05

DESIGN GUIDELINES

Existing signage along the Bonneville Shoreline Trail

DESIGN GUIDELINES

OVERVIEW

Trails are the primary way in which people experience the Foothills Natural Area. Natural surface trails that are carefully and sustainably sited within the Foothills will promote an enjoyable user experience and minimize future maintenance requirements. These design guidelines specify how trails and supporting facilities should be designed and constructed within the Foothills Natural Area. The following guidelines compile best practices from numerous natural surface trail design manuals including:

- US Forest Service Standard Trail Plans and Specifications
- IMBA Trail Solutions: IMBA's Guide to Building Sweet Singletrack
- Minnesota DNR Trail Planning, Design, and Development Guidelines

Each trail both creates and is affected by an entire web of relationships between its site, visitors, alignment, soils and materials, water, management, and far more."

-Troy Scott Parker, Natural Surface Trails by Design

DESIGN GUIDELINES

TYPES OF FOOTHILL TRAILS

TYPES OF FOOTHILL TRAILS

Natural surface trails can be designed to accommodate a broad or narrow range of users depending on the experience desired. Trails may also be required to serve other utilitarian access functions depending on the underlying property ownership or access agreement.

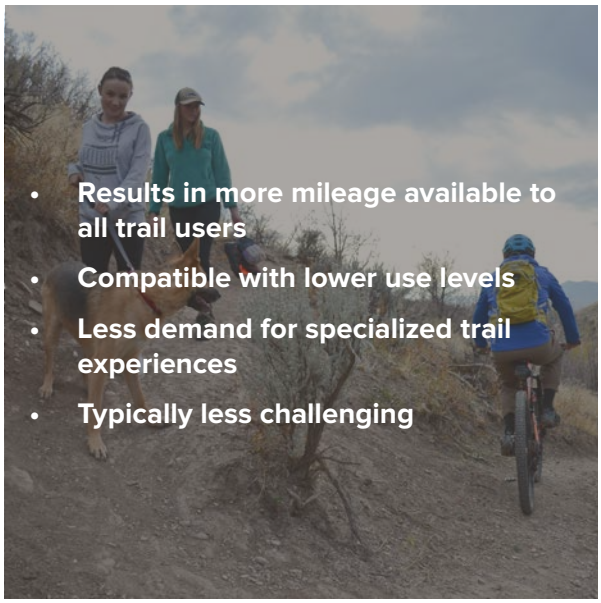
	SHARED USE TRAILS	BIKE OPTIMIZED TRAILS	HIKE OPTIMIZED TRAILS	SERVICE / ACCESS ROADS	ACCESSIBLE TRAILS
Description	Shared-use trails accommodate all types of non-motorized trail users (most commonly hikers, bicyclists, and equestrians)	Bicycle optimized trails are constructed to enhance the experience and efficiency of riding a bicycle	Hiking-optimized trails are constructed to facilitate access to hikers and trail runners.	Service access roads may facilitate trail user circulation however ultimately exist to facilitate access to infrastructure or other destinations	Accessible Trails comply with the ADAAG's regulations for "Accessible Trails"
Tread Width	36"-72"	36"-72"	18"-60"	Varies, typically 60"-120"	36" min.
Running Slope	Overall running slope of 10% or less (up to 15% for short segments)	Overall running slope of 6-8% or less to limit braking (up to 15% for short segments)	Can be routed with steeper running slopes up to 15% (depending on local soil conditions)	Usually predetermined by existing route	Running slope of 1:20 (any distance); 1:12 (max 200'); 1:10 (max 30'); 1:8 (max 10')
Cross Slope	5% max	5% max	8% max	Usually predetermined by existing route	5% max
Appropriate Characteristics	Small berms, rollers, slow-speed technical features, clear sightlines on faster segments of trail	Larger berms and/or high speed features, jumps, drops, elevated structures, and other technical features suited to bicyclists	Narrow tread, steps (where needed), tight switchbacks,	Varies by purpose but typically constructed to accommodate periodic motorized access	Cross slope below 5%, 2" max. height tread obstacles, passing space every 1000' where tread is less than 60"
Inappropriate characteristics	Large berms, jumps, drops, high-speed features	Mandatory advanced features without "ride-arounds"	Large berms, jumps, drops, high-speed features	Any trail features that would interfere with the utilitarian purpose of the service road and prevent access to the associated infrastructure	Any characteristics that compromise the accessible requirements noted above
Management Considerations	Typically managed as shared use	Direction of travel is commonly specified; may also be preferred-use or single use	May be designed as single-use, or preferred-use trails; if bicyclists are permitted, direction of travel may be specified	Typically managed as shared use	Typically managed as shared use

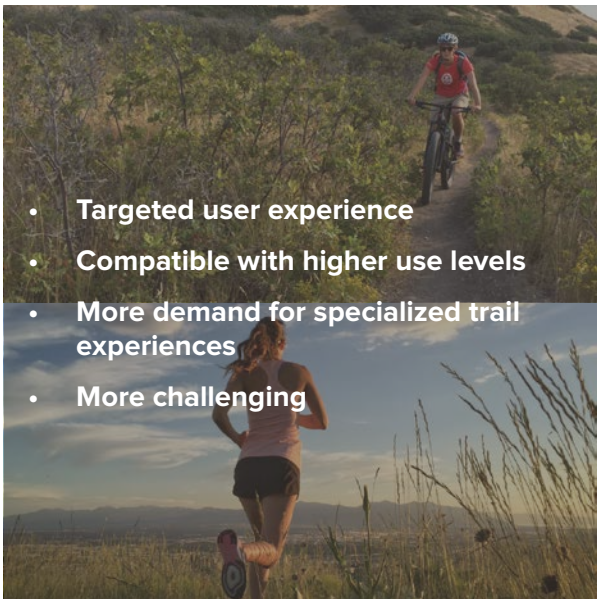
DESIGN GUIDELINES

TRAIL MANAGEMENT CONSIDERATIONS

SHARED-USE TRAILS VS. SINGLE-USE TRAILS

Natural surface trails can be managed and designed as shared use (allowing all types of non-motorized trail users), preferred use, or single use (allowing a single type of trail user).





Shared Use — Preferred Use — Single Use

SHARED USE DESIGNATION CONSIDERATIONS

- Shared use trails accommodate the broadest range of users and provide the most mileage available to all user groups.
- Promotes shared stewardship of the trails.
- Cost- and resource-efficient, taking advantage of available space and trail mileage. This results in fewer miles than would be necessary to accommodate trails for individual user groups.
- Support the most visitors. Trails that lead to specific major destinations, such as historic features and scenic vistas, should be considered for shared use, since most visitors will be drawn to the point of interest regardless of the mode they'll use to get there.

PREFERRED USE DESIGNATION CONSIDERATIONS

- Preferred-use trails allow two or more user types to access a trail but are designed to primarily accommodate the experience of only one of them.

SINGLE-USE DESIGNATION CONSIDERATIONS

- Single use trails can alleviate congestion and conflicts among user groups when used in conjunction with shared use trails.
- Single use trails can be more technical or rugged, or provide higher quality trail experiences catered to a single trail user group.
- Single use trails can accommodate narrower tread widths without compromising the safety or enjoyment of other trail users.
- Single use trails can also help to mitigate site-specific constraints such as poor sightlines, steep terrain (by allowing construction of stairs), or sensitive environmental areas.

DESIGN GUIDELINES

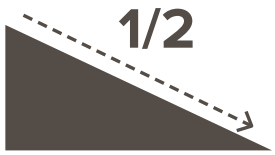
TRAIL ALIGNMENT

* Application of trail alignment principles may not be possible on existing trails but should always be applied on new trails.

TRAIL ALIGNMENT PRINCIPLES*

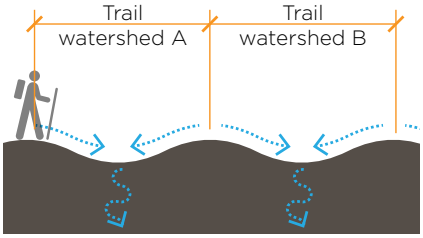
IDENTIFY CONTROL POINTS

Positive control points are places that people want to go. These points might include scenic overlooks, trail access points, interesting landforms, water, or historic sites. Negative control points are places that the trail system should avoid. These could include places like private property, sensitive environmental resources, or safety hazards. By routing trail users to places they instinctively want to go and avoiding potential liabilities, trail planners can mitigate the potential for unauthorized social trails while limiting trail user exposure to unsafe or undesirable places.



ADHERE TO THE HALF RULE

Trails whose running slope generally exceeds more than half the grade of the sideslope it's crossing are considered "fall line" trails. Drainage crossing a fall-line trail will follow the trail rather than crossing it creating a high probability for erosion.

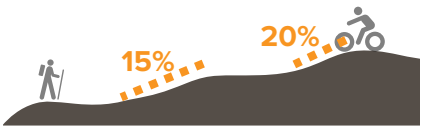


ROLLING CONTOUR TRAILS

Rolling contour trails gently undulate while traversing side slopes to divide trails into distinct trail watersheds. Trail watersheds limit the amount of drainage flowing across a trail by combining an out-sloped trail tread with frequent high and low points (grade reversals) along the trail profile.

10 % MAX. AVERAGE GRADE

An overall trail grade of less than or equal to 10% provides a general framework for a sustainable trail profile. An overall trail grade of 5-7% allows for some undulation and for short sections approaching 10%. Overall trail grades below 10% are also suitable for most soil types and minimizes erosion.



MAXIMUM SUSTAINABLE TRAIL GRADES

Maximum sustainable trail grades relate to short segments (10' or more) that may exceed the recommended overall average grade of 10%. Typically maximum sustainable trail grades vary between 15% and 20% depending on soil type, rock, annual rainfall, direction of travel or many other factors.

CREATE LOOPS

Routing trails as loops where feasible provides a more interesting trail experience. "Out and back", or dead-end trails sometimes promote the development of social trails when trail users are temped to create their own loops.

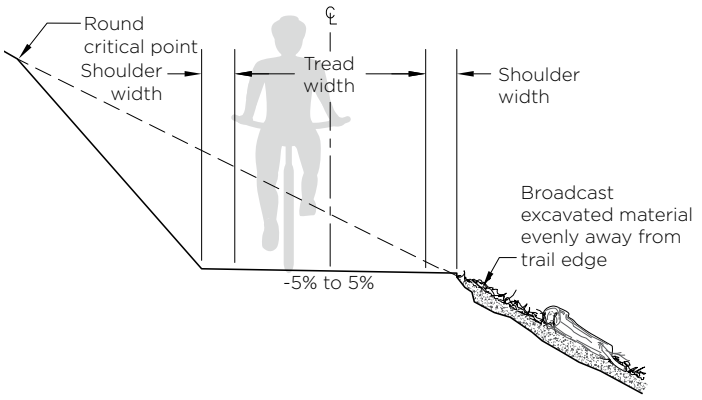
DESIGN GUIDELINES

TRAIL CONSTRUCTION

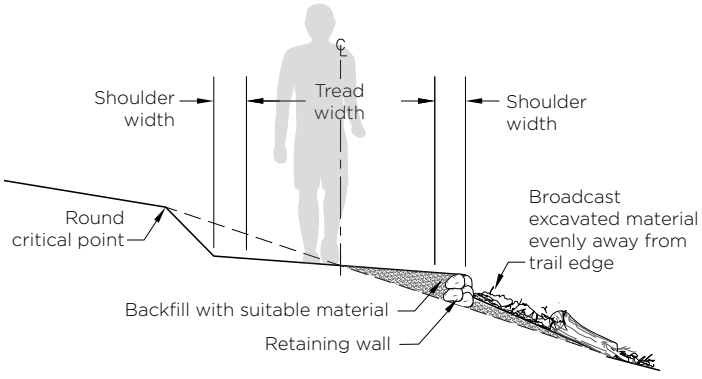
NATURAL SURFACE TRAIL CONSTRUCTION

Natural surface trails meet the recreational demands of hikers, mountain bikers, equestrians, and other non-motorized recreational trail users. Proper trail construction is important to reduce ongoing maintenance costs as well as to ensure that the trail is both usable and enjoyable for intended user groups.

FULL BENCH CONSTRUCTION TRAILS



PARTIAL BENCH CONSTRUCTION TRAILS



DESIGN STANDARDS

- **Tread:** Trail surface should be compacted native material soil.
- **Trail Benching:** Full bench trails provide the most durable trail construction however partial bench trails can provide an adequate trail surface where full bench trails are not possible or “singletrack” is desired without waiting for vegetation to re-naturalize adjacent to the trail. Partial bench trails are only allowed with retaining walls on the downhill side.
- **Trail Texture:** Trail texture should vary based on intended user skill level, with smoother trails for less-skilled users and rugged trails for more-skilled users
- **Tread Width:** Varies by anticipated use levels, skill levels, and types of users (24” - 8’-0”).
- **Horizontal Clearance:** A 1 ft. shoulder maintained with minimum vegetation should be provided free of obstacles.
- **Vertical Clearance:** 8 ft. min., 10’ where equestrian use in anticipated
- **Cross Slope** May vary from -5% to 5%, but always sloped counter to user forces.
- **Running Slope:** Varies by intended trail type, see guidelines on p. 72.
- **Drainage:** Provide regular grade reversals (approximately every 25’) and exits for trail drainage.
- **Erosion Control:** Spread approved native seed mix throughout disturbed soil areas along all new trails.
- **Additional Resources:** US Forest Service Standard Trail Plans and Specifications, IMBA Trail Solutions: IMBA’s Guide to Building Sweet Singletrack (2004)

DESIGN GUIDELINES

CONSTRUCTION METHODS

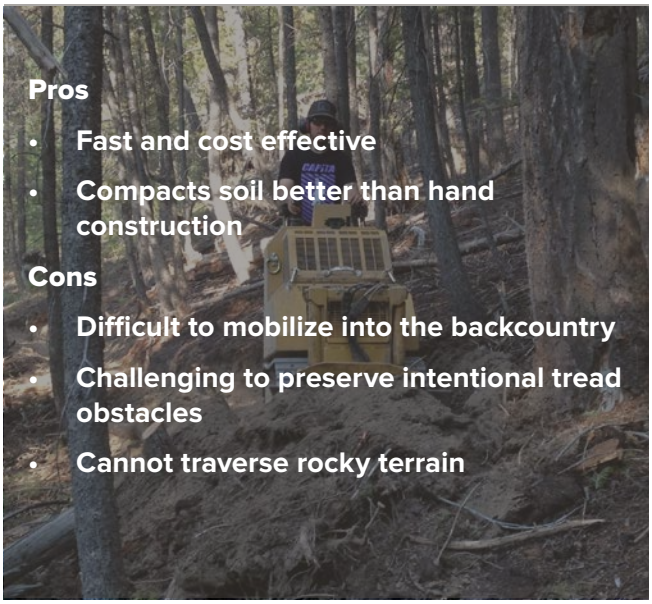
TRAIL CONSTRUCTION METHODS

The manner by which a trail is constructed (mechanized or by hand) influences the finished product. However, the two methods should not be conflated with a desired end result. Rather than rely on an implementation method, a proposed trail should be described using the following performance/design standards:

- Impacts (visual, soil and plant disturbance)
- Tread width
- Tread texture
- Tread shaping (in/out-slope, berms, lips/landings)
- Clearing limits
- Sinuosity/meander
- Drainage features (spacing and amplitude of grade reversals)
- Angle of repose of the back-slope
- Maximum height of tread obstacles

It is then up to the contractor to select the most cost-effective method to build the trail in conformance with the performance standards. For example, a narrow, rugged trail in the backcountry will likely be built by hand whereas a 48”-wide, smooth trail in the front-country will likely be built using mechanized equipment. Even with performance standards it is good practice to mandate maximum equipment size so that unqualified contractors don’t bid on a project expecting to use equipment that is better suited for road building than trail construction.

