

Newell Creek Canyon Trail Feasibility Assessment

Oregon City, OR

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PREPARED FOR: Metro

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1 Overview

This document provides guidance and suggestions for the creation of a shared-use natural surface trail system in the Newell Creek Canyon Natural Area near Oregon City, OR. This trail system would capitalize on the growing demand for urban recreational trails that are optimized for mountain bicycling. Metro has asked the International Mountain Bicycling Association's Trail Solutions program to assess the area and study the feasibility of developing trails that are optimized for mountain bicyclists. To that end, the purpose of this document is to explore the opportunities and constraints for the development of a shared-use trail system and associated support facilities compatible with the environment and with other trail users. This document will have three components: A summary of existing conditions, a trail construction feasibility analysis, and a comparison between Newell Creek Canyon Natural Area and other regional mountain bicycle trail precedents.

About IMBA

The International Mountain Bicycling Association (IMBA) is a 501(c)(3) non-profit educational association whose mission is to create, enhance, and preserve great mountain bicycling experiences. Since 1988, IMBA has been bringing out the best in conservation-minded mountain bicyclists by encouraging low-impact riding, volunteer trailwork participation, cooperation among different trail user groups, grassroots advocacy, and innovative trail management solutions.

Based in Boulder, CO, and with staff distributed across the country and the world, IMBA meets its goals through programs, notably the Trail Care Crew (TCC) and Trail Solutions (TS) consulting teams. IMBA has a strong history of working with the BLM, with notable projects in the King Range National Conservation Area, CA; the Sandy Ridge Trails outside of Portland, OR; and The Black Canyon Trail outside of Phoenix, AZ. In 2003, the IMBA TCC and TS teams won Nevada State's "Best Trail Project" award with a shared-use collaboration and makeover construction of the Evans Creek Canyon Trail in Reno.

2 Existing Conditions

Area Description

The Newell Creek Canyon Natural Area is an amalgamation of parcels encompassing 219 acres of land, near Oregon City. These parcels were purchased as part of two bond measures passed in 1995 and 2006 to protect critical habitats space around the Metro area. It is bounded to the east by Highway 213, and to the south by retail businesses along South Beavercreek Road. To the west and north is a mix of housing developments, utility rights-of-way, and undeveloped private properties. The natural area is owned and managed by Metro and, thanks to a partnership with the Greater Oregon City Watershed Council, has been the subject of restoration efforts. These projects began in 2012 and have focused on controlling invasive plant species and replanting with natives.



Newell Creek Canyon Natural Area

Previous Analysis by IMBA TS

In 2010 staff from IMBA Trail Solutions along with Metro personnel took part in a brief survey of existing uses on the southernmost parcel of the Newell Creek Canyon Natural Area. This survey analyzed existing uses of the zone. The primary observations were:

1. Saturated soils, heavily eroded drainages, and steep sideslopes leave very few areas suitable for extensive trail development without costly trail hardening.



2. There were only a limited number of access points for the property. These access points were inadequate for construction of a large trailhead facility.
3. The site only had “top down” access, meaning that trail users had to access the terrain from the highest elevations, descend to the bottom and then climb back to the top. Trails built in this type of terrain are not optimal for mountain bicycle (MTB) trails. It is generally less rewarding to finish a bike ride with a climb. Indeed, trail users of all types often prefer to ascend first and end with a descent.
4. Transient camps have heavily impacted the site. It appeared that the majority of the trail formation and use was by transients. These trails serve as access routes between the limited number of access points and campsites.

Current Use

Based on observations by TS of trail user patterns and impacts and by comments from Metro staff, current recreational use of the area is low. Use is primarily by nature viewers, walkers, and runners. There were no visible signs of regular mountain bicycle use. The most active trail use observed on natural surface trails in the area was by transients. Metro has undertaken a concerted effort to reduce the number of homeless camps on the site to minimize impacts to natural resources.

