DRAFT

Tahoe Donner Trails Master Plan

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TAHOE DONNER™

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1 Introduction

This section presents the purpose and scope of the Trails Master Plan (TMP or Plan), the vision for the trail system, key goals and policies of the TMP, and an overview of the planning process.

1.1 Purpose and Scope

The purpose of the Tahoe Donner TMP is to provide long-term guidance for summer trails planning, management, maintenance, and funding. The TMP:

- Provides recommendations for design, planning, development, management, and maintenance of the summer trail system
- Incorporates recommendations from Tahoe Donner members gained during the TMP planning process
- Establishes a process for implementation of the TMP

View from Crag Ridge

The Plan does not provide nor attempts to address solutions to all of the issues facing the trail system; rather it provides a general guideline for the long term that allows for detailed planning from year to year. The Plan will be updated every five years in order to remain current with the needs of the membership, accommodate changes in use, and to allow for adaptive management.

1.2 Trails Master Plan Boundary

Tahoe Donner is comprised of approximately 7,000 acres, with over 4,000 acres of recreation space, and 1,300 acres of common area interspersed among the community homes (see **Figure 1-1**). The TMP covers the Association trails within the boundaries of Tahoe Donner and possible connections with other trail systems in the area. Any newly acquired properties will be included into the TMP boundary and subject to the standards and guidelines set forth in this Plan.

1.3 Vision

The Tahoe Donner trail system supports the varied membership use, encourages continual exploration and stewardship of the community and recreation space.

This Plan utilizes a planning method which designs trails to protect natural areas, accommodate multiple users, and provide access to significant features. The Plan also promotes connectivity within the Tahoe Donner community and connections with the Truckee-Tahoe community. This is a comprehensive approach which aligns and maintains trails as necessary to provide opportunities for non-motorized transportation, recreation, education, and nature appreciation and to protect sensitive environmental and cultural resources.

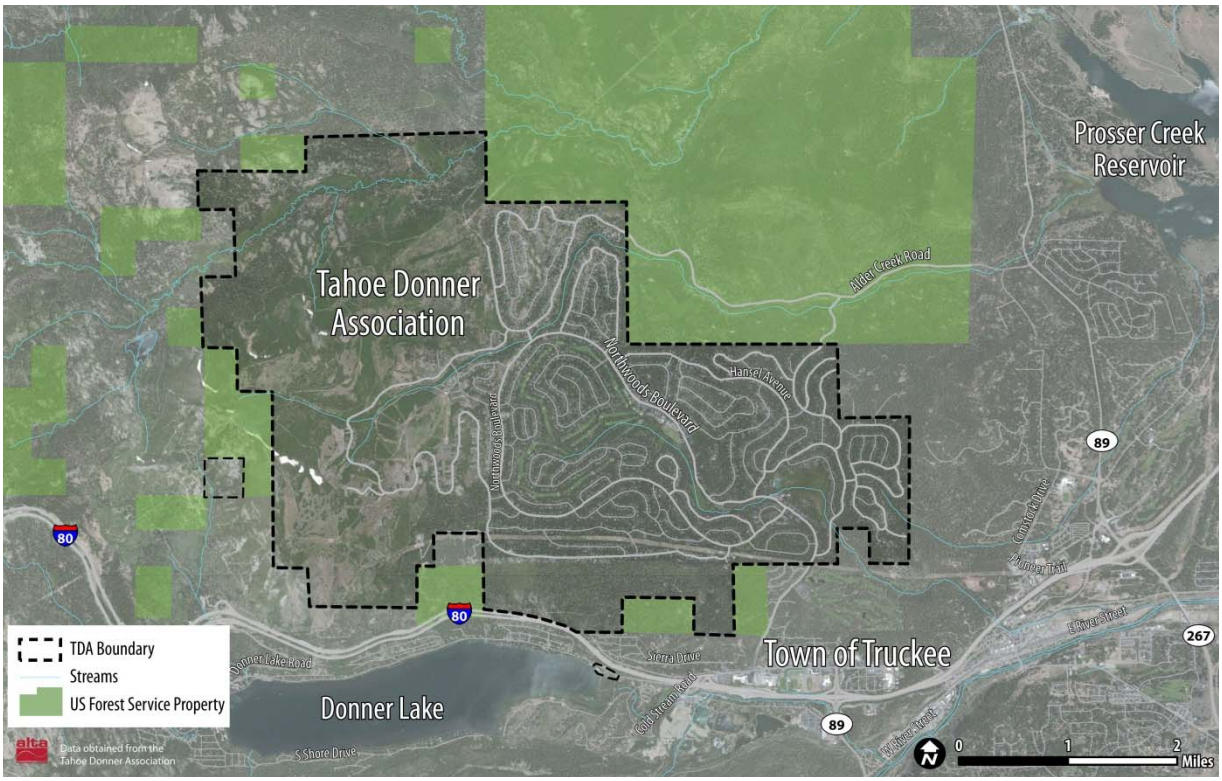


Figure 1-1: Tahoe Donner Trails Master Plan Boundary

1.4 Goals, Objectives, and Policies

With this Plan, the Association seeks to provide for an outstanding recreation experience through careful planning, development and implementation; and employ best management and maintenance practices keeping in mind safety, the environment, and historical resources.

Key goals of the Plan include:

Goal 1: Management. Establish management practices and protocol for a comprehensive trail system utilized by a diverse population.

Policy 1.1: Benefit and Opportunities. The trail system in Tahoe Donner will be managed to benefit the community and provide a variety of recreational opportunities for all user types.

Policy 1.2: Multi-Use Trail System. Tahoe Donner will provide a system of trails to accommodate a variety of users including hikers, joggers, bicyclists, equestrians, cross country skiers, snowshoers, and dog owners.

Policy 1.3: Trail System Rules. Management will work to establish and communicate trail system rules to reduce user conflict, effectively manage risk, and improve user experience.

Policy 1.4: User Conflict. Management will work to reduce user conflict through trail design and maintenance, as well as working with users to establish and promote communication for trail sharing.

Policy 1.5: Stewardship. Management of the trail system will make every effort to sustain the trail system and the surrounding environment through sound management practices and community involvement.

Policy 1.6: Resource Conservation. Tahoe Donner will strive to practice resource conservation through its trail system, future development, and programs established for the trail system.

Policy 1.7: Communication. Tahoe Donner will effectively communicate this Plan, projects and programs, and welcome user feedback.

Goal 2: Planning. Create a framework and focus for trail design, construction, and maintenance of the trail system through defined standards and priorities.

Policy 2.1: Trail Design, Construction and Maintenance for user group needs. Trail design, construction and maintenance will incorporate the needs of the user groups as specified in the recommended trails standards.

Policy 2.2: Trail Standards. Development, construction and maintenance of the trail system will conform to the recommended trail standards.

Policy 2.3: Trail Type. The trail system should include multi-use and user-preferred trails of varying levels of difficulty and provide the opportunity to connect to other trail systems which may offer more trail class types.

Policy 2.4: Trail Location. Any improvement work on existing trails will consider the recommended trail standards and key destinations. New trail locations will align with the recommended trail standards for design, development, construction and maintenance.

Policy 2.5: Easement Use. Reasonable attempt will be made to avoid utilizing the recreation easements on private property for the trail system.

Policy 2.6: Connectivity of Tahoe Donner Community. Tahoe Donner trail system will attempt to connect to landmarks, vistas, and other locations within the Association.

Policy 2.7: Connectivity to Regional Trail Systems. Focus will be given on connecting the trail system with trail systems and points of interest in the region to the benefit of the membership.

Goal 3: Development. Establish guidance for trail development and construction to achieve best practices and prudent funding mechanisms.

Policy 3.1: New Development. New development of trails will incorporate the recommended goals and policies. Development of trails will be at a level appropriate to the surroundings.

Policy 3.2: Evaluation Process. All projects will be evaluated individually for safety, feasibility, cost analysis and environmental impact.

Policy 3.3: Trail System Phasing. Phasing of trail system improvements will be based on project priority and funding availability. Project priority will be based on safety needs, environmental impact, member input, and the ability of the project to add immediate value to the existing trail system.

Policy 3.4: Construction Best Management Practices. Trail and ancillary facility construction will be consistent with best management practices to ensure goals and policies are achieved as well as minimize natural resource and neighbor impacts for the short- and long-term.

Policy 3.5: Project Management Best Practices. Every effort will be made to plan, implement, and execute each project thoroughly.

Policy 3.6: Agency Approval. Trail construction will be compliant with all relative land use and development regulations.

Policy 3.7: Tahoe Donner Association Funding. Funding will be considered for the development, construction, and maintenance of the trail system.

Policy 3.8: Outside Funding. Federal, State and private grant funds will be reviewed for the benefit of the trail system.

Goal 4: Maintenance. Provide for standardization of trail system maintenance.

Policy 4.1: Asset Preservation. Tahoe Donner will strive to maintain the trail system, ancillary structures, and the surrounding recreation space for sustainability.

Policy 4.2: Regular Maintenance. This Plan will serve as strategic guidance for the standard and type of maintenance to occur on the trail system.

Policy 4.3: Inspection. Regular systematic inspections of the trail system will occur to prevent and mitigate degradation of use, minimize hazards and risk, and promote general trail activity and feedback through trail presence by staff and the membership.

1.5 Planning Process

TMP Background

During the development of the Association's 2030 General Plan, the General Plan Committee Trails sub-group prepared a working paper which detailed the Committee's recommendation for land purchases to expand homeowners' recreation opportunities. There were also operational recommendations including human resource allocation dedicated to the trail system and increased focus on the trail system through the operational and capital budgets.

The Board of Directors approved the 2030 General Plan in early 2011, including approval to assess for land acquisitions as recommended by the General Plan Committee. The Board of Directors provided management with a directive to allocate resources to the trail system by way of operational and capital funding through inclusion of the trails and ancillary facilities as Reserve Replacement components. This allows for long-term planning and funding of the trail system. Furthermore, the Board of Directors directed management to prepare a trails master plan.

Tahoe Donner hosted eight trails member input, town hall, and Trails Master Plan Validation meetings in which to gather member's opinions on the current state of the trails, any future development or changes, and recommended trail improvements. The minutes for each meeting were posted on the Tahoe Donner website; the meetings were published on line and in the Tahoe Donner newsletter.

Tahoe Donner 2030 General Plan
March 2011

Trails Member Input Meetings
July 2011
August 2011
September 2011

Town Hall Meetings
September 2012
November 2012

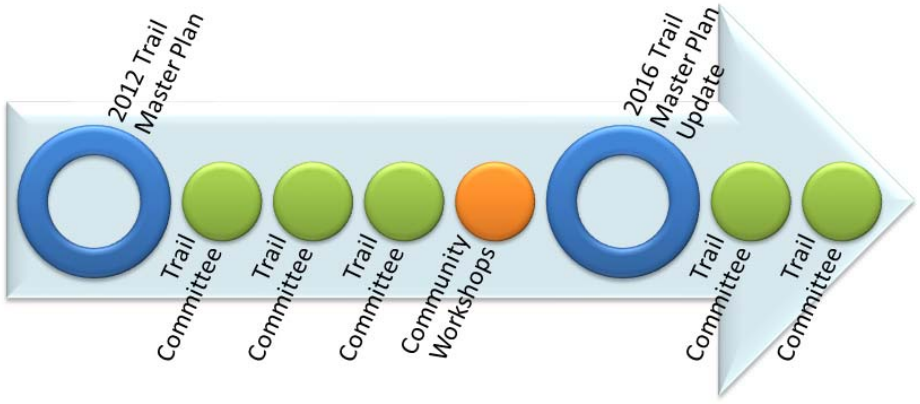
Trails Master Plan Meetings
September 2012
October 2012
December 2012

Trails Master Plan Process

Periodic Updates

The Trail Master Plan will be updated every five years in order to remain current with the needs of the membership, accommodate increases in use, and to allow for adaptive management. The review process diagrammed to the right illustrates how a Trail Committee and community-wide meetings will interface with the update process.

Adaptive Management is a process of making slight adjustments to a system as needed to meet goals and objectives. Tahoe Donner management can utilize an adaptive system by engaging active trail users through a Trail Committee. The Trail Committee could meet several times a year and work with management to discuss and resolve trail issues.



Trails Master Plan Update Process

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2 Relationship to Tahoe Donner Guiding Plans and Regional Trails Master Plans

This section provides key goals and recommendations from Tahoe Donner and other agency plans that provide guidance for the planning, design, operation, and/or maintenance of the Tahoe Donner trail system and connecting regional trails.

2.1 Tahoe Donner Plans

Tahoe Donner Strategic Plan (2010)

- Goals 2010 – 2015
    3. Establish leading year round Association specific events and programs to benefit the membership.
    7. Establish a proactive approach to maintaining the health of our natural resources and defensible space.

2030 General Plan (2011)

- Purpose.
    - "The primary concern of the membership, as established in past General Plan Surveys, is to maintain Tahoe Donner character as a mountain community."
    - "Continuously maintaining and upgrading amenities to benefit the membership and capture public use and revenue, while still giving members priority and preference, is highly desirable."
- Funding.
    - Development fund draws approx. $1.6 million each year from assessed parcels. Year 2012 assessed funding level for the Development Fund is $250 per assessed unit. Used for identified projects and building maintenance/replacement.
    - Additional funding of the 2030 General Plan beyond the annual assessment may take place by annual transfers into the Development Fund from the Operating Fund, based on the current Operating Fund policy and net operating results achieved favorably in excess of budget each year. Appropriate Reserve Replacement Funds will also be utilized to fund projects which have components that are identified and funded thru the 30-year Reserve Study.
- Projects.
    - 2010-2015 Projects.

        - The plan calls for the expansion of parking lots for both the Cross Country Ski Lodge and for the Downhill Ski Area. Both parking lots are closely adjacent to trailheads.
        - The plan sets aside $700,000 for land acquisition, possibly for securing additional recreation space.
    - 2015-2020 Projects.
        - Construct and/or replace trail bridges at Alder Creek & at Trout Creek.
        - Construct a bridge to accommodate trail expansion across Prosser Creek. This project is contingent upon securing additional property in the Euer Valley.
    - Additional Project Considerations. Parking expansion and restrooms at the Glacier Way trailhead. Improvements at other graveled off-road parking at other trailheads. Create a long-term strategy to align with homeowners desires to maintain, preserve, and enhance the recreation user experience.

2.2 Plans by Other Agencies

Town of Truckee Trails & Bikeways Master Plan (2007)

- Goals.
    - Development Goal 1 – New Development. New development should provide for trail alignment reservations, dedications, and/or construction when trail corridors are identified within the Plan through these private lands.
- Policies.
    - A public forum should be established, in cooperation and coordination with local and regional responsible agencies and community groups, to encourage community and affected landowner participation in the preparation and review of proposed projects and their management.
- Types of Recreational Trails
    - In most applications, recreational trails involve the use of soft surface trail surfaces. Recreational trails will encompass a wide variety of designs, ranging from rough-graded dirt single-track trails to wider decomposed granite or gravel paths. The type, width, and surfacing of recreational trails will be dependent upon the anticipated use and user of the individual trail segment.
    - Class I bike paths, defined as a separated (from the roadway) paved surface path, are also considered within the recreational trail classification. Consistent with Master Plan Planning Goal 3, Class I bike paths are the preferred type of recreational trails due to their capability of supporting multiple types of users, although not practical for all trail segments due to a less intense projected use and / or physical site constraints.
- Proposed Trails and Bikeways (from Appendix D Exhibit 1 Local Map).

- Bike lanes on Alder Creek Rd.
- # 4 Recreational Trail. Tahoe Donner to Commemorative Emigrant Trail. Connects to: 15, 16 & Alder Creek Road bike lane. Regional link.
- #5 Recreational Trail – Surface TBD. East end of Donner Lake to Donner Summit. Connects to: 8 & Sierra Drive bike route. Regional link.
- #8 Recreational Trail – Surface TBD. Armstrong Tract/Donner Lake to Tahoe Donner. Connects to: 5, 13, Northwoods Blvd. bike lane & Thomas Drive bike route.
- #10 Recreational Trail – Surface TBD. Gateway to Tahoe Donner. Connects to: 13 (Tahoe Donner 3rd access) & Donner Pass Road bike lane.
- # 11 Class I with Unpaved Element. Tahoe Donner to Downtown. Connects to: 12, 13, 20 & Lausanne Way / Basel Place bike routes.
- # 12 Recreational Trail – Surface TBD. East end of Tahoe Donner to Commemorative Emigrant Trail. Connects to: 4, 11 & 16.
- # 13 Class I Bike Path. Downtown to Tahoe Donner Connects to: 8, 10, 11, 20, 21 & 27.
- # 16 Recreational Trail – Surface TBD. Prosser Lake Heights/PC-2 to Tahoe Donner/ Commemorative Emigrant Trail. Connects to: 12 & Beacon Road extension bike route.

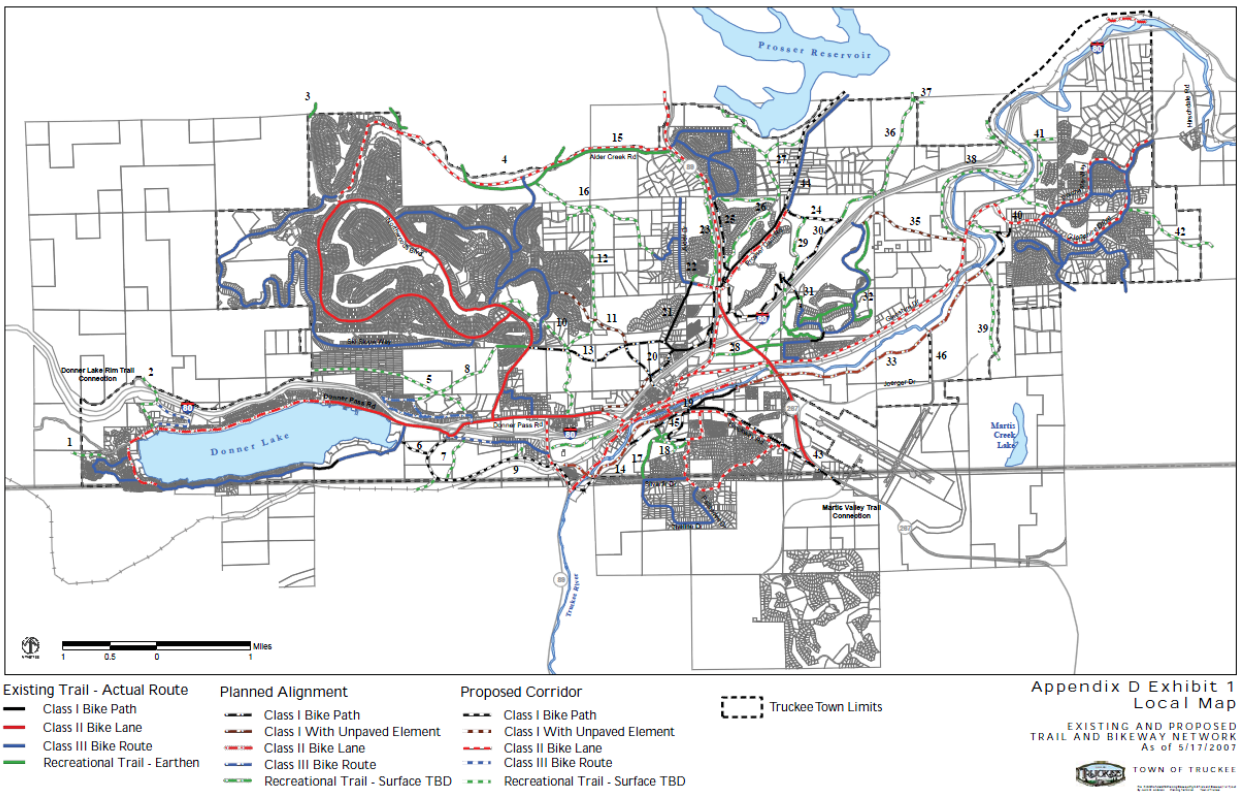

Figure 2-1: Town of Truckee Trails & Bikeways Master Plan Appendix D Exhibit 1 Local Map

Nevada County General Plan (1995)

- Objective 5.6: "To create a comprehensive, and where possible integrated, regional recreational trails system."

Nevada County Non-Motorized Transportation Plan (2000)

- There are five "Trail Study Corridors" adjacent to the TDA plan area: the Donner Lake Rim 2, Commemorative Emigrant, and Carpenter Valley 1 through 3 Study Corridors.

3 Existing Trail System

This section describes the existing Tahoe Donner trail system, including key destinations, trail types, trail system rules, and signage and wayfinding. Existing regional trails and connect with Tahoe Donner trails are also identified.

Sundance

3.1 Trails within Tahoe Donner

Tahoe Donner's 38-mile multi-use trail system includes old logging/fire roads and single-track trails that traverse residential neighborhoods and the high alpine environment in the Sierra Nevada (see **Figure 3-1** and **Figure 3-2**). The trail system provides access to mountain top views, expansive meadows, and Tahoe Donner activity centers. Several trails traverse year-round and seasonal springs, which also support the biological habitat of the area. The trails are made of earthen surface, semi primitive, and are for non-motorized, maintenance vehicle, and emergency vehicle access.

Brief History of the Trail System

Tahoe Donner Association was originally developed with the intention of building a family resort with vacation amenities for its members. The first home was built in 1971. The original trail system was constructed for equestrian use and consisted of approximately 15 miles. It was maintained by Multi-Use Management (M.U.M.), an outside contractor. In 1982, Tahoe Donner Association acquired the 2,000 Acres, which contains many forest roads and skid trails created to facilitate the late 1800's logging operation to support the railroad and the salvage logging operation after the 1960 Donner Ridge Fire.

Doug Smith, the first forester for Tahoe Donner (from 1988 until 1993) created the basis for today's trail system. There were 16 miles of multi-use trails in 1994. Since that time, the TDA Forestry Department has continued to construct new trail segments and reroute exiting trails as needed to improve access and protect sensitive resources.

Since 2002, Tahoe Donner has acquired an additional 1,142 acres, including two Euer Valley purchases, the Bucknam-Sinclair Tract, the McGlashan Springs parcel, and a 20 acre property adjacent to the Bucknam-Sinclair Tract. The acquisitions included documented cross country skiing access to the Euer Valley floor through a previous recreational license, timber harvest and other access roads, and horse trails.

Today, the trail system varies in development with 18.2 miles of single track and 20.6 miles of trail following a system of old logging and access roads. Many of the existing trails were developed as logging and access roads which do not provide a varied user experience or do not connect to vistas or other points of interest. Others were built with steep grades or along creeks and experience regular problems with erosion. In recent years, Association members have expressed interest in a more deliberate trail experience.