Other factors besides access and physical characteristics may influence the chosen trail construction method. Schedule and availability of volunteers may also impact trail construction methods.



(Photo Credit: Sagebrush Construction)

(Photo Credit: Bingham Cyclery)

DESIGN GUIDELINES

TRAIL TURNS

CLIMBING TURNS

Climbing turns help trail users to gain elevation at a consistent and sustainable grade. There is no constructed platform or landing, and users will be climbing directly in the fall line for a short segment. Therefore, climbing turns should be free-flowing and gentle, and are not suitable for sideslope grades steeper than 7 %.

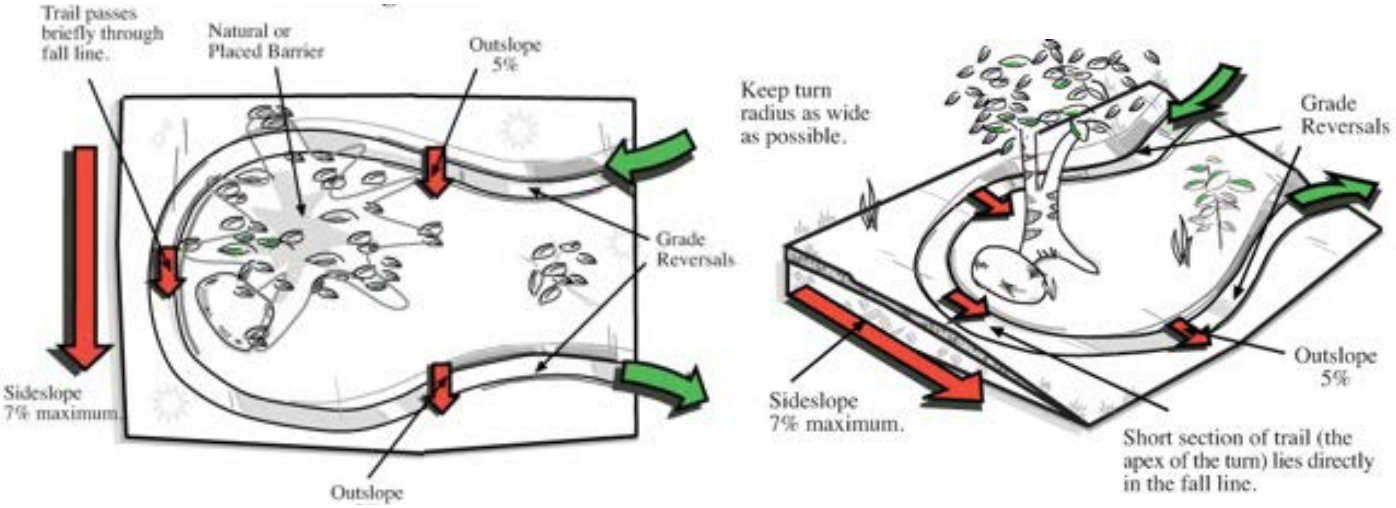


Image Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- Climbing turns can located on shallow slopes at or below 7%.

Typical Construction

- Climbing turn radii should be kept as wide as possible, ideally 20' or more.
- Upper and lower legs of the turn are joined by a short section of trail that lies in the fall line. Armoring can be used to reduce maintenance on the fall line section of trail.
- Grade reversals should be located above and below the turn.

DESIGN GUIDELINES

TRAIL TURNS

SWITCHBACKS

Switchbacks allow trails to reverse direction via a small, constructed platform. Switchbacks are more sustainable than climbing turns on steeper slopes.

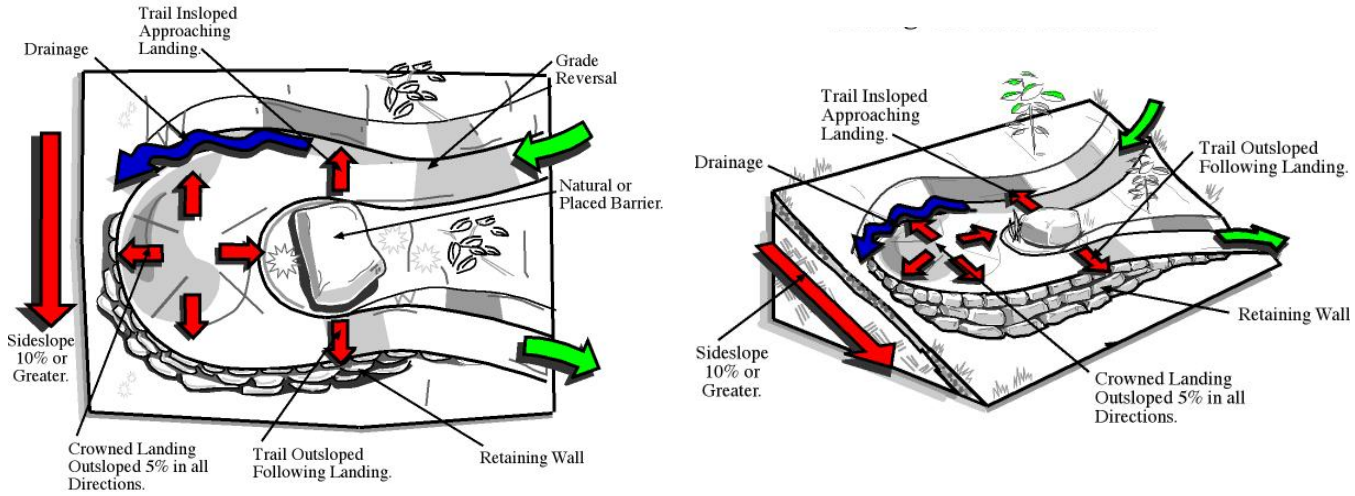


Image Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- Switchbacks should be located on the gentlest slope available. Gentle knobs or other natural platforms are good places to locate switchbacks.
- Stagger switchbacks to avoid short cutting.

Typical Construction

- Turn should be placed on a near level platform that is slightly crowned.
- The turning platform should have a minimum 6' radius.
- Approaches should follow the contour and include grade reversals in advance of the turning platform.
- Grade reversals should be located above and below the turn.
- Approaches should be designed to control trail user speeds into the turning platform to reduce braking and maintenance.
- Material excavated from the top leg can be used to build up the bottom leg.
- Excavated material forming the turning platform and lower leg should be held in place with a retaining wall.

DESIGN GUIDELINES

TRAIL TURNS

IN-SLOPED TURNS

In-sloped turns can limit skidding and trail widening for mountain bike trail users at turns in the alignment while providing a fun and sustainable feature.

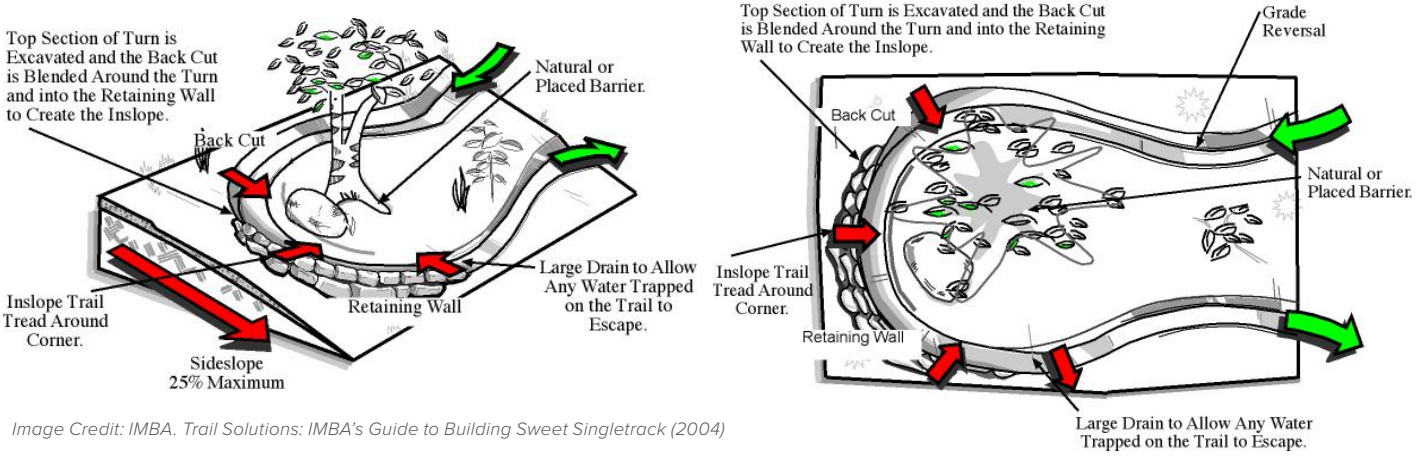


Image Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- In-sloped turns should be considered for any location where slowing is likely needed to allow a trail user to negotiate a turn.
- In-sloped turns work best on gentle sideslopes up to 25%.

Typical Construction

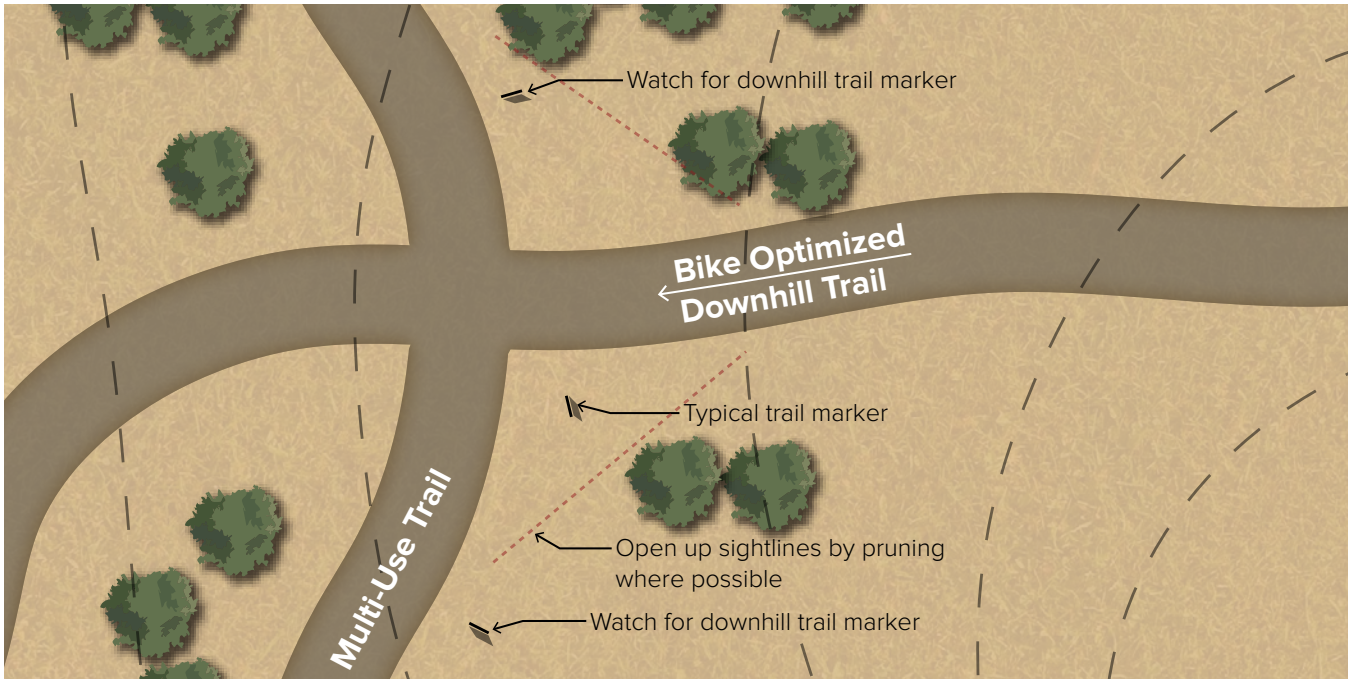
- Approaches should follow the contour and include grade reversals in advance of the turn.
- The approach above the turn should be kept at a relatively gentle grade (5-8%) to keep speeds in check prior to the turn.
- The approach below the turn should be brief but steep (around 15%).
- Keep the radius of the in-slope turn between 10 to 15 feet.
- Position the turn around a natural features such as a boulder or tree to prevent short-cutting of the turn.
- Keep sightlines clear since trail users will be capable of navigating these turns at higher speeds.

DESIGN GUIDELINES

TRAIL INTERSECTIONS

TRAIL INTERSECTIONS WITH BIKE-OPTIMIZED DOWNHILL TRAILS

Directional trail intersections require some subtle design strategies to promote safety for both downhill mountain bike directional trail users and trail users traveling along the intersecting trail



RECOMMENDED APPLICATION

Directional Trail Intersections

- Layout crossing trail to slightly climb to meet the directional trail intersection to promote slower speeds and orient trail users so they are looking up the directional trail for downhill traffic
- Consider placing a technical feature or choke point along the directional trail to slow downhill traffic prior to the trail intersection
- Locate intersection in an area with good sightlines; prune adjacent vegetation as needed
- Place warning signage along the multi-use trail in advance of the intersection warning trail users to watch for downhill traffic

DESIGN GUIDELINES

TRAIL DRAINAGE CROSSINGS

NATURAL SURFACE TRAIL DRAINAGE CROSSINGS

Backcountry trail crossings of drainages can span a variety of treatments depending on the size, flows, and frequency of water flowing through the drainage.

Direct Crossing

Hardened Crossing

Culvert

Bridge

Increasing drainage flows and frequency

Increasing construction complexity & cost

Increasing water quality protection

RECOMMENDATION APPLICATION

Direct Crossing

- Direct crossings can be utilized for drainages where flows are spread out and clearly intermittent and the facility is low-use.

