

Oquirrh Mountains Trails Plan 2024

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Chapter 1: Background

EXECUTIVE SUMMARY

The Oquirrh Mountains have long been a cherished destination for outdoor enthusiasts. The range offers a diverse playground for nature lovers, with activities typically including hiking, mountain biking, horseback riding, ATV and OHV, hunting, and winter sports such as cross-country skiing and snowmobiling. Despite its long-held popularity, the absence of a formal trails plan has resulted in a network of trails informally created over time. Complicating matters is the patchwork nature of land ownership, with private properties checkerboarding the mountains, particularly along the bench. While improvements, including signage, have been made, the lack of a cohesive plan has hindered the overall management of the area. This Oquirrh Mountains Trails Plan is the first comprehensive plan specifically created to address these trails. The intention is that the goals, policies, standards, and overall framework in this Plan will enhance and sustain the recreational experience in the Oquirrh Mountains for generations to come.

This Trails Plan outlines the purpose of public trails, the importance of trails to the community, the availability and nature of current trails, the approach to trail development, standards, and best practices for improvements, suggested approaches to maintenance of established trails, and opportunities for funding and support. This Plan includes a basic trails audit of four main canyon areas—Bates, Middle, Settlement, and Ophir Canyon. As part of the creation of this Plan, a public survey was sent out, which received over 1,000 responses. The feedback in the survey was used to inform this Plan.

THE MOUNTAIN RANGE

The Oquirrh Mountains are a north-trending mountain range between Tooele and Salt Lake Valley. The range lies on the southern end of the Great Salt Lake, about thirteen miles south of Antelope Island, and extends approximately thirty miles south. The range features many peaks above 9,000 feet, with some peaks toward the south extending to over 10,000 feet in elevation. The name “Oquirrh” means “wooded mountain” in the Goshute language.¹

¹Encyclopedia Britannica, “Oquirrh Mountains,” <https://www.britannica.com/place/Oquirrh-Mountains>

The range is a fault block mountain range that began formation around the Late Cretaceous period (100-66 million years ago), with substantial uplift occurring during the Tertiary Period (66 million to 2.6 million years ago).² The rocks exposed on the Oquirrh Mountains are generally clastic accumulations of quartzite, shale, limestone, and dolomite.³ During the Pleistocene Ice Age, historic Lake Bonneville covered much of the basin, with a shoreline that rested at different levels along the Oquirrh Mountains. Water currents in the lake caused sand and gravel to accumulate at different locations along lower mountain elevations.⁴ This has contributed to a series of alluvial fan deposits along the range.⁵

The range is historically the eastern border of the native Goshute peoples, who named the mountains the Apa-yaw-i-up, or “place of the weeping (or wailing) ancestors.”⁶ The Goshute occupied the adjoining Tooele Valley in settlements made of wickiup dwellings until being displaced to what is now the Skull Valley Reservation.

Since the time of European migration, the range has been an important source of mineral production. Shortly after arriving in what is present-day Utah, Mormon settlers noticed rich mineral deposits in the mountain range. Much of this ore was copper ore. Large-scale mining of the ore did not become profitable until the linking of the railroads at Promontory Point in 1869.⁷ The demand and profitability increased dramatically with the expansion of electric power, which required copper.⁸ This resulted in several new mining, smelting, and refining operations along the mountains and in the adjacent Salt Lake and Tooele Valleys. Extraction peaked during World War II, when a significant portion of the copper used by the Allied armies—some put estimates at nearly a third of the entire copper supply—was extracted from the Oquirrh Mountains.⁹

Today, mining has largely been consolidated into the Kennecott Corporation’s open pit mine, located on the East side of the mountain range. This mine continues to extract

copper, gold, silver, and molybdenum. Other minerals extracted from the range include limestone, sand, and gravel. Estimates of the value of minerals extracted from the range place it well above the entire combined value of minerals taken during the famous California, Nevada, and Klondike gold and silver rushes.¹⁰

The historic mining districts of Mercur, Ophir, and Stockton are now inactive. Recreational visitors see remnants of this past and the mining legacy is still felt in the region. Many trails pass by old mine tailings and equipment, and in several areas throughout the range, the landscape has been permanently altered due to mining. No active mines exist on the west side of the range facing Tooele County.

The Oquirrh Mountains remain a critical habitat for a wide range of flora and fauna. Gamble (or “scrub”) oak and quaking aspen are found throughout the mountain range, while north facing slopes and inner canyons provide a suitable environment for big tooth maple, with curl leaf mahogany trees commonly found on south facing slopes. Recreators enjoy abundant wildflowers, including mule’s ears, balsam root, Indian paintbrush, and scarlet gilia. The low foothills and benches are dominated by sagebrush and oak-brush.

Commonly found wildlife include:

- Golden Eagles
- California Quail
- Ring-necked Pheasant
- Wild Turkey
- Grouse
- Scrub Jays
- Crows
- Mule Deer
- Mountain Lion
- Rocky Mountain Elk

There are several sensitive animal species found in the region, which include¹¹:

- Bobolink (bird)
- Burrowing Owl
- Ferruginous Hawk
- Greater Sage-Grouse
- Lew’s Woodpecker
- Long-Billed Curlew
- Short-Eared Owl
- Snowy Plover
- Monarch Butterfly
- Western Bumble Bee
- Allen’s Big-Eared Bat
- Dark Kangaroo Mouse
- Fringed Myotis
- Kit Fox
- Pygmy Rabbit
- Townsend’s Big-Eared Bat

² “Geology of the Oquirrh Mountains, Utah,” United States Geological Survey (1999), Paper 162, Pg. 17-20, 26 <https://digitalcommons.usu.edu/govdocs/162/>

³ “Geology of the Oquirrh Mountains, Utah,” United States Geological Survey (1999), Paper 162, Pg. 8 <https://digitalcommons.usu.edu/govdocs/162/>

⁴ “Geology of the Oquirrh Mountains, Utah,” United States Geological Survey (1999), Paper 162, Pg. 17 <https://digitalcommons.usu.edu/govdocs/162/>

⁵ See UGRC GIS dataset, <https://opendata.gis.utah.gov/datasets/utah-alluvial-fans/explore?location=40.540711%2C-112.278398%2C-1.00>

⁵ UHQ, Vol 1, No 1, as found on the American West Center’s Mapping Indigenous Placenames GIS, <https://mlibgisservices.maps.arcgis.com/apps/webappviewer/index.html?id=82b345020c4248a9a0a27cb1feb3072>

⁶ “The Mountains Held a Treasure Trove of Minerals,” April 25, 2016, Utah Dept of Cultural & Community Engagement, <https://historytogo.utah.gov/treasure-trove/>

⁷ “Copper Mining, the King of the Oquirrh Mountains,” April 21, 2016, originally published by Philip F. Notarianni, Behive History, 16, <https://historytogo.utah.gov/copper-mining-oquirrh/>

⁹ Id.

¹⁰ Encyclopedia Britannica, “Oquirrh Mountains,” <https://www.britannica.com/place/Oquirrh-Mountains>

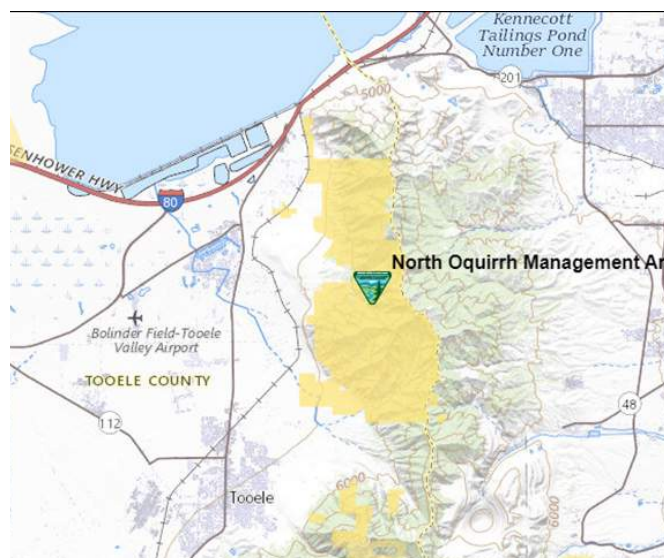
¹¹ Utah BLM Sensitive Wildlife Species List, by county: <https://www.blm.gov/sites/blm.gov/files/Utah%20BLM%20Sensitive%20Wildlife%20Species%20List.pdf>

In addition to sensitive habitat and animal species, there are sensitive plant species that may be present.

- Dunes four-wing saltbush, *Atriplex canescens* var *gigantea*
- Pohl's milkvetch, *Astragalus lentiginosus* var *pohlii*
- Cottam's cinquefoil, *Potentilla cottamii*

NORTH OQUIRRH MANAGEMENT AREA

To protect these critical environments, the Bureau of Land Management created the North Oquirrh Management Area (NOMA). This management area was created in the 1990s through a sequence of land exchanges aimed at safeguarding significant resource values. These include vital watershed areas, essential winter habitats for elk and mule deer, nesting areas for bald eagles, raptors, and sage grouse, protections for marsh and wetland areas, transplanting Rio Grande Turkeys, and historical and prehistorical cultural sites like the petroglyph site at Yates Springs.



NOMA covers much of the North Oquirrh Range. Trails and other disturbances in this area needs to be approved by BLM and conform to BLM's NOMA Master Plan.

In 1997, BLM amended their Pony Express Resource Management Plan to include policy objectives and guidance for the NOMA. At the time, this included 14,254 surface acres. This management plan established a policy that rights-of-way applications within NOMA would not be approved above the 5,200' elevation mark, within Visual Resources

Management ("VRM") Class II areas, on lands with slopes greater than 30%, and on lands within ¼ mile of live water sources.

At the time of amendment of the resource management plan, VRM Class II areas comprised approximately 87% of the land area, or 12,445 acres of the 14,254 total acres.

VRM is "a system for minimizing the visual impacts of surface-disturbing activities to maintain scenic values for the future."¹³ The classification helps improve the scenery of public lands and is required by federal law. The stated objective of VRM Class II is to "retain the existing character of the landscape" and "allow a low level of change that should not attract the attention of a casual

observer." Any change to the landscape would need to meet the VRM Class II standards. A map of lands by VRM class can be found in the Pony Express Plan by the Salt Lake Field Office of the BLM.

Importantly, the Resource Management Plan also established that no new trails could be constructed within the NOMA. However, additional signage would be allowed to provide for visitor safety and protect natural resources. OHV use was restricted to designated roads and trails. Today, several unpaved roads make their way through the NOMA. These roads are well-marked.

In April 2021, the Salt Lake Field Office of the BLM issued a record of decision allowing for up to 15 miles of new single-track trails within NOMA. The Decision Record indicated the trail tread would be between 12-36 inches wide with 2-4 feet of clearance. Blading of trails would not be permitted. Before new trails could be constructed, a right-of-way application and environmental reviews would need to be submitted for site-specific BLM review and approval. The Decision Record specified that restrictions surrounding



BLM signage within NOMA outlines OHV restrictions.

¹²North Oquirrh Management Area (NOMA), BLM, <https://www.blm.gov/visit/north-oquirrh-management-area-noma>

¹³Visual Resources Management (VRM), <https://www.blm.gov/sites/blm.gov/files/uploads/Get%20Involved-RAC-Colorado-FR-5.9.12-VRM%20Briefing.pdf>

motorized access remained unchanged, but trail systems supporting hiking, biking, horseback riding, and “other human-powered recreational uses” could be expanded accordingly. Furthermore, the Record Decision stated that “any current, existing trails as established by the date of this decision, that are in concert with the protective measures can be incorporated into the overall trail network and will not be considered ‘new’ construction.” Meanwhile, any existing trail that does not meet BLM’s protective measures will be reclaimed or rerouted.

The BLM Decision Record includes a mandate that all trail development within the NOMA will follow best practice trail design standards, which include the BLM’s “Guidelines for a Quality Trail Experience” and the United States Access Board’s “Architectural Barriers Act Accessibility Guidelines for Outdoor Developed Areas.” This Oquirrh Mountains Trails Plan outlines best practices for trail development; however, special attention should be given to trail development within NOMA in order to follow the specific guidelines requested by the BLM.

CARR FORK WILDLIFE MANAGEMENT AREA

Established in 1994, the Carr Fork Wildlife Management Area is situated in eastern Tooele County in the North Oquirrh area near Pine Canyon. Its designation serves to encompass and incorporate the Tooele County Health Department’s (TCHD) International Smelter & Refining Superfund Site. It is the site of a former smelter, which has left traces of arsenic, lead, and other contaminants in the soil.¹⁴ This Wildlife Management Area covers land immediately west of Pine Canyon Conservation and Wildlife Management Area and has a primary goal of environmental cleanup. The property is traversed by Pine Creek, which supports a riparian ecosystem with a small population of California Quail and pheasants.¹⁵

PACIFIC FLYWAY AND CELESTIAL RESOURCES

The range provides a substantial visual barrier between Tooele Valley and Salt Lake Valley, which greatly reduces the skyglow effect from Salt Lake Valley. This decreases light pollution and makes the Oquirrh Range a popular place for stargazing. Stansbury Park Observatory is a popular

astronomical observatory located in the valley, about three miles west of the base of Farnsworth Peak. Additionally, the Range is located along the Pacific Flyway, which sees an extensive annual bird migration from March to May and September to November. Migrating birds tend to travel at night and preserving the dark skies is an important component of protecting this critical bird migration.¹⁶

PINE CANYON CONSERVATION AND WILDLIFE MANAGEMENT AREA

This wildlife management area is in the southeast portion of the North Oquirrh area near Pine Canyon. It is managed by the Utah Division of Wildlife Resources and includes 3,020 acres in a conservation easement. A goal of the management area is to preserve and protect critical mule deer and elk habitat and mitigate



habitat loss due to human impacts. The management area is closed to OHVs and has seasonal restrictions on hunting.

ECONOMIC IMPACT

This area is a growing outdoor recreation hub. The State of Utah has seen recent expansion in the outdoor recreation market, with an economic jump of 27.3% from 2020 to 2021. As of 2022, Outdoor recreation accounts for 2.7% of Utah’s GDP with an economic output of \$6.1 billion.¹⁷ Development of trails and trail systems in and along the Oquirrh Mountains will help Tooele County capture more of this economic growth.

¹⁴“International Smelter & Refining Superfund Site,” Tooele County Health Department, <https://tooelehealth.org/intermountain-smelter-refining-superfund-site/>

¹⁵Pine Canyon Conservation, Utah Division of Wildlife Resources, <https://dwrapps.utah.gov/ram/>

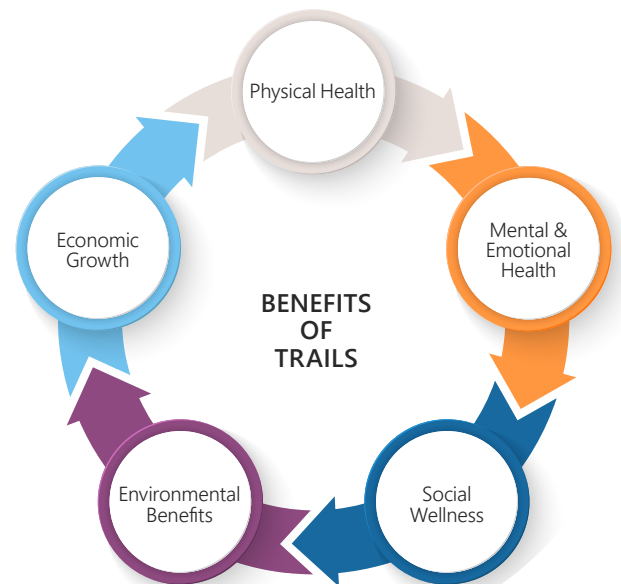
¹⁶Great Salt Lake Audobon Society, <https://greatsaltlakeaudobon.org/resources/dark-skies>

¹⁷“Outdoor Recreation Economy Surges in Utah, According to U.S. Bureau of Economic Analysis,” Austin, Nov 9, 2022, Utah DNR, <https://recreation.utah.gov/outdoor-recreation-economy-surges-in-utah-according-to-u-s-bureau-of-economic-analysis/>



Chapter 2: Why Trails?

Trails are a simple, cost effective, and publicly supported way to promote physical, emotional, mental, spiritual, and social health. A 2011 study by the American Heart Association found that, on average, a \$1 investment in constructing trails results in nearly \$3 of savings in health care costs.¹⁸ Hiking and biking are great ways to obtain physical exercise. Nearly 80% of American adults and 75% of adolescents do not obtain the suggested amount of weekly exercise.¹⁹ This increases the likelihood of developing chronic illnesses, such as heart disease, diabetes, high blood pressure, or any of the many conditions linked to sedentary lifestyles. Unplugging from daily life and exercising outdoors is great for mental and emotional health, with studies showing that exercise in nature is linked to reduced rates of depression and improved wellness.



¹⁸Fact Sheet—Active Transportation, American Heart Association, <https://www.heart.org/-/media/files/about-us/policy-research/fact-sheets/physical-activity/active-transportation-fact-sheet-2019.pdf?la=en&hash=F98B6BE12D9C61B6AEAB157B51FE2A89845B6C90>

¹⁹National Health Interview Survey, NCHS, https://public.tableau.com/app/profile/tina.norris/viz/FIGURE7_4/Dashboard7_4

POSITIVE IMPACT ON PUBLIC HEALTH

There is ample need for opportunities to improve public health. According to a study by the CDC, 42.4% of the U.S. adult population is classified as obese.²⁰ Furthermore, the Utah Department of Health & Human Services estimates that 67.9% of residents in Tooele Valley are overweight or obese.²¹ Being overweight has been found to increase the risk of many chronic illnesses, including heart disease, stroke, type 2 diabetes, hypertension, osteoarthritis, and some cancers.²² Approximately one-fifth of all U.S. adult deaths are from heart disease.²³

Research has shown both the harm incurred from lack of exercise and the benefits of movement, including hiking outside. One study showed that as the amount of walking decreased, the risk of cardiovascular disease increased.²⁴ It is estimated that adults who are physically active see a thirty (30%) percent reduction in health care costs compared with adults who are physically inactive.²⁵ Another study determined that exercise, including hiking and biking, have been found to be a great way to fight childhood obesity.²⁶ Establishing legal trails for residents to walk and enjoy nature is a great way to promote public health and improve the welfare of local residents. Hiking, or even simply spending time outdoors in the woods, has been shown to decrease systolic blood pressure and resting heart rate.²⁷ The unique exercise environment of the mountains provides additional opportunities for public health efforts. Due to the uneven terrain, hiking burns more calories than walking.²⁸ Estimates

are that hiking burns 223-266 calories per hour.²⁹ This can help improve public health metrics.

Exercise, specifically hiking, helps improve sleep.³⁰ Reduced sleep quantity and quality are causally linked to an increased risk of heart disease, kidney disease, and diabetes³¹ and Americans are increasingly getting insufficient sleep. One study suggests that around 40% of Americans go without the recommended nightly amount of sleep.³² This amount has quadrupled since the 1940s and is a significant contributor to reduced health. Hiking and spending time outdoors helps us reset our circadian rhythm and return to a more natural and healthy sleeping pattern.

POSITIVE IMPACT ON EMOTIONAL AND MENTAL HEALTH

Spending time outdoors, whether hiking, mountain biking, horseback riding, or engaging in other activities is linked to improved emotional and mental health. Hiking is shown to improve mood and, when compared with walking in an urban environment, does an even better job at reducing anxiety.³³ Several studies found decreased levels of cortisol, blood pressure, and heart rate.³⁴ One study found that after 20 minutes of simply being outside, study participants had a 21.3% reduction in the

Outdoor Recreation is an important part of maintaining or improving my mental & emotional well-being¹

Response	Total	Percentage
Strongly Agree	968	90%
Agree	93	9%
Neutral	7	1%
Disagree	5	0%
Strongly Disagree	5	0%

²⁰<https://www.cdc.gov/nchs/products/databriefs/db360.htm>

²¹"Health Indicator Report of Overweight or Obese," Utah Department of Health & Human Services, <https://ibis.health.utah.gov/ibisph-view/indicator/view/OvrwtObe.SA.html>

²²"Health Indicator Report of Overweight or Obese," Utah Department of Health & Human Services, <https://ibis.health.utah.gov/ibisph-view/indicator/view/OvrwtObe.SA.html>

²³"Heart Disease Facts," Centers for Disease Control and Prevention (CDC) <https://www.cdc.gov/heartdisease/facts.htm>

²⁴"Walking as an Opportunity for Cardiovascular Disease Prevention," John D Omura, et al, Preventing Chronic Disease 2019, 16: E66, published online May 30, 2019, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6549420/>

²⁵"Higher direct medical costs associated with physical inactivity," M. Pratt, et al., Physician and Sports Medicine, 2000, 28(10), 63-70.

²⁶"Exercise in the treatment of childhood obesity," Selda Bulbul, National Library of Medicine, Turk Pediatri Ars., 2020, 55(1), published online March 9, 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7096559/>

²⁷"Preventative medical effects of nature therapy," Yoshifum Miyazaki, et al, Nihon Eiseigaku Zasshi, Sept 2011, 66(4):651-656. <https://pubmed.ncbi.nlm.nih.gov/21996763/>

²⁸"Biomechanics and energetics of walking on uneven terrain," Alexandra S. Voloshina, et al., J Exp Biol, 2013 Nov. 1: 216(21): 3963-3970, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4236228/>

²⁹"Calories burned in 30 minutes for people of three different weights," March 8, 2021, Harvard Health Publishing, Harvard Medical School, <https://www.health.harvard.edu/diet-and-weight-loss/calories-burned-in-30-minutes-of-leisure-and-routine-activities>

³⁰"A before and after comparison of the effects of forest walking on the sleep of a community-based sample of people with sleep complaints," Emi Morita, et al., Biopsychosoc Med, 2011, 5:13, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3216244/>

³¹"What are sleep deprivation and deficiency?" National Heart, Lung, and Blood Institute, <https://www.nhlbi.nih.gov/health-topics/sleep-deprivation-and-deficiency#:~:text=Sleep%20plays%20an%20important%20role,pressure%2C%20diabetes%2C%20and%20stroke>

³²"In U.S., 40% get less than recommended amount of sleep," Jeffrey M. Jones, Dec 19, 2013, <https://news.gallup.com/poll/166553/less-recommended-amount-sleep.aspx#:~:text=Americans%20currently%20average%206.8%20hours,nine%20hours%20sleep%20for%20adults>

³³"The benefits of nature experience: Improved affect and cognition," Gregory N. Bratman, et al., Landscape and Urban Planning, Volume 138, June 2015, 41-50, <https://www.sciencedirect.com/science/article/abs/pii/S0169204615000286>

³⁴"A Randomized Crossover Trial on Acute Stress-Related Physiological Responses to Mountain Hiking," Martin Niedermeier, et al, Int. J. Environ. Res. Public Health, 2017, 14(8), 905, <https://www.mdpi.com/1660-4601/14/8/905>

stress hormone cortisol, as compared to an indoor control group.³⁵ Several studies have found improved mental health after sustained periods of frequent hiking and exercise. This is consistent with the Oquirrh Mountains Trails Plan Survey, in which roughly 99% of respondents indicated that they either “strongly agree” or “agree” that outdoor recreation is an important part of maintaining or improving their mental and emotional well-being.

POSITIVE IMPACT ON SOCIAL WELLNESS

Trails provide opportunities for social interaction. Trails and outdoor recreational areas provide a type of “third place.” These are social spaces that are

Outdoor Recreation is an important part of maintaining or improving my social wellness³⁷

Response	Total	Percentage
Strongly Agree	721	68%
Agree	238	22%
Neutral	83	8%
Disagree	15	1%
Strongly Disagree	5	0%

distinct from home and the workplace. These locations are informal and relaxed and play a crucial role in providing opportunities for social interaction across socioeconomic strata. These are also places where friends and family can spend time together away from day-to-day life. One study found that hiking together as a family had a significant positive impact on helping the family bond. Respondents of the Oquirrh Mountains Trails Survey seemed to agree with this assessment, with approximately 90% of respondents indicating they either “strongly agree” or “agree” that outdoor recreation plays an important role in maintaining or improving social wellness.

TRAILS PROMOTE A SENSE OF PLACE AND PROTECTION OF NATURAL ENVIRONMENT

Experiencing the beauty of the natural environment serves as a catalyst toward public awareness of the need for conservation. Public trails allow residents to experience nature, gain appreciation for the world around them, and take greater ownership of conservation efforts. One study found that “overall time spent in nature leads to increased perceived value for connectedness to nature and, subsequently, greater pro-environmental attitudes and behaviors.”

INVESTMENT IN PUBLIC TRAILS LEADS TO ECONOMIC GROWTH

Trails and outdoor recreation opportunities enhance the economy in several ways. Proximity to trails improves property values. The desirability of trails causes homes and properties near trails to increase in value. Some economic studies suggest that property value increases can be seen up to two (2) miles from a trailhead, while others found the impact concentrated on those properties much nearer to trails.

Trails bring visitors, who spend money on local services, especially at restaurants, hospitality, and retail establishments. The Outdoor Industry Association estimates that consumers spend around \$887 billion annually, which generates \$65 billion in federal tax and \$59 billion in state tax. An investment in trails can help Tooele County better capitalize on this spending and better stabilize its tax base.

Additionally, proximity to trails and outdoor recreation helps employers attract and retain talent. Trails and outdoor recreation opportunities promote a higher quality of life. Younger workers in particular are drawn to locations with these abundant outdoor recreation opportunities. By investing in trails, the desirability of living nearby increases, which helps industries retain young talent.

³⁵Urban Nature Experiences Reduce Stress in the Context of Daily Life Based on Salivary Biomarkers, *Front. Psychol.*, 04 April 2019, Volume 10- 2019 <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.00722/full>

³⁶<https://pubmed.ncbi.nlm.nih.gov/22486584/>; <https://pubmed.ncbi.nlm.nih.gov/23953873/>; <https://pubmed.ncbi.nlm.nih.gov/31223536/>

³⁷See Appendix A for fully survey results.

³⁸“Family Vacation Activities and Family Cohesion,” Xinran Y. Lehto, et al., *Journal of Travel & Tourism Marketing*, Volume 29, Issue 8, 2012, 835-850, <https://www.tandfonline.com/doi/abs/10.1080/10548408.2012.730950>

³⁹Time Spent in Nature is Associated with Increased Pro-Environmental Attitudes and Behaviors,” *Int J Environ Res Public Health*, July 2021, 18 (14), 7498, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8305895/>

⁴⁰Asabere, P. and F. Huffman. 2009 “The relative impacts of trails and greenbelts on home price.” *The Journal of Real Estate Finance and Economics* 38 (4): 408-419

⁴¹“Understanding the impact of trails on residential property values in the presence of spatial dependence,” Parent, O & Vom Hofe, R, *The Annals of Regional Science*, 2013, 51(12), 355-375

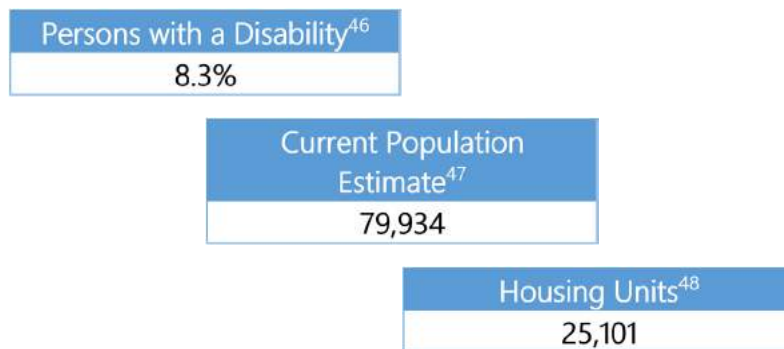
⁴²“Greenways and greenbacks; the impact of the Catawba Regional Trail on property values in Charlotte, North Carolina,” Campbell, H, Jr, et al., *Southeastern Geographer*, 2007, 47(1) 118-137

⁴³“Trails make economic sense,” *American Trails* <https://www.americantrails.org/resources/trails-make-economic-sense#:~:text=Outdoor%20recreation%20now%20outpaces%20the,more%20desirable%20place%20to%20live.>



Chapter 3: Demographics and Growth

Tooele Valley is a rapidly growing community. Population growth in recent decades has outpaced the State of Utah. While Utah grew 18% in the decade between 2010 and 2020, Tooele County saw growth of nearly 25%. In the decade between 2020 and 2030, the State of Utah is projected to grow an additional 18%,⁴⁴ while Tooele County is projected to outpace this growth again significantly with a 32% population increase. The Kem C. Gardner Policy Institute anticipates that growth will continue in future decades, but cool from the rapid growth rate experienced in the early 2000s.



Tooele County Population Growth

Census ⁴⁵	Population	% change
1910	7,924	7.6
1920	7,965	0.5
1930	9,413	18.2
1940	9,133	-0.3
1950	14,636	60.3
1960	17,868	22.1
1970	21,545	20.6
1980	26,033	20.8
1990	26,601	2.2
2000	40,735	53.1
2010	58,218	42.9
2020	72,697	24.9
2030	96,600	32.9
2040	115,253	19.3
2050	133,001	15.4
2060	148,890	11.9

⁴⁴Kem C. Gardner Policy Institute, University of Utah, <https://gardner.utah.edu/demographics/population-projections/>

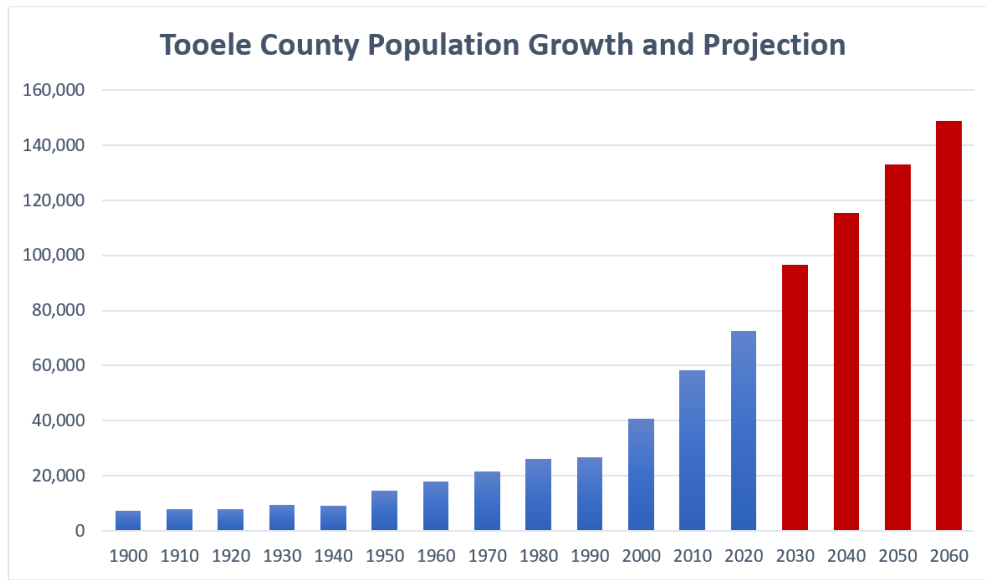
⁴⁵U.S. Decennial Census

⁴⁶Persons with a Disability, under age 65, 2017-2021, <https://www.census.gov/quickfacts/tooelecountyutah>

⁴⁷Population estimate as of July 1, 2022, <https://www.census.gov/quickfacts/tooelecountyutah>

⁴⁸Housing Units estimate as of July 1, 2022 <https://www.census.gov/quickfacts/tooelecountyutah>

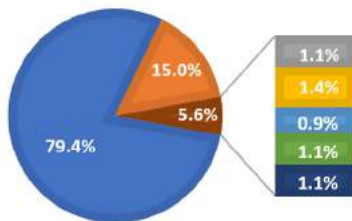
With over 8% of residents having a form disability, it is important to consider accessibility when creating and promoting a trail network. Tooele County is predominantly White, non-Hispanic, with a growing Hispanic or Latino representation.⁴⁹



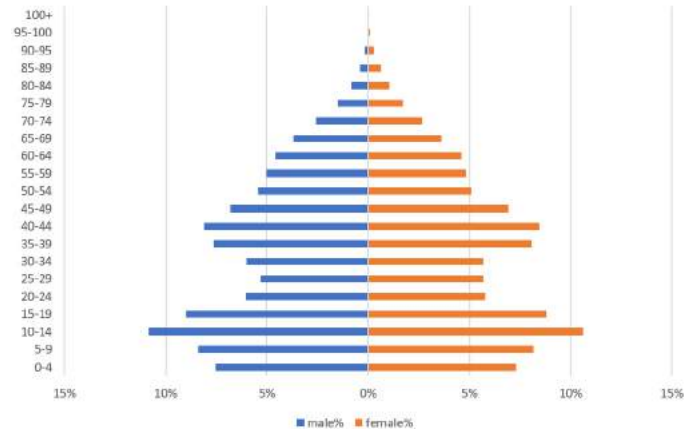
Historical growth is shown in blue with projected future growth displayed in red.

TOOELE COUNTY RACE & ETHNICITY

- White, non-Hispanic
- Black or African American
- Asian
- Other
- Hispanic or Latino
- American Indian or Alaska Native
- Native Hawaiian or Pacific Islander



Tooele County Population by Age



The Tooele County age pyramid shows a disproportionate number of older children and individuals aged 35-49.⁵⁰ This is indicative of a large family population without many young professionals, college students, or other young families.



Much of the County's growth has been occurring, and will likely continue to occur, on the east side of the County, near the Oquirrh Mountains. This growth, along with a relatively younger demographic, will lead to additional demand for trails and recreational opportunities within the Oquirrh Mountains. By providing a robust trail network, with a range of use types, skill levels, distances, and destinations, the County can meet the needs of the growing population and avoid overcrowding on individual trails.

⁴⁹U.S Census Data, July 1, 2022 estimate, <https://www.census.gov/quickfacts/tooelecountyutah>

⁵⁰Kem C. Gardner Policy Institute, University of Utah, <https://gardner.utah.edu/demographics/population-projections/>

⁵¹Median Household Income (in 2021 dollars), 2017-2021, <https://www.census.gov/quickfacts/tooelecountyutah>

⁵²Persons in Poverty, Percentage, <https://www.census.gov/quickfacts/tooelecountyutah>



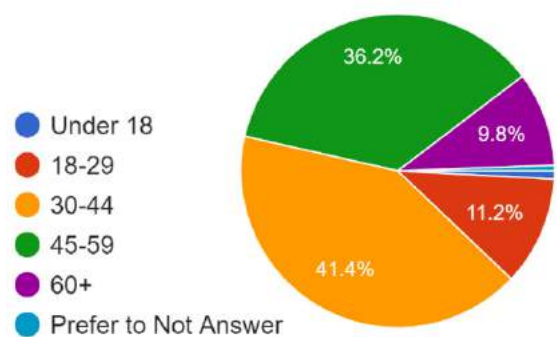
Chapter 4: Community Guidance

In August 2023, a community survey was conducted to better understand community attitudes, preferences, observations, experiences, and concerns regarding trails in the Oquirrh Mountains. The survey was conducted online via Google Forms and was posted across numerous social media pages. Fliers with a QR code were posted at trailheads and various locations throughout the county. In total, the survey recorded 1,082 responses.

The survey provided clear guidance on many issues and policy objectives. Respondents expressed concerns with public access, adequate signage, and trail quality. Respondents overwhelmingly expressed support for public trails, using county resources to work toward resolving private property issues and installing necessary infrastructure. This chapter will outline the survey responses and key themes.

Responses represented a wide range of ages and educational backgrounds and were skewed toward men and more affluent households. Nearly 75% of respondents lived within Tooele County, while approximately 25% indicated they resided outside the County. This was likely due to people visiting Tooele for the County Fair, which was one of several locations where notices were posted.

Age
1,076 responses

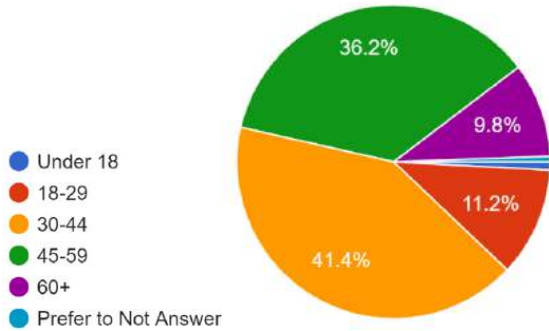


Limitations

Due to constraints, the survey likely includes some sampling and non-response bias. The survey does not represent a simple random sample.