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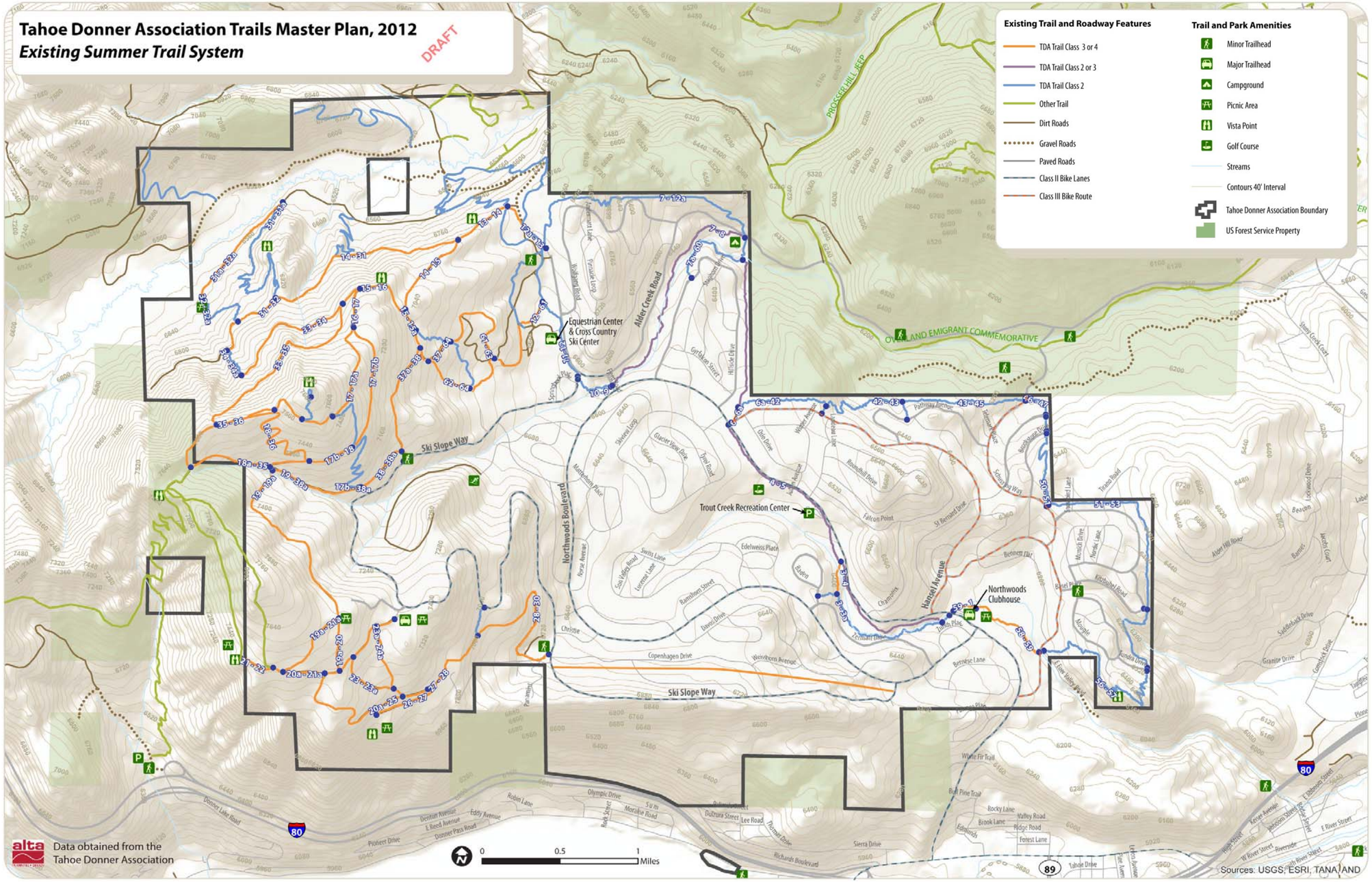

Figure 3-1: Existing Summer Trail System

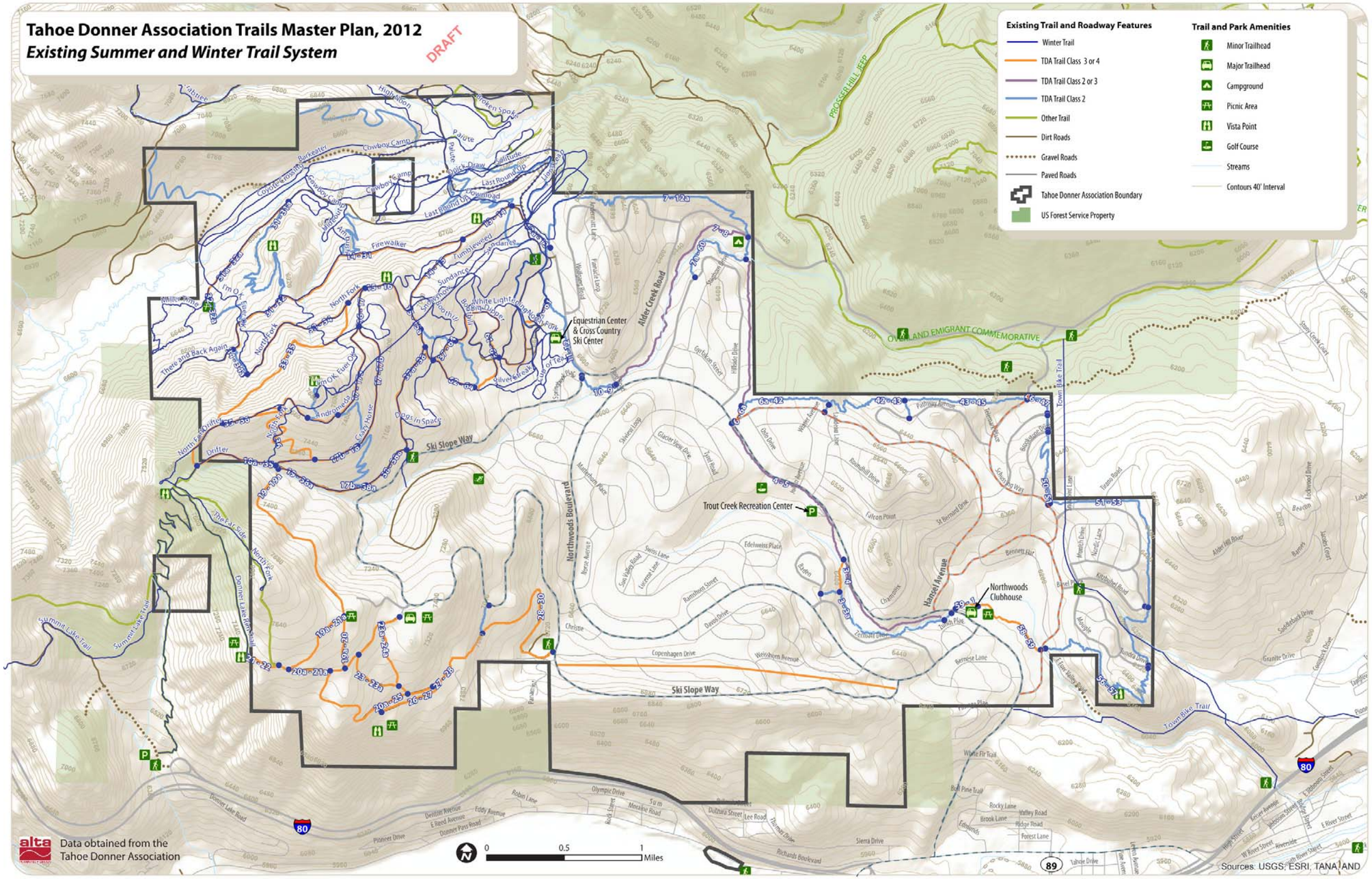

Figure 3-2: Existing Summer and Winter Trail System

Key Destinations

The trail system provides access to a number of destinations within and near to Tahoe Donner (**see Figure 3-1**). See *Section 3.2 Trail Connections* and *Section 4.5 Regional Connections* for discussions on regional trail connections.

Within Tahoe Donner

- Equestrian Center
- Cross Country Center
- Downhill Ski Area
- Trout Creek Recreation Center
- Northwoods Clubhouse
- Driving Range
- Golf Course
- Tennis Course
- Alder Creek Campground
- Northwoods Pool/Playground

Near Tahoe Donner

- Downtown Truckee
- Donner Lake
- Vistas (various)

The vista overlooking Donner Lake at Trail Marker 22 serves as a destination for trail users

Trail Types

The trail system consists of old access roads, old logging skid trails, equestrian trails, and trails adopted into the system as a result of repeated use. Historically, trails have been constructed to various standards. Few trails were actually built by the TDA Forestry Department as multi-use recreational trails.

In recent years, Tahoe Donner has sought to construct and maintain trails to United States Department of Agriculture Forest Service's (U.S. Forest Service's) standards[1]. **Table 3-1** provides a short description of the U.S. Forest Service standards for trail types 4 through 2, as modified for Tahoe Donner trails.

[1] Within the Tahoe region, the Tahoe Rim Trail, the Pacific Crest Trail, and the Donner Lake Rim Trail all use the Forest Service standards for trail construction and management. The successful implementation and execution of these standards has led management to recommend adopting the usage of the USDA Forest Service trail standards for classification, design, construction, and maintenance.

Table 3-1: Trail Types

Type 4	Type 3	Type 2
• Wide smooth tread • Vegetation cleared away • Obstacles infrequent • Trail signs and structures common	• Tread continuous and obvious • Vegetation cleared away • Obstacles common • Trail signs for assurance • Structures common	• Tread continuous, but narrow and rough • Vegetation may encroach on trail • Obstacles common and substantial • Trail signs at junctions • Structures limited
		

Some trails at Tahoe Donner do not meet these standards due to the fact that they were constructed before such standards were widely accepted and/or are limited by slope and available area. In an effort to standardize existing trails, management has cataloged the entire trail system according to the modified U.S. Forest Service standards and identified work to be completed to get the existing trail system to a consistent standard. **Table 3-2** presents a summary of Tahoe Donner trails by U.S. Forest Service trail classification.

Table 3-2: Existing TDA Trails by Trail Type

US Forest Service Trail Classification	Single Lane Road (Miles)	Single Track Trail (Miles)
4	0.04	--
3 or 4	22.38	1.26
2 or 3	2.02	--
2	0.01	12.64
Subtotal	**24.45**	**15.92**
Total		**38.35**

Trail Conditions

Problematic trail conditions include erosion, impediments to access to and through the trail system, flooding of trail segments, and vegetation overgrowth (see **Figure 3-3**).

Long, steep slopes exacerbate erosion problems

Erosion

Much of the soil underlying the Town of Truckee consists of glacial till, moraines, and outwash[2]. These soils, which can be described as silty/sandy gravels or gravelly/silty sands, are susceptible to erosion. Sections of the trail system were constructed on steep slopes with poor soils, including many popular mountain biking and equestrian trails. Heavy use exacerbates erosion resulting from unsuitable design. Additional trail segments (e.g., between Trail Markers 7 and 8) receive water from an adjacent street, which causes further erosion.

Steep grades near Marker 50 make accessing the trail challenging

Access To and Through the Trail System

Access needs include bridge and elevated walkways and street crossing improvements. There are sections of the trail that egress from town streets and rights-of-way. These areas are particularly prone to erosion because of the difference in elevation between the road and trail corridor. Trail crossings are not signed. Several areas along the trail are identified as being habitually wet (e.g., along Alder Creek). All types of users will avoid mud within the trail tread by walking around it, which widens the trail tread and increases the potential for erosion. Trail users also widen the trail tread to avoid cobble-sized rocks within the tread.

Rocks within the trail tread create obstacles, leading to braided trails and increased erosion

Flooding

Several trail segments are located within a floodplain. Beaver activity along Alder Creek is raising the water level, causing the adjacent meadow and creek to flood.

[2] Town of Truckee 20205 General Plan Draft Environmental Impact Report, 2006.

Vegetation Overgrowth

Vegetation clearing is needed for fire safety and access. Dead trees present a hazard to trail users and must be removed annually to minimize the potential for bark beetle attacks.

Ancillary Facilities

Ancillary facilities include trailheads and related structures including parking and pet waste receptacles, picnic tables and benches, signage, and bridges and elevated walkways (see **Figure 3-1**). **Appendix A** catalogs each ancillary structure.

The Nature Loop trailhead includes a kiosk with a trail map, directional signage, garbage receptacle, and a pet waste station

Trail System Rules

Tahoe Donner staff has developed the following trail system rules.

Access Rules

- No motorized vehicles
- Only enter and exit the trail systems at a trailhead, community or other approved connectors
- Trail system is open from sunrise to sunset
- Obey all signs, gates and barriers
- Do not enter a "no trail" or "closed" area

Safety Rules

- Yield Standard - mountain bikers yield right of way to hikers and equestrians
- Plan ahead and be informed
- Never spook animals
- Beware of natural wildlife and respect their space
- Carry photo identification at all times
- Communicate your presence
- Stay in control of your bike and/or animal at all times
- Report and suspicious or innapropriate activities

Usage Rules

- Trails are multi-use
- Stay on designated trails
- Pets must be on leash at all times
- No camping on trails
- No fires, fireworks, firearms or hunting

Sustainability Rules

- Leave no trace
- Practice low impact use
- Respect others and the resource
- Building features and trails is prohibited
- Prevent spreading invasive seeds

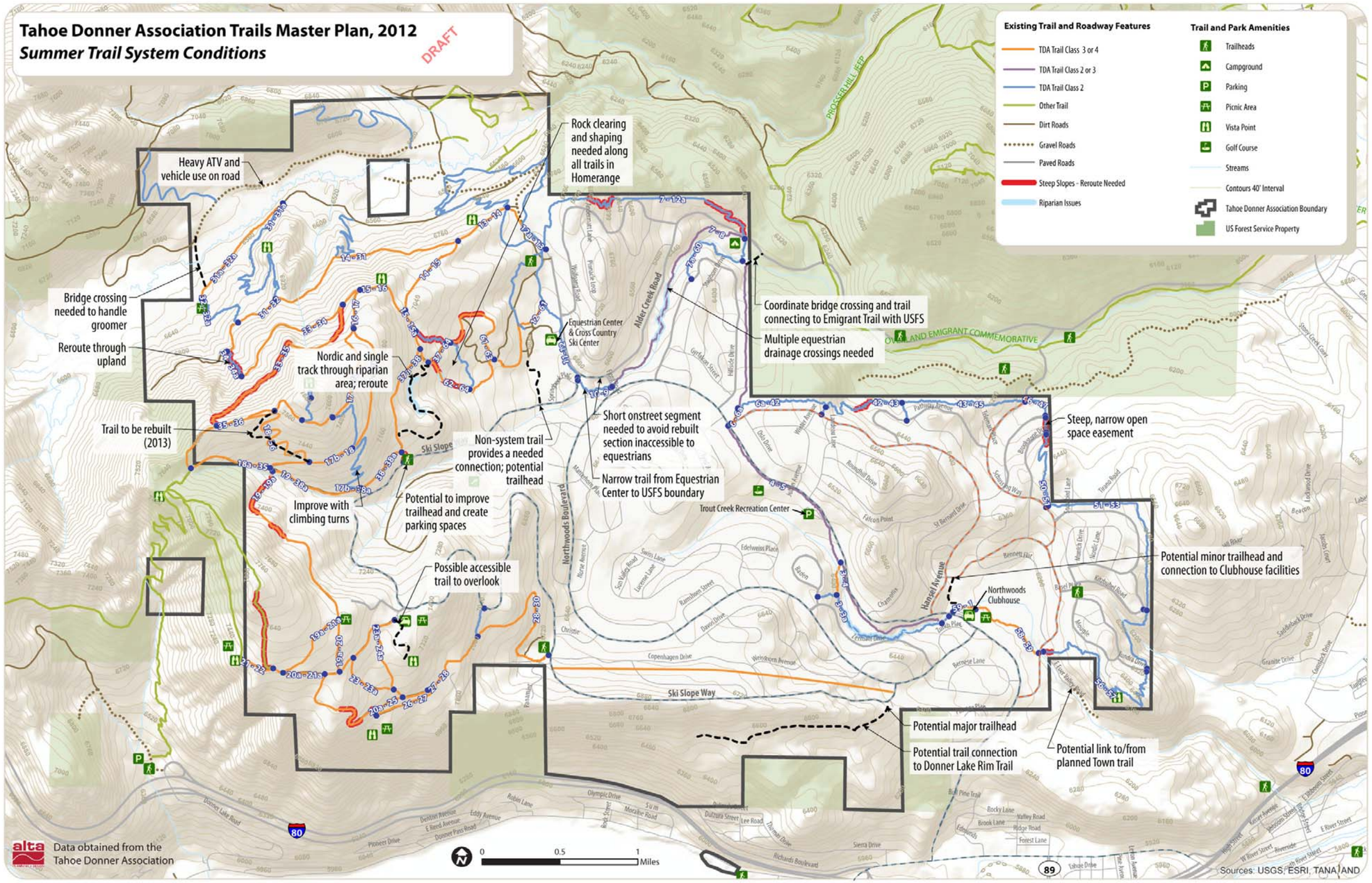

Figure 3-3: Existing Summer Trail Conditions

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Signage and Wayfinding

There are currently three different trail systems using three different signage systems in Tahoe Donner.

Sign Post 3

Cross Country Ski Signs

Winter signs are posted by the Cross Country Ski Center and the summer signs are posted by the TDA Forestry Department, both are removed seasonally.

TDA Signs

Signs erected by Tahoe Donner Association must be brown and white and cannot be attached to trees or vegetation. Yield signs were added in August of 2011 to educate users to the trail etiquette. There are a series of interpretive signs erected on the Nature Loop. These signs are geared for interactive use with families as they enjoy the scenery and active wildlife.

Other Signs

There are also metal signs placed at various entry points into Tahoe Donner. They identify the property boundary and trail network as non-motorized. These signs currently need to be replaced as they remain outside all winter and are no longer legible. No hunting signs have been added for hunting season at possible entry points.

3.2 Trail Connections

U.S. Forest Service

Tahoe Donner's boundary is contiguous with several U.S. Forest Service properties. Because of the common boundary with public lands, there are many points Tahoe Donner residents use to access them. Several user created trails exist through U.S. Forest Service land to the Tahoe Donner trail system (off of trail marker 7A) which cause significant erosion problems. There are additional user created trails behind St. Bernard Drive through U.S. Forest Service property. While the Tahoe Donner trail system connects to U.S. Forest Service trails, the U.S. Forest Service (and not TDA) maintains and monitors trails on U.S. Forest Service properties.

Emigrant Trail

The Emigrant Trail is a Tahoe National Forest trail that includes 20 miles of single track and connects with Prosser Reservoir. It is a historic route used by early settlers to California and a very significant trail within the Town of Truckee. The trail starts just outside Tahoe Donner boundaries on Alder Creek Drive.

Donner Lake Rim Trail (DLRT)

Currently the DLRT ends at trail marker 22 as it travels through U.S. Forest Service land from Negro Canyon. The DLRT plans to extend along the ridge between Skislope Way and Interstate 80 (I-80). There is a recreation easement through the Tahoe Donner property known as the Bucknam Sinclair tract, which was established at the time of the joint effort to purchase this property with the Town of Truckee and the Truckee Donner Land Trust. The continued expansion of the DLRT will improve access to the Marina and Donner Lake for Tahoe Donner members.

Donner Lake Rim Trail from Trail Marker 22

Town of Truckee

As of February 2012, the Town of Truckee is preparing a preliminary Design Report for paved, multi-use trails between Downtown Truckee and Tahoe Donner. The feasibility study was paid for with Town Special Service Area (TSSA-1) funds and two routes have been surveyed. The trails will provide an alternate route to travel along Northwoods Boulevard, a major collector roadway in Truckee which connects Tahoe Donner to Donner Pass Road. The Town of Truckee's Trail 11 alignment extends from Basel Way to the corner of Bridge Street and Jiboom Street in downtown Truckee. The Town of Truckee's Trail 13 alignment connects with Northwoods Boulevard near the intersection of Lausanne Way and follows the power line easement to Comstock Drive and Pioneer Trail. Both trails are being considered. The City has authorized use of TSSA-1 funds for construction of the Trail 13 segment between Northwoods Boulevard and E. Euer Valley Road.

Bikeways in Tahoe Donner

The Town of Truckee has jurisdiction over streets within Tahoe Donner and maintains several on-street bikeways within the Association boundary. Northwoods Blvd includes Class II bike lanes (see **Figure 3-1**). Skislope Way, Hansel Avenue, part of Schussing Way, and Lausanne Way include Class III bike routes. A Class II bike lane provides a striped lane for one-way travel on a street or highway. A Class III bike route provides for shared use with vehicular traffic. On-street bikeways can facilitate non-motorized access to trails.

4 Needs Analysis

This section summarizes beneficial aspects of trails, Tahoe Donner trail user groups, and membership input gained during the planning process. The Tahoe Donner trail system is multi-use which provides for all types of users on all trails. A brief overview of types of trail users establishes known facts about these groups and provides for better management.

4.1 Benefits of Trails

A well-planned trail system benefits the surrounding community in many tangible and intangible ways. The Equestrian Design and Guidebook for Trails Trailheads and Campgrounds by the U.S. Forest Service succinctly details these benefits:

- Conservation of the natural environment, native species and wildlife corridors
- Alternative to motor vehicle travel by linking to other trail systems and open spaces
- Access to remote areas
- Increased opportunities for physical activity and outdoor recreation
- Increased property values and benefits to the local economy

4.2 User Groups

The trail user groups include foot travel users, mountain bikers, equestrians, and winter sport enthusiasts. The trails are primarily used in the summer; however, there is an increasing number of winter time uses including snowshoeing, backcountry skiing, and skijoring in the Cross Country Ski Area boundary area and trails. Motorized vehicles including ATVs, motorcycles, snowmobiles, and vehicles, are prohibited from use off-road within the boundaries of Tahoe Donner with the exception of motorized vehicles associated with maintenance and recreation support uses (e.g., vehicles used to transport food and supplies for recreational activities, including summer family BBQs and other group activities) authorized by Tahoe Donner.

Foot Travel Users

Foot travel users – hikers, runners, walkers - may constitute the largest user group on Tahoe Donner trail network. Due to the numerous trail access points, it is difficult to enumerate hiker use levels. However, the Tahoe Donner Hiking Club has 236 active members and regularly schedules hikes both in Tahoe Donner and outside the Association.

Hikers enjoy the Hillside access trail

Hikers are the most flexible trail users and adapt to the broadest range of trail designs. Traveling by foot allows hikers to adjust to varying trail conditions, travelling over trails that are extremely steep or barely evident. Hiking trails generally traverse all types of environments, grades, and surfaces. While people on foot can impact the trail and surrounding resources,

upgrading or adding structures to manage impacts of a hiking-designated trail is less problematic than for equestrian or mountain bike trails.

