



**MAG**

Expert Resources. Enriching Lives.

# TransPlan50

2019-2050 REGIONAL TRANSPORTATION PLAN



## Environmental Impacts and Hazards

Appendix B



## **TITLE SIX / ENVIRONMENT JUSTICE**

A 1994 Presidential Executive Order directed every federal agency to make Environmental Justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on “minority and low-income populations.” The DOT’s Environmental Justice initiatives accomplish this goal by involving the potentially affected public in developing transportation projects that fit harmoniously within their communities without sacrificing safety or mobility.

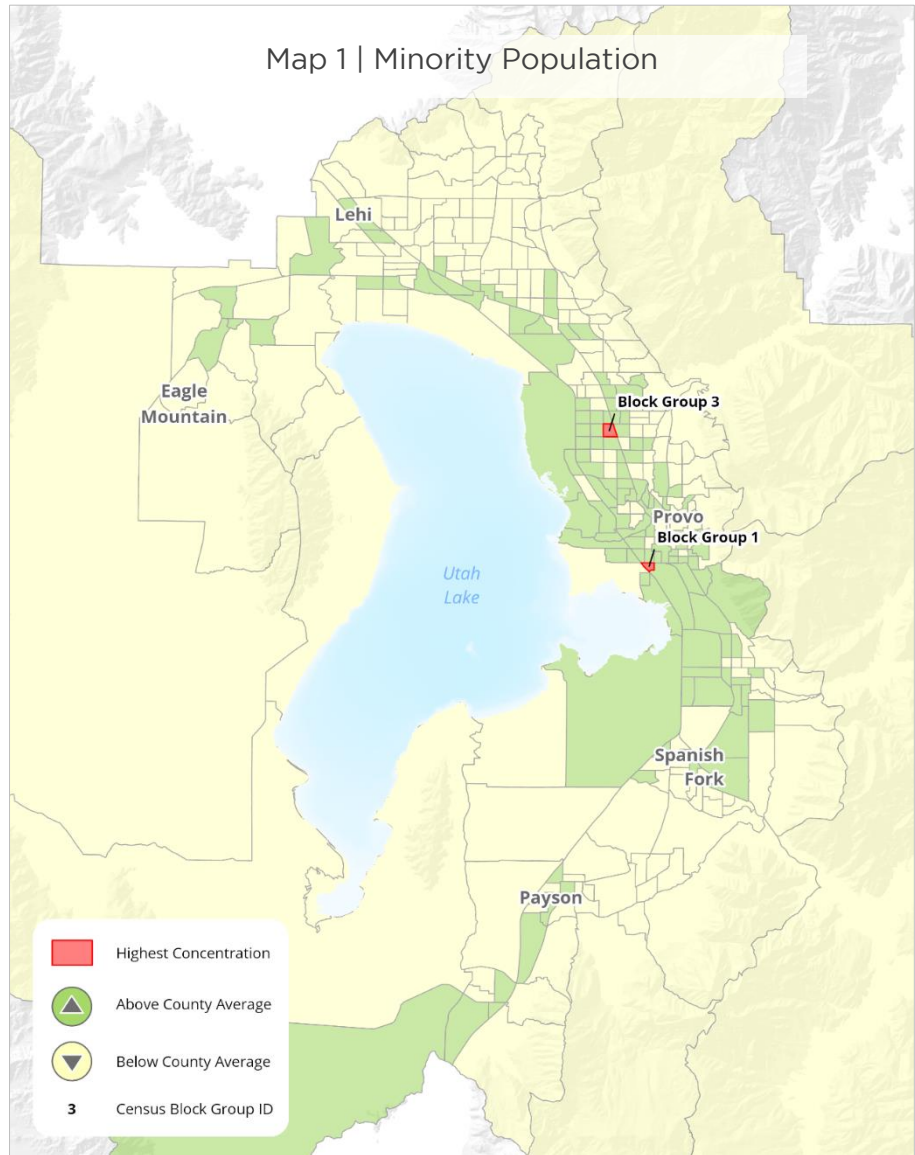
There are four fundamental Environmental Justice principles:

1. To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low- income populations.
2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.
4. To certify compliance with Title VI and address Environmental Justice, MPOs need to:
  - a. Enhance their analytical capabilities to ensure that the Regional Transportation Plan and the Transportation Improvement Program (TIP) comply with Title VI.
  - b. Identify residential, employment, and transportation patterns of low-income and minority populations so that their needs are identified, and the benefits and burdens of transportation investments can be fairly distributed.
  - c. Evaluate and - where necessary - improve their public involvement processes to eliminate participation barriers and engage minority and low-income populations in transportation decision-making.



**Minority, Low-Income, Disable, and Elderly Populations:** Road and transit project impacts may have significant effects on minority, low income, elderly, and disabled populations. Proposed projects in the Regional Transportation Plan were evaluated for their potential cumulative impacts on these population groups. These populations were mapped by greater than or less than the region-wide average by census tracts or block groups, then overlaid with the Regional Transportation projects. Based on this overlay analysis, none of the analyzed populations will receive a disproportionate benefit or negative impact of the proposed transportation projects. Some of these populations may visually appear on the maps to be concentrated in the more rural area of the Metropolitan Planning Organization (MPO); however, that may be attributed to the large geographic size of the rural census tracts or block groups in those areas.

**Minority Groups:** The MPO area includes minority groups and persons identifying themselves as Black or African American, American Indian, Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Hispanic or Latino, or



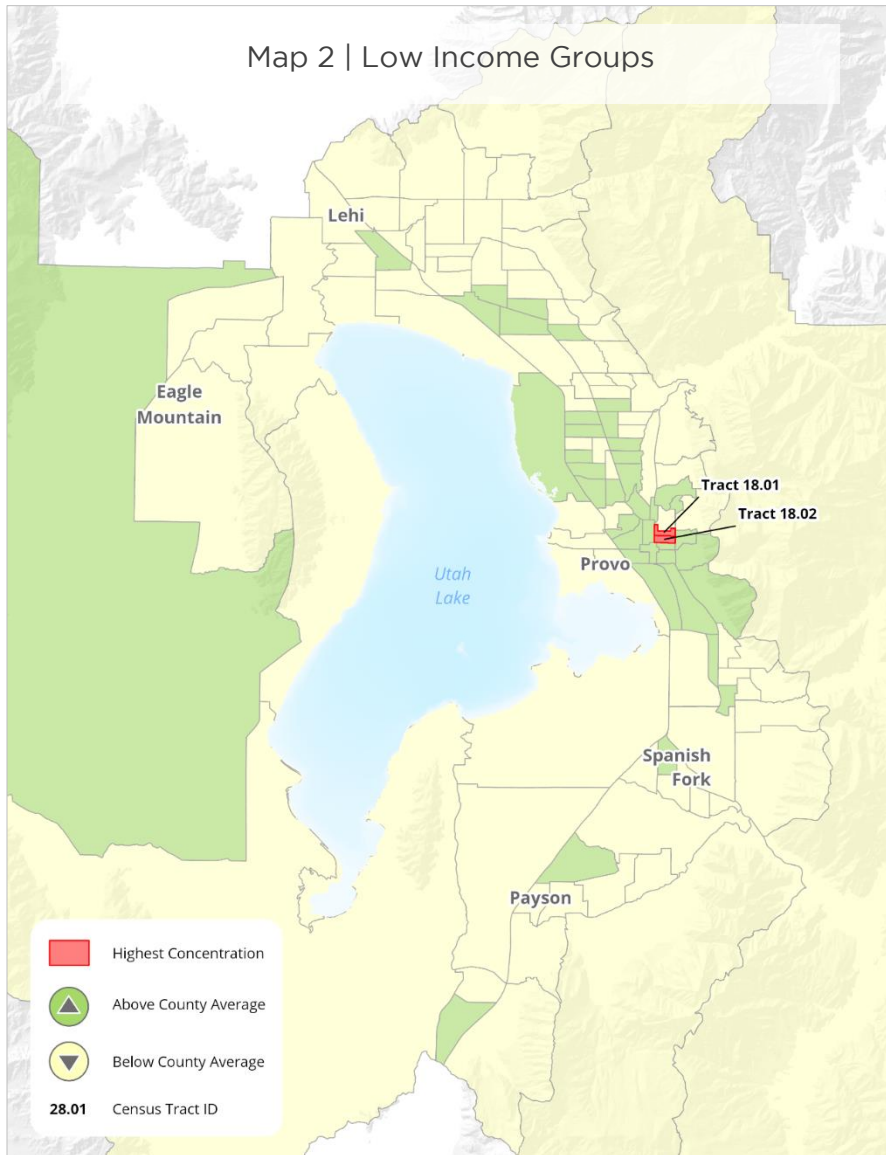


in combinations of the above, in the 2017 Census American Community Survey (ACS). Utah County's minority population of 111,659 is approximately 19.8% of the total and appears to cluster in the Provo / Orem / Vineyard areas. Due to the distribution of this population and the planned projects, the effects of the projects on the minority populations do not appear to be significantly greater than the projected impacts on the area's population in general.

Map 2 Minority Population map illustrates minority populations by census block groups that have a greater than the region-wide average. The highest two census block groups by percentage are in Orem (Census Block Group 3) and Provo (Census Block Group 1). Using Travel Demand Model output data tool that estimates travel time, an off-model test for each location was conducted from each origin going north to Draper and south to Santaquin to see how the Regional Transportation Plan performed for the minority population from 2019 to 2050. The two locations will experience drive times like nearby Traffic Analysis Zones (TAZ) (#2332 & #2416) that had minority populations below the regional average. No significant difference exists between the minority population's travel time and the population as a whole.

**Low-Income Groups:** Low-income residents with a 4-person household annual income equal to or less than \$25,750 were used as an impact indicator as specified by the U.S. Department of Health and Human Services 2019 poverty guidelines for the 48 contiguous states and the District of Columbia. The 2017 ACS indicates that 11.8% of all individuals (or 66,394) are at or below the poverty thresholds. The low-income population in Utah County appears to cluster in the Provo / BYU area. Due to the distribution of this population and the planned projects, the effects of the projects on the low-income populations do not appear to be significantly greater than the projected impacts on the area's population in general.