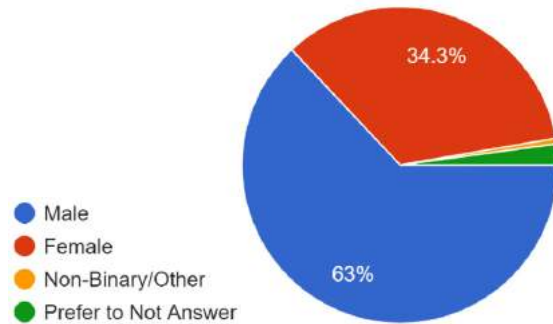
Age

1,076 responses



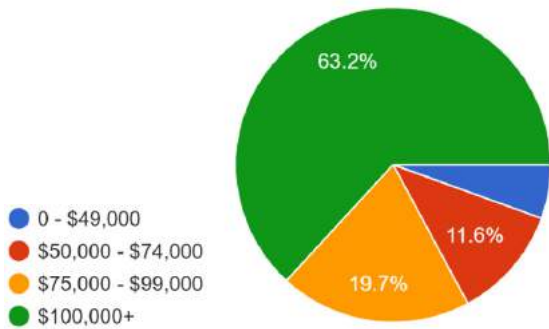
Gender

1,070 responses



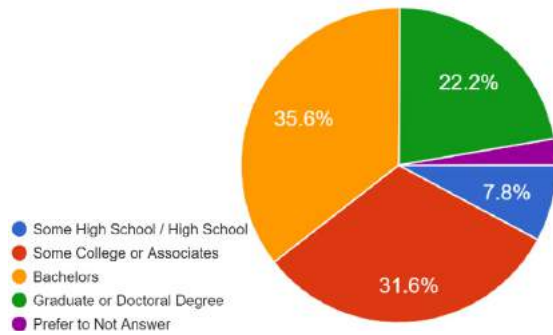
Household Income

1,032 responses



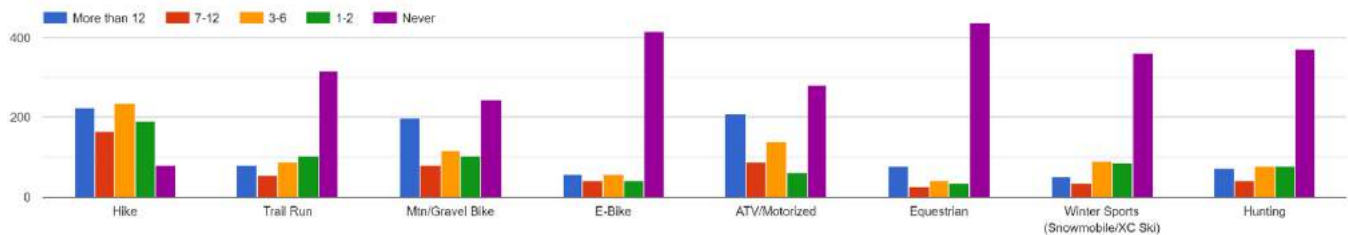
Education

1,072 responses



Respondents represented a wide range of user group types. Hiking was the most reported activity, followed by mountain biking and ATV/OHVs. Other uses, such as trail running, horseback riding, hunting, e-bike riding, and winter sports—such as XC skiing, snowshoeing, and snowmobiling—were all well-represented, but constituted a smaller percentage of respondents.

Which activities do you typically engage in when using trails in the Oquirrh Range? (Frequency per year)

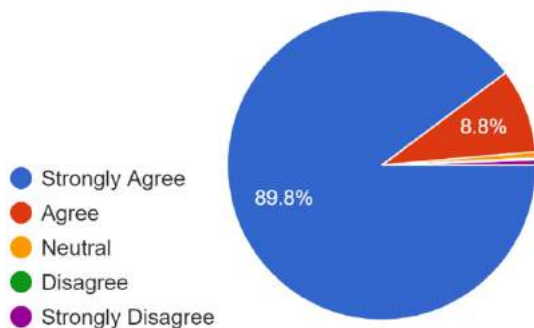


OVERWHELMING SUPPORT FOR PUBLIC TRAILS

Survey results showed robust public support for trails. Nearly 99% of respondents indicated trails are very important and 95.8% indicated they either “agree” or “strongly agree” that it is a good use of public resources to create and maintain trails and trail facilities. Furthermore, 91.9% of respondents indicated promoting outdoor recreation is an important part of regional economic development, with only 3.1% in disagreement.

Access to public trails is very important to me

1,079 responses



“Trail system is way overdue.”

“We need more trails! ”

“A trail from Stockton to Lake point.”

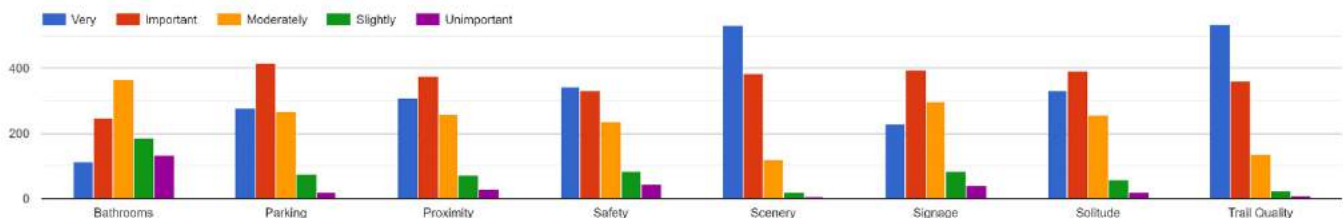
“More mountain biking trails”

“I'm hopeful our trails can become the envy of Utah!”

ISSUES OF PUBLIC ACCESS, SIGNAGE, AND TRAIL QUALITY ARE SIGNIFICANT BARRIERS TO TRAIL USAGE

The survey highlighted the need for significant improvements to the quality of trails and trail infrastructure. Of the factors impacting whether to use a trail, trail quality and scenery were the most important factors.

How important are these factors in deciding whether to use a trail?



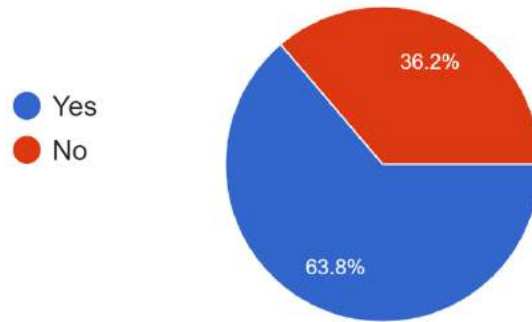
A majority of respondents indicated that there are activities they would like to participate in, but are not able to. A subsequent question was posed to better understand those motives. Some of the motives were internal, such as having sufficient time, expertise, ability, and support. Others dealt with external forces, such as access to information about the trails, trail signage, and trail availability for the desired use type. Respondents overwhelmingly selected external motives as their reasons for not using trails as much as they'd like. Nearly half of respondents indicated there is insufficient information about trails, and 42% indicated trails are insufficiently marked or maintained. These results are striking when compared with a 2017 national survey, which showed barriers to participating in outdoor activities were far and away primarily due to individual constraints, such as time, money, skills, availability of friends, as opposed to the nature of the trails. In that survey, only 9% of respondents indicated access to information as a barrier to participating. Even more strikingly, only 2% indicated outdoor recreational places as being poorly maintained as a barrier.⁵³

“I WANT to hike but don't even know where to start.

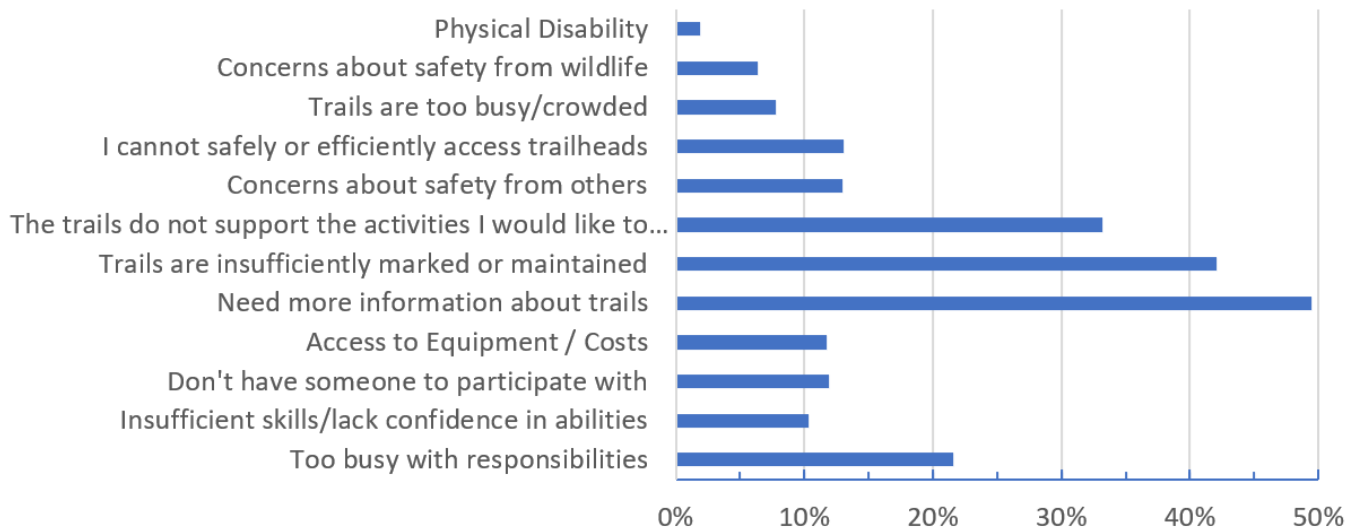
I've lived in the county for 13 years and it is not an easy thing to determine.” –Respondent

⁵³Reasons for not participating in outdoor activities among Caucasians in the U.S. 2018, Statista Research Department, Dec 9, 2022, Outdoor activities: reasons for non-participation among Caucasians U.S. 2017 | Statista

Are there activities in which you would like to participate in the Oquirrh Mountains but do not?
1,068 responses



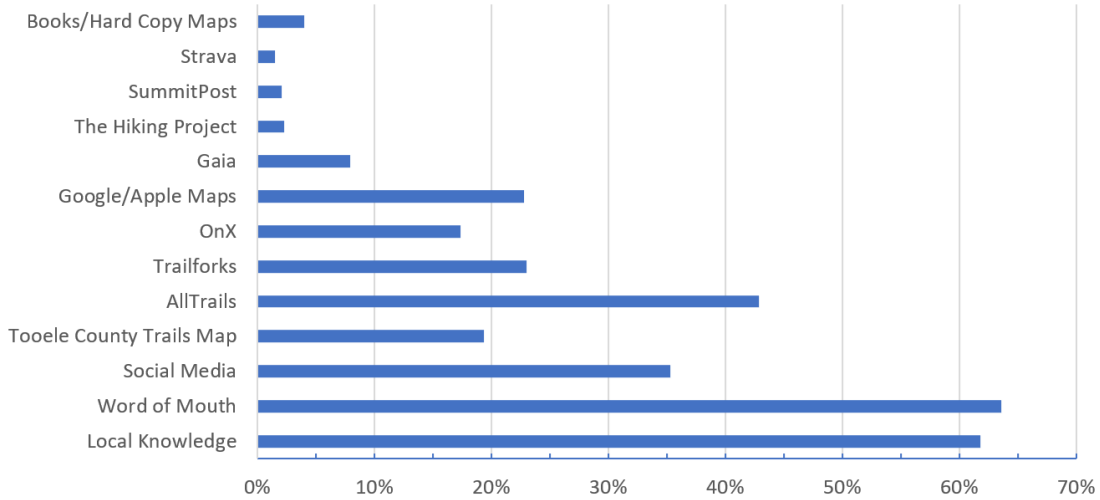
If yes, what are the primary reasons?



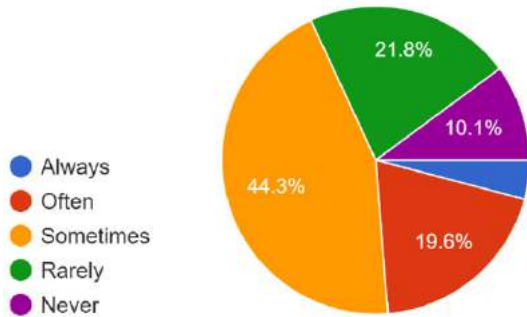
Part of the challenge for residents to obtain information about trails is the vast number of social, or DIY, trails that were created without authorization. These trails are listed on numerous open-source trails platforms, such as Alltrails, Trailforks, and Strava. Many of these trails' cross private property, which is not clearly shown on trail maps, leaving trail users uncertain to issues of legality and liability. Additionally, trails were not properly designed to meet industry standards for trail design elements such as slope, trail width, and drainage, have numerous splinter or shortcut trails, lack signage, and do not start or end at designated trailheads. These conditions make online resources and the trails themselves inherently unreliable and leave trail users to rely on their own experience and institutional knowledge. This is reflected in the results.

Nearly a quarter of all respondents indicate they either "often" or "always" have difficulty wayfinding on trails in the Oquirrh Mountains, with an additional 44.3% reporting they "sometimes" have said difficulties. Less than a third of respondents report being able to know where to go without having problems. These conditions result in both an impediment to trail usage and a threat to public safety.

How do you typically learn about trails in the Oquirrh Mountains and find trail information? (select all that apply)

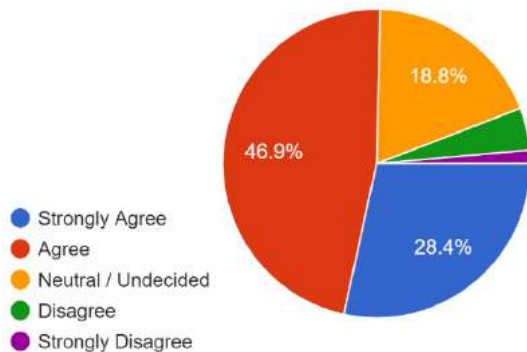


Difficulty wayfinding (hard to know where to go)
1,049 responses

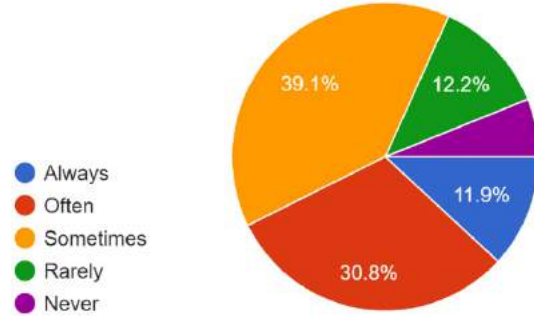


There are times I find it difficult to know when I'm on a trail that has been legally established and when I am not

1,063 responses

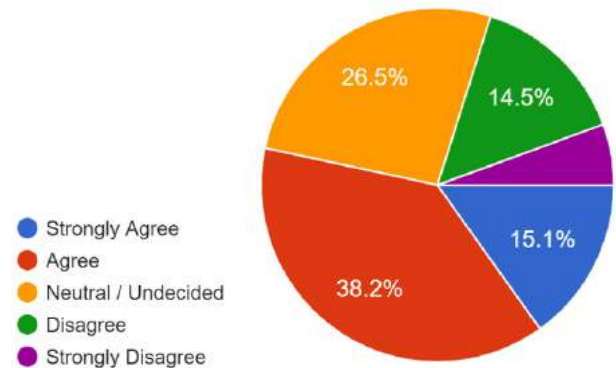


Uncertainty about legal trail access or trespassing
1,053 responses



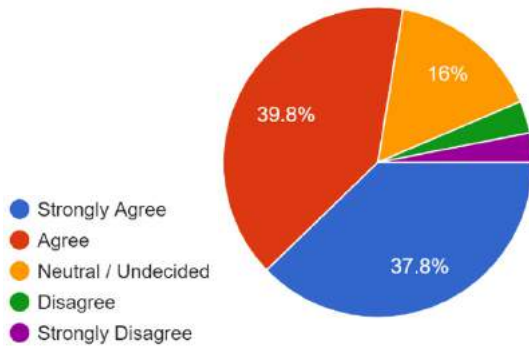
Lack of signage or trail promotion deters me from experiencing new trails

1,059 responses



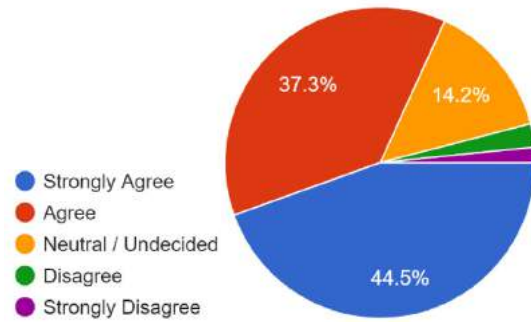
Protecting private property rights is important to me

1,075 responses



I would like to see many of the social trails become established legal trails

1,067 responses



In addition to being unsure where to go to follow a trail, respondents expressed uncertainty as to knowing when they are trespassing. Only 18.3% of respondents indicated they are “rarely” or “never” uncertain about legal trail access or trespassing. Meanwhile, over 42% state they are “always” or “often” unsure about legal access and trespassing. This represents a sizable portion of respondents and a significant barrier the County will need to overcome.

Similarly, respondents overwhelmingly agree that it is difficult to know whether they are on a trail that has been legally established. Over 73% of respondents agreed there are times when it is difficult to know whether a trail is legally established. Only 5.8% felt secure in knowing a trail was legally established.

These results are consistent with survey findings regarding signage. The survey found that most respondents (53.3%) either “agree” or “strongly agree” that lack of signage or trail promotion deters them from experiencing new trails.

Part of this concern may stem from an ethos of respecting private property rights. Of respondents, only 6.7% suggested that protecting private property rights is not important, while nearly 77% indicated it is important. By installing improved signage and working with property owners to resolve trespass issues, residents will be able to recreate without fear of violating a widely respected and valued right.

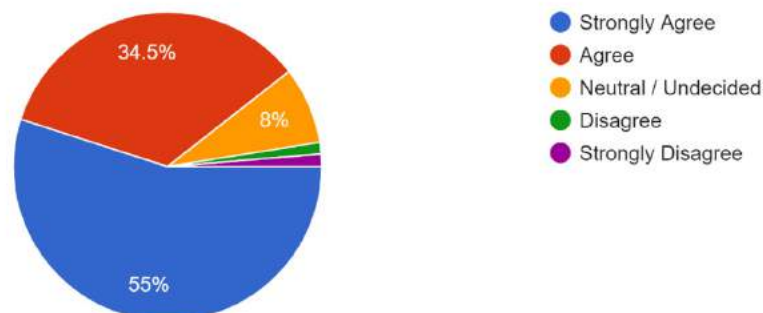
RESIDENTS SUPPORT TAKING ACTION TO ADDRESS TRAILS ISSUES

Respondents overwhelmingly concurred that they would like to see actions taken to convert social trails to legally established trails. Nearly 82% agreed, compared with 4% indicated disagreement.

To achieve the vision of legally establishing trails, the County would need to undertake several steps. Some of these steps could include investments of time and money. One of the first steps is resolving conflicts between private property owners and the public by obtaining permission for public trail use and improvements. 90% of respondents agreed that they would like to see this happen.

I would like to see conflicts between private property owners and the public at large resolved by obtaining permission for public trail use and trail improvements

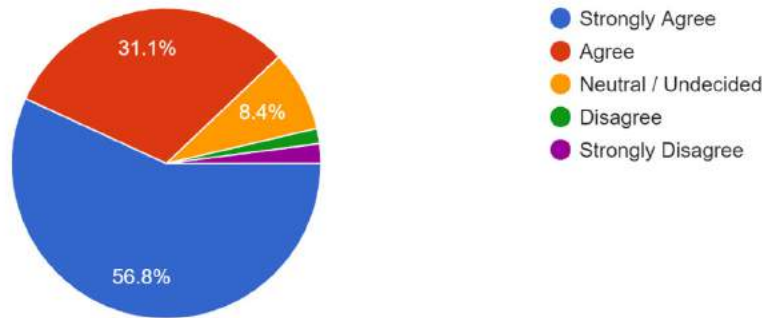
1,070 responses



Resolving these conflicts in a way that keeps trails open could include the County purchasing land or access rights through easements. Again, the public was very supportive of the County taking on these efforts, with nearly 88% indicating support.

I support the County purchasing easements, purchasing property, and/or engaging in land swaps with private property owners to obtain legal permission for new and existing trails and trail facilities

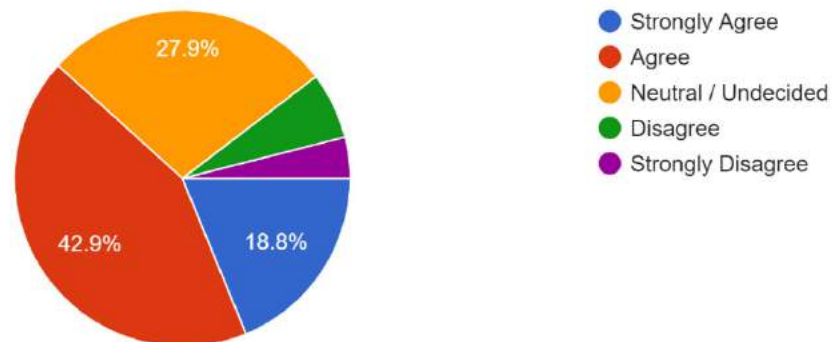
1,073 responses



Similarly, efforts to enhance trail access saw high levels of support. "Improved vehicular access to trail heads" and "improved multi-use trail access to mountain trail heads" both saw significant public support. Nearly 62% "agree" or "strongly agree" that they would like improved vehicular access to trail heads, while only 10.4% indicated a level of disagreement. Meanwhile, 67.4% stated they either "agree" or "strongly agree" that they would like improved multi-use trails (such as bike trails) to mountain trails.

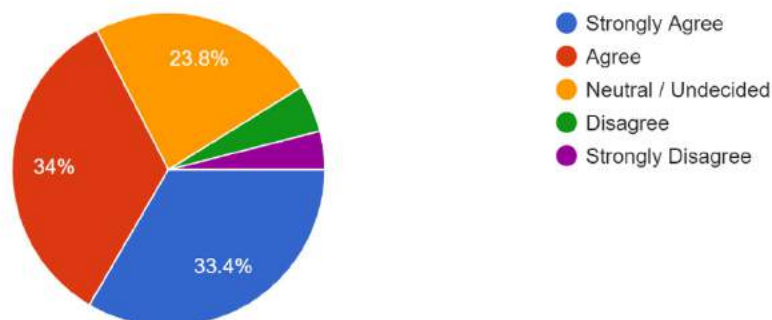
I would like improved vehicular access to trail heads

1,063 responses



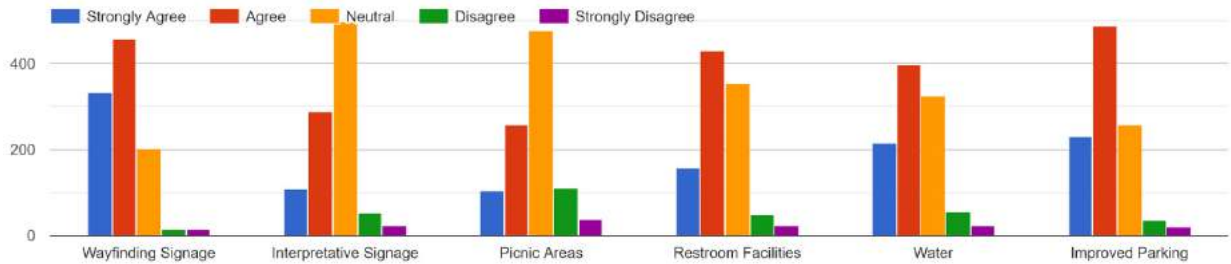
I would like improved multi-use trail (such as bike trail) access to mountain trail heads

1,065 responses



Respondents indicated support for trail improvements. Consistent with results throughout the survey, a strong desire is for improved wayfinding signage. Nearly 90% of respondents agreed that they would like to see wayfinding signage improvement. While each improvement type received general support, other popular desired improvements included parking (69%), water (60%), and restroom facilities (58%). No polled potential improvement saw significant disapproval, with “neutral” being the most consistent alternative response.

I would like more of the following amenities included in the trails system

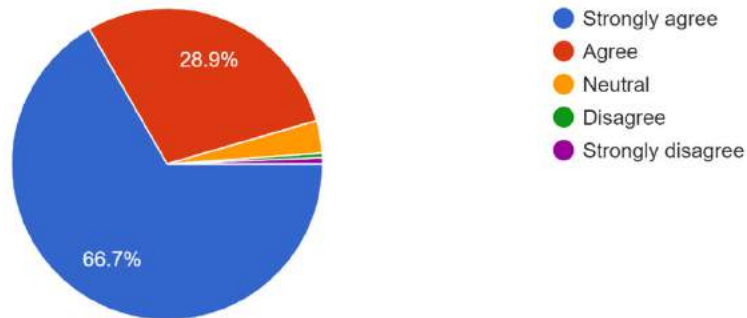


	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
<i>Wayfinding Signage</i>	33%	45%	20%	2%	2%	1024
<i>Interpretative Signage</i>	11%	30%	51%	5%	2%	972
<i>Picnic Areas</i>	11%	26%	48%	11%	4%	988
<i>Restroom Facilities</i>	16%	42%	35%	5%	2%	1018
<i>Water</i>	21%	39%	32%	6%	2%	1017
<i>Improved Parking</i>	22%	47%	25%	3%	2%	1031

Taking on the tasks to provide the desired improvements will require significant investment by Tooele County. Respondents indicated broad support for such efforts, with 95.6% indicating support for using County resources and 93.9% supporting the County pursuing matching grants.

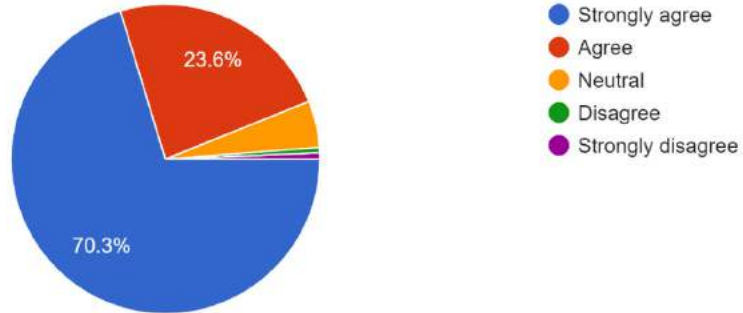
I support using County resources to enhance outdoor recreation

1,071 responses



I support the County pursuing matching grant opportunities to enhance outdoor recreation

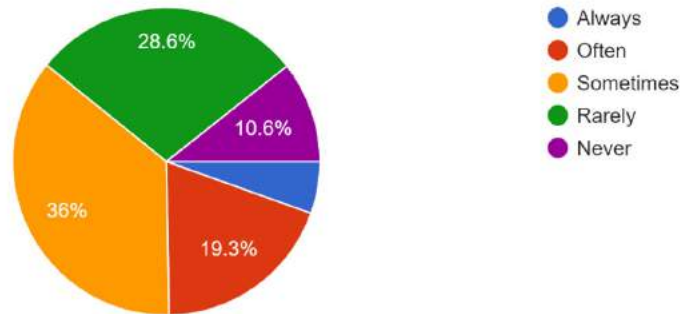
1,070 responses



Questions not covered:
Incompatibility between user groups

Incompatibility between user groups, such as hikers, mountain bikers, horseback riders, or ATV riders, that share the trail

1,043 responses





Chapter 5: Vision

The public survey provided clear guidance on desired components for the trail system and current challenges and barriers for trail users. This Trails Plan lays out a path to address those concerns and desires. The Plan outlines a vision to create a robust, healthy, and sustainable trails system. The vision is based on BLM's three components for trail sustainability.¹

The vision consists of six components:

1. Trails meet best practice standards in their design and signage.
2. Trail networks interconnect and connect into active transportation networks.
3. Trail networks provide the desired range of trail types and meet the needs of a diverse population.
4. Access issues are clarified and resolved,
5. The public knows what trails are available and which uses are permitted on each trail
6. The trail network is sustainable and set up for success.

In this chapter, goals and action items are established to meet that vision. The Tooele County Trails Committee should review the goals and actions annually and develop measures to achieve them. These goals should be used as justification and support for pursuing grants, expending resources, and engaging community volunteers.

The goals and actions are subject to review and amendment. The Trails Committee should establish priorities, as some goals and actions represent pressing needs while others establish a long-range vision.

Three Components of Trail Sustainability

Environmental Sustainability: Will the trail provide for resource protection? This is the definition that is commonly used when referring to what does or does not provide for a sustainable trail.

Social Sustainability: This is frequently overlooked in the trail development process. Evidence of the failure to meet desired user outcomes—experiences and associated benefits—are everywhere: overcrowded trails, trails with little use, trail users who feel “pushed out” by other users, and unauthorized routes.

Economic Sustainability: Can the land manager and community bear the long-term costs of maintaining a trail? If it provides a valuable experience, it is likely worth the investment, but it must be weighed against shrinking maintenance budgets.

¹ source: “Guidelines for a Quality Trail Experience, 2017, BLM, <https://www.blm.gov/sites/blm.gov/files/Guidelines-for-a-Quality-Trail-Experience-2017.pdf>

Goals and Actions

1	Increase Trail Quality
A	Design new trails to the trail standards recommended in this Plan and associated best practice trail standard guides.
B	Take mitigation measures to redesign or rehab existing trails where tread and drainage does not meet trail standards. Relocate trails that cannot meet design standards.
C	Design trails for intended user groups and install clear signage. Incompatible user groups are kept on separate trails. Where needed, install barriers to prevent access from unpermitted user groups.
D	Splinter trails, duplicate trails, and trail areas that cannot meet best practices will be retired, with signage installed informing the public that the trail is closed and stating the purpose for the trail closure.
E	Install interpretative signage to increase public awareness of history, culture, conservation, and environmental stewardship.

2	Create a Regional Trail Network
A	Ensure that each desired trail user group is represented in the regional network
B	Identify trail corridors for future trails to connect canyon trail networks to each
C	Coordinate with the Bonneville Shoreline Trail Committee to explore extension of the BST around the northern end of the Oquirrh Range and south to Ophir
D	Connect trailheads into active transportation system through multi-use paths, bike lanes, or other bike friendly infrastructure

3	Improve Individual Trail Networks
A	Improve parking lots at trailheads to include parking lot name signage, trailhead signage, and facilities as needed, which may include restrooms, water, picnic areas, pavilions, and parks and greenspace.
B	Improve parking and circulation at parking lots, based on the need for the trail. Parking lots may be paved or dirt/gravel based on demand.
C	Connect all trails to established trailheads
D	Establish which uses are permitted on each trail in light of the trail network, with each individual trail network specializing in some use (hiking, mtn biking, equestrian, atv/ohv, snowmobile, xc skiing, snowshoeing)
E	Develop a system of trails that meet a variety of abilities at each trailhead
F	Ensure vehicular routes to trailheads are well-graded and suitable for driving

4	Establish Clear Access, with All Trails Legally Established
A	Work with property owners to obtain formal consent for public access and resolve issues relating to trespass. When a government agency is involved, this may require signed approval documents.
B	Record easements, licenses, or other forms of consent on title to establish a clear understanding of access rights and reduce uncertainty for future trail stewards
C	Relocate or retire trails where access permission not granted
D	Install clear signage indicating trespass areas: Public has clear understanding of public access and trespass
E	Install signs on major roads directing to trail heads
F	Update trailhead signage
G	Install and update wayfinding signage at all trail junctions and ensure cairns are placed where needed

5	Increase Public Knowledge of Trails
A	Update Tooele County Trails map
B	Update commonly used open source maps, such as Alltrails, Trailforks, OnX, SummitPost, and Google Maps
C	Announce new or rehabbed trails on social media and other outlets
D	Update public on efforts to enhance recreational experience
E	Involve stakeholder groups to disseminate information about formally established trails

6	Improve Sustainability
A	Develop a trail maintenance schedule
B	Pursue trail grants to help achieve the goals of this plan
C	Continue to pursue avenues to obtain County funding for trails and recreation
D	Collaborate with, and continue building, volunteer networks
E	Enhance trail stewardship through joint efforts with volunteer networks and stakeholders to promote public education and awareness of new trails, trail etiquette, and trails issues
F	Sponsor annual trails days to clean up or rehab trails and trail facilities

7	Create a Trails Alliance
A	Coordinate with similar trails alliance groups to learn best practices and pitfalls of creating, supporting, and collaborating with a non-profit trails alliance
B	Assist in establishing a trails alliance with a board of directors and membership
C	Facilitate and guide the trails alliance's efforts to develop partnerships, sponsors, and advisors
D	Coordinate with the trails alliance to develop annual events and activities to raise awareness, advocate, maintain, and improve trails
E	Support the trails alliance in developing fundraising events and opportunities
F	Assist the trails alliance in providing informational materials to the public regarding local trails
G	Collaborate with trails alliance on maintenance and trail development efforts



Chapter 6: Trails Audit

This chapter provides an inventory of presently used trails. Several trails included are social, or “DIY,” trails that were not necessarily created with formal permission from property owners, are unlikely to have been built by professional trail builders, and may have not received standard periodic maintenance. The purpose of this audit is to create informed decisions regarding where to invest time and resources. It is not intended to be an exhaustive list of all trails used by the public.

Trail Issues

- First and foremost, many of trails shown cross private property. The presence of the trail does not guarantee formal permission has been granted.
- Some positive control points lack a trail and a new trail may be warranted.
- Trail networks in the individual canyon areas do not interconnect or provide connection into neighborhoods.
- Trail network does not connect into regional trail networks, such as the Bonneville Shoreline Trail.
- Trail configurations may not reflect proper grading, nor address negative control points. Individual trail audits will need to reassess control points and alignment.
- Several represent duplicate trails (trails that serve the same control points) and some may need to be decommissioned. Many of these trails have informal splinter trails that are not shown on these maps. To reduce confusion, promote public safety, and protect natural resources, these splinter trails will need to be identified and decommissioned through a mixture of signage, barriers, and public awareness campaigns.
- Ongoing trail creation: In recent years many new unauthorized trails have been created. Several of these are in the Bates Canyon area. These trails are often created without formal property owner permission and do not meet the standards of this Trails Plan.

Consensus Building

The successful development of public trails hinges on inclusive collaboration among all stakeholders. Failing to engage various user groups in the planning and implementation process can lead to dissatisfaction and non-compliance. When specific user needs are overlooked, individuals may resort to creating unauthorized trails or disregarding access regulations altogether. This is particularly true for user segments known for non-compliance in the past, having established their own trails without official permission. To mitigate such issues, it is crucial to involve representatives from diverse user communities, including ATV enthusiasts, horseback riders, and mountain bikers, among others. By ensuring that the voices of all trail users are heard, and their unique requirements are considered, the likelihood of widespread compliance with regulations increases significantly. This inclusive approach fosters a sense of ownership among users, making them more willing to adhere to established rules, ultimately contributing to the success and sustainability of the trail project.

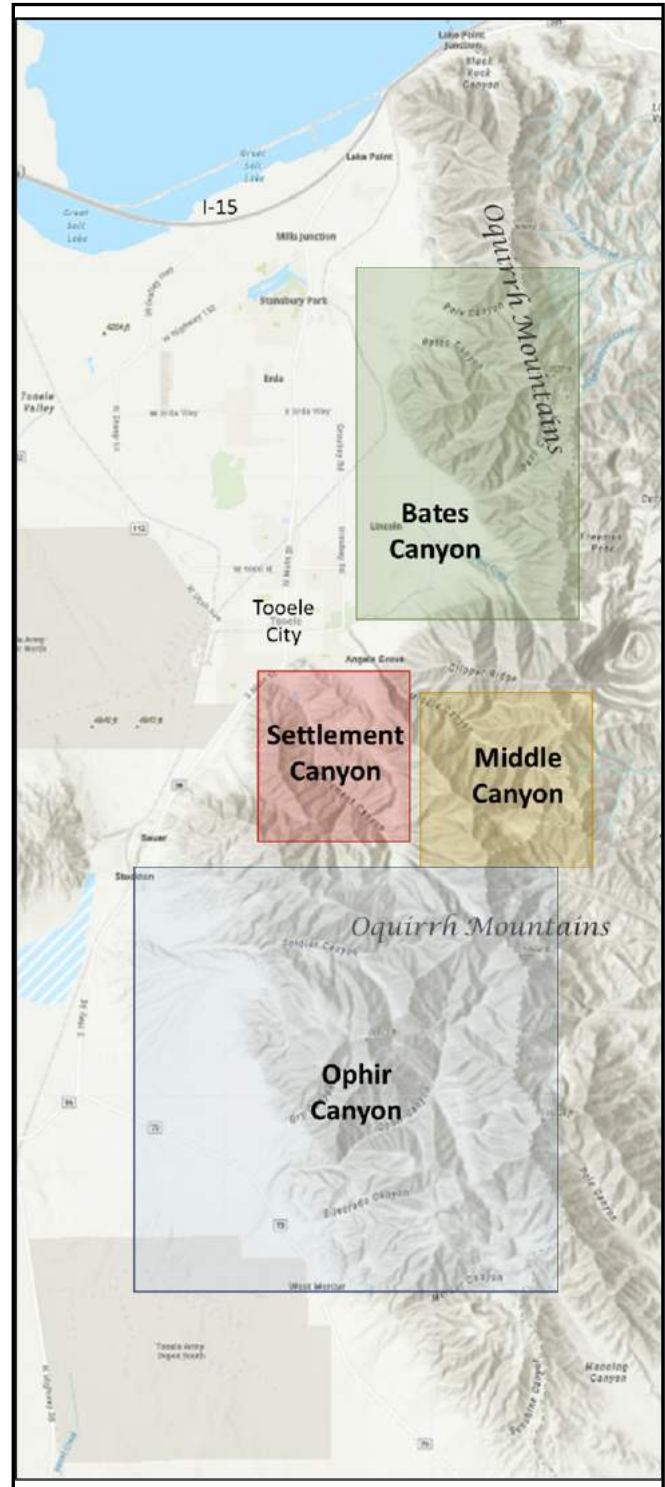
Understanding the Maps

The trails do not reflect legally established trails, instead they reflect what people have been using. Trail configurations were pulled from Alltrails, TrailForks, Strava, and the Tooele County Trails Map. Each of these represent user experiences, not formal trails.