Mountain Bikers

Although the Tahoe Donner trail system was not originally designed with mountain biking in mind, this user group uses the trail system as a significant resource and utilizes the system to access other popular trail networks neighboring Tahoe Donner.

Mountain bikers enjoy Tahoe Donner's varied terrain

Tahoe Donner mountain bikers can be characterized as cross country mountain bikers and trail riders. Cross country mountain bikers generally prefer riding point-to-point or in a loop that includes climbs and descents on a variety of terrain. Recreational mountain bikers prefer to bike on single-track trails and dirt roads.

Tahoe Donner Bike Works was established in 2011 and includes a bike rental and maintenance shop. It is located at the Cross Country Ski Center. Bike

Several popular mountain biking routes already cross or connect to Tahoe Donner property, including Hole in the Ground, Summit Lake, Negro Canyon, and some popular trails on U.S. Forest Service land off Wolfgang Road. These biking trails are recognized and described on outside websites.

Equestrians

There is a long history of equestrian use in the Truckee-Tahoe region with record of horse and rider use on trails in Tahoe Donner prior to its development. Currently, the Equestrian Center owns approximately 20 horses which are available for public trail rides. The Equestrian Center uses approximately four to six of the trails on the trail system for group trail rides; boarders and daily use riders utilize the entire trail system through a daily trail pass available at the Center. Trail rides are offered four times daily and can range from one to two hours in length.

Equestrians partake in individual and group trail rides

Equestrian trails have a more demanding set of requirements than hiking trails including a greater line of sight to give the animals a chance to react to objects and other trail users. Horse and rider also constitute the largest sized user on most trail systems. Metal horse shoes create additional pressure on the trail surface. Horse riders appreciate shaded trails; Equestrian Center staff chose the trail ride routes for that reason. The Equestrian Center needs a minimum of three routes for group trail rides; two routes where the rides last one hour in length, and one to two routes for the two hour trail rides.

Cross Country Skiing, Snowshoeing, and Other Non-Motorized Winter Users

There are several established cross country centers with winter trail systems in the Truckee-Tahoe region, including Tahoe Donner's Cross Country Center. In addition to using established centers, cross country skiers, snowshoers, and other winter sport enthusiasts utilize the expansive National Forest lands in the region for their sport.

Winter trail use includes cross country skiing and snowshoeing

Tahoe Donner's Cross Country Center receives an average of 30,000 skier visits a year. The Cross Country Center charges a fee for day and seasonal passes. These are the only type of trails maintained for winter use. The Center utilizes much of the recreational space for its trail system however; it does not follow the summer trail system in many cases (see **Figure 3-2**). Winter trail users use groomed winter trails (some of which are located along summer trail routes and some of which are not) and create their own routes. Individuals who utilize the Cross Country area trails to access out of bounds open space are subject to the Center's current policies and Trail Pass requirements.

Snowshoeing is permitted on designated snowshoeing trails within the Tahoe Donner Cross Country Ski Area, while the area outside the Cross Country Ski Area boundary is open to member access without a trail pass. The Glacier Way Trailhead has been a popular spot for members to snowshoe, access back country skiing and walk their dogs during the winter months. Intermittently in the past and again during the 2010/11 season, Tahoe Donner groomed a section of Glacier Way trail where dog skiing was allowed. In 2010, the TDA Forestry Department installed pet waste stations at trailheads. The TDA Forestry Department empties the station at Glacier Trailhead in the winter. In 2012/13, the Cross County Center added two dog trails leaving from the Center.

Some of the winter trails experience repeated drainage problems and may benefit from drainage improvements or reroutes.

4.3 Membership Input

Membership-recommended areas of focus for the TMP include:

- Vision for the trail system
- Appropriate usage of the trails
- Set priorities for improvements
- Improvements to existing trails
- Signage improvements
- Identification of funding mechanisms for the trail system
- Future trail development focus
- Increase and encourage community involvement

Members have expressed a desire for more connections to the trail system within Tahoe Donner neighborhoods and more secondary trailheads. Many non-system trail connections exist through common areas in neighborhoods that join up to the existing system. A few noted connections include:

1. There is a user created trail through the common area (3K) on Skislope Way that connects to Teton Way. It travels along a side hill and shows little erosion. However, it traverses the back of some private lots.
2. The Nature Loop has a connection to Zurich Place.
3. The trail comes very close to Wolfgang Road on the second switchback coming down the hill from trail marker 12A. Homeowners in the area use this access point.
4. There is an access point to the trail network from Skislope Way to just east of trail marker 19.

4.4 Non-System Trails

Tahoe Donner includes a number of trails that are not considered part of Association's trail system, including Nordic trails, old dirt roads constructed to facilitate logging or site access, and volunteer trails for hiking, biking, and equestrian use. Volunteer trails are user made trails that can imply a desired connection or experience not provided by the current trail system. Some volunteer trails traverse steep slopes leading to erosion problems. Others may duplicate access to a desired amenity. Some non-system trails, such as the paved, accessible trail from Glacier trailhead, would be valuable additions to the Tahoe Donner trail system.

The trail system could incorporate some non-systems trails, such as the paved trail from Glacier Way Trailhead

4.5 Regional Connections

The General Plan Committee has placed a priority on increasing the connectivity of the Tahoe Donner trail system with other trail systems and neighborhoods in the Truckee area. The U.S. Forest Service manages much of the land bordering Tahoe Donner, providing the opportunity for managed access through U.S. Forest Service properties. Many of the connections between the Tahoe Donner trail system and public land are the result of long periods of informal use. Formalizing these connections will keep these trails open and benefit the membership.

5 Design Guidelines

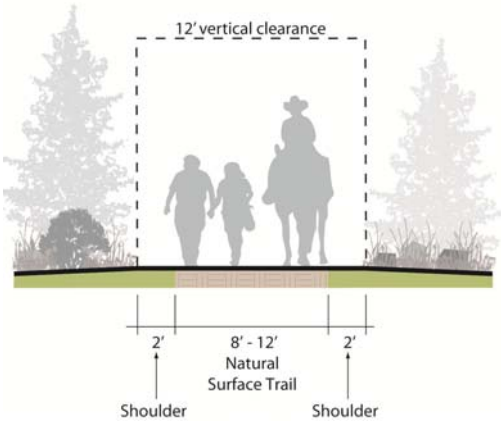
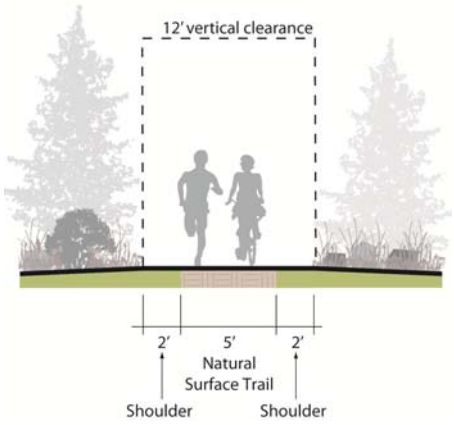
Trail Standards

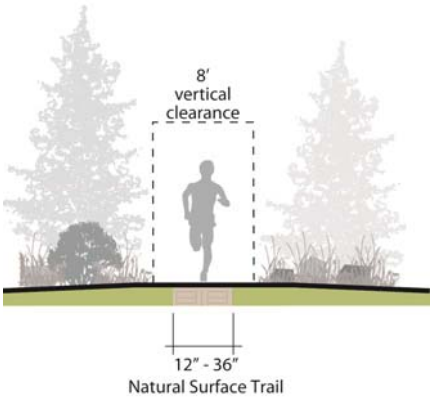
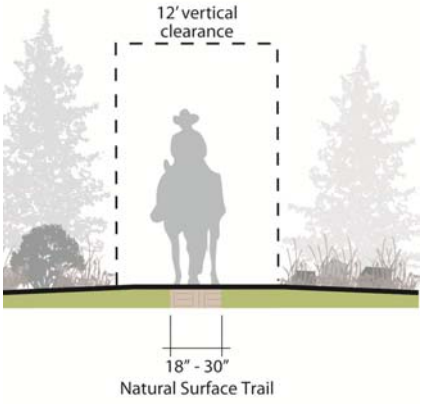
Tahoe Donner's existing trail types are adapted from U.S. Forest Service Trail Classification descriptors. The recommended trail types further refine the existing trail types, incorporating local conditions, topography, and user group needs. The trail types are roughly consistent with Town of Truckee trail types. The Plan recommends four trail types, as summarized below, to represent a range of development scale. All trails are multi-use.

- Type 4 Multi-Use. This trail type is a wide double-track trail where users can pass or walk side by side.
- Type 3 Multi-Use. These trails are wide single-track trails with passing pull-outs.
- Type 2 Hiker and Mountain Biker Preferred. This narrow single-track trail type is designed to meet the needs of hikers and mountain bikers. Equestrians would be allowed on these trails.
- Type 2 Equestrian Preferred. This narrow single-track trail type is designed to meet the needs of equestrians. Hikers and mountain bikers would be allowed on these trails.

The trail types incorporate the following maintenance best practices for sustainable trails:

- Trail Grade: Grade is the elevation gain between two points divided by the linear distance between them. It is expressed as a percentage. The "Half Rule" is a general guide for trail grading such that a trail should not exceed half the grade of the hillside it traverses. The recommended average grade for recreational trails is between 5 and 10 percent. Trails with greater difficulty can reach grades of up to 15 percent with sufficient armoring and reinforcement. Trails over 25 percent are not recommended.
- Out sloping: Outsloping is a common practice used to increase drainage off trails whereby the downhill or outer edge of the trail tread is tilted slightly downwards away from the high side. Recommended outslopes vary from 3 to 8 percent.
- Vertical Clearance: Vertical clearance should be adequate to allow trail users to pass underneath trees. The recommended space from trail tread to vegetation should be 8 to 12 feet. If more than half of a tree must be pruned for clearance, then it should be removed.
- Horizontal Clearance: Along narrow trails, both the U.S. Forest Service and Nevada County trail standards recommend vegetation should be cleared approximately three feet either side of the center. On a heavier used trail the corridor can be up to 16 feet wide. On moderate to steep side slopes users traveling along the outer or lower edge of the trail can cause tread failure; therefore vegetation should be cut on the uphill side of the trail to encourage users to stay to the high side.
- Sustainability of the natural environment: The natural aesthetic is an important factor in designing and maintaining trails. The trail should "lie lightly on the land", as if it had always been there. Trail builders must take advantage of features in the landscape for drainage.

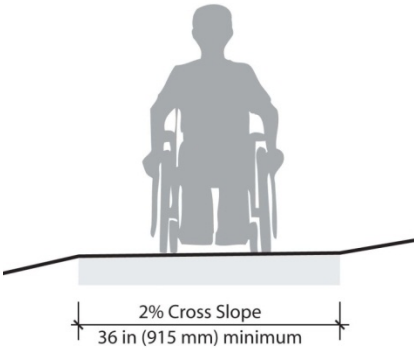
Trail Type	Type 4 Multi-Use	Type 3 Multi-Use
Overview	This is a wide, multi-use trail.	This is a narrower multi-use with passing pull-outs. Type 3 ADA Multi-Use trails meet Type 3 and Universal Design trail standards.
Photo		
Cross Section		
Tread Width	8' to 12'	5'
Horizontal Clearance	12' to 16'	9'
Vertical Clearance	12'	12'
Surface	Native soil and rock	Native soil
Average Grade	</= 5%	</= 5%
Max Grade	10%	15%
Outslope	2 to 5%	3 to 8%
Climbing Turn Radius	15' to 20'	7' to 15'
Switchback Turn Radius	>/= 10'	3' to 8'

Trail Type	Type 2 Hiker and Mountain Biker Preferred	Type 2 Equestrian Preferred
Overview	User preferred trails are multi-use, but designed to meet the needs of one or multiple trail user groups. These standards would be implemented along with trail mapping and signage to communicate high use by one or more user groups. Wider passing spaces would be provided at intervals not exceeding 1,000 feet.	
Photo		
Cross Section		
Tread Width	12" to 36"	18" to 30"
Horizontal Clearance	3' to 4'	4' to 8'
Vertical Clearance	8'	12'
Surface	Native soil and rock	Native soil
Average Grade	</= 10%	</= 5%
Max Grade	25%	15%
Outslope	3 to 8%	3 to 8%
Climbing Turn Radius	>7'	>10'
Switchback Turn Radius	2' to 8'	3' to 8'

Universal Design

Description

Tahoe Donner strives to meet the needs of a broad range of users, including those with physical and cognitive impairments. Oftentimes, constructing outdoor trails includes challenges that make meeting ADA guidelines difficult and sometimes prohibitive. Prohibitive impacts of meeting ADA standards include harm to significant cultural or natural resources, a significant change in the intended purpose of the trail, requirements of construction methods that are against federal, state or local regulations, or terrain characteristics that prevent compliance.



As stated in the ADA Guidelines, every effort should be made to install and maintain accessible trails. To this end, the Guidelines contain standards for accessible trails such as maximum running slopes, minimum width and frequency of resting spaces, maximum acceptable gaps in the trail surface, optimal clearances and signage requirements. The Guidelines further state that accessible trails should represent the most significant features and environmental experiences unique to the area.

The following table represents the best practices as outlined by the California State Parks Accessibility guidelines and the U.S. Access Board's Draft Final Accessibility Guidelines for Outdoor Developed Areas.

Item	Recommended Treatment	Purpose
Trail Surface	Hard surface such as asphalt, concrete, wood, compacted gravel	Provide smooth surface that accommodates wheelchairs
Trail Gradient	5% maximum without landings 8.33% maximum with landings 10% maximum for a distance of 30 feet 12% maximum for a distance of 10 feet	Greater than 5% is too strenuous for wheelchair users
Trail Cross Slope	2% maximum	Provide trail drainage, avoid excessive gravitational pull to side of trail
Trail Width	36" minimum, 60" passing areas	Accommodate a wide variety of users and allow for the passage of two wheelchairs
Detectable pavement changes at curb ramp approaches	Place at top of ramp before entering roadways	Provide visual and/or tactile queues for visually impaired users
Parking	Provide at least one accessible parking area per every 25 vehicle spaces at each trailhead	User convenience and safety
Rest Areas	On trails specifically designated as accessible, provide rest areas or widened areas on the trail optimally at every 300 feet	User convenience and safety

Guidelines

- Draft Final Accessibility Guidelines for Outdoor Developed Areas (AGODA) (2009)
- FHWA. (2001). Designing Sidewalks and Trails for Access, Chapter 14: Shared Use Path Design, Section 14.5.1: Grade. www.fhwa.dot.gov/environment/sidewalk2/sidewalks212.htm#tra2
- Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas Final Report, (1999). http://www.access-board.gov/outdoor/outdoor-rec-rpt.htm

Winter Trail Classifications

Nordic System

Tahoe Donner Cross Country grooms a trail system for paid access winter recreation. Trails are mostly multi-use and snow-cat groomer maintained. Some trails are designated exclusively for "Classic" technique or snowshoeing and some trails are designated dog friendly.

For the purpose of trail upkeep it is important to classify the non-winter attributes of the terrain underlying the winter trail routes' use. The winter groomer routes can be classified as follows:

Type 1 - Main vehicle access road

- Summer use road used as access to 7C ranch and Carpenter Valley
- Non-gated main roads wide enough to in most places to allow cars to pass while staying on roadway
- Wide enough and maintained for summer traffic so should require little maintenance for winter use

Type 2 – Gated roads

- Used mainly for forestry motorized vehicle access
- Generally vehicles must pull off road to pass
- Attention must be paid to maintain 20 ft.* wide clearance from encroaching brush
- Where appropriate drainage issues should be addressed
- Gates and fence placement need to be addressed pre and post season

Type 3 – Off-trail route fully maintained

- Considered a main high priority winter trail route
- No regular summer motorized vehicle access but hiking possible
- Needs to be maintained for 20 ft.* width and appropriate ground clearance for "low" snow on a priority basis. Also safe and efficient turning radius of groomer needs to be considered

Type 4 – Off-trail route minimally maintained

- Considered a secondary winter trail route
- Passage during summer often restricted by brush
- Needs appropriate snow depth to open
- Width and turning radius to be maintained for "safe" groomer operation on an "as needed" basis
- Trail bed maintained to permit passage of groomer in its intended route on an "as needed" basis

Type 5 – Off-trail non-groomer

- Route designated for snowmobile groomed traffic, ski patrol, or private property access
- Similar to Type 4 except that only 5 ft. of width needed
- In certain circumstances route needs to be cleared of brush that has grown too high to permit passage

*The 2013 groomer tillers are approx. 16 ft. in width which leaves some room for safe and efficient operation. To be determined on a case by case basis.

Non-TDXC Trails

The Association may maintain other winter trails or routes on a staff determined basis.

Roadway Crossings

Discussion

Trail crossings present the potential for trail user and motorist conflict. It is for this reason that crossing should be designed so that trail users and motorists are aware of each other. Signage and pavement marking should be used to heighten this awareness and minimize conflicts.

Design Summary

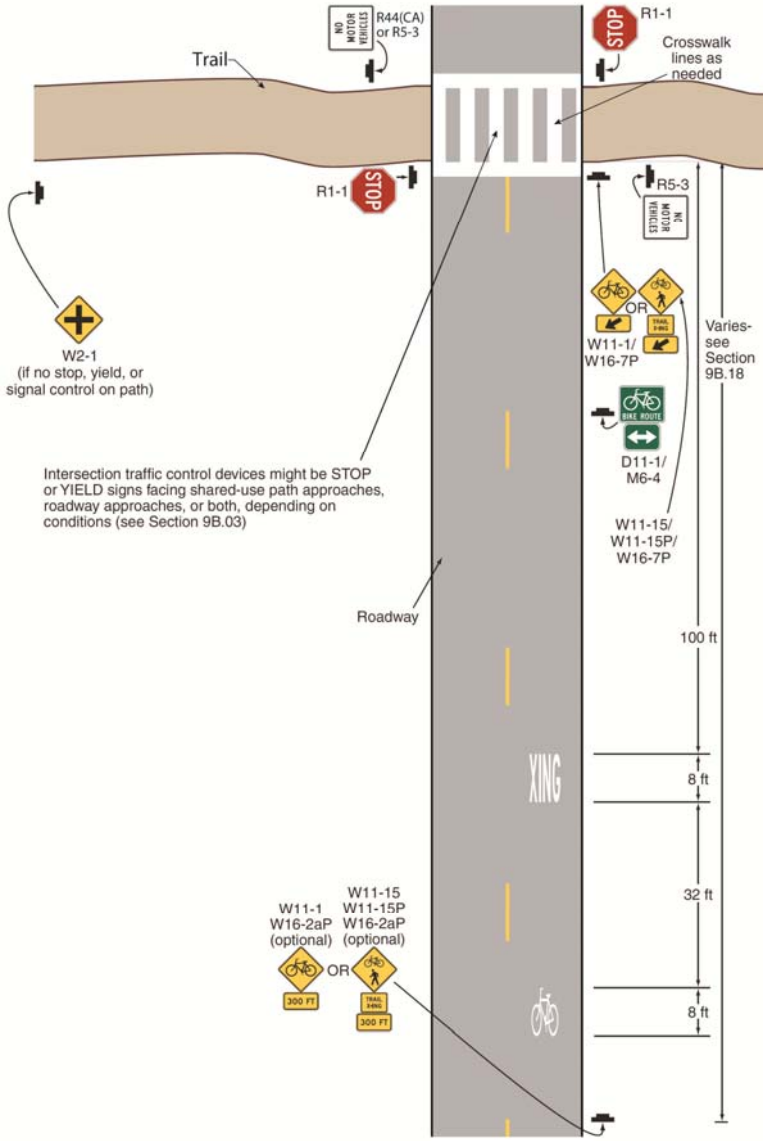
Warning Signs

Warning markings on the path and roadway should be installed. The Bicycle Warning (W11-1) sign alerts the road user to unexpected entries into the roadway by trail users, and other crossing activities that might cause conflicts. A supplemental plaque with the legend AHEAD or XXX FEET may be used with the Bicycle Warning sign. Bicycle Warning signs, when used at the location of the crossing, shall be supplemented with a diagonal downward pointing arrow (W16-7p) plaque to show the location of the crossing. The R10-4 or R62-C signs may be used where the crossing of a street by bicyclists is controlled by pedestrian signal indications.

Pavement Markings

A ladder crosswalk and bicycle crossing stencil installed on roadway 100' in advance of trail crossing are recommended.

Recommended Design



Examples of Signing and Marking for Trail Crossing (Adapted from 2012 CA MUTCD)

Guidance

- Caltrans Highway Design Manual (Chapter 1000)
- MUTCD – California Supplement, Parts 2 and 9
- AASHTO Guide for the Development of Bicycle Facilities

Stream Crossings

When possible, avoid or minimize the use of or number of stream crossings through evaluation of alternative trail alignments or locations. Where feasible, consolidate and minimize the number of crossings or use existing roads.

Bridges

Some trails require a stream crossing with a bridge. While bridges can be some of the most interesting features of a trail system, they can also be the most challenging. Bridges should be at least as wide as the trail. ADA guidelines require handrails no shorter than thirty-six inches and decking material that is firm and stable. Bridges should accommodate maintenance vehicles if anticipated. Bridge structures should be located out of the 100-year floodplain. Footings should be located on the outside of the stream channel at the top of the stream bank. The bridge should not impede fish passage or constrict the floodway. Cost, design, and environmental compatibility will dictate which structure is best for the trail.

Fords

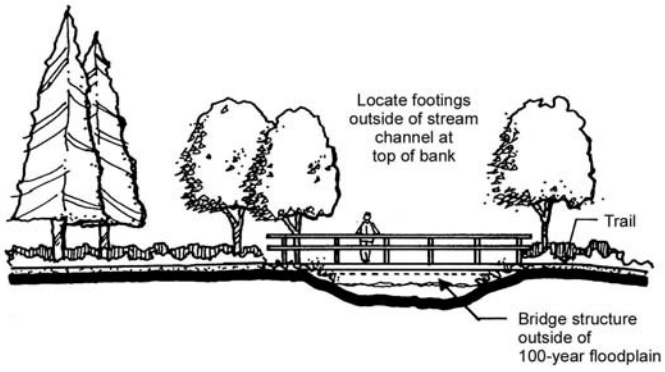
A ford is a shallow place with good footing where a river or stream may be crossed by wading with a horse, on a bicycle, or in a vehicle. The following guidelines apply to design of fords:

- The cross-sectional area of the crossing should be equal to or greater than the natural channel cross-sectional area.
- A portion of the crossing should be depressed at or below the average stream bottom elevation when needed to keep base flows or low flows concentrated.
- Provide cutoff walls at the upstream and downstream edges of ford-type stream crossings when needed to protect against undercutting.
- Evaluate the need for water depth signage at ford crossings.
- The ford shape shold match the channel cross-section to the extent possible. To the extent possible, the top surface of the ford crossing should follow the contours of the stream bottom.