Map 2 Low-Income Group map illustrates low-income populations by census tracts that have greater than the region-wide average of 11.8% low-income population. The highest two census tracts by percentage for low-income groups were both located in Provo City (Census Tracts 18.01 and 18.02) Using a Travel Demand Model output data

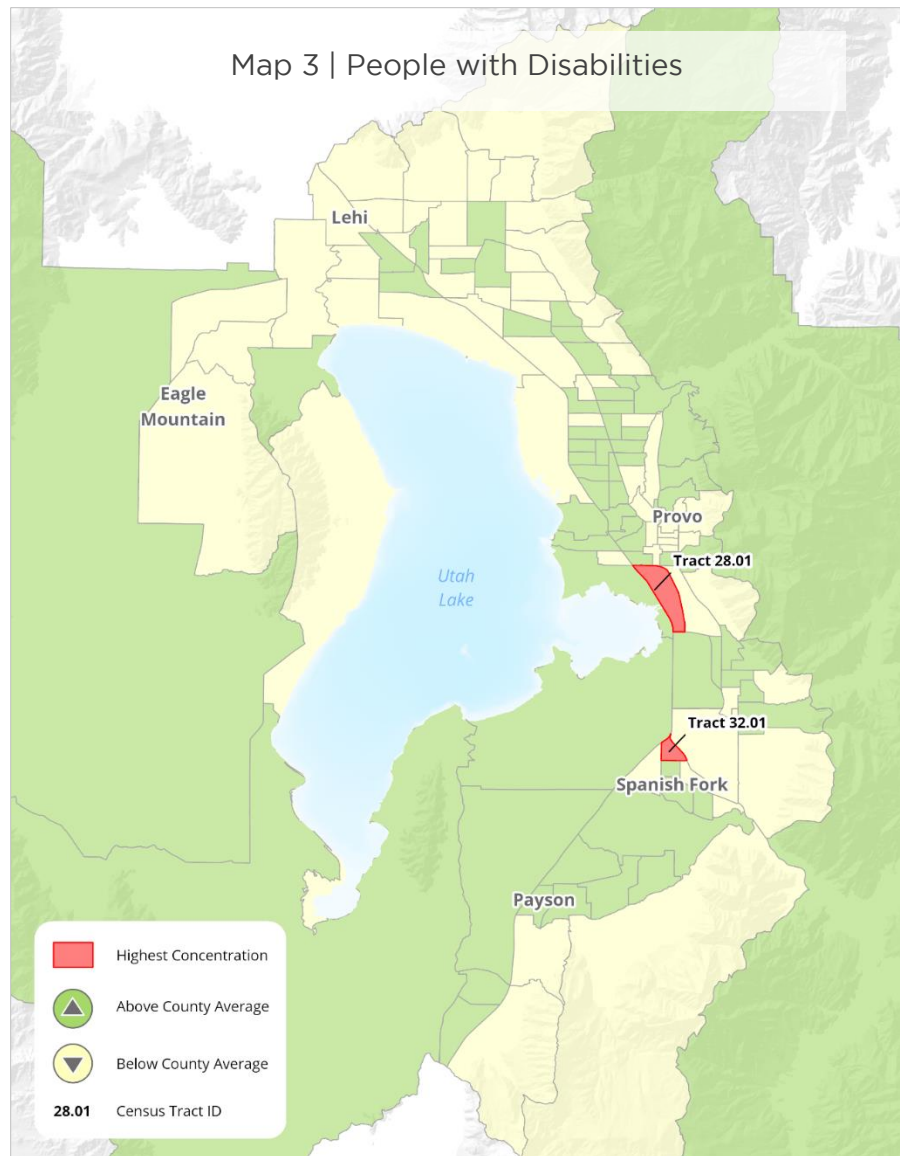


tool that estimates travel time, an off-model test for each location was conducted from each origin going north to Draper and south to Santaquin to see how the Regional Transportation Plan performed for the low-income population from 2019 to 2050. The two locations will experience drive times similar to nearby TAZ (#2385 and #2402) that had low-income population below the regional average. No significant difference exists between the low-income population's travel time and the population as a whole.

**People with Disabilities:** People with disabilities are described in the 2017 ACS as non-institutionalized persons with mobility limitations, age five years and older. Based on 2017 ACS information, 43,414 people, or 7.7% of the total population, were considered disabled with various kinds of limitations. The disabled population appears to be evenly distributed throughout the MPO. The Regional Transportation Plan projects impacts, and benefits do not appear to be significantly greater upon the disabled population than that on the area's population in general.



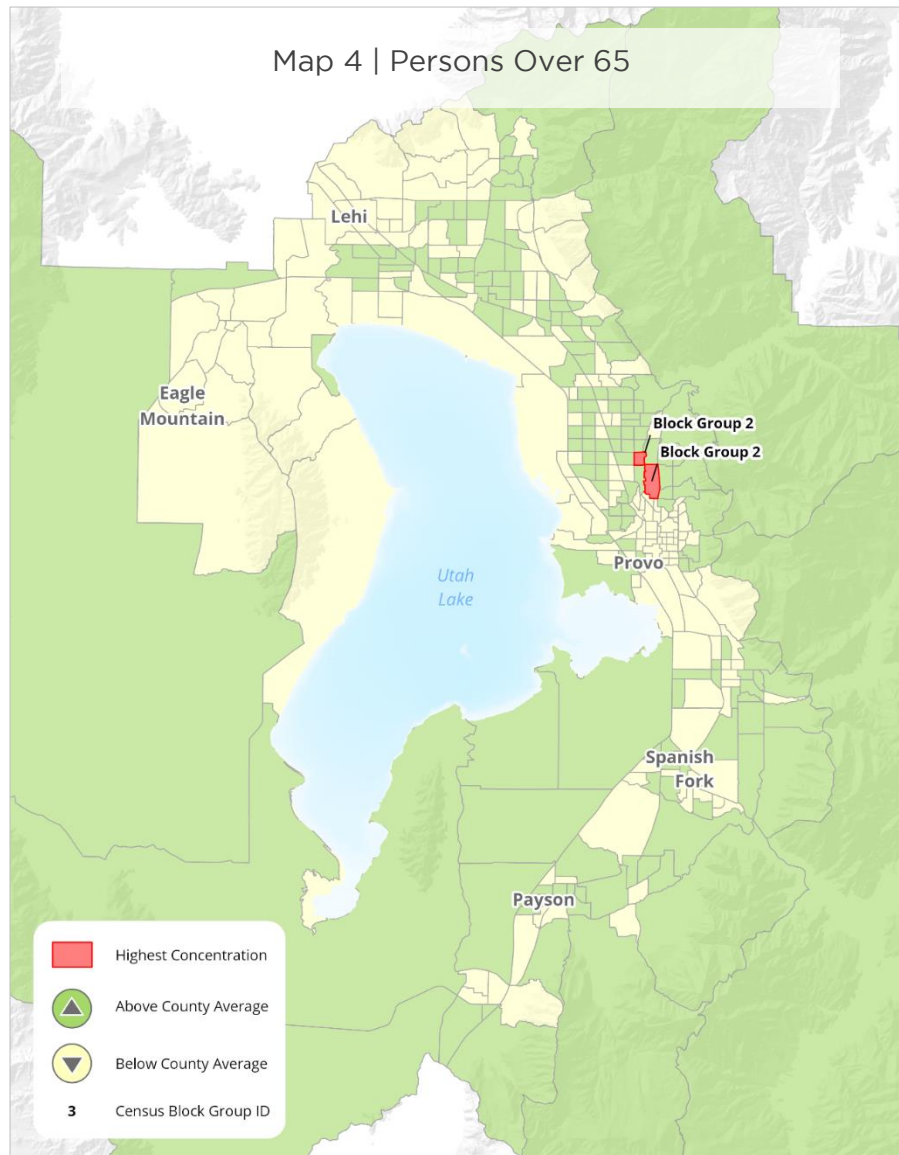
Map 3 People with Disabilities map illustrates disabled populations by census tracts that have greater than the region-wide average of 7.7% disabled population. The highest census tracts by population percentage are located in Provo (Census Tract 28.01) and Spanish Fork (Census Tract 32.01). Using a Travel Demand Model output data tool that estimates travel time, an off-model test for each location was conducted from each origin going north to Draper and south to Santaquin to see how the Regional Transportation Plan performed for the disabled population from 2019 to 2050. The two locations will experience drive times similar to nearby TAZ (#2480 and #2560) that had disabled populations below the regional average. No significant difference exists between the disabled population's travel time and the population as a whole.





**Persons Over 65:** Persons described as elderly in the 2017 ACS data are 65 years and older represent 7.4% of the population or 41,777 persons in Utah County. The elderly population in Utah County appears to slightly clustered in the Provo / Orem area. Due to the distribution of this population and the planned projects, the effects of the projects on the elderly populations does not appear to be significantly greater than the projected impacts on the population in general.

The Persons over 65 Map illustrates elderly populations by census block groups that have greater than the region-wide average of 7.4%. The highest two census block groups by percentage for persons over 65 are located in Orem (Census Block Group 2) and Provo (Census Block Group 2). Using Travel Demand Model output data tool that estimates travel time, an off-model test for each location was conducted from each origin going north to Draper and south to Santaquin to see how the Regional Transportation Plan performed for the elderly population from 2019 to 2050. The two locations will





experience drive times similar to nearby TAZ (#2325 and #2371) that had elderly populations below the regional average. No significant difference exists between the elderly population's travel time and the population as a whole.

**Mitigation Approach:** The following strategies will help ensure populations of minority, low-income, people with disabilities, and persons over 65 in the metropolitan planning area from being negatively impacted by the Regional Transportation Plan.

-Provided these population groups the opportunity to participate in the Regional Transportation Planning process through the annual transportation planning open house and public comment period for the Regional Transportation Plan.

- Many cities have general plans that outline neighborhoods as well as neighborhood councils, which can help design transportation facilities that provide access without creating social barriers.

-Any Transportation Project that will create a barrier within a currently functioning neighborhood should be redesigned or relocated.

-Design for convenient access to shopping, medical services, and employment should be provided with special consideration of the elderly and disabled. For example, wide street crossings need sufficient signalization and time allotted for slower moving citizens to cross.

-Uneven burdens for transportation negative impacts or benefits should be avoided through considering the spatial distribution of disadvantaged groups in relation to transportation facilities.

-A balanced system providing equal benefits and impacts throughout the area with all modes is included in the Regional Transportation Plan through GIS analysis. This balance should be carried forward through the implementation of the plan.





**Outreach:** MAG staff compiled a contact list of organizations and agencies that work closely with minority, low-income, disabled, and elderly populations. This contact list will be utilized to invite these populations to participate in the public comment period for the Regional Transportation Plan. This list will also be used to invite these populations groups to our annual transportation planning open house. MAG also provides a communication portal through it's website ([www.mountainland.org](http://www.mountainland.org) - under the **contact us** section) to allow these population groups to address any Environmental Justice and Title VI concerns or issues.

## **ENVIRONMENTALLY SENSITIVE AREAS**

Road and Transit projects in the transportation plan will have both positive and negative impacts on the social and physical environment of the region. For example, highway and transit improvements may reduce congestion, increase accessibility, resulting in fewer accidents, and improve air quality. However, the construction or upgrading of highways may impact existing agriculture protection easements, increase vulnerability to geologic hazards, disturb existing EPA study sites, and impact historic or public recreation areas. The MPO encourages transportation project sponsors to mitigate these impacts by working with UDOT, US Army Corps of Engineers, Utah DWR, US Fish, and Wildlife Service, and the State Historic Preservation Office to mitigate impacts in concert with Formal Conservation Plans--existing mitigation projects established by these organizations—in identified high-value locations.