Hardened Crossings

- Hardened crossings are most appropriate for drainages that experience seasonal, slow moving water that would otherwise erode a trail.
- Trail hardening can be accomplished through a variety of materials such road base or large flat stones tightly fitted together.

Culverts

- Culverts are most appropriate for drainages with periodic flows in narrow, defined channels where ramping up to the crossing is not necessary.
- Culverts shall be armored around the inlet.

Bridges / Boardwalks

- Bridges or boardwalks are the preferred crossing strategy for all drainages with flowing or continuously present water.
- Deck width shall match the trail width.

DESIGN GUIDELINES

TRAIL DRAINAGE IMPROVEMENTS

KNICKS

Knicks are effectively out-sloped drains. Knicks can be utilized to re-direct water off of poorly draining sections of trails on gentle slopes.

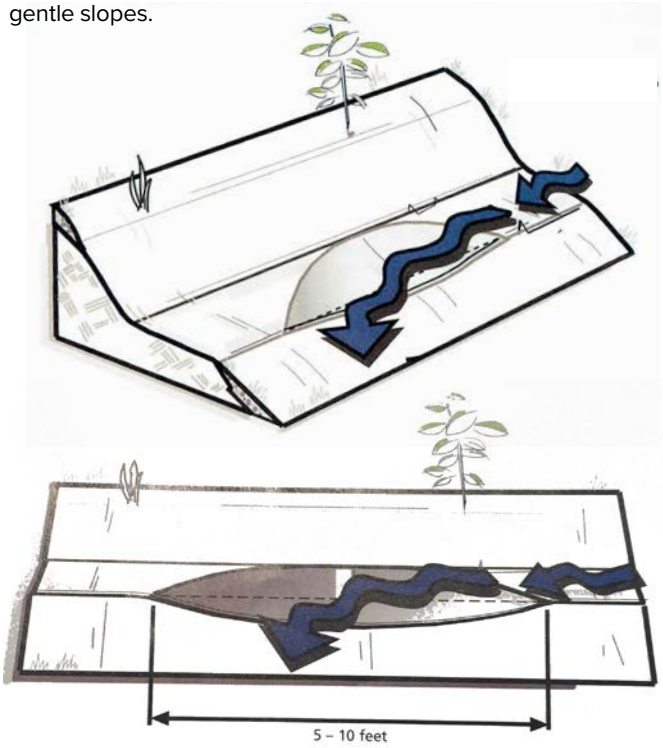


Image / Photo Credit: Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- Knicks are normally located on gradual segments of existing trail where puddling occurs.
- Knicks should be located adjacent to ground lower than the trail so that the knick will have a place to drain.

Typical Construction

- Knicks should be constructed as semi-circular depressions, about 10-feet in diameter, that direct water to the outside of the trail.
- Knicks should be constructed with a 15 % max. out-slope.

DESIGN GUIDELINES

TRAIL DRAINAGE IMPROVEMENTS

ROLLING GRADE DIPS

Rolling grade dips are useful in draining water from a trail whose slope is too steep to be drained by a knick alone. Rolling grade dips are preferred over waterbars which require frequent maintenance and compromise the trail user experience. Rolling grade dips may have limited application within the Foothills as they require cohesive soils that are not common throughout most of the project area.

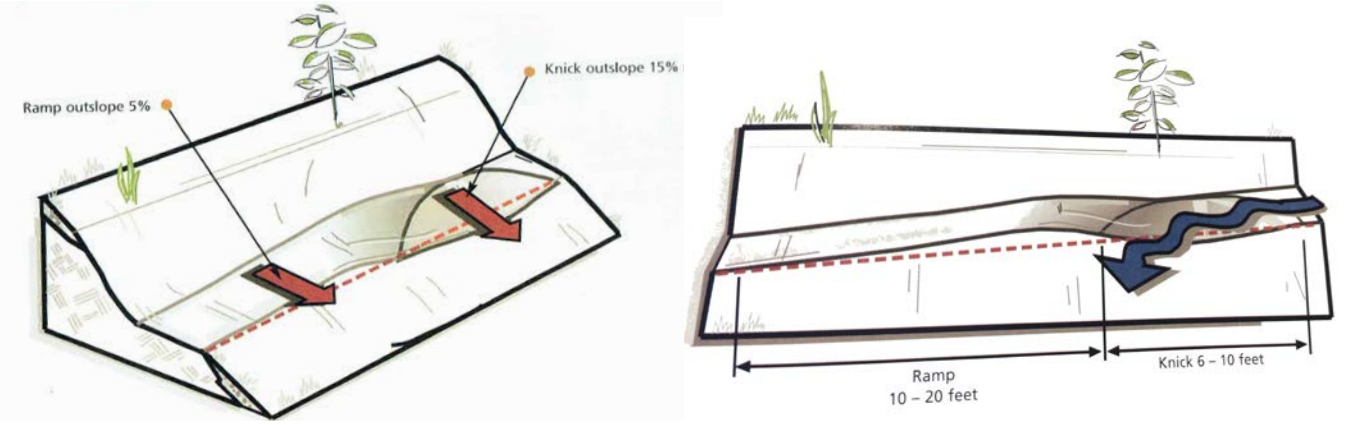


Photo Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

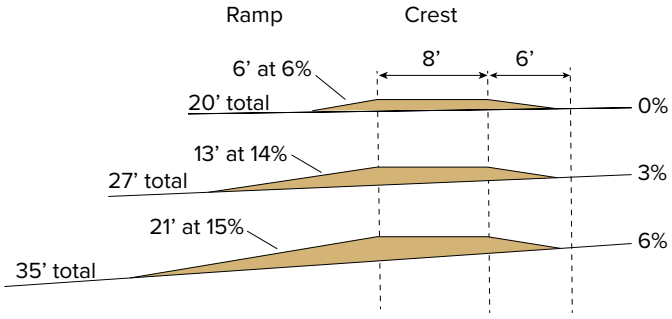
DESIGN STANDARDS

Typical Placement

- Rolling grade dips are typically located at sections of trail where water flows down the trail rather than across it.
- Rolling grade dips can be employed on steeper slopes than knicks.
- Rolling grade dips should only be installed on cohesive soils. Sandy or gravelly soils are not conducive to construction of rolling grade dips.
- Rolling grade dips are best located at a natural roll or change in trail grade that can be enhanced.
- Rolling grade dips are generally most useful when placed near the mid-point of a segment of descending trail.

Typical Construction

- A rolling grade dip features a knick followed by a crest and a long, gentle ramp hindering water from flowing down the trail
- Ramps and crests should be thoroughly compacted and consolidated to resist the velocity of water running down the trail.
- Typically, soil excavated from the knick can be used to construct the crest.



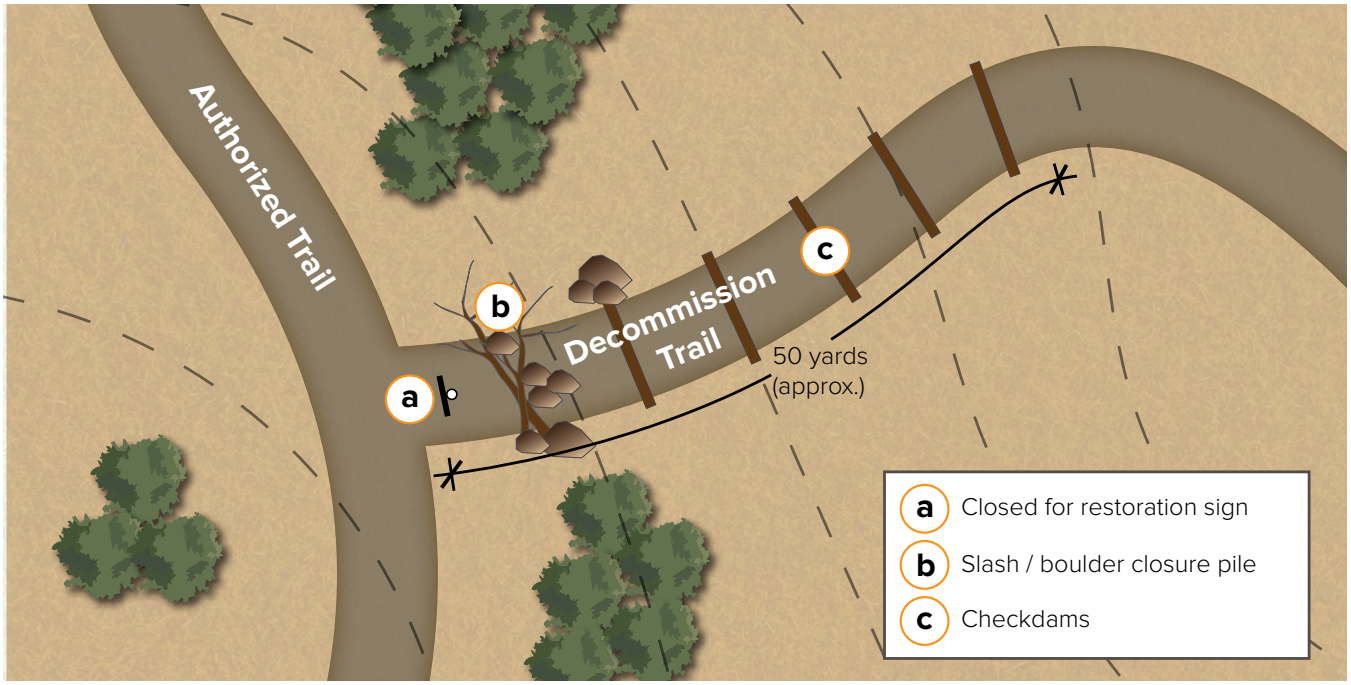
Diagrams adapted from MNDOT Trail Planning, Design and Development Guidelines (2006)

DESIGN GUIDELINES

TRAIL DECOMMISSIONING

ACTIVE TRAIL DECOMMISSIONING

Active trail decommissioning is recommended for trails that are actively eroding, highly susceptible to erosion, or are near sensitive environmental resources such as high quality habitat or watershed lands. Treatments for these locations attempt to deter trail user access and stop existing erosion. With management and time, these trails should be restored to a more natural state.



RECOMMENDED APPLICATION

Trail Entrance

- Place “Closed for Restoration” sign at entrance to trail to be decommissioned.
- Place slash and/or boulders completely across trail and behind signage to reinforce the trail closure.

Erosion Control

- Stabilize all existing erosion issues within the first 50 yards of the trail access. Assess the full length of the trail for other key drainage locations that may require erosion control measures.
- Place timber or boulder check dams at areas that are currently eroding.
- Fill trail ruts with soil and/or slash. Straw wattles or similar sediment catchment may also be used.
- Obliterate any major trail cuts and blend the trail bench back into the surrounding landform.

Revegetation

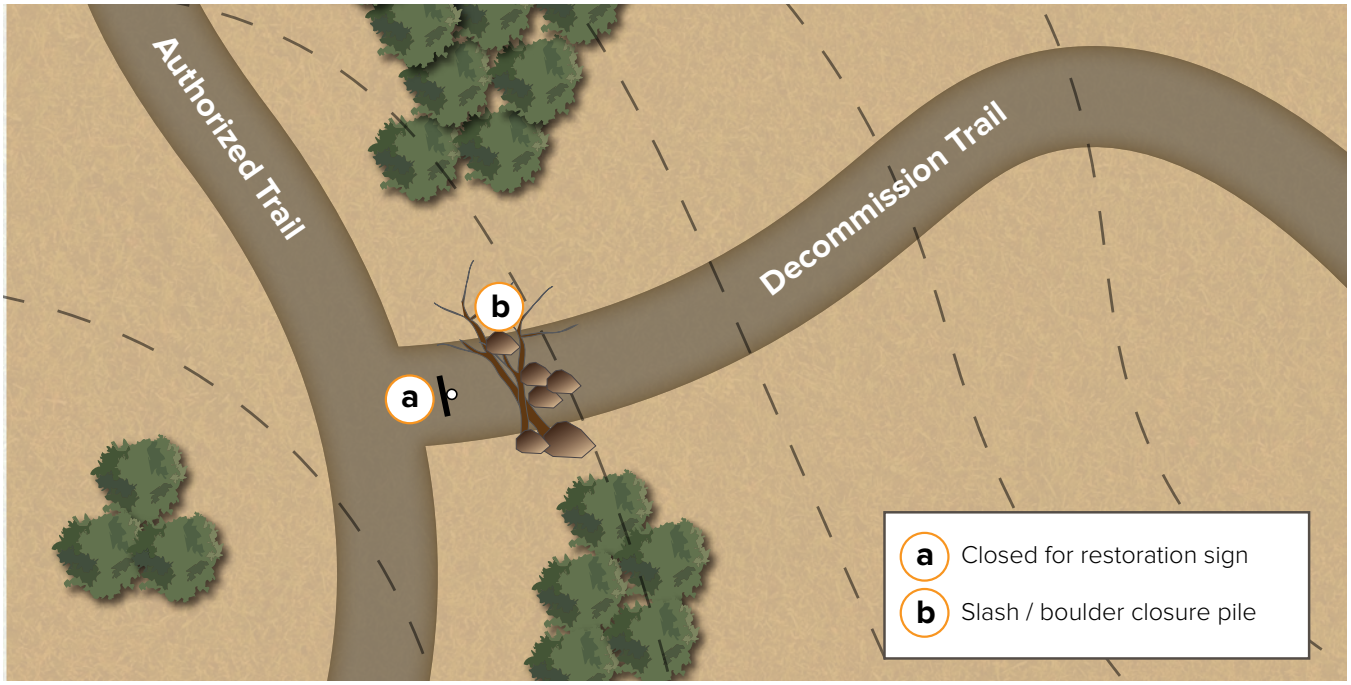
- Scarify soil 2”-6” and revegetate by broadcast or hydroseeding with an approved Foothills native seed mix. Seed only in the spring or fall.
- Erosion control blanketing may be utilized in difficult or critical areas.

DESIGN GUIDELINES

TRAIL DECOMMISSIONING

PASSIVE TRAIL DECOMMISSIONING

Passive trail decommissioning is recommended for trails that are generally stable and pose limited danger to sensitive natural resources. Treatments for these locations focus on deterring trail use and allowing the trail to re-naturalize over time.



RECOMMENDED APPLICATION

Trail Entrance

- Place “Closed for Restoration” sign at entrance to trail to be decommissioned.
- Place slash and/or boulders completely across trail and behind signage to communicate the trail closure. Use on-site slash piles for material or gain approval from land owner to fell adjacent trees.

Erosion Control

- Review the complete extent of the trail for major erosion issues. Mitigate erosion as needed.