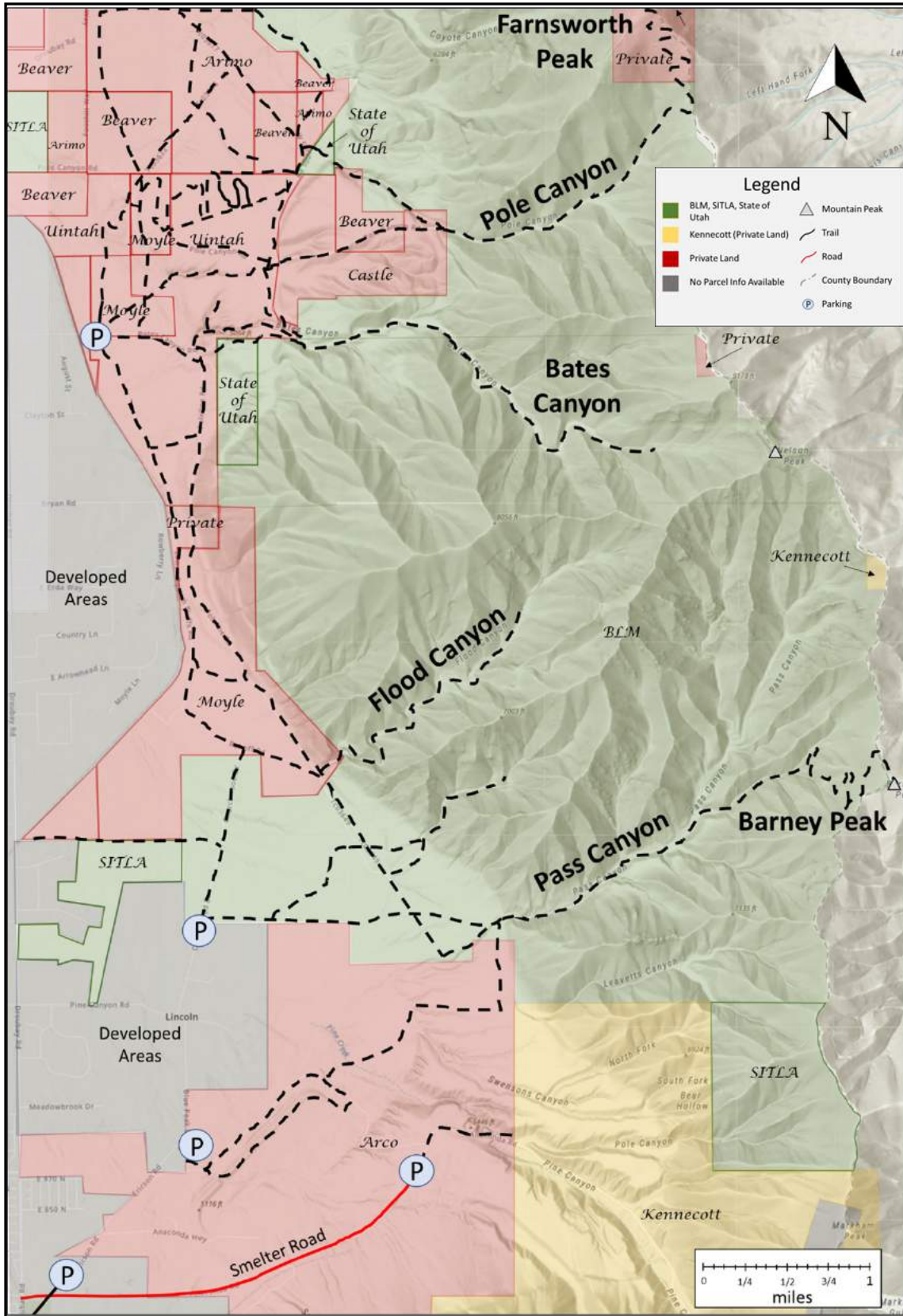
Parcel lines are illustrative of ownership at the time and subject to change. Please consult the latest Tooele County GIS map for specific details.

Many trails shown cross private property. Display of the trail on any given map does not indicate public access has been granted. Rather, trails crossing private property indicate locations where public access needs to be addressed.

The audit is broken into four main regional trail systems, shown in the adjacent map. The trail systems from North to South are Bates Canyon, Middle Canyon, Settlement Canyon, and Ophir Canyon. Each of these trail systems present their own unique conditions and challenges. They are presented in turn.



Bates Canyon Trail Network



The Bates Canyon area consists of public lands primarily in the mountains with the foothills and basin consisting of a checkboard of private ownership. While land is divided into numerous parcels, the vast majority is held by a total of eight ownership groups, including Kennecott and Arco.





Trails primarily crossing public lands are shown with their commonly used trail names, while trails located on private property are left unnamed to avoid promotion of trails that might not be authorized by the property owner. Many trails in the foothills are unlabeled and interconnect in a labyrinth. Some areas, such as the North Oquirrh Management Area, have well-established signage with use restrictions. Other areas have minimal signage. This has led to a proliferation of ad hoc trails where it is difficult for visitors to know which trail they are on and when they are trespassing.

Three management areas exist within this region, including North Oquirrh Management Area, Carr Fork Wildlife Management Area, and Pine Canyon Conservation and Wildlife Management Area. Each of these areas present their own restrictions and regulations.



Unmarked Trails from Bates Canyon Trailhead

Select Trails

Trail	Miles	Elev.	Type					Issues
Bates Canyon Trail	9.2	3389'	Singletrack	✓		✓		Access in valley
Bates Foothills Loop	3.7	728'w	Gravel doubletrack	✓	✓	✓		Private property, routing
Oquirrh Wave	6.78	1045'	Doubletrack	✓	✓	✓		
Serengeti Loop	10.6	972'	Gravel, doubletrack, and singletrack	✓	✓	✓		
Farnsworth & Kessler Peaks		4450'	Doubletrack, singletrack	✓		✓		Private property at base and approach to summit
Barney Peak via Pass Canyon	11.9	3471'	Singletrack	✓		✓		Unmarked scramble toward peak
Flood Canyon	4	1237'	Singletrack	✓		✓		
Anaconda Road	2.4	511'		✓	✓			Not well marked.

Trail Descriptions

Oquirrh Wave

Along the foothills is a web of interconnected and largely unmarked trails. This region is characterized by a rocky and grassy open and undulating terrain crisscrossed by an expanding number of user-created trails. The Oquirrh Wave trail describes a loop created among this network. Strava data indicates, however, that visitors do not follow any route any particular. This presents a challenge as much of the land is private property.

This area has become popular for mountain bikers. TrailForks data indicate the two most popular trails are Sidewinder (including upper and lower) and Raptor (including upper and lower). Many of the foothill trails are DIY mountain bike trails and do not meet professional design standards. Tooele County should coordinate with these individuals to come up with a

solution to meet these needs and provide a product and experience that will work for property owners, the County, and trail users.

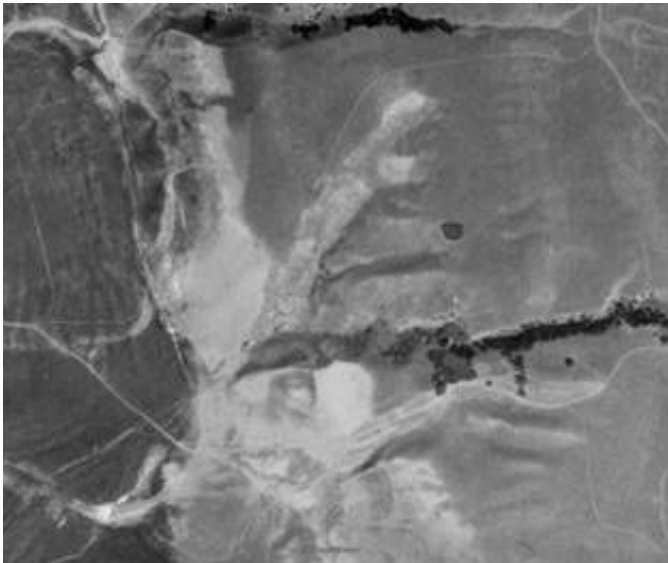
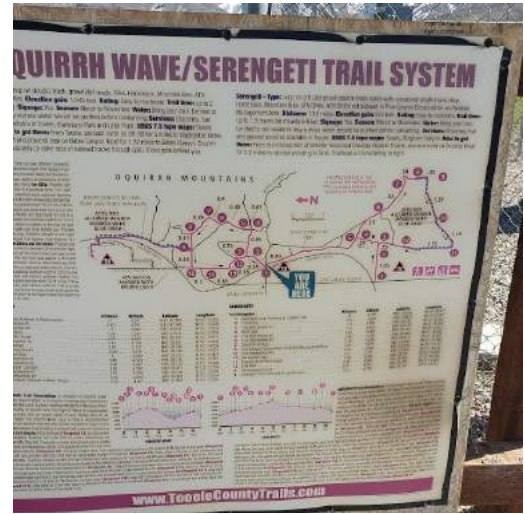
The area is also popular for ATV/OHV users. The complexity of competing user group interests and private property makes this area a prime focus point for the Trails Committee.

Bates Canyon

This is a popular trail up a mountain canyon toward a summit with a forested canyon, open ridgeline, and scenic views. The trail initially follows a doubletrack jeep trail before turning into a singletrack route and a scramble toward the summit of Nelson Peak. No motor vehicles are permitted past the gate. Hikers indicate ATV's and OHV's have caused damage to the tread. Wayfinding signage is needed from the trailhead to assist visitors in navigating the complex crisscrossed network of trails in the foothills and help promote its visitation.

Farnsworth and Kessler Peaks (Pole Canyon)

This is a popular hike through Pole Canyon with many people continuing on to summit Farnsworth and Kessler Peaks. The peaks are located on private property, which creates uncertainty among hikers. The peaks provide 360 degree views of the Great Salt Lake, Tooele Valley, and Salt Lake Valley. After the initial doubletrack climb through the foothills, the trail is single track and not suitable for motorized vehicles.



Aerial imagery of DIY trail growth from 1997 (left) to 2022 (right). The image on the right shows extensive routes developed over the past couple decades. Many of these trails do not appear in online searches.

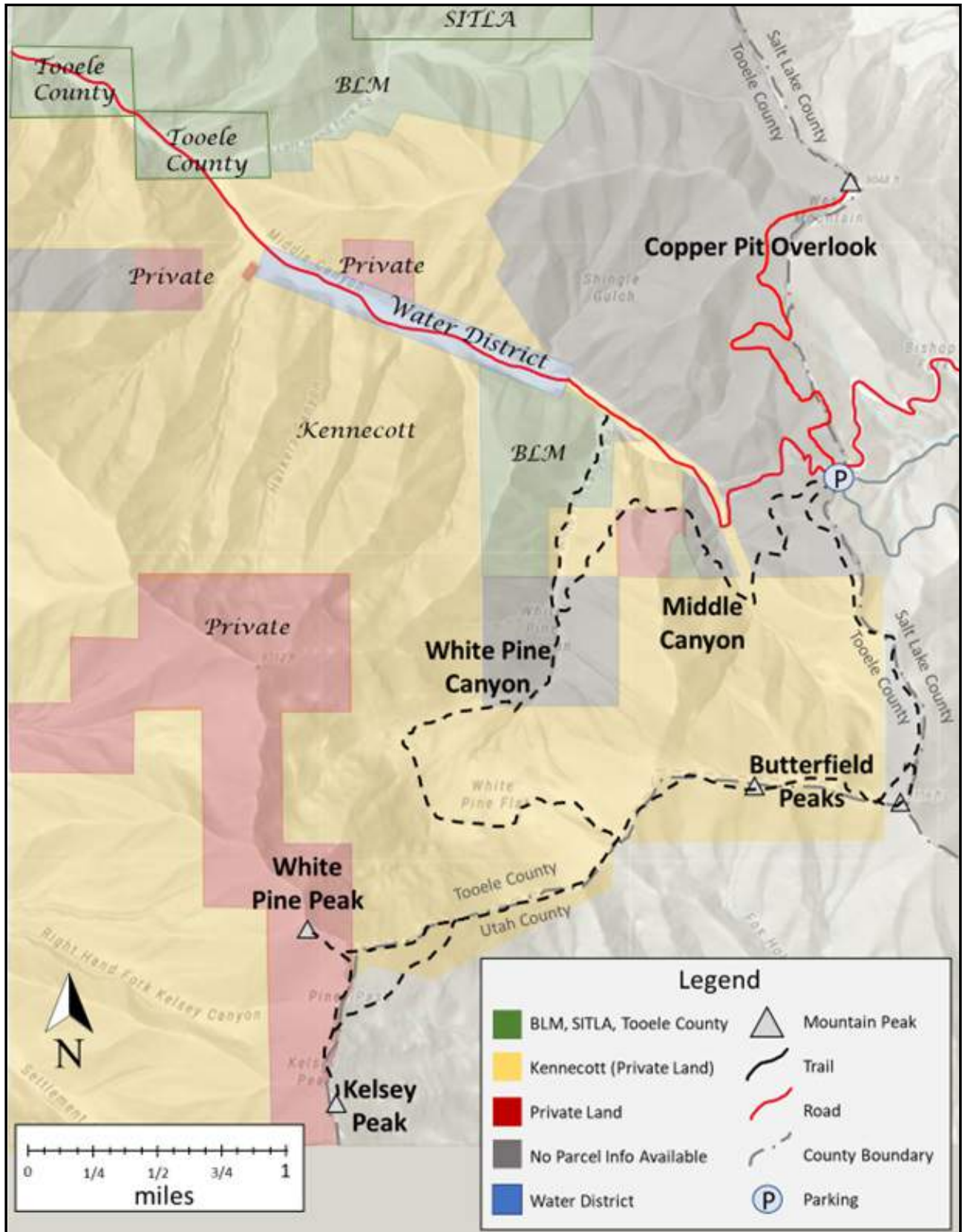
Barney Peak (Pass Canyon)

This is a relatively popular hiking trail. The hike doesn't have a direct trailhead, requiring hikers to cross a portion of the "Serengeti Loop." The hike has both doubletrack and singletrack areas until it turns into a scramble on the way to the summit of Barney Peak. The Peak can be accessed on public lands and provides views over both Tooele and Salt Lake Valleys. Like many of the hiking trails in the northern Oquirrh Range, the trail lacks signage. This makes it more difficult for locals to discover the presence of the trail. Additionally, perspective hikers have to navigate the web of foothill trails to reach the Pass Canyon trailhead.

Serengeti Loop

Much of this loop goes through Pine Canyon Conservation and Wildlife Management Area. This area is open to foot traffic and equestrian traffic only, and restricts bicycles and motorized vehicles, including ATV's and OHV's.

Middle Canyon Trail Network







The Middle Canyon Trail Network consists of non-motorized trails south of Middle Canyon Road. This road provides seasonal access between Tooele County and Salt Lake County. Herriman adopted a Butterfield Canyon Trails Plan in 2023, which outlines a non-motorized trails network on the Butterfield Canyon side of the Oquirrh Range.

Much of the land in Butterfield Canyon is owned by Kennecott. Kennecott supports conservational stewardship and low impact recreation. Trails on Kennecott property prohibit motorized use, including all motorbikes, ATVs and OHVs. In exchange for access, Tooele County would be responsible for trail maintenance and improvements. Any new trail crossing Kennecott property requires their review and authorization before approval may be granted. This Plan does not propose any new trails on Kennecott property at this time. However, it does propose trail quality improvements, trailhead improvements, and consistent maintenance to achieve desired trail standards. Once these improvements are made and a feasible and effective maintenance schedule is established, expansion of the trails network may be merited.

North of Middle Canyon Road, the Copper Pit Overlook Road provides views over Salt Lake and Tooele Counties, as well as over Bingham Mine. This road is privately owned with an agreement that maintenance is upheld by Tooele County. While the road is seasonally open to motorized and non-motorized traffic, any travel outside the road is not authorized. Trails outside the road should be blocked off and removed from trails websites.

Select Trails

Trail	Miles	Elev.	Type					Issues
Copper Pit Overlook	5.1	1243'	Road and Singletrack	✓			✓	Confusion about legal access and legal route.
Butterfield Peaks	3	1574	Gravel doubletrack	✓	✓	✓		Very steep. Unlikely to meet trail design standards.
Middle Canyon	4.4	574'	Singletrack	✓	✓	✓		Not designed for MTB, may cross private property. Needs maintenance and better connection to White Pine Canyon trail.
White Pine Canyon	5.6	1780	Doubletrack, and singletrack	✓	✓	✓		Rocky jeep trail until junction, then singletrack to ridgeline. Unmarked.
White Pine and Kelsey Peaks	9	3818'	Singletrack	✓		✓		Steep sections, ridgeline scramble, unmarked trail, crosses private property at summits.
T Trail	1.9	770'	Singletrack	✓				Unmarked, confusion about legal access

Trail Descriptions

White Pine – Middle Canyon – Butterfield Peaks

Each of the trails in this network have minimal wayfinding signage, rocky tread, and were not designed to meet best practice standards. Routes may need to be rerouted to create sustainable trails, reduce maintenance costs, and improve public safety. A portion of the Middle Canyon Trail appears to cross private property and may need to receive permission or be rerouted. Signage and trailhead improvements are needed. Trails show signs of loss of tread and in many locations switchbacks need to be installed to prevent trail tread deterioration due to fall line slopes.

These trails do not permit motorized vehicles, although several users indicate the presence of ATV's/OHV's, which degrade trail tread and are not authorized by the property owner. Barriers near entrances as well as instructive signage explaining the purpose for the restriction should be installed to improve compliance. Furthermore, signage should be installed at the Middle Canyon entrance to inform visitors of the restrictions. Any staff working at the booth should be instructed to inform visitors with ATVs/OHVs of the restrictions and the purpose behind the regulations.

T Trail

The T Trail starts at an unmarked road pullout along Middle Canyon Road about ¼ mile northwest of the Middle Canyon entrance gate. The road has a wide shoulder and is long enough to accommodate 5-6 vehicles. Trail is unmarked and goes to a gate. The gate provides a pedestrian crossing to the side of the gate, however no signage is present indicating the trail, public access permission, or permitted activities. The trail crosses private property for much of the duration of the hike until the trail approaches the T on the mountain side. Visitors frequently express uncertainty about public access. Complicating matters, the route has many splinter trails, some of which have public access and others appear to not have public access granted. A trail specific plan will need to be created that includes wayfinding and private property.

Other Trails

From the summit of White Pine Peak, some hikers continue west along the ridge line to Settlement Canyon. This connects at the upper junction of the Ridge Trail and Bench Trail in the Settlement Canyon trail system. The route is shown on Alltrails, however there is not a description for it, and the Strava Heat Map shows it receives light usage. The route crosses private property near White Pine Peak as well as at a second section lower along the ridgeline. If any issues relating to private property access could be resolved, this would make an intriguing regional connection between the two trail systems.

Winter Access

Middle Canyon is subject to seasonal winter vehicular closure. The canyon is typically closed to vehicles from November to May or early June. During this time, Middle Canyon road is informally used for winter recreation. Some of the upper trails, such as Middle Canyon and the White Pine Canyon doubletrack, may see use. At the base of the canyon, the parking lot at the mouth of the canyon next to the toll booth is a common place for winter parking.

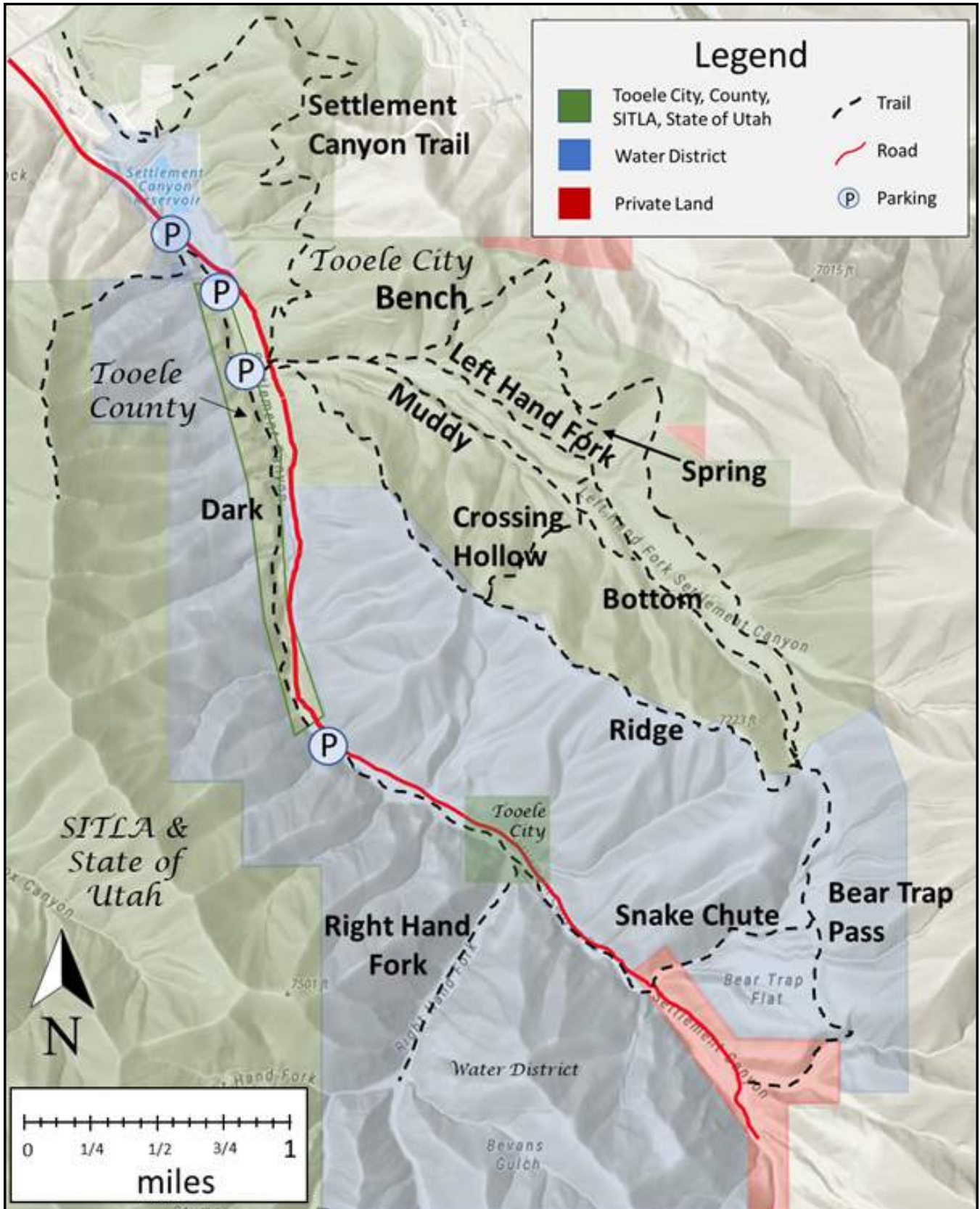
The Copper Pit Overlook Trail is closed during winter. Kennecott closes the gate to all traffic, and trail users should be made aware of this seasonal closure. This closure is intended to protect visitors of hidden dangers that may exist as they enter an area that has seen extensive mining operations over the years. Winter closures toward the Copper Pit Overlook may remain well into summer, after Middle Canyon Road has re-opened. This is due to snowfields at higher elevations that may require additional time to melt.

Tooele County should further consult with trail users to determine where to allocate resources for winter improvements, such as signage and grooming. Presently, winter recreation up this canyon is informal, without designated winter routes or signage.





Before winter trails should be formally recognized, Tooele County should coordinate with avalanche monitoring agencies to provide up to date information to recreational users and guide the County in orienting trails away from known avalanche paths. Once Tooele County is prepared with the resources to monitor and disseminate information regarding avalanches and avalanche risk, the Trails Committee should proceed with formalizing winter trails, maintenance, and signage.



Settlement Canyon Trail Network



Select Trails

Trail	Miles	Elev.	Type					Issues
Dark	3.3	318'	Singletrack	✓	✓	✓		Splinter trails, tread, signage, entrance, private property
Settlement Canyon	8.6	900'	Singletrack	✓	✓			Connection to trailhead and trail network
Bench x	6	1350'	Singletrack	✓	✓	✓		Tread
Left Hand Fork	4.5	1089'	Singletrack	✓	✓	✓		
Muddy & Bottom	4.4	1566'	Singletrack	✓	✓	✓		Tread
Crossing Hollow	1.1	511'	Singletrack	✓	✓	✓		Tread, trail design
Ridge	5.4	2046'	Singletrack	✓				Trail design, signage
Bear Trap Pass	6.7	1660	Singletrack	✓				Trail design, tread, signage, private property
Snake Chute	1.2	547'	Singletrack	✓				Trail design, tread, signage, private property
Right Hand Fork	1.9	520'	Singletrack	✓		✓		

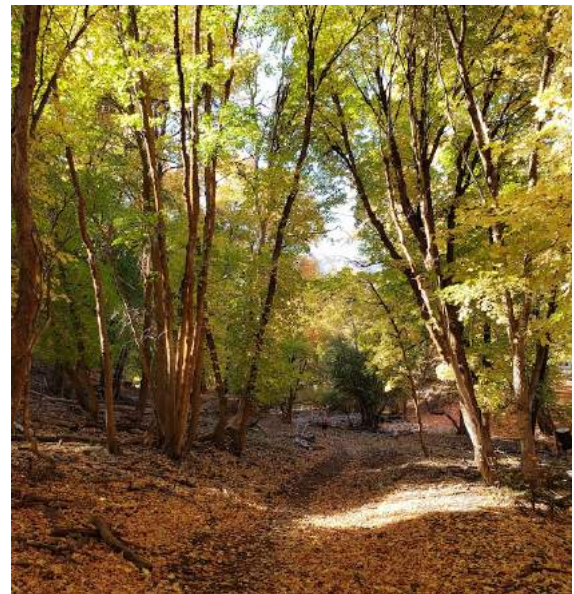
Trail Descriptions

Dark Trail

The Dark Trail meanders its way through a tree canopied canyon forest parallel to Settlement Canyon Road. This is one of the more established trails in the trail system and its gentle grade makes it a popular stroll for hikers. It's common to see riders on horseback and bicycles, as well as trail runners. The trail is currently divided and splintered. On some websites, the trail is divided into a lower and upper Dark Trail. However, the trails are connected and make a continuous path parallel to Settlement Canyon Road. These online resources need to be updated to reflect the continuous nature of this trail.

The trail can be accessed at multiple points, including each parking lot in the canyon. Wayfinding signage needs to be installed directing people from the parking lots to the trail. Many of the splinter trails are duplicate trails that should be blocked off to keep visitors on the trail. The numerous amount of splinter trails increase erosion and detract from the natural environment. The upper portion of the trail crosses private property. Signage is ambiguous leaving visitors uncertain as to regulations.

The trail has room for improvement to meet sustainable design standards, which will help reduce maintenance costs and improve the trail integrity. At several points the trail tread needs to be stabilized to improve runoff and reverse the tread creep that has advanced over the years. Part of the challenge is users haven't stayed on the trail and spread out along the canyon valley floor. This degrades the tread and increases muddiness. In some sections it may be beneficial to separate different user groups to develop a tread that better accommodates the activity.



Autumn Foliage Lines the Dark Trail

This trail starts to the side of the road shortly after the entrance to the canyon. If the Tooele Overlook trail is improved, the beginning of that trail could be used to create a connection from the Settlement Canyon Reservoir parking lot directly to the Dark Trail. This would allow an established year-round trailhead to provide access to the entire trail system.



The start of the Settlement Canyon Overlook Trail could be used to connect to the Dark Trail.

Bench, Left Hand Fork, Muddy & Bottom Loop



These trails provide sweeping views, canopied forests, and meadows, and grassy meadows. They are popular singletrack trails for hiking, mountain biking, trail running, and horseback riding. Users report occasional issues with tread quality. Some restoration work may need to be done to reduce maintenance needs and enhance the recreational experience. Wayfinding signage has been installed at several of trail junctions, making the trails relatively easy to navigate.

Ridge Trail

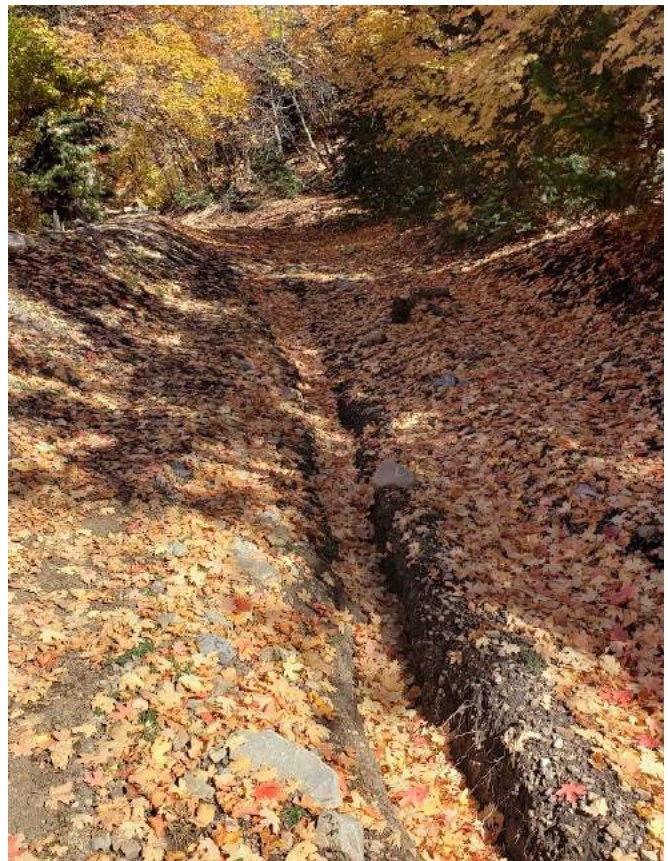
This trail provides sweeping views of the canyon by climbing up the ridge line. It starts at an unmarked point along

Settlement Canyon Road shortly after the start of Left Hand Fork. The grade at the start of this trail greatly exceeds trail design standards and would present a hazard for many user groups. Additionally, with the construction of the Settlement Canyon Trail, the entrance to this trail marks the third trail entry along Settlement Canyon Road within close proximity, as the entrance to Ridge Trail is nearly 100 feet from Left Hand Fork trails. This beginning of this trail should be reoriented to connect into the Left Hand Fork trail and meet design standards.

Snake Chute and Bear Trap Pass

These trails form the back portion of a loop that connects the Left Hand Fork area to the Dark Trail. Both Snake Chute and Bear Trap Pass cross private property and enter the canyon floor at a point where public access signage is ambiguous. Public access needs to be resolved and clearly marked to inform visitors.

Both trails present significant need for rehabilitation. The trails will need to be realigned to meet sustainable trail design standards. The trails have a grade in excess of 10%, have no contour to push off water, and show significant fall line rutting. These conditions make the trail a danger to trail users and will only continue to worsen over time.



Fall line rutting along Snake Chute Trail

New Trails

Tooele Overlook Trail

This trail begins at the Settlement Canyon Reservoir Trailhead. This trailhead is the winter road terminus, which provides access to this trail year-round. Relatively lower elevation and sun exposure allows for winter hiking and trail running with micro-spikes. During high snow years, the route provides opportunities for snowshoeing.

The trail starts at the parking lot and is currently unmarked. The initial ascent is excessively steep, making it a fall-line trail. However, it's sun exposure and arid terrain make it a good candidate for a trail design that allows for a steep incline. This may include rock steps to fortify against mud and erosion. After the initial ascent, the trail meanders up the ridgeline, providing views of Settlement Canyon and Tooele Valley.

Wayfinding signage would be needed at multiple spots along the trail. As the trail ascends, it crosses multiple splinter trails, including a jeep trail. A lack of signage would result in increased off-trail use and splinter trail creation. This harms the natural environment and is frustrating for hikers and trail runners seeking to reach their desired destination. Additionally, some of the trails make their way to private property, where access has not been granted.

Trail Details

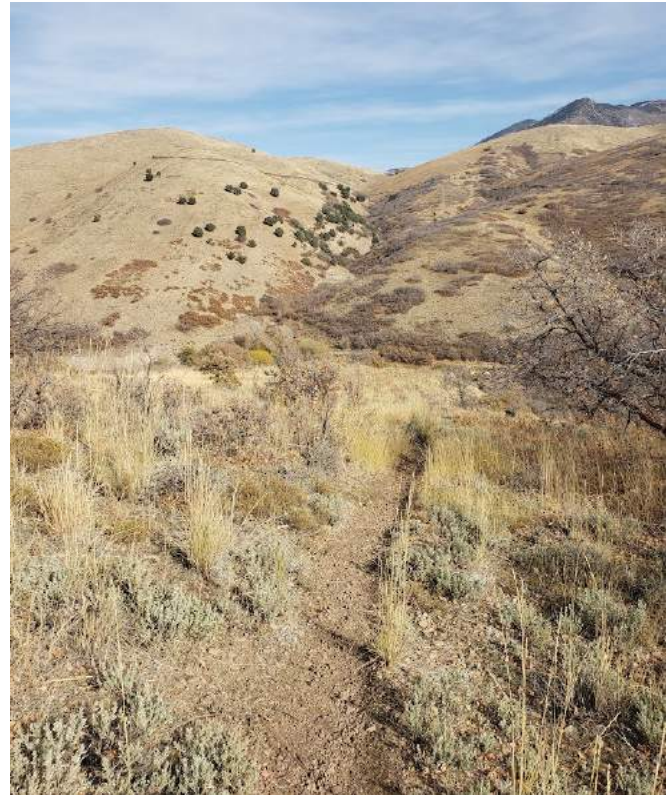
- 2.6 miles RT
- Rating: Difficult
- 1640 ft elevation gain
- Singletrack

Property Ownership

Tooele County, Water District, SITLA

Current Status

Corridor unnamed but shown on trails maps. Strava data shows some usage.



Lower Canyon Views from the Tooele Overlook Trail

Right Hand Fork

This trail is part of the AllTrails route for the Dark Trail, however the trail alignment is not shown on the map. Strava data indicates it is used by hikers and trail runners. It is also shown on some equestrian trail websites. The route would need to be signed and audited to ensure it meets trail standards. The trail is located entirely on Tooele City and water district property, so it avoids private property. The terrain is relatively smooth with a gradual incline, making this an ideal location for an established trail.