**Data Collection:** MAG staff consulted with local resource agencies to understand environmental factors that could be impacted by transportation planning efforts. Each resource agency was contacted directly for environmental themed Geographic Information System (GIS) data for MAG's environmental assessment analysis. Below is a list of environmental-themed GIS data collected:

- EPA Study Sites
- 4(F) & 6(F) Properties (Parks, Golf Courses, School Playgrounds, 6(F) Recreational Areas, Trails, Historic Sites, & Cemeteries)
- Farmland & Agriculture Protection Zones

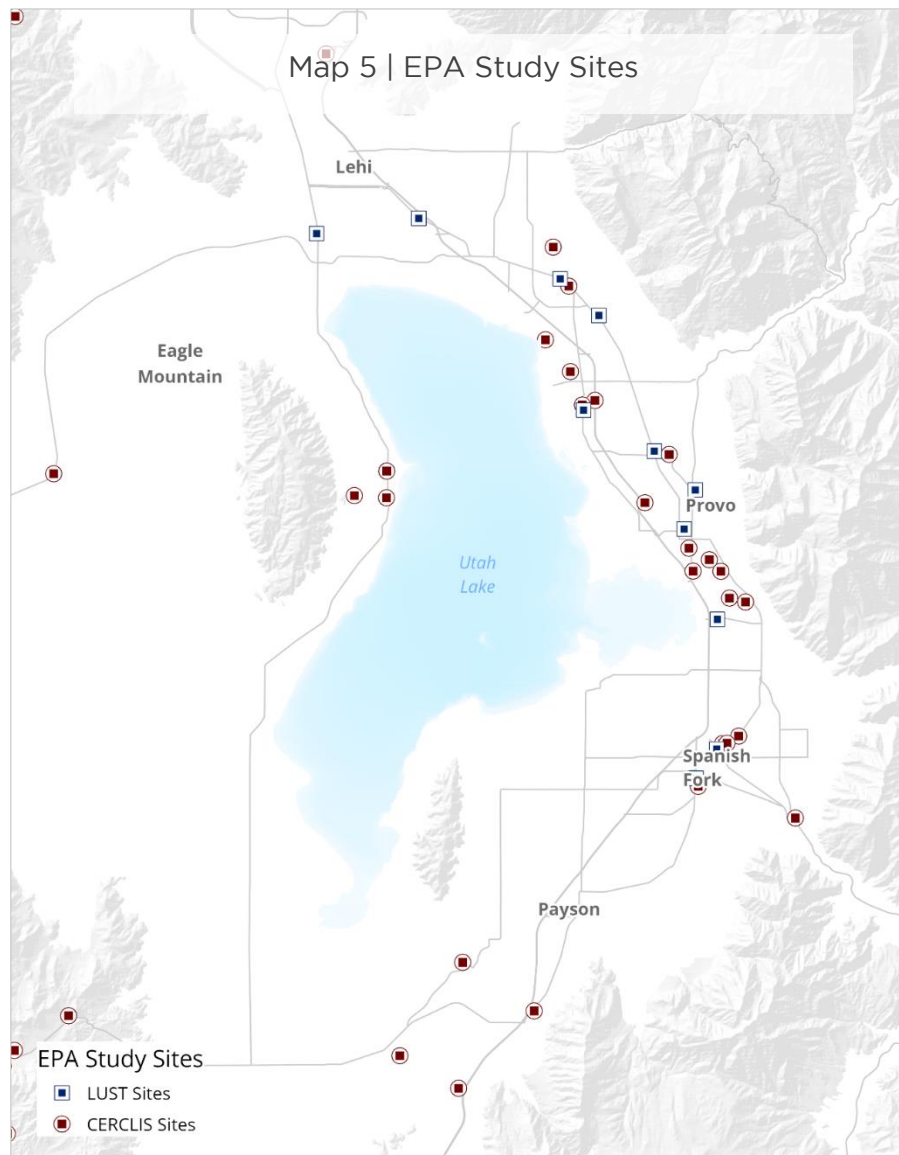


- FEMA Floodplains
- Geologic Hazards (Faults, High Liquefaction Areas, & Debris Flow Zone)
- Wetlands (National Wetland Inventory, Utah Lake Preserve, & UDOT Wetland Mitigation Bank)

**MAG - Environmental Assessment Tool:** Staff then utilized an in-house application called MAG Environmental Appraisal Tool to evaluate the impacts of the Regional Transportation Plan on these environmental-themed GIS datasets. This tool utilizes GIS to identify which environmental features fall within the extents of road projects planned for 2019 to 2030. The results of this analysis are presented as tables in this document. This information will assist transportation planners, state transportation practitioners, and resource agencies to better understand the potential environmental impacts associated with the Regional Transportation Plan.

### EPA STUDY SITES

The potential for hazardous waste in project rights-of-way is a concern in the setting of transportation





facilities, because the purchase of a contaminated site or of property split from a contaminated parcel may result in the public agency becoming liable for hazardous waste clean-up. This liability could create significant financial burdens and project delays. To identify projects that could conflict with hazardous waste sites, MAG staff compared the location of Regional Transportation Plan projects with the location of hazardous waste sites listed in the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) and Leaking Underground Storage Tanks (LUST). CERCLIS is the database used by the EPA to track superfund progress at potential and confirmed hazardous waste sites. Inclusion in CERCLIS means EPA has been notified of the possibility of some release of a hazardous substance to the environment, triggering the need for a preliminary assessment of Underground Storage Tanks (UST) which are regulated and monitored by the EPA. The EPA has provided a Trust Fund for LUST clean up. The Trust Fund provides money for oversight and enforcement of corrective action by the responsible party. The Trust Fund also provides money for cleanups at UST sites where the owner or operator is unknown, unwilling, or unable to respond, or which require emergency action. The EPA Study Sites Map illustrates the current inventory of EPA CERCLIS and LUST sites within the MPO area. The potentially impacted planned projects by EPA study sites are listed below in the analysis results table.

**Analysis Results:**

*There are no EPA study sites that impact any projects in phase one of the Regional Transportation Plan.*

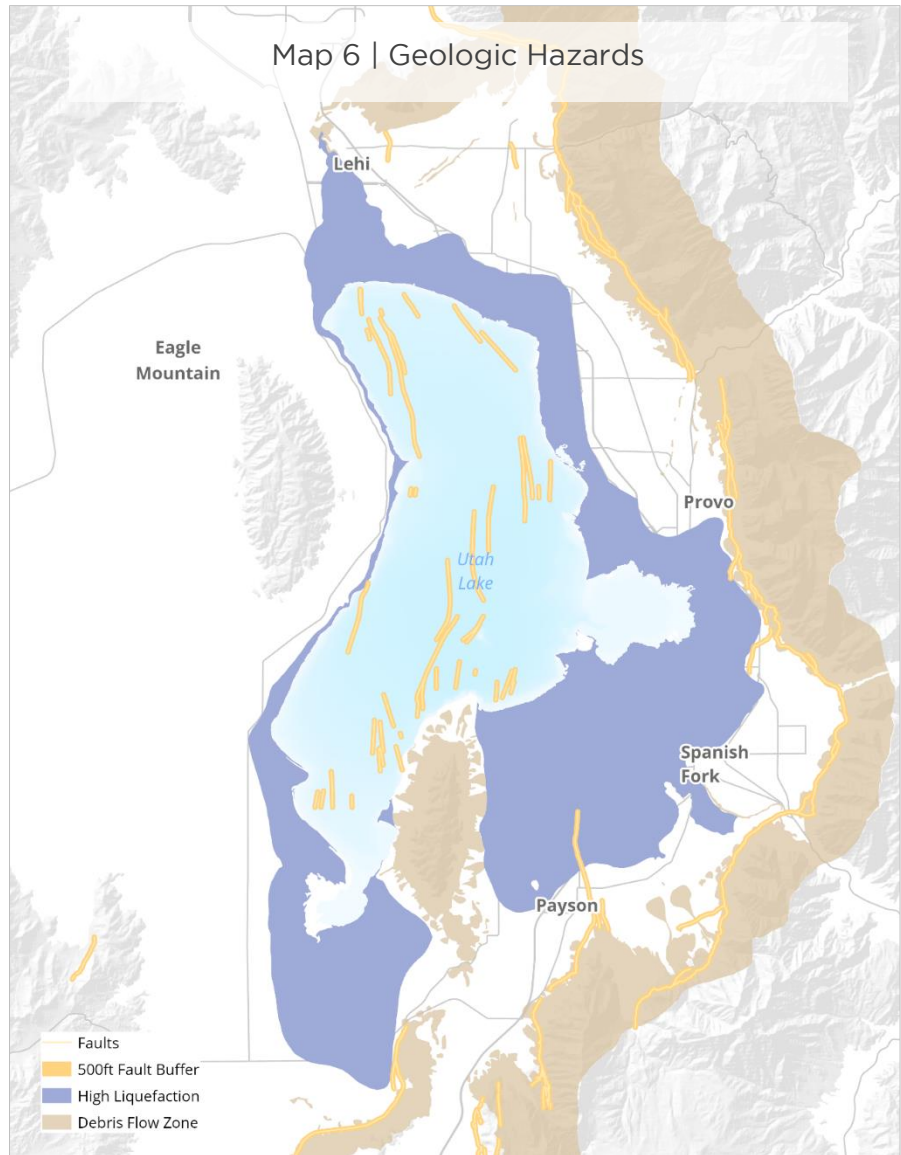
**Mitigation Approach:**

- The presence of an EPA site may significantly increase the cost of any project. Clean up, and mitigation cost should be included during the project's cost estimating.
- While increasing project costs a transportation project can be the catalyst for removing a negative environmental condition and spur further clean up and reclaiming of land for development. Appropriate land uses, and community participation in reclaiming a site should be sought in the early planning process thru completion.



### GEOLOGIC HAZARDS

The Wasatch Fault, the creator of the area’s steep eastern slopes, runs the length of the MPO area and marks the potential for significant, damaging earthquakes. Many such hazard areas exist that must be considered for the potential impact on transportation facilities. Fault lines of known earthquake activity, slope hazard or debris flow areas, and high potential liquefaction areas should be avoided. Safeguards should be implemented during the project’s design and implementation to lessen the impact of these possible hazards.



Map 6 Geologic Hazards map illustrates these hazards in relation to the proposed projects. The following table below was generated using a comparison of known geologic hazards and the proposed transportation projects.