DESIGN GUIDELINES

TRAIL DECOMMISSIONING

TRAIL ABANDONMENT

Some trails within the Foothills that are not actively contributing to management or environmental problems but are not viable candidates to become part of the official trail system may simply be abandoned in place. These trails may receive occasional use by specific user groups such as trail runners or downhill mountain bikers, but lack widespread appeal to a majority of trail users. These trails would not be actively closed through either intensive decommissioning or passive decommissioning. They would receive little to no maintenance and would not be addressed through the Foothills Natural Area signage and wayfinding program. SLC Parks and Public Lands may monitor these trails for increases in erosion or management issues that could necessitate active or passive decommissioning.

REVEGETATION

Existing trails identified for intensive decommissioning, proposed trail re-routes, and other disturbed areas should be revegetated with native plants and grasses. Areas to be seeded should be scarified with a fire rake or similar tool to a depth of 1/4 - 1/2” and wattles or connectivity modifiers installed to catch and hold seeds. Cultivation should take place no sooner than 2 weeks prior to seeding. Preferred time of seeding is late October - February. Areas that are inaccessible or have existing native vegetation that has been disturbed should not be cultivated.

All areas to be seeded should be prepared with a cleated roller, crawler tractor, or similar equipment that forms longitudinal depressions at least 2 inches deep. This method should be used for stabilization and preparation of the surface to be seeded. The entire area should be uniformly covered with longitudinal depressions formed perpendicular to the natural flow of water on the slope. The soil should be conditioned when possible with sufficient water so the longitudinal depressions remain in the soil surface until completion of the seeding. Areas prepared for seeding should be in a weed free and bare condition. All bags of seed should be brought to the site in sealed bags and should have seed labels attached showing the seed meets the requirements. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.

Seed shall be dispersed with a hand-crank or wheeled seed-spreader. Straw wattles or erosion control blankets should be used on slopes steeper than 3:1.

Foothills Revegetation Seed Mix		Percent Cover Desired
Pascopyrum smithii	**Western wheatgrass**	**30**
Pseudoroegneria spicata	**Bluebunch wheatgrass**	**25**
Poa secunda	**Sandberg Bluegrass (native genotype)**	**20**
Hedysarum boreale	**Northern sweetvetch**	**5**
Balsamorhiza saggitata	**Arrowleaf balsamroot**	**5**
Achillea millefolium var. occidentalis	**Western yarrow**	**5**
Artemisia tridentata	**Big sage**	**5**
Ericameria nauseosus	**Rabbit brush**	**5**

DESIGN GUIDELINES

SOIL AND GEOLOGY CONSIDERATIONS

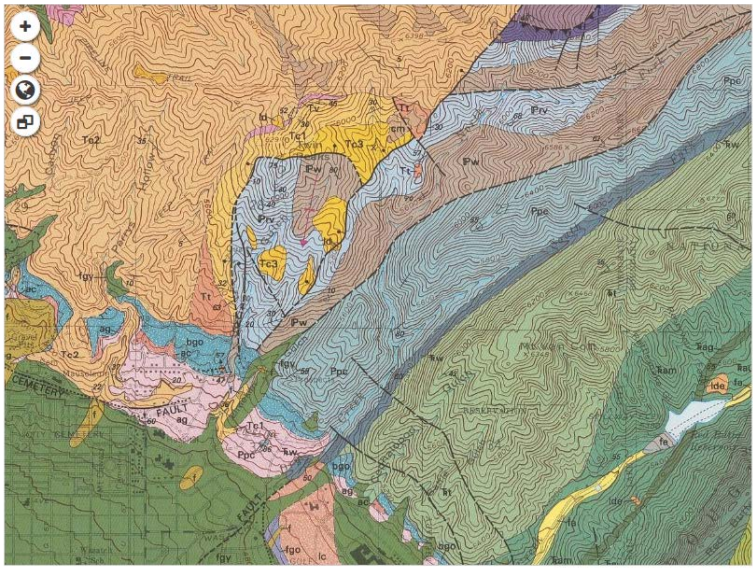
Local soil types and surficial geology can necessitate lower running slopes, higher cross slopes, and other alterations to the standards shown on page 72. Soil compaction and susceptibility to compaction, displacement, wetting and erosion should always be carefully evaluated prior to final alignment and construction of any trail segment. In some cases, the presence of shale layers or other challenging rock types may necessitate substantial adjustments to the trail alignments shown in Chapter Four.

Particular layers of concern in the Foothills Natural Area include the Woodside Shale, Donut Shale, and Mead Peak member of the Phosphoria formation in the south fork of Dry Creek and the south face of Little Black Mountain. The clay minerals in these shale layers absorb water into their mineral structure when wet, and become extremely clumpy, sticky, and prone to massive trail damage. Trail construction should avoid these layers where possible, or trails should be closed seasonally to avoid major damage when trails are wet.

Tertiary conglomerates are widespread in the Central and (especially) Northern Sub-Areas and can make for challenging trail construction and maintenance. Grade control is EXTREMELY important for trail sustainability in these rock units, and maximum grades should be kept slightly lower than those shown in the table on page 72.

A tertiary tuffaceous layer inconsistently appears in locations around lower City Creek, including around Ensign Peak and in Hell Canyon. This layer can become very gloppy when wet, and prone to sloughing. It is also hard to identify, so geologic maps should be carefully consulted during trail layout. Trail construction in this layer should have lower running slopes and very good drainage.

One final geologic consideration includes the fossil resources located on the lower slopes of Mt. Van Cott above the University Medical Center. Trail alignment should avoid these fossil resources to prevent vandalism, and trails should be carefully routed to prevent inadvertent destruction of any fossil-containing rocks.



This image is an excerpt of the USGS Fort Douglas Geologic Quadrangle, available at:

https://ngmdb.usgs.gov/Prodesc/proddesc_9901.htm

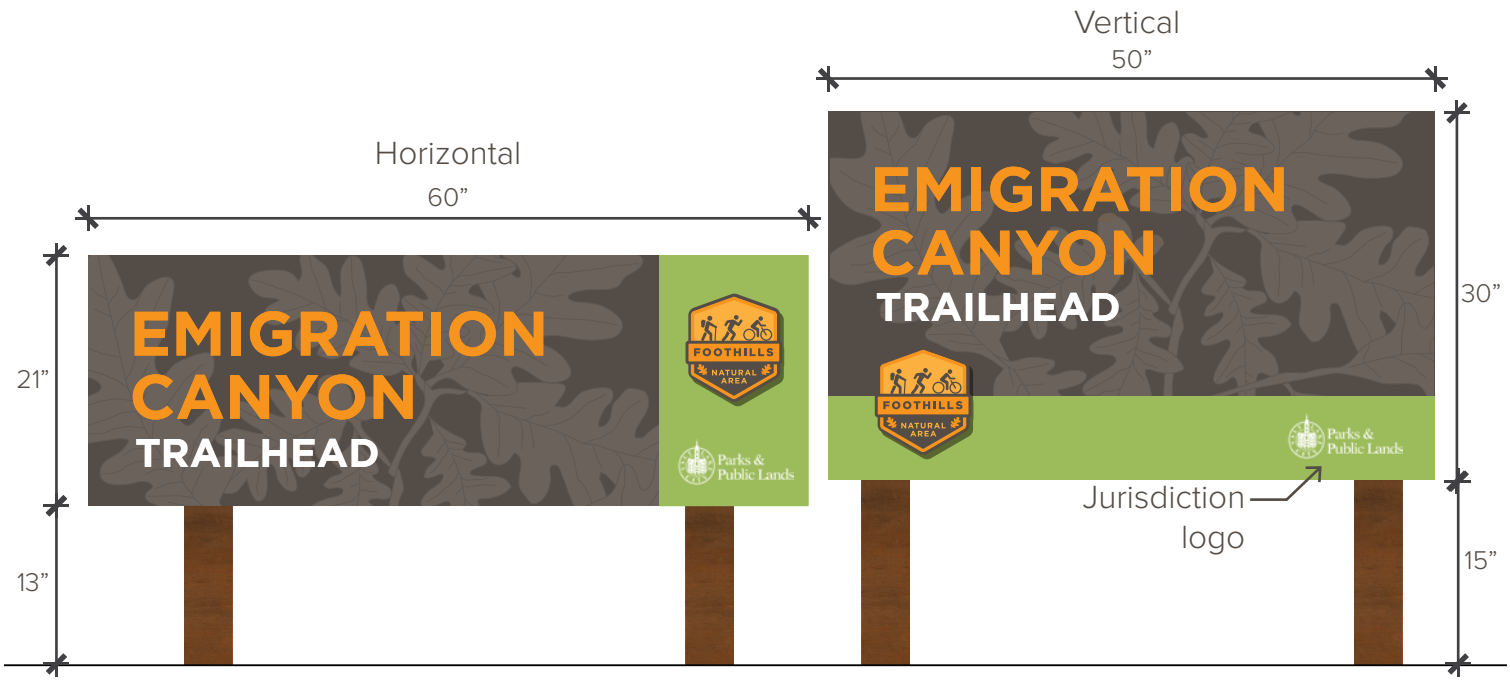
USGS science for a changing world
U.S. Geological Survey

DESIGN GUIDELINES

TRAIL WAYFINDING

TRAILHEAD MONUMENT

Trailhead monuments alert pedestrians, bicyclists, and motorists traveling along a public roadways to the presence of a trailhead for the Foothills Natural Area.



RECOMMENDED APPLICATION

Placement

- Trailhead monuments should be located adjacent to the public ROW near the trailhead parking lot.
- Monument signage should be visible from adjacent streets and comply with the SLC Sign Code.

Construction

- **Support Posts:** Treated or rot-resistant 6x6 wood posts, tubular weathered steel, or weathered angle-iron.
- **Sign Panel:** Digital print on aluminum (size varies). Place one panel on each side of the monument or use double-sided sign panel where monuments can be viewed from two directions.
- **Permitting**: Secure applicable sign permits.

Community Wayfinding

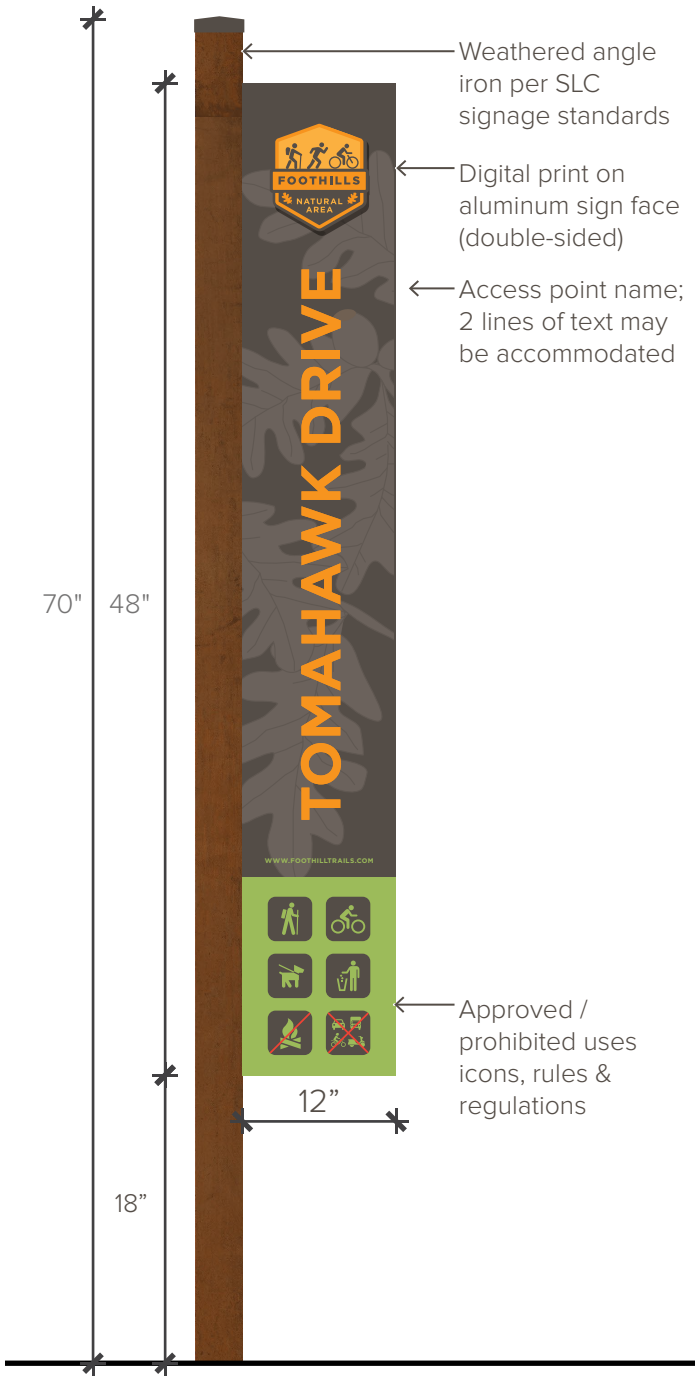
- SLC should develop recommendations and design standards for community wayfinding signage in residential neighborhoods adjacent to the Foothills Natural Area. Consistent recognizable in-street signage will help guide trail users to access points which otherwise may be difficult to locate, and minimize disruption to neighbors from potential trail users driving around looking for trails.

DESIGN GUIDELINES

TRAIL WAYFINDING

ACCESS POINT SIGNAGE

Secondary access points with limited parking, services, or user traffic may not necessitate the same level of information and signage as formal trailheads with greater use.



RECOMMENDED APPLICATION

Placement

Access point signage should be placed at all access points from the public ROW.

- Access point signage should be situated so that the sign blade is perpendicular to adjacent street or public ROW
- Signage should be placed 2’-0” off of the trail in the most visible location

Construction

- **Sign Post:** 5’-10” height, weathered angle iron
- **Sign Panel:** Double-sided, digital print on aluminum, 12” x 48”
- **Permitting**: Secure applicable sign permits.