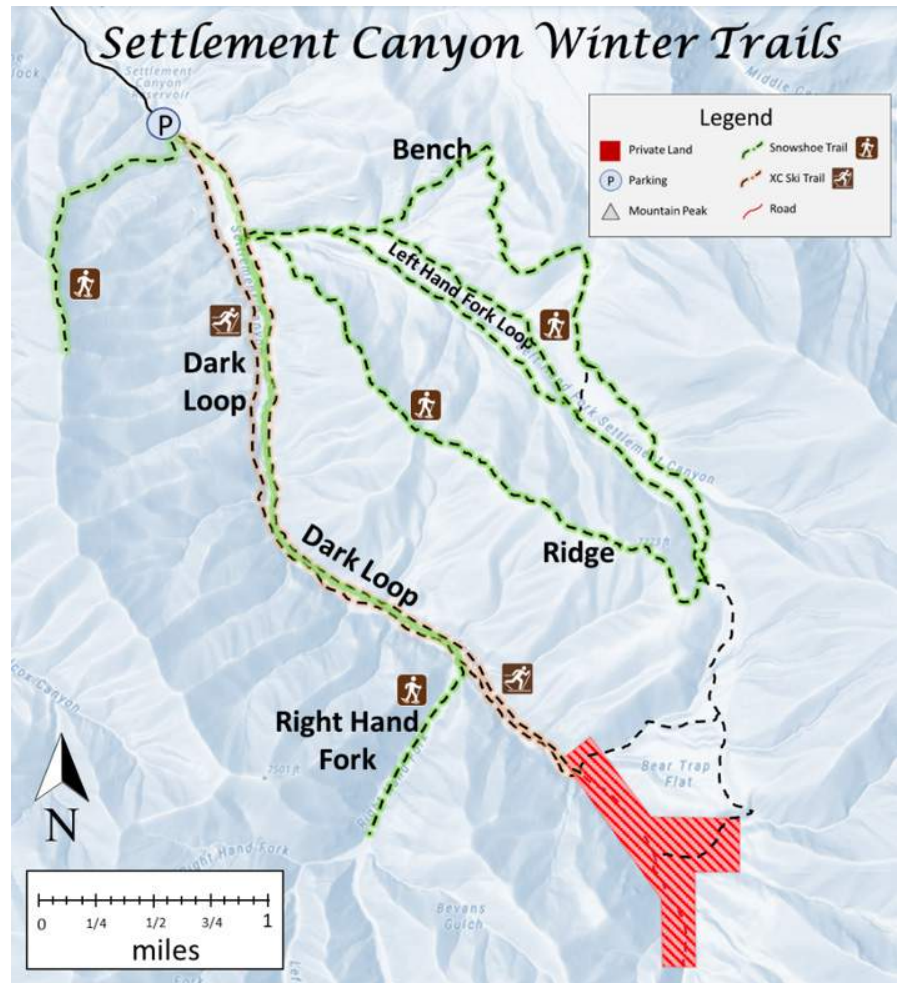
Settlement Canyon Trail

This trail was professionally designed and built in 2023. It connects Tooele City into Settlement Canyon and provides sweeping views over the valley. The trail has a tread width of at least 36", which is designed to accommodate hikers, trail runners, and mountain bikers. It has an average grade of 4%, with short sections of incline between 6% and 10%. The trail is designed to meet sustainable trail design standards, which should significantly reduce maintenance costs. This trail is new and Tooele County will need to promote the trail and install signage to orient to the trail and keep visitors on the trail. This will prevent undesired splinter trails and reduce trespassing on nearby private property.

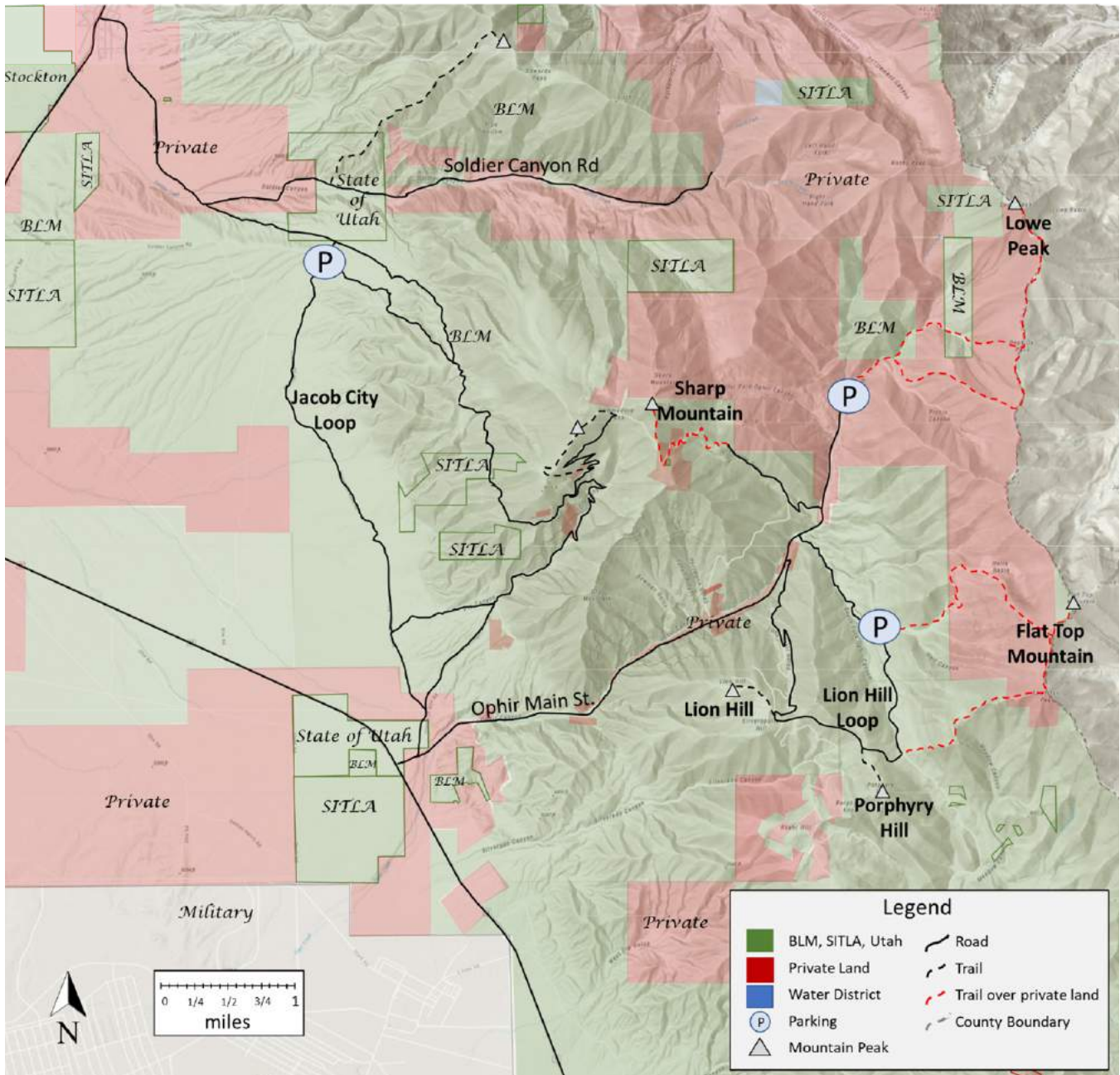
Winter Trails

Settlement Canyon provides abundant winter recreation opportunity. The canyon is subject to seasonal vehicular road closure, typically from November to April. During this time, the Settlement Canyon Reservoir parking lot is the road terminus and winter trailhead parking. Settlement Canyon Road is used by snowmobiles for recreation and property access. The Dark Trail and Settlement Canyon Road create a cross country ski loop. The remaining trails are available for hiking and snowshoeing. Before individual trails are promoted, the County should review avalanche risks.

The public survey showed strong demand for winter trail access. Settlement Canyon has easy winter access and all trails in the network can be accessed from the winter parking lot. Must trails appear to be in locations that have historically presented minimal avalanche threat. Tooele County should coordinate with an organization that provides avalanche assessment to inform the winter trail assessment process before promoting winter trails.







Ophir Canyon Trail Network



Trails in the Ophir Canyon network include extensive sections of private property. Some property owners may restrict access or grant access on a limited basis. Due to these conditions, these trails are shown in red. Before the County seeks to establish any improvements, including maintenance, signage, trails promotion, or places the trails on formal trails maps, public access issues should be resolved through formal agreements in writing.

Select Trails

Trail	Miles	Elev.	Type					Issues
Jacob City Loop	16.7	4080'	Dirt road	✓	✓	✓	✓	Eastern portion of loop shown on many sites is not permitted as it crosses private property.
Sharp Mountain	9.2	3274'	Gravel doubletrack	✓				Private property, ATV's not allowed after end of road
Lowe Peak	12.1	4379'	Singletrack	✓				Private property, unmarked scramble to saddle and summit
Lion Hill Loop	7.4	1706'	4WD road and doubletrack	✓	✓	✓	✓	Needs signage. Spur trails damaging terrain.
Flat Top Mountain	4.9	2857'	Singletrack	✓		✓		Private property, 4WD needed to access trailhead, no signage, scramble to summit

Trail Descriptions

Out-and-back north of Solider Canyon: This comes up on the Strava Heat Map as a trail that is used by hikers and/or trail runners. It reaches an unnamed summit near Edwards Pass that overlooks both Soldier Canyon and Settlement Canyons. The trail is not part of any trails site. It appears the trail avoids private property. It is unlikely that this trail has any signage or meets trail design standards.

Jacob City Loop: This is a double track 4WD road for ATV/OHV, hiking, or mountain biking. Many sites show a broader loop, however the loop toward the East goes through private property and the trail is washed out in several places. (Tooele Trails, Alltrails, Tooele County Trails all display the wider loop) The route is popular for ATV/OHV riding.

Sharp Mountain: The beginning of this trail is popular (Strava heatmap), however it hits private property. The Alltrails route goes through private property to the summit.

Lowe Peak: This is shown on Alltrails, however it goes through private property and does not appear permission has been granted. Strava data indicates people often turn around at the end of the road, but some continue on to the saddle (Dead Ox Pass) and to Lowe Peak. This route is shared on SummitPost. The description on SummitPost incorrectly states that the route avoids private property. The road is designated as a public Local Class B Road and terminates on private property owned by Warner Sherie A Co-Trustee (parcel 06-046-0-0004). The trail then passes the following properties in sequential order:

Ownership	Name	Parcel	Description
Private	Warner Sherie A Co-Trustee	06-046-0-0004	Parking pullout at terminus of public road and approximately 0.5 mile walk through Ophir Canyon
Public	BLM		Approximately 0.4 mile walk through Ophir Canyon
Private	Bryant Marilyn T Trustee	06-046-0-0003	Private road through Ophir Canyon and turnoff to Dead Ox Pass
Public	BLM		1/3 mile of ascent out of Ophir Canyon
Private	Warner Sherie A Co-Trustee	06-046-0-0001	Final ascent to Dead Ox Pass and approximately 1 mile ridge climb
Private	SOA Investments	06-046-0-0011	Ridgeline approaching summit
Private	Ja Laine W Carson Trustee	06-004-0-0009	Possibility that trail briefly clips this property near summit

Picnic Canyon: This trail is an alternative route from Ophir Canyon to Dead Ox Pass and the ridge to Lowe Peak. From the parking area at the end of Ophir Canyon road, the trail continues through Ophir Canyon (the same trail as Lowe Peak) until it splits after a half mile. The trail is unmarked and goes through several private properties. There is no GPX file of trail readily available online, so the route is an educated guess.

Ownership	Name	Parcel	Description
Private	Warner Sherie A Co-Trustee	06-046-0-0004	Parking pullout at terminus of public road and approximately 0.5 mile walk through Ophir Canyon. The trail then splits to the southeast and continues another half mile on the Warner property as it starts the ascent up Picnic Canyon
Private	Glover Family Trust	06-046-0-0005	1/3 mile of trail through Picnic Canyon
Private	Elwin Ault Elison Trustee	06-046-0-0018	Brief crossing in route up Picnic Canyon
Private	Lavar Lewis Elison	06-046-0-0016	Brief crossing in route up Picnic Canyon
Private	Ault Legacy, LLC	06-046-0-0015	About 0.1 miles in route toward top of Picnic Canyon
Private	Kim Elison	06-046-0-0008	Crossing toward top of Picnic Canyon
Private	Louis O Ault, Trustee	06-046-0-0014; 06-046-0-0013	Final half mile from canyon to ridgeline
Private	Warner Sherie A Co-Trustee	06-046-0-0009	Half mile along ridge line to connect to Lowe Peak Trail at Dead Ox Pass

Lion Hill Loop: This is shown on the Tooele County Trails Map. It is a double track road that requires high clearance. The entire length of the route is located on BLM property. It is also known as South Fork Ophir Canyon, and is shown on some trails apps, such as TrailForks. This route is taken to reach Porphyry's Hill, Lion Hill, and Flat Top Mountain trails.

Porphyry's Hill

This is located on the south side of the Lion Hill Loop. The entire route is located on BLM land. The route up Lion Hill Loop to the summit of Porphyry's Hill is a common snowshoe and backcountry ski route due to its relatively easy access from Ophir Canyon.

Lion Hill

This short trail is located on BLM property. It provides a vista over Ophir Canyon.

Flat Top Mountain

This is a hiking trail that requires ATV/4WD access through the Lion Hill Loop. It goes through Private Property. While this trail is difficult to access and the trail itself is poorly maintained, it is important to the hiking community as it is one of Utah's eight ultra-prominence peaks. This route is posted on SummitPost as "Lewiston Peak Ridge," the route initially hits Lewiston Peak before continuing on to Flat Top Mountain. The SummitPost description incorrectly states that if you stay on the trail, you are avoiding private property.

The trail starts on BLM property from Lion Hill Loop but crosses two parcels privately owned by Ault Farm Properties LLC (Parcels 06-048-0-0001 and 06-047-0-0007). These private parcels include the final ascent to Lewiston Peak, Lewiston Peak itself, and much of the ridge from Lewiston Peak toward Flat Top Mountain. Flat Top Mountain, however, is on public land. That land cannot be accessed from the West without crossing private property.

Ophir Canyon Campground Trail: This is the loop trail to the east of Lion Hill Loop. It appears on Alltrails with this name. Users suggest the trail continues about 7 miles and goes through private property.

Analysis by Use Group

The trails audit shows extensive availability of trails by user group throughout the trails system. User group incompatibility has presented a number of challenges to trail users in the Ophir Range, however this does not need to remain the case. By ensuring that each user group is accounted for, has trails designed for their use, and has their needs addressed in marketing and promotion, users will be directed to the ideal locations for their use and away from areas poorly suited for their use. This will improve user satisfaction and reduce conflicts. Once a site is recognized as the optimal location for a specific purpose, it is crucial to ensure that trail design, promotional efforts, trailheads, parking facilities, and other requirements are all fulfilled to cater to the intended users' needs.

Oquirrh Mountains
Trails Survey

61%

experience
user group
incompatibility

Hiking: These trails are found in all trail systems. Many of the trails in the Ophir area are tailored to ATV/OHVs or require a high clearance 4WD vehicle to access the trail head. Improving accessible to hiking trails would generally improve this trail system. Similarly, trails in the Bates Canyon area are often tailored to mountain bikes or ATV/OHVs before becoming hiking trails as the trails ascend mountain canyons or ridgelines. Separated and distinct hiking trails would improve user experience.

Backpacking: Long distance hiking trails that connect trail systems are informal and often cross private property. User data suggests recreators make these trips, however the routes are informal and may present challenges for property owners and emergency responders. Developing a route that interconnects the trail systems and hits the desired positive control points would be beneficial.

Mountain Biking: These trails are found in all trail systems. The Bates Canyon area and Settlement Canyon provide extensive mountain bike trails. Neither system has widespread mountain bike signage. A mountain bike signage plan would benefit both trail systems. Trails in the southern portion of the Bates Canyon area (toward Pass Canyon) frequently restrict bicycle access. A bike route connecting the trail systems along the bench would be beneficial and was brought up by several respondents in the Trails Survey.



A county-wide multi-use dirt trail, similar to the Bonneville Shoreline Trail, would be a popular route connecting neighborhoods and trail networks.

Equestrian: These trails are found in all system, but especially prominent in Settlement Canyon. Settlement Canyon includes parking lot designs to accommodate horse trails.

ATV/OHV: These trails are found in the Bates Canyon trails network, Middle Canyon, and Ophir Canyon. In the Bates Canyon area in particular, trails frequently cross private property and lack tread designed for any particular use. This has degraded trail quality. Trail separation with signage, gates, and barriers may help reduce conflicts between user groups and preserve the integrity of trails systems.

Snowmobiling: On years with sufficient snowfall, this appears to be popular in Middle Canyon and Ophir. Not all years bring sufficient snow to make this reliable, however, with more study and collaboration, routes can be identified, appropriately signed, and marketed.

Cross-Country Skiing: On years with sufficient snowfall, this is well suited for Settlement Canyon. Other areas have either insufficient snowfall or excessively rugged terrain.

Snowshoeing: Trails in the Settlement Canyon system provide sufficient snowpack and have year-round accessibility. Opportunities are more limited or present challenging access in other trail networks.



Chapter 7: Trail Development Process

This chapter outlines the process for developing, promoting, and maintaining new trails. Due to the volume of many existing DIY trails, initial efforts will likely consist of reconfiguring areas of existing DIY trails into legally-established trails. Any formally established trail will have legal public access granted and recorded for the entirety of the trail, have a trail design that appropriately handles snow and water runoff, meets best practices for slope, grading, width, and other design elements, and has proper wayfinding signage and, as needed, interpretative and etiquette signage. These trails will connect to established trailheads, be publicly promoted, and part of a deliberate maintenance schedule. Trails that cannot meet these standards, especially legal public access, will need to be decommissioned. Ownership represents a critical cut and hurdle. Trails located exclusively on property granting public access should be given priority in development efforts.

An Inclusive Trail Network

Every community has a range of trail users. A healthy trail system plays host to the young and elderly, the timid and fearless, the social butterflies and dedicated calorie burners. Trails can see traffic consisting of folks on feet, wheels, or hoofs. The mix of use categories and trail user types was highlighted in the Plan Survey. Requests in the open-ended response ranged from wanting more advanced mountain biking trails to more inclusive walking trails for wheelchairs. Establishing trails that meet this variety is a crucial part of trail network development.

Trail intensity is a deliberate choice. Some trails are intended as short nature walks, others follow gradual slopes, while others, still, are deliberately designed to be challenging, often entailing a higher degree of risk. To the extent possible, each canyon network should support at least a gradual, intermediate, and challenging hiking trail, and any canyon with a mountain bike network should have beginner, intermediate, and advanced rides. Ideally, a trailhead would provide trails to multiple different abilities or skill levels. Due to the nature of ATVs and OHVs, canyons should be very clear about where motorized vehicles are and are not permitted, and, where permitted, should provide the desired

Oquirrh Mountains Trails Survey

75%

experience uncertainty knowing whether they are on a legal trail

Oquirrh Mountains Trails Survey

Hike	78%
Mountain Bike	48%
ATV/Motorized	48%
Trail Run	31%
Hunt	26%
Winter Sports	25%
E-Bike	19%
Equestrian	17%

% who report participating in past year

range of trail types.

Phases of Trail Development

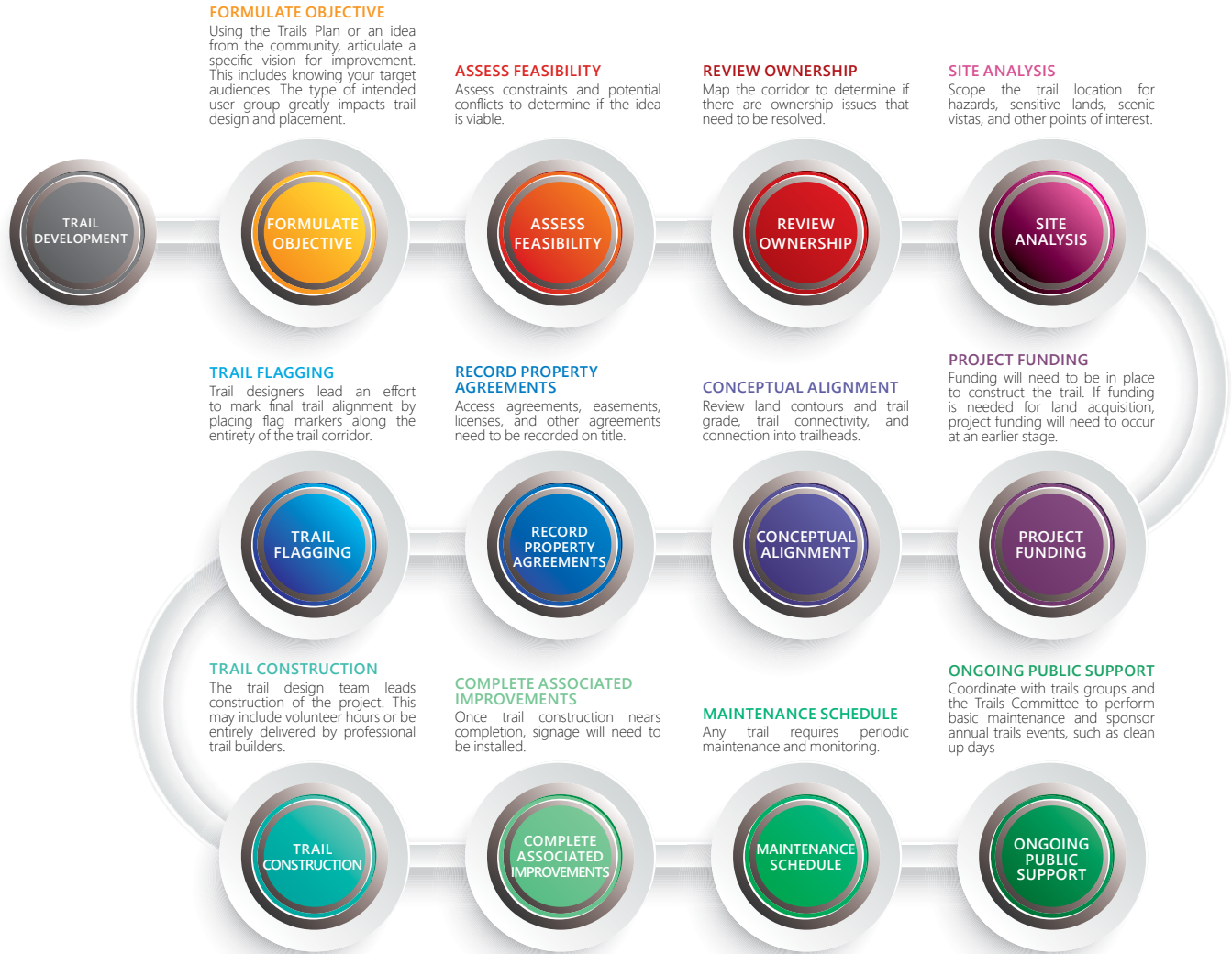
Trail development starts with a vision. This chapter and the following chapters help guide from a vision to a completed and sustainable product. Once the broad needs of the trail network are determined and assessed, individual trails can be assessed. This helps articulate a specific goal. From there, constraints are assessed, which may include trailhead and parking locations, terrain, habitat preservation and environmental concerns, funding and maintenance, and several other concerns. A critical constraint is land ownership and management.

Engage property owners, trail managers, County staff, and the Tooele County Trails Committee early in the process. Once the trail alignment is established and agreed to by all property owners, land managers, and the County, any access agreement needs to be recorded on the respective property title at the Tooele County Recorder's Office. Further trail creation should not occur unless legal access is formally established on all portions of the trail.

Trail alignment should be accomplished in light of property ownerships and agreements regarding access. A professional trail builder should be consulted for trail design. If the trail is an existing DIY trail, the trail may have developed splinter trails or alternate routes than need to be retired. Some portions of the primary trail may require relocation due to land ownership or trail design standards.

Signage should be uniform across all trails and meet the standards of this Trails Plan. Trailhead signage should be updated to include the new trail, and signs should be placed at all trail junctions. With the new trail, a maintenance schedule should be created to ensure adequate funding and efforts are in place to address minor issues before they grow costly.

Following and completing each step is critical to establishing legal, sustainable, and responsible trails. Each step is dependent on completing prior steps, although some steps may be worked on concurrently. Some steps may take years to complete, while others may be accomplished over a brief period. By methodically addressing and completing each phase, the County can focus and channel efforts into the appropriate phase of development and avoid the pitfalls of wasting resources that



may result when skipping ahead. Acknowledging and following a phase schedule facilitates stakeholder consensus and helps iron out both short and long-term goals and strategies to complete individual trails.

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Enhance Partnerships

The Oquirrh Mountains present patchwork of property ownership, with an array of ownership types, from individual to corporate to federal, state, and local government. This presents both challenges and opportunity. The creation of a formally established interconnected trails system requires communication and coordination from all owners involved. For those property owners interested in participating, providing clear direction and vision will help all parties assess opportunities and needs. Active communication before, during, and after trail development will help create an effective trail system, better protect property owners, and allow for an enhanced experience for trail users.

Public involvement is a crucial component of these partnerships. Through the Trails Committee, trails surveys, and public meetings, key stakeholders can remain informed on public sentiment and better steer efforts toward the public interest. For a trail to function properly it needs to have support from property owners, backing from the County, and public support to use and help maintain the trail.

Landownership: Private Land

Private landowners need to be brought into discussions early on, not just for questions about legal access, but also to share valuable insights about user behavior and unique conditions of the land. Their insights will help inform decisions on recreational use, design, parking, and maintenance issues, as well as increase the likelihood of private property owners continuing to remain partners with land managers, such as Tooele County.

Landownership: Public Land

Trails planning on federal land may still require a long and costly path. To formally designate a trail, the trail must go through a public review process required under the National Environmental Policy Act (NEPA). If the trail crosses state lands, it may require permission from the relevant Utah State agency.

Coordination with the Bureau of Land Management

Many trails in the Oquirrh Mountains cross land owned and under the jurisdiction of the Federal Bureau of Land Management (BLM). Any such trail requires agency approval. As part of the trail planning process, it is important to collaborate efforts with the BLM. It is advisable for all entities interested in enhancing trails on public lands around their communities to actively participate in the BLM's travel management planning processes and maintain open communication regarding trail and connected route improvements. The BLM offers grants for trail development, and establishing a positive relationship with them will position Tooele County more favorably to secure funds for trail improvements. A shared challenge faced by both the BLM and communities in pursuit of trail projects is the difficulty in finding suitable matches for the grant funding they seek. By working collaboratively, there are opportunities to leverage federal dollars to complement local grants or contributions, and vice versa.

Coordination with SITLA

The School and Institutional Trust Lands Administration (SITLA) oversees diverse lands in Tooele County, each with unique characteristics and locations. Several trails cross SITLA land and will necessitate coordination with SITLA. SITLA has established processes and requirements for the review and permitting of any trails, making it crucial to involve them early in the planning process for routes crossing Trust Lands. Many of these trails have been used for decades and may already have approvals. Key considerations for coordinating with SITLA include the following:

- SITLA is open to addressing trail proposals on trust lands on a case-by-case basis during the planning process. While aiming to be cooperative community partners, SITLA must fulfill its fiduciary duty to beneficiaries and will only approve trails that align with the interests of the trust.
- SITLA possesses credible experience collaborating with various groups to plan recreational trails on trust lands statewide. Similar strategies, such as leases, rights of entry, MOUs, easements, and engaging in reciprocal easements with the BLM, may be employed on a situational basis.
- SITLA has diligently worked to establish class B and D road easements on trust lands for vehicular travel, including OHVs. Collaboration with SITLA will be vital to formally establishing trails that cross their jurisdiction.

*Oquirrh Mountains
Trails Survey*

82%

**support action to
legalize trails. Only 4%
disagree.**

- In general, SITLA has expressed concern about unauthorized construction of trails on trust lands. Such activities compromise SITLA's support for future trail development, constituting trespass and incurring additional management costs without appropriate compensation considerations. Coordination and adherence to established processes are crucial to fostering a positive and effective partnership with SITLA in trail planning efforts.

Oquirrh Mountains Trails Survey

“I've never encountered an angry land owner, but I would feel better if there was an easement allowing me to access the trails legally.”

- Survey respondent

Oquirrh Mountains Trails Survey

90%

would like to see access issues resolved.

Access

All access to trails, including the trail itself, must be on accomplished with permission of the property owner. In some instances, the property owner will be a government or conservation agency who provides access as public lands. In other instances, access will be limited to an access easement along a trail corridor.

The public survey highlighted uncertainty among the public as to what areas are public lands, trails with legal access, and unauthorized trails trespassing on private property. Furthermore, the survey showed that protecting private property rights was a significant value that residents would like to protect and even residents who

DETERMINE ACCESS POINTS

Safe, direct access to the trail needs to be provided at the respective trailhead. If a trail currently dead ends on a road, it will need to be re-routed or re-signed to connect directly to the trailhead. Where multiple trails end in similar spots, connect them into a regional trailhead.

DETERMINE TRAIL LOCATION

The trail configuration will need to be reviewed by trail design specialists before land or an easement is purchased. Existing trail locations are often not sited for sustainability and may need to be relocated to meet trail design best practices, such as erosion prevention.

ASSESS OWNERSHIP

Parcel lines and ownership are subject to change. This Plan is intended to provide a framework and a concept of the types of ownership and challenges presented in the Oquirrh Mountains. It is not intended to provide detailed ownership information. The most recent ownership data, as recorded at the Office of the Tooele County Recorder will need to be reviewed when making decisions. A survey may be needed.

ASSESS APPROVALS

State and Federal agencies each have their own approval process. Trails may have been created without jurisdictional approval, which makes collaboration vital. Easements and other access agreements need to be recorded on title at the Office of the Tooele County Recorder.

ASSESS APPROVALS

In some cases, the best course of action is to purchase or exchange land. This approach is effective when the objective includes installing trailhead facilities, amenities, or bike parks, or when the land is sought for conservation or broad public recreation purposes. When a landowner is committed to conservation and the desired public use involves only a trail without additional facilities, a recorded easement will often suffice.

CONSERVATION & PUBLIC USE EASEMENT

Lands can be preserved through a conservation easement. The easement may specify permitted uses.

know they are trespassing would rather not.

In instances where the County needs to obtain access, access can only be achieved from a willing seller or provider. In Utah, eminent domain cannot be used to obtain land for trails.

Actions to Establish Legal Access



Access Easement

A public use easement will need to be at least ten (10) feet wide with a twenty-five (25) foot maintenance easement for temporary construction and maintenance. Place signage at the property boundary indicating that the trail is on an easement and to remain on trail until the next sign indicates public lands.

Signage explaining the purpose and intent of a regulation is more impactful than simply stating the regulation. For example, a sign at the property boundary stating to remain on the trail will be more impactful when it states why. The sign may indicate the trail user is entering private property and the property owner has generously agreed to allow public access along the trail. A statement to please respect these wishes in order to maintain access for future trail users gives users a clear understanding of the purpose of the regulation. This has been found to increase compliance.

Control Points



For trails to efficiently connect people to their various destinations, while avoiding the creation of duplicate trails, trails need to efficiently connect people between control points. These include “positive control points,” or locations to include, such as vistas, peaks, waterfalls, and other natural attractions that trail users seek after. If a trail doesn’t efficiently link to all places trail users want to visit, unauthorized trails are created.

Trails that don’t clearly and directly connect to positive control points lead to the creation of “desire trails.” These are paths that go off trail to locations the public want to go. The creation of desire trails can be eliminated by identifying control points, including perceived control points, ensuring the trail takes users to these locations, and by using natural barriers to block off perceived desire routes.

Negative Control Points

An analysis of the control points for a specific trail also includes places to avoid, or “negative control points,” such as cliffs, protected habitat and watersheds, attractive nuisances, and private property. By undertaking an analysis of all the control points for a given trail before the trail is cut, the pitfalls of poor trail placement can be avoided.

The Oquirrh Mountains feature numerous mining remnants. Some of these present potential hazards. By identifying potentially hazardous locations as negative control points and designing trails to avoid these areas, trails will avoid bringing unprepared trail users in contact with those locations.

Cost Assessment

The cost to build and maintain the trail is a vital part of trail development and design. When deciding whether to construct,

Trails Installation Costs Estimate	Low Estimate/Mile	High Estimate/Mile
Dirt	\$1,000	\$50,000
Gravel	\$80,000	\$1,000,000
Paved	\$150,000	\$1,200,000

rehabilitate, or decommission a trail, the cost needs to be considered. Cost elements to consider include:

- Access rights/easements/land acquisition
- Construction costs: trail design and engineering, grading and contouring, slope stabilization, surfacing (many trails are pre-existing as DIY trails and need to be re-designed), foot bridges



Control points are key locations that guide trail placement:

- Trailheads
- River/stream crossings
- Scenic vistas
- Peaks
- Natural barriers and attractions
- Other destinations

- Facilities and improvements costs: signage, restrooms, drinking fountains, benches, pavilions, parking lots, roadway improvements
- Ongoing maintenance: repairs, trail and road maintenance
- Inadequately designed trails lead to high maintenance costs and may contribute to undesired duplicate trails being created over time.

Decommissioning Trails

When a trail system does not meet the broad needs of residents, people often end up carving their own trails. Similarly, if an officially designated trail does not present the path of least resistance, users will invariably forge their own. It is imperative that any trail is not only conspicuous but also offers the most straightforward and convenient route, and that the network provides the desired range.

The Oquirrh Range is home to many trails created without authorization. This includes a number of desire paths, shortcuts, duplicate trails, trails to avoid unmaintained or hazardous sections of trail, trails created from wayfinding confusion, and ad hoc trails to separate use groups. The Trails Committee should carefully analyze sections of trail to determine which path should be the primary path and then take action to close or otherwise decommission undesired trails.

A trail may need to be decommissioned for a number of reasons:

- Trail has become unsafe
- Trespass
- Unauthorized duplicate, splinter, or desire trail
- Trail creates a conflict between user groups
- Trail crosses environmentally sensitive area

Efforts to decommission:



- Place natural barriers, such as rocks or logs to block the path
- Install signage directing to the correct path

Alltrails: to delist an unauthorized trail, email Alltrails staff at publiclands@alltrails.com

Trailforks: navigate to the webpage for the trail, scroll to the bottom of the webpage and select "flag"

- If decommissioned trail is still seeing usage, place signage explaining that the trail has been decommissioned with an explanation of the purpose

When a trail will be decommissioned or altered, immediately contact popular trail listing sites to remove or modify the trail.



Chapter 8: Trail Design

Recreational pathways cater to people from all walks of life, providing a unique opportunity to reconnect with our primal instincts. In an era where automobiles and concrete dominate our landscape, these trails offer a vital link to the natural world. They facilitate a profound connection with our environment, offering solace to our minds, a test of our physical limits, and a platform for honing age-old skills.

While a good trail seems natural in its design, the elements that make the trail sustainable and desirable are the result of careful planning and designed. So much so that the most natural trails are, in fact, deliberately curated. Efficient water runoff, bank stabilization and protection against erosion is not achieved without forethought in design. An effective trail should be intuitive to find and follow, readily accessible, and user-friendly. This requires thoughtful placement, placemaking, signage, and, at times, landscape design. This chapter outlines the standards of trail design and points to resources to aid the County in following best practices.

Trails are generally grouped into five classifications. Classifications center around tread quality, width, and type.

TRAIL CLASSIFICATION	TRAIL DESCRIPTION
CLASS 1	Minimally Developed: Tread intermittent and often indistinct
CLASS 2	Moderately Developed: Tread continuous and discernable, but narrow and rough
CLASS 3	Developed: Tread continuous and obvious
CLASS 4	Highly Developed: Tread wide and relatively smooth with few irregularities
CLASS 5	Fully Developed: Paved. Tread wide, firm, stable, and generally uniform

Many trails in the Oquirrh Range are Class 1, 2, or 3. For many trails, the ideal is to maintain a lower class level, which helps preserve a more rugged and natural environment. However, steps should still be taken to improve and maintain the trail, as trail design helps reduce injuries and maintenance costs. This chapter outlines steps to consider in improving existing trails and establishing new trails. General Principles of Trail Design

*Oquirrh Mountains
Trails Survey*

97%

say trail quality is an
important factor in
choosing a trail.

Constructing trails to best practice standards takes additional planning and upfront effort, but will save time, money, and resources in the long run. Through thoughtful planning, Tooele County can avoid the common pitfalls of poor trail design.

A trail design is sustainable if it can last 20 years with only minimal maintenance.

Trail Pitfalls	Reasoning
Multiple trails	The trail wasn't placed in the best spot. Consider the control points (discussed later)—trailheads, destinations, overlooks, and intersections.
Erosion	Poor trail design, lack of undulation, poor soils
Water runoff funneling down the trail	The trail is likely too steep
Trespassing	Property ownership not checked or access rights weren't obtained
Attractive nuisances	Avoid negative control points

Signs of Proper Trail Design

- Water is moved away from the trail, rather than running down it
- Trail surface is well-drained and retains surface material
- Users stay on the trail rather than venturing off-trail
- Trails start at trailheads and have defined endpoints
- Trails are intuitive to use



Before cutting a new trail, or investing in rehabbing a DIY trail, a soil scientist can help identify prime trail locations and areas to avoid.