**Analysis Results:**

Map #	Project Name	Project Location	Impact	Acres In ROW
12	Lehi 1200 W	I-15 to Timpanogos HWY	500ft Fault Zone	6
5	Clubhouse DR	I-15 to Lehi 3600 W	Liquefaction Potential	5.15
13	Lehi 2100 N FWY SR194	Mountain View Corridor to I-15	Liquefaction Potential	68.09
14	Lehi 3600 W/Point of the Mtn. Connector	Lehi 2600 N to Salt Lake County	Liquefaction Potential	1.65
15	Lehi 3600 West	Lehi Main ST to Clubhouse DR	Liquefaction Potential	34.95
16	Lehi Main ST	Commerce DR to Lehi 500 W	Liquefaction Potential	30.68
20	Pioneer Crossing	Redwood RD to Lehi 2300W	Liquefaction Potential	26.84
21	Pleasant Grove BLVD	Vineyard Connector to I-15	Liquefaction Potential	6.26
22	Pleasant Grove BLVD	N. County BLVD to State ST	Liquefaction Potential	14.29
23	Pony Express PKWY	Redwood RD to Vineyard Connector	Liquefaction Potential	68.64
25	State ST	American Fork 500 W to Pleasant Grove 200 S	Liquefaction Potential	0.84
28	Triumph BLDV/Lehi 2300 W	Lehi 2100 N to Lehi 1900 S	Liquefaction Potential	46.31
29	Vineyard Connector	Geneva RD to Pioneer Crossing	Liquefaction Potential	112.64
33	Lakeview PKWY/Geneva RD	Provo 500 W to University PKWY	Liquefaction Potential	94.28
36	Orem Center ST	I-15 to Geneva RD	Liquefaction Potential	1.39
38	Provo 820 N	Geneva RD to University AVE	Liquefaction Potential	1.4



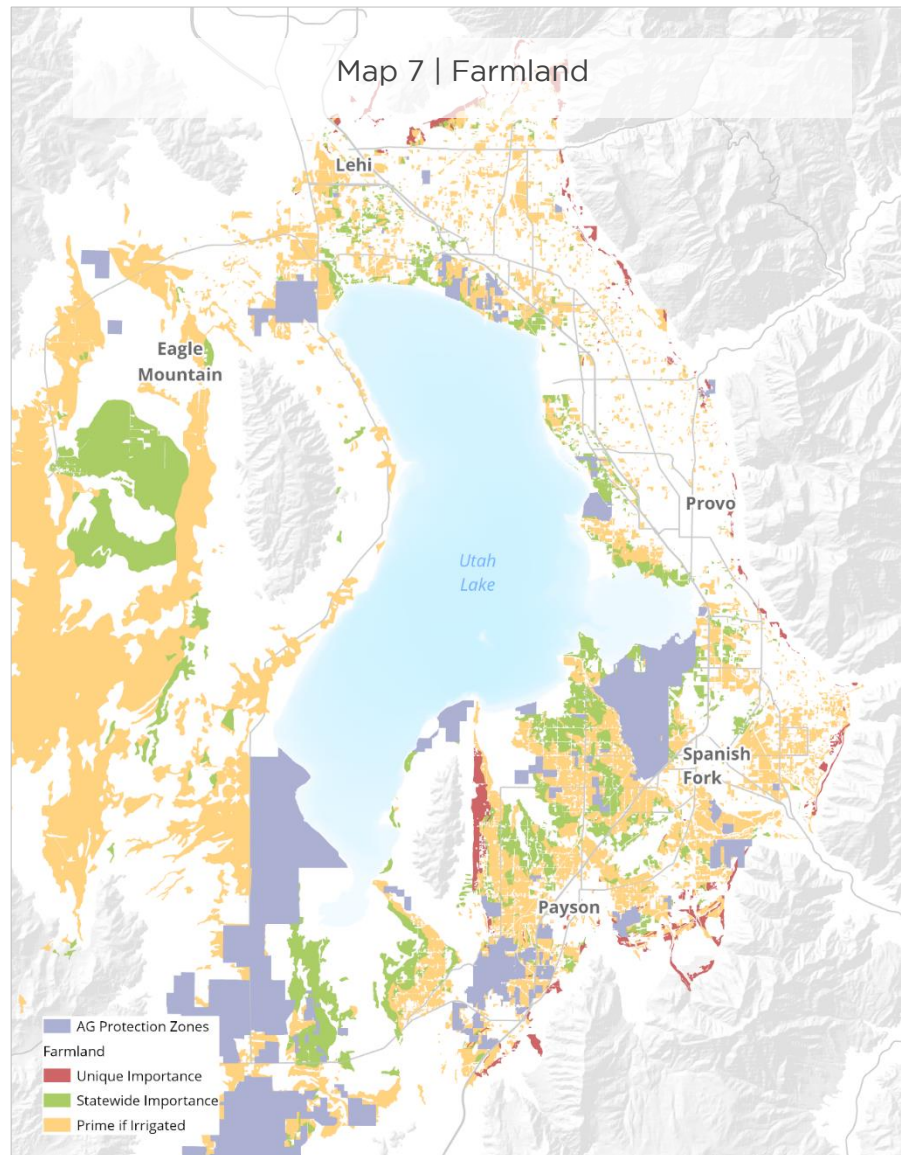
Map #	Project Name	Project Location	Impact	Acres In ROW
39	Provo Center ST	Geneva RD to Provo 1600 W	Liquefaction Potential	4.39
40	Provo Geneva RD	Provo Center ST to Lakeview PKWY	Liquefaction Potential	24.55
41	University AVE	Provo 920 S to Provo 300 S	Liquefaction Potential	7.19
43	Elk Ridge DR	UC 8000 S to SR198	Liquefaction Potential	23.08
49	Nebo Belt RD	Payson Main ST to SR198	Liquefaction Potential	15.32
51	Spanish Fork 1550 W	UC 8000 S to I-15	Liquefaction Potential	12.41
55	Springville 1200 W/Cyn. Creek PKWY	Market Place DR to US89	Liquefaction Potential	66.66
56	Springville 1400 N SR75	I-15 to Springville Main ST US89	Liquefaction Potential	23.51
57	Springville 1600 S/ Spanish Fork 2700 N	Spanish Fork Main ST to SR51	Liquefaction Potential	28.17
59	SR198	Arrowhead Trail to Salem 400 N	Liquefaction Potential	4.21
61	US6	I-15 to Spanish Fork Center ST	Liquefaction Potential	13.74
5	Clubhouse DR	I-15 to Lehi 3600 W	Debris Flow Zone	3.58
13	Lehi 2100 N FWY SR194	Mountain View Corridor to I-15	Debris Flow Zone	1.78
14	Lehi 3600 W/Point of the Mtn. Connector	Lehi 2600 N to Salt Lake County	Debris Flow Zone	7.4
27	Traverse Mtn BLVD	West Point Connector to East Point Connector	Debris Flow Zone	4.92
55	Springville 1200 W/Cyn. Creek PKWY	Market Place DR to US89	Debris Flow Zone	0.16
<b>Total</b>				<b>760.45</b>



**Mitigation Approach:**

- One of the primary concerns that should be addressed when planning a facility in an area prone to geologic hazards is to ensure that there are alternative routes providing similar access.
- Alternative rights-of-way in less unstable areas should be considered.
- Engineering and design should include mitigation for such conditions.
- Funding of projects should include sufficient funds for mitigation measures.

**FARMLAND:** The MPO Area has several important tracts of unique, important, and prime farmland as mapped and identified by the United States Department of Agriculture. These assets have significance beyond local boundaries. While most of the alfalfa and feed grains such as winter wheat and sweet corn are used locally, specialty crops of apples, pears, and cherries find their way into national and international markets. Also, Utah County has designated “Agriculture protection areas,” geographic





areas granted specific legal protection for the production of “crops, livestock, and livestock products” or devoted to an agency of the state or federal government. Many projects in the Regional Transportation Plan will impact these unique and prime farmlands as well as the agriculture protection areas. These impacts include the use of farmland for rights-of-way and the division of large contiguous pieces of farmland into smaller units. Smaller units may not be as economically viable for farming. Historically the valley floor has been almost entirely agriculture as there are large areas of high-quality soil. The increase in population has led to the conversion of much of the land to residential and commercial use, and irrigation water to industrial and residential purposes. See the table in the analysis results for specific projects and associated impacts.

**Analysis Results:**

Map #	Project Name	Project Location	Impact	Acres In ROW
9	Foothill BLVD	Cory Wride FWY to Stillwater DR	AG Protection	19.25
15	Lehi 3600 West	Lehi Main ST to Clubhouse DR	AG Protection	0.21
16	Lehi Main ST	Commerce DR to Lehi 500 W	AG Protection	0.22
23	Pony Express PKWY	Redwood RD to Vineyard Connector	AG Protection	1.84
29	Vineyard Connector	Geneva RD to Pioneer Crossing	AG Protection	15.92
33	Lakeview PKWY/Geneva RD	Provo 500 W to University PKWY	AG Protection	17.45
40	Provo Geneva RD	Provo Center ST to Lakeview PKWY	AG Protection	0.83
60	Summit Ridge PKWY	US6 to Santaquin 500 S	AG Protection	4.76





Map #	Project Name	Project Location	Impact	Acres In ROW
3	Airport RD	Cory Wride HWY to East Expressway	Farmland	15.61
4	American Fork 100 E/Alpine HWY	State ST to Canal BLVD, Highland	Farmland	1.07
5	Clubhouse DR	I-15 to Lehi 3600 W	Farmland	1.17
6	Cory Wride FWY	Mountain View Corridor to Ranches PKWY	Farmland	27.21
7	Cory Wride HWY	Ranches PKWY to Airport RD	Farmland	0.51
8	East Expressway	Eagle Mountain BLVD to Eagle Mountain BLVD	Farmland	33.65
9	Foothill BLVD	Cory Wride FWY to Stillwater DR	Farmland	39.03
12	Lehi 1200 W	I-15 to Timpanogos HWY	Farmland	1
13	Lehi 2100 N FWY SR194	Mountain View Corridor to I-15	Farmland	27.15
14	Lehi 3600 W/Point of the Mountain Connector	Lehi 2600 N to Salt Lake County	Farmland	12.35
15	Lehi 3600 West	Lehi Main ST to Clubhouse DR	Farmland	17.13
16	Lehi Main ST	Commerce DR to Lehi 500 W	Farmland	3.17
17	Mid Valley RD	Eagle Mountain BLVD to East Expressway	Farmland	3.45
18	Mountain View FWY	Cory Wride HWY to Porter Rockwell PKWY	Farmland	19.25
19	Mt. Saratoga BLVD	Talus Ridge RD to Pony Express PKWY	Farmland	0.52



Map #	Project Name	Project Location	Impact	Acres In ROW
20	Pioneer Crossing	Redwood RD to Lehi 2300 W	Farmland	0.3
21	Pleasant Grove BLVD	Vineyard Connector to I-15	Farmland	3.15
22	Pleasant Grove BLVD	North County BLVD to State ST	Farmland	0.57
23	Pony Express PKWY	Redwood RD to Vineyard Connector	Farmland	35.98
24	Pony Express PKWY	Sandpiper RD to Eagle Mountain BLVD	Farmland	5.17
25	State ST	American Fork 500 W to Pleasant Grove 200 S	Farmland	0.14
27	Traverse Mtn BLVD	West Point Connector to East Point Connector	Farmland	2.79
28	Triumph BLDV/Lehi 2300 W	Lehi 2100 N to Lehi 1900 S	Farmland	7.71
29	Vineyard Connector	Geneva RD to Pioneer Crossing	Farmland	60.73
33	Lakeview PKWY/Geneva RD	Provo 500 W to University PKWY	Farmland	69.11
34	Orem 1200 W	Sandhill RD to Orem Center ST	Farmland	0.69
35	Orem 1600 N	Orem 1200 W to State ST	Farmland	0.11
39	Provo Center ST	Geneva RD to Provo 1600 W	Farmland	0.23
40	Provo Geneva RD	Provo Center ST to Lakeview PKWY	Farmland	3.55
43	Elk Ridge DR	UC 8000 S to SR198	Farmland	17.61
49	Nebo Belt RD	Payson Main ST to SR198	Farmland	26.63



Map #	Project Name	Project Location	Impact	Acres In ROW
51	Spanish Fork 1550 W	UC 8000 S to I-15	Farmland	3.55
52	Spanish Fork 2000 E	US6 to Canyon RD SR198	Farmland	6.9
54	Spanish Fork PKWY	Mapleton Slant RD to SR51	Farmland	4.88
55	Springville 1200 W/Canyon Creek PKWY	Market Place DR to US89	Farmland	23.22
56	Springville 1400 N SR75	I-15 to Springville Main ST US89	Farmland	0.45
57	Springville 1600 S/Spanish Fork 2700 N	Spanish Fork Main ST to SR51	Farmland	1.93
59	SR198	Arrowhead Trail to Salem 400 N	Farmland	1.86
60	Summit Ridge PKWY	US6 to Santaquin 500 S	Farmland	4.61
<b>Total</b>				<b>544.66</b>

**Mitigation Approach:**

- Transfer of development rights, open space preservation program through Utah’s Quality Growth commission should be pursued for these large parcels and transportation facilities designed to preserve them.
- Project sponsors should consider the implication of the Agriculture protection areas on the project budget and project development timeline.