Existing Trails

Current access for the site is via an access road on the south end of the property, adjacent to Nelson’s Nautilus. This road is in acceptable condition for management of the site but doesn’t provide suitable access for recreational users. Some of the existing trails follow old logging or other access roads. None of the existing trails were planned, nor were they built in a manner that is compatible with recreational use or natural resource impacts. With the exception of the access road on the south end, all trails suffer from one or more major sustainability issues. These issues include, but are not limited to:

- Located in low lying or wet area
- Located in steep, eroded, or erosion-prone area
- Constructed on fall-line route which focuses water drainage and accelerates erosion
- Does not access or interpret the site in a manner that provides recreation while minimizing impacts on the environment



Topography and Soils

The canyon is comprised of steep slopes, creek drainages, and low-lying flat areas, with an extensive network of landslide slip zones and scarps. Elevation ranges from 40 to 440 ft. Slopes in excess of 50% are common along the upper elevations. Numerous creeks and small drainages flow through the canyon, with seasonal and persistent wet areas along low-lying terrain.

Soils on the site are primarily xerochrepts and haploxerolls, colluvium resulting from landslides (20-70% slopes); Helvetia and Chehalis silt loam comprise the remainder on slopes ranging from 0-30%. The soil in the Newell Creek Canyon Natural Area is frequently saturated, with seeps along slopes, numerous drainages, and ponding occurring in low-lying areas. While soil conditions vary depending on the location within the canyon, season, and weather conditions, many existing trail areas were reported as wet year-round.

The entire property is considered to have moderate to high deep landslide susceptibility, and about 80% as moderate to high shallow landslide susceptibility. As most of the area has steep slopes combined with silt loam soils, it is rated as severe erosion risk and high susceptibility to compaction; with areas on slopes <30% rated as moderate erosion risk. (NRCS, 2013)

Steep, slide prone slopes are generally very poor locations for the siting of trails, although it is not impossible. Some of the low rounded hills that mark the locations of older landslips represent terrain that could be useable for trail development. The steeper slopes which lie mostly along the rim are generally less compatible with trail development. Techniques for building trails in these steep slopes do exist but they represent a higher cost. Also less compatible with trail development are the many low lying, flat and wet areas. These areas usually harbor more sensitive species and require more expensive trail construction techniques. There are numerous creeks and drainages in the project area. Crossings of any drainages will be sited at appropriate locations outside of critical habitat zones and using techniques such as bridging or stone armored fords to minimize impacts to watercourses. Trail alignment will likely be constrained due to limitations in siting of creek and drainage crossings. Each creek and/or drainage crossing will result in a significant increase in costs, however most trail users are drawn to trails that take them near water. This leaves a relatively small area of the site that is readily developable for a trail network.



Soil and slope conditions could require seasonal or temporary closures to prevent trail damage by users. Many key indicators for unstable ground that is prone to landslides can be observed onsite. These include hummocky ground, scarps, bent trees, and standing water. In 2006 the ground in an area adjacent to the natural area moved enough to damage or destroy several units of an apartment complex. This type of land movement is ongoing and indicative of the challenging soil conditions that exist within the natural area. To develop sustainable trails, construction techniques that counter these soils related issues are necessary. All of these techniques represent a higher cost for development, as they require increased labor, machinery, and materials such as stone and rot resistant wood or composites.

Vegetation

The site is forested area typical of Douglas fir – big leaf maple forest communities, with groves of Western red cedar. Understory is typical of this forest type, with sword fern dominating the herbaceous layer under closed canopy. Inundated areas host skunk cabbage and clusters of stinging nettles. Several invasive species were observed on the site, including Himalayan blackberry (*Rubus discolor*) and English holly (*Ilex aquifolium*). Metro is actively managing the site to control invasive species and has undertaken removal efforts concurrent with native replanting.

Access Points

Access is a constraint to recreational development at the site: there are currently no developable access points that can be utilized as trail heads with designated parking. Users must park on neighborhood streets or in local business parking lots. There are two access points that are currently useable, yet lack a clearly defined legal right of way. The most southern of these lies in the area just off of Beaver Creek Road. This location provides the best access point for users visiting the site from other parts of the Metro area. Its location just off of Hwy 213 and in close proximity to a major shopping area suggests it will likely be the best access point for developing a major trailhead access point. Other access points should be developed as entry points for neighborhood users. This will minimize any impacts on residential areas due to traffic and noise.