3 Essential Rules of Sustainable Trail Design

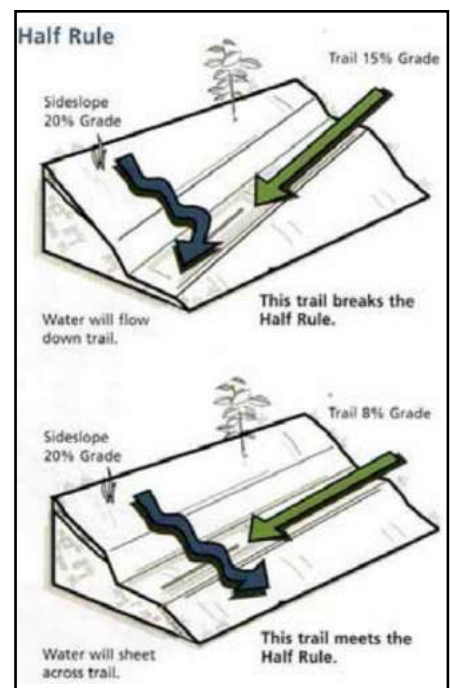
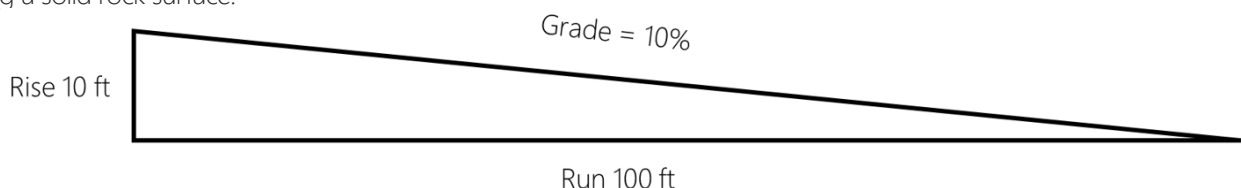
Half Rule: A trail's grade should not be steeper than half the hillside or side slope. If the trail is steeper than half the grade, it is a "fall line trail." This means that water will flow down the trail rather than run across it.

The "Trail Design & Maintenance" guide provides this explanation²:

"A 'contour' is a line of points that are at the same elevation. If you walk precisely parallel to a contour, you are walking at a level (0%) grade. If you walk downhill perpendicular to a contour you are walking along the "fall-line," the same path that water would flow down during a rainstorm.

A well-designed sustainable trail is always laid out to traverse a hillside, angled closer to the contour line than the fall-line. Trails aligned with the fall-line or near it collect and pass water directly down the trail, eroding soil from the tread, exposing roots, and creating gullies. It's nearly impossible to remove water from an entrenched fall-line trail. Trail professionals always avoid these alignments and relocate trail segments with fall-line alignments to side-hill positions."

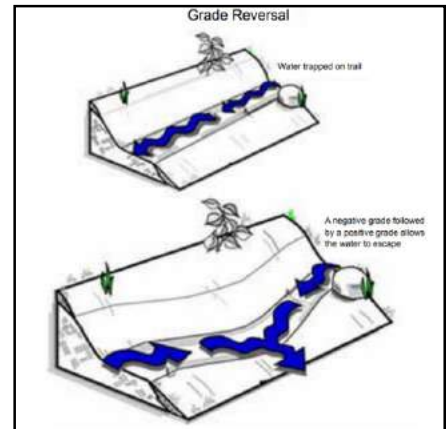
10% Average Grade: On steep slopes, trails much lower than half the grade still become fall line trails. Unfortunately, the "half rule" has an upper limit. Enter the 10% average grade rule. Trails with grades above 10% should only be made if using a solid rock surface.



² Trail Design & Maintenance, Jeff Marion, <https://cdn2.assets-servd.host/material-civet/production/images/documents/JM-Trail-Maintenance-Guidance.pdf?dm=1657907308>

Steep Terrain

Sometimes the nature of the terrain necessitates a steeper trail grade. The grade can be increased to 20% for short distances between switchbacks, as the switchback provides grade separation that prevents fall line runoff. The steep short distance between switchback creates necessary elevation distance between lower and upper trails. Where switchbacks are used, it is important to avoid short switchback sections, as they will encourage users to shortcut the switchback. Switchback cutting is most prominent on barren slopes and more successful when dense shrubbery or other barriers prevent off-trail shortcuts. A hiking trail can accommodate a short steep section greater than 10% and even above 20% provided that rock steps or other tread protection efforts are employed. Grades above 20% typically rely on boulders and other rock surfaces to provide stability and prevent erosion.



Rolling Contour Trails: Trail undulation with frequent grade reversals isn't just aesthetically pleasing, it allows for efficient water runoff, which reduces erosion. This maintains a healthy tread. The grade dip and grade reversal prevents water from gaining volume and momentum and staying on the trail. The grade reversals will stop the motion parallel to the trail, and if properly outsloped, the water will exit the trail. **Grade dips and reversals are essential to avoiding frequent and costly maintenance.**

How often should a trail have a grade reversal? Depends on the trail grade.³ Approximate guidelines for spacing between grade reversals are below.

Trail Grade	Spacing
3-5%	500 ft
6-10%	300 ft
11-15%	100 ft
16+%	<50 ft

Erosion—what gives?

A poorly designed trail may lose a half inch or more of soil. After 20 years of use and neglect, the trail becomes a gully nearly a foot deep! This is costly to remove. If the trail remains in use the gully will continue to deepen.

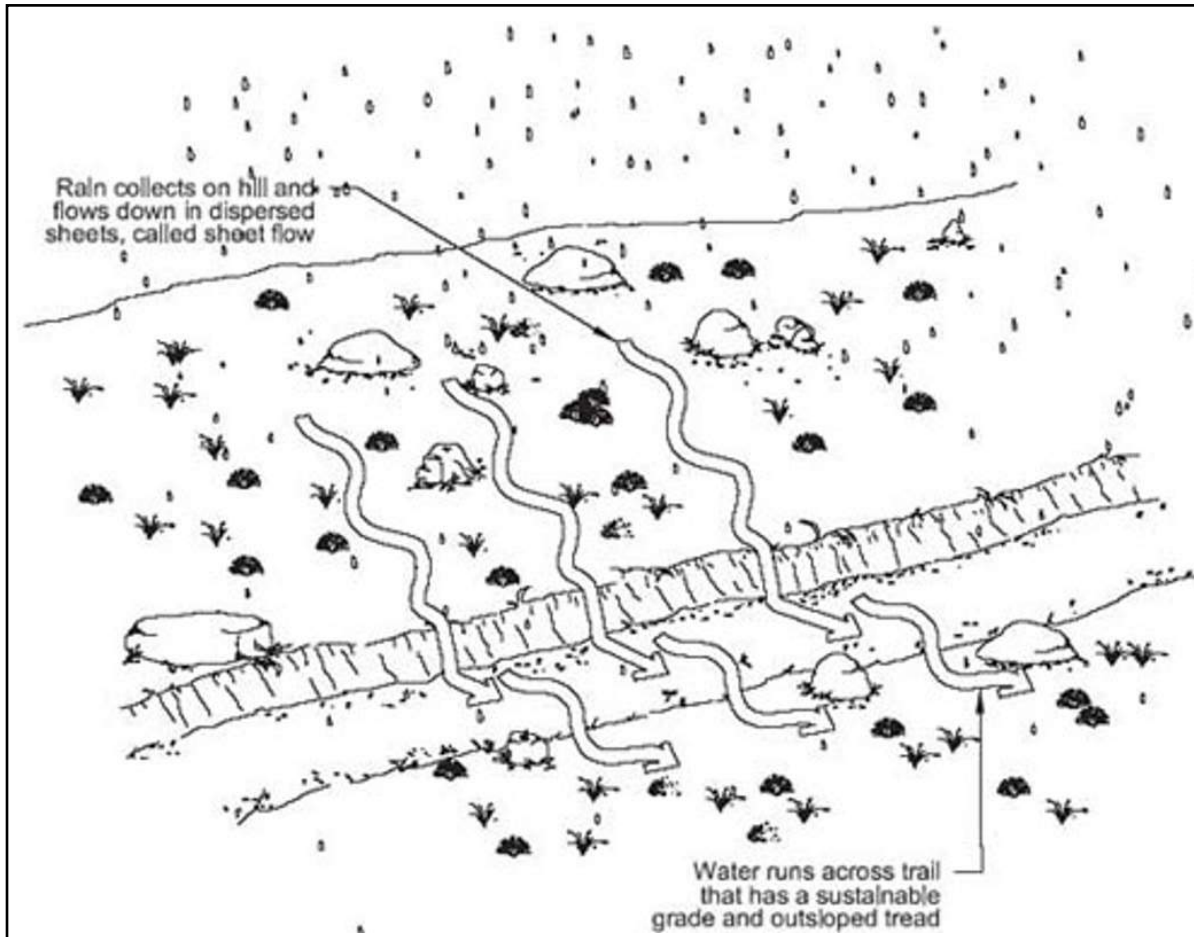


An example of a rolling contour trail. The undulating surface helps collect and dispel water. This prevents erosions and greatly reduces maintenance needs.

³ Trail Design & Maintenance, Jeff Marion, <https://cdn2.assets-servd.host/material-civet/production/images/documents/JM-Trail-Maintenance-Guidance.pdf?dm=1657907308>

Erosion Control

A proper rolling contour trail allows for sheet flow across the trail, instead of pooling or creating a fall line flow.



Source: Trail Construction and Maintenance Handbook, 2007, USDA, <https://www.fs.usda.gov/t-d/pubs/htmlpubs/htm07232806/page06.htm#fig09>

Water is encouraged to continue to sheet across the trail through grade reversals and outsloped tread. According to the U.S. Forest Service "Trail Construction and Maintenance Notebook," the tread should be outsloped at least 5%. With a grade reversal, a downward slope is temporarily reduced for a period of ten (10) to fifteen (15) feet after a descent of twenty (20) to fifty (50) feet. This slows the flow of the water while the outslope moves the water off the trail.

The need for outsloping, maintenance of outsloping, and impact of neglect can be seen on many trails in the Oquirrh Mountains. Many of these trails have developed deep rutting and gullies that make the trails hazardous. The rutting introduces trip hazards and can trap mountain bike tires. The rutting runs parallel down trails and facilitates increased erosion, which removes even more tread and turns trails into rivers after rainstorms and during spring runoff. This leaves trails muddy and impassable. Similarly, the deep gullies trap water, compounding the problem. These trails will need costly reconstruction to remove the gully and provide an outslope.

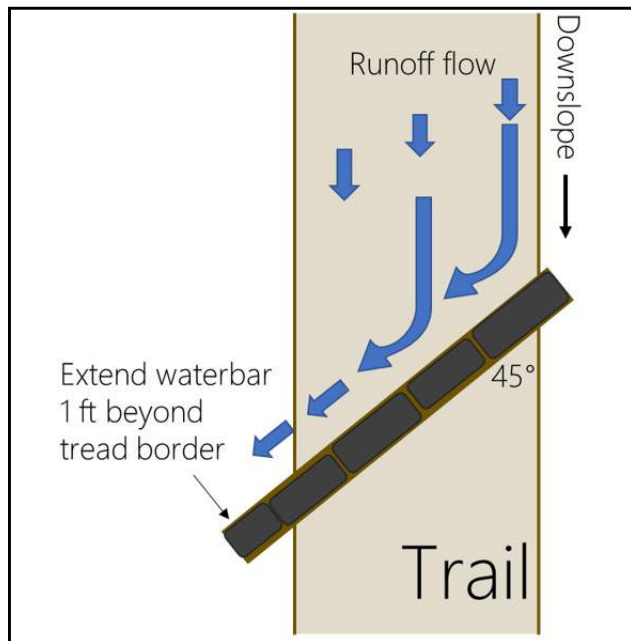
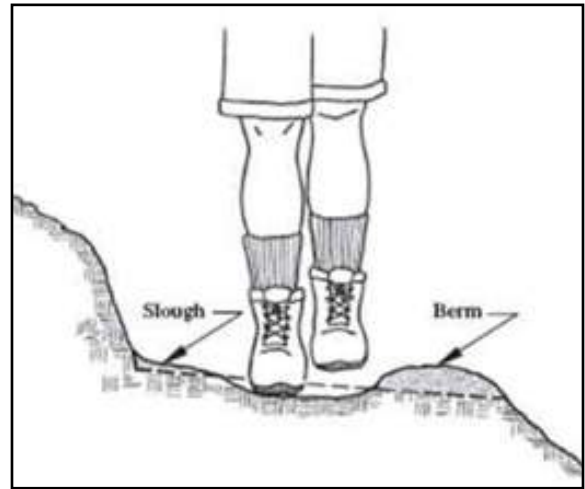
The gully forms as tread is worn down. The inside of the trail berms up due to material that falls from the uphill side of the trail. This berm is referred to as the "slough," which is rock and material that has sloughed off the hillside. The reduction in tread toward the middle of the trail is due to trail use, which leaves a berm on the outside of the trail where the outslope should occur. Once a small gully has started, the forces are in place for a rapid deepening of the gully through the power of erosion.

⁴ United States Forest Service, "Trail Construction and Maintenance Notebook," <https://www.fs.usda.gov/t-d/pubs/htmlpubs/htm07232806/page09.htm>

In this diagram published in the Forest Service's "Trail Construction and Maintenance Notebook," you can see the outslope represented by a dashed line sloping away from the trail. The slough and the berm prevents water runoff and the gully deepens.

When the depth of gullies prevents reasonable efforts to redesign a trail to outslope, waterbars can be installed to push water off the trail. Waterbars cross the trail at a 45° angle.

The "Trail Construction and Maintenance Notebook" provides a detailed step by step guide to waterbar installation. Due to the nature of waterbar design, regular maintenance is needed. Soil and other material will build up around the waterbar and needs to be removed. This will need to be done roughly twice per year. This task remains simple provided it is undertaken regularly. Without maintenance the waterbar will quickly be rendered ineffective and erosion will continue.



Waterbar Installation Steps:

- 1) Mark waterbar location on the ground, extending 1 foot beyond trail borders. Angle the waterbar at about 45°.
- 2) Collect *large* flat or rectangular rocks (12-16 in. long) or cut rot-resistant logs (e.g., cedar, locust, oak) 6-8 in. in diameter (best to remove bark).
- 3) Dig a trench almost as deep as the rocks or log and install the rocks or log so that the top is several inches above the uphill side of the trail. Flat rocks can be overlapped like roof shingles; blocky (not rounded) rocks should be fit tightly. Arrange the straightest edge of the rocks across the top. Rocks or log must be securely anchored to withstand trail traffic. Logs can be anchored by embedding large rocks on either side at the ends or by driving wooden stakes (2-3 in. by 2 ft.) at an angle from both sides to pin the log to the ground.
- 4) Rework the soil up to 2 ft. on the uphill side of the waterbar so that there is a deep wide drainage swale extending down off the trail with a 4-5 in. step on the uphill side of the waterbar. Place the excavated soil on the downhill side and build it up level with the top of the waterbar. Compact all loose soil by stomping.

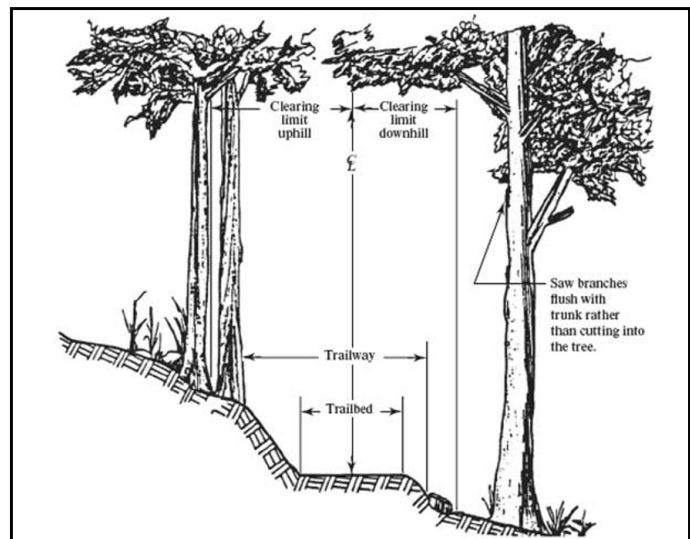
Tread Creep

Tread creep occurs when trail users, or wildlife, repeatedly step on the outside of a trail and lead to gradual increase of the tread. Puddles are a common culprit, as are livestock and ATVs. The tread will need to be stabilized. Efforts will depend on the type of trail creep. Numerous trail resources can guide efforts. For instances where trail creep is already substantial, professional trail design consultant will need to re-engineer the trail.

Trail Corridors

Part of ongoing maintenance is maintaining clearing limits. This reduces trip hazards and other obstacles, and helps

Source: "Trail Construction and Maintenance Notebook," Figure 21, <https://www.fs.usda.gov/t-d/pubs/htmlpubs/htm07232806/page07.htm>.





reduce mountain bike injuries. Trails used for livestock will need a higher and wider clearing limit, typically around at least ten (10) feet high and eight (8) feet wide, while trails used for hiking can have a reduced minimum clearing limit, typically eight (8) feet high and six (6) feet wide.

Many trails in the Oquirrh Mountains were built without best practices for drainage in mind. These trails have developed several problem areas and will likely require trail design experts to identify the most cost-effective and impactful solutions. In some instances, the current trail configuration may not allow for a sustainable solution to prevent erosion and the trail corridor will need to be relocated and redesigned.

In instances where it is not effective to rehab a trail, new trail corridors will be identified and flagged, barriers will need to be installed discouraging or outright blocking access to the decommissioned trail, and signage will need to be placed informing the public as to the reason of the closure.

Trail Flagging

Once the control points are established, the trail design team will scout the route in the field. During this phase, the team will:

- Verify control points and identify any additional positive and negative control points that were missed during the trail planning stage.
- Assess feasibility of the trail on the ground
- Identify the best trail alignment based on the desired trail type
- Assess any complication of constructing and maintaining the route



Trees and Roots

Route the trail above tall trees. Constructing below trees can compromise their root system and introduce unwanted roots onto the trail.

Roots that cross parallel to the tread funnel water and increase erosion and risk of slipping.

Roots that cross perpendicular to the trail can remain unless they rise above the tread and create a tripping hazards.



DO

- ✓ Install signage with clear trail etiquette between user groups
- ✓ Designate segments of trails for specific uses when necessary to prevent conflict or trail damage. For example, a separate trail for mountain biking and hiking, especially on steep grades.
- ✓ Establish clear use regulations. When signage is insufficient, install use appropriate barriers at gates near trailheads



DON'T

- ✗ Seek to accommodate all user groups on each trail. No trail design will work for every group and skill level
- ✗ Mix hiking trails with off-road vehicle trails. Motorized vehicles cause significant trail erosion and tread creep that makes hiking less enjoyable
- ✗ Provide inadequate trails for desired user groups. Otherwise users make unauthorized DIY trails.

Hiking

A hiking trail can be kept as a narrow single track. Tread can range from 18 to 48 inches along with a horizontal foot of vegetation clearance on either side, and eight feet of vertical clearance. For nature trails where wheelchairs are expected, use a hard-packed tread wider clearance.

Utah UORG recommends several resources for hiking and walking trails, including design for accessibility:

- Trail Construction and Maintenance Notebook (USFS)
- BLM Guideline for a Quality Built Environment
- ADA Accessibility Guidelines for Building and Facilities or Final Accessibility Guidelines for Outdoor Developed Areas
- Recreational Facilities in the ADA and ABA Standards

Mountain Bike

All trails permitting mountain bikes should be assigned a rating to enable potential riders to make well-informed and safe decisions. The International Mountain Bicycling Association (IMBA) has devised a standardized difficulty rating system specifically designed for mountain bike trails (This is outlined in the signage chapter). Ensuring that trail signs at trail heads display ratings in accordance with IMBA's standards and provide essential trail characteristics, such as total length, elevation change, and estimated trip times, enables all potential users to make informed decisions about the trails they choose.

To meet IMBA standards, trails should have a natural surface treatment and a tread width ranging from 2 to 4 feet. Keeping a smaller tread of single track promotes environmental stewardship and long-term sustainability. Construction should involve bench-cut techniques, featuring a tread surface with an outward slope to the outer edge, maintaining a grade below 10%, and meeting all other erosion-resistant methods outlined in this chapter, such as grade reversals. These elements are vital for minimizing tread erosion by facilitating gentle, non-erosive water drainage and keeping soil on the trail.

The Trails Survey showed strong support for mountain bike trails. In the open ended comments section, many respondents suggested a desire for a **NICA (National Interscholastic Cycling Association) course or bike park. To meet NICA needs and standards, the Trails Committee and County should consult directly with NICA and local high schools.**

Utah UORG has recommended the following source:

- Avoiding the Most Common Mountain Bike Trail-bound Mistakes and Community Mountain Bike Skills Parks

Equestrian





Horse trails need greater width than hiking trails. When mixed with hiking trails, horses and other stock may widen tread and cause damage to erosion control efforts. Hikers and mountain bikers may spook horses, and trail etiquette, despite signage and best efforts, may not always be followed. When possible, equestrian-specific trails may result in long term savings on maintenance and provide a more pleasant recreational experience for all involved.

- Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

ATV/OHV

Similar to mountain bike trails, ATV/OHV trails have assigned difficulty standards.⁵ The ratings are based on the most challenging section of trail during a trail segment. For example, if a 5 mile long segment of trail is generally quite easy, but has a relatively short steep and rocky section that meets the "most difficult trails" criteria, the segment will be rated a solid black diamond. Signage should not only be located at the beginning of the trail, but also shortly before the challenging section of trail.

Difficulty Rating System

	<p>1. Easiest Trails (solid green circle) These are gravel or dirt surface routes that are relatively flat and wide. For ATV riders, these routes are generally wide enough to pass a full-sized vehicle safely. They may have gentle curves, shallow stream crossings, and minor wheel ruts. They may be dusty but are relatively smooth throughout with no rocks or roots protruding more than three inches above the surface.</p>
	<p>2. More Difficult Trails (solid blue square) These are loose gravel, sandy, rocky or slickrock surface routes. They may have short sections, which may be narrow and can have blind turns, steep or roller coaster grades, minor drop-offs, dust, ruts and frequent changes in riding surfaces. There are occasional obstacles that may strike the frame.</p>
	<p>3. Most Difficult Trails (solid black diamond) These are routes with rocky surfaces, sharp turns, switch backs, steep grades, narrow passages, low overhangs, ledges and large rocks. They can be slippery and muddy when wet. These routes may have steep side-slope with exposure to drop offs and can be very rough due to past erosion. They may have tree stumps, limbs or other debris. Machines with low ground clearance may strike or high center on obstacles. Some riders may be more comfortable using 4-wheel drive machines.</p>
	<p>4. Extreme Trails (solid double black diamond) These routes may be extremely steep and rocky with ledges and drop-offs, narrow switchbacks, boulders and uneven or unbalanced trail surfaces. There may be long stretches of loose rock or deep sand on steep grades with extreme side-slopes. Some obstacles will high center most machines. Four-wheel drive is recommended. In some areas it may be necessary to walk machines over or have a helping third hand. These routes require experienced riders with a full array of good riding skills. All users should consider riding abilities and machine capabilities before attempting these routes.</p>

⁵"Difficulty Rating System," Statewide OHV Trail Signing Standards, pp 3-4, www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5203092.pdf

A commonly cited design guidebook is the U.S. Forest Service's Designing Sustainable Off-Highway Vehicle Trails. While this guidebook was created for Alaska, it draws heavily on standards created by California State Parks and International Mountain Biking Association's (IMBA) essential elements of sustainable trails.⁶ The guide establishes the following six "sustainable OHV trail design guidelines, which are quoted directly here:"⁷

1. **Contour Curvilinear Alignment** — Align the trail so it runs along the natural contour of the terrain.
2. **Controlled Grade** — Strive for a design trail grade of 10 percent or less and a maximum sustainable trail grade based on local soil and terrain conditions. Limit the length of the segments with maximum grade to less than 100 feet and their combined length to less than 5 percent of the total trail length.
3. **Integrated Drainage** — Integrate water control in the design and construction of the trail using outslope, grade reversals, and grade dips to maintain the terrain's natural drainage patterns. Space drainage structures close enough to prevent water erosion on tread surfaces or at points of discharge. The very best drainage designs are those built into new construction. These include frequent grade reversals and outsloping the entire tread. The classic mark of good drainage is that it's self-maintaining, requiring minimal care.
4. **Full Bench** — Construct a full bench by cutting the full width of the tread into the hillside on native, undisturbed material and casting the excavated soil as far from the trail as possible. Full-bench construction requires more excavation and leaves a larger backslope than partial-bench construction. Full-bench construction may have more visual impacts. The trailbed also will be more durable and require less maintenance. Use full-bench construction whenever possible.
5. **Durable Tread** — Provide a durable tread surface of compacted mineral soil, imported capping material, bedrock, or a hardened tread surfacing. Providing a durable tread for OHV trails is critical for sustainability. In some cases, durable tread can help meet the intent of sustainable trail design guidelines 1 through 4.
6. **Appropriate Maintenance** — Conduct routine maintenance and periodic project work to ensure that the trail remains within its original design specifications

Tread width, surface type, and design grade standards are determined by the trail classification. ATV/OHV trails are divided into the same five (5) trail classifications as general trails, based on the intended design and management standards.⁸ These classifications are:

ATV/OHV TRAIL CLASSIFICATION	TRAIL DESCRIPTION
CLASS 1	Minimally Developed
CLASS 2	Moderately Developed
CLASS 3	Developed
CLASS 4	Highly Developed
CLASS 5	Fully Developed

Design Parameters		Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Design Parameters						
Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of National Forest System trails, based on their Designed Use and Trail Class and consistent with their management intent. ¹ Local deviations from any Design Parameter may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.						
Designed Use ALL-TERRAIN VEHICLES (ATVs)						
Design tread width	Single lane	Typically not designed or actively managed for ATVs, although use may be accepted.	48" – 60"	60"	60" – 72"	Typically not designed or actively managed for ATVs; although use may be accepted
	Double lane		96"	96" – 108"	96" – 120"	
	Structures (Minimum width)		60"	60"	60"	
Design surface²	Type		Native, limited grading May be continuously rough Sections of soft or unstable tread on grades < 5% may be common and continuous	Native with some onsite borrow or imported material where needed for stabilization, occasional grading Intermittently rough Sections of soft or unstable tread on grades < 5% may be present	Native with imported materials for tread stabilization common, routine grading Minor roughness Sections of soft tread not common	
	Protrusions		≤ 6"	≤ 3"	≤ 3"	
	Obstacles (Maximum height)		12"	6"	3"	
Design grade²	Target grade		10% – 25%	5% – 15%	3% – 10%	
	Short pitch maximum		35%	25%	15%	
	Maximum pitch density		20% – 40% of trail	15% – 30% of trail	10% – 20% of trail	

⁶ Designing Sustainable Off-Highway Vehicle Trails, pg 3, www.americantrails.org/resources/designing-sustainable-off-highway-vehicles-trails

⁷ Id., page 3-4 (Note: the guide includes helpful photos, illustrations, and explanations of terms used)

⁸ Id., pp 11-14

Cross Country Ski

The Trails Survey showed broad support for groomed winter trails. This was backed up by open ended comments that suggested a desire for more information and development of winter trails, including snowshoeing, cross country skiing, and snowmobile.

Cross country skiing requires a minimum of six (6) inches of snowpack on a trail to avoid damaging the trail and/or ski equipment. A cross country ski trail can follow an existing trail, road, or right of way. Cross country ski trails use a four-tier difficulty rating system:

- Blue (beginner): These trails have slopes less than 10% with minimal turns and are well-suited for beginners, including children.
- Red (intermediate): These routes have slopes up to 20% and may require a well-developed ski technique to negotiate turns.
- Black (difficult): These trails have gradients—up and down—exceeding 20% and should be used by advanced skiers only.
- Orange (ski hiking trails): These are ungroomed backcountry trails designed for ski touring.

Snowmobile

Snowmobile trails should be sufficiently wide to handle two-way traffic and should include extra width around corners. The minimum width is eight (8) feet, with an ideal width of ten (10) or twelve (12) feet and a minimum height clearance of ten (10) feet. For shorter secondary trails with low traffic volumes, a narrow width of four (4) feet may suffice.⁹ This is due to the lack of needing to accommodate consistent two-way traffic. Specific trail design standards, best planning practices, design tips and tricks, and management principles are thoroughly outlined in “Best Practices for The Development of Snowmobile Trails,” published by The Vermont Association of Snow Travelers (VAST).

Oquirrh Mountains Trails Survey

Would you like year-round trails,
including groomed trails?

Yes 55% No 11%



⁹ Standards and graphic from “Best Practices for the Development of Snowmobile Trails,” Vermont Association of Snow Travelers, Inc., 2017, https://fpr.vermont.gov/sites/fpr/files/doc_library/VAST-Best-Practices-for-the-development-of-snowmobile-trails.pdf



Chapter 9: Signage

PURPOSE

This chapter outlines the purpose and methodology of signage, the different types of signage needed for the various activities found in the Oquirrh Mountains, and best practice standards. Signage is an essential component of any trail system. Without proper signage, residents don't know to visit, and visitors don't know where to go or what to do. The Trails Survey showed a critical need to review and improve signage to better assist the public. Over half of respondents indicated that inadequate signage deters them from using trails in the Oquirrh Mountains.

Signage starts at the planning stage and should meet an identified need to communicate with trail users and help them make informed decisions. Signage promotes:

- Public safety
- Public awareness of recreational opportunities
- Understanding of trail conditions and trail selection
- Understanding of restrictions, including use regulations, legal access, and seasonal closures
- Etiquette

PLANNING

Providing information is a delicate balance. If signs inundate trail users with excess information, critical information will be overlooked. Therefore, before signage is created and installed, the Trails Committee and Staff should prioritize what information should be provided and where. Non-essential information may be provided online or in brochures, but will likely overwhelm or bog down perspective trail users if provided on-site on wayfinding signage.

*Oquirrh Mountains
Trails Survey*

53%

are deterred from using trails due to lack of signage or trail promotion.

At the planning stage, before any sign is installed, staff should consider the rationale for the sign. What are the most essential messages to communicate? What information has already been shared? Once the message has been determined, the next phase is the delivery. How can this message be shared as quickly as possible? Can text be replaced by a graphic or icon? Where should the message be located to maximize visibility to the target group?

LOCATION STANDARDS

The type of information shared is determined by location and can be categorized by three main regions:¹

1. Exterior

This region is located outside the trail network and consists of directional signage pointing visitors to the site. Information should be brief and directional in nature. The purpose is to orient people toward the location where they can find more information, such as a trailhead kiosk. Detailed information, such as trail maps, should be located online and disseminated through public awareness campaigns. To determine placement of directional signage, it is helpful to work backwards from the site, such as a trailhead, and consider the routes taken to arrive at the site. Consider routes up until a highway or other major arterial roads. Directional signage should then be installed at decision points to assist travelers.

2. Entrance

An entrance should announce that visitors have arrived and provide information regarding what services and facilities are available. Administrative information, such as costs, open and close times, and announcements, are also included. Much of this can be communicated quickly and efficiently through graphics showing that a service, facility, or activity is or is not available.

3. Interior

This is signage found at the destination, such as parking lots, trailheads, service stations, campgrounds, other facilities, and along trails. It is more detailed and reinforces prior signage. This signage may include regulatory issues, maps, service specifics, warnings, and trail distances. Interior signage should also be placed at trail junctions and property boundaries.

Information should be shared strategically based on location, with careful consideration given to avoid information overload. In the Trails Survey, residents overwhelming reported uncertainty about trail regulations. During the trail audit, critical gaps in signage information were present. Current signage provides a good starting point to establish

the regulations, however, a future phase will need to include a thorough canyon by canyon signage audit, a cohesive information sharing strategy, condensing information to reduce overload, and installing standardized signage to match the goals of this plan and any strategic communication and sign goals of the Trails Committee.

CREATING A SIGN PLAN

When assessing a trail network's signage, first take inventory of existing signs. The inventory may be time intensive and best achieved through use of volunteers. An inventory should include:

- a. Date inventoried and name of person conducting the inventory
- b. Sign location
- c. Size, color, shape, height, material of sign
- d. Text and graphics on the sign
- e. Font, size, color of lettering
- f. Condition of sign
- g. Type of post
- h. Condition of post
- i. Miscellaneous notes (visibility, obstructions, recurring problems, etc.)

The inventory will help assess communication effectiveness and critical needs to achieve communication strategies and goals. These include:

- a. Are the signs consistent internally and with planning goals and objectives?
- b. Is the sign needed? Does it serve a purpose?
- c. Is the sign effective? Is it ambiguous or could it be confusing? Are there more efficient ways to convey the message? Is the lettering or icons easy to read for the driver of a vehicle traveling at the anticipated rate of speed?
- d. Is the location for the message appropriate? Is there a better location?
- e. Is the sign consistent in style and size with others in the area?
- f. Does the messaging meet the applicable sign standards?
- g. What is the condition of the sign? When should the sign be replaced?

A sign inventory should be completed before signs are ordered and installed. Piecemeal installation of signs increases the likelihood that important messages will be inconsistent, duplicated, or ignored. A communication gap can have significant consequences on public use, and may increase the rate of inappropriate use of public lands or avoidance of public recreation altogether.

¹See the BLM Sign Guidebook, 2004, pp 5-15, <https://cdn2.assets-servd.host/material-civet/production/images/documents/bureau-of-land-management-sign-guide-book.pdf?dm=1620402993>

²Several of these questions come from the BLM Sign Guidebook

SIGN CATEGORIES

Sign content needs to cover a wide range of categories. To avoid information dumping, it is best to separate signs by content. Common sign categories include:

- Identification signs: These signs serve to announce locations and orient visitors.
- Guide signs: These are directional signs that direct visitors to a specific location. These signs typically include a distance.
- Informational kiosk or bulletin board: Typically at a trailhead or parking lot. It is best to be succinct and avoid visual clutter. Excessive information will disengage visitors.
- Instructional signs: These are instructions for a specific use, such as how to reserve and pay for a campsite.
- Interpretive signage: These are placed near a cultural, historical, or environmental resource and serve to inform the public.
- Accessibility signage: This is ADA signage for parking, loading/unloading, restrooms, and access.
- Traffic control: These are standard MUTCD traffic signs.
- Regulatory and warning signs: These include seasonal closures, environmental protections, user restrictions, and other warnings.
- Etiquette and stewardship signs: These signs promote awareness of etiquette and environmental stewardship and may include messages like “leave no trace.”

SIGN DESIGN

After a sign inventory and communication plan, messages and signage types should be selected and located conspicuously and strategically. Signs should face the direction of expected traffic and have a font type and size visible for the anticipated traffic type and speed. As the rate of speed and distance from the sign increases, font and graphic size needs to increase.

The following are generic guidelines. For vehicles, three (3) inch lettering is advised for speeds 30 MPH and under, while four (4) inch lettering is used up to 45 MPH.

Max Viewing Distance (feet)	Minimum Capital Letter Height (inches)
0-20	0.75
21-27	1
28-41	1.5
42-55	2
56-83	3
84-111	4

SIGN MATERIAL

A variety of material may be used for recreational signage. Trail wayfinding signage is often accomplished on wood or Carsonite posts. Monument signs at trailheads and parking lots can be wood, stone, aluminum, or other durable materials. Monument signs that utilize native materials tend to better fit the landscape. For example, a stone monument sign in a desert environment, or a wooden monument sign in a forest. Aluminum signage is often used along roadways as it is highly durable, visible, standardized, and recognizable.



Aluminum Signage

Recreational aluminum signage follows standard icons and color schemes. Prior familiarity with the signs, fonts, and color schemes increases the likelihood that the sign content will be observed and understood.

Recreational Signage Colors

Brown (white lettering)	General trail and recreational guidance
Blue (white lettering)	Water—marinas, boat launch
Yellow	Yielding and warning
Red	Regulations and prohibited uses
Green	Directional, typically automobile directions

This uniformity helps residents more easily recognize and understand the nature of the signs.

Examples of signs include:





Several websites provide standard aluminum recreational signage, such as the images above.³

Benefits of using standard signage:

- ◊ Icons commonly recognized and understood
- ◊ Can interpret at a glance
- ◊ Understood across English language literacy levels
- ◊ Already designed

Sign Placement: Height, Distance, Tilt, and Canting

For roadways, signs should be placed so the bottom of the sign is at least five (5) feet above the level of the roadway. Signs should be 6-12 feet from the edge of the roadway to

the inner side of the sign, with a distance closer to six (6) feet preferred for roads with speeds 30 MPH and under.