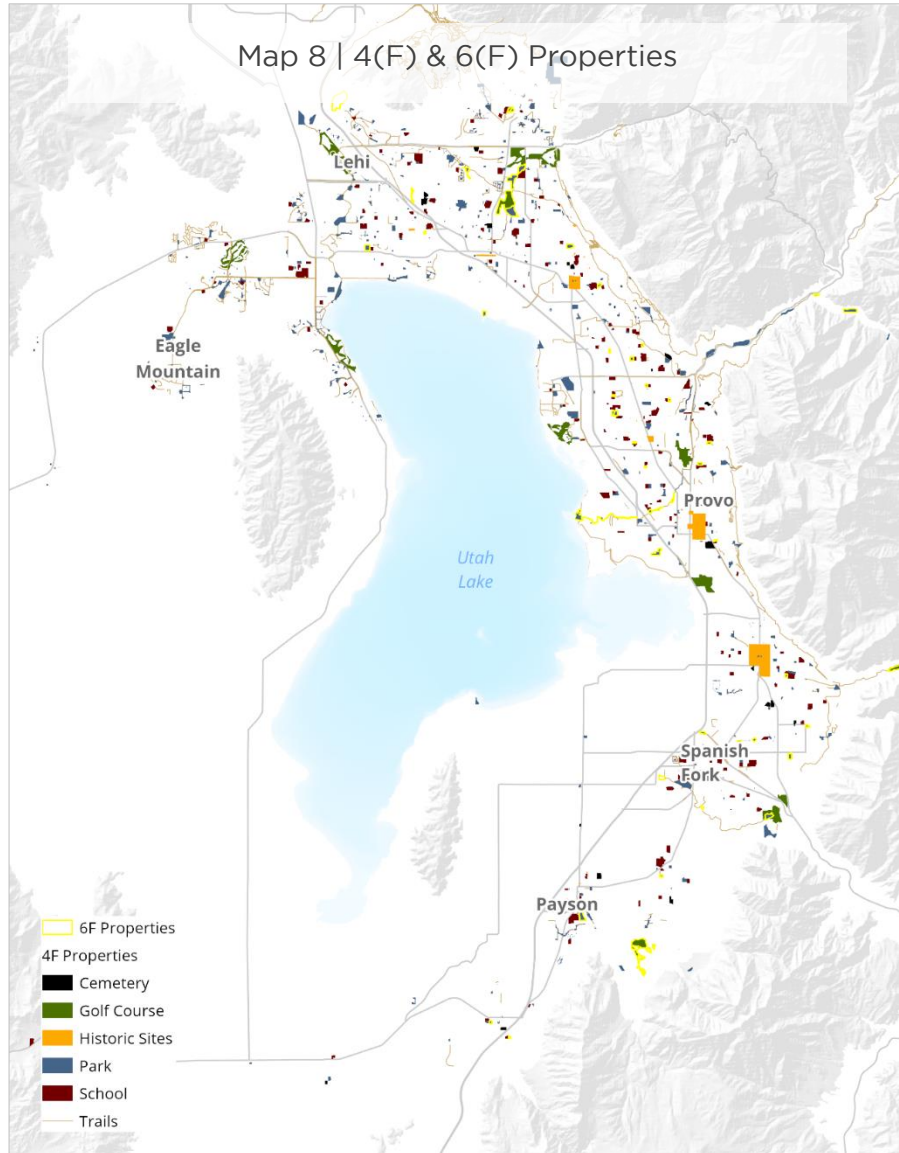
**4(F) & 6(F) PROPERTIES**

Section 4(F) of the Department of Transportation Act of 1966 and Section 6(F) of the Land and Water Conservation Act of 1965 provide protections for certain



properties that may be impacted by planned transportation facilities. 4(F) properties include publicly owned parks and recreational areas, publicly owned wildlife and waterfowl refuges, public or privately-owned historic sites, cultural resource sites, and publicly owned and accessible trails.

Outdoor recreational properties funded by the Land and Water Conservation Fund (LWCF) are referred to as 6(F) properties. The following table lists planned transportation projects that intersect with public parks, public recreation areas, historic sites, cemeteries, school playgrounds, public golf courses, and existing non-motorized trails.





**Analysis Results:**

Map #	Project Name	Project Location	Impact	Acres In ROW
35	Orem 1600 N	Orem 1200 W to State ST	6(F) Property	0.11
40	Provo Geneva RD	Provo Center ST to Lakeview PKWY	6(F) Property	0.16
4	American Fork 100 E/Alpine HWY	State ST to Canal BLVD, Highland	4(F) Property	0.49
5	Clubhouse DR	I-15 to Lehi 3600 W	4(F) Property	3.88
6	Cory Wride FWY	Mountain View Corridor to Ranches PKWY	4(F) Property	2.37
14	Lehi 3600 W/Point of the Mountain Connector	Lehi 2600 N to Salt Lake County	4(F) Property	0.78
16	Lehi Main ST	Commerce DR to Lehi 500 W	4(F) Property	0.58
23	Pony Express PKWY	Redwood RD to Vineyard Connector	4(F) Property	1.14
24	Pony Express PKWY	Sandpiper RD to Eagle Mountain BLVD	4(F) Property	0.59
28	Triumph BLDV/Lehi 2300 W	Lehi 2100 N to Lehi 1900 S	4(F) Property	1.16
29	Vineyard Connector	Geneva RD to Pioneer Crossing	4(F) Property	0.26
33	Lakeview PKWY/Geneva RD	Provo 500 W to University PKWY	4(F) Property	0.2



Map #	Project Name	Project Location	Impact	Acres In ROW
35	Orem 1600 N	Orem 1200 W to State ST	4(F) Property	0.39
38	Provo 820 N	Geneva RD to University AVE	4(F) Property	0.21
40	Provo Geneva RD	Provo Center ST to Lakeview PKWY	4(F) Property	0.63
53	Spanish Fork Center ST	Spanish Fork 900 E to US6	4(F) Property	0.53
55	Springville 1200 W/Canyon Creek PKWY	Market Place DR to US89	4(F) Property	0.12
1	I-15 Freeway	Timpanogos HWY to Lehi Main ST	4(F) Trails	N/A
2	I-15 Freeway	US6 to Salt Lake County	4(F) Trails	N/A
4	American Fork 100 E/Alpine HWY	State ST to Canal BLVD, Highland	4(F) Trails	N/A
5	Clubhouse DR	I-15 to Lehi 3600 W	4(F) Trails	N/A
6	Cory Wride FWY	Mountain View Corridor to Ranches PKWY	4(F) Trails	N/A
8	East Expressway	Eagle Mountain BLVD to Eagle Mountain BLVD	4(F) Trails	N/A
9	Foothill BLVD	Cory Wride FWY to Stillwater DR	4(F) Trails	N/A
12	Lehi 1200 W	I-15 to Timpanogos HWY	4(F) Trails	N/A



Map #	Project Name	Project Location	Impact	Acres In ROW
13	Lehi 2100 N FWY SR194	Mountain View Corridor to I-15	4(F) Trails	N/A
14	Lehi 3600 W/Point of the Mountain Connector	Lehi 2600 N to Salt Lake County	4(F) Trails	N/A
15	Lehi 3600 West	Lehi Main ST to Clubhouse DR	4(F) Trails	N/A
16	Lehi Main ST	Commerce DR to Lehi 500 W	4(F) Trails	N/A
17	Mid Valley RD	Eagle Mountain BLVD to East Expressway	4(F) Trails	N/A
18	Mountain View FWY	Cory Wride HWY to Porter Rockwell PKWY	4(F) Trails	N/A
20	Pioneer Crossing	Redwood RD to Lehi 2300 W	4(F) Trails	N/A
21	Pleasant Grove BLVD	Vineyard Connector to I-15	4(F) Trails	N/A
22	Pleasant Grove BLVD	North County BLVD to State ST	4(F) Trails	N/A
23	Pony Express PKWY	Redwood RD to Vineyard Connector	4(F) Trails	N/A
24	Pony Express PKWY	Sandpiper RD to Eagle Mountain BLVD	4(F) Trails	N/A
26	Traverse Mtn BLVD	Timpanogos HWY to Triumph BLVD	4(F) Trails	N/A
27	Traverse Mtn BLVD	West Point to East Point Connector	4(F) Trails	N/A



Map #	Project Name	Project Location	Impact	Acres In ROW
28	Triumph BLDV/Lehi 2300 W	Lehi 2100 N to Lehi 1900 S	4(F) Trails	N/A
29	Vineyard Connector	Geneva RD to Pioneer Crossing	4(F) Trails	N/A
33	Lakeview PKWY/Geneva RD	Provo 500 W to University PKWY	4(F) Trails	N/A
35	Orem 1600 N	Orem 1200 W to State ST	4(F) Trails	N/A
36	Orem Center ST	I-15 to Geneva RD	4(F) Trails	N/A
37	Provo 2230 N	Provo Canyon RD to Stadium AVE	4(F) Trails	N/A
38	Provo 820 N	Geneva RD to University AVE	4(F) Trails	N/A
39	Provo Center ST	Geneva RD to Provo 1600 W	4(F) Trails	N/A
40	Provo Geneva RD	Provo Center ST to Lakeview PKWY	4(F) Trails	N/A
53	Spanish Fork Center ST	Spanish Fork 900 E to US6	4(F) Trails	N/A
55	Springville 1200 W/Canyon Creek PKWY	Market Place DR to US89	4(F) Trails	N/A
59	SR198	Arrowhead Trail to Salem 400 N	4(F) Trails	N/A
61	US6	I-15 to Spanish Fork Center ST	4(F) Trails	N/A
			<b>Total</b>	<b>13.63</b>