3 Trail Construction Feasibility

Trail System Concept

The trail system concept provides a conceptual framework for trail planning within the Newell Creek Canyon Natural Area. These recommendations are made based upon TS's current understanding of site constraints, restoration and resource protection goals, stakeholder input, and latent demand for mountain bicycling opportunities within the metro region.

Newell Creek Canyon is envisioned as supporting a natural surface, single-track trail system that minimizes impacts to the natural area while providing high quality user experiences. At 219 acres, with many acres being unsuitable for trail development, the site is most suited to having a small, primarily shared-use trail system. Site constraints and resource protection goals limit the areas for trail development. Based on the available terrain, the Newell Creek Canyon trail system could sustainably host a small system of trails, providing anywhere from 10 minutes to 2 hours of trail activity for users. It is recommended that trails be divided into some combination of single and shared use, to accommodate diverse uses within the relatively small trail system.

Based upon the potential for trail mileage and user experiences, it is presumed that the majority of users who will enjoy this system will likely live within a 30-minute drive of the primary access point. It is expected that many users will be local, visiting the trails from neighborhoods and schools within a 10-minute walking or bicycling distance.

Experience Zones

To better guide the site planning process for trail development and management, Experience Zones are used to divide areas within the site. The system of trails should be divided into three Experience Zones, to provide a range of experiences within the relatively small planning area: purpose-built trails for mountain biking only ("bike-optimized trails"), shared-use trails, and hiking-only. Most of the trail length should be split roughly evenly between bike-optimized and shared-use trails, with short hiking only loops near trailheads. In this scenario, most of the trails would be open to mountain bicyclists, in part because they cover greater distances more efficiently and need a larger number of trail miles to enjoy their activity than most hikers. Shared-use trails could accommodate a wide range of active uses: hiking, mountain bicycling, trail running, bird watching. Hiking-only trails would provide excellent opportunities for hiking as well as more passive uses, such as site interpretation and education.



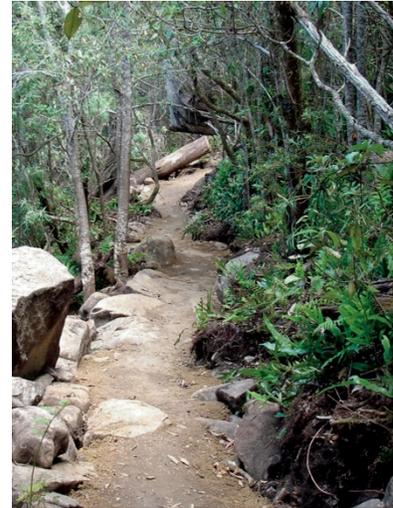
While zones are shown dividing the entire planning area for simplicity, it is recognized that many locations may be unsuitable and/or unsustainable for trail construction within each zone, particularly in areas of high resource value and/or due to other environmental constraints.

Foot Use Trail Zone

These trails will be built using sustainable trail construction techniques. They may be steeper in grade than shared-use trails but will require surface hardening techniques to provide a durable 4-season trail. These trails should provide foot users with an opportunity to find a sense of solitude in an urban environment. Scenic vistas, wildlife viewing, interpretive signs, and resting points should be integrated where possible.

This zone is planned to be located for neighborhood access from small trailhead access points towards the center of the natural area (see *Newell Creek Canyon Natural Area Conceptual Plan Map*, page 11). The foot use zone is expected to see frequent use by area residents for short walks or as a starting point for longer hikes and runs. This small area has suitable terrain for short loop trails and interpretive sites that can connect to shared-use trails. Slopes less than 30% dominate the area, good for contour trail alignment, flatter areas (<10%) and those near streams will require additional hardening and/or raised tread.

- *Approximate Construction Costs*
\$40,000-60,000/mile



Single use foot trail

Mountain Bicycle (MTB) Trail Zone

These trails will be built using sustainable trail construction techniques. They should be purpose-built for MTB users only. This type of MTB-optimized trail is constructed with features such as rock gardens, berms, larger grade reversals, wider cambered turns, and modest jumps. These trails should make use of gravity and, where possible, be managed to enhance trail flow for descending riders. These trails will need surface hardening techniques to provide a durable 4-season trail. They should be designed for users in the intermediate to advanced skill levels. Hybrid trail construction can accommodate intermediate and advanced riders within the same trail corridor by providing optional



advanced features. This allows many skill levels to experience the full trail mileage, while providing for skill progression, within a smaller trail footprint.