DESIGN GUIDELINES

TRAIL WAYFINDING

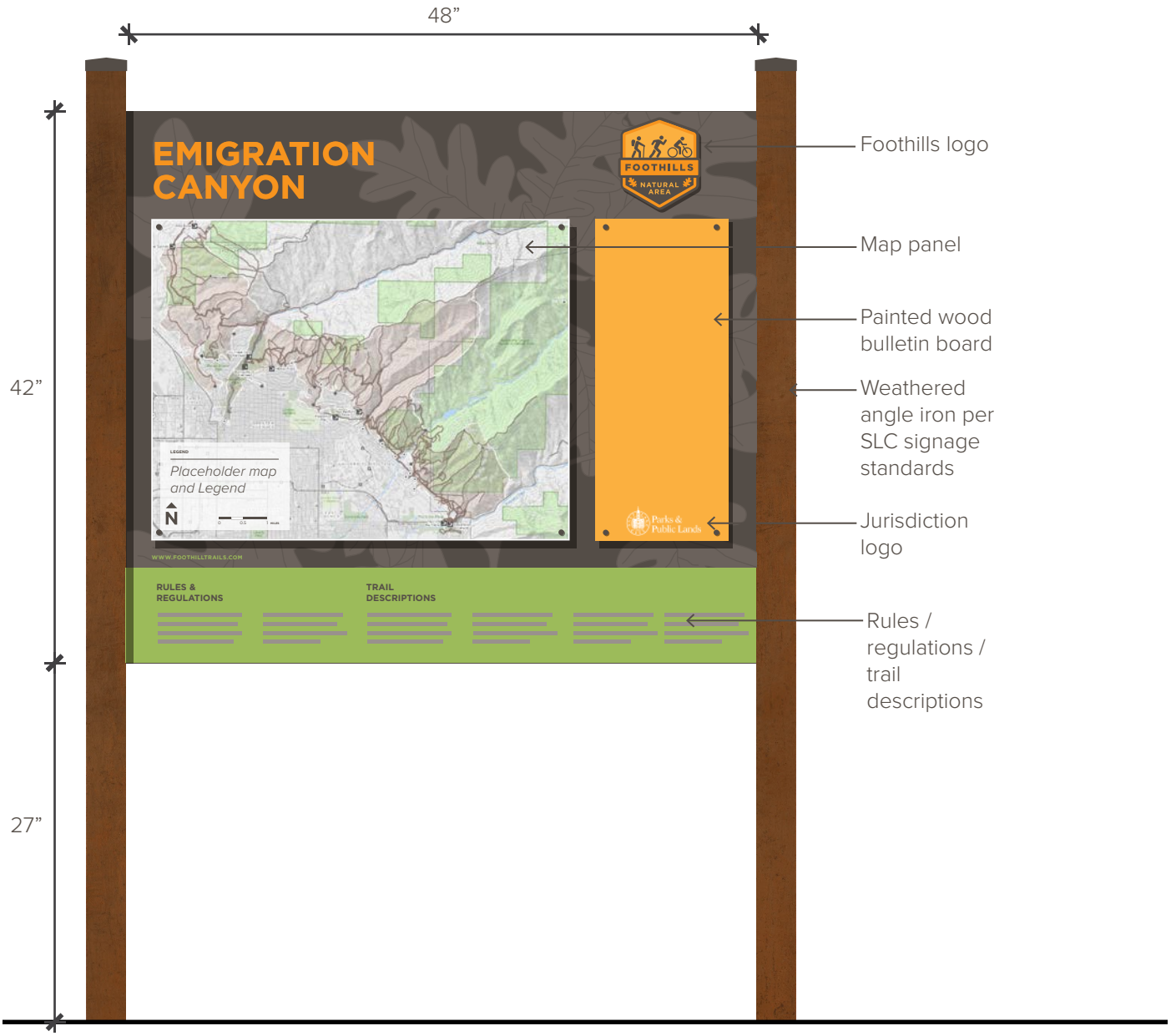
KIOSK MAP

Trailhead kiosk maps should be located at all major and minor trailheads that access the Foothills Natural Area. Kiosks should be located in conspicuous areas along the primary route from parking areas to the trail. Sufficient space should be provided around the kiosk to allow people to observe the information without obstructing adjacent walkways and meet ADA clear zone requirements.

RECOMMENDED APPLICATION

Construction

- **Post:** 6'-0" height, weathered angle iron
- **Sign Panel:** Double-sided, digital print on aluminum, 42" x 48"



DESIGN GUIDELINES

TRAIL WAYFINDING

KIOSK MAP (CONTINUED)

RECOMMENDED APPLICATION

Kiosk maps display helpful navigational information where trail users may be stopping long enough to digest more information. Kiosks should be located in conspicuous areas along the primary route from parking areas to the trail system. Sufficient space should be provided around the kiosk to allow people to observe the information without obstructing adjacent walkways and meet ADA clear zone requirements.

Typical elements to be included on trailhead kiosks are:

- Trail Map
- Regulations, hours, emergency contact information, trail etiquette
- Approved or prohibited uses, and
- Additionally, per the Americans with Disabilities Act (ADA) standards, trailhead facilities built with federal funds shall include the following information:
- Length of the trail or trail segment
- Surface type/firmness/stability
- Typical and minimum tread width
- Typical and maximum running slope
- Typical and maximum cross slope

Map designs may vary widely and still produce effective navigation guidance to trail users. Easily interpreted trail maps can contain a number of standard elements including:

- North arrow
- Scale / distance references
- Legend
- Trail names
- Use of approved icons for ease of use and to accommodate non-English speakers
- Trail alignments, lengths, surface types
- Trail elevation profiles
- Jurisdiction and agency boundaries
- Basic amenities including restrooms, trailheads, parks, and civic institutions
- Specific trail hazards (if present)
- “You are here” indicators

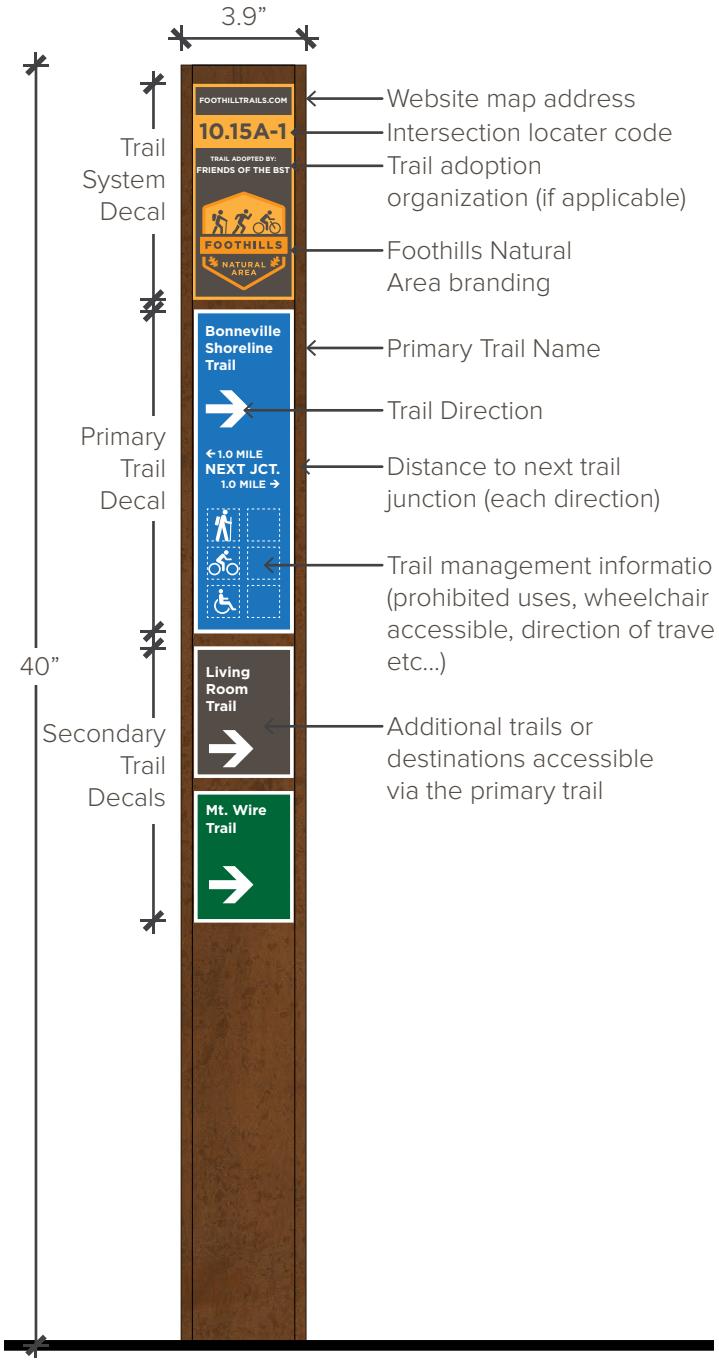
Map Panel Material	Advantages	Disadvantages	Approx. Cost (42” x 48”)
Embedded fiberglass (digital output encapsulated in clear fiberglass)	Resistant to shattering, weather, fading, and graffiti. Excellent colors and resolution. 10 year warranty	May need to occasionally buff with sandpaper. Edges not as attractive as high pressure laminate.	$800 - $950 (1/8”-1/2” thick)
High Pressure Laminate (digital output encapsulated in clear plastic resin)	Resistant to shattering, weather, fading, and graffiti. Excellent colors and resolution. 10-20 year warranty	Can be scratched or damaged with significant effort.	$700 - $1050 (1/8”-1/2” thick)
ImageLOC® (printed and fused to aluminum substrate)	Resistant to shattering, weather, fading, and graffiti. Excellent colors and resolution. 10-20 year warranty	Can be scratched or damaged with significant effort.	$550 - $650

DESIGN GUIDELINES

TRAIL WAYFINDING

TRAIL MARKER

Recreational trail markers provide useful information at key decision points along a natural surface trails. Trail markers are utilized to assure users that they are on the correct trail, define where connecting trails lead, and indicated mileages and level of difficulty.



RECOMMENDED APPLICATION

Construction

- **Post:** 3.9” wide dual-sided carsonite marker or triangular carsonite post depending on configuration of trail intersection.
- **Vinyl Decals:** Custom retroreflective vinyl decals
- **Trail System Decal:** The Trail System Decal includes a number of elements consolidated into a single vinyl decal including the website address for the Foothills Natural Area, intersection locater code (described below), trail adoption organization (if applicable) and Foothills Natural Area branding.
- **Intersection Locater Code:** The intersection locater code will help facilitate emergency response efforts and provide a precise way to communicate spatial information for a variety of purposes. All BST trail intersections would have a simple numerical mileage code taken out to two decimal places as needed when many intersections are clustered together. (Example 1.1, 10.1, 10.11). Numbering should be organized from north to south along the BST and would serve as de facto mileage markers. All other intersections off of the BST will have the following information in addition to the baseline numbering:

  XX.XX-(A or B)-# (1-9)

  XX.XX- Equals the intersections approximate location perpendicular to the BST

  A- Indicates locations above the BST in elevation

  B- Indicates locations below the BST in elevation

  #- Numbered intersections outwards from the BST

- **Primary Trail Decal:** The primary trail decal includes the trail name, level of difficulty (denoted by color: green, blue, or black), directional arrow, mileage to nearest trail junction (in one or both directions), and applicable management information such as approved trail uses, wheelchair accessibility, or directional travel information.
- **Secondary Trail Decals (optional):** Secondary trail decals denote trails or destinations that are accessible from the primary trail. As with the primary trail decal, color can be used to denote the level of difficulty for a specific trail.

DESIGN GUIDELINES

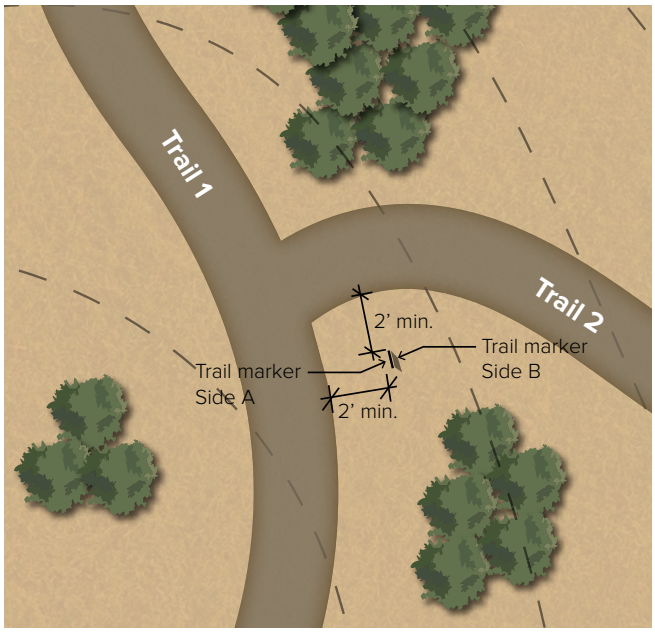
TRAIL WAYFINDING

TYPICAL TRAIL MARKER PLACEMENT

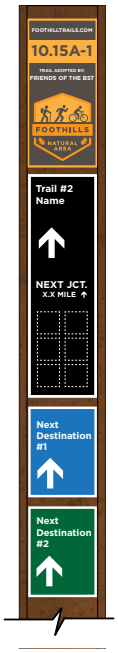
Trail markers should be placed at all official trail intersections within the Foothills Natural Area

- Trail markers should be placed 2'-0" off of the trail in the most conspicuous location. Either two-sided carsonite markers or triangular carsonite posts may be utilized depending on which type provides the most visibility for the particular location.

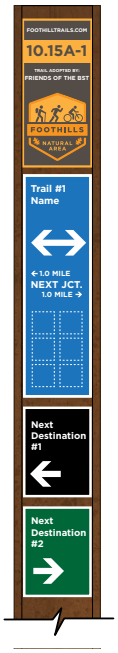
EXAMPLE APPLICATION



Trail Marker Side A



Trail Marker Side B

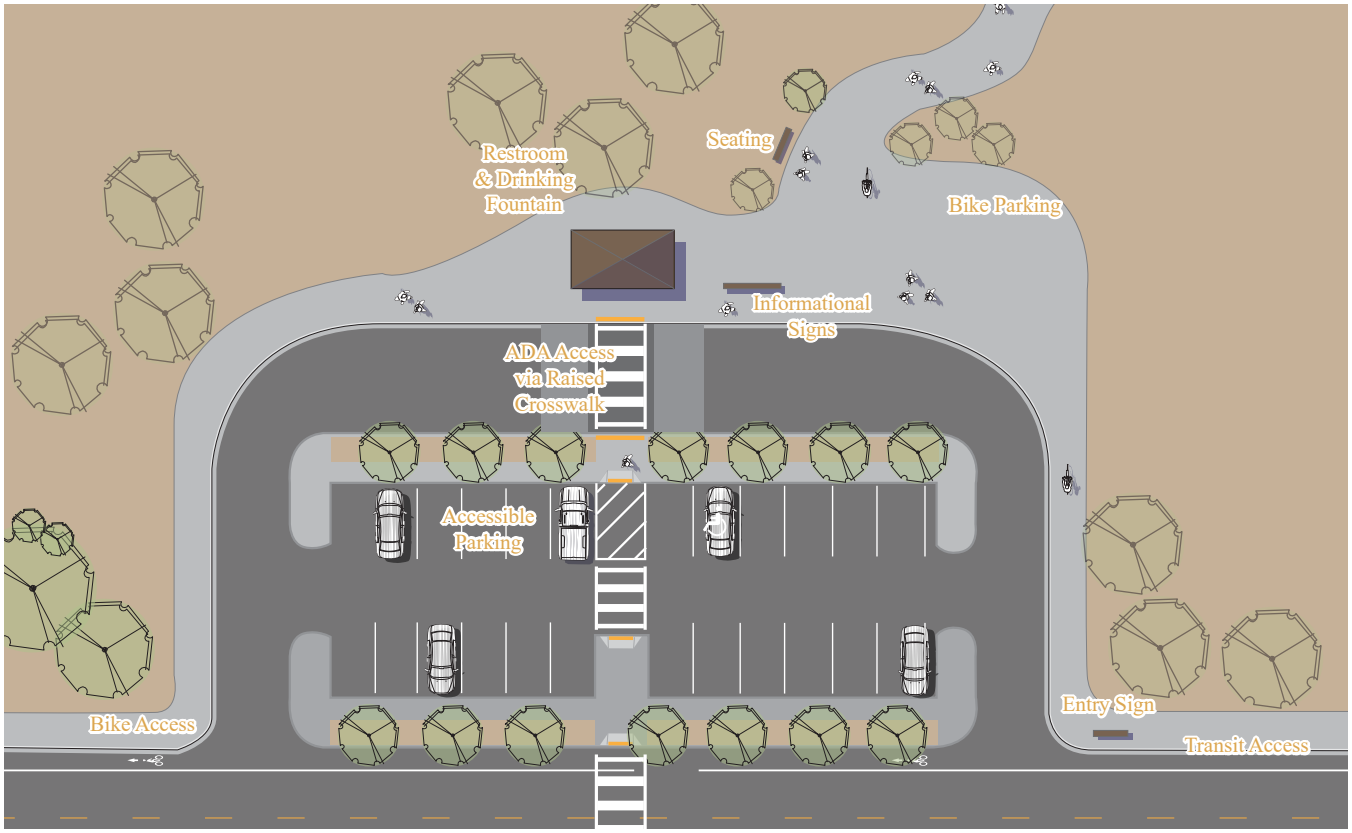


DESIGN GUIDELINES

TRAILHEAD PLANNING & DESIGN (CONT.)