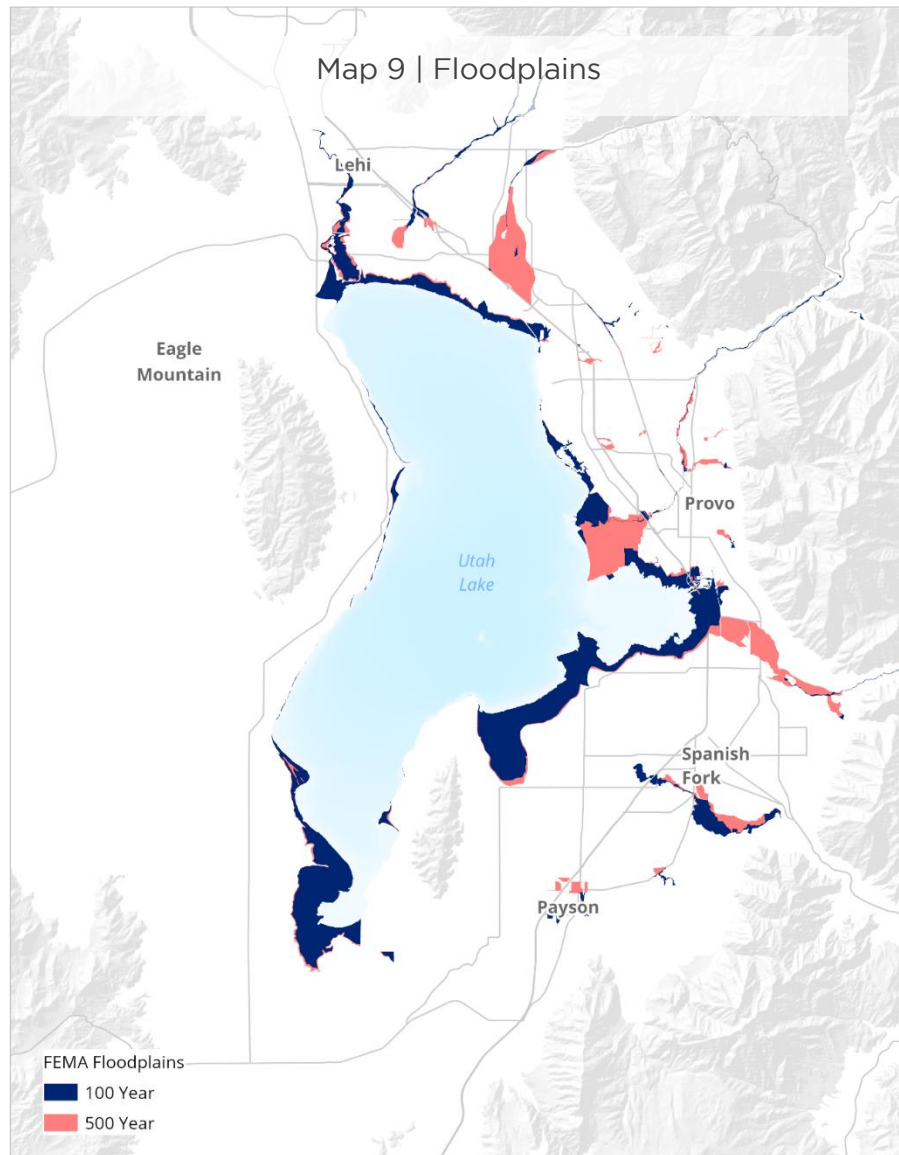


### Mitigation Approach:

- Transportation alternatives need to be determined to lessen the impact on 4(F) and 6(F) properties.
- Modifications to the transportation alignment must be considered to avoid impact to 4(F) and 6(F) properties.
- If there are no feasible alternatives to impacting 4(F) and 6(F) properties minimization efforts should be pursued to lessen the overall impact.

### FLOODPLAINS

Floodplains and water bodies help to accommodate periodic high-water flows and moderate erosion in a waterway. Highway projects can impact these areas in many ways, including disturbing ground within 20 feet of natural or semi-natural rivers and streams, placing obstructions in floodplains, and realigning or channeling meandering rivers and streams. Specific impact assessments and mitigation measures will be made during the environmental evaluation and review





phase of the project development process. The following table below lists planned transportation projects that intersect floodplains as inventoried by the Federal Emergency Management Agency (FEMA).

**Analysis Results:**

Map #	Project Name	Project Location	Impact	Acres In ROW
4	American Fork 100 E/Alpine HWY	State ST to Canal BLVD, Highland	FEMA Floodzone	6.25
5	Clubhouse DR	I-15 to Lehi 3600 W	FEMA Floodzone	0.41
13	Lehi 2100 N FWY SR194	Mountain View Corridor to I-15	FEMA Floodzone	9.19
14	Lehi 3600 W/Point of the Mountain Connector	Lehi 2600 N to Salt Lake County	FEMA Floodzone	0.31
16	Lehi Main ST	Commerce DR to Lehi 500 W	FEMA Floodzone	6.98
20	Pioneer Crossing	Redwood RD to Lehi 2300 W	FEMA Floodzone	12.44
23	Pony Express PKWY	Redwood RD to Vineyard Connector	FEMA Floodzone	45.54
25	State ST	American Fork 500 W to Pleasant Grove 200 S	FEMA Floodzone	14.3
29	Vineyard Connector	Geneva RD to Pioneer Crossing	FEMA Floodzone	6.63
33	Lakeview PKWY/ Geneva RD	Provo 500 W to University PKWY	FEMA Floodzone	72.34



Map #	Project Name	Project Location	Impact	Acres In ROW
34	Orem 1200 W	Sandhill RD to Orem Center ST	FEMA Floodzone	6.36
38	Provo 820 N	Geneva RD to University AVE	FEMA Floodzone	0.27
39	Provo Center ST	Geneva RD to Provo 1600 W	FEMA Floodzone	2.46
40	Provo Geneva RD	Provo Center ST to Lakeview PKWY	FEMA Floodzone	6.2
51	Spanish Fork 1550 W	UC 8000 S to I-15	FEMA Floodzone	1.91
55	Springville 1200 W/Canyon Creek PKWY	Market Place DR to US89	FEMA Floodzone	10.56
56	Springville 1400 N SR75	I-15 to Springville Main ST US89	FEMA Floodzone	4.03
<b>Total</b>				<b>206.17</b>

**Mitigation Approach:**

- Special emphasis should be given during the public input phase of these projects to increase public awareness of this danger. Floodplains are not often recognized as a danger arid places, and floods are few and far between. However, their effects may be devastating.
- Alternate routes during flood times should be planned.
- Land uses near floodplains should be appropriate i.e; no hospitals or schools.
- Streams and rivers should be crossed at ninety-degree angles.
- Meandering waterways should not be improperly channeled by a roadway.

**WETLANDS, WETLAND MITIGATION BANK & PRESERVE**

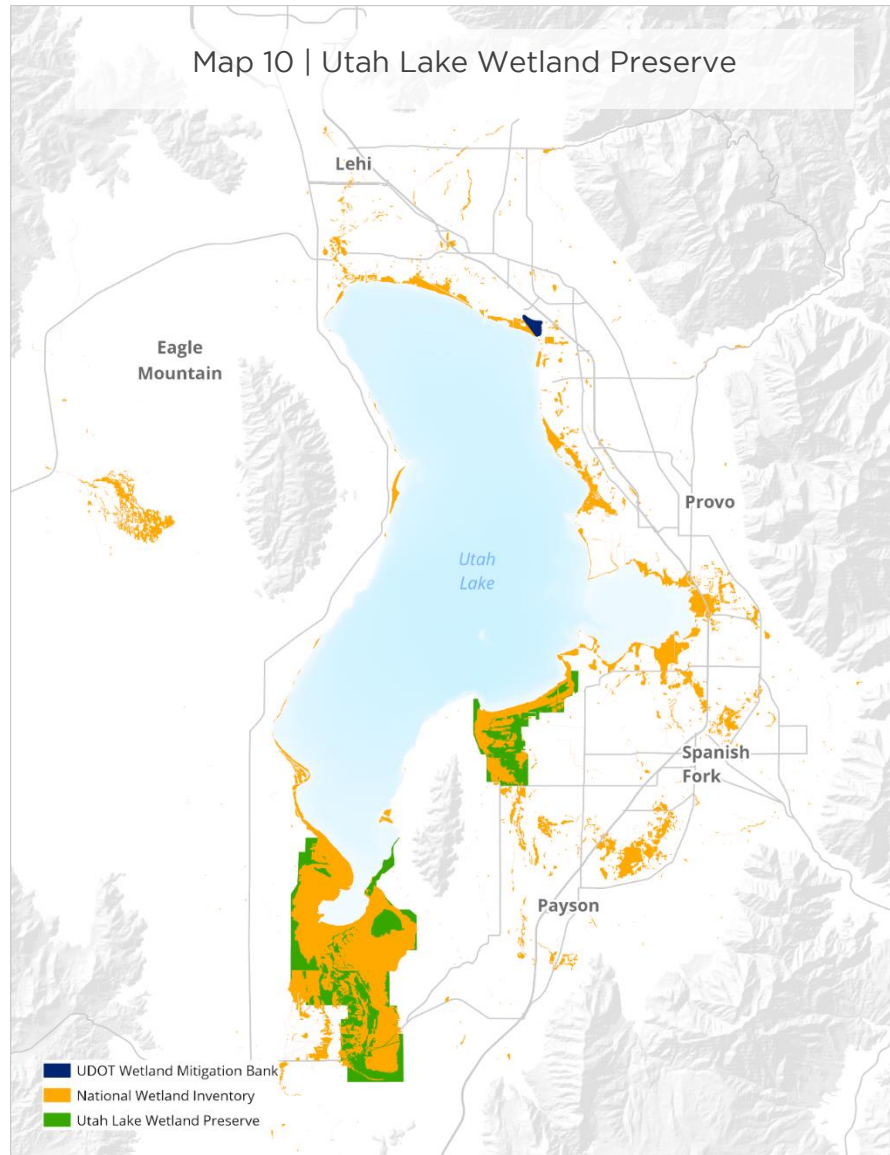
Wetlands serve critical environmental functions, including flood control, water purification and the provision of habitat for fish and wildlife. Wetlands are defined as



those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils conditions. The significance of roadway wetland impacts varies based upon the project's characteristics, the size, and quality of the wetlands area, and the level to which the wetlands have already been disturbed by people. A project may generally impact wetlands by destroying the immediate footprint of the wetland with the planned facility or by creating a barrier between adjacent wetland areas. The National Wetlands Inventory of the U.S. Fish & Wildlife Service produces information on the characteristics, extent, and status of the Nation's wetlands and deep-water habitats. Federal, State, and local agencies, academic institutions, U.S. Congress, and the private sector use the National Wetlands Inventory information along with species distribution, habitat relationships, threatened and endangered species status, and property/real estate at-risk determinations in conducting wetland analysis and developing environmental policies and regulations.

## **UTAH LAKE WETLAND PRESERVE**

Utah Lake is the largest naturally occurring freshwater lake in the western United States. Its wetlands have long been recognized locally and nationally for their critical importance to fish and wildlife habitat. The Utah Lake wetland ecosystem is important as a breeding area and stopover for many migratory birds in the Pacific Flyway. Approximately 226 species of birds, 49 mammalian species, 16 species of amphibians and reptiles and 18 species of fish, are known to use Utah Lake wetlands. The Utah Lake Wetland Preserve, a network of wetland and interspersed upland habitats near the southern end of Utah Lake, is being established to partially mitigate for past and anticipated future impacts of the Central Utah Project water development (*resource: Utah Reclamation Mitigation and Conservation Commission*). Wetland delineation, jurisdictional wetland impact assessments, and mitigation measures will be determined utilizing wetland maps and other measures during the environmental evaluation and review phase of the individual project development process.