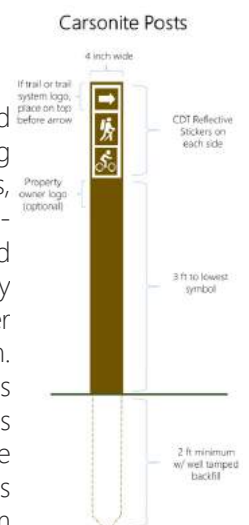
For non-motorized trails, signs should be at least three (3) from the outer edge of the trail tread to the closest edge of the sign. This provides adequate clearance for trail users, including stock animals. Signs should be placed four (4) to five (5) feet off the ground.

Tilting a sign slightly forward is a practical strategy to help prevent environmental contaminants, such as sap or bird residue, from defacing the sign. This adjustment can be effective for outdoor signs or displays exposed to the elements. Here are a few reasons why tilting a sign forward can be beneficial:

1. Preventing Accumulation: By angling the sign forward, you reduce the likelihood of contaminants accumulating on the surface. This can be particularly useful in areas with frequent bird activity or where tree sap may be present.
2. Promoting Runoff: If rain or other liquids come into contact with the sign, angling it forward encourages runoff. This can help prevent substances from settling on the sign's surface, minimizing the chances of staining or damage.
3. Ease of Cleaning: When a sign is tilted forward, it may be easier to clean as contaminants are less likely to adhere to the surface. Cleaning the sign becomes more straightforward, as gravity helps in removing debris or substances that might otherwise stick to a horizontal surface.
4. Longer Lifespan: By reducing exposure to environmental contaminants, a sign that is tilted forward may have a longer lifespan and maintain its aesthetic appeal for a more extended period.
5. In addition to tilting the sign slightly forward, a sign may be canted a few degrees away from traffic to reduce glare and increase overall visibility.

CARSONITE WAYFINDING SIGNS

Carsonite posts provide a simple and cost-effective solution to marking road crossings and trail junctions, especially in meadows and other non-wooded areas. Icons display permitted and non-permitted uses, and may include a logo for the property owner agency and the trail or trail system. For long distance thru-trails, such as the Bonneville Shoreline Trail, a logo is essential to help keep trails users on the correct trail. For local trails, a trail logo is not warranted. However, a trail system



³ Sign images from <https://www.campgrounds signs.com/>

may use a logo to help trail users understand they are still within the system and help create a greater sense of place. For trails with a difficulty rating system, such as mountain bike or OHV trails, a rated system icon should be included.

If a particular use is not permitted throughout the entire trail, or at least to the next junction or destination, it should not be allowed on the trail. Include icons indicating permitted and prohibited uses on wayfinding signs at trail junctions. This will prevent confusion.

REASSURANCE MARKERS

At times a trail may become difficult to follow. This can be due to difficulty following the tread or seasonal changes, such as snowfall. In these instances, markers are needed to provide assurance that the individual is on the trail. These markers can be cairns, posts, or tags on trees. Trails with high traffic typically have well-established tread, while more advanced and remote trails may require more reassurance markers to prevent confusion. A specific trail audit should mark points where tread is difficult to determine, such as rock outcroppings or turns in the trail that may be missed when covered in snowpack.

SIGNAGE BY TRAIL TYPE

Trails serve a diverse range of purposes. The selection of appropriate signage for each trail depends in part on its intended use and primary function. While many trails permit multiple activities, some trails cater to specific use groups and signs will need to be adjusted accordingly. User-group based signage can significantly help reduce conflicts between user groups.

HIKING TRAILS

Hiking trails are primarily designed for pedestrian use, emphasizing minimal environmental impact. Consequently, they often feature minimal signage, with blazes or markers and occasional directional signs at trail junctions. For designated long-distance hiking trails, agencies or trail organizations which oversee and manage the trail should provide guidelines for marking and signing.

Interpretive trails are pedestrian routes designed for observing and appreciating natural or cultural features within the landscape. These short trails, often configured as loops, are usually accessible to individuals with disabilities. Interpretive trails are typically posted with distinctive interpretive signage, as well as directional and regulatory signs. Nature trails educate users about natural features, wildlife, and natural history, while fitness trails focus on enhancing physical fitness through specific features. Other interpretive trails educate users about cultural history along the route.

Interpretive Signs

These signs should tell a story with each individual sign having its own consistent theme. The sign itself should contain 1/3 graphics, 1/3 text, and 1/3 open space.⁴ Mounting height should be 24 to 30 inches with a 30 to 45 degree angle. Story lines should be straightforward and succinct, with no more than 150 words for a 24" x 36" panel or 200 words for a 36" x 48" panel. When interpretive signs are part of a series, there should be a consistent style across all signs.

MOUNTAIN BIKE TRAILS

Mountain bike trails, designed for low-impact use, vary in difficulty and may include markers and regulatory signs to keep bikers on the designated path. Trail difficulty levels may also be indicated by specific signage. A consistent rating and signage system helps visitors make informed choices and better calculate risk and skill level. This reduces injuries and accidents. The International Mountain Bicycling Association has assigned five difficulty levels, which see widespread use in the mountain biking community.

- White circle: Easiest
- Green circle: Easier
- Blue square: More difficult
- Black diamond: Most difficult
- Double-black diamond: Extremely difficult, use extra caution

Oquirrh Mountains






Trails Survey

68%

experience difficulty
wayfinding on trails
in the Oquirrh
Mountains.

⁴U.S. Forest Service, Interpretive Planning, Rocky Mountain Region, https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5167249.pdf

IMBA has published the following standards for trail design that correspond to each sign type.⁵

IMBA Trail Difficulty Rating System					
	 EASIEST WHITE CIRCLE	 EASY GREEN CIRCLE	 MORE DIFFICULT BLUE SQUARE	 VERY DIFFICULT BLACK DIAMOND	 EXTREMELY DIFFICULT DBL. BLACK DIAMOND
TRAIL WIDTH	72" (1,800 mm) or more	36" (900 mm) or more	24" (600 mm) or more	12" (300 mm) or more	6" (150 mm) or more
TREAD SURFACE	Hardened or surfaced	Firm and stable	Mostly stable with some variability	Widely variable	Widely variable and unpredictable
AVERAGE TRAIL GRADE	Less than 5%	5% or less	10% or less	15% or less	20% or more
MAXIMUM TRAIL GRADE	Max 10%	Max 15%	Max 15% or greater	Max 15% or greater	Max 15% or greater
NATURAL OBSTACLES AND TECHNICAL TRAIL FEATURES (TTF)	None	Unavoidable obstacles 2" (50 mm) tall or less Avoidable obstacles may be present Unavoidable bridges 36" (900 mm) or wider	Unavoidable obstacles 8" (200 mm) tall or less Avoidable obstacles may be present Unavoidable bridges 24" (600 mm) or wider TTF's 24" (600 mm) high or less, width of deck is greater than 1/2 the height	Unavoidable obstacles 15" (380 mm) tall or less Avoidable obstacles may be present May include loose rocks Unavoidable bridges 24" (600 mm) or wider TTF's 48" (1,200 mm) high or less, width of deck is less than 1/2 the height Short sections may exceed criteria	Unavoidable obstacles 15" (380 mm) tall or less Avoidable obstacles may be present May include loose rocks Unavoidable bridges 24" (600 mm) or narrower TTF's 48" (1,200 mm) high or greater, width of deck is unpredictable Many sections may exceed criteria

⁵IMBA Trail Difficulty Rating System, <https://www.imba.com/resource/trail-difficulty-rating-system>

EQUESTRIAN TRAILS

Signs for equestrian trails should be placed farther away and higher to increase visibility. An equestrian trail should have at least 3 feet of clearance on either side of the tread. Where gates, cattle guards, bridges, or other obstacles are present, signage should be placed in advance to alert the rider. Unfamiliar obstacles may cause a horse or mule to balk. If a sign is posted nearby, it may cause harm to either livestock or riders. It is best to place warnings signs at least 15 feet of these obstacles to provide ample space.⁶



CROSS-COUNTRY SKI TRAILS

Cross-country ski trails are specifically designed for skiing, often consisting of looped trails with varying difficulty levels. Due to the desire to maintain a groomed trail, other winter uses are typically prohibited unless there is dedicated space alongside ski tracks. Ski trails are also suitable for various summer activities. Signs on cross-country ski trails may indicate trail difficulty and offer guidance for travelers during poor weather or low-light conditions.



Snow trail signage should be placed at least forty (40) inches above the average maximum snowpack level. The sign should be oriented away or protected from the prevailing wind, if possible. This will help maintain visibility and reduce wear and tear. High snowpack may bury reassurance markers for hiking trails, making them unreliable for winter orientation. Reassurance blazers should be mounted on trees. Vegetation should be pruned to maintain visibility of the marker, which includes pruning limbs above the marker that may droop and obscure the sign.⁷

ATV/OHV TRAILS

Motor vehicle trails, including all-terrain vehicle (ATV), off-highway vehicle (OHV), and four-wheel-drive (4WD) trails, have a difficulty rating system similar to mountain bike trails (see Trail Design Chapter for standards). These signs should be installed at the beginning of the section of trail that receives the rating as well as before any difficult or challenging section. Regulatory signage, etiquette signage, wayfinding, and route signage tailored toward ATVs and OHVs should also be installed throughout any trail system that supports their use. The NRCC Technical Team has created detailed ATV/OHV signage standards that should be consulted.⁸

TRAIL ETIQUETTE AND REGULATIONS

Signs promoting trail etiquette and information as to trail regulations should be placed at trailheads and along popular trails toward the beginning of the trail. These serve as reminders. Statements that set a standard of behavior, such as “thank you for staying on trail” often lead to greater compliance. Which behaviors and regulations are promoted often depend on the unique conditions of the trail, but often include:

- “Pack in, pack out” or “Leave No Trace”
- Stay on trail. At trailheads or targeted locations where trail cutting is a problem, explanations are found to improve likelihood of changing human behavior. A statement like “shortcutting the trail destroys vegetation and leads to erosion” can work wonders.
- Avoid trail use when muddy. At trailheads or targeted locations where this has historically been a problem, a statement like “trail use when muddy may cause severe rutting and lead to expensive maintenance costs.”
- “Keep Dogs on Leash” or “Clean up after your dog”
- Respect wildlife
- Right of way guidelines

*Oquirrh Mountains
Trails Survey*

60%

report trail
etiquette issues.

*Oquirrh Mountains
Trails Survey*

82%

experience
uncertainty about
trespassing and
legal trail access.

⁶Equestrian Design Guidebook, Chapter 12, U.S. Forest Service, <https://www.fs.usda.gov/t-d/pubs/htmlpubs/htm07232816/page19.htm>

⁷Signposts for Snow Trails, U.S. Forest Service, <https://www.fs.usda.gov/t-d/pubs/pdfpubs/pdf98232806/pdf98232806pt01.pdf>

⁸Statewide OHV Trail Signage Standards, https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5203092.pdf

Regulations and other information may include:

- Backcountry camping
- Drones
- Hunting
- Trespass
- Contact info for trail maintenance and issues

One issue of particular importance in the Oquirrh Mountains is private property. The mountain range, bench, and immediate valley present a patchwork of ownership with differing grants of permission and regulation. Signage needs to be clear in terms of ownership and permissions granted. When public access rights require a use restriction, informing the public of the purpose for the regulations helps improve compliance. For example, explaining that the reason to stay on the trail is that the user is entering private property and the owner has generously provided an easement along the trail, helps users develop greater respect for the private property rights and reduces the likelihood that they will wander off trail.

Respect
the Land
Owner
Stay on
Trail

When “no trespassing” signage is installed with no additional guidance, the public may be left uncertain as to whether access has been granted. This is particularly true where the public perception is that the trail continues. Clear guidance such as “private property, trail ends” or “stay on trail” indicates whether the trail continues. If the permitted activities differ, signage explicitly outlines the prohibition needs to be installed.



When a multi-use trail restricts a type of activity in only part of its length, signage should be installed at the beginning of the trail warning users of this restriction. If users commit to a trail only to discover a portion of the trail does not permit their use, they must decide whether to backtrack or break the rules.

TRAIL NAMES

Trail names are an important part of branding and wayfinding. Occasionally, social trails have gone by different names among different use groups. This creates confusion. Names should be selected and confirmed by the Tooele County Trails Committee, Tooele County, and the entity with jurisdiction over the trail, such as BLM or Tooele City.

Trail names should follow best practice standards, including:⁹

Yes:

- Names that promote a destination or endpoint
- Names that describe a natural feature of the trail
- Names that have positive historic significance

No:

- Naming after individuals
- Names suggesting adverse or undesirable conditions
- Names that promote improper usage of the trail or natural resources
- Any disrespectful name
- Names that promote an attractive nuisance or encourage off-trail usage (such as naming after a viewpoint, when better viewing options are found off-trail)

⁹Trail Signage Plan and Guidelines, New York State Parks, pg 7, <https://parks.ny.gov/documents/recreation/trails/TrailsTechnicalSignageGuidelines.pdf>



Chapter 10: Trailhead Improvements

Trailheads play a critical role in promoting and sustaining local and regional trails. Trailheads are the central hubs of trails activities and deserve intentionality in design.



Trailheads provide a reliable service, where residents can confidently assume they can show up at the trailhead and be led to the variety of trails offered. By providing a hub in a connected system of trails that serve a variety of user groups and ability levels, trailheads become an invaluable lifeline to a healthy recreation system.

Public survey data exhibited a desire for trailhead improvements. While trail quality and scenery were the most important factors when deciding whether to use a trail, the presence of common trailhead improvements were also found to be essential. Only 13% of respondents indicated that bathrooms were “unimportant” when deciding whether to use a trail. Less than 4% said the same about signage and under 2% for parking availability. This shows that trailhead improvements matter and are a vital component of a thriving trail system.

This chapter outlines best practices for trailheads, the current condition of trailheads, and steps toward establishing proper trailheads that will better meet the needs of a broad cross-section of local residents.

TRAILHEAD STANDARDS

Trailheads need to be accessible to be functional. This includes paving or maintaining a graded gravel or compacted dirt road that accommodates standard passenger and emergency vehicles. Routes to trailheads should be signed from major arterial and collector roads to inform residents of the presence of and access to the trailhead. The trailhead is the hub of the trail system, and trails need to connect into the trailhead, otherwise the public is left confused on what trails are available and how they are accessed.

When possible, trailheads for mountain trails should connect into a neighborhood, city, or regional urban trail system. In the Trails Survey, 67% of respondents indicated they would like multi-use trail (such as a bike trail) access to mountain trailheads, with only 9% indicating this wasn't important. When connected to multi-use paths and/or bike lanes, a trailhead should include bike racks to encourage active transportation and allow for bike parking.

GENERAL GOALS:

- Identify trailheads: Several are identified and audited as part of this plan. Others may need to be identified and or developed.
- Adopt uniform standards
- Use trail counters and parking surveys to determine number of spaces needed
- Use site layout to integrate with parks and establish amenities
- Provide opportunity for a variety of outdoor abilities at each trailhead
- Connect trailheads into trail and active transportation system

*Oquirrh Mountains
Trails Survey*

62%

would like improved vehicular access to trailheads.

*Oquirrh Mountains
Trails Survey*

67%

would like multi-use trails that access mountain trailheads.

To maximize functionality, trailheads should be easily recognizable, accessible, reliable in their amenities, and easily locatable by following predictable signage. The following chart outlines general trailhead standards:

01

CLASS 1 TRAIL HEAD - REGIONAL/MAJOR

Major developed gathering and parking hubs/ community and regional trails/heavy usage/ comprehensive set of amenities.

- Dedicated paved parking lot
- Parking stall number determined by typical weekend usage. May accommodate trailers, including horse trailers, where needed.
- Parking lot design should promote effective circulation patterns, appropriate site distances, proper drainage and stormwater runoff management
- Year-round access, plowed as needed in the winter
- Monument sign near entrance
- Direct and safe trail access with wayfinding signage
- Information kiosks with maps and educational content
- Restrooms and drinking fountains
- Bike racks
- Dark sky friendly security lighting
- Native landscaping
- May include other amenities, such as picnic benches, pavilions, playgrounds or lawn area, and other park facilities, depending on location.

02

CLASS 2 TRAILHEAD - MIDSIZE

Either multiple destination trailheads with moderate traffic or popular single trails/may close seasonally/ fewer amenities.

- Dedicated parking area with number of stalls based on demand (typically 6-20 parking stalls)
- Parking lot may be road base, gravel, or pavement
- Parking lot design to address effective circulation patterns, site distances, and, if necessary, proper drainage and stormwater runoff management
- Restrooms, depending on traffic volume
- Map kiosks,
- Wayfinding signage,
- Safe and direct trail access
- Other amenities, including landscaping, lighting, parking lot monument sign, bike racks, picnic benches, park areas, are as needed and may not be included

03

CLASS 3 TRAILHEAD - LOCAL

Serves one trail or a lightly-used network/few parking stalls/largely undeveloped/minimal amenities.

- Dedicated parking area with number of stalls based on demand (typically 6-20 parking stalls)
- Parking lot may be road base, gravel, or pavement
- Parking lot design to address effective circulation patterns, site distances, and, if necessary, proper drainage and stormwater runoff management
- Restrooms, depending on traffic volume
- Map kiosks,
- Wayfinding signage,
- Safe and direct trail access
- Parking area, either small parking lot or on-street parking, typically with five (5) or fewer parking spaces
- Wayfinding signage
- Safe trail access
- May include trail map kiosk with information

CURRENT TRAILHEADS

Bates Canyon Trail System

Trailhead	Class	Property Owner	Description	Action Items
Bates Canyon	1	Private – Cal-Maine Foods, Inc.	Restrooms, dirt parking lot, grading issues, trail map	Trailhead entrance monument sign, Pave and stripe, update trailhead signage,
North Oquirrh (Churchwood Dr)	3	Tooele County	Dirt shoulder	
Pine Canyon (Blue Peak Dr)	2	Private— Arco	Dirt parking lot, 15+ spaces, trail signage, grading issues make lot inaccessible to lower clearance vehicles	Trailhead entrance signage, regrade entrance, update trail signage
Oquirrh Mountain Trails	2	Tooele City	Dedicated gravel parking lot with space for 30+ vehicles.	
Pine Canyon (Smelter Road)	3	Private— Arco	Dirt parking on wide shoulder and turnout area	

BATES CANYON, CLASS 1



Location: Approximately 1400 E Bates Canyon Road

The Bates Canyon Trailhead serves as a major regional trailhead for the Bates Canyon area. The parking lot is dirt and at times has grading issues that make it difficult for lower clearance vehicles. If striped, the parking lot has ample space for over thirty vehicles. The trailhead includes a bathroom and a kiosk with trail information.

BATES CANYON TRAILHEAD AUDIT

Current Status	Actions—Short Term	Actions—Long Term
Access on and through private property	Continue working to enhance public – private partnerships	
Trailhead named and labeled on Google Maps		
Parking lot has grading issues entering making it difficult for cars, lack of paving makes parking lot difficult or altogether inaccessible in winter	Regrade entrance and where needed. Provide grading maintenance.	-Conduct parking study to determine number of parking stalls. -Create site design for improved efficiency and circulation. -Pave parking lot.
No monument sign at entrance	Install monument sign with trailhead name	
Trailhead signage needs updating	Update trailhead signage to meet best practices in Signs Chapter	
Minimal wayfinding signage	Install wayfinding signage	
Vault restroom	None – Continue to maintain	
No security lighting or landscaping	None	-Install dark sky friendly security lighting and native landscaping with parking lot redesign
No additional amenities	None	-At parking lot redesign, consider pavilion, picnic tables, and bike racks



NORTH OQUIRRH TRAILHEAD, CLASS 3

Location: approximately 220 N Churchwood Drive



This trailhead is located at the northern end of Churchwood Dr in unincorporated Lincoln. The dirt shoulder along Churchwood Drives serves as the pullout area at the end of the pavement and point of seasonal winter closure for trails in BLM’s North Oquirrh Management Area. The shoulder can accommodate about 8-10 vehicles.

When the dirt road is closed, a pedestrian access gate is located to the side of the gate. The gate is designed with a bar across the bottom to discourage bicycles and motor vehicles from entering. At the gate entrance is a raised monument sign stating the name of the location and jurisdictional authority.

This is followed up with a kiosk including information regarding permitted uses, seasonal closures, and etiquette.



North Oquirrh Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Access directly from public street to BLM land	None	
A wide shoulder on both sides of the street allows for on-street parking and turnaround.	Soft shoulders can become rutted. Continue periodic maintenance.	
A monument sign provided behind the gate	None	
Map kiosk	Coordinate with BLM to update trail information as needed	
Wayfinding signage which includes allowed and not-allowed activities	None	When a regional thru trail is legally established, update wayfinding at each junction of the thru trail.

PINE CANYON TRAILHEAD, CLASS 2



Location: 1040 N Blue Peak Drive

This dirt/gravel parking lot provides access to trails within the Pine Canyon Conservation and Wildlife Area and Pass Canyon. The parking lot has ample parking spaces to accommodate visitors, however the entrance has grading challenges that present a barrier for vehicles with low to moderate clearance.

The parking lot includes a kiosk with trail information. There is no street-facing sign indicating a trailhead name.



Pine Canyon Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by Arco Environmental Remediation as part of a public-private partnership.		
Provides safe and direct trail access		
Parking lot not named and identified on Google Maps and other online maps	Identify name on Google Maps and other online maps	
Gravel parking lot, well-graded interior with significant grading issues on access	Regrade access. Will require additional fill to address lack of water runoff.	
No trailhead sign at the entrance	Install trailhead sign at the entrance facing the road and access	
Trailhead signage needs updating	Update trailhead signage to meet best practices in Signs Chapter	
Minimal wayfinding signage		Install wayfinding signage once legal routes established, with an emphasis on thru-trails

OQUIRRH MOUNTAIN TRAILS PARKING LOT, CLASS 2



Location: 895 E Vine Street

This gravel/dirt parking lot is large and well graded. However, it provides minimal, if any, connection to the public trails system. There is a trail across the street, however, this appears to be a private trail (after the entrance on public land, it exclusively traverses private property). The parking lot is loosely connected to the terminus of a neighborhood multi-use paved trail that runs about a half mile before ending inside a neighborhood toward the west. The parking lot does not provide direct connection to the paved trail, however based on ownership and topography, it would be a simple connection to make.

The parking lot features regional signage, however, the trailhead's place and purpose within the regional trail network is uncertain. While this trailhead provides some information about uses, it is vague and located in a place where it is unlikely users would stop to notice the regulations without given specific direction.



Paved Neighborhood Multi-Use Trail

Oquirrh Mountain Trails Trailhead Audit

Current Status	Actions—Short Term
Property owned by Tooele City and next to neighborhood trail but no direct access	Open direct access to the neighborhood trail
Parking lot accesses trail to private property across the street	Install signage on the property (owned by Tooele City, Parcel ID# 02-147-0-0004) indicating private property and no public access
Parking lot not identified on Google Maps and other online maps	Identify name on Google Maps and other online maps
Gravel parking lot, well-graded, maintained and fenced	None
The parking lot has ample space for circulation	None
No monument sign at the entrance. The signage faces the interior of the parking lot.	Install a sign that faces traffic at the entrance with the trailhead name
Trailhead signage needs updating	Update trailhead signage to meet best practices in the Signs Chapter
Minimal wayfinding signage	Install wayfinding signage, if the parking lot is an overflow lot for Middle Canyon, rather than for a trail, it should be identified as such.



Trailhead Kiosk Signage includes a map, regulations, and historical interpretation.

PINE CANYON (SMELTER ROAD) TRAILHEAD, CLASS 3



Location: E Smelter Road (at gate)

This trailhead consists primarily of dirt/gravel parking along the side of Smelter Road. Near the gate there is a wide turnaround area that is used for parking. There are multiple gravel pull out areas in the vicinity. Additionally, the shoulder along the road is wide enough to support parallel parking. No facilities exist. Signage is minimal.



Pine Canyon (Smelter Road) Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by Arco Environmental Remediation as part of a public-private partnership.	None	
A wide shoulder on both sides of the street allows for on-street parking and turnaround.	A soft shoulder can become rutted. Continue periodic maintenance.	
No signage except on the gate	If this is a road terminus, coordinate with the property owner to formalize the parking area	
No kiosk or trailhead signage	Coordinate with property owner to install kiosk with trailhead signage and map of public trails	
Minimal wayfinding signage	Coordinate with property owner to install wayfinding signage, especially at trail junctions	When a regional thru trail is legally established, update wayfinding at each junction of the thru trail.

Middle Canyon Trail System

Trailhead	Class	Property Owner	Description	Action Items
T Trail	3	Tooele City	Gravel pullout parking area	
Middle Canyon Entrance	2	Tooele City	Gravel pullout parking area	
Butterfield Peaks	2	Federal	Gravel pullout parking area	

T TRAIL TRAILHEAD, CLASS 3

Location: E Middle Canyon Road

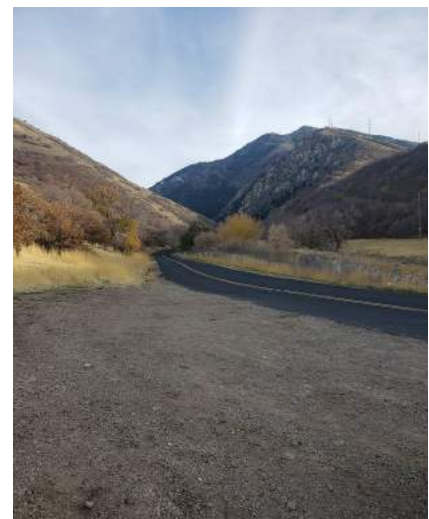
This trailhead is along the side of Middle Canyon Road next to a large pullout area. The trailhead is along a private road and leads to a private gate, with a pedestrian crossing to the side of the gate. The trail briefly follows the private road before heading off on its own single track.



Unmarked gate near entrance

The parking area can accommodate several cars; however, the parking area is located at the junction with a private double track road which can easily be blocked if drivers are unaware or aren't careful. Signage should be installed to alert drivers to avoid parking within the private road access area.

Access to the trail is found around a gate. There is no signage at the trailhead or gate informing the public as to access and permitted activities. This has led to significant confusion as manifested in comments on popular trails sites online.



Gravel parking area

T Trail Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by Tooele City	None	
A wide shoulder on the north side of the street allows for on-street parking both east and west of the trailhead.	Install a sign to steer clear of private access lane	A soft shoulder can become rutted. Continue periodic maintenance as needed.
No kiosk or trailhead signage	Install a T Trail sign at the trailhead adjacent to the parking lot, including icons for permitted activities	
No wayfinding signage	Coordinate with property owners to install wayfinding signage, especially at trail junctions	

MIDDLE CANYON ENTRANCE TRAILHEAD, CLASS 2



Location: E Middle Canyon Road, at gate

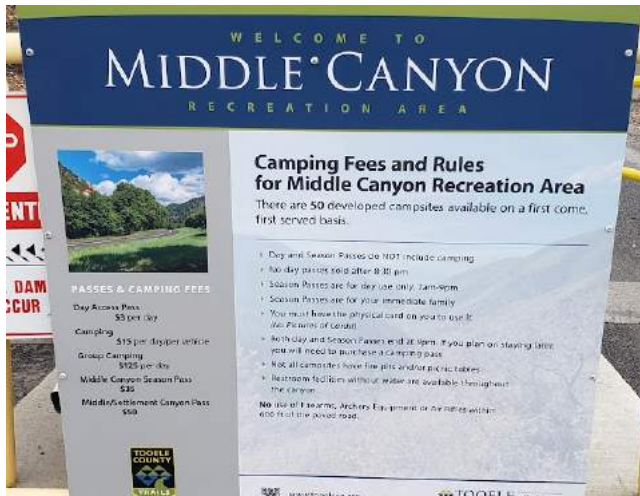
This parking lot is a mid-sized parking lot adjacent to the Middle Canyon entrance gate. This parking lot has been expanded in recent years and can now accommodate several vehicles.

Middle Canyon is subject to seasonal road closure, making this parking lot the winter road terminus. During winter months, the road is used as a trail for winter recreationalists, including snowmobile and cross-country skiing. During that time, this parking lot serves as the trailhead. During warmer months, there are no trails originating from this trailhead. This parking lot serves as a gathering spot at the mouth of the canyon and a parking spot for cyclists riding the canyon.

The parking lot is unmarked, however a sign at the entrance gate to Middle Canyon is immediately adjacent to the parking lot and includes detailed information about camping and visitation. As this parking lot is the winter terminus and trailhead, it would be beneficial to include information about winter recreational use, including trail information, winter use etiquette and regulations, and warnings and restrictions.



Aerial view of parking lot



Middle Canyon Trailhead Audit

Current Status	Actions—Short Term
Property owned by Tooele City and next to neighborhood trail but no direct access	None
Parking lot not identified on Google Maps and other online maps	Identify name on Google Maps and other online maps
Gravel parking lot, well-graded, maintained and fenced	None
The parking lot has ample space for circulation	None
No sign at the entrance	Install a sign that faces traffic at the entrance with the trailhead name
No trail signage	Install trail signage to meet best practices in the Signs Chapter. Signage for winter trails should be placed higher based on the anticipated snowpack level.
No additional amenities	None

BUTTERFIELD PEAKS TRAILHEAD, CLASS 2



Location: E Middle Canyon Road at summit between Middle Canyon and Butterfield Canyon

This trailhead is a gravel pullout area at the base of trails leading to Butterfield Peaks, Middle Canyon, and White Pine Canyon. Hikers or gravel bike riders also use this parking lot to ascend the Copper Pit Overlook. There are no amenities and minimal signage.

This parking lot is also the summit of Butterfield Canyon, which features a growing trail network. Salt Lake County adopted the Butterfield Canyon Master Plan in 2023. This designated over 13 miles of new trails as well as a new regional parking lot. New trails in Butterfield Canyon are multi-use with a primary design for mountain bike use.



Aerial view of parking lot

Butterfield Peaks Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property ownership unclear on Tooele County GIS map	Identify property owner and coordinate	
Dirt parking lot with space for a few vehicles	Continue to maintain	
Parking lots often overcrowded with insufficient space for circulation		Redesign parking lot to accommodate more vehicles and amenities
Parking lot identified on Google Maps and other online maps	Ensure the parking lot is identified on all popular maps	
No sign at the parking lot.		When the parking lot is redesigned, install a sign trailhead name
Trailhead signage needs updating	Update trailhead signage to meet best practices in the Signs Chapter	
Minimal wayfinding signage	Install additional wayfinding signage, including at all junctions	
No additional amenities	None	Consider bathrooms and other amenities when the parking lot is redesigned.

Settlement Canyon Trail System

Trailhead	Class	Property Owner	Description	Action Items
Settlement Canyon Reservoir	2			
Settlement Canyon Trailhead	1			
Dark Canyon – Upper	3			

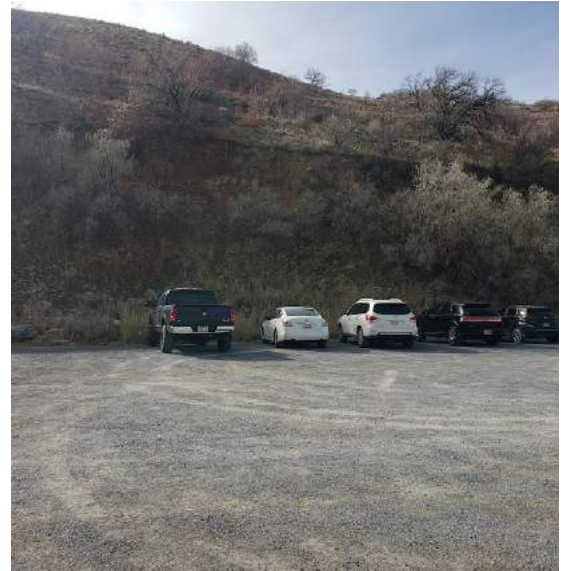
SETTLEMENT CANYON RESERVOIR, CLASS 2



This parking lot is the winter terminus of Settlement Canyon Road and is located next to the toll booth at the entrance point for the Settlement Canyon seasonal fee area. The parking lot is dirt/gravel and provides ample parking space. The parking lot is also used for fishing on Settlement Canyon Reservoir. There are no amenities.

The Settlement Canyon Overlook Trail starts on the southeast end of the parking lot. This trail is unmarked trail and would require trail improvements on the initial ascent to meet trail design standards. This trail is accessible from this parking lot on a year-round basis.

During the winter, Settlement Canyon is popular for cross-country skiing, snowshoeing, trail running, and hiking. This parking lot serves at the main winter recreational parking lot.



Settlement Canyon Reservoir Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by Tooele County and Settlement Canyon Irrigation Company	Continue to partner with Water District	
Parking lot accesses one trail directly – the Tooele Overlook Trail – which is largely undeveloped.		
Parking lot does not connect to Dark Canyon Trail. There is a <u>400 foot</u> gap between the parking lot and the Dark Canyon trail entrance, which is directly off the road with no shoulder.		Consider ways to close this gap. Bike sharrows can direct mountain bikers to the Dark Trail entrance. An improved Tooele Overlook Trail can be used to create a short hiking trail rising and descending from the butte to connect to the Dark Trail.
Parking lot identified on Google Maps		
Gravel parking lot, well-graded and maintained	None	
Parking lot has ample space for circulation	None	
Large sign at booth / gate indicates Settlement Canyon	<u>Sign</u> at gate has low visibility. Visible to drivers waiting in line. Signage information needs to be prioritized and placed conspicuously.	
Trailhead signage needs updating	Seasonal recreational use information needs to be included. This could be accomplished on the kiosk.	Install signage for Tooele Overlook Trail (and possibly the Dark Trail) after the trail has been improved
Minimal wayfinding signage		Install wayfinding signage once routes and trails have been determined
No additional amenities	None	

SETTLEMENT CANYON TRAILHEAD, CLASS 1



This trailhead is located inside Settlement Canyon, near the mouth of the canyon, and is accessible seasonally. The parking lot provides access to Dark Trail. The parking lot entrance features a sign indicating the “Dark Trail Loop,” however additional signage is needed to orient visitors from the parking lot to the Dark Trail. Without signage, visitors have made numerous spur trails in multiple directions. Many of these trails interconnect and eventually make their way to Dark Trail.

This parking lot serves as a good home base to complete the full Settlement Canyon Loop. From the parking lot, the northern portion of the loop—Left Hand Fork, Bench Trail, Muddy, and Ridge Trails, are access after an approximately 0.4 mile hike along relatively flat terrain. This junction also connects to the newly constructed Settlement Canyon Trail. Signage, including a map of the trail system, would need to be installed at Settlement Canyon Trailhead to inform visitors of this recreational opportunity.



Settlement Canyon Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by Tooele County and Settlement Canyon Irrigation Company	Continue to partner with the Water District	
Trailhead not named and labeled on Google Maps	Update online mapping resources to display trailhead name	
Gravel parking lot, well-graded and maintained. Seasonal closure reduces the need to pave the parking lot.		
No monument sign at the entrance. One sign at the entrance indicates horse parking and the presence of Dark Trail “loop”	Install monument sign with parking lot name	
Trailhead signage needs updating	Update trailhead signage to meet best practices in the Signs Chapter	
Minimal wayfinding signage	Install wayfinding signage at junctions. There are many desired trails and splinter trails. To maintain environmental integrity, several routes need to be decommissioned and blocked off.	
No restrooms. However, there are restrooms at the campground ¼ mile up the road		If signage, trail development, and promotion increase users, a restroom may be warranted.
Fire pits and covered picnic tables	Parking lot signage should indicate that this is a day-use area.	

Legion Park Campground

There are plans to expand this parking lot include trailhead parking. This parking area is in close proximity to the upper bench trails on the Settlement Canyon Loop—primarily Left Hand Fork, Bench Trail, Muddy, Ridge, and Settlement Canyon Trail.

UPPER DARK TRAILHEAD, CLASS 3



This is an informal trailhead up Settlement Canyon that provides additional access to Dark Trail along with Settlement Canyon Campground and restrooms. Parking is located in dirt pullout areas on either side of Settlement Canyon Road. No additional amenities or signage is provided.