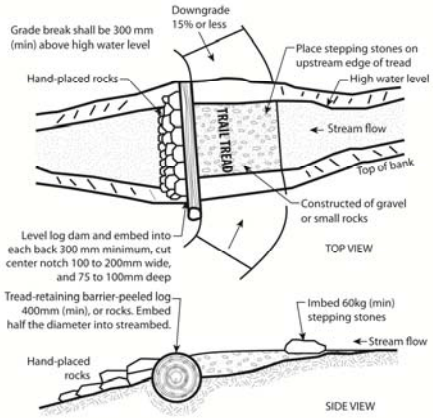
Types of fords:

- Concrete Fords. Concrete ford crossings are recommended only where the foundation of the stream crossing is determined to have adequate bearing strength.
- Rock Fords and the Use of Geosynthetics. Coarse aggregate or crushed rock ford crossings are often used in steep areas subject to flash flooding and where normal flow is shallow or intermittent.

Graphics



Bridges should be used to cross continual running water and areas of riparian or wildlife value.



Fords should be located in wider, shallower portions of the stream. (Source: U.S. Forest Service, U.S. Department of Agriculture)

Guidance

- Natural Resource Conservation Service Conservation Practice Standard Stream Crossing (2011)
- The U.S. Forest Service, United States Department of Agriculture Trail Construction and Maintenance Notebook (2004)

Boardwalks

Discussion

Trails may cross wetlands and other environmentally sensitive habitats for which careful consideration of potential trail development impacts should be taken. Trail development through wetlands should seek to avoid or minimize the filling of wetlands by choosing the least environmentally damaging feasible trail alignment. If wetlands or other sensitive habitat areas are impacted, mitigation measures and best management practices will need to be employed as outlined by CEQA to minimize adverse environmental impacts. Boardwalks can minimize impacts to sensitive wetlands and create "showcase" trail segments that allow users to experience riparian or sensitive coastal ecosystems with minimal impact.

Biological conditions may require platforms to be located so as not to shade sensitive resources. Trail treads should allow light to penetrate to vegetation under the trail. Screw piles are recommended for building boardwalks and viewing platforms along the trail. Screw piles are less disruptive to the creek or wetland beds than wooden pier foundations and more environmentally sensitive than using chemically treated lumber. Boardwalk surfacing should resist deformation and user slippage. Boardwalks can be very expensive and should go through an extensive design process so they do not contribute to flooding hazards, are ADA-compliant, and minimize impact to the surrounding environment.

Design Summary

Design Criteria

Design criteria for boardwalks must meet AASHTO design recommendations for paved shared-use paths. Boardwalks could also be designed to structurally support the weight of a small truck or a light-weight maintenance vehicle.

Width

AASHTO recommends carrying the clear area (a 2-foot wide space on either side of a trail) across the structure. This provides an appropriate horizontal shy distance from the railing and allows for maneuvering space to avoid conflicts with users stopped on the structure.

Height from Ground

Boardwalk height should be set to allow for small animal movement under the structure, a minimum of 6 inches above grade.

Railings

Boardwalks less than 30 inches above grade may not require a railing according to current building standards. Six inch curb rails may be used. Trails higher than 30 inches above grade require a 42-inch high railing. AASHTO recommends 42-inch high railings on any structured path.

Photos

Boardwalk through a wetland

Boardwalk through a biologically sensitive area

Guidance

- AASHTO Guide for the Development of Bicycle Facilities Chapter 2
- ADAAG Sections 4 and 15U.S.
- U.S. Forest Service, Wetland Trail Design and Construction, 2007 Edition

Drainage and Erosion Control

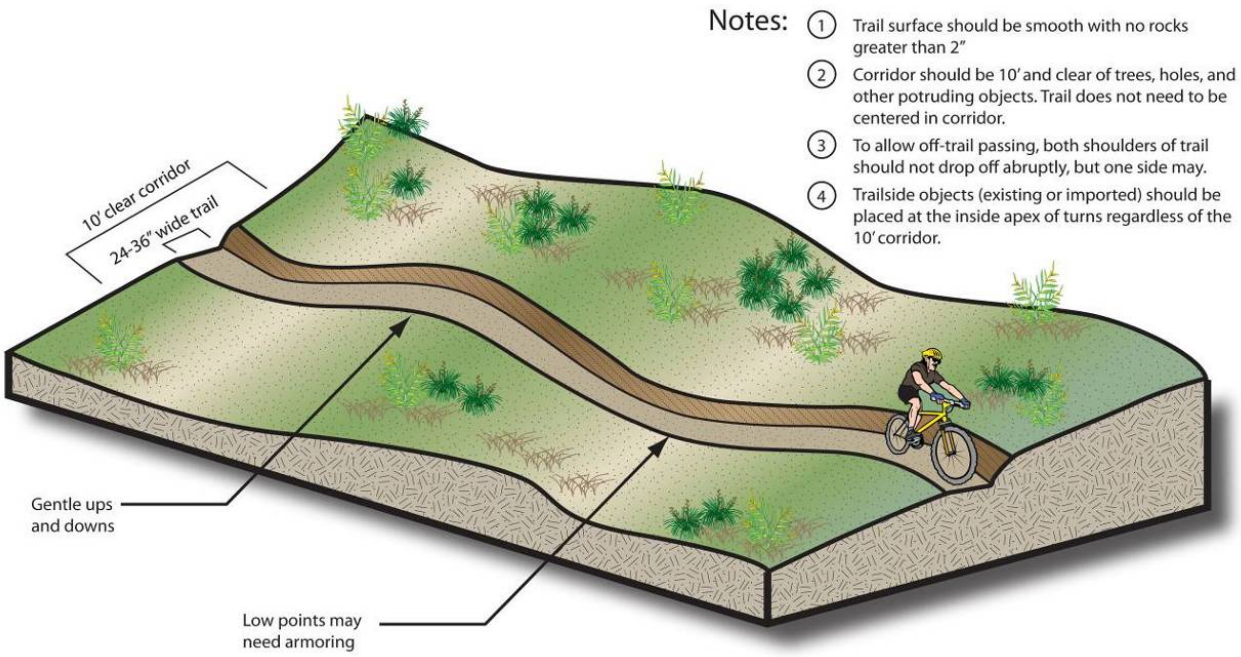
Discussion

Erosion control is necessary to maintain a stable walkway and trail surface. The goal is to outslope the trail so that water sheets across it, instead of down its tread. Grade reversals are the preferred way to mitigate trail erosion because they do not present barriers to users.

A grade reversal is an undulation within the trail tread: a short dip followed by a rise. This grade change in the tread catches water at the low point and diverts it off the trail. Grade reversals can be traversed by all users and require little maintenance once installed. When not incorporated into the original construction of the trail, there are two techniques available to retrofit them into the tread:

- Knick: In soils with a high displacement factor, a grade reversal should be accomplished by removing a wedge of soil to create a dip in the tread.
- Rolling Grade Dip: This technique uses the soil excavated from the low section of a trail to build up the entrance and exit to the dip. Ideally dips use natural features, such as trees or rocks, as landscape anchors.

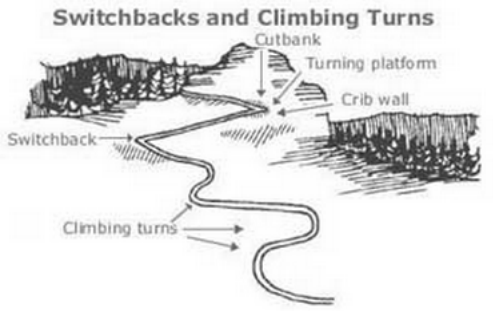
Rolling grade and grade reversals are preferred to other mechanical methods of routing water off of trails such as water bars, check dams, and culverts because they do not present a barrier to users.



Techniques for Gaining Elevation

Switchbacks and climbing turns are used to reverse the direction of travel on hillsides and to gain elevation in a limited distance. Trail designers should make every effort to minimize the use of these turns. Planning carefully to avoid impassable or very difficult terrain reduces the need for switchbacks and climbing turns.

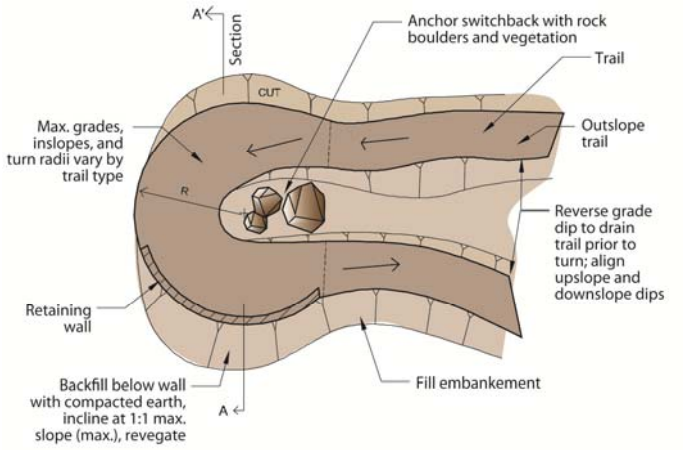
A climbing turn is a reversal in direction that maintains the existing grade going through the turn without a constructed landing. A switchback is also a reversal in direction, but has a relatively level constructed landing. Switchbacks usually involve special treatment of the approaches, barriers, and drainages. They are used on steeper terrain, usually steeper than 15 to 20 percent. Both of these turns take skill to locate and are relatively expensive to construct and maintain.

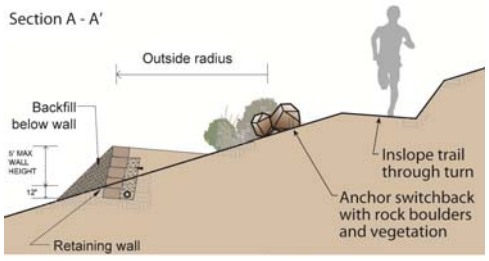


Climbing turns can be built on gentler slopes whereas switchbacks are needed on steeper slopes.
(Source: http://www.fhwa.dot.gov)

Climbing Turns

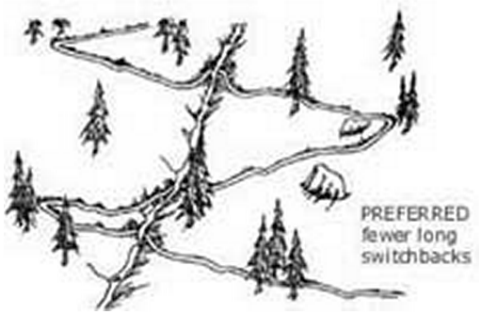
A turn used to change direction that does not have a constructed platform or landing. The upper and lower legs of a climbing turn are joined by a short section of trail (the apex) that lies in the fall line. Water is shed to the inside of the trail turn. Climbing turns may be used where sideslopes are moderate and foot traffic will be minimal. Berming of turns may be appropriate on preferred mountain biking trails where there is adequate drainage control prior to the turn.





Switchbacks

A technique for moving a trail up steep sideslopes. The transition is made by way of a flat landing or pad. A correct switchback will shed water off the back of the landing, and there is an immediate separation of trail segments.



Fewer, long switchbacks are preferable to frequent short switchbacks. (Source: http://www.fhwa.dot.gov)

Trailheads

Design Summary

- Major trailheads should include automobile and bicycle parking, trail information (maps, user guidelines, wildlife information, etc.), garbage receptacles and a pet waste station. Some may include restrooms.
- Minor trailheads should provide a subset of these amenities, except off street parking.

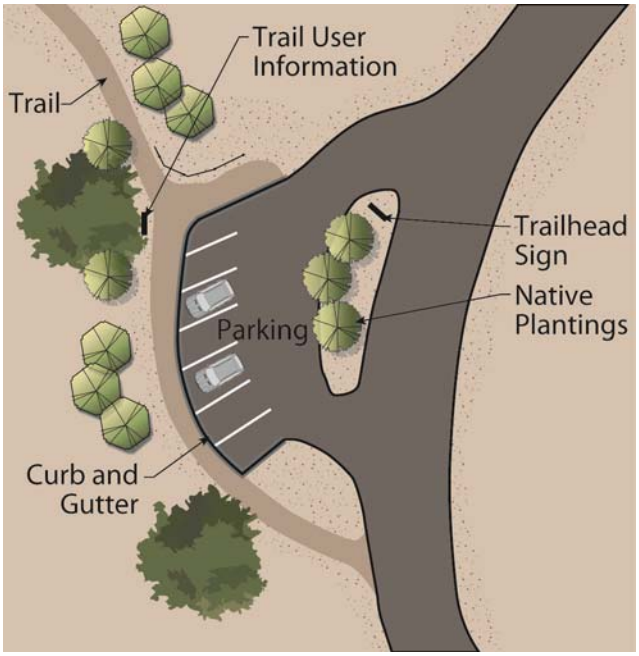
Discussion

Good access to a trail system is a key element for its success. Trailheads serve trail users by car, transit, bicycle or other modes. Trailheads provide essential access to the trail system and include amenities such as off street parking for vehicles, bike parking, a kiosk, a pet waste station, and trash receptacle.

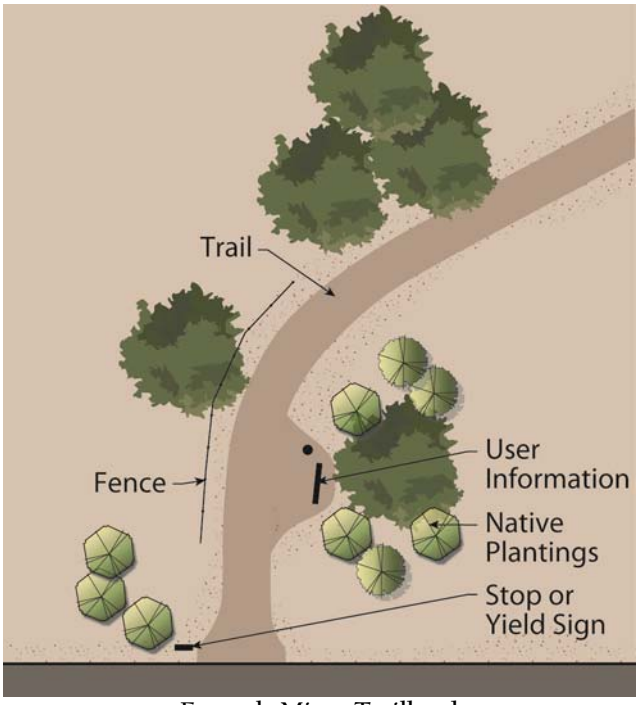
Trailheads without parking delineate an entrance into the trail system within areas of nearby public parking or within residential subdivisions where parking areas are not necessary or would be incompatible with the surrounding neighborhood. A user information area should be provided for any informational signs or other supporting facilities, backed with native vegetation, rocks and fencing if necessary.

Guidance

- AASHTO Guide for the Development of Bicycle Facilities.
- Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas.



Example Major Trailhead



Example Minor Trailhead

Wayfinding Standards and Guidelines

Design Summary

Types of signs include:

Regulatory signs indicate to cyclists the traffic regulations which apply at a specific time or place on a bikeway.

Warning signs indicate in advance conditions on or adjacent to a road or bikeway that will normally require caution and may require a reduction in vehicle speed.

Guide and information signs indicate information for route selection, for locating off-road facilities, or for identifying geographical features or points of interest.

MUTCD Sign R5-6 is a regulatory sign that designates where bicycling is prohibited.

Discussion

The ability to navigate through a region is informed by landmarks, natural features, and other visual cues. Signs throughout Albuquerque can indicate to pedestrians and bicyclists their direction of travel, location of destinations, and travel time/distance to those destinations.

Warning signs are yellow, such as this combination of W11-15 and W11-15P from the MUTCD.

Guidance

AASHTO Guide for the Development of Bicycle Facilities.

MUTCD

Wayfinding signs are green and include an arrow (MUTCD sign D1-3C).

Trail Signing

Design Summary

The intent of the signage system is to provide necessary information to users without disrupting the experience that the trails provide. Signing style and imagery should be consistent throughout the trail to provide the trail user with a sense of continuity, orientation, and safety. Where possible, signs should be collocated with other signage to minimize clutter.

Discussion

The following types of signage are recommended:

Trail Information Kiosks

These signs can provide the universe of information including a trail map, distances to destinations, trail conditions, trail experiences, connection with area amenities, and regulatory and safety information (trail rules, etc.).

Directional Signs

These are typically placed at road and trail junctions (also called decision points) to guide trail users toward a destination or experience.

Trail Identification Markers

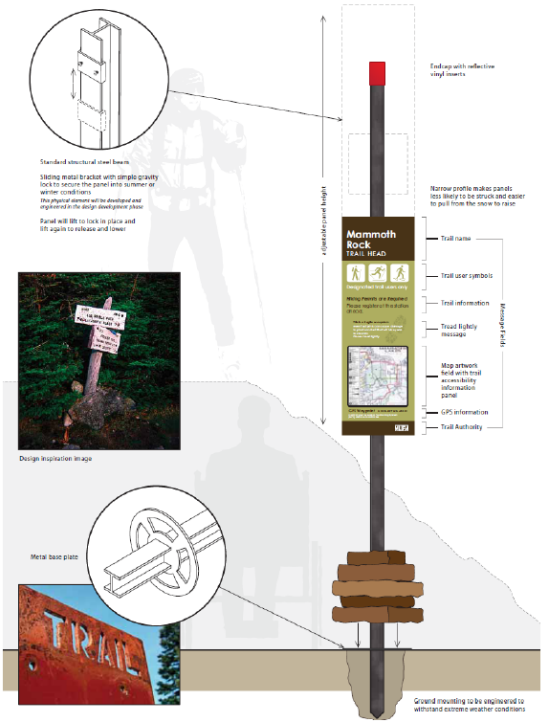
These signs identify the trail. They should be large enough to be visible and readable for drivers, with appropriately sized typography. Information to be displayed could include the name of the trail, a jurisdictional branding element, and whether the trail is multi-use or a user-preferred trail.

Interpretive Signs

These communicate specific messages to visitors. They are most commonly used for self-guiding trails or for wayside exhibits at points of interest, such as viewing areas and resource management areas. The ultimate goal is to convey stewardship in the minds of the users.

Placement

In an effort to keep the trail as natural and uncluttered as possible, signage should be clustered at intersections, rather than placing sign elements randomly along the trail. This would concentrate signage at trailhead entrances/exits and intersections.



Sample signage with adjustable panel height to accommodate summer and winter conditions. (Source: Town of Mammoth Lakes Trail System Master Plan)

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6 Trail System Recommendations

Trail system recommendations include organizing the trail system, improvements to existing trails, proposed new trails, roadway crossing and access improvements, and wayfinding signage.

6.1 Organizing the Trail System

The approach for organizing the trail system includes slightly modified trail types, introduction of equestrian loops, and decommissioning of non-system trails and roads as shown in **Figure 6-1**.

6.1.1 Sustainable Trail Design and Protection of Sensitive Resources

Sustainable trail design allows for a high-quality recreational experience for trail users and protects the natural beauty and environmental integrity of the region. These trails have little impact on the environment; resist erosion through proper design, construction, and maintenance; and blend with the surrounding area. Sustainable trails also appeal to and serve a variety of users.

Sustainable trail design has and will promote protection of the substantial environmental and cultural resources in Tahoe Donner that need to be protected with all development proposals, including trails. Sensitive environmental resources include meadows, drainages, wetlands, and riparian areas. Cultural resources exist in greenbelts and include Native American sites and historical resources. The following guiding principles are recommended for sustainable trail design that protects sensitive resources:

- Avoid wet meadows and wetlands.
- Avoid hazardous areas such as unstable slopes, cliff edges, embankments and undercut streams, and avalanche prone zones (in the winter).
- Avoid sensitive or fragile historic sites.
- Avoid trail routing that encourages shortcutting. Use natural topography or features to screen short cuts.
- Avoid routing trails too close to other trail systems to minimize trail proliferation and user conflict.
- Design trails to "lie lightly on the land" as if they have always been there.
- Take advantage of features in the landscape for drainage.

6.1.2 Multi-Use Trail Types

The proposed trail system consists primarily of open connecting trails of several trail types that allow users to "mix and match" various segments to create their own experience. This type of trail system is most suited to Tahoe Donner's current trail system and management practices. This system works well when the management goal is to get the most use out of a few trails in a limited region. This Plan proposes several multi-use trail standards to meet user group needs and interests and achieve safety and environmental goals. The recommended trail types are defined and illustrated in *Section 5: Design Guidelines* and include the following:

Type 4 Multi-Use Trails

Type 4 trails are 8- to 12-foot wide, double track trails that generally follow existing fire roads and dirt roads where standards are not exceeded. These are popular routes that attract a variety of users and provide access to a number of vista points and picnic areas within Tahoe Donner. Type 4 trails are proposed in the Homerange and Euer Valley areas and the McGlashan Springs Bucknam/Sinclair Tracts.

Type 3 Multi-Use Trails

Type 3 trails are 5-foot wide, double track trails that follow some existing fire roads and trail routes. Proposed Type 3 trails include the Nature Loop and the trail along Alder Creek where access is popular, but site conditions may not support a wider trail.

Type 3 ADA trails meet Type 3 and universal design trail standards. These trails would be double track, have an ADA-accessible surface, and meet maximum grade standards necessary to allow for universal access. Type 3 ADA trails are proposed along Northwoods Boulevard, around the Clubhouse, and leading to the vista point accessible from the Glacier Way Trailhead.

Type 2 User Preferred Trails

Tahoe Donner policy prescribes that all trails are multi-use. The proposed user preferred trails would be multi-use, but designed to meet the needs and interests of a particular user group. Two kinds of user preferred trails are proposed: hiker and mountain biker preferred trails and equestrian preferred trails. These trails would be single track with passing spaces provided. Hiker and mountain biker preferred trails are proposed along the eastern Tahoe Donner's perimeter and in the Homerange and Euer Valley areas. These serve as spur trails connecting with Type 4 and 3 trails. Equestrian preferred trails are proposed in the Homerange area and would connect with the Equestrian Center.

6.1.3 Equestrian Loops

Concentrating group ride equestrian use in certain areas could reduce varied trail use encounters and allow Tahoe Donner to monitor and maintain these trails more effectively. The proposed equestrian loops are comprised on Type 2 Equestrian Preferred trails and Type 4 Multi-Use trails (see **Figure 6-2**). These routes connect with the future Equestrian, Mountain Bike, and Cross Country Ski Center. Group trail rides from the Equestrian Center would be restricted to these loops. Equestrians not part of group rides would be welcome on all system trails.