**Analysis Results:**

Map #	Project Name	Project Location	Impact	Acres In ROW
13	Lehi 2100 N FWY SR194	Mountain View Corridor to I-15	NWI Wetlands	3.45
15	Lehi 3600 West	Lehi Main ST to Clubhouse DR	NWI Wetlands	0.18
16	Lehi Main ST	Commerce DR to Lehi 500 W	NWI Wetlands	0.14
18	Mountain View FWY	Cory Wride HWY to Porter Rockwell PKWY	NWI Wetlands	0.09
20	Pioneer Crossing	Redwood RD to Lehi 2300 W	NWI Wetlands	6.94
23	Pony Express PKWY	Redwood RD to Vineyard Connector	NWI Wetlands	8.1
28	Triumph BLVD/ Lehi 2300 W	Lehi 2100 N to Lehi 1900 S	NWI Wetlands	0.18
29	Vineyard Connector	Geneva RD to Pioneer Crossing	NWI Wetlands	4.07
33	Lakeview PKW/ Geneva RD	Provo 500 W to University PKWY	NWI Wetlands	15.32
43	Elk Ridge DR	UC 8000 S to SR198	NWI Wetlands	8.82
49	Nebo Belt RD	Payson Main ST to SR198	NWI Wetlands	0.54
55	Springville 1200 W/Canyon Creek PKWY	Market Place DR to US89	NWI Wetlands	4.75
56	Springville 1400 N SR75	I-15 to Springville Main ST US89	NWI Wetlands	0.36



Map #	Project Name	Project Location	Impact	Acres In ROW
57	Springville 1600 S/Spanish Fork 2700 N	Spanish Fork Main ST to SR51	NWI Wetlands	0.25
<b>Total</b>				<b>53.19</b>

**Mitigation Approach:**

- Sufficient funds should be included in all requests to provide mitigation for impacted wetlands.
- Wetland areas should be avoided if possible.
- No development of land in wetland areas should be allowed.
- Banking wetlands can help with future mitigation efforts.
- Enforce limits of disturbance during construction activities near wetlands.
- Encourage local governments to adopt wetland protection regulations.

**Outreach:** MAG provided local resource agencies the opportunity to participate in and provide feedback to the development of the Regional Transportation Plan through an open house held on February 20th, 2019. Participants viewed a series of maps that illustrated how the Regional Transportation Plan interacted with the following environmental themes: EPA study sites, 4(F) & 6(F) properties, farmland, floodplains, geologic hazards, and wetlands. Handouts of MAG’s Environmental Appraisal analysis along with copies of the proposed highway, transit, and bike/ped facilities maps were made available to the resource agencies. For those who could not attend, an online application was provided that illustrated all the materials and information provided at the open house along with the ability to provide comments. The partnerships and involvement of the resource agencies in the Regional Transportation Plan are of high value in developing environmentally friendly transportation options for the future.



## HAZARD PLANNING

Every 5 years MAG updates the Pre-Disaster Hazard Mitigation Plan (PDM). Hazards are mapped to help quantify and understand loss probabilities and potentials due to natural disaster. Each participating jurisdiction then uses the information provided to create strategies to mitigate the effects of a disaster. This is the current extent of MAG's hazard planning efforts, though more robust modeling will be performed in the future. Below is a summary of the 2017 Pre-Disaster Hazard Mitigation Plan (PDM).

**Purpose:** To fulfill federal, state, and local hazard mitigation planning responsibilities; to promote pre- and post-disaster mitigation measures, short/long-range strategies that minimize suffering, loss of life, and damage to property, and to eliminate or minimize conditions which would have an undesirable impact on residents, the economy, environment, and the well-being of the state of Utah. This plan is an aid in enhancing the awareness of local, state, federal agencies, and the public, to the threat that hazards have on property and life and for planning mitigation measures.

**Scope:** Utah PDM Planning is statewide. The State of Utah worked with all local jurisdictions by means of the seven regional Association of Governments to complete the Utah State PDM. Future monitoring, evaluating, updating and implementing will take place as new incidents occur and or every three to five years and will be included in the local mitigation plans as well. Natural hazards addressed are flooding, wildland fire, landslide, earthquake, drought, and severe weather.





**Table B1 | Probability Calculations for Utah County**

<b>Hazard</b>	<b>Number of Events</b>	<b>Years in Record</b>	<b>Recurrence Interval (years)</b>	<b>Events per Year (Probability)</b>	<b>Source</b>
<b>Avalanche</b> (Injuries or damages)	26	19	0.8	1.4	NOAA
<b>Drought</b> (Moderate, PDSI<-2)	N/A	N/A	4.4	0.3	Utah State Water Plan
<b>Earthquakes 3.0 and greater</b>	11	115	10.5	0.1	Univ. of Utah Dept. of Seismology
<b>Floods</b>	30	51	1.7	0.6	Various
<b>Hail</b> (all events)	42	19	0.5	2.2	NOAA
<b>Landslides causing damage</b>	13	51	4	0.3	SHELDUS
<b>Lightning</b> (fatalities and injuries)	3	19	6.7	0.2	NOAA
<b>Wildfires</b> (over 300 acres)	74	55	0.8	1.3	Utah Division of Forestry Fire and State Lands and BLM
<b>Wildfires</b> (over 50 acres)	140	55	0.4	2.5	Utah Division of Forestry Fire and State Lands and BLM
<b>Wind</b> (with injuries/ damages)	66	60	0.9	1.1	NOAA
<b>Winter Weather</b> (w/ injuries/damages)	39	19	0.5	2.1	NOAA

Recurrence interval: (number of years in record +1)/number of events.

Frequency: Number of events/Number of years in record.



**Water Hazards:** Some flooding occurs within Utah County on almost a yearly basis, usually due to snow melt or severe thunderstorms. Flood potential also increases on lands damaged by wildfire or drought. As development occurs on the bench areas of Utah Valley, along the shore of Utah Lake, or near river and stream corridors, more homes and infrastructure will be in danger of floods. Communities should apprise developers and homeowners of flood risk and contribute to mitigation actions. The 100- and 500-year floodplains in the adjacent map are designated by FEMA. Dam failure mapping was performed by the Utah Division of Wildlife Resources and Army Corps of Engineers.





**Fire Hazards:** Multiple wildland fires occur in Utah County every summer and fall, mostly on hillsides, mountainous areas, open grass and rangelands. About 50% of fires are human caused by activities such as camping, illegally setting off fireworks, and sparks from off-road vehicles. Recent fires have cost millions to contain, forced evacuations of dozens of homes, and contributed to debris flows. As development extends into the urban/wildland interface, or the areas where homes meet wildland, more people and structures are at risk of loss from wildfire. From a transportation perspective, firefighters need access roads and residents need multiple options for evacuation. FIREWISE community development principles, such as not storing firewood near homes, installing fire resistant roofing and cleaning debris from rain gutters

will reduce potential losses. The Fire Risk Index on the map was created for the Council of Western State Foresters and represents the likelihood of an acre igniting and potential losses. Locations of past fires were provided by the Bureau of Land Management and Forest Service.

The Utah Division of Forestry, Fire, and State Lands (FFSL) helps communities develop Community Fire Plans. According to the FFSL, the purpose of community fire planning is to:

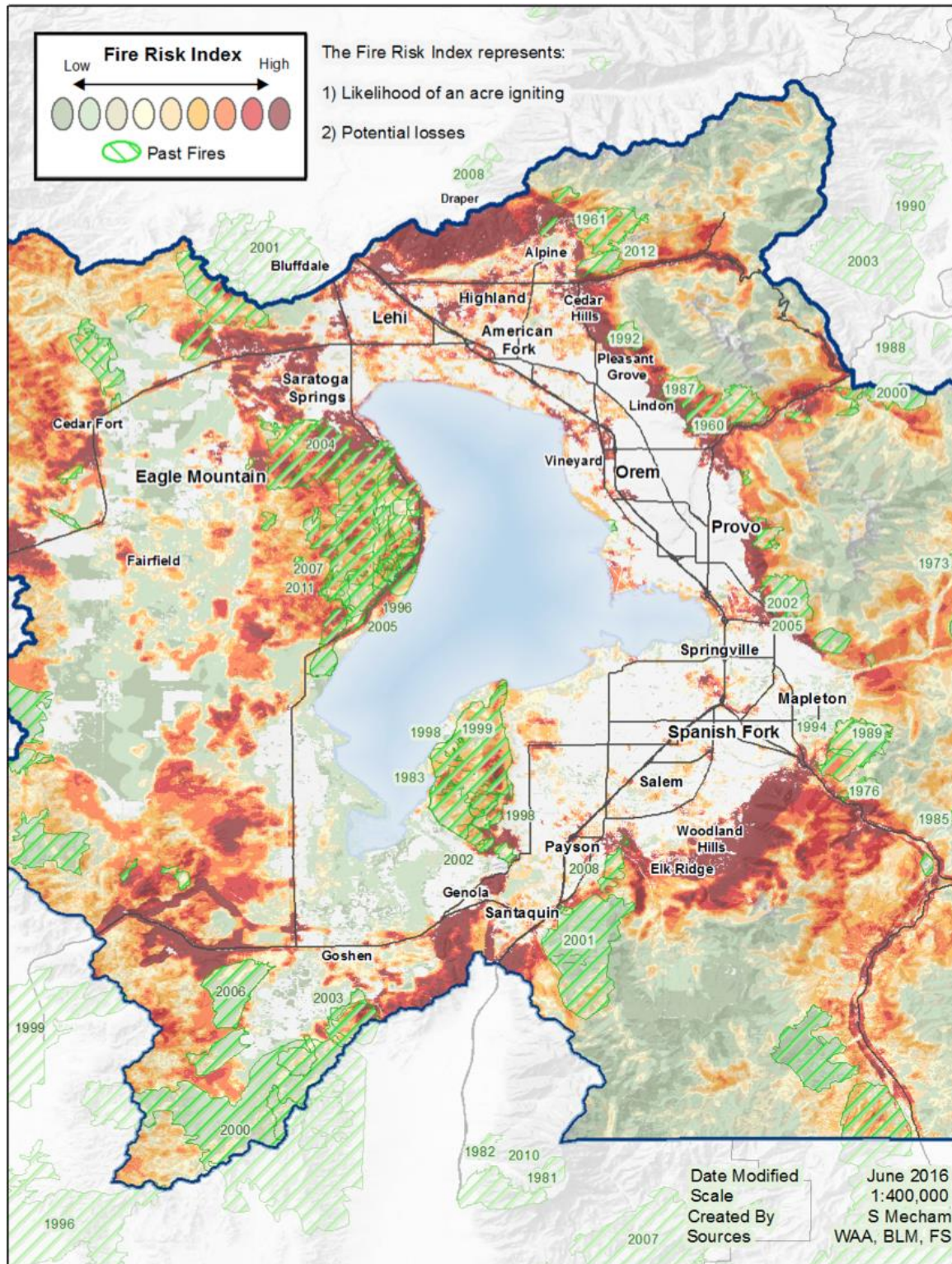
- Empower communities to organize, plan, and take action on issues impacting community safety
- Enhance levels of fire resistance and protection to the community
- Identify the risks of wildland/urban interface fires in the area
- Identify strategies to reduce the risks to homes and businesses in the community during a wildfire.



