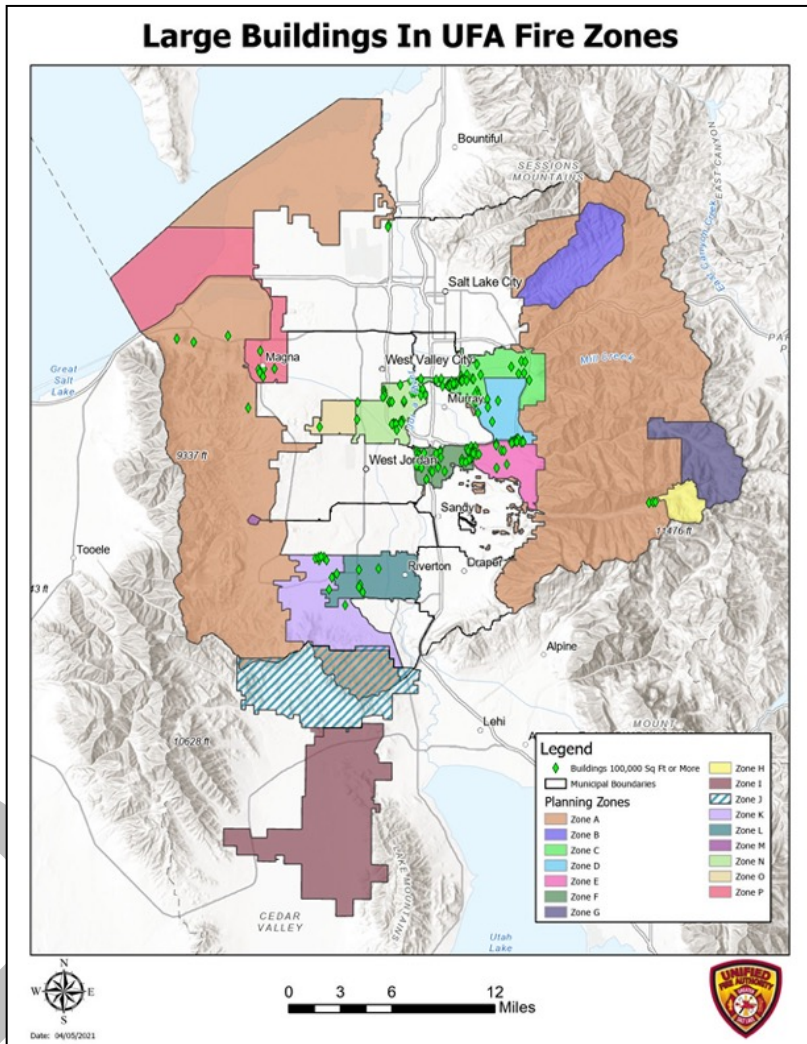
## Mid-Rise Buildings

Buildings which are three or more stories in height are often classified as mid-rise buildings.

These buildings have specific hazards which include building heights that will typically require the use of an aerial apparatus to access the upper floors and the roof.

The number and placement of aerial apparatus assists in response to mid-rise buildings and also accomplishes the desired requirement of the ISO which is that an aerial apparatus is within two and a half miles from buildings that are three or more stories in height.

UFA protects approximately 1544 mid-rise buildings.



Map 20 - Location of All Large Buildings Within the Service Area



## **Unified Fire Authority**

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