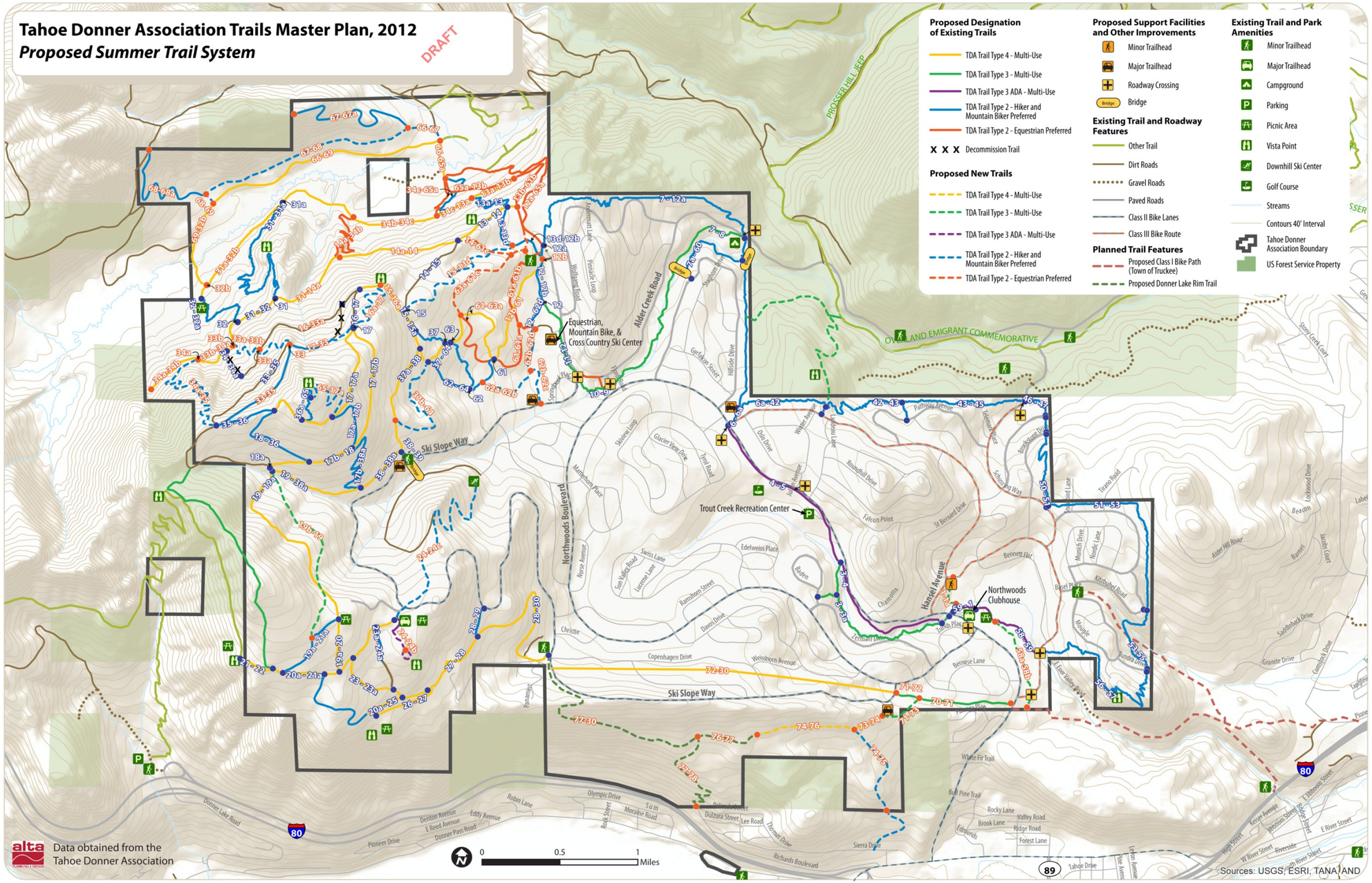

Figure 6-1: Recommended Trail System

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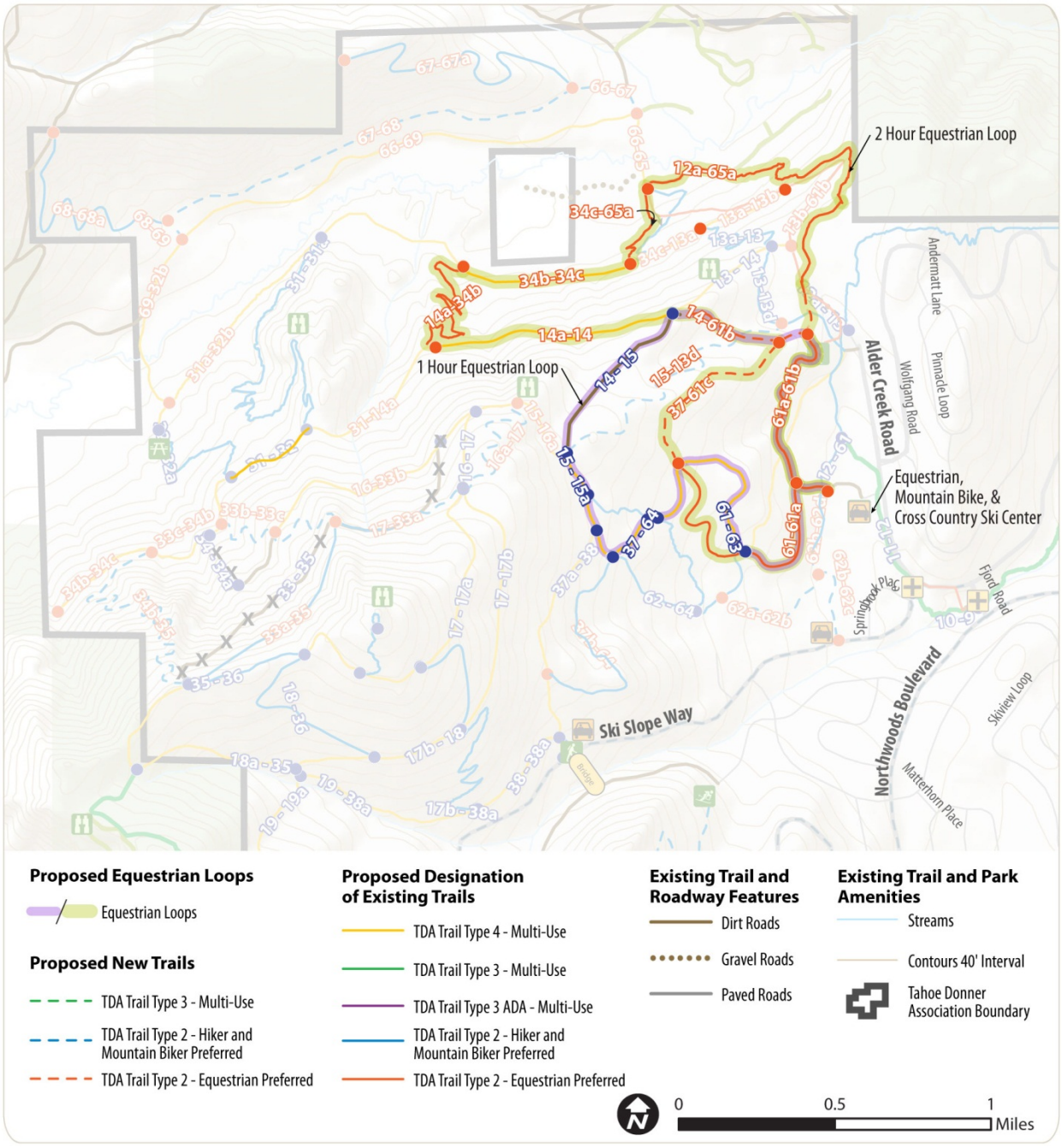

Figure 6-2: Proposed Equestrian Loops (At Build Out)

6.1.4 Non-System Trails

There are many trails in Tahoe Donner that are not part of the official system. The current policy of the TDA Forestry Department is to only decommission trails that are a safety hazard, an environmental hazard, or are not on Tahoe Donner common property.

This Plan recommends decommissioning 0.92 miles of Trail Classifications 2 and 3 near the Homerange area that experience severe erosion or are located on steep slopes (see **Figure 6-1**). A more intensive trail inventory of non-system trails is recommended to identify and select which additional trails should be decommissioned, taking into consideration how decommissioning the trails would affect the overall system. Trails and dirt or gravel roads to be decommissioned should be restored through planting and seeding with species native to the area. This Plan also recommends recontouring the trail tread to match the surrounding area and placement of large rocks, logs, and signs at the entrance to the decommissioned trail segment to discourage reopening of the trail.

Trail signage, seeding, and placement of logs/branches are recommended at entrances to trails to be decommissioned to help users distinguish between system and non-system trails

Non-system trails recommended for inclusion in the Tahoe Donner trail system are discussed in *Sections 6.3* and *6.4*, including trails under the transmission lines along Skislope Way and connections with the Emigrant Trail.

Winter Trails

This Plan recommends Tahoe Donner Association consider developing trail standards for its winter trails. Possible winter trail classifications include Type 4 shared multi-use, Type 3 shared Nordic/skate trails, Type 2 preferred showshoe/hiking trails, Type 2 preferred Nordic trails, and Type 1 routes.

Vegetation clearing for winter trails has led to the creation of non-system summer trails, which is impacting soils and vegetation. To discourage the creation of non-system summer trails, this Plan recommends restoration of vegetation on all Nordic ski routes that do not have a built summer trail within their alignment. In Spring, soils and vegetation along winter trails would be restored in areas where nordic trails are groomed. This would not affect the number or alignment of nordic ski routes.

6.2 Improvements to Existing Trails in Tahoe Donner

This Plan recommends improvements to existing trails which would result in trail types and mileages as identified in **Table 6-1**. Improvements may include rerouting trails, rock raking and regrading trails, vegetation removal to meet recommended horizontal clearances, reconstructing climbing turns or switchbacks, drainage improvements, and/or rerouting of trail segments to meet recommended grades. See **Appendix B** for a list of recommended improvements to existing Tahoe Donner trails and new system trails.

Table 6-1: Proposed Conversion of Existing Trails

Existing Trail Classification	Total Mileage	Proposed Trail Type					
		4	3	3ADA	2HB	2E	Decommissioned Trail
4	0.04	--	--	0.04	--	--	--
3 or 4	21.69	13.95	0.18	0.45	5.92	0.46	0.73
2 or 3	4.05	--	1.27	1.72	1.06	--	--
2	12.35	--	1.30	0.05	10.60	0.22	0.18
Total	**38.13**	**13.95**	**2.76**	**2.25**	**17.57**	**0.68**	**0.91**
Note: 0.73 miles of Trail Marker 33-35 is recommended to be decommissioned. The remaining 0.31 miles of this existing Type 3 or 4 trail would be designated Type 2 Hiker and Mountain Biker Preferred.							

Some trails, such as the trail along Alder Creek, would be improved to the extent feasible along their current alignments. The trail along Alder Creek provides an important link and is located in an environmentally sensitive area where it experiences heavy erosion and regular flooding. Recommended improvements include a new bridge across the creek in one of two potential locations. Due to right-of-way limitations, an alternate trail route outside the 100-year floodplain is not available. This Plan recommends significant, regular maintenance if the trail is to remain in its current location.

In some locations, shielding of telephone pole guy-wires which cross trails is needed. There are at least two instances of this: in the Homerange area near Trail 14-15 and along the eastern TDA perimeter, south of Brookstone Drive. If the trails cannot be re-routed away from the guy-wires, then the wires should be shielded (such as with a plastic sleeve) to prevent trail user injury.

Trails Meeting Universal Design Standards

TDA members have noted there is a lack of easy trails (grade less than 5%) within the trail system. The Tahoe Donner trails system has one small component which is accessible to people with limited mobility and families with strollers: the picnic area at Glacier Trailhead. This trail is not currently identified as ADA accessible on the trail map. Designation of existing and creation of new accessible trails would benefit persons with limited mobility and families with strollers or small children.

This Plan proposes designation of 2.25 miles of existing trails as accessible, including the non-system trail accessible from the Glacier Trailhead. These trails are currently located along relatively level ground, facilitating ADA-compliant grades, and provide access to some of Tahoe Donner's most popular destinations. Some trail segments, such as the trail from Glacier Trailhead, require limited improvements to meet universal design standards. Other trails, such the trail along the southwest side of Northwoods Boulevard between trail markers 3 and 5, would require significant improvement including partial regrading to meet grade recommendations.

6.3 New System Trails

6.3.1 Multi-Use Trails

This Plan proposes approximately 13 miles of new Type 4, 3, and 2 trails as identified in **Table 6-2** and **Figure 6-1**. Proposed trails include new Type 2 User Preferred trails in the Homerange area and Euer

Valley. New Type 4 and 3 Multi-Use trails are proposed near the Clubhouse and in the McGlashan Springs Bucknam/Sinclair Tracts. See **Appendix B** for a list of recommended improvements to existing Tahoe Donner trails and new system trails.

Table 6-2: Proposed New Multi-Use Trails

Trail Type	Existing Trails (MI)	Proposed New Trails (MI)	Total (MI)
4 Multi-Use	13.95	0.49	14.44
3 Multi-Use	2.76	0.79	3.55
3 ADA Multi-Use	2.25	0.22	2.47
2 Hiker and Mountain Biker Preferred	17.57	9.34	26.91
2 Equestrian Preferred	0.68	1.84	2.52
Total	**37.21**	**12.68**	**49.89**

Notes:
Existing trails mileage does not include trails to be decommissioned.
Table does not include Land Trust projects anticipated to result in construction of an additional 2.18 miles of trails.

Terrain Features

Tahoe Donner trails see a great deal of mountain bike use. With the development of Tahoe Donner Bike Works rental operation, there is an effort by the Association to accommodate members' interest in mountain biking. Every year banked turns and jump features appear on the trail system. This indicates an interest in freestyle mountain biking. While the character of Tahoe Donner does not support a freestyle bike park, there is a need for some further discussion.

6.4 Regional Trail Connections

6.4.1 Trails through U.S. Forest Service Property

Tahoe Donner does not currently have a Special Use Permit (SUP) with the U.S. Forest Service for summer trails. While trails on U.S. Forest Service land may exist, Tahoe Donner cannot direct people to them, develop, or maintain them. If approved, a SUP would allow trail construction and operation on U.S. Forest Service land. Without a SUP, the U.S. Forest Service could decommission these connections as unofficial trails at any time. Establishment of official trail(s) would lessen the area impact as the route could be designated through signage, providing access and deterring establishment of multiple volunteer trails.

There is an issue with homeowners moving trails from Tahoe Donner property onto U.S. Forest Service land, particularly along Wolfgang Road. Tahoe Donner signs have been moved and existing trails have been covered with debris directing users onto U.S. Forest Service property. Instead of one trail there are several and the TDA Forestry Department is only responsible for maintaining the official trail on Tahoe Donner property. This widens the impact on the area and is against federal law. Tahoe Donner should work with property owners to identify potential trail alignments within U.S. Forest Service property to pursue. Several potential trail alignments connecting with the Emigrant Trail and Donner Lake Rim Trail through U.S. Forest Service property are shown on **Figure 6-1**.

The formal process to establish these connections with the U.S. Forest Service would require an official proposal by Tahoe Donner and obtaining a SUP. The most efficient way to establish these connections would be to obtain one permit with the multiple alignments listed. The SUP application should include a project description and map, information on environmental impacts, benefits to the public, lands to be occupied or used, and compliance with applicable laws and regulations.[1] Tahoe Donner would also be required to comply with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), which apply to activities undertaken, funded, or requiring an issuance of a permit by a public agency. The SUP would also establish a management plan for the trails.

This Plan recommends Tahoe Donner apply for a SUP from the U.S. Forest Service for trails within U.S. Forest Service properties. Tahoe Donner staff work with Association members to refine the potential trail alignments within U.S. Forest Service properties identified in this Plan (see **Figure 6-1**). The refined trail alignments would become part of the SUP application submitted to the U.S. Forest Service.

Emigrant Trail

Several volunteer trails through U.S. Forest Service land link to the Tahoe Donner trail system off of trail marker 7A and cause significant erosion problems. There are additional volunteer trails behind St. Bernard Drive through U.S. Forest Service lands. In talking with Joe Flannery, the recreation officer for the Tahoe National Forest (8 July 2011), creation of formal trails would be a high priority project for them to support.

This Plan recommends two trail connections between Tahoe Donner and the Emigrant Trail, one from Trail 6a-7a east of Hillside Drive and a second from Trail Marker 42 north of Hansel Avenue.

Donner Lake Rim Trail

As of 2012, one could access the Rim Trail from trail marker 24 to 24A to 23 to 20 to 21 to 22 or by trail marker 39 to 38 to 19 to 18A. Trails from trail marker 18A or 35 to 21 are on U.S. Forest Service property. This is an important section of trail because it offers a connection from the Glacier Way Trailhead (trail marker 24) to the western Skislope Way Trailhead (trail marker 39), the Equestrian Center, and points north. Formalizing this connection could expand the Associations access to Castle Peak, the Pacific Crest Trail, and Hole in the Ground, Lola Montez, and many other U.S. Forest Service properties to the west. It would also provide an alternate way for Tahoe Donner members to access Donner Lake and the Beach Club Marina.

6.4.2 Town of Truckee Trails

As discussed in Section 3.2, the Town of Truckee is in the process of designing paved multi-use trails between Downtown Truckee and Tahoe Donner. The Town is examining two potential routes. The Town of Truckee's Trail 11 would extend from Basel Way to the corner of Bridge Street and Jiboom Street in Downtown Truckee. The Town of Truckee's Trail 13 would leave Northwoods Boulevard near the intersection of Lausanne Way and follow the power line easement to Comstock Drive and Pioneer Trail.

[1] http://www.fs.fed.us/specialuses/special_app_process.shtml

Trail 13 is a priority over Trail 11. The City has authorized use of TSSA-1 funds for construction of the Trail 13 segment between Northwoods Boulevard and E. Euer Valley Road. This Plan recommends a new Type 3 Multi-Use trail which would connect TDA Trail 58-59 near the Clubhouse with Town of Truckee's Trail 13.

6.5 Crossing Improvements

Tahoe Donner trails cross roadways in several locations. None of the existing crossings include traffic controls (e.g., a stop sign) or signage. This Plan recommends improvements at eight locations (see **Figure 6-1**). Recommended improvements include advance warning and pedestrian crossing signage.

6.6 Trailheads

This Plan proposes four new major trailheads and one minor trailhead. Major trailheads, as defined in *Section 5: Design Guidelines*, may include vehicular and bicycle parking, trail information (maps, user guidelines, wildlife information, etc.), garbage receptacles, and a pet waste station. Some may include restrooms. Minor trailheads would provide a subset of these amenities, except off street parking. Major trailheads are proposed along Skislope Way and at the future Equestrian, Mountain Bike, and Cross County Ski Center location. The proposed minor trailhead is located off Lausanne Way. This minor trailhead would allow users to access the Clubhouse along a new Type 3 Multi-Use Trail around the west side of the tennis courts.

6.7 Signage and Wayfinding

Signage recommendations include kiosks with trail maps, directional signs, trail identification markers, and interpretive signs. Wayfinding could include a set of color-coded trails and identification of trail difficulty ratings.

6.7.1 Trail Map

The Existing Summer Trail System map (**Figure 3-1**) could be adapted to update the Trail Map. This graphic identifies trail and road features, trail and parking amenities, 40-foot contour lines, and TDA and U.S. Forest Service's properties. The following additional information is recommended for inclusion on the map:

- Trail distances and difficulty ratings. This would help users understand the length and difficulty of the trails.
- Trail and trailhead names.
- Trail rules.
- Cross country ski huts to tie the two systems loosely together.

Trail Naming

Naming of trails makes them easier to find and follow, particularly in open connecting trail systems. Aligning trail names with an existing vernacular which is comfortably used for either a nearby road that supports primary access to the trail or a famous landmark in or near the trail is recommended to help

users develop a mental map that locates the position of the trail within the environment. This Plan recommends Tahoe Donner name all trails within the proposed trail system. Summer and winter trails which share the same alignment would have the same name. Trail names would be displayed on signage that is put in place over time as individual trail segments are improved.

In order to ensure the trail system is navigable and user-friendly, naming conventions should be consistent, concise, and descriptive. This applies especially to the naming trailheads and trails. Trailhead names should be brief while providing a first-time user with an idea of the geographic features or experiences which can be accessed from that trailhead.

Color-Coded Trails

This Plan proposes signage with trail names which would be put in place as trails are improved and/or constructed. Considering build-out of the trail system will take time, use of color-coded trail wayfinding markers along existing trails is also proposed. Color-coding of key trails would significantly improve wayfinding within Tahoe Donner at minimal cost. **Table 6-3** and **Figure 6-3** present recommended trail color-coding which could be implemented as a near-term project. These color-coded trails would serve as the spine of the Tahoe Donner trail system and provide connections to many of TDA's key destinations. Naming of the color-coded trails should be undertaken as part to the overall trail system naming.

Over time, this Plan recommends signage with trail names replace the color-coding system. The proposed color-coded trails could be incorporated as recommended loops or routes displayed on trail maps with corresponding mileage and route descriptions.

Table 6-3: Proposed Trail Color-Coding and Mileage

Trail Name	Length (MI)
Nature Loop	1.8
Hawk's Peak Loop	4.1
Eastern Perimeter Trail	12.6
Western Perimeter Trail	6.8
Alder Creek Trail	1.8
Negro Canyon Loop	0.6
Euer Valley Loop	1.8

Trail Difficulty Rating

Association members have expressed interest in a trail difficulty rating similar to that used in the ski industry to inform trail users of conditions to expect along the trail. **Table 6-4** presents general parameters to be considered when assigning trail difficulty ratings at Tahoe Donner. Trail difficulty ratings could be incorporated into trail maps and displayed at kiosks and online.