Below are communities which have developed Community Fire Plans.

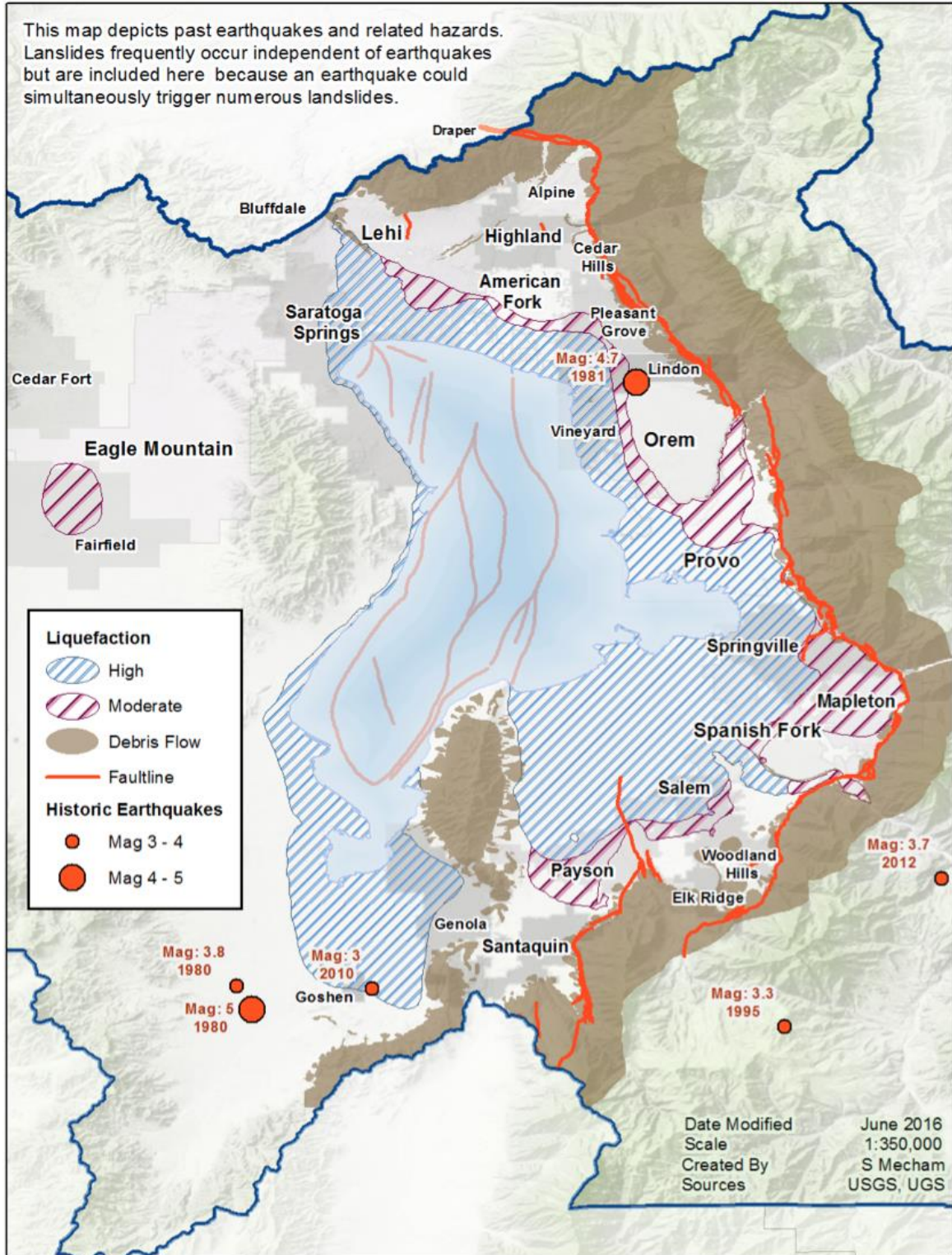
<b>Table B2   Firewise Communities</b>		
<b>Community Name</b>	<b>County</b>	<b>Date Signed</b>
Cedar Fort	Utah	16-Dec
Covered Bridge (Spanish Fork Canyon)	Utah	2002
Eagle Mountain	Utah	2014
Saratoga Springs	Utah	3-Dec
Sundance*	Utah	Apr-99
Woodland Hills*	Utah	11-Mar
Santaquin	Utah	14-Aug

\*Nationally recognized as Firewise communities which have completed a wildfire risk assessment, action plan prioritizing projects/investments, educational outreach, and yearly activities to reduce wildfire impacts. FIREWISE development principles include actions such as not storing firewood near homes, installing fire resistant roofing and cleaning debris from rain gutters to reduce potential losses.





**Earthquake and Related Hazards:** Utah County is particularly susceptible to earthquakes and their secondary hazards due to its situation between (or in many cases, on top of) fault lines and Utah Lake's unstable soils. Utah County is certain to have mass movement along the bench and liquefaction beneath the numerous structures, roads, and utilities built near the lake in addition to the normal collapse of chimneys and broken glass from earthquakes magnitude 5.0 and above. Fires are also common following earthquakes in urbanized areas as gas lines break, electrical shorts occur, and response capabilities of firefighters are overwhelmed by the number of incidents and possibly damaged streets and water lines. The following map created in 2016 shows locations of fault lines, past earthquakes, and liquefaction as determined by the United States and Utah Geological Surveys. Multiple earthquakes have occurred in and near Saratoga Springs since then.







**Severe Weather:** Utah County’s mountainous terrain makes it particularly susceptible to severe weather, especially winter weather. Add to the topography those who seek snowy slopes for recreation and disaster can ensue, as seen in the table below. Avalanches caused the most weather-related deaths in Utah County. Winter weather caused the most injuries while wind was responsible for the most monetary damages. Though the table below does not specify road-related injuries, avalanches have blocked US-198 in Provo Canyon, SR 92 in American Fork Canyon and other backcountry roads.

Table B3   NOAA Extreme Weather Events Summary*									
Event	Deaths			Injuries			Property Damage		
	1950 - 99	2000 - 09	2010 - 15	1950 - 99	2000 - 09	2010 - 15	1950-99	2000-09	2010-15
<b>Avalanche</b>	4	16	6	6	7	0	\$50k	\$20k	0
<b>Dense Fog</b>	0	4	0	0	5	0	0	\$520k	0
<b>Hail</b>	0	0	0	8	0	0	\$327k	\$2k	0
<b>Heavy Rain</b>	0	0	0	0	0	0	\$308k	0	0
<b>Lightning</b>	0	0	0	1	2	0	\$160k	\$7k	-
<b>Wind</b>	1	3	1	22	2	26	\$51k	\$7.7m	\$792k
<b>Winter Weather**</b>	10	4	0	39	20	0	\$623k	\$918K	\$90k

\*National Oceanic and Atmospheric Administration data  
[www.ncdc.noaa.gov/stormevents](http://www.ncdc.noaa.gov/stormevents)

\*\*Winter Weather includes Winter Weather, Blizzard, and Snowstorm, Cold/Wind Chill/Extreme Cold. Wind includes High Wind, Thunderstorm Wind, Strong Wind



**Protecting Residents and Structures:** A major component of the Pre-Disaster Hazard Mitigation Plan is to develop strategies with Utah County and its cities to mitigate losses should a disaster occur. Below are the strategies that relate to transportation. Enhanced analysis is possible with FEMA's HAZUS software, but not performed for this plan.



Table B4 | Protecting Residents and Structures (Road Related)

Jurisdiction	Hazard	Action	Priority	Timeline	Cost
Cedar Fort	Wildfire	Fuel Thinning	High	2 years	Minimal
Cedar Hills	Flooding	Storm Water/ Ditch System Cleaning	Medium	2 years	TBD
Elk Ridge	Wildfire	Educate homeowners on FIREWISE practices. seek assistance for upgraded fire suppressing equipment	High	Ongoing	Minimal
Elk Ridge	Landslide	Create infrastructure that will eliminate/prevent future erosion of the dugway (Park DR)	Extremely high	1 year	TBD
Highland	Wildfire	Create maintenance plan, cut native grasses in fire hazard areas of city owned property by July each year	High	1 year	Minimal
Highland	Flooding/ Dam Failure	Maintain drainage ways	Med	Ongoing	TBD
Highland	Landslide	Review Development standards for issues with hillside development	Med	2 years	Minimal
Lehi	Flood	Require developers to provide site-specific environmental information to identify possible on and off-site methods for mitigating impacts	High	Ongoing	Minimal
Lehi	Landslide	Encourage maintenance of existing vegetation and retain natural drainage	Med	Ongoing	Minimal
Lindon	Debris Flow	Construct / Install debris flow basins in inventoried hazard areas	Medium	5 years	High
Lindon	Debris Flow	Maintain debris flow basins. Monitor wildfire and landslide areas	High	Ongoing	Minimal
Pleasant Grove	Dam Failure	Upgrade Battle Creek and Grove Creek dams to conform to seismic standards	High	2 years	TBD
Provo	Flooding/ Dam Failure	Participate in the Provo River Levee Analysis and Mapping Process (LAMP) to identify potential improvements	High	3 years	TBD
Provo	Flooding/ Dam Failure	Replace vulnerable areas of large diameter pipe	High	5 years	CIP
Salem	Flooding/ Canal Breach	Coordinate efforts with Salem Canal, Strawberry Highline Canal and Bureau of Reclamation	High	Ongoing	TBD
Saratoga Springs	Flooding/ Dam Failure	Continue phases of building 2 <sup>nd</sup> Detention basin above Jacobs Ranch development. Further education and participation in NFIP	High	3 years	TBD
Spanish Fork	HAZMAT	Fire dept. HAZMAT certified	High	1 Year	Minimal
Utah County	Wildfire	Fuel Mitigation plan with AF canyon	High	1 year	Minimal
Utah County	Flooding/ Drought	Highline Canal Retrofit	High	3 years	TBD
Utah County	Flooding	Canal assessment with Provo City	High	2 years	TBD
Utah County	All Hazards	Implement Early Notification System	High	1 year	TBD
Vineyard	Earthquake	Build overpasses to be usable after earthquake. Overpasses are the main access across railroad	High	5-10 years	\$10m
Vineyard	Earthquake	Develop evacuation plan	High	1-3 years	\$50k
Vineyard	All Hazards	Maintain fund for timely replacement and updates of infrastructure	High	Ongoing	\$4/home per month
Vineyard	Liquefaction	Geotechnical study in town center area for potential tall buildings and frontrunner station	High	1-3 years	\$200,000



## **FUTURE TRANSPORTATION CONSIDERATIONS**

Many jurisdictions identified potential vulnerabilities in their road networks and developed strategies to address those vulnerabilities, such as larger culverts, secondary evacuation routes, and re-routing hazardous materials. MAG conducted limited modelling upon city request. In the next Pre-Disaster Hazard Mitigation Plan we will include miles of major roadway at risk per city, scenario plans using FEMA's HAZUS program, and State Route Vulnerability as provided by UDOT and FHWA (a work in progress).