MAJOR TRAILHEADS

Good access to a trail system is a key element for its success. Trailheads serve the local and regional population arriving to the trail system by car, transit, bicycle or other modes. Trailheads provide essential access to the shared use path system and include information and amenities for trail user comfort.



RECOMMENDED APPLICATION

Major trailheads may provide a wide range of user amenities, such as:

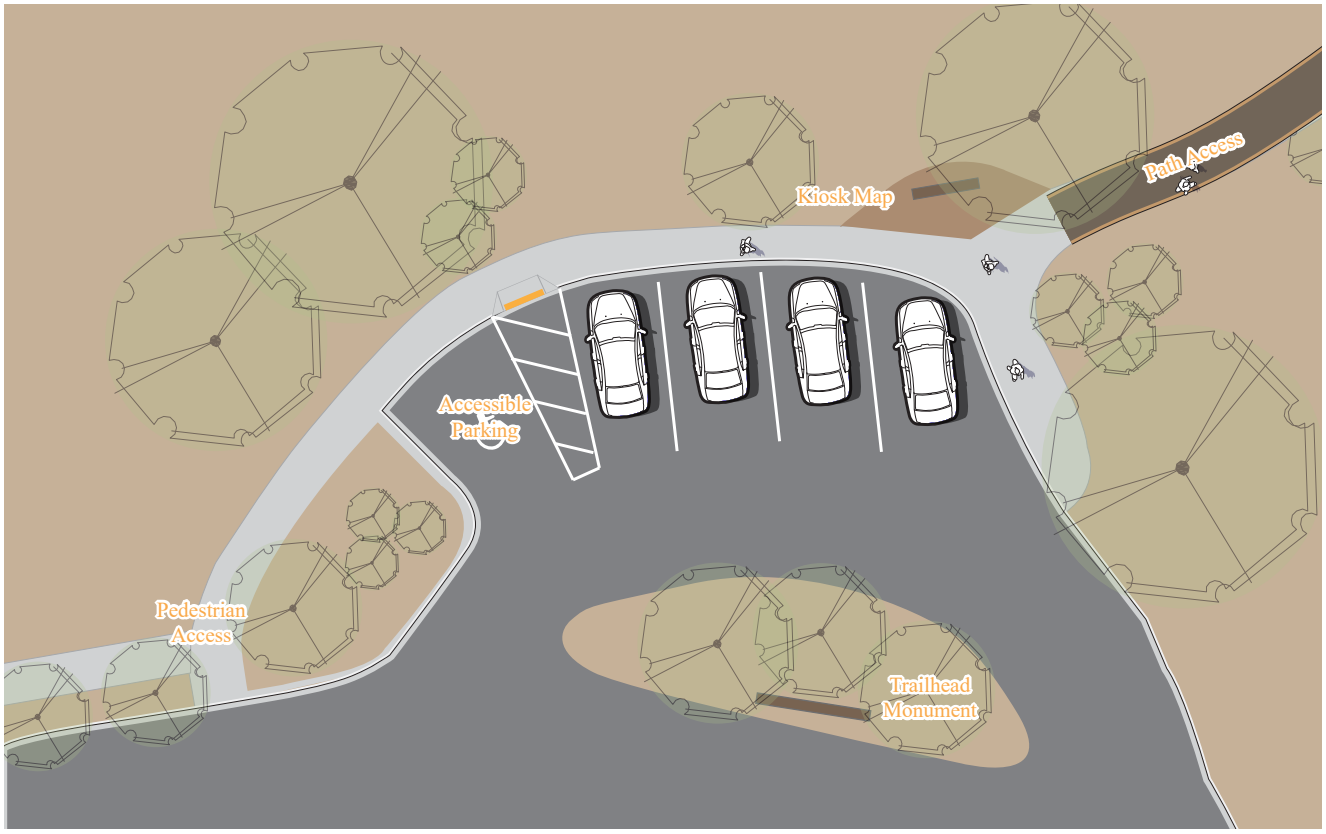
- Convenient access to transit stops (where feasible)
- Motor vehicle parking, including accessible parking spaces
- Short term bicycle parking such as racks or secure parking areas
- Wayfinding kiosks, with orientation and interpretive information
- Accessible trail signs noting trail conditions and degrees of difficulty
- Drinking water fountains (where feasible)
- Restrooms (where feasible)
- Shelters or picnic areas
- Scenic viewpoints or overlooks
- Benches and/or picnic tables
- Staging or gathering spaces
- Interpretive signs
- Trash and recycling containers

DESIGN GUIDELINES

TRAILHEAD PLANNING & DESIGN (CONT.)

MINOR TRAILHEADS

Minor trailheads are access points with some parking but minimal infrastructure. They can occur at locally known spots, such as parks and residential developments. Minor trailheads could include a small parking lot for up to 8 passenger vehicles.



RECOMMENDED APPLICATION

Minor trailheads may provide parking for up to eight vehicles. The parking area may be asphalt or gravel, as long as ADA requirements are met. Minor trailheads should accommodate emergency and maintenance vehicle access. Minor trailheads should provide:

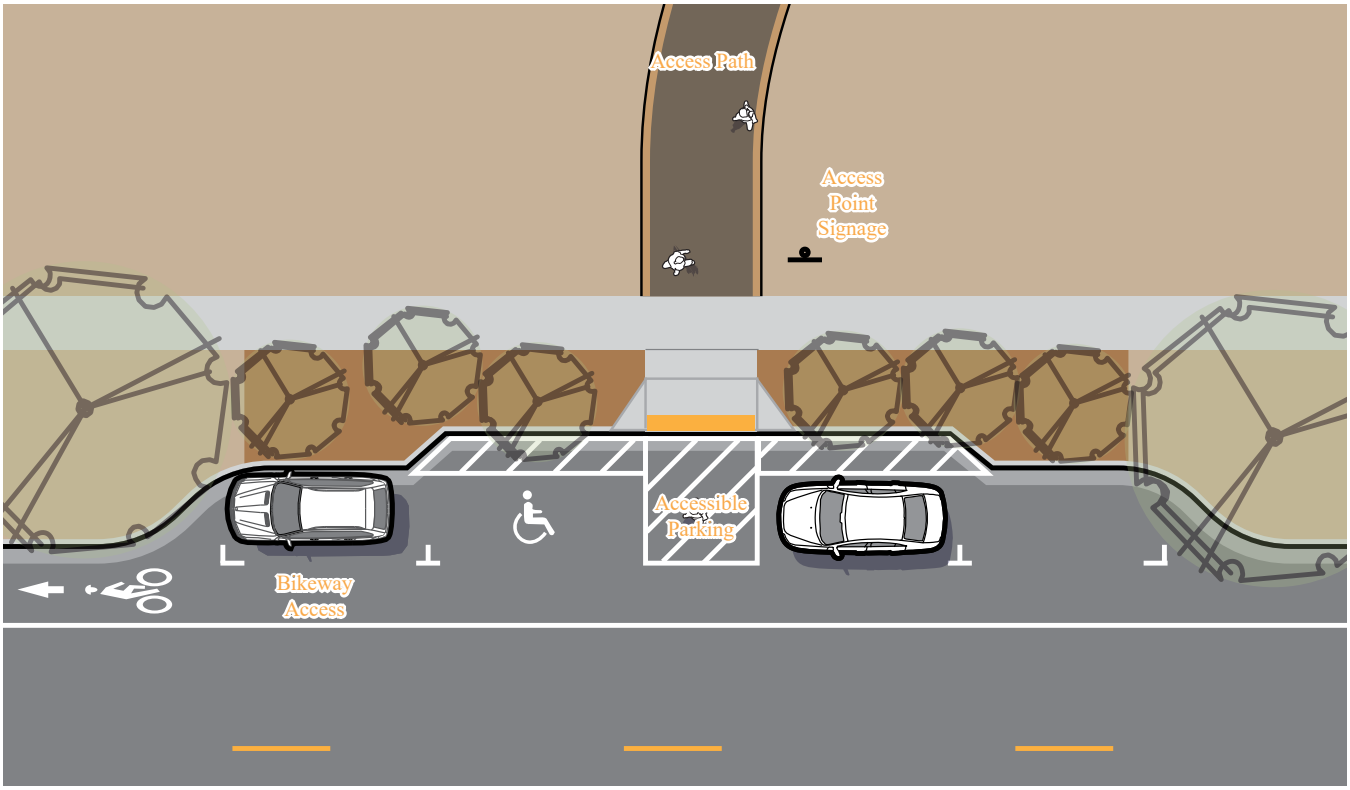
- Convenient access to transit stops (where feasible)
- Motor vehicle parking for up to 8 vehicles, including accessible parking spaces.
- Short term bicycle parking such as racks
- Kiosk map
- Trailhead monument
- Drinking water fountains (if feasible)
- Benches and/or picnic tables
- Trash and recycling containers

DESIGN GUIDELINES

TRAILHEAD PLANNING & DESIGN (CONT.)

TRAIL ACCESS POINTS

Trail access points are formalized small trailhead facilities which may or may not be served by on-street parking along an adjacent roadway and connected via an access path. Access points should be designed with a consistent character to larger trailhead locations, but may feature fewer amenities due to limited space requirements.



RECOMMENDED APPLICATION

Trail access points should be located where property acquisition or existing easements allow. Ideally access points can be utilized to their full potential when they are near existing transit stops or on-street bikeways.

- Access points should provide designated on-street parking where feasible, to reduce parking impacts to neighbors
- Accessible curb ramps should be provided from the parking lane to the access point if they lead to an accessible trail
- Access point signage should always be located at public trail access points, a minimum of 2'-0" off of the trail, and should be oriented towards the street
- Additional amenities such as a map kiosk, benches, or a trash receptacle may be considered if space allows
- Installation of "No Parking" signs should be considered where disruption of residential parking is common

DESIGN GUIDELINES

SPECIAL USE CYCLE TRAILS

SPECIAL USE CYCLE TRAILS

In addition to traditional shared-use natural surface trails, mountain bikers are increasingly seeking specialized experiences to provide technical challenges and expand their skills. Features may be provided in clustered areas or along specific trails designed for mountain bikers. By reducing trail use conflicts, these trails increase safety and trail experience for all users.

Photo Credit: dreamadaptive.org

ADAPTIVE CYCLE TRAILS

Adaptive mountain bike trails are built to accommodate a range of adaptive mountain bikes including hand cycles or recumbent cycles. Typically these trails are slightly wider than normal singletrack trails and have stricter cross-slope tolerances so as to prevent tricycles from tipping over.

Example: Porcuclimb and Down Dog at Round Valley

FREERIDE MTN. BIKE TRAILS

Freeride mountain bike trails and flow trails are built specifically for mountain bikers and often prohibit other types of users, such as hikers or equestrians, to mitigate safety concerns. Trails are typically directional (downhill only) and provide features such as banked turns, rock gardens, drop-offs, jumps, or other man-made technical features. Signage should be used extensively to identify upcoming features and denote the level of difficulty. Providing safe, authorized freeride trails is an important consideration for trail planners because freeride mountain bikers will often seek to create their own freeride trails in the absence of legitimate options.

Example: Bobsled Trail

BIKE PARKS AND PUMP TRACKS

Bike parks are a relatively recent development and the growth of compact facilities specifically for mountain bicycling have allowed more people to recreate outdoors. Bike parks often include numerous elements such as pump tracks, jump lines, or freeride trails for a variety of skill levels. Skills areas may include log skinnies, rock gardens, teeter-totters and other features to provide additional challenge. Bike parks are often co-located within existing parks or near trail systems.

Pump tracks include a series of “rollers” and banked turns that allow bicyclists to navigate through the course without pedaling by “pumping” up and down. Pump tracks are suitable for all ages and allow children and experienced bicyclists a place to grow their skills. Pump tracks should generally be sited on slopes between 3-7%. Public pump tracks typically can be designed with footprints as small as 5000 square feet.

Examples: I-Street Bike Park

06

IMPLEMENTATION

Women's Trail Build Day (Photo Credit: Bingham Cyclery)

IMPLEMENTATION

OVERVIEW

Implementation of the Foothills Trail System Plan will require a phased approach that accounts for both capital construction and ongoing maintenance. Maintenance needs for the future 106-mile system will vary significantly from the existing 41-mile official trail system. However, by constructing trails in a sustainable manner as described in Chapter Five, trail maintenance can be kept at manageable levels for Salt Lake City Parks and Public Lands.

The following chapter specifies proposed phasing for the implementation of the Foothills trail system that addresses public needs, necessary permitting and pre-construction activities. Although project phasing is recommended, Salt Lake City Parks and Public Lands should remain flexible and opportunistic in regards to implementation. Deviation from the proposed implementation schedule may be warranted if opportunities exist to construct projects more economically, partner with other agencies, respond to specific grant funding, or address a pressing public need.

"Thousands of tired, nerve-shaken, over-civilized people are beginning to find out going to the mountains is going home..."