The area highlighted for the MTB Trail Zone consists of a large area at the south end of the Natural Area, where several existing informal trails and legacy access routes exist. This zone is also located to provide access from the two possible trailhead access points, as identified on the Conceptual Plan Map, via shared-use trails from the west and MTB-only trails from the south. Seasonally inundated areas along the lower creek drainage are outside this zone, due to cost of construction and potential impacts to natural resources. As most of this area is consider high risk for landslides and erosion-prone, construction will likely require additional tread stabilization in the form of retaining walls, tread hardening, and frequent drainage structures.

- *Approximate Construction Costs*
\$50,000-60,000/mile



Purpose-built MTB Trail

Shared Use Trails Zone

These trails will be built using sustainable trail construction techniques. Routes will be constructed and maintained using techniques that will minimize user conflict. These trails will need surface hardening techniques to provide a durable 4-season trail. They should be designed for users in the beginner to intermediate skill levels.



Shared-Use Trail

The Shared-Use Trails Zone is the largest trail zone, spanning the south and central areas to provide connections to other trail zones and trailhead access points, while allowing exploration of the natural area and some separation from higher density trails in the other zones. There are some steep slopes in this zone, but most areas in excess of 50% have been excluded. Trails on steeper slopes may require retaining walls or other structures to minimize side-hill erosion and tread failure.

- *Approximate Construction Costs*
\$50,000-60,000/mile



Highly Constrained Trails Zone

While environmental constraints severely limit trail construction, an additional possible shared-use zone is shown in the northern area (shown in red). This area has numerous small creeks and steep slopes, with Newell Creek running its length from north to south. Any trails on slopes greater than 50% will likely require armoring and tread hardening for stability. Creek and drainage crossings will require bridges and/or armoring, and some low-lying areas may require boardwalks or raised tread. However, this central and northern area is slightly less landslide-prone than much of the rest of the property. Construction of trails in this area will be much more expensive and require greater maintenance.