Table 6-4: Trail Difficulty Parameters for Soft Surface Trails

Symbol	Skill Level	Min. Tread Width	Min. Horizontal Clearance	Average Grade	Max. Grade	Outslope	Turn Radius	Obstacles
●	Easy	36”	4’	</= 5%	8%	2-5%	>/= 3’	Obstacles infrequent and insubstantial
■	Moderate	24”	3’	</= 10%	15%	3-8%	>/= 2’	Obstacles may be common, but not substantial
◆	Difficult	12”	3’	> 10%	25%	3-8%	>/= 2’	Obstacles may be common, substantial, and intended to provide increased challenge

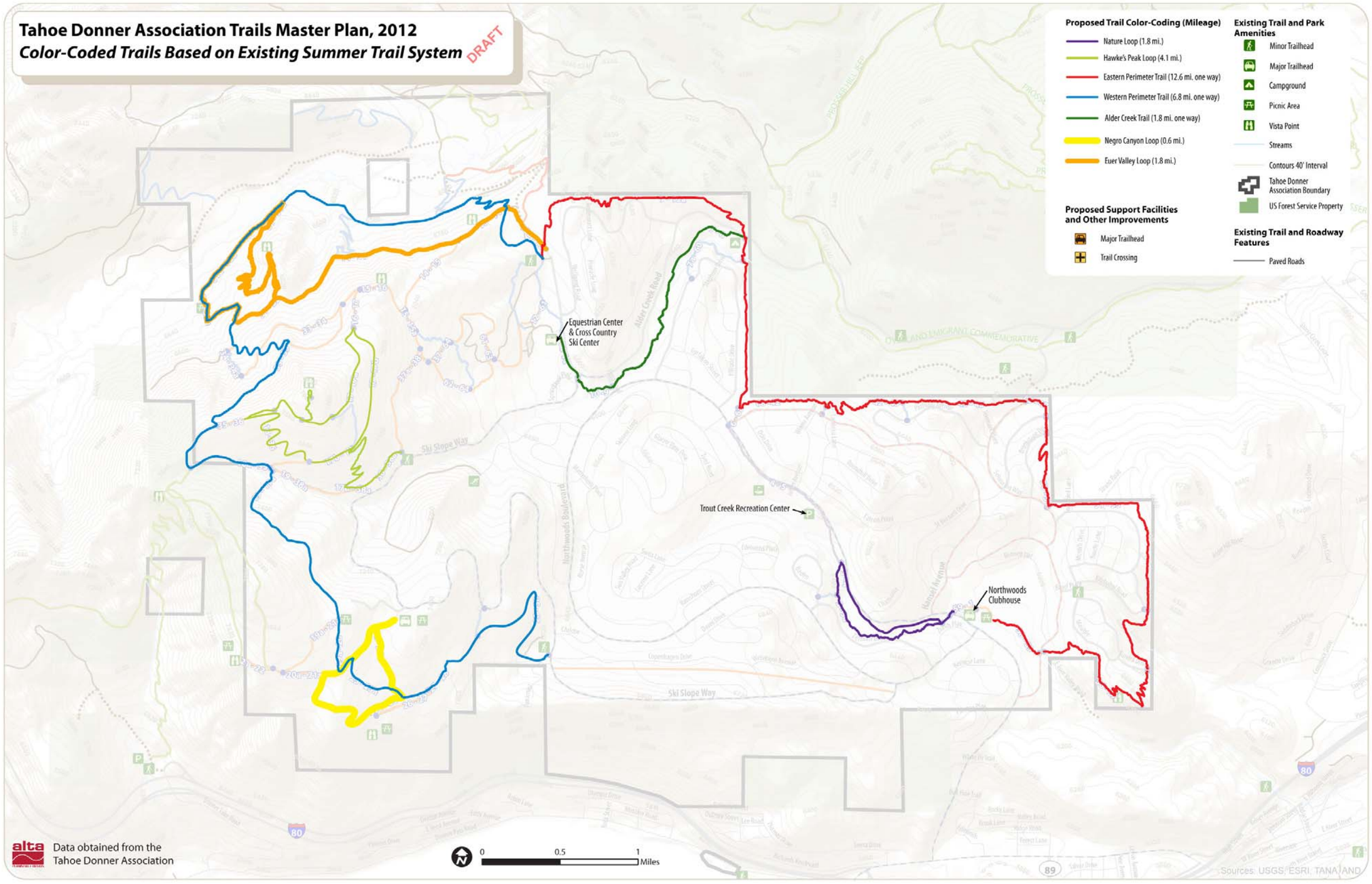

Figure 6-3: Recommended Color-Coded Trails Based on the Existing Summer Trail System (Includes Planned Year 2013 Trail Improvements)

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6.7.2 Trail Information Kiosks

Information kiosks are recommended at all trailheads. These signs can provide the universe of information including a trail map, distances to destinations, trail conditions, trail difficulty rating, connection with area amenities, and regulatory and safety information (trail rules, etc.). Trail kiosks should display the trailhead name to allow users to better identify their location within the trail system.

6.7.3 Directional Signs

These are typically placed at trail junctions (also called decision points) to guide trail users toward a destination or experience. Directional signs are recommended where named trails intersect.

6.7.4 Trail Identification Markers

Two types of trail identification markers are proposed: one type which communicates trail information and a second which delineates trail edge. Information to be displayed could include the name and/or color designation for the trail, a jurisdictional branding element (such as along planned Town of Truckee Trails within Tahoe Donner), and whether the trail is multi-use or a user-preferred trail. The following recommendations apply to trail identification markers at Tahoe Donner:

- Use a color coded system that identifies loops or routes. Apply colored markers to existing trail markers. Only use additional markers where the trail is vague or hard to follow.
- Consider adding adjustable height signs that can be also seen in the winter.
- Identify locations for and install markers along the perimeters of summer trails which are also winter trails to guide groomer operators. This signage would limit environmental damage when Nordic trails are groomed, especially when visibility is low or during heavy snowfall.

6.7.5 Interpretive Signs

Interpretive signs communicate specific messages to visitors, such as information on cultural, environmental, or historical resources. They are most commonly used for self-guiding trails or for wayside exhibits at points of interest, such as viewing areas and resource management areas. The ultimate goal is to convey stewardship in the minds of the users. Potential interpretive signage locations include along the Nature Loop and at scenic vistas. The information provided at each interpretive installation should be based on the experiences, knowledge, and interests of its expected audience.

6.7.6 Placement

In an effort to keep the trail as natural and uncluttered as possible, signage should be clustered at intersections, rather than placed randomly along the trail. Too much signage along a trail or at a trailhead is self-defeating, not to mention unpleasing to the eye. Clustering signage would concentrate signage locations trailhead entrances/exits and trail crossings.

6.8 Decommissioned Trails and Roads

Tahoe Donner includes a number of trails and roads inherited from past land owners and logging activities that are in poor condition due to factors such as erosion and flooding. A number of these trails and roads do not lead to any destination of interest to trail users and/or are not part of a connecting trail route. Trails have an impact on the environment that needs to be weighed appropriately to align with TDA's commitment to environmental stewardship and provision of responsible access. Potential impacts to the environment include vegetation loss and compositional change, soil compaction, erosion, muddiness, degraded water quality, and disruption of wildlife.

Table 6-5 identifies the 0.92 miles of existing TDA system trails that are recommended for decommissioning due to severe erosion problems. A thorough inventory of existing non-system trails to be decommissioned is also recommended.

Table 6-5: Trails and Roads Recommended to be Decommissioned

Trail Markers	Trail Type	Trail Length (MI)
33-35 (por.)	Dirt Road	0.73
34-34a	2	0.19
Total		**0.92**

7 Operation and Maintenance

7.1 Roles and Responsibilities

The TDA Forestry Department operates and maintains the summer trail system. The Cross Country Ski Area has a small budget to maintain vegetation along their trails. The Equestrian Center has no budget for trail maintenance and completes no maintenance on the trails they use for their operation.

7.1.1 TDA Forestry Department

Operation and Maintenance Activities

The TDA Forestry Department's operational budget funds day-to-say management. The Department's capital budget funds planning and development of the trail system and its facilities. In 2012, the TDA Forestry Department constructed the Euer Valley Hike Bike Down Trail and the Euer Valley Equestrian Return Trail; rerouted trail 18-36, trail 28-27, and trails near trail marker 12A, and modified the access from Hillside Drive in addition to several other trail projects.

The TDA Forestry Department provides the day-to-day maintenance on the trail system with direction to maintain all existing trails, ancillary structures, and surrounding open space for sustainability. The Department follows best practices of trail maintenance, which include:

- Correct any unsafe situation.
- Correct any problems causing significant trail damage (soil erosion or water channeling onto or from the trail)
- Restore trails to trail design standards.

The TDA Forestry Department operates a seasonal trail crew to complete trail maintenance on the system. The TDA Forestry Department does not maintain the Cross Country Ski Area. Trail maintenance must occur every year in order to allow safe access, and prevent erosion and damage to facilities. Annual maintenance activities include:

- Vegetation control. This activity includes removing fallen trees that block the trail and trimming back vegetation. In some cases, professional fallers with skill have been needed to remove trees. Brush and branches that encroach on the horizontal clearance and can make a trail less safe. In some areas machinery can be used but all single track trails must be cleared by hand. In the fall, this material is removed and chipped or burned in place if it cannot be removed.
- Erosion control. This activity includes repairing washed out water bars and drainage elements and inspecting and clearing culverts. The spring snowmelt will blow through water bars, change drainage patterns, and/or move rocks. It is a priority to keep water off the trails. The trail crew inspects culverts annually and clears culverts that are blocked with debris in the spring.
- Structure repair. This activity includes inspecting and repairing elevated walkways for snow damage and repairing picnic tables and benches. In heavy snow years, snow can crush or

break elevated walkways along the trail system. For example, boards may be pushed out and become hazardous.

- Pet waste station maintenance. This activity includes emptying pet waste stations two times a week during the summer season and seasonally removing and replacing the stations. The TDA Forestry Department provides bags and labor to inspect the stations and monitor the trails nearby.
- Trail map distribution. This activity includes refilling kiosks with trail maps weekly. Trail maps are provided for each trailhead at each kiosk. In one season 3,000 maps were distributed.
- Trail signage and kiosk placement and removal. This activity includes seasonally removing and installing kiosks and approximately 90 trail posts and signs. The posts attach to metal sleeves cemented permanently in the ground. The trail crew stains all kiosks and sign posts in the spring and stains and repairs the plantation signs.
- Structure placement and removal. This activity includes removing temporary bridges along trails in the fall and replacing them in the spring. Removal of the structures protects them from damage associated with possible high water and flooding.
- Situational maintenance. This activity includes responses to vandalism, accidents, or special weather events. Situational maintenance can be difficult to anticipate and budget for. With a limited budget and season of operation, it can be difficult at times to perform the necessary trail maintenance.

Operation and Maintenance Budget and Costs

Before 2012, the maximum total operating budget for trail work (labor and materials) was approximately $35,000 per year. The 2012 budget for trail work was approximately $102,230, which included labor, materials, and capital funds for trail projects. Year 2012 trail work included trail construction in Euer Valley, bridge repair along the Nature Loop, picnic benches and tables, trail drainage and walkway repair, signage at Glacier Trailhead, and other trail improvements. The Board-approved 2013 budget includes an increase in operational staff expense, $228,000 in projects funded by Reserve Replacement funds, and $75,000 in Development funds that is earmarked for a new cross country ski trail and new trails in Euer Valley. Currently, $100,000 is earmarked for major trail projects from 2014 on. Reroutes, replacement of walkways, etc. are treated through another part of the capital fund which can be accelerated or treated in small fashion over a long time.

Annual trail maintenance costs $40,000 to $50,000 dollars per season or approximately $1,050 to $1,350 per mile of trail per year. The TDA Forestry Department budget for trail maintenance includes two to three seasonal workers, some contract crew time, one vehicle, and operating supplies. Examples of costs include:

- $27,000 for seasonal staffing
- $2,500 for yearly vehicle cost
- $1,500 for vehicle fuel
- $1,000 for vehicle maintenance
- $5,000 for heavy labor completed by the contract crew
- $8,000 for heavy labor completed by TDA Forestry Department crew

- $4,000 for supplies

Maintenance generally runs from mid-May through October; however, it can be shortened due to late springs or early winters.

This Plan proposes approximately 13 miles of new system trails, which is anticipated to increase annual maintenance costs to approximately $54,000 to $67,000 at buildout of the Plan.[2]

7.1.2 Cross Country Ski Center

Maintenance Activities

The Cross Country Ski Center is responsible for its winter trail maintenance using its operational budget. The impact of Cross Country Center actions on trails is minimal due to the season of operation. There is some damage to existing mature trees, trees in fuel breaks/plantations, and other vegetation from groomer operations. Vegetation clearing for cross country use has led to creation of some volunteer summer trails.

Ski Center staff conduct approximately two weeks of work each season by hand and work with TDA Forestry Department crews in the summer to complete the bulk of their maintenance. They trim brush and trees as changing snow conditions require throughout the winter season. The TDA Forestry Department helps with disposal of the material in the summer season.

Maintenance Budget and Costs

The Cross Country Ski Center has an average annual budget of $4,000 to $5,000 for contracted service trail maintenance. This money is used for brush cutting and vegetation management. They work in concert with the TDA Forestry Department to prioritize projects which benefit both departments and maximize use of funds.

7.2 Recommendations

This section presents recommendations related to operation and maintenance of the trail system. Recommendations that would assist with outreach and education include establishment of a Trails Manager, Focus Group, and volunteer activities.

7.2.1 Maintenance Activities

The TDA Forestry Department conducts a comprehensive maintenance program. This Plan recommends the Department continue its existing maintenance activities. *Section 6: Trail System Recommendations* presents some trail system recommendations which could reduce maintenance hours needed for certain tasks. These recommendations include installation of bridges outside the floodplain and use of adjustable height signs that do not need to be removed, stored, and replaced seasonally.

[2] Assumes annual trail maintenance costs of approximately $1,050 to $1,350 per mile of trail per year.

7.2.2 Trail Manager

This Plan recommends creation of a permanent staff position to manage Tahoe Donner's trail system and act as liaison to user groups (hikers, mountain bikers, equestrians, and winter trail users). Under general supervision, the Trail Manager would assist the Director of Facilities and Risk Management with the coordination needed to plan, acquire, develop, and maintain the summer trail system as defined in this Plan. Potential responsibilities include:

- Coordinate the Trail Crew and Trail Ranger program.
- Serve as a liaison between the TDA Forestry Department and Equestrian, Mountain Bike, and Cross Country Ski Center staff in the planning, acquisition, development, and maintenance of the summer trail system.
- Act as the liaison between the TDA Forestry Department and Association members, keeping members informed about work activities and trail closures, as reported by TDA Forestry Department staff.
- Coordinate with Association members with properties near non-system trails to designate an alignment or alignments to be incorporated into the trail system. The Trail Manager would communicate with the membership and neighbors to ensure there is appropriate dialog with all parties.
- Coordinate with Town of Truckee and U.S. Forest Service staff to plan future trail connections.
- Plan training activities which bring together volunteers who wish to help maintain the trail system. These meetings should be held at least annually.
- Coordinate and facilitate volunteer trail work days and keep a record of the number of volunteers and number of volunteer hours.
- Work with a trails focus group to establish trail rules to be listed on trail maps and posted at kiosks and online.
- Coordinate updates to the Association website concerning volunteer days and other trail activity days.
- Keep track of Association member recommendations regarding trail construction and maintenance needs and trail-related activities.
- Create an annual summary of the year's maintenance, promotional, and other trail-oriented activities to share with the Board of Directors.

7.2.3 Focus Group

This Plan recommends establishment of a Focus Group consisting of Association members who represent the range of trail users, including hikers, mountain bikers, equestrians, dog walkers, and winter trail users. Recommended tasks include:

- Serve as an advisory group for future Trails Master Plan updates.
- Work with the Trail Manager to establish trail rules.

- Work with the Trail Manager to establish trail names.
- Provide feedback on proposed trail alignments, including trail realignments.
- Help coordinate volunteer programs, such as an annual trail work day.

Trail Rules

A key task of the Focus Group would be to work with the Trail Manager to refine Tahoe Donner's trail rules. Participation by a variety of trail users is recommended to ensure a broad range of views and objectives are discussed and that the agreed upon rules work for all user groups. Note the psychology of information is important. Studies have found polite and explicit signs are more effective than signs that simply give orders (Weber et al, 2007). "Stay on the Trail" should be replaced with "Re-vegetation in progress, please remain on the trail". The outcome of this activity would be a set of rules which could be displayed on signage at trailheads, on trail maps, and online.

7.2.4 Annual Trails Education Day

Tahoe Donner could establish an annual trails education day providing lessons on open space subjects aimed at school aged children. The annual trails education day could include a short, guided hike, TDA Forestry Department talks, and a trail safety and courtesy workshop. The goal would be to instill a sense of stewardship at an early age.

7.2.5 Volunteer Activities

Volunteer activities present an opportunity for members to give something back and physically improve their trails and recreation space. Tahoe Donner could offer a trail work calendar including an annual work day, several small crew work sessions, trails education days, and a volunteer trail patrol. At volunteer activities, members could enjoy a day of fresh air, camaraderie, and exercise while getting the whole family involved.

June 2012 Volunteer Trail Day

Annual Trail Work Day

This Plan recommends continuing the annual trail work day, which has brought a large number of community volunteers together to help with trail maintenance and construction for the last 10+ years. All trail user groups and outdoor enthusiast in general would be encouraged to show their support for the trail system by taking part in this event. Volunteer activities could include:

- Clearing debris such as rocks and brush from trails
- Trail tread and drainage maintenance
- New trail construction
- Mulch distribution

Other trail management agencies have had success coordinating annual work days that conclude at noon with a "thank you" luncheon provided for annual trail work day participants. The luncheon could also include an educational activity focusing on trail rules.

Special Trail Work Days

Special trail work days could provide opportunities for volunteers to perform public service and gain a sense of accomplishment by maintaining trails within Tahoe Donner. Special work days would also extend the capabilities of the TDA Forestry Department to maintain and repair trails by enlisting the help of volunteers. Special work days would be distinguished from the annual trail work day by their size and frequency and would be held as needed throughout the summer trail season. The focus would be on a smaller scope of work than the annual trail work day projects.

Volunteer Trail Ranger Program

TDA could encourage clubs to establish a trail ranger program with the purpose of extending the efforts of the TDA Forestry Department staff through the use of trained patrols of volunteer hikers, mountain bikers, and equestrians; to provide opportunities for member involvement in trail management; and to enhance the safety and enjoyment of trail system users. The volunteer trail rangers could perform the following activities:

- Inform users of trail rules verbally and/or through distributing written trail rules
- Observe and report trail maintenance needs, physical hazards on trails, or potentially hazardous behavior by trail users
- Assist trail users who require first aid or other forms of help
- Pick-up trash on trails
- Refresh kiosks with maps

Adopt a Trail Program

An adopt a trail program could encourage member participation in the on-going maintenance, realignment, and build-out of Association trails and related improvements through the "adoption" of specific trails, or portions thereof, by an individual or group. Volunteer activities along adopted trails could include:

- Routine maintenance such as removing rocks, brush, tall grasses and litter.
- Work projects involving tasks that cannot be completed through routine maintenance. These tasks would be identified by the adopter or the TDA Forestry Department and ultimately approved by the TDA Forestry Department. Activities could include tread and drainage maintenance, non-native plant removal alongside trails, revegetation of non-system trails, and staining kiosks, picnic tables or other furnishings.
- Supervised build-out of approved and permitted new trails requiring no use of power tools.
- Financing a particular project or trail maintenance need would be welcome. Financing could take the form of contribution of materials, fundraising events, matching funds, and/or direct donations to the Association.

7.2.6 Partnership with Research Institutions

Tahoe Donner includes significant natural and cultural resources to be preserved with the trail system. Tahoe Donner could partner with Northern California research institutions (e.g., the University of California at Davis) to locate and map these resources. An improved understanding of the locations and extent of these resources would help refine potential trail alignments.

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8 Implementation and Funding

Implementation and funding recommendations include project prioritization and phasing, based on the Association's anticipated operation and maintenance budget and other potential funding sources.

8.1 Preliminary Cost Estimates

8.1.1 Unit Costs and Contingencies

Table 8-1 presents planning level unit costs used for the purpose of programming for Tahoe Donner trail maintenance and capital improvements. These unit costs (and the cost estimates based on them) are intended for planning purposes only and actual construction costs can be determined after each project has undergone more detailed feasibility and engineering design work.

Table 8-1: Unit Costs

No.	Item	Unit*	Cost
Trails			
1	Trail construction (natural surface)	MI	$26,400
2	Trail construction (paved)	MI	$300,000
3	Rolling dips	MI	$64,000
4	Turnpike	LF	$32
5	Climbing turns / switchbacks	MI	$47,520
6	Rock rake and regrade (reroute/rebuild)	MI	$32,400
7	Close and Restore Trail (Rip, recontour, seed trail; two regulatory signs/mi. of trail)	MI	$26,400
Trailheads			
8	Major Trailhead (vehicular and bike parking, kiosk, garbage receptacles, pet waste station)	LS	$32,900
9	Minor Trailhead (includes kiosk, garbage receptacles, pet waste station)	LS	$2,500
10	Restroom	EA	$50,000
Crossings			
11	Ford	LF	$20
12	Culvert	EA	$15,000
13	Boardwalk (non-motorized, no maintenance access)	LF	$250
14	Bridge - Wood short (8-14 ft span)	EA	$9,000
15	Bridge - Wood long (15-20 ft span)	EA	$16,000
16	Bridge - Fiberglass Composite (20-45 ft span)	LF	$1,800
17	Bridge - Concrete Deck/Steel Girder - Simple Span; 12 ft wide (45-150 ft span)	LF	$1,656
18	Bridge - Concrete Deck/Steel Box Girder; 12 ft wide (150-280 ft span)	LF	$1,920
19	Engineering study for roadway crossing improvements	LS	$2,000
Misc.			
20	Construct Natural Drainage Swale w/ Rock check dams	LF	$12
21	Inventory Trails for Potential Closure (Assumes 4 hours of staff time to walk 6 to 8 miles of trail, noting trails to be closed)	LS	$350
22	Erosion control	MI	$500
23	Trim Vegetation / Remove Trees	MI	$500

* LS = lump sum, EA = each, LF = linear foot, MI = mile

The detailed segment cost estimates (**Appendix B**) include cost "placeholders" (also called contingencies) for major construction projects to account for each stage of project implementation, based on factors of the construction cost, including:

- Construction overhead (mobilization and general conditions) – 10 percent
- Survey, technical studies, design, permitting – 20 percent
- Environmental analysis – 10 percent
- Project administration during planning design, and construction – 5 percent

The total contingency is estimated at 45 percent of construction costs.

8.1.2 Trail System Improvements

Appendix B presents preliminary cost estimates for the recommended trail system improvements by trail segment. Costs to implement the trail improvements identified in this Plan are estimated at approximately 2.5 Million. Build out of the Plan is assumed to be 20 years such that the average annual investment is estimated at $125,000.

Signage and Wayfinding

This Plan recommends Tahoe Donner undertake a comprehensive wayfinding program to be implemented over time as existing trails are improved and new trails are constructed. First steps would include naming all trails and trailheads within the proposed summer trail system (see **Figure 6-1**) and selecting a preferred design for the signs.