-John Muir

IMPLEMENTATION

CAPITAL COSTS

OVERVIEW

Implementation for the recommended trail system for the Foothills Natural Area will vary by site and intended use. In some cases, bridges and structures may be required. The following guidelines may be used to approximate costs prior to the bidding process. For planning purposes, new trail construction has been estimated at $2.50, $5.00, or $8.00 / lineal foot for new trails based on known site constraints including steepness of terrain, underlying geology, and vegetation density. However, actual construction costs will likely vary due to actual site conditions encountered during final trail layout, and timing of implementation. An annual inflation factor of 2% has been applied to trail construction in future phases.

Trailhead cost estimates and detailed improvement designs will be developed beginning in 2020. Implementation costs for all proposed trailhead improvements are expected to be in the range of $2M - $5M.

Women's Trail Build Day (Photo Credit: Bingham Cyclery)

Trail Type	Sub-Type	Discussion/Description	Planning-Level Cost
Construction of hike, bike, or shared use singletrack, 30" - 40" wide	Easy	10% - 30% sideslopes; minimal vegetation; minimal rock; climbing turns or small berms; no drainages; no armoring or retaining walls; easy access to work site	$2.50 per LF
	Moderate	31% - 50% sideslopes; moderate vegetation; small, loose rock; switchbacks or switchberms; no steep drainages; minimal armoring or retaining walls; easy access to work site	$5.00 per LF
	Difficult	51%+ sideslopes; dense vegetation; large rock; switchbacks or switchberms with retaining walls; steep drainages; armoring or retaining walls; difficult access to work site	$8.00 per LF
	Bike-Optimized	Bike-optimized trails with advanced dirt and rock features	$8.00+ per LF
Bridges and Structures	Engineered	Bridges and structures must be priced separately. Bridges requiring engineering typically cost $1,000 per LF.	$1,000 per LF

IMPLEMENTATION

MAINTENANCE COSTS

OVERVIEW

In order to protect the City's long-term investment in the Foothills Trail System, adequate on-going maintenance and management are critical to preserving the plan pillars of:

- Environmental sustainability
- User experience
- Accessibility
- Safety
- Physical sustainability

Maintenance and management activities generally fall into three primary categories:

- Annual trail maintenance, and
- Weed control along trail corridors, and
- Management costs (Foothills Natural Area Ranger)

Annual Trail Maintenance

Annual trail maintenance includes repairs, decommissioning of developing social trails, erosion control, and other activities due to weather or user-created damage to trails.

Weed Control

Seasonal treatment of harmful weeds along trail corridors to mitigate recreational impacts on natural vegetation and habitat; includes weed mapping & inventory, physical and chemical treatments, and reseeding of desirable species.

Maintenance / Management Activity	Total Mileage	Planning-Level Annual Maintenance Costs
North Sub Region	30.63 miles	$97,700 / year
Central Sub Region	40.24 miles	$128,350 / year
South Region	34.98 miles	$111,600 / year
Foothills Ranger		$81,500
Total System	105.85 miles	$419,150 / year

More information on weed control is provided on the following page.

Management

With anticipated increases in users and trail mileage within the Foothills Natural Area, dedicated management resources will become necessary to help facilitate enforcement, emergency response, weather-related trail closures, and other "boots on the ground" management activities. A full-time Foothills Ranger position or positions would help address many of these needs. Trail ranger positions are widely cited as an invaluable component of successful, popular trail systems elsewhere in the country.

Maintenance / Management Activity	Sub-Type	Discussion/Description	Planning-Level Cost
Annual Maintenance	Sustainably-Built Trails	Costs increase slightly for backcountry trails because of the time associated with mobilizing personnel, equipment, and materials into remote areas.	4% of construction costs
	Unsustainable Legacy Trails	Difficult to estimate; each trail would have to be evaluated individually.	Require individual evaluation
Weed Control	N/A	Aggressive control and containment of weeds to current extent will keep future costs low; public education at trailheads can help reduce weed dispersal along trails.	$1,500 per trail system mile
Trails Management	N/A	Develop a position for a ranger or rangers to monitor and manage activities within the Foothills Natural Area. Includes salary, benefits, fuel, equipment maintenance, and cell phone.	$81,500 / year (one position)

IMPLEMENTATION

WEED CONTROL AND TRAIL SYSTEM IMPLEMENTATION

OVERVIEW

Managing invasive weeds in the Foothills Natural Area, and working proactively and aggressively to limit their spread along recreational trail corridors, will be critical to protecting the ecological health of the FNA, and also the quality of the trail user experience. Currently, invasive species like cereal rye grass and cheat grass are becoming widespread in the FNA. While appearing harmless, these species and other annual grasses grow aggressively and can outcompete native bunchgrasses, but lack the extensive root systems of perennial natives. Invasive annual grasses are more fire-prone, and their shallow root systems mean that following major disturbances like wildfire, hillslopes and be highly susceptible to erosion and even landslides. Extensive monocultures of these invasive grasses also deteriorate habitat quality for many desirable wildlife species. Similarly, invasive forbes like Dyer's woad, dalmation toadflax, and myrtle spurge can form massive monocultures that reduce biodiversity, out-compete desirable native wildflowers and other plans, impair ecosystem health, and contribute to soil loss.

Other invaders such as puncture vine and yellow star thistle also are making incursions into the FNA. These weed species not only threaten habitat quality, but also pose a serious threat to recreation. Thorny, spiny plants and sharp seeds, when growing out of control, can clog trail corridors, pop bike tires, injure dogs and people, and generally diminish the quality of the recreational experience that the Foothills Natural Area is known for.

All of these invasive weeds can be spread more effectively by trail users than by just about any other means. Inadvertent transmission of weed seeds on hiking boots or shoes, bike tires, or dog's fur can quickly transport noxious invasive plants deep into undisturbed areas, where the weeds will find fertile ground and can quickly spread before they are detected.

It is critical that an aggressive information and weed mitigation campaign be initiated simultaneously with any improvements to the Foothills Trail System. Proactive measures should include widespread education about weed seed transmission at every foothill access point, weed identification information at major trailheads, coordinated volunteer weed pulls during appropriate seasons, and ongoing funding for a weed mitigation crew to travel the Foothills Trail System, identify new occurrences of invasive weeds, and control them using all appropriate biological, manual, chemical, and restoration methods. It is unavoidable that trail system expansion will result in spread of invasive plants in the Foothills Natural Area. But with proper proactive management, spread of the most concerning weeds can be slowed and mitigated along many trail corridors, and habitat areas and recreational experiences can be protected into the future.

TRAIL PRIORITIZATION

OVERVIEW

In order to establish a logical and publicly-supported implementation schedule for the proposed Foothills Trail System, the Planning Team developed a simple prioritization methodology to score, rank and phase proposed trail projects. This methodology considered three basic criteria for each proposed trail:

- Public support, and;
- Underlying land ownership, and;
- Necessity of habitat data collection

Public Support

Public support for each proposed trail was measured using input from public meetings and the online public input map. At the two public meetings where the Foothills Trail System plan was presented, the public was asked to identify their top five projects for implementation. A similar exercise was conducted using the online input map. The results of these two activities were then compiled and tabulated to create a public support score for every project.

Land Ownership

In addition to public support, underlying land ownership for each trail segment was also cataloged. Projects entirely on Salt Lake City and/or University of Utah land pose the least barriers to implementation, while trails over state-owned and USFS lands will take slightly longer to coordinate and construct. Trails proposed over private lands require the most coordination and lead time to plan and construct.

Habitat Data Collection

Additional habitat data collection is proposed in each of three "habitat study areas," where existing recreational trail impacts are small, and new trail development could have detrimental effects on wildlife. Trail construction in these areas should be delayed for several years until sufficient data analysis can be performed.

Phasing

In order to separate the proposed trail projects into phases, projects were categorized based on their public support score. Projects with scores in the upper 50% of all projects were deemed “high priority”. High priority projects on Salt Lake City or University of Utah property were then classified as Phase I projects, except within habitat study areas (such trails were postponed to Phase II). High priority projects on State of Utah and USFS lands were deemed suitable for Phase II. Projects on private lands, as well as all "low-priority" projects were selected for Phase III. In a small number of cases, low-priority projects were moved to Phase I or Phase II in order to facilitate the overall function of a high-priority trail alignment; similarly, a small number of trails initially in Phase I were moved to a later phase because their proper function depended on a Phase II or Phase III trail segment. Each phase was reviewed to ensure that the trail system evolves logically and that the phasing does not contribute to connectivity or management problems. Anticipated scheduling for the various phases is as follows:

- Phase I: 0-3-year build-out
- Phase II: 4-6-year build-out
- Phase III: 7-10-year build-out

Phasing Other Trail System Components

In addition to new trail construction, trailhead improvements, trail system signage, trail decommissions, and upgrades to existing system trails need to be incorporated into the phased development of the Foothills Trail System. Trail decommissioning and signage costs are comparatively small, and these items should be incorporated sequentially as individual trail alignments are constructed (trails should be decommissioned as soon as they are replaced by a functional alternate route). Trailhead improvements and upgrades to existing "system" trails are not as dependent on phase, and detailed designs and costs have not be calculated as part of this plan. However, these improvements, especially trailhead developments, are critical to the functionality of the overall trail system. Design documents and cost estimates should be developed for trailhead improvements, and recommended improvements should be implemented as soon as funding is available.

IMPLEMENTATION BY THE NUMBERS

$620K for Phase I implementation

$2.8 Mil for full system buildout

$419K annual maintenance & management cost (at full buildout)

Note: May not include all soft costs and estimates may increase over time.

	Land Ownership			
	SLC/ U of U	State of Utah	USFS	Private
Top 50% Priority	Phase I	Phase II	Phase II	Phase III
Bottom 50% Priority	Varies	Phase III	Phase III	N/A

Trail Construction Costs

Phase	Proposed Mileage	Planning-Level Cost
Phase I	14.37 miles	$620,564
Phase II	37.31 miles	$1,643,932
Phase III	13.37 miles	$582,886
Grand Total	65.05 miles	$2,847,382

Trail Decommissioning Costs

Decommission Type	Unit Cost	Estimated Project Area Cost
Passive Decommissioning	$600 / trail junction	$42,000 (70 locations)
Active Decommissioning	$8.00 / linear foot	$184,000

Other Trail System Development Costs

Improvement	Unit Cost	Estimated Project Area Cost
Trailhead Development	varies / TBD	TBD pending design
Trail System Signage	$130 - $1,000	$32,000
Trailhead Signage	$5,000	$70,000

**Planning-level costs are approximate and do not include acquisition (if necessary), permitting, or engineering (if necessary). Final costs will vary based upon local conditions. Phase II & III costs include a 2% per annum inflation factor.*

PROPOSED TRAIL SYSTEM

TRAIL PRIORITIZATION PHASE I

Phase I trail improvements consist of highly ranked public priorities that can be built on Salt Lake City and University of Utah owned property.

TRAIL NETWORK

EXISTING

- Existing Trails and Paths

PUBLIC PRIORITY TRAILS

- Phase 1 - Salt Lake City Lands
- Phase 2 - State and University of Utah Lands
- Phase 3 - Federal Lands
- Current Phase Highlight

DESTINATIONS + BOUNDARIES

- Major Trailhead
- Minor Trailhead
- Access Point
- Train Stations
- School
- Project Boundary
- Habitat Study Area
- Cemetery
- Parks
- Water Body
- Salt Lake City

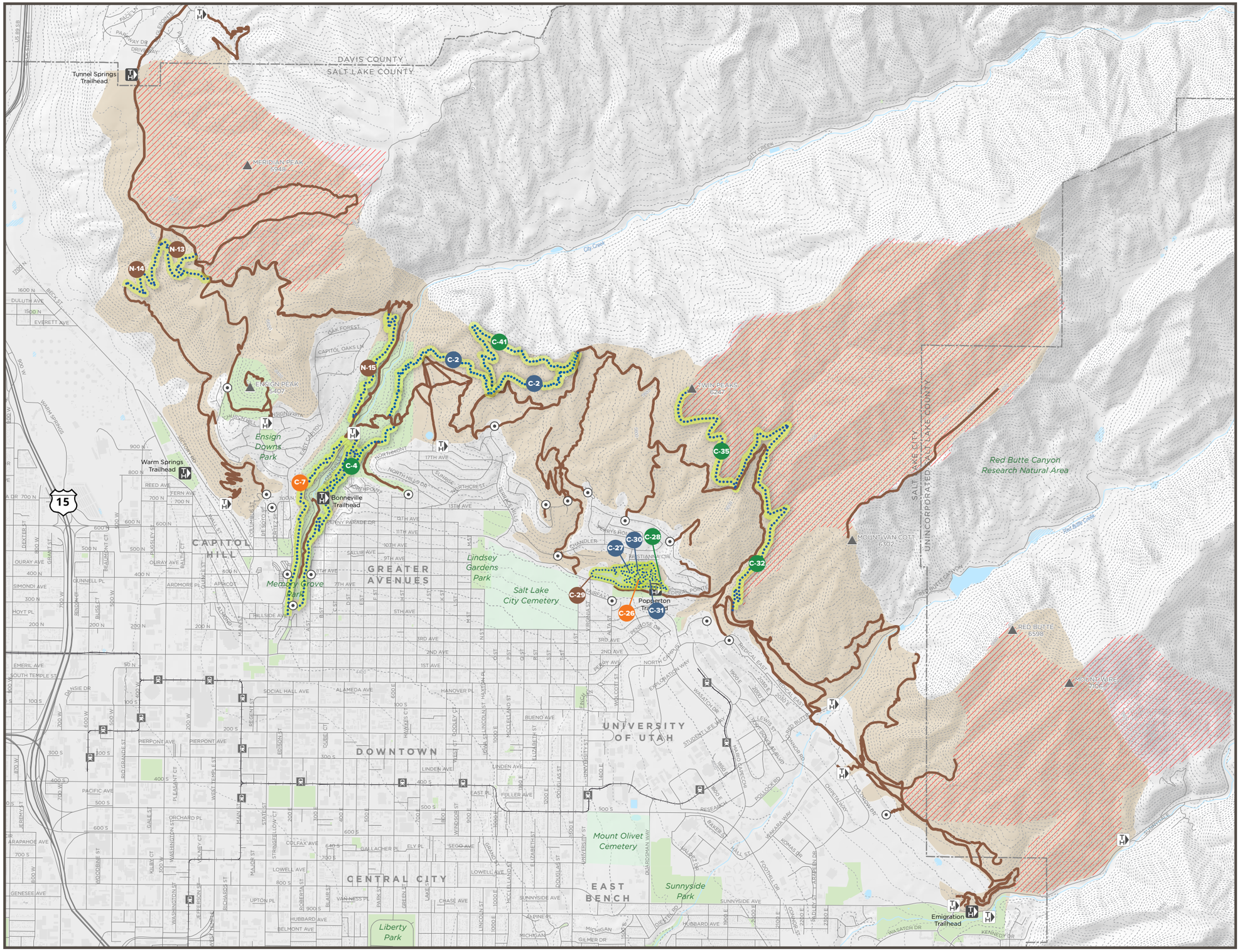
Parks & Public Lands

0 0.5 1 MILES

N

alta

Data provided by the SLC Parks & Public Lands, AGRC and Trailforks.com
Map produced June 2018