Upper Dark Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by Tooele County	None	
A wide shoulder on both sides of the street allows for on-street parking and turnaround.	If areas are to be protected as meadows, natural barriers, such as large boulders or wooden fencing will need to be installed to direct drivers to desired pullout areas.	Parking on the sides of the road can gradually increase the size of the shoulder. Consider designing a more dedicated area.
No signage except on the gate	If this is the public road terminus	
No kiosk or trailhead signage	Coordinate with property owner to install kiosk with trailhead signage and map of public trails	
Minimal wayfinding signage	Coordinate with property owner to install wayfinding signage, especially at trail junctions	When a regional thru trail is legally established, update wayfinding at each junction of the thru trail.
Vault toilet, technically part of Settlement Canyon Campground		

Ophir Canyon Trail System

Trailhead	Class	Property Owner	Description	Action Items
Jacob City Loop	2	State of Utah / BLM	Dirt/gravel	
Lion Hill Loop	2	BLM	Dirt/gravel	
Lowe Peak	3	Local Class B Road on Private Property	Dirt/gravel shoulder	

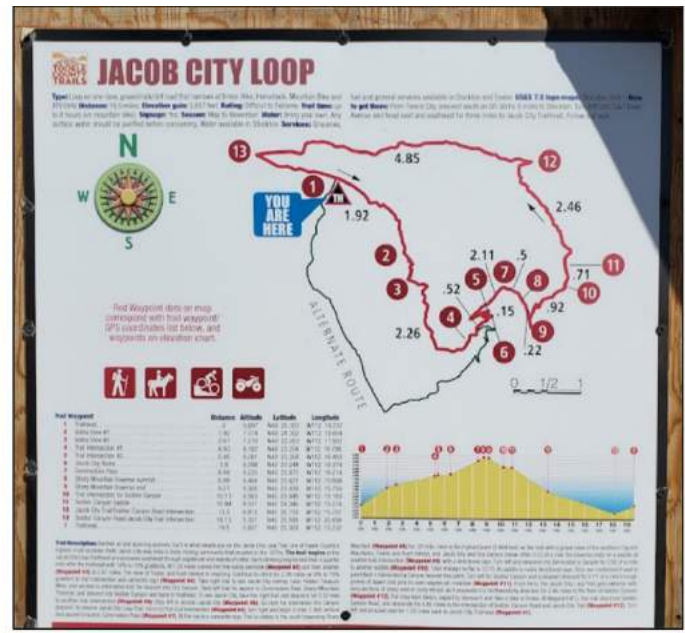
JACOB CITY TRAILHEAD, CLASS 2



Located on Bald Mountain Road at the junction with TC20929. The parking lot and roads reaching it are dirt/gravel. The parking lot is well-graded and provides ample parking space, including sufficient space for trailers. The parking lot features vault toilets, a trail map, a regional trails map, and interpretive signage. While primarily used for ATV/OHV recreation, trail runners, gravel bikers, hikers, and horseback riders also use the dirt roads. During winter, on high snowpack years, the roads are used for snowmobiling and skiing.



Aerial view with property line. State of Utah on the north, BLM to the south.



Trailhead signage provides a historical perspective as well as a trail map.

Jacob City Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by Utah State and BLM	None	
Dedicated gravel/dirt parking lot with fencing	None—continue to maintain	
Entrance signage (?)	Install a sign at the entrance and approaching entrance announcing "Jacob City Trailhead Parking"	
Has trailhead signage		Yes, update when deteriorated with signage that meets the standards in this Plan.
Minimal wayfinding signage	Install signage indicating the direction to go for the loop	
Vault toilet	Continue to maintain	

LION HILL LOOP PARKING, CLASS 2



Located up South Fork Road this is a gravel/dirt parking area. South Fork Road is a dirt/gravel road that requires a high clearance vehicle and becomes increasingly challenging after this parking lot. The parking lot serves as an unloading place for ATV/OHVs, horses, and bicycles. It is also the parking lot for individuals seeking to hike to the summit of Flat Top Mountain.



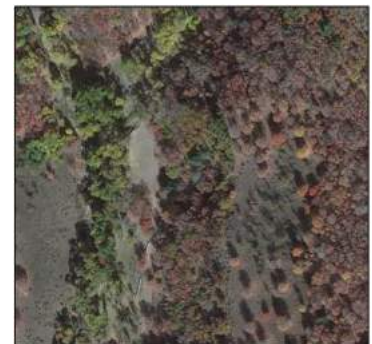
Lion Hill Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by BLM	None	
Dedicated gravel/dirt parking lot with fencing	Continue to maintain	
Entrance signage (?)		Install a sign placard indicating the parking lot name
No trailhead signage		The current trail situation needs to be solidified. Once conditions are established, the corresponding signage should be installed
Minimal wayfinding signage		Once trail routes are formally established, install wayfinding signage consistent with the standards in this Plan.
No other facilities		

LOWE PEAK PARKING



Located up the terminus of Ophir Canyon Road, this is a gravel/dirt parking turnaround area. This parking area is used by individuals seeking to hike to the summit of Lowe Peak. Lowe Peak is currently accessed by two different routes, both of which extensively cross private property. As such, neither route has been formally recognized. Parking in a turnaround may cause challenges for emergency vehicles. If access issues are resolved and the hiking trails are formally recognized, then the parking situation will need to be re-evaluated.



Aerial view with the property line. State of Utah on the north, BLM to the south.

Lowe Peak Trailhead Audit

Current Status	Actions—Short Term	Actions—Long Term
Property owned by private owner (Parcel 06-046-0-0004, Warner). The road is a Class B Public Road. Some or all the current turnarounds may be public.	None	If trails from this location are accepted, then property ownership of parking locations will need to be re-examined and evaluated to prevent trespass.
Gravel/dirt parking area at turnaround at the public road terminus		
No parking lot signage	No actions are taken until trails are formally adopted.	
No trailhead signage		
No wayfinding signage		
No restrooms or amenities		



Chapter 11: Maintenance and Sustainability

A sustainability and maintenance management plan helps streamline ongoing maintenance and promotion of trails. This Chapter presents a plan, establishes priorities, and provides a framework to manage maintenance and ongoing support for local trails. Regular maintenance creates a positive feedback loop:

- Extends the life of a trail
- Results in lower long-term costs compared to the significant expenses required for rehabilitation of a trail that has suffered neglect due to inconsistent maintenance.
- Reduces injuries, lost or stranded trail users, and expensive search and rescue efforts
- Improves user satisfaction and encourages responsible trail use
- Deters bad behaviors, such as illegal dumping and vandalism
- Improves relations with property owners and agencies
- Fosters pride in the community and environmental stewardship

*Oquirrh Mountains
Trails Survey*

96%

say maintaining trails
is a good use of
public resources.

Common tasks:

- Erosion control
- Vegetation management, including corridor clearing
- Sign rehabilitation or replacement
- Trash pickup
- Restroom and facilities maintenance
- Graffiti removal
- Parking lot grading or resurfacing
- Seasonal preparations
- Reviewing and updating online trail resources
- Informing the public on trail maintenance and management issues

ANNUAL TRAILS AUDIT

Original trail design is the #1 factor impacting maintenance. A poorly designed trail leads to excess maintenance costs. Before assessing long-term maintenance, ensure the trail has been properly aligned and designed. Otherwise, the trail is left susceptible to erosion, muddiness, cracking, tread damage, and widening. Trails in these conditions are hazardous, unenjoyable, and require constant maintenance to remain usable. Once a trail is properly designed it is imperative to stay on top of maintenance.

Trail Logs

- First, the Trails Committee will need to determine the scope of trails within the maintenance jurisdiction of Tooele



County. These are trails that have met all the standards in this Trails Plan.

- ◇ Who will perform the maintenance?
- ◇ What maintenance will occur?
- ◇ Which funds will be used to cover costs?
- Second, a log will need to be created. The log will include a list of improvements and locations along the trail (in miles). This will help prioritize and schedule improvements and assess the effectiveness of actions. Include:
 - ◇ name of a given trail
 - ◇ trailhead improvements,
 - ◇ wayfinding and other signage,
 - ◇ cairns and other reassurance markers
 - ◇ erosion control efforts and erosion hotspots,
 - ◇ any other improvement.
 - ◇ the dates improvements are made
 - ◇ dates for anticipated improvements
 - ◇ maintenance priority level (low, medium, high)
- Third, the log should include a photo inventory of all signage

Tread loss that removes outslope is often the #1 maintenance problem. Focus on reestablishing outslope to prevent costly maintenance.

- Fourth, include trail facilities, such as trailhead improvements and bathrooms.

Signage Photo Inventory

- Maintain a photo inventory log of signs along with:
 - year installed,
 - manufacturing information of the sign (supplier and product number) and
 - life expectancy.
- Why?
 - ✓ cost forecasting
 - ✓ streamlining the purchasing and maintenance process,
 - ✓ facilitate price discounts from bulk purchases, and
 - ✓ provide improved consistency in signage.
- If sign damaged before reasonably expected wear and tear, consider why:
 - Stolen? Consider theft-resistant mounting hardware.
 - Damaged? Reconsider sign material, size, and placement.
- Some wayfinding signs may need to be attached to trees or wooden posts.
 - As a tree grows, the sign's lag screws may need to be loosened to provide growing room for the tree.
 - Identify rotting wood. Replacing the wood before it falls into decay. This will better serve the public and reduce risk of sign damage.

- Fifth, include the overall maintenance schedule. This includes:
 - ◇ Tasks
 - ◇ Frequency of tasks
 - ◇ Costs
 - ◇ Estimated annual costs
 - ◇ Delegated party

REPORTING

Place a trail maintenance contact phone number and email at trailheads. If a website has a trail hazard/maintenance submittal, a QR code at trailheads could help facilitate communication.



On longer trails, mile marker posts help reporters more accurately indicate the location of trail hazards and maintenance issues.



Following up with individuals who report helps show accountability and create goodwill in the community.

TRAIL AND ROAD CLOSURES

Closing trails during times when the trail is vulnerable to damage is essential for preservation. This is especially true during muddy seasons, both spring runoff and after heavy rainfall.



Using a muddy trail makes the trail susceptible to soil compaction, can damage vegetation, widen the tread, cause rutting, and damage, or altogether destroy erosion control measures.

The County can prepare for this and streamline the protection of trails by creating standardized notices in advance that can quickly be placed at trailheads and on social media.



To maximize effectiveness, notices should include the purpose of the closure and why it is in the public's best interest to temporarily close the trail.

Take Advantage of Seasonal Road Closures



Seasonal road closures can provide unique opportunities to promote community and trail usage. For example, spring and fall bike ride events before spring road opening and after fall road closures. This promotes car-free riding and increases public knowledge and appreciation of the recreational resource.

BUDGETING

Obtaining resources for maintenance is often more challenging than securing funding for trail construction. Improperly designed trails often result in deferred maintenance, where necessary upkeep tasks are delayed due to insufficient funds, labor, or equipment. By constructing trails in line with best practices, maintenance budgets can be met. A properly constructed trail should last at least 20 years with very basic annual maintenance.

Consider costs before construction

Considering future maintenance costs can help make informed decisions at the trail development stage. If choosing between multiple options that have similar public benefits, pick the one with the least maintenance costs.

COLLABORATION

- Many trails in the Oquirrh Mountains cross multiple jurisdictions, including government agencies and private properties. For trails on government agency land, funding, resources, and management help may be provided by the agency. Partnering with the agency may help facilitate maintenance and trail promotion. Consider periodic communication with the agency and the sharing of strategic action items.
- Opening periodic communication with property owners will provide a structure for information sharing. This will help the County and its partners address trails and recreation issues before they get out of hand.

VOLUNTEERS

Using volunteers, both ongoing individual volunteers and large organized events can provide labor hours at minimal costs. However, tasks should be carefully selected to avoid cutting corners in the quality of trail design and maintenance, as this may result in increased long-term costs.

Volunteers

- When used correctly, reduces costs and promotes stewardship.
- A trail maintenance plan should identify tasks that volunteers could undertake with minimal training and legal risk.
- Volunteer tasks may range from large community projects to individual tasks.
- Volunteers are best used for efforts with a clear impact. This generates excitement and increases the likelihood of follow through.
- Actions requiring experts, such as trail design and engineering, should not be left to volunteers. This may result in additional costs and legal liability.

Common Volunteer Activities

One-time group activities:

- Manual labor, such as removing fallen branches and trees or clearing brush
- Collecting litter and trash
- Painting or staining benches or wooden posts

Ongoing committed volunteer activities:

- Conducting trail audits and inventories
- Grooming winter trails
- Updating online trails resources (such as Alltrails, Trailforks, Google and Apple Maps)

Organized programs and volunteer titles, like “Trail Ambassador,” helps recognize and reward committed volunteers.

**DATA COLLECTION**

The collection of trail data is all about efficiency. Data helps support trail and facility sustainability and provides insights on where to allocate resources. Data can show which trails are crowded or underutilized and where additional facilities are or aren't needed.

Trail Counters

- Work with a Trails group to install trail counters.
- Trail counters can be used to determine the success of trail advertisement and development.
- Trail counters can help make data-informed decisions when making priorities. Sometimes a priority may be to improve a commonly used trail, while another priority may be shifting use to a seldom used trail to reduce overcrowding.
- Trail Counters also provide valuable data to assist in applying for grants and funding.

Traffic and Parking Data

- Parking and traffic data can help determine the number of parking stalls needed. This is necessary before making costly improvements, such as paving and striping parking lots. The data is also valuable to help understand barriers in the system and the success of trail promotion efforts.
- Traffic counters provide data on traffic speeds and frequency and can help make informed decisions on mixing user groups, for example, understanding safety concerns of cyclists sharing the road with vehicles.



Chapter 12: Public Marketing

Public promotion of legally established trails is essential to creating sustainability. A successful public marketing campaign will include directing the public to legal trails, educating the public on etiquette, and ongoing dialogue on trails issues and maintenance. This transparent flow of information and promotion of well-designed trails will enhance public support, goodwill, and sense of ownership.

ONGOING PUBLIC OUTREACH

Once trails meet all the standards of this Plan and have been legally established, it is important to collect ongoing public feedback about enjoyment and challenges.

QR code for feedback survey at trailheads

- A quick, simple survey with not more than a few questions asking whether they enjoyed the trail and encountered any problems. If the user encountered problems, a free flow box will allow them to submit their experience. This helps with maintenance and improves public goodwill.

Periodic surveys for levels of service, ideas, feedback

Follow up survey to trails plan (create follow up questions to measure improvement)

- This will help measure improvement and assist in obtaining grant monies.

OQUIRRH MOUNTAINS TRAILS SURVEY

37% of all respondents state they do not participate as much as they would like **due to lack of information about trails.**

PUBLIC SUPPORT

Events, both volunteer and recreational, foster community engagement, promotes health and wellness, attracts visitors, encourages environmental awareness, enhances social connections, and improves quality of life.

- **Trails Committee:** The Trail Committee serves as a liaison between various user groups and the County. It has a dual function of providing the County with information and spreading information back out to the community.
- **Annual events:** These can include volunteer days to maintain or clean up trails as well as community recreational events.
- **Youth activities promotion:** Encouraging outdoor recreation and stewardship among the rising generation promotes public health and creates continuity in trail usership.

PUBLIC AWARENESS CAMPAIGNS

New or improved outdoor recreational opportunities are important components of improving public health and economic growth. Outdoor recreation encourages visitors, who spend at local restaurants, grocery stores, and hospitality. New trails and improved trail systems can lead to the sponsoring of organized events

Trail and trail network promotion

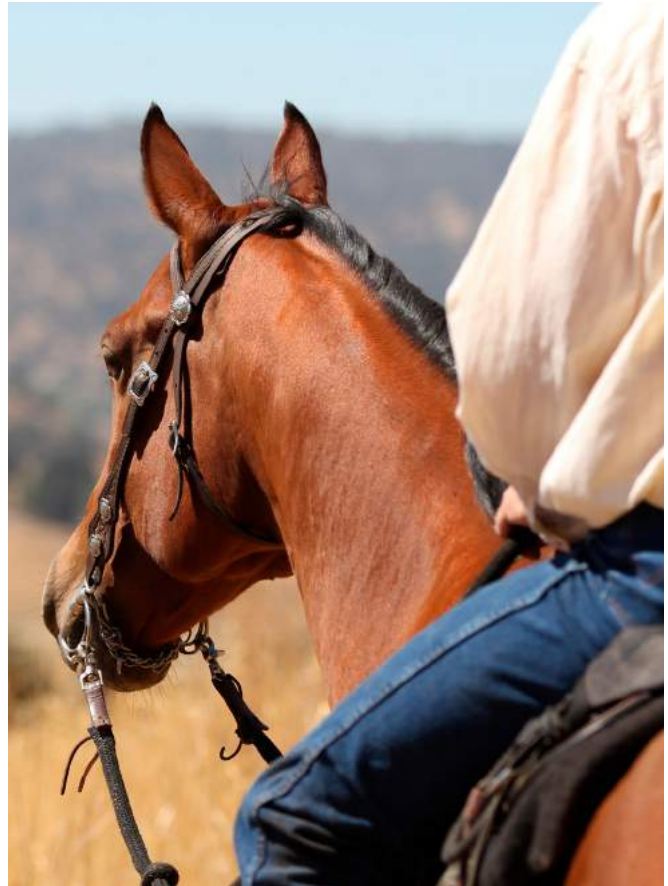
- Consider highlighting official trails and trail networks on social media and other communications. Seasonal changes are a good time to promote the changes of use. Many residents may not know about winter recreation opportunities.

New trail promotion

- When a trail meets all the standards in this Trails Plan it is ready for official recognition. The trail can then be promoted on social media and official communications. Online resources will need to be updated to include the trail and accurately reflect the official trail configuration. Depending on the nature of the improvement, a ribbon cutting, or other kickoff event may help spread the word and generate public enthusiasm.

OQUIRRH MOUNTAINS TRAILS SURVEY

82% say promoting outdoor rec is **important to economic development.**



RESOURCES TO UPDATE

Oquirrh Mountains Trails Survey

60%+ say word of mouth and local knowledge

30% to 60% say Alltrails and social media

15% to 30% say Google and Apple Maps, Trailforks, OnX, Tooele County Trails Map

Other resources to update include SummitPost, The Hiking Project, Gaia, and The MTB Project.



Chapter 13: Funding Sources

Funding from grants plays a crucial role in the development and sustainability of regional trails. Many grants permit an in-kind match through volunteer hours and donations. Collaboration with local trails groups and enthusiasts can help meet these match requirements, provide valuable labor and local knowledge, and serve to promote and provide community support for new improvements. This chapter outlines available funding sources that are commonly used for trails and how this plan can be leveraged to obtain funding from those grants. Funding sources and their requirements are subject to change.

GRANTS COVER A RANGE OF NEEDS:

- Land acquisition
- Easements
- Legal Advocacy
- Trail design
- New trail construction
- Trail re-construction
- Trail counters
- Habitat protection
- Trailhead improvements
- Signage
- Regional connection into trails
- Trail integration into routes to schools
- Public Education

OQUIRRH MOUNTAINS TRAILS SURVEY

94% of respondents **support** the County pursuing matching **grants** for outdoor recreation.

Funding from grants plays a crucial role in the development and sustainability of regional trails. Many grants permit an in-kind match through volunteer hours and donations. Collaboration with local trails groups and enthusiasts can help meet these match requirements, provide valuable labor and local knowledge, and serve to promote and provide community support for new improvements. This chapter outlines available funding sources that are commonly used for trails and how this plan can be leveraged to obtain funding from those grants. Funding sources and their requirements are subject to change

This Oquirrh Mountain trails plan plays a vital role in obtaining grant funding

How to leverage the Oquirrh Mountains Trails Plan to receive grants

1. STATE THE CHALLENGE

The trails planning process helped develop a shared understanding of the unique local challenges facing trails in the Oquirrh Mountains. These hurdles range from public land access, trespass, the prevalence of DIY social trails that do not meet trail design standards, lack of signage, inconsistent trail names, cutoff trails and other unauthorized trails, insufficient trailhead facilities, and lack of knowledge among residents about legal trails. Furthermore, the survey confirmed public demand for trails and a desire to resolve these issues. This baseline establishes a need for action.

2. SHARE THE VISION

This plan outlines a vision for the development and management of a regional trails network. The plan establishes incremental goals and objectives that build on each other toward a final shared vision. This vision helps grant providers understand a project's purpose and expected outcomes and how the individual phase fits within a larger picture. This demonstrates that projects are deliberate and part of something greater.

3. ESTABLISH CREDIBILITY AND ACCOUNTABILITY

The thoughtful formation of the plan signifies commitment to trail development from staff, elected officials, and stakeholders and demonstrates a standard of excellence in trail design. This ensures grantors that funding will be well-spent and used deliberately.

4. PROVIDE JUSTIFICATION THROUGH DATA

The community survey provided invaluable data regarding community attitudes, preferences, and support. The survey showed broad support for trails, a wide range of user groups,

and the extent and need to address trail improvements. This data can be used to justify the need for grant funding and demonstrate how the project aligns with community values and will receive public support.

5. ESTABLISH FEASIBILITY

Grantors want to see that the project is viable and part of an achievable vision. This plan outlines steps to establish a robust interconnected trail network full of legally established trails that meet best-practice standards. Grantors are more likely to provide financial support to projects that have a clear path to success.



6. DISPLAY SUPPORT

Community support, including stakeholder support, is important for grantors. This shows that the community will value the project. The survey showed substantial support from a wide variety of user groups and highlighted a range of stakeholder groups. This support should be leveraged to gain and extend resources.

7. WALK TOWARD SYNERGY

Many of the goals in this plan support one another. Grantors like to see the best bang for their buck. Showing that the impact of efforts will be compounded toward a positive end will make grant applications even more competitive.

Local Funding

At a county level, local funding is provided through the Tooele Tourism Grant. This is based on a county-wide 0.005% tax. The funding is provided on a project by project basis administered as a grant through Tooele County. Individual cities may have their own Recreation, Arts, and Parks (RAP) tax to support trails.

Grants and funding Sources Funding

The following chart outlines some of the commonly used trails grants as of 2023:

Grant/Source	Funding Amount	Minimum Match	Application Date	Type of Project	Oquirrh Trails Potential
Land and Water Conservation Fund (LWCF)-- Utah Div of Outdoor Rec	\$50K-\$2.5M	50%, remaining 50% is reimbursed	Spring (May)	Acquisition and development. Must relate to Utah State Comprehensive Outdoor Rec Plan	Acquisition of land to legalize and connect trails. Properly construct DIY trails
LeRay McAllister Critical Land Conservation Fund	Varies	50% (match higher to be competitive)	June	Conservation easement acquisition (willing buyers and sellers)	Purchase of conservation easements for trails and conservation
OHV Access and Education Grant	\$1.5K to \$350K	Varies	Spring (April)	Public education campaign	public education campaigns
OHV Recreation Grant (OHVR)	\$1.5K to \$350K	No minimum, but 25% is competitive	March & July	Trail work, access protection	Acquisition, trail construction & improvement, legal advocacy to protect public lands access for OHVs
ORPA	N/A This is staff assistance from state rec planner	N/A	Winter (February) Mini-consultation ongoing	Planning. Intended to build capacity, not replace consulting services	Trail counter deployment, pre-DOR grant coordination, field data collection, conceptual trail design assistance
Recreation Restoration Infrastructure (RRI)	\$5-\$150K	50%	Winter (March)	Restore high use and high priority trails, repair, realign, reconstruct, re-sign	Signage, proper construction of popular DIY trails
Recreational Trails Program (RTP)	Up to \$150K	50%, may be in-kind	Spring (April)	Trail construction & maintenance, property or easement acquisition, equipment purchase, new trails that increase regional connectivity	Acquisition, trailhead improvements, signage, shared trails (motorized & non-motorized) with connections
Safe Routes to School—UDOT	Varies		Fall (October)	Trails and sidewalk improvements within 1.5-2 miles of school	New trails connecting schools and trailheads

Utah OHV Trails Program	Small (\$175K total pool)	50%		Trail construction & rehabilitation, trailhead facilities & signage	
Utah Outdoor Recreation Grant (UORG)	Varies, Tier 1 \$15K-\$200K	Varies, 40%, up to 25% in-kind	Winter (March)	Must provide economic opportunity to attract or retain residents or tourism. Planning or land purchase not included.	Sustainable trails to replace DIY trails, trail realignment, trail and wayfinding signage, trailhead improvements

Grants change significantly per year. Federal agencies offers many other grants, including RAISE grants and STBG grants, among others. Private entities, including corporations and advocacy groups, provide additional grants for a variety of trail building and recreational endeavors.

Example of how grants could be used to achieve the vision of this plan:

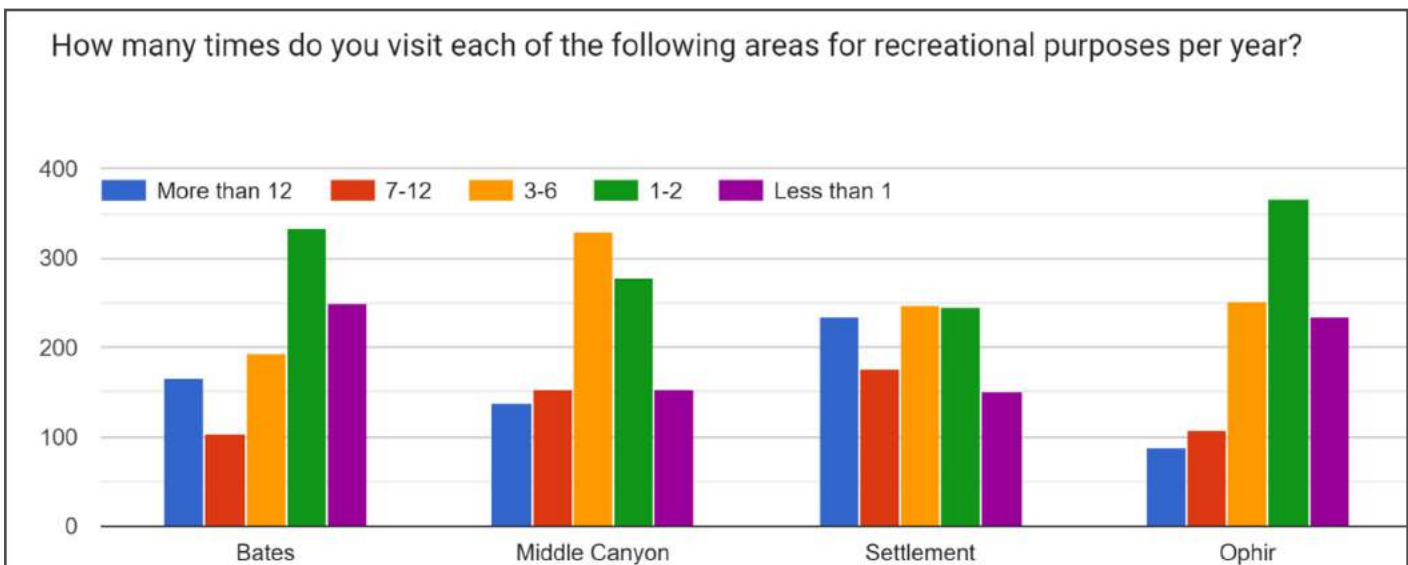
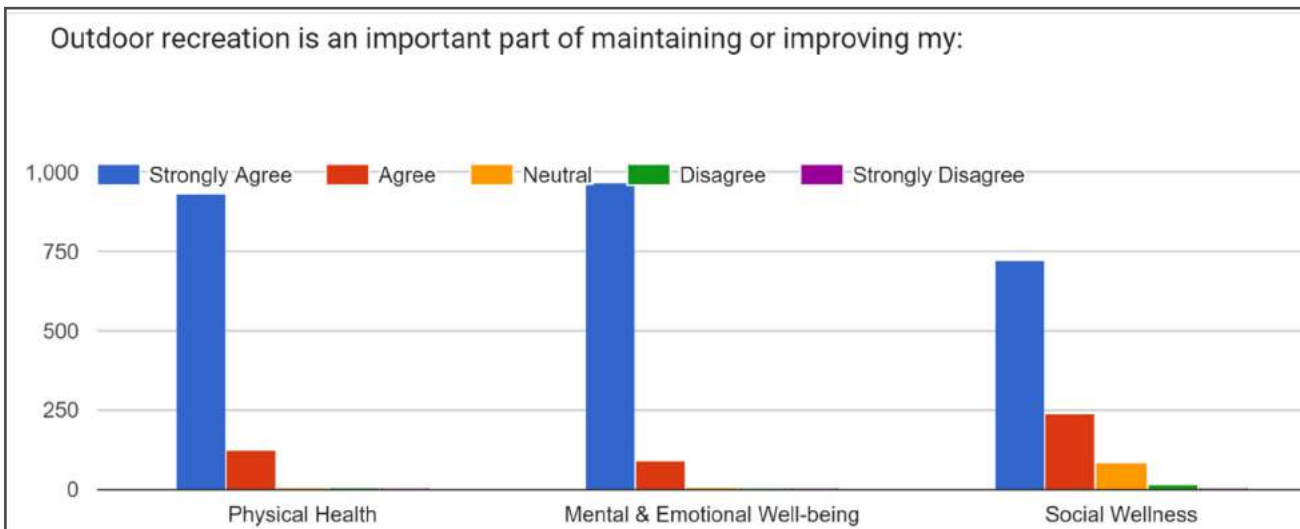
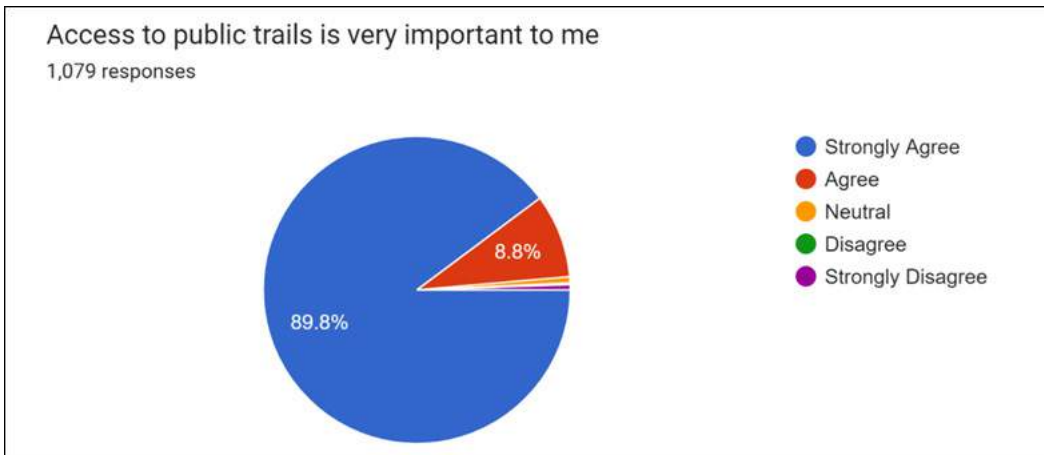
Action	Grant
Land Acquisition and Conservation Easement Acquisition	LWCF & LeRay McCallister grants
Land Acquisition and Trail Improvements for OHV Trails	OHVR
Trail Counting and field data collection	ORPA
Trail Construction and Signage	RTP, RRI, UORG, and TAP
Design and Construction multi-use trails to trailheads	TIF Active Transportation



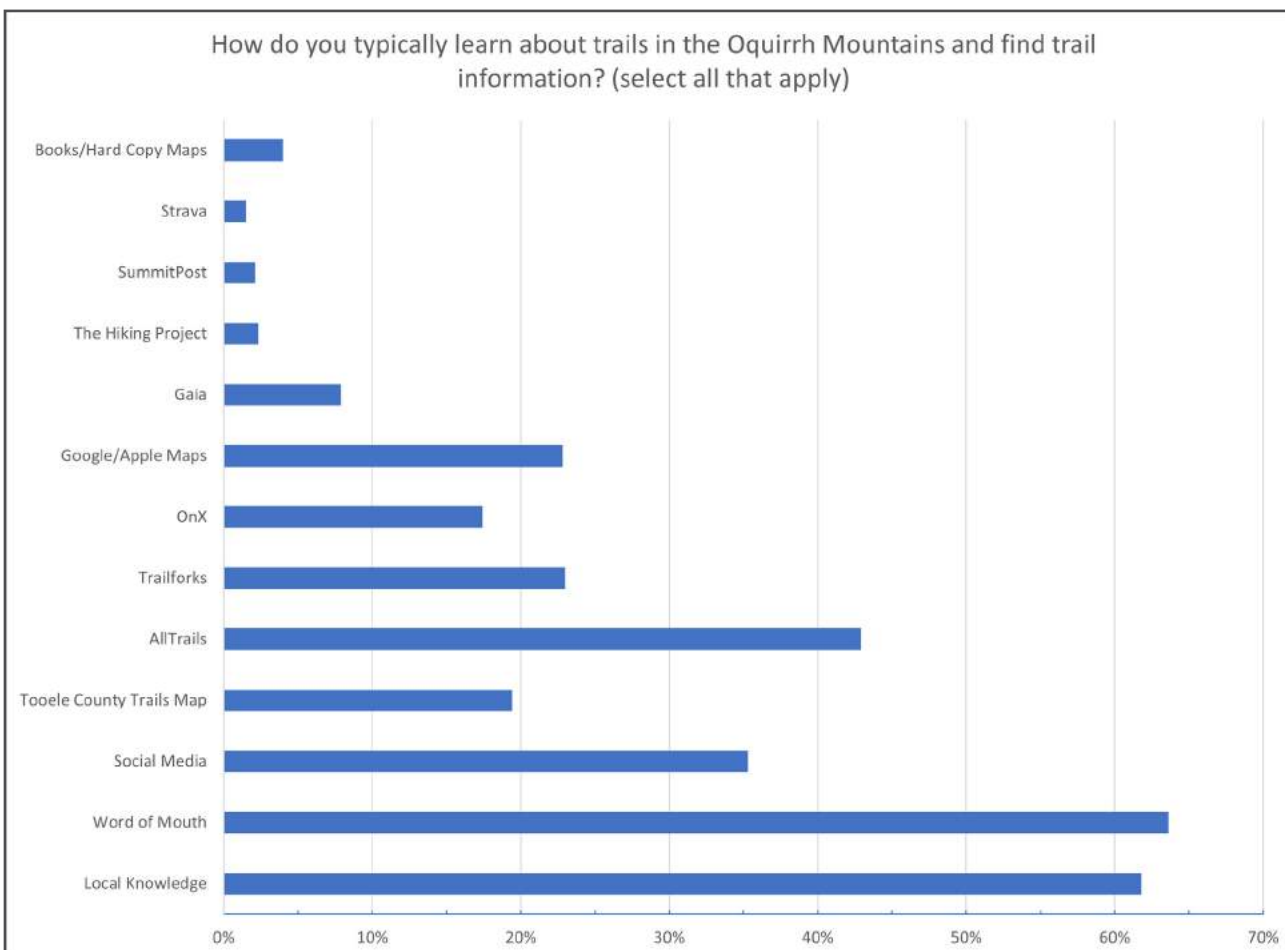
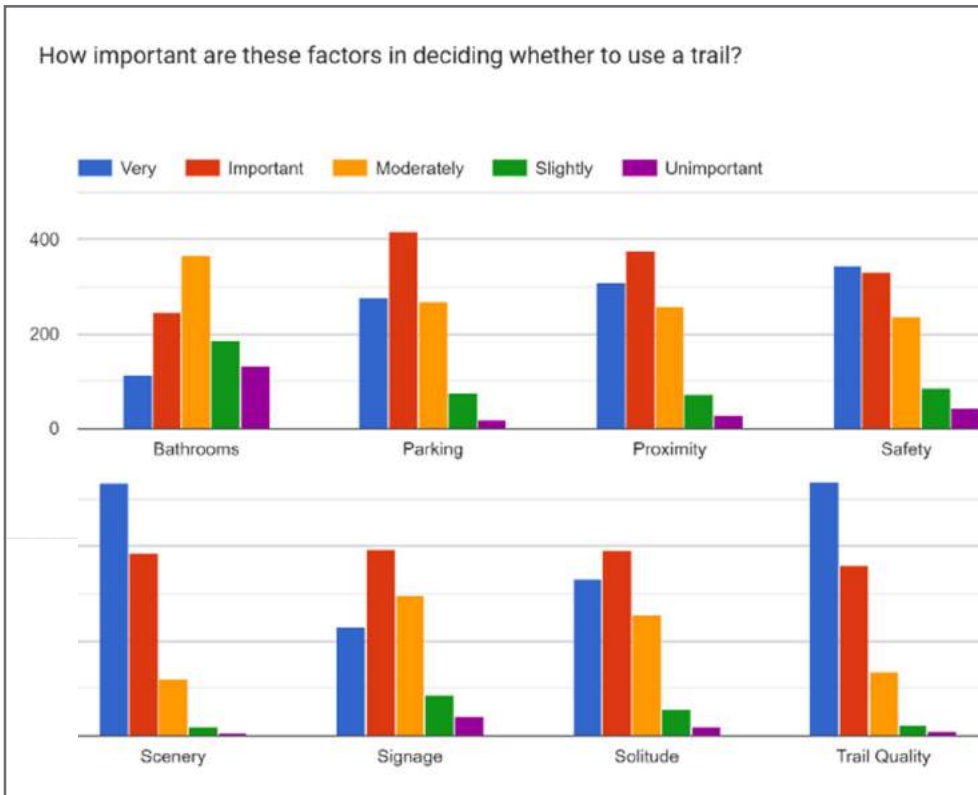
Appendix A | Survey Results

Appendix

Between the time of July and August 2023, a survey about the Oquirrh Mountains Trails was active online using Google Forms. Surveys were distributed via social media and fliers. The fliers, containing a QR code to access the survey, were distributed at trail heads and at the Tooele County Fair. There were 1,089 survey respondents. Here are the survey results.