Costs

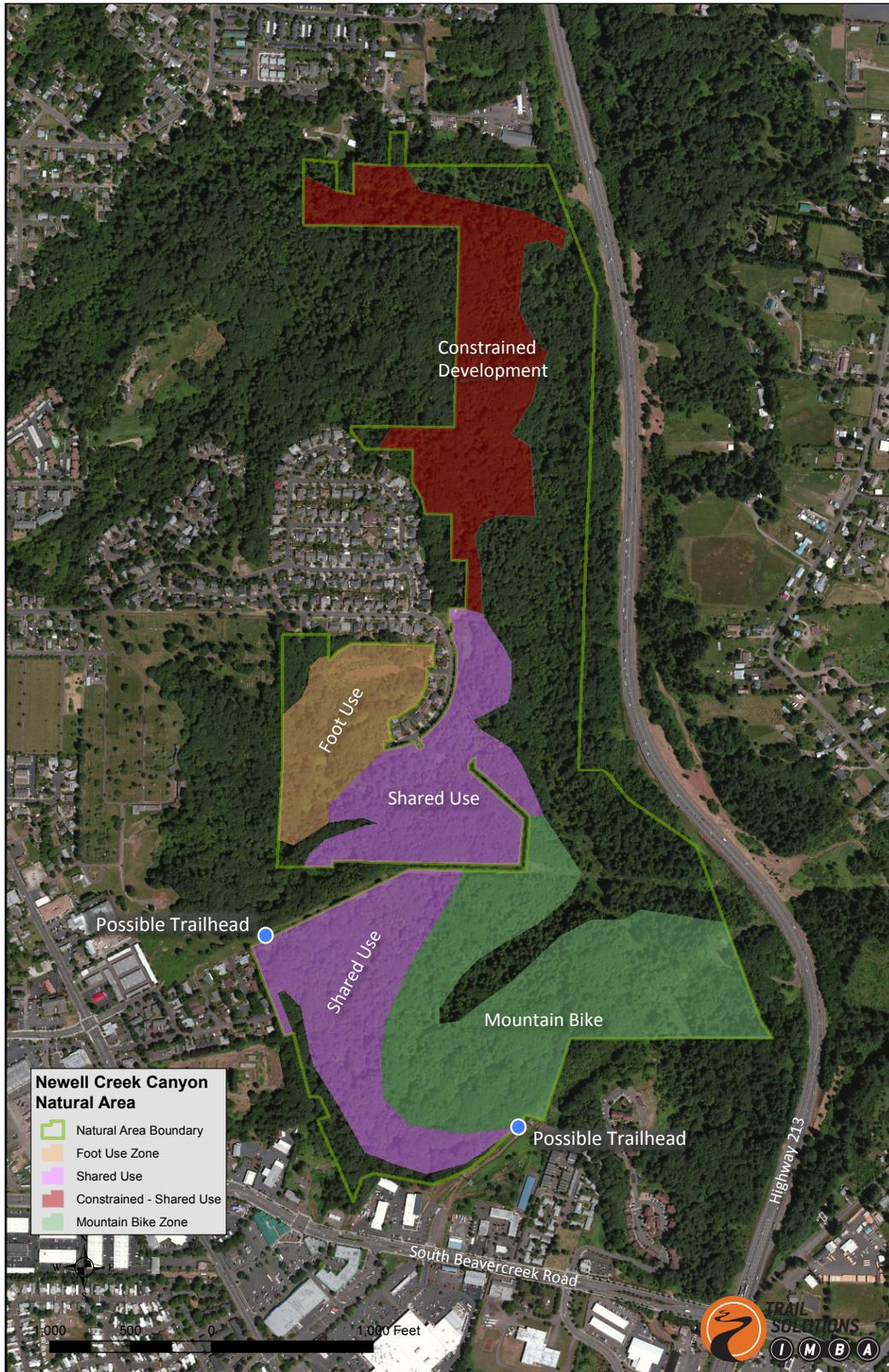
Construction costs are broad estimates based upon initial site visits and development constraints and assume all design and construction by a professional trailbuilder. Costs do not include design and permitting, typically estimated at 10-20% of construction costs. Engaging a professional in trail planning, design, and construction will generate the best trail system conditions for the long term. Trails and facilities development can be undertaken in phases. Volunteers can offset small costs for construction and maintenance, and, more importantly, engaging volunteers builds a community of support and sense of ownership for the trails and natural area.

Phased Construction

If construction is to be undertaken in phases, it is recommended that at least some bike-optimized trails be constructed in Phase 1, in addition to shared-use trails. Phase 1 trails should also include beginner and intermediate options in loops from primary access points.



Newell Creek Canyon Trail Assessment

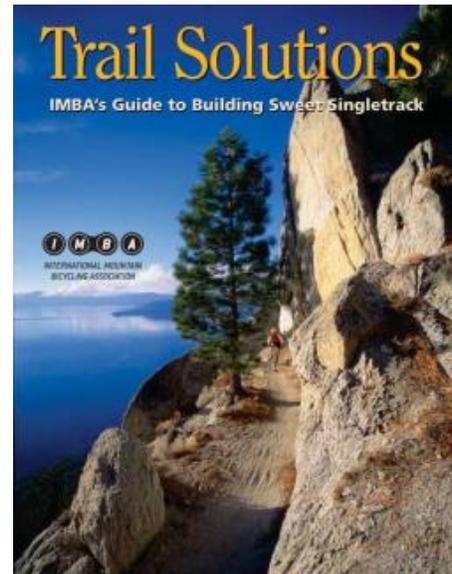


Newell Creek Canyon Natural Area Conceptual Plan Map



Trail Construction Guidelines

The natural environment is dynamic and unpredictable. The nature of recreational trails, the desired user experience, and the constant forces acting on natural surface trails and roads make strict standards untenable and undesirable. As such, the guidelines below are simply that: best management practices that should be followed within the site-specific environmental constraints of Newell Creek Canyon.