PHASE 1 TRAILS

Trail Id	Name	Proposed Mileage	Management Controls	Planning Level Cost
N-13	Over The Cliffs	0.58	Shared Use	$24,499
N-14	Lakeview Trail	0.75	Shared Use	$31,680
N-15	North City Creek Trail	0.92	Shared Use	$38,861
C-2	Long Way Home Trail	1.94	Mountain Bike Only	$81,946
C-4	New Bonneville Shoreline Trail Alignment	0.68	Uphill Mountain Bike/Multi-Directional Hiking	$28,723
C-7	Memory Grove	2.56	Hiking Only	$108,134
C-26	Popperton Gulch Nature Trail	0.25	Hiking Only	$10,560
C-27	Popperton - Beginner Mountain Bike Trail	0.4	Mountain Bike Only	$10,560
C-28	Popperton Climbing Trail	0.35	Uphill Mountain Bike/Multi-Directional Hiking	$9,240
C-29	Popperton Loop Trail	0.74	Shared Use	$19,536
C-30	Popperton - Blue Square Descending	0.24	Mountain Bike Only	$10,138
C-31	Popperton - Black Diamond Descending	0.3	Mountain Bike Only	$12,672
C-32	New Bonneville Shoreline Trail (Dry Creek Section)	2.13	Uphill Mountain Bike/Multi-Directional Hiking	$112,464
C-35	Twin Peaks Trail	1.13	Uphill Mountain Bike/Multi-Directional Hiking	$47,731
C-41	New BST / Morris Mountain Trail	1.4	Uphill Mountain Bike/Multi-Directional Hiking	$73,920
			Phase I Total	$620,564

PHASE 2 TRAILS

Trail Id	Name	Proposed Mileage	Management Controls	Planning-Level Cost
N-5	New BST - North Foothills	2.28	Shared Use	$60,192
N-6	Prime Meridian Trail	2.35	Mountain Bike Only	$62,040
N-7	Meridian Peak Trail	3.47	Uphill Mountain Bike/Multi-Directional Hiking	$91,608
N-11	Towers Trail	3.67	Uphill Mountain Bike/Multi-Directional Hiking	$155,020
C-14	Avenues Ridgeline Trail	1.18	Shared Use	$31,152
C-34	Dry Spell	1.92	Mountain Bike Only	$81,101
C-36	South Fork Dry Creek Trail	1.41	Shared Use	$37,224
S-2	Mt. Van Cott Trail	3.17	Uphill Mountain Bike/Multi-Directional Hiking	$167,376
S-5	Red Butte Canyon Downhill	0.73	Mountain Bike Only	$19,272
S-7	Skyline Nature Trail East	1.84	Shared Use	$77,722
S-9	Living Room Trail	1.89	Foot Traffic Only	$99,792
S-10	Mt. Wire Trail	4.6	Uphill Mountain Bike/Multi-Directional Hiking	$242,880
S-11	Lithograph Fork Trail	4.3	Shared Use	$227,040
S-12	Lithograph Point Trail	0.1	Shared Use	$5,280
S-14	The Slip Trail	0.8	Mountain Bike Only	$42,240
S-16	Wild Mouse	1.1	Mountain Bike Only	$46,464
S-18*	Rollercoaster Uphill	0.4	Uphill Mountain Bike/Multi-Directional Hiking	$16,896
S-30	Wagner Peak Loop Trail	2.1	Shared Use	$55,440
			Phase II Total	$1,518,739

PROPOSED TRAIL SYSTEM

TRAIL PRIORITIZATION

PHASE II - STATE OF UTAH

Phase II trail improvements consist of highly ranked public priorities that occur on lands owned by the State of Utah and the USFS.

TRAIL NETWORK

EXISTING

- Existing Trails and Paths

PUBLIC PRIORITY TRAILS

- Phase 1 - Salt Lake City Lands
- Phase 2 - State and University of Utah Lands
- Phase 3 - Federal Lands
- Current Phase Highlight

DESTINATIONS + BOUNDARIES

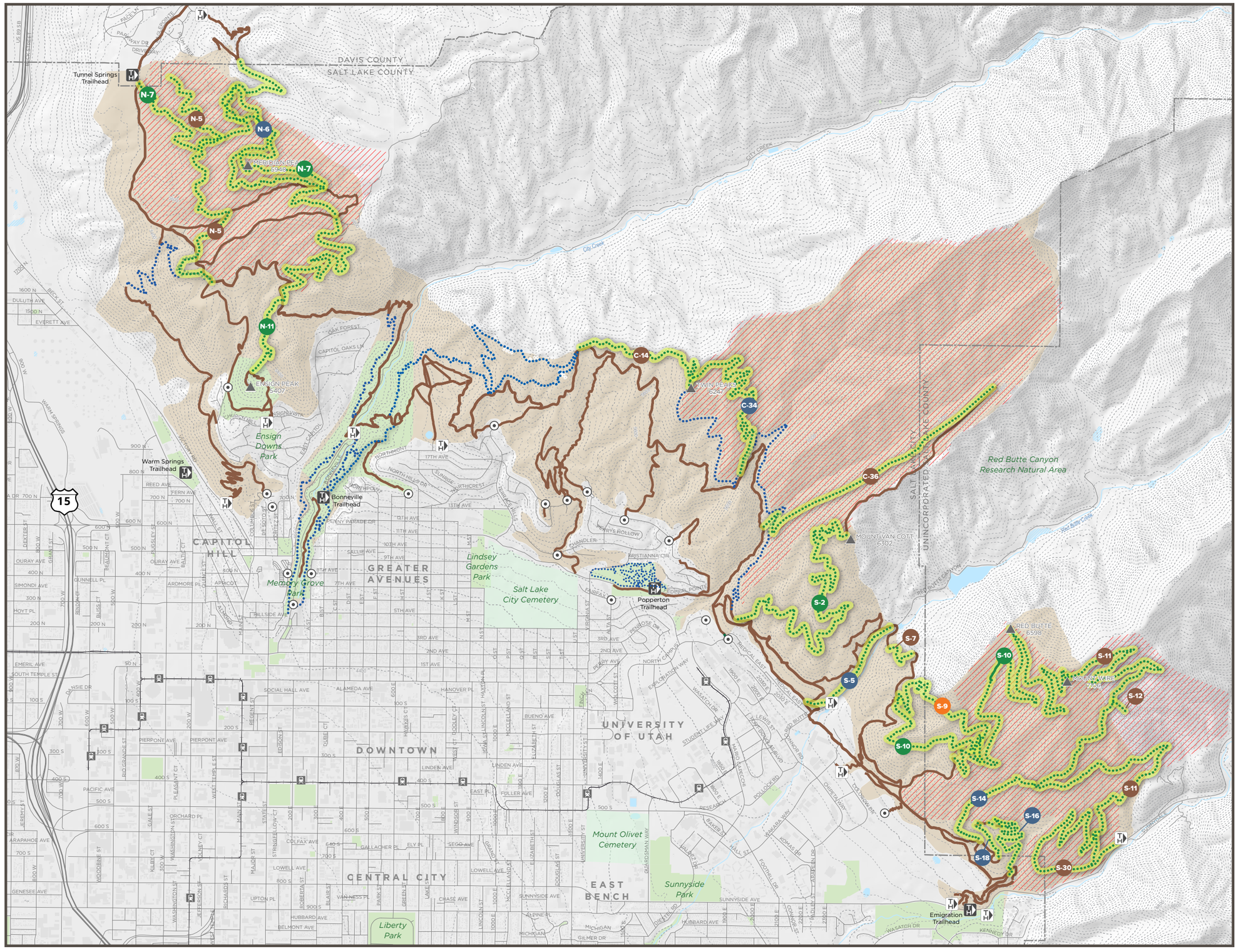
- Major Trailhead
- Minor Trailhead
- Access Point
- Train Stations
- School
- Project Boundary
- Habitat Study Area
- Cemetery
- Parks
- Water Body
- Salt Lake City

Parks & Public Lands

0 0.5 1 MILES

N

alta Data provided by the SLC Parks & Public Lands, AGRC and Trailforks.com
Map produced June 2018



PROPOSED TRAIL SYSTEM

TRAIL PRIORITIZATION PHASE III

Phase III trail improvements consist of highly ranked public priorities that occur on privately owned lands.

TRAIL NETWORK

EXISTING

- Existing Trails and Paths

PUBLIC PRIORITY TRAILS

- Phase 1 - Salt Lake City Lands
- Phase 2 - State and University of Utah Lands
- Phase 3 - Federal Lands
- Current Phase Highlight

DESTINATIONS + BOUNDARIES

- Major Trailhead
- Minor Trailhead
- Access Point
- Train Stations
- School
- Project Boundary
- Habitat Study Area
- Cemetery
- Parks
- Water Body
- Salt Lake City

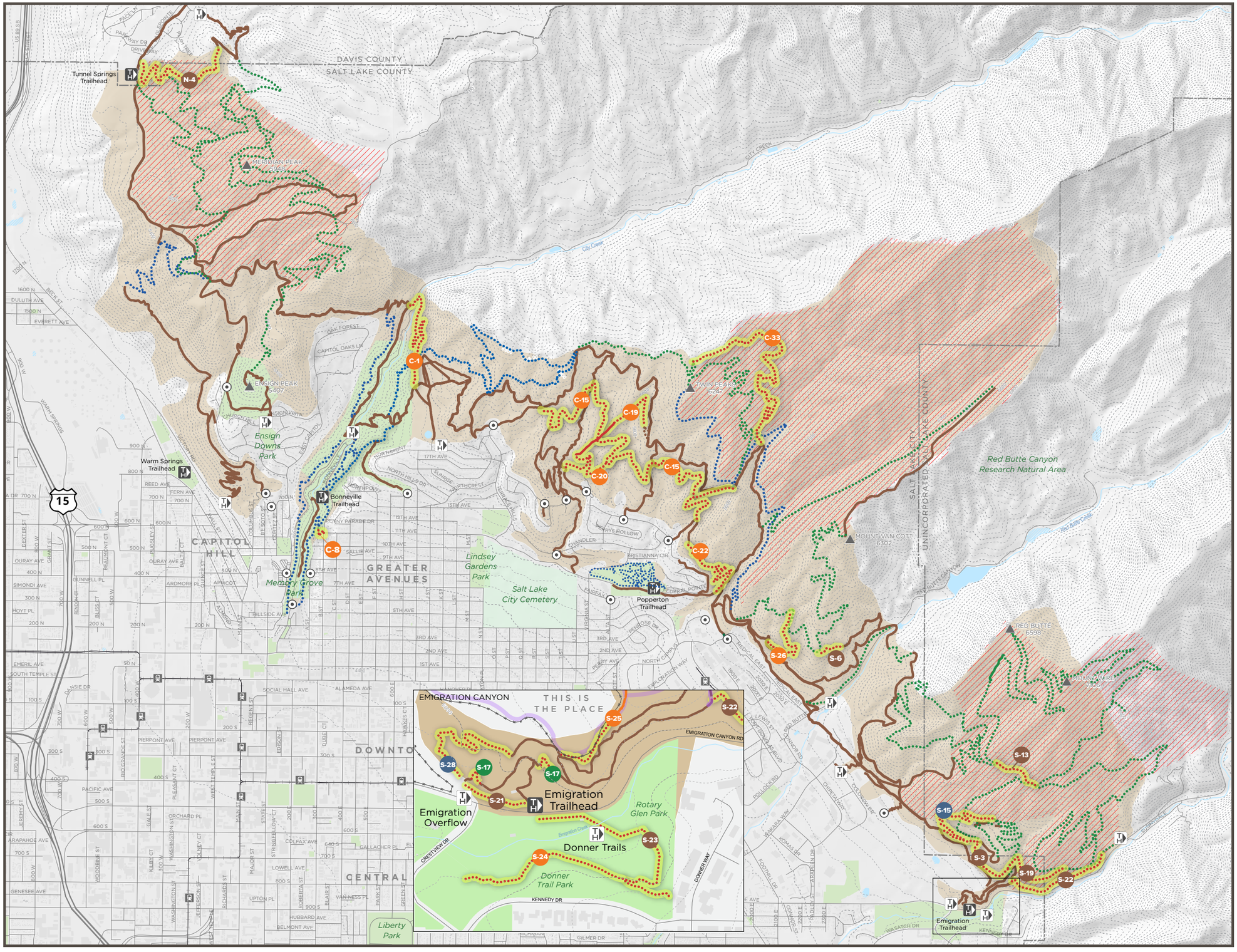
Parks & Public Lands

0 0.5 1 MILES

N

alta

Data provided by the SLC Parks & Public Lands, AGRC and Trailforks.com
Map produced June 2018



PHASE 3 TRAILS

Trail Id	Name	Proposed Mileage	Management Controls	Planning-Level Cost
N-4	NSL BST	0.96	Shared Use	$25,344
C-1	Morris Creek Trail	1.03	Hiking Only	$43,507
C-8	11th Avenue Connector	0.09	Hiking Only	$3,802
C-15	Gullies & Hollows Trail	2.79	Foot Traffic Only	$117,850
C-19	East Fork Perry's Trail	0.5	Hiking Only	$13,200
C-20	East Fork Parley's Trail (Alternate)	0.47	Hiking Only	$12,408
C-22	Block U Hiking Trail	1.18	Hiking Only	$49,843
C-33	North Fork Dry Creek Trail	1.64	Hiking Only	$69,274
S-3	Bonneville Shoreline Trail	0.79	Shared Use	$20,856
S-6	Skyline Nature Trail West	0.17	Shared Use	$7,181
S-13	Lithograph Fork Connector	0.26	Shared Use	$13,728
S-15	Colossus	0.69	Mountain Bike Only	$29,146
S-17	Emigration Ascending Trail	0.08	Uphill Mountain Bike/Multi-Directional Hiking	$3,379
S-19	Wagner Hollow Trail	0.44	Shared Use	$18,586
S-21	Emigration Trailhead Connector Trail	0.1	Shared Use	$2,640
S-22	Wagner Spring Trail	0.63	Shared Use	$16,632
S-23	Rotary Donner Connector	0.38	Shared Use	$16,051
S-24	Secret Garden Trail	0.26	Hiking Only	$10,982
S-25	Sagebrush Flats Trail	0.11	Hiking Only	$2,904
S-26	Battle Gulch Trail	0.54	Hiking Only	$22,810
S-28	Emigration Bike Descent Route	0.26	Mountain Bike Only	$6,864
			Phase III Total	$507,437