8.2 Prioritization

The intent of project prioritization is to identify achievable, priority projects for near-term implementation as well as projects for mid- and longer-term implementation. The evaluation criteria presented in **Table 8-2** are intended to give weight to those projects that best support the Plan's goals and will therefore receive higher priority. On a scale of one to five, each project is rated separately for safety, environmental opportunity, connections, and public input. These scores are then added together, with 20 being the highest possible score, thus the greatest priority for the Tahoe Donner trail system.

Two prioritization lists are proposed: one for major projects and one for minor projects. Major project include construction and maintenance projects for which Tahoe Donner must acquire regulatory agency permits, accumulate funds, and/or conduct environmental review. Minor projects include smaller repair and trail rerouting projects and maintenance needs.

Table 8-2: Project Ranking Criteria

Criterion	Description	Rating	Rating Description
Safety	Projects that improve safety receive a higher score. Safety issues may include the presence of obstacles in the trail tread, trails or trail segments that are not wide enough for passing, vegetative obstacles within recommended lateral or vertical clearances, steep trail segments, and roadway crossings without vehicular controls or signage.	1 or 2	Minimal safety concerns
		3 or 4	Moderate safety concerns
		5	Significant safety concerns
Environmental Opportunities	Projects that improve environmental conditions receive a higher score. Environmental improvements may address erosion or braiding of the trail surface, sedimentation into nearby drainages, and disturbance to ecologically sensitive areas such as wetlands and riparian habitat.	1 or 2	Minimal environmental opportunity
		3 or 4	Moderate environmental opportunity
		5	Significant environmental opportunity
Connections	Projects that improve overall system connectivity or provide immediate value to trail system receive a higher score.	1 to 3	Not along a named trail, not along an equestrian loop, another nearby trail segment provides access to the same area or point of interest
		4 or 5	Fills a gap in the trail system, provides access to an otherwise inaccessible area or point of interest, along a named trail, or part of an equestrian loop
Public Input	Membership's priority projects receive a higher score.	1 to 5	Ranked highly by the membership
Maximum Score		**20**	

8.3 Phasing

This Plan distinguishes major and minor projects by near- term, mid-term, and long- term phases. See **Appendix C** for a list of all trail improvement projects by phase. Phasing of trail system improvements is based on project priority and funding availability. Near-term projects could be carried out within the next five years. Mid-term projects would be carried out in a period 5 to 10 years from adoption of this Plan. Long-term project would be carried out in a period 10 to 20 years from adoption of this Plan.

8.3.1 Near-Term (0 to 5 Years)

Recommended near-term trail improvement projects include those projects slated for implementation in 2013 and other highly ranked projects (see **Figure 8-1** and **Appendix C**), including:

- Study potential trail alignments between trail markers 1 to 2 connecting with the stop-controlled intersection of Northwoods Blvd. and Northwoods Blvd.; conduct an engineering study to identify crossing improvements.
- Additional roadway crossing studies.Trail construction and improvements in Euer Valley.
- Trail improvements to the Nature Loop (trail markers 2-3 and 3-3a).
- Construction of trails in the Bucknam-Sinclair Tract and the McGlashan Springs parcel.
- Work with the Donner Lake Rim Trail planners to design and construction the DLRT segments the Bucknam-Sinclair Tract and the McGlashan Springs parcel.

- Bridge replacement along Trout Creek (between trail markers 3a – 4).
- Some work could begin on improvements to the Nature Loop (trail markers 3-3a) within the near-term. The remainder of the project would be pursued as a mid-term project.

8.3.2 Mid-Term (5 to 10 years)

Recommended mid-term trail improvement projects include:

- Construct new trails in Euer Valley.
- Installation of a bridge over Alder Creek (between trail markers7a-7). Installation of a multi-use trail bridge across Alder Creek and rebuilding or upgrading an approximately ¼-mile long trail segment. Replace the bridge within the campground that provides access to the campsites. Alternate option: Install an alternate bridge between trail markers 7a-60 and upgrade an approximately ¼-mile long trail segment.
- Analysis of the stream corridor between trail markers 7 and 8.
- Construction of trails in the Bucknam-Sinclair Tract and the McGlashan Springs parcel.
- Surface improvements to existing trail in power line corridor.Drainage crossings and reroutes.

8.3.3 Long-Term (10 to 20 years)

Recommended long-term trail improvement projects include:

- Parking and other improvements at the Glacier Way Trailhead.
- Trail construction and improvements in Euer Valley.Trail connection between the Glacier Way Trailhead and the Downhill Ski Center.
- Trail improvements along Alder Creek (trail markers 7a-60).
- Prosser Creek crossing improvements (trail markers 32b-69).
- Install parking at the trailhead at marker 39.

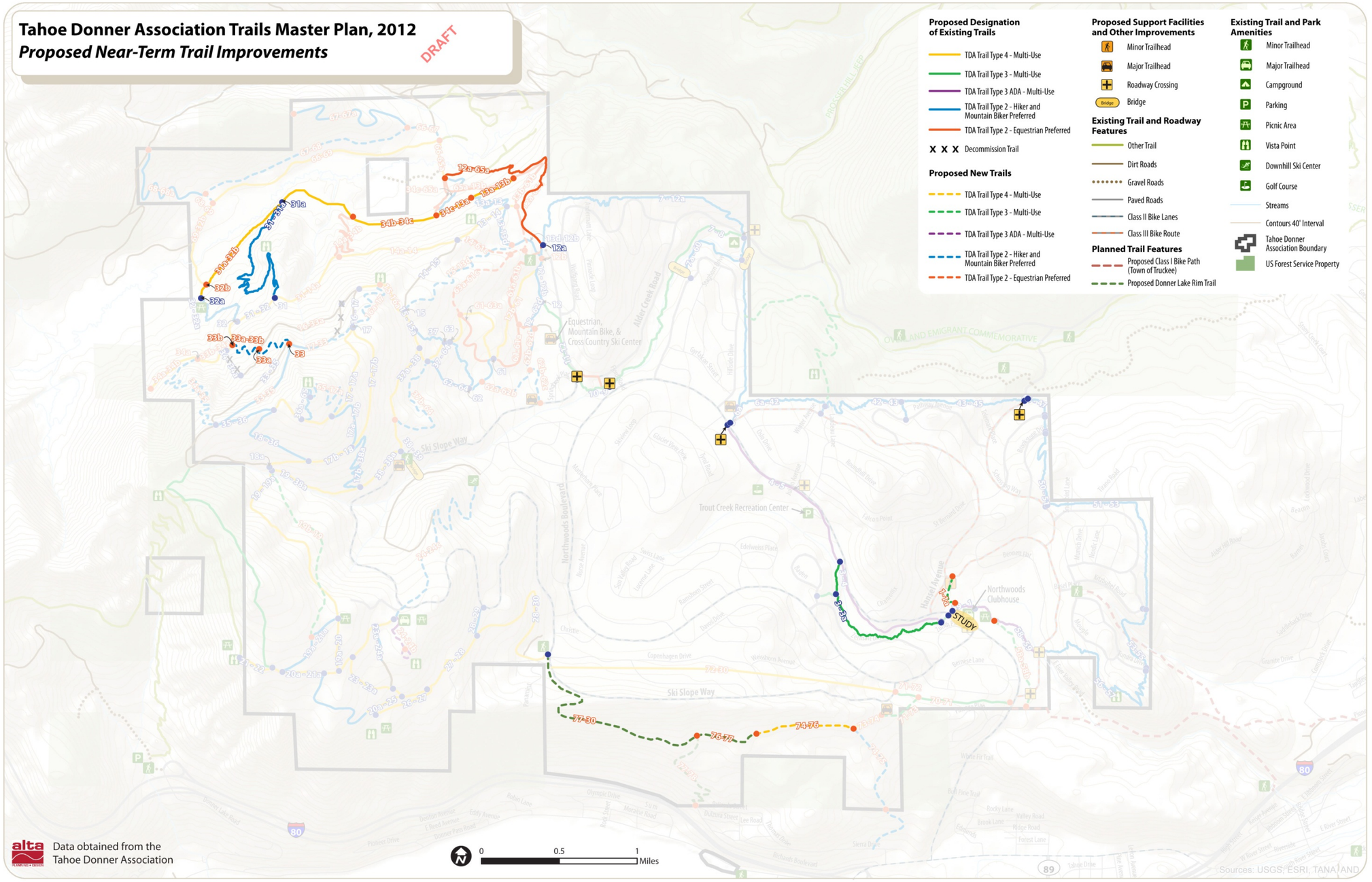

Figure 8-1: Recommended Near-Term Trail Improvemnets

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8.4 Potential Funding Sources

This section presents potential funding sources for Tahoe Donner trails, support facilities, and programs.

8.4.1 Tahoe Donner Association Capital Funds

Tahoe Donner's current funding source for trail operation, maintenance, and new construction is operational and capital funds, which include the New Machinery Equipment Fund, Reserve Replacement Fund, and the Development Fund. The Reserve Replacement Fund will continue to be a funding source for the repair, replacement and improvement of the trail system components. New Machinery and Equipment Funds can be approved for equipment, machinery or fixtures for the trail system and its ancillary facilities. Development Fund money can be allocated towards large-scale projects which may arise in the future.

8.4.2 California Department of Forestry and Fire Protection Urban Forestry Grants

The mission of the California Department of Forestry and Fire Protection's (Cal Fire's) Urban Forestry Program is to lead the effort to advance the development of sustainable urban and community forests in California. Cal Fire administers grants that are offered under Propositions 40 and 84 for activities such as tree planting, municipal tree inventories and management plans, urban forest educational efforts, and innovative urban forestry projects. Cal Fire granted TDA a $50,000 grant in for 2012/2013 for creation of defensible space and fuels reduction.

8.4.3 Volunteer Programs

Additionally, utilizing the volunteer base in Tahoe Donner is an excellent way to accomplish several of the outlined goals and policies including community involvement, outdoor education, and resource conservation. Utilizing the volunteer base can be achieved through Hiking Club and Friends of the Trails Club activities, Adopt-A-Trail programming, National Trails Day, annual trail work and trails education days, special trail work days, and a volunteer trail patrol.

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Appendix A: Trail System Ancillary Facilities

This appendix presents a summary of ancillary features within the Tahoe Donner trail system, including picnic tables, benches, trailheads, bridges, and elevated walkways/puncheons.

A.1 Picnic Tables

1. Three tables at the Glacier Way Trailhead, trail marker 24
2. Two tables at the Donner Lake Overlook, trail marker 26
3. One table at the connection with the Donner Lake Rim Trail, trail marker 22
4. One table in Euer Valley at trail marker 32
5. One table on the Nature Loop near trail marker4
6. One table in the Aspen Grove near trail marker 62
7. One hand-made table between trail marker 37A and 38

A.2 Benches

1. Three manufactured and two hand-made benches on the nature loop
2. One hand-made bench on Donner Ridge between trail marker 19A and 21A
3. Two hand-made benches on Hawk's Peak near trail marker 65
4. One hand-made bench by Alder Creek near trail marker 7A
5. One hand-made bench by Alder Creek between trail markers 7 and 8
6. One rustic bench between trail marker 20A and 25

A.3 Trailheads

There are many trailheads located throughout the trail system at Tahoe Donner. Trailheads have varied parking facilities. Some contain kiosks that have a posted small scale trail map and individual maps available to be carried with the user. The kiosks were built in-house in 2005. Pet waste stations that include a garbage can and plastic bags are available at some locations. With one exception, trailheads are seasonally open from mid-May through October, weather depending. The kiosks are stained and installed in the spring and removed in the fall. The pet waste stations are removed during the winter months and the garbage cans made unusable.

1. The Northwoods Trailhead is located at trail marker 1 north of the Northwoods Clubhouse. The trailhead includes paved parking that is shared with the Clubhouse, a pet waste station, and a kiosk.
2. An unimproved trailhead is located north of trail marker 4 south of the driving range. It contains a small, unpaved parking area (wood chips) and a pet waste station. Picnic tables are located within 200 feet of the parking area.
3. An unimproved trailhead is located at trail marker 6 at the Hansel Avenue mailboxes. It contains a small paved parking area around the mailboxes and a pet waste station.

4. An unimproved trailhead is located at trail marker 7 near the campground. The trailhead includes limited, paved parking at the campground and contains a pet waste station and kiosk.
5. The Alder Creek Trailhead is located at the end of Alder Creek Drive near trail marker 12A and has a small paved parking lot. It contains a pet waste station and a kiosk.
6. The Lower Skislope Way Trailhead is located at trail marker 39. It includes unimproved parking along Skislope Way, a pet waste station, and a kiosk.
7. The Glacier Way Trailhead is located at the top of Skislope off Glacier Way located at trail marker 24. It contains a paved parking area, pet waste station, and a kiosk. Also it has an improved picnic area adjacent to the parking area.
8. The Teton Way Trailhead is located off Skislope Way near Christie Lane at trail marker 30. It has a small unimproved parking area, pet waste station, and a kiosk.
9. There are also unimproved trailheads located at South Skislope Way at trail marker 29, Hansel Avenue at trail marker 41, Schussing Way at trail marker 52, Kitzbuhel Road at trail marker 54 and Baden Loop at trail marker 40.

A.4 Bridges and Elevated Walkways/Puncheons

There are three seasonal bridges located on Alder Creek between trail markers 7 and 8 to allow trail users to cross the creek. These are placed over the creek in the spring and removed in the fall. A bridge is located near trail marker 4; this bridge was replaced in 1997 after the flood. Seventeen puncheons are located throughout the trail system.

Hillside elevated walkway

Appendix B: Trail Improvements by Trail Segment

Table B-1 presents the recommended trail improvements by trail segment.

Table B-1: Recommended Trail Improvements and Preliminary Cost Estimates

Trail Marker	Length (LF)	Proposed Trail Type	Recommended Improvements	Additional Study Needed?	Town of Truckee Permit Needed?	Environmental Review Needed?	Total Cost Estimate	Major / Minor Project	Combined Project Rating
1-2	195	3ADA	Study trail reroute to the intersection of Northwoods Blvd. and Northwoods Blvd., conduct engineering study to identify crossing improvements.	Y	Y	Y	$25,000	Major	12
1-1a	556	3	Construct new trail segment. Route through tennis center if feasible.				$2,780	Minor	15
2-3	264	3ADA	Rebuild trail to elevate trail type from rough class 2 to type 3 accessible. Remove cobble, widen trail, ensure proper drainage, elevate out of floodplain or reroute away from streambank, and minimize grade changes. Trim vegetation as needed.				$4,287	Minor	14
3 - 4	3,994	3ADA	Rock rake, regrade or widen trail to meet new type 3 accessible classification 2,000 LF (50%) of trail. Construct ditch/swale along Northwoods Boulevard to direct drainage away from the trail. Remove dead trees.				$60,394	Major	14
3-3A	3,896	3	Note: $3,000 of trail improvement, $3000 of drainage repair, and $15000 of bridge improvement completed in 2012 including replacing 603 LF of boardwalk. Replace 282.4 LF of bridges. Reconstruct 1,950 LF of trail to smooth, wider surface and resolve drainage issues.			Y	$799,226	Major	17
3A - 4	892	3	Replace 40 foot long bridge.			Y	$104,400	Major	15
3A - 40	582	3	Reroute 250 LF of trail to lower grade along trail.				$2,500	Minor	10
4-5	5,084	3ADA	Reroute 250 LF of trail to improve access from street. Adjust grades or reroute 750 LF of trail for accessibility. Pave parking lot for three cars. Add crosswalks at each driveway where trail crosses.				$22,750	Minor	12
5-6	93	2HB	Conduct engineering study to determine crossing improvements.	Y	Y		$2,000	Minor	12
6-6A	479	2HB	Pursue easement, or reroute 250 LF of trail if necessary.				$2,500	Minor	5
6A-7A	3,982	2HB	Obtain easements on two properties.				$2,000	Minor	11
6A-42	2,767	2HB	Rock rake and regrade 830 LF of trail (30%).				$5,093	Minor	5
7A-7	674	2HB	Install 70 LF multi-use trail bridge across Alder Creek and rebuild or upgrade 1,100 LF trail. Replace 20 LF bridge within campground to access campsites. Alternate option: Install alternate 30 LF bridge crossing at 7a-60 trail and upgrade 1,000 LF trail.			Y	$199,259	Major	15
7A-60	2,653	2HB	Trail is on steep hillside and substantial stream bank erosion is undermining the trail where the trail is too close to Alder Creek. Rebuild approx. 1,000 LF trail further up slope and away from Alder Creek. Utilize remnant quarry roads where feasible. Area likely to have historic resources.			Y	$14,500	Minor	14
7-8	6,727	3	Analyze stream corridor to develop long term sustainable corridor.	Y		Y	$50,750	Major	15
7-12A	7,783	2HB	Reconstruct 1,500 LF (20%) of trail to include rolling dips. Reconstruct 250 LF (10 turns of 20 LF ea) of climbing turns/switchbacks.				$19,982	Minor	6
8-9	54	2E	Reroute 100 LF of trail. Conduct engineering study to identify crossing improvements.	Y	Y		$3,000	Minor	12
10-11	83	3	Conduct engineering study to identify crossing improvements.	Y			$2,000	Minor	11
12-62d, 62d-61a, 61a-61	2,711	2HB	Rock rake, regrade and install proper drainage features 1,000 LF of trail.				$6,231	Minor	11
13-14	1,591	4	Rock rake 100% and regrade 750 LF of trail.				$9,834	Minor	11
12a-65a	5,257	2E	Construct new equestrian trail segment.			Y	$38,113	Major	15
13d-15	4,558	2HB	Construct new trail segment.			Y	$33,046	Major	12

Trail Marker	Length (LF)	Proposed Trail Type	Recommended Improvements	Additional Study Needed?	Town of Truckee Permit Needed?	Environmental Review Needed?	Total Cost Estimate	Major / Minor Project	Combined Project Rating
14-15	2,412	RD	Rock rake and regrade 700 LF of trail (30%). Trim vegetation. Sign as maintenance road.				$4,428	Minor	9
14-31	5,513	4	Rock rake and regrade 1,600 LF of trail (30%). Trim vegetation.				$10,121	Minor	8
14-61b	1,462	2E	Construct new trail segment.				$7,310	Minor	6
15-16	1,639	4	Rock rake and regrade 500 LF of trail (30%). Trim vegetation.				$3,163	Minor	8
15-15A	626	4	Rock rake and regrade 130LF (20%).				$4,798	Minor	8
15A-37	1,075	2HB	Rebuild and reroute trail; 1,075 LF Type 2 hike/bike.				$10,750	Minor	9
15A-37A	486	4	Trim vegetation.				$46	Minor	6
16-17	1,048	4	Rock rake and regrade 500 LF of trail. Trim vegetation.				$3,116	Minor	7
16-33a	620	RD	Rock rake and trim vegetation.				$3,862	Minor	7
16a-17	3,253	2HB	Construct new trail segment.				$16,265	Minor	18
17-33	702	2HB	Construct new trail segment.				$3,510	Minor	15
18-18A	1,080	4	Rock rake and regrade 215 LF of trail (20%). Trim vegetation.				$1,422	Minor	7
17-17A	2,795	4	Rock rake and regrade 700 LF of trail (25%). Trim vegetation.				$4,560	Minor	7
17-17B	3,530	4	Rock rake and regrade 880 LF of trail (25%). Trim vegetation.				$5,734	Minor	7
17A-36A	891	4	Rock rake and regrade 225 LF of trail (25%). Trim vegetation.				$1,465	Minor	7
17A-17B	1,839	2HB	Reconstruct 50 LF of switchback as climbing turn with erosion control dips/nicks.				$481	Minor	10
17a-65	2,426	2HB	Construct new trail segment.				$12,130	Minor	9
17B-18	1,231	4	Rock rake and regrade 300 LF of trail (25%). Trim vegetation.				$1,957	Minor	7
17B-38A	3,688	2HB	Reconstruct 7 switchbacks into climbing turns (175 LF).				$1,575	Minor	10
18A-19	135	4	Rock rake and trim vegetation.				$841	Minor	7
18A-35	3,765	4	Apply for a Forest Service Special Use Permit for segment on USFS managed lands. Reroute or install rolling dips to resolve erosion issues and steep grades on 2,000 LF trail.				$10,000	Minor	15
19-19A	5,212	4	There are several steep segments of this trail that should be rerouted (2,000 LF)				$20,000	Major	10
19A-21A	2,163	2HB	Trim vegetation as needed.				$205	Minor	6
19-19b	4,863	2HB	Construction new trail segment.				$24,315	Major	5
19-38A	2,495	4	Rebuild, regrade, and/or rock rake as needed to improve trail base and prevent erosion, approx. 1,870 LF of trail (75%). Trim vegetation.				$9,586	Minor	9
19A-20	1,405	4	Trim vegetation as needed.				$133	Minor	4
20-20A	402	4	Trim vegetation as needed.				$38	Minor	4
20-23	529	4	Rock rake and regrade 500 LF of trail. Trim vegetation.				$3,118	Minor	7
20A-21A	1,107	4	Rock rake and regrade 830 LF of trail (75%). Trim vegetation.				$5,198	Minor	7
20A-25	3,914	4	Rock rake and regrade 2,514 LF of trail. Trim vegetation. 1,400 LF of this road can be rebuilt and rerouted as single track hike/bike (type 2) trail to decrease grades and prevent erosion.				$22,798	Major	9
21-21A	292	4	Trim vegetation as needed.				$28	Minor	4
21-22	1,042	4	Trim vegetation as needed.				$99	Minor	4