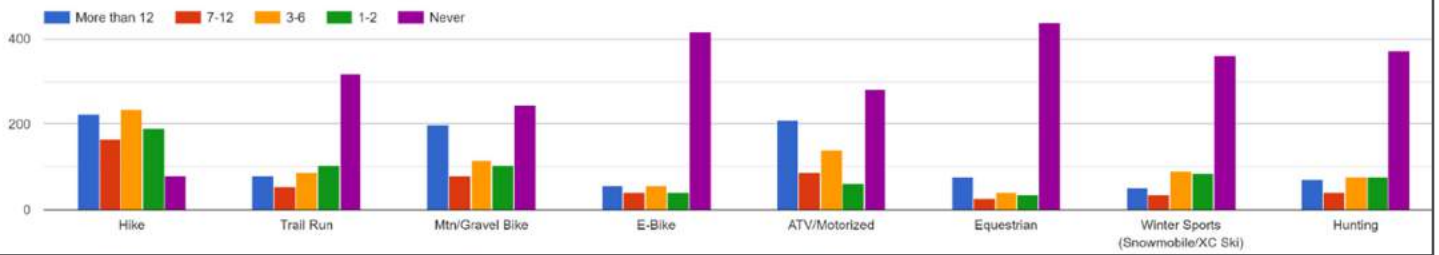


Appendix

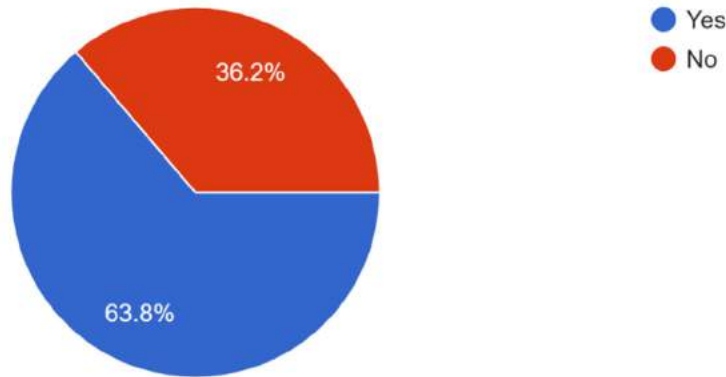


Appendix

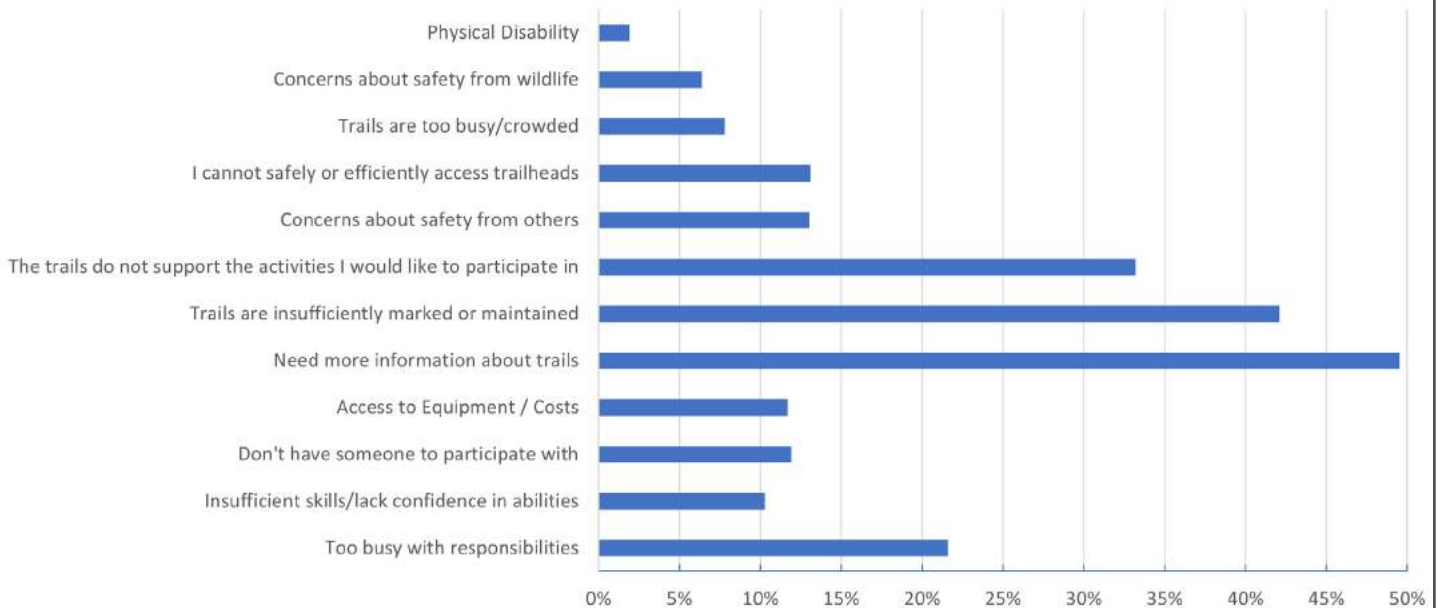
Which activities do you typically engage in when using trails in the Oquirrh Range? (Frequency per year)



Are there activities in which you would like to participate in the Oquirrh Mountains but do not?
1,068 responses

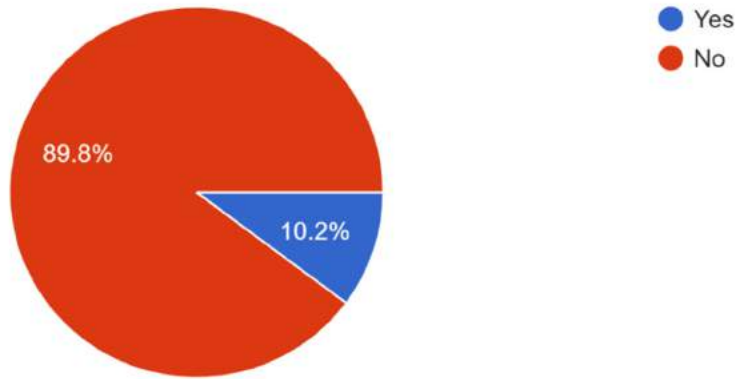


If yes, what are the primary reasons?



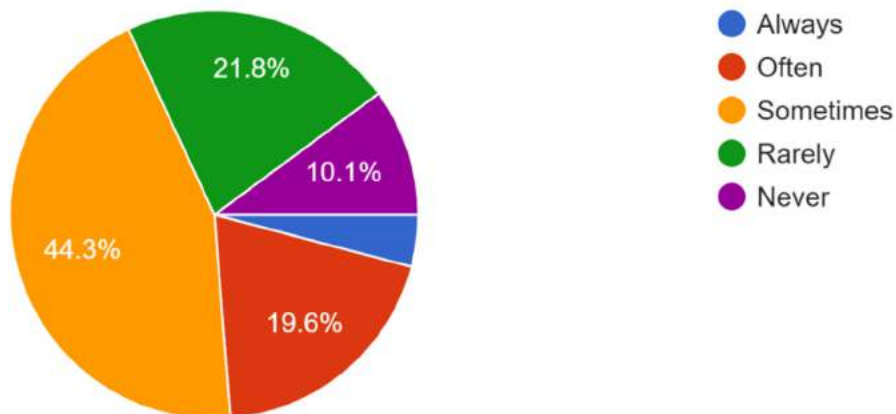
Are you aware of any areas along the trails that are prone to accidents or pose specific safety risks?

1,069 responses



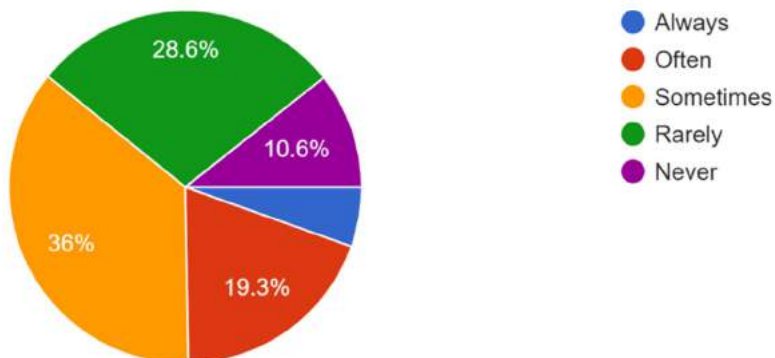
Difficulty wayfinding (hard to know where to go)

1,049 responses



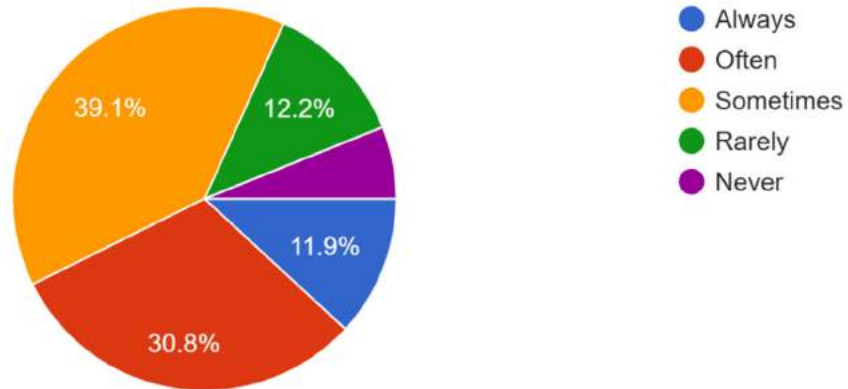
Incompatibility between user groups, such as hikers, mountain bikers, horseback riders, or ATV riders, that share the trail

1,043 responses



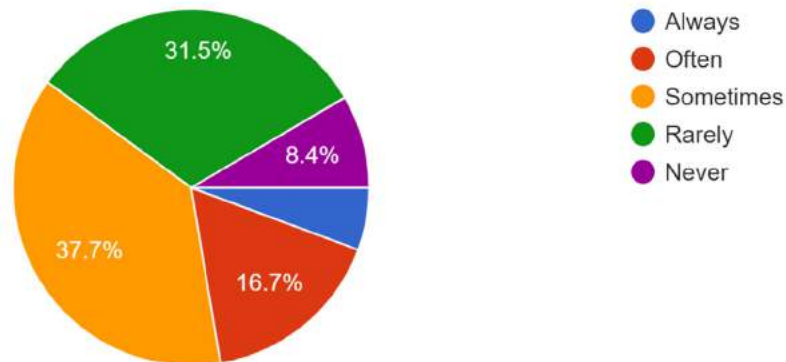
Uncertainty about legal trail access or trespassing

1,053 responses



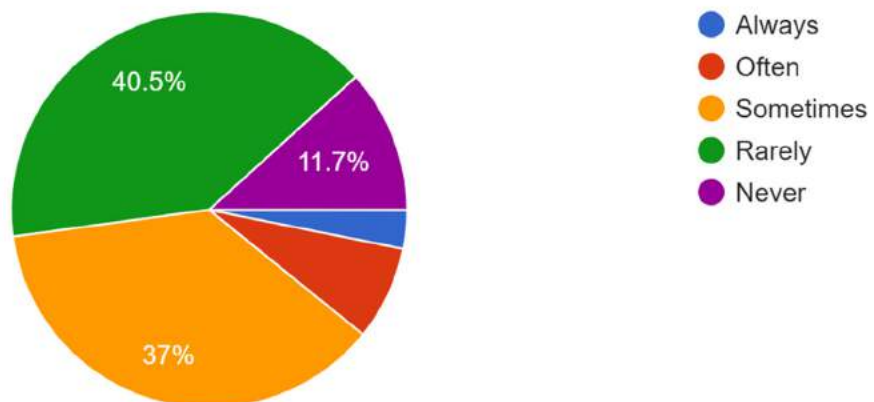
Other trail users who do not follow proper trail etiquette or safety guidelines?

1,042 responses



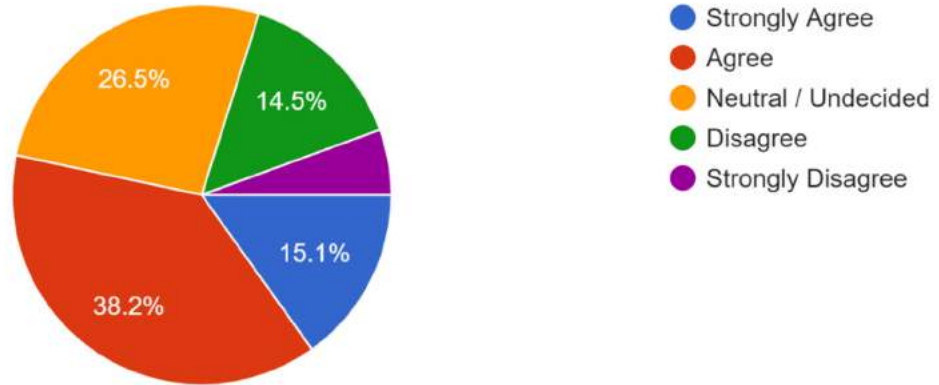
Overcrowding

1,043 responses



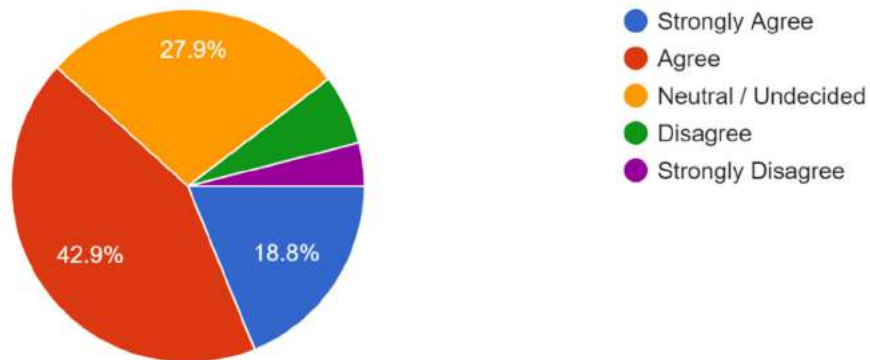
Lack of signage or trail promotion deters me from experiencing new trails

1,059 responses



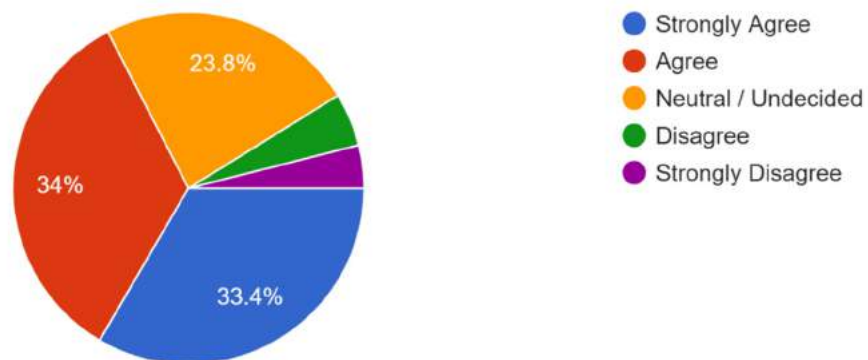
I would like improved vehicular access to trail heads

1,063 responses



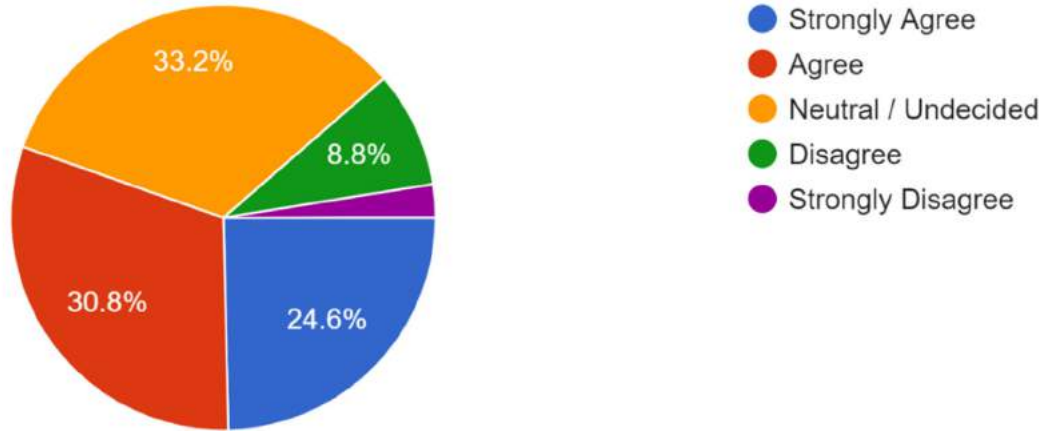
I would like improved multi-use trail (such as bike trail) access to mountain trail heads

1,065 responses

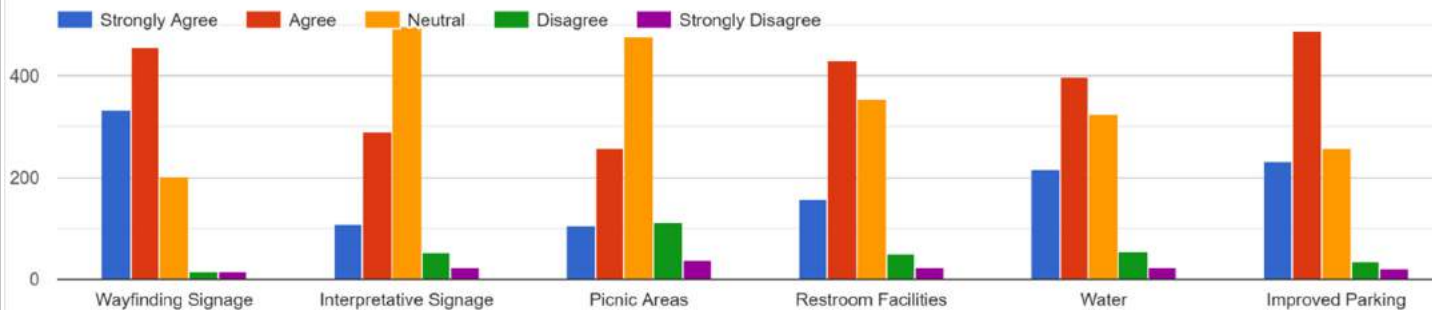


I would like year-round access to trails, such as groomed winter trails

1,065 responses

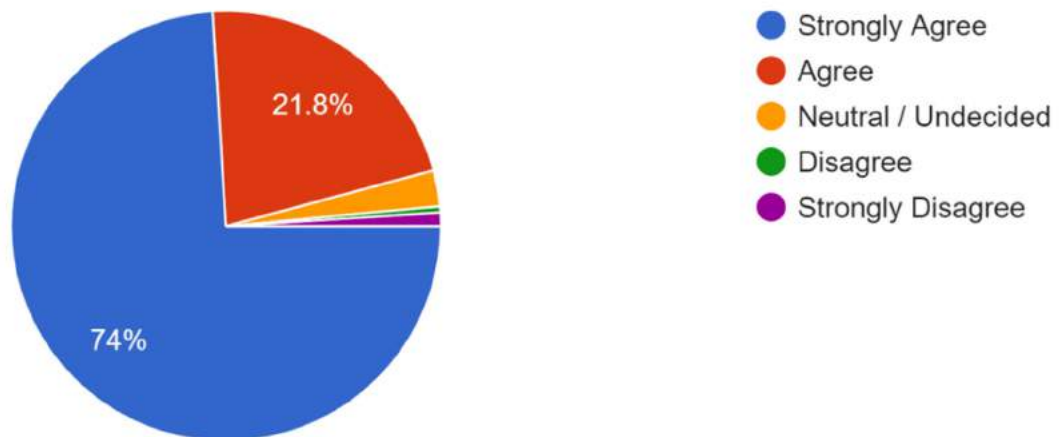


I would like more of the following amenities included in the trails system



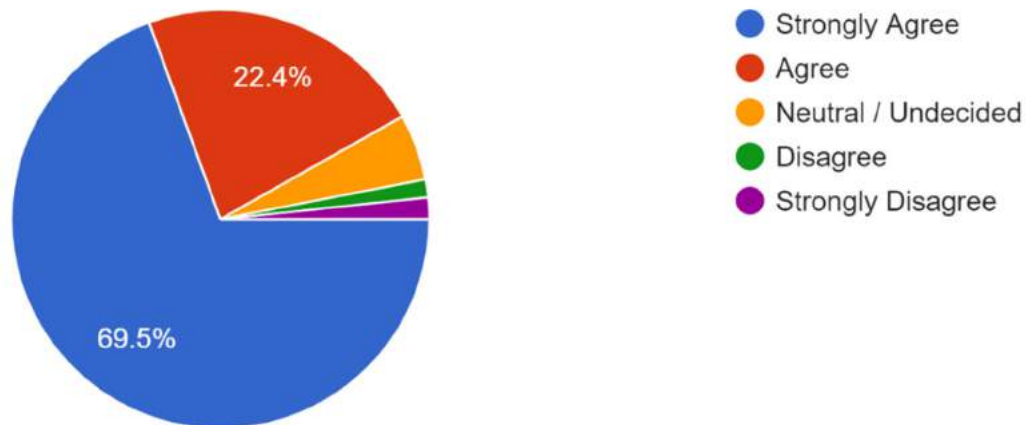
Creating and maintaining trails and trail facilities is a good use of public resources

1,078 responses



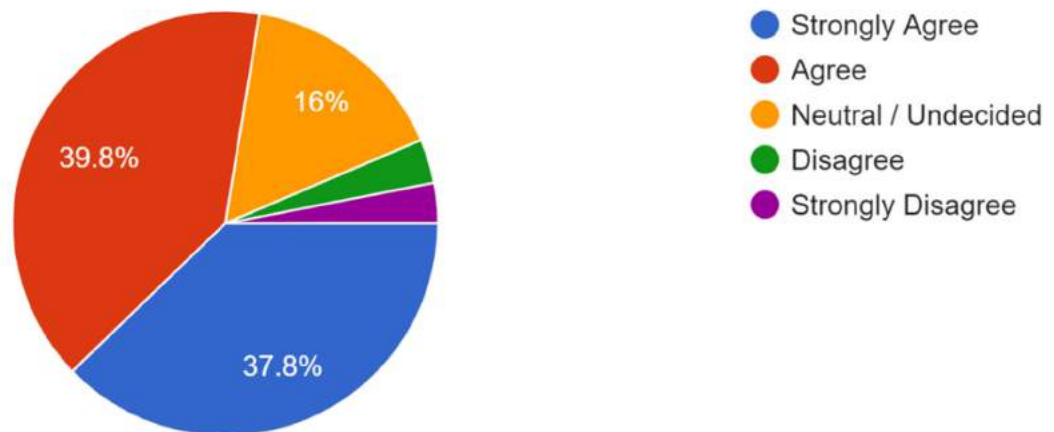
Promoting outdoor recreation is an important part of regional economic development

1,077 responses



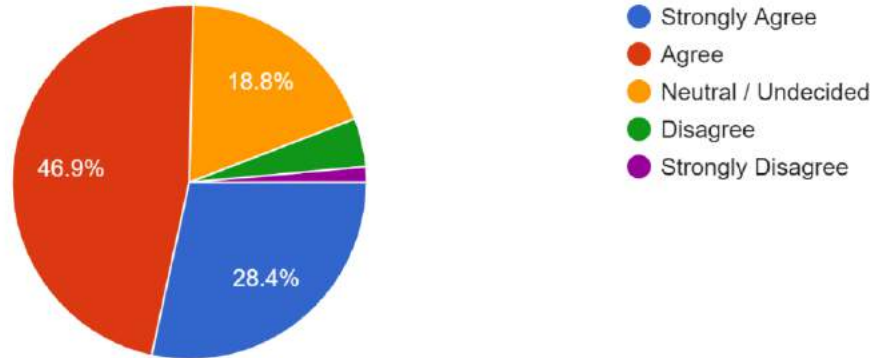
Protecting private property rights is important to me

1,075 responses



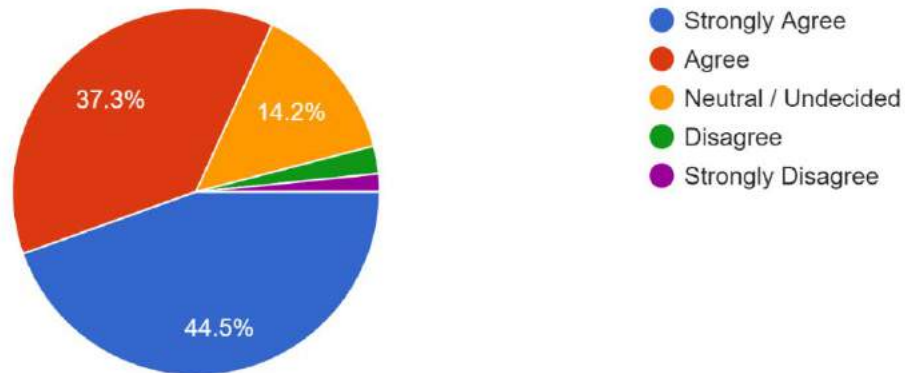
There are times I find it difficult to know when I'm on a trail that has been legally established and when I am not

1,063 responses



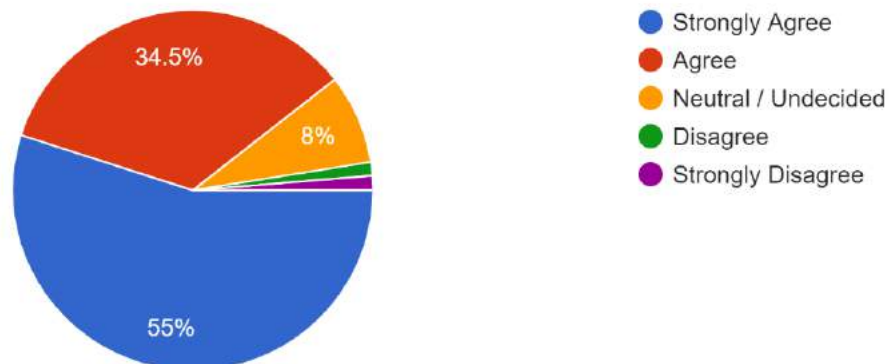
I would like to see many of the social trails become established legal trails

1,067 responses



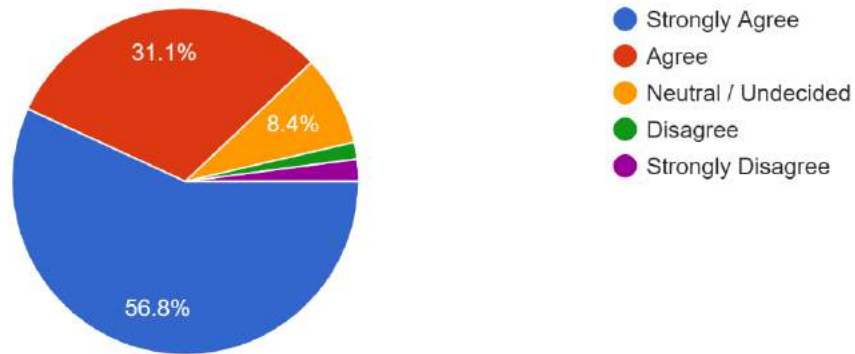
I would like to see conflicts between private property owners and the public at large resolved by obtaining permission for public trail use and trail improvements

1,070 responses



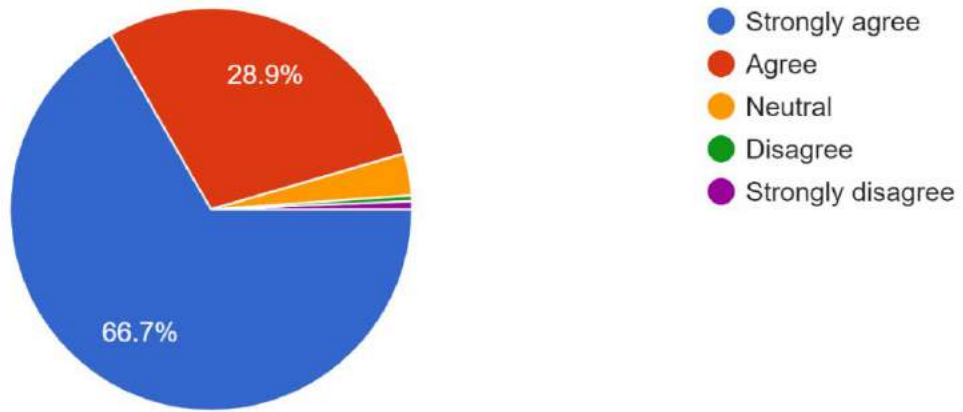
I support the County purchasing easements, purchasing property, and/or engaging in land swaps with private property owners to obtain legal permission for new and existing trails and trail facilities

1,073 responses



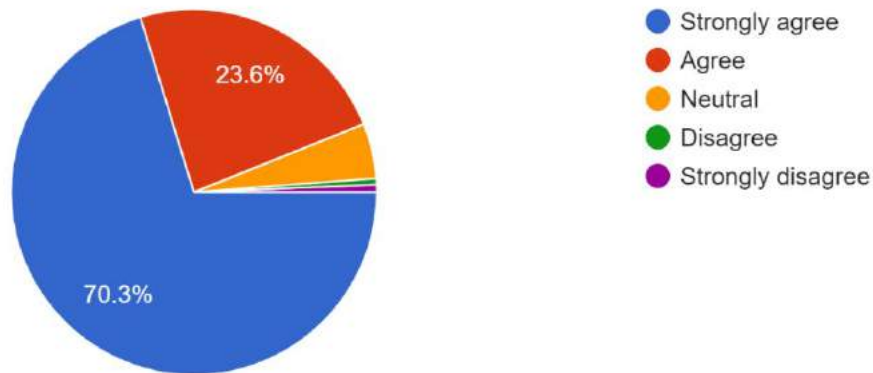
I support using County resources to enhance outdoor recreation

1,071 responses



I support the County pursuing matching grant opportunities to enhance outdoor recreation

1,070 responses



Overview of Open Ended Survey Questions

Question: Are you aware of any areas along the trails that are prone to accidents or pose specific safety risks?

Report of Results

1. TRAIL CONDITIONS AND MAINTENANCE

Feedback: Numerous concerns regarding trail conditions and maintenance:

- Deep ruts, erosion, and washed-out areas on various trails
- Overgrown trails with fallen trees and obstacles
- Lack of proper trail markings and signage
- Trails not adequately maintained, leading to hazardous conditions

Key Observations: Urgent need for regular trail maintenance and better marking systems.

2. USER BEHAVIOR AND SAFETY

Feedback: Various safety-related concerns due to user behavior and user group conflicts:

- Encounters with aggressive dogs and unleashed pets
- Speeding mountain bikers and ATVs
- Lack of courtesy and yielding on multi-use trails
- Encounters with racing bicyclists and mountain bike racing teams not yielding

Key Observations: Safety and trail etiquette education needed. Trails designed for specific user groups (with specific user group exclusions) needed.

3. SAFETY HAZARDS AND CONCERNS

Feedback: Concerns and suggestions related to specific trail areas:

- Ophir Canyon trails in poor condition with deep ruts
- Challenges in Bates Canyon due to ATV impact and lack of marked trails
- Safety issues on Dark Trail due to poor maintenance

Key Observations: Targeted improvements required for specific trail sections.

4. SAFETY HAZARDS AND CONCERNS

Feedback: Safety concerns arising from hazardous trail features:

- Steep drop-offs, cliffs, and narrow sections
- Presence of barbed wire fences and gates near trails
- Prone areas for landslides, erosion, and washouts

Key Observations: Mitigation of hazardous trail features and improved signage needed.

5. ACCESSIBILITY AND INFRASTRUCTURE

Feedback: Issues related to trail access and infrastructure:

- Difficulty accessing trailheads for certain vehicles (ATVs, e-bikes)
- Inadequate parking facilities
- New gates obstructing horse access and creating hazards

Key Observations: Enhancements required for trail access and facility management.

6. GENERAL CONCERNS AND MISCELLANEOUS

Feedback: Miscellaneous concerns expressed by respondents:

- Littering and dumping of garbage
- Drug paraphernalia and safety risks from drug users
- Lack of continuity in trail system connections

Key Observations: Addressing cleanliness, safety, and trail network design is vital.

Question: Are there any particular events or programs related to the trail system that you would like to see implemented?

Report of Results

Mountain bike trails, pump tracks, and events were one of the most popular responses, with 61 mentions.

1. EVENTS OR PROGRAMS SUGGESTED:

- **NICA (National Interscholastic Cycling Association) Races:** Many respondents expressed interest in hosting or participating in NICA mountain bike races. They see potential economic benefits and community involvement in such events.
- **Trail Races:** Multiple suggestions were made for organizing trail races, including 10k, 5k, and other distance races. These events could attract participants and showcase the area's trails.
- **Guided Tours and Hikes:** Some respondents mentioned the idea of guided nature tours, educational hikes, or disability-friendly hikes to promote outdoor exploration and learning.
- **Trail Maintenance and Cleanup Days:** Several respondents emphasized the importance of regular trail maintenance, suggesting volunteer-led cleanup events and trail improvement initiatives.
- **Bike Parks and Skills Courses:** There was interest in creating dedicated bike parks or skills courses for mountain biking, offering areas for practicing bike handling and fostering community interaction.
- **Educational Programs:** Suggestions included classes, workshops, and education on outdoor ethics, trail etiquette, and safe recreation practices.
- **Multi-Activity Events:** Ideas for multi-activity events included scavenger hunts, obstacle runs, mud runs, and other creative activities to engage the community and encourage trail use.
- **Race Venue and Facilities:** Respondents mentioned creating a designated race venue for various outdoor events, including races and competitions.

2. OTHER TOPICS, ISSUES, CHALLENGES, AND SUGGESTIONS:

- **Multi-Use Trails:** There was a recurring theme of finding ways for different user groups (e.g., mountain bikers, hikers, equestrians, motorized vehicles) to coexist on shared trails and addressing conflicts between them.
- **Trail Maintenance:** Many respondents emphasized the need for regular trail maintenance to keep trails safe, accessible, and enjoyable for all users. This included repairing damaged trails caused by various activities.
- **Private Land Access:** The challenge of accessing trails through private land and the need for public access agreements with landowners was mentioned. Some suggested involving volunteers in trail upkeep as a way to gain access.
- **E-Bikes:** E-bikes were a topic of interest, with some suggesting separate trails for e-bike users and others advocating for more inclusive access.
- **Environmental Conservation:** Some respondents highlighted the importance of responsible outdoor use, minimizing trail erosion, and preserving natural habitats.
- **Community Engagement:** Several suggestions focused on community involvement, such as offering incentives for picking up trash, involving local organizations, and hosting events to bring people together.
- **Infrastructure and Facilities:** The need for improved trailhead facilities, signage, restrooms, parking lots, and more was discussed.
- **Economic Benefits:** Many saw the potential economic benefits of hosting events, races, and outdoor activities, bringing visitors to the area who would spend money on accommodations, dining, and more.
- **Health and Wellness:** The desire to provide opportunities for physical activity, exercise, and outdoor recreation for the community's health and well-being was highlighted.
- **Access for Various Activities:** Suggestions were made to accommodate various recreational activities, including hiking, dirt biking, snowshoeing, horseback riding, and skiing.
- **Trail Connectivity:** Respondents wanted better connectivity between existing trails and the creation of trail networks.

that link different communities and destinations.

- **Educational Outreach:** There was a call for better communication, education, and outreach to inform the public about trail rules, regulations, and responsible use.
- **Impact of Growth:** As the area grows, the need for more outdoor recreational opportunities, trails, and facilities was mentioned to meet the demand.

Overall, respondents expressed a strong interest in hosting events, races, and programs that encourage outdoor activities, community engagement, and responsible trail use. While they highlighted challenges like user conflicts and trail maintenance, their suggestions were geared toward creating inclusive and enjoyable outdoor experiences for a diverse range of recreational interests.