Trail Marker	Length (LF)	Proposed Trail Type	Recommended Improvements	Additional Study Needed?	Town of Truckee Permit Needed?	Environmental Review Needed?	Total Cost Estimate	Major / Minor Project	Combined Project Rating
21-USFS intersection	7,155		Trim vegetation as needed.				$678	Minor	4
23-23A	1,655	4	Rock rake and regrade 825 LF of trail (50%). Trim vegetation.				$5,219	Minor	7
23-24A	1,092	4	Rock rake and regrade 500 LF of trail (50%). Trim vegetation.				$3,172	Minor	7
24-24A	536	4	Rock rake and regrade 250 LF of trail (50%). Trim vegetation.				$1,585	Minor	7
23A-24A	1,773	2HB	Trim vegetation as needed. Opportunity to decommission 1/2 road and rebuild as type 2 trail.				$9,032	Minor	9
23A-25	315	4	Trim vegetation as needed.				$30	Minor	4
24			Install trailhead improvements: parking for an additional 10 to 15 cars and restrooms.		Y	Y	$120,205	Major	12
24-24c	7,299	2HB	Construct new trail segment.				$36,495	Major	12
24-24b	1,163	3	Construct paved loop trail, connecting with existing paved trail segment.				$77,093	Major	12
25-27	696	4	Rock rake and regrade 350 LF of trail (50%). Trim vegetation.				$2,214	Minor	7
26-27	1,715	4	Trim vegetation as needed.				$162	Minor	4
28-29	837	2HB	Trim vegetation as needed. Regrade/reroute trail as needed to improve egress from Skislope Way, trail should be on contour.				$4,262	Minor	9
28-30	4,879	4	Obtain easement over private property. Reroute 200 LF of trail if necessary. Trim vegetation as needed.				$2,462	Minor	4
30-77	6,335	3	Construct new trail segment (Land Trust project).			Y	$0	Major	10
31-32	1,224	4	Trim vegetation as needed.				$116	Minor	4
31-31A	7,267	2HB	Reconstruct 800 LF of trail to include rolling dips and widen as needed for user safety.				$9,697	Major	14
13b-13a, 13a-34b, 34b-31a, 31a-32b, 23b-32a	3,413	4	Replace 2 culverts. Reconstruct 900 LF of trail (26%).			Y	$50,025	Major	14
32-32a	2,416	2HB	Construct drainage crossing. Trim vegetation as needed.			Y	$2,900	Minor	13
32-34a	966	4	Trim vegetation as needed.				$91	Minor	4
32b-69	1,700	4	Pursue drainage crossing improvements over Prosser Creek. Widen trail to Type 4.	Y		Y	$89,500	Major	10
33-35	5,469	RD	Sign as maintenance road				$400	Minor	8
33-33a, 33a-33b	2,465	2HB	Construct new trail segment.				$12,325	Minor	18
34-34A	934	DECOM	Decommission trail and restore vegetation.				$4,669	Minor	12
34a-35	7,103	2HB	Construct new trail segment.			Y	$51,497	Major	18
35-36	1,616	2HB	Rock rake and regrade 800 LF of trail (50%). Trim vegetation.				$5,062	Minor	7
36a-36	1,124	4	Rock rake and regrade with rolling dips 550 LF of trail (50%). Trim vegetation.				$10,148	Minor	7
36a-65	1,392	2HB	Reconstruct 250 LF of climbing turns or switchbacks. Extend trail 1,200 LF from peak to create looped trail.				$8,250	Minor	9
63-61c	3,005	2E	Construct new trail segment. Connect with existing road.				$15,025	Minor	6
37-64	704	4	Rock rake and regrade/reroute to reduce grade of 150 LF of trail. Inventory nearby non-system trails; identify potential closures.				$1,270	Minor	7
37A-38	2,999	4	Trim vegetation as needed. Regrade erosion control problem spots to install rolling dips and grade reversals, 750 LF (25%) of trail.				$9,375	Minor	9

Trail Marker	Length (LF)	Proposed Trail Type	Recommended Improvements	Additional Study Needed?	Town of Truckee Permit Needed?	Environmental Review Needed?	Total Cost Estimate	Major / Minor Project	Combined Project Rating
37A-64	436	4	Rock rake and regrade/reroute to reduce grade of 150 LF of trail. Inventory nearby non-system trails; identify potential closures.				$1,270	Minor	7
37b-64	3,573	2HB	Construct new trail segment.				$17,865	Minor	6
38-38A	1,507	4	Trim vegetation as needed. Regrade erosion control problem spots to install rolling dips and grade reversals, 375 LF (25%) of trail.				$4,688	Minor	8
38-39	331	2HB	Steep erosive trailhead. Reroute/regrade to reduce grade. Add climbing turns and grade reversals where feasible; 330 LF.				$4,000	Minor	11
39			Install major trailhead, including parking for 3-5 cars.		Y	Y	$44,805	Major	9
42-43	3,204	2HB	Repair 1,000 LF (30%) of trail with rolling dips, grade reversals, and climbing turns wherever feasible. Install 200 LF of turnpike.				$15,400	Minor	7
43-44	518	2HB	Rock rake 518 LF of trail.				$3,179	Minor	7
43-45	3,573	2HB	Install rules and regulations signage along trail to reduce nuisance trail building; close and restore 750 LF of trail on Forest Service property. Rebuild TDA trail per type 2 hike bike guidelines. Replace 100 LF of walkway.				$8,000	Minor	8
45-46	108	2HB	Completed in 2012. Conduct engineering study to identify crossing improvements.	Y			$2,000	Minor	8
47-48	62	2HB	Study crossing at St. Bernard	Y	Y		$2,000	Minor	12
48-49	439	2HB	Reroute 75 LF of trail at TM 48 to reduce grade and reduce erosion. Add rolling dips where feasible. Armor slope if needed due to confined easement. Close shortcut trails; 30 LF. Prune vegetation. Reroute and rebuild 250 LF trail downhill from TM 49. Shield guywires or reroute away from; reroute away from storm drain outlet; steep cobbly trail.				$1,775	Minor	11
49-50	56	2HB	Reroute approx. 100 linear feet of trail.				$1,000	Minor	0
50-51	2,708	2HB	Reroute uphill egress from TM 50 150 LF. Trail is very steep and narrow and easement is quite narrow.				$1,500	Minor	11
51-52	62	2HB	Trim vegetation as needed.				$6	Minor	4
51-53	5,423	2HB	Trim vegetation as needed.				$513	Minor	4
53-55	2,564	2HB	Repair 1,000 LF (30%) of trail with rolling dips, grade reversals, and climbing turns wherever feasible.				$9,000	Minor	7
55-56	74	2HB	Reroute or rebuild trail egress at TM 56 75 LF; very steep and loose soil. Install climbing turns and grade reversals where feasible.				$675	Minor	7
56-57	6,180	2HB	Reconstruct 1,850 LF (30%) of trail to include rolling dips and grade reversals. Widen 1,850 LF (30%) of trail.				$16,650	Minor	7
57-58	141	2HB	Completed in 2012.				$0	Minor	0
58a-58b	2,741	3	Construct new trail segment.				$13,705	Minor	15
61-62	1,354	2HB	Reconstruct 675 LF (50%) of trail. Install 100 LF of turnpikes. Inventory nearby non-system trails; identify potential closures.				$6,925	Minor	9
61-61c, 61c-63	3,038	4	Rock rake and regrade 1,520 LF (50%) of trail. Install rolling dips and grade reversals where feasible. Inventory nearby non-system trails; identify potential closures.				$9,677	Minor	9
62-63	1,636	2HB	Prune shrubby vegetation away from trail to improve sightlines. Install rolling dips where feasible to wet areas of trail. Some short segments may need to be rerouted or have gravel base turnpikes installed to allow water to pass beneath the trail - while keeping the trail tread dry. Approx. 500 LF.				$5,155	Minor	9
62-64	1,435	2HB	Rock rake and regrade 1,520 LF (50%) of trail. Install rolling dips and grade reversals where feasible. Reroute steep sections and wet areas. Inventory nearby non-system trails; identify potential closures.				$9,677	Minor	7
62a-62b	1,658	2HB	Construct new trail segment.				$8,290	Minor	6
62b-62c	1,230	2HB	Construct new trail segment.				$6,150	Minor	9
67-67a	4,827	2HB	Reroute trail				$48,270	Major	6
66-67, 67-68, 68-69	7,407	2HB	Construct new trail segment.			Y	$53,701	Major	13

Trail Marker	Length (LF)	Proposed Trail Type	Recommended Improvements	Additional Study Needed?	Town of Truckee Permit Needed?	Environmental Review Needed?	Total Cost Estimate	Major / Minor Project	Combined Project Rating
68-68a	4,397	2HB	Reroute trail				$43,970	Major	6
70-71, 71-72	3,144	3	Surfacing improvements to existing trail (20%).				$3,859	Minor	17
71-73	882	3	Construct new trail segment.				$4,410	Minor	20
73-74	1,188	4	Existing road to classify as Type 4.				$0	Minor	20
74-75	2,780	2HB	Construct new trail segment.				$13,900	Minor	6
74-76	2,600	4	Construct new trail segment.				$13,000	Minor	20
76-77	1,578	3	Construct new trail segment (Land Trust project).				$0	Minor	20
77-78	3,611	3	Construct new trail segment (Land Trust project).				$0	Minor	6
						Total Costs	$2,510,669		

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Appendix C: Trail Improvement Phasing

Table C-1 presents the recommended trail improvements by phase: Near-Term (0 to 5 years from Plan adoption), Mid-Term (5 to 10 years), and Long-Term (10 to 20 years).

Table C-1: Recommended Project Phasing

Major or Minor Project	Combined Project Rating	Trail Marker	Recommended Improvements	Construction Cost Estimate
Near-Term				
Major	17	3-3A	Note: $3,000 of trail improvement, $3000 of drainage repair, and $15000 of bridge improvement completed in 2012 including replacing 603 LF of boardwalk. Replace 282.4 LF of bridges. Reconstruct 1,950 LF of trail to smooth, wider surface and resolve drainage issues. Due to the high cost of these improvements, work would begin as a near-term project and conclude as a mid-term project.	$430,000
Major	15	3A - 4	Replace 40 foot long bridge.	$104,400
Major	15	12a-65a	Construct new equestrian trail segment.	$38,113
Major	14	31-31A	Reconstruct 800 LF of trail to include rolling dips and widen as needed for user safety.	$9,697
Major	14	13b-13a, 13a-34b, 34b-31a, 31a-32b, 32b-32a	Replace 2 culverts. Reconstruct 900 LF of trail (26%).	$50,025
Major	12	1-2	Study trail reroute to the intersection of Northwoods Blvd. and Northwoods Blvd., conduct engineering study to identify crossing improvements.	$25,000
Major	10	30-77	Construct new trail segment (Land Trust project).	$0
Minor	20	76-77	Construct new trail segment (Land Trust project).	$0
Minor	18	33-33a, 33a-33b	Construct new trail segment.	$12,325
Minor	12	5-6	Conduct engineering study to determine crossing improvements.	$2,000
Minor	12	8-9	Reroute 100 LF of trail. Conduct engineering study to identify crossing improvements.	$3,000
Minor	12	34-34A	Decommission trail and restore vegetation.	$4,669
Minor	11	10-11	Conduct engineering study to identify crossing improvements.	$2,000
Minor	8	45-46	Conduct engineering study to identify crossing improvements.	$2,000
Minor	6	77-78	Construct new trail segment (Land Trust project).	$0
			Near-Term Subtotal	**$683,228**
Mid-Term				
Major	18	34a-35	Construct new trail segment.	$51,497
Major	17	3-3A	Continuation of project (see near-term project list above)	$369,226
Major	15	7A-7	Install 70 LF multi-use trail bridge across Alder Creek and rebuild or upgrade 1,100 LF trail. Replace 20 LF bridge within campground to access campsites. Alternate option: Install alternate 30 LF bridge crossing at 7a-60 trail and upgrade 1,000	$199,259

Major or Minor Project	Combined Project Rating	Trail Marker	Recommended Improvements	Construction Cost Estimate
			LF trail.	
Major	15	7-8	Analyze stream corridor to develop long term sustainable corridor.	$50,750
Major	14	3 - 4	Rock rake, regrade or widen trail to meet new type 3 accessible classification 2,000 LF (50%) of trail. Construct ditch/swale along Northwoods Boulevard to direct drainage away from the trail. Remove dead trees.	$60,394
Major	13	66-67, 67-68, 68-69	Construct new trail segment.	$53,701
Minor	20	71-73	Construct new trail segment.	$4,410
Minor	20	73-74	Existing road to classify as Type 4 .	$0
Minor	20	74-76	Construct new trail segment.	$13,000
Minor	18	16a-17	Construct new trail segment.	$16,265
Minor	17	70-71, 71-72	Surfacing improvements to existing trail (20%).	$3,859
Minor	15	1-1a	Construct new trail segment. Route through tennis center if feasible.	$2,780
Minor	15	17-33	Construct new trail segment.	$3,510
			Mid-Term Subtotal	**$828,650**
Long-Term				
Major	12	13d-15	Construct new trail segment.	$33,046
Major	12	24	Install trailhead improvements: parking for an additional 10 to 15 cars and restrooms.	$120,205
Major	12	24-24c	Construct new trail segment.	$36,495
Major	12	24-24b	Construct paved loop trail, connecting with existing paved trail segment.	$77,093
Major	10	19-19A	There are several steep segments of this trail that should be rerouted (2,000 LF)	$20,000
Major	10	32b-69	Pursue drainage crossing improvements over Prosser Creek. Widen trail to Type 4.	$89,500
Major	9	20A-25	Rock rake and regrade 2,514 LF of trail. Trim vegetation. 1,400 LF of this road can be rebuilt and rerouted as single track hike/bike (type 2) trail to decrease grades and prevent erosion.	$22,798
Major	9	39	Install major trailhead, including parking for 3-5 cars.	$44,805
Major	6	67-67a	Reroute trail	$48,270
Major	6	68-68a	Reroute trail	$43,970
Major	5	19-19b	Construction new trail segment.	$24,315
Minor	15	18A-35	Apply for a Forest Service Special Use Permit for segment on USFS managed lands. Reroute or install rolling dips to resolve erosion issues and steep grades on 2,000 LF trail.	$10,000
Minor	15	58a-58b	Construct new trail segment.	$13,705
Minor	14	2-3	Rebuild trail to elevate trail type from rough class 2 to type 3 accessible. Remove cobble, widen trail, ensure proper drainage, elevate out of floodplain or reroute away from streambank, and minimize grade changes. Trim vegetation as needed.	$4,287

Major or Minor Project	Combined Project Rating	Trail Marker	Recommended Improvements	Construction Cost Estimate
Minor	14	7A-60	Trail is on steep hillside and substantial streambank erosion is undermining the trail where the trail is too close to Alder Creek. Rebuild approx. 1,000 LF trail further up slope and away from Alder Creek. Utilize remnant quarry roads where feasible. Area likely to have historic resources.	$14,500
Minor	13	32-32a	Construct drainage crossing. Trim vegetation as needed.	$2,900
Minor	12	4-5	Reroute 250 LF of trail to improve access from street. Adjust grades or reroute 750 LF of trail for accessibility. Pave parking lot for three cars. Add crosswalks at each driveway where trail crosses.	$22,750
Minor	12	47-48	Study crossing at St. Bernard	$2,000
Minor	11	6A-7A	Obtain easements on two properties.	$2,000
Minor	11	12-62d, 62d-61a, 61a-61	Rock rake, regrade and install proper drainage features 1,000 LF of trail.	$6,231
Minor	11	13-14	Rock rake 100% and regrade 750 LF of trail.	$9,834
Minor	11	38-39	Steep erosive trailhead. Reroute/regrade to reduce grade. Add climbing turns and grade reversals where feasible; 330 LF.	$4,000
Minor	11	48-49	Reroute 75 LF of trail at TM 48 to reduce grade and reduce erosion. Add rolling dips where feasible. Armor slope if needed due to confined easement. Close shortcut trails; 30 LF. Prune vegetation. Reroute and rebuild 250 LF trail downhill from TM 49. Shield guywires or reroute away from; reroute away from storm drain outlet; steep cobbly trail.	$1,775
Minor	11	50-51	Reroute uphill egress from TM 50 150 LF. Trail is very steep and narrow and easement is quite narrow.	$1,500
Minor	10	3A - 40	Reroute 250 LF of trail to lower grade along trail.	$2,500
Minor	10	17A-17B	Reconstruct 50 LF of switchback as climbing turn with erosion control dips/nicks.	$481
Minor	10	17B-38A	Reconstruct 7 switchbacks into climbing turns (175 LF).	$1,575
Minor	9	14-15	Rock rake and regrade 700 LF of trail (30%). Trim vegetation. Sign as maintenance road.	$4,428
Minor	9	15A-37	Rebuild and reroute trail; 1,075 LF Type 2 hike/bike.	$10,750
Minor	9	17a-65	Construct new trail segment.	$12,130
Minor	9	19-38A	Rebuild, regrade, and/or rock rake as needed to improve trail base and prevent erosion, approx. 1,870 LF of trail (75%). Trim vegetation.	$9,586
Minor	9	23A-24A	Trim vegetation as needed. Opportunity to decommission 1/2 road and rebuild as type 2 trail.	$9,032
Minor	9	28-29	Trim vegetation as needed. Regrade/reroute trail as needed to improve egress from Skislope Way, trail should be on contour.	$4,262
Minor	9	36a-65	Reconstruct 250 LF of climbing turns or switchbacks. Extend trail 1,200 LF from peak to create looped trail.	$8,250
Minor	9	37A-38	Trim vegetation as needed. Regrade erosion control problem spots to install rolling dips and grade reversals, 750 LF (25%) of trail.	$9,375
Minor	9	61-62	Reconstruct 675 LF (50%) of trail. Install 100 LF of turnpikes. Inventory nearby non-system trails; identify potential closures.	$6,925

Major or Minor Project	Combined Project Rating	Trail Marker	Recommended Improvements	Construction Cost Estimate
Minor	9	61-61c, 61c-63	Rock rake and regrade 1,520 LF (50%) of trail. Install rolling dips and grade reversals where feasible. Inventory nearby non-system trails; identify potential closures.	$9,677
Minor	9	62-63	Prune shrubby vegetation away from trail to improve sightlines. Install rolling dips where feasible to wet areas of trail. Some short segments may need to be rerouted or have gravel base turnpikes installed to allow water to pass beneath the trail - while keeping the trail tread dry. Approx. 500 LF.	$5,155
Minor	9	62b-62c	Construct new trail segment.	$6,150
Minor	8	14-31	Rock rake and regrade 1,600 LF of trail (30%). Trim vegetation.	$10,121
Minor	8	15-16	Rock rake and regrade 500 LF of trail (30%). Trim vegetation.	$3,163
Minor	8	15-15A	Rock rake and regrade 130LF (20%).	$4,798
Minor	8	33-35	Sign as maintenance road	$400
Minor	8	38-38A	Trim vegetation as needed. Regrade erosion control problem spots to install rolling dips and grade reversals, 375 LF (25%) of trail.	$4,688
Minor	8	43-45	Install rules and regulations signage along trail to reduce nuisance trail building; close and restore 750 LF of trail on Forest Service property. Rebuild TDA trail per type 2 hike bike guidelines. Replace 100 LF of walkway.	$8,000
Minor	7	16-17	Rock rake and regrade 500 LF of trail. Trim vegetation.	$3,116
Minor	7	16-33a	Rock rake and trim vegetation.	$3,862
Minor	7	18-18A	Rock rake and regrade 215 LF of trail (20%). Trim vegetation.	$1,422
Minor	7	17-17A	Rock rake and regrade 700 LF of trail (25%). Trim vegetation.	$4,560
Minor	7	17-17B	Rock rake and regrade 880 LF of trail (25%). Trim vegetation.	$5,734
Minor	7	17A-36A	Rock rake and regrade 225 LF of trail (25%). Trim vegetation.	$1,465
Minor	7	17B-18	Rock rake and regrade 300 LF of trail (25%). Trim vegetation.	$1,957
Minor	7	18A-19	Rock rake and trim vegetation.	$841
Minor	7	20-23	Rock rake and regrade 500 LF of trail. Trim vegetation.	$3,118
Minor	7	20A-21A	Rock rake and regrade 830 LF of trail (75%). Trim vegetation.	$5,198
Minor	7	23-23A	Rock rake and regrade 825 LF of trail (50%). Trim vegetation.	$5,219
Minor	7	23-24A	Rock rake and regrade 500 LF of trail (50%). Trim vegetation.	$3,172
Minor	7	24-24A	Rock rake and regrade 250 LF of trail (50%). Trim vegetation.	$1,585
Minor	7	25-27	Rock rake and regrade 350 LF of trail (50%). Trim vegetation.	$2,214
Minor	7	35-36	Rock rake and regrade 800 LF of trail (50%). Trim vegetation.	$5,062
Minor	7	36a-36	Rock rake and regrade with rolling dips 550 LF of trail (50%). Trim vegetation.	$10,148
Minor	7	37-64	Rock rake and regrade/reroute to reduce grade of 150 LF of trail. Inventory nearby non-system trails; identify potential closures.	$1,270
Minor	7	37A-64	Rock rake and regrade/reroute to reduce grade of 150 LF of trail. Inventory nearby non-system trails; identify potential closures.	$1,270
Minor	7	42-43	Repair 1,000 LF (30%) of trail with rolling dips, grade reversals, and climbing turns wherever feasible. Install 200 LF of turnpike.	$15,400
Minor	7	43-44	Rock rake 518 LF of trail.	$3,179

Major or Minor Project	Combined Project Rating	Trail Marker	Recommended Improvements	Construction Cost Estimate
Minor	7	53-55	Repair 1,000 LF (30%) of trail with rolling dips, grade reversals, and climbing turns wherever feasible.	$9,000
Minor	7	55-56	Reroute or rebuild trail egress at TM 56 75 LF; very steep and loose soil. Install climbing turns and grade reversals where feasible.	$675
Minor	7	56-57	Reconstruct 1,850 LF (30%) of trail to include rolling dips and grade reversals. Widen 1,850 LF (30%) of trail.	$16,650
Minor	7	62-64	Rock rake and regrade 1,520 LF (50%) of trail. Install rolling dips and grade reversals where feasible. Reroute steep sections and wet areas. Inventory nearby non-system trails; identify potential closures.	$9,677
Minor	6	7-12A	Reconstruct 1,500 LF (20%) of trail to include rolling dips. Reconstruct 250 LF (10 turns of 20 LF each) of climbing turns/switchbacks.	$19,982
Minor	6	14-61b	Construct new trail segment.	$7,310
Minor	6	15A-37A	Trim vegetation.	$46
Minor	6	19A-21A	Trim vegetation as needed.	$205
Minor	6	63-61c	Construct new trail segment. Connect with existing road.	$15,025
Minor	6	37b-64	Construct new trail segment.	$17,865
Minor	6	62a-62b	Construct new trail segment.	$8,290
Minor	6	74-75	Construct new trail segment.	$13,900
Minor	5	6-6A	Pursue easement, or reroute 250 LF of trail if necessary.	$2,500
Minor	5	6A-42	Rock rake and regrade 830 LF of trail (30%).	$5,093
Minor	4	19A-20	Trim vegetation as needed.	$133
Minor	4	20-20A	Trim vegetation as needed.	$38
Minor	4	21-21A	Trim vegetation as needed.	$28
Minor	4	21-22	Trim vegetation as needed.	$99
Minor	4	21-USFS intersection	Trim vegetation as needed.	$678
Minor	4	23A-25	Trim vegetation as needed.	$30
Minor	4	26-27	Trim vegetation as needed.	$162
Minor	4	28-30	Obtain easement over private property. Reroute 200 LF of trail if necessary. Trim vegetation as needed.	$2,462
Minor	4	31-32	Trim vegetation as needed.	$116
Minor	4	32-34a	Trim vegetation as needed.	$91
Minor	4	51-52	Trim vegetation as needed.	$6
Minor	4	51-53	Trim vegetation as needed.	$513
Minor	0	49-50	Reroute approx. 100 linear feet of trail.	$1,000
			Long-Term Subtotal	**$998,791**
			Total for all Phases	**$2,510,669**