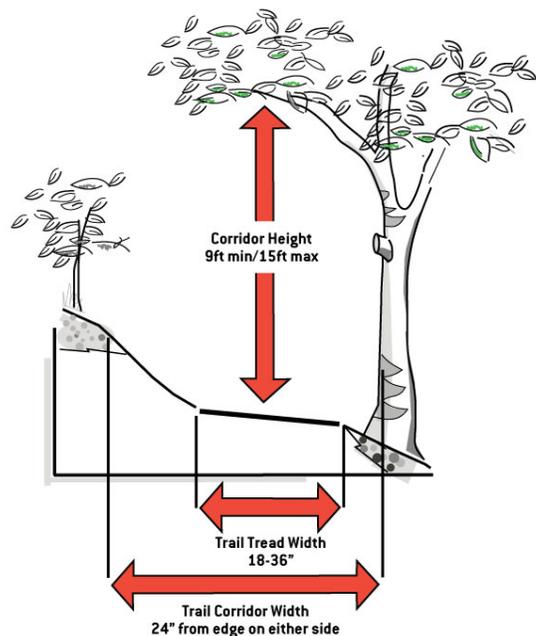


Use Sustainable Trail Construction Guidelines -

Sustainable trails balance many elements. They have little impact on the environment, resist erosion through proper design, construction, and maintenance, and blend with the surrounding area. A sustainable trail also appeals to and serves a variety of users, adding an important element of recreation to the community. It is designed to provide enjoyable and challenging experiences for visitors by managing their expectations and their use effectively. Following trail design and construction guidelines allows for high-quality trail and education experiences for its users while protecting the sensitive resources. An eye to sustainability and creating a trail system that blends with its landscape is particularly important for trails within the Newell Creek Canyon Natural Area.

Construct Narrow Singletrack Trails - Sustainable trail design can minimize user conflicts. The faster speed of mountain bikers compared to other trail users can cause conflict. While there are always a few renegades, most mountain bikers are responsible, conscientious trail users who seek an enjoyable experience, not excessive speed. Narrow (18" to 36") singletrack trails that have twists and turns, rougher surfaces, and natural obstacles will provide challenges and thrills for mountain bikers while keeping speed down, which in turn may reduce user conflict.

Single Track Trail Corridor





This concept, known as “traffic calming,” has long been used on city streets to slow cars. Wider trails commonly called doubletrack (4’ to 12’) encourage wheeled users to go faster and increase the likelihood of conflict.

Maintain Good Clear Sightlines on MTB and Shared Use Trails - A crowded trail with a mix of foot users and MTB users requires greater visibility. Vegetation within 2’ of the trail edges should be trimmed back regularly. Keep vegetation below waist level to control trail width and anchor turns but still allow for clear sightlines. Don’t remove trees near the trail tread; just trim their branches for improved visibility. Clear sightlines equal good communication between user types and fewer conflicts.

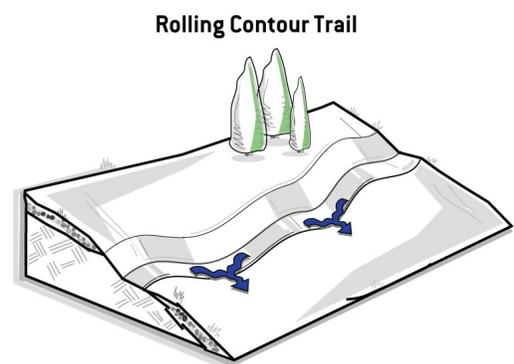
Avoid the Fall Line – Fall-line trails usually follow the shortest route down a hill – the same path that water flows. The problem with fall-line trails is that they focus water down their length. The speeding water strips the trail of soil; exposing roots, creating gullies and scarring the environment. This is a particular concern at Newell Creek Canyon, where unstable topography and saturated soils can make trails more vulnerable to rill erosion and even slope failure.

Avoid Flat Areas – Trails that are not located on a slope have the potential for the trail to become a collection basin for water leading to chronically muddy conditions. The trail tread must always be slightly higher than the ground on at least one side of it so that water can drain properly. For Newell Creek Canyon, flat areas will need to be raised and/or hardened to prevent ponding.

Follow the Half Rule - The trail grade should not exceed half the grade of the hillside or sideslope that the trail traverses to prevent it from becoming a fall line trail. Additionally, average trail grade should not exceed 10% for the majority of the trails to reduce user-based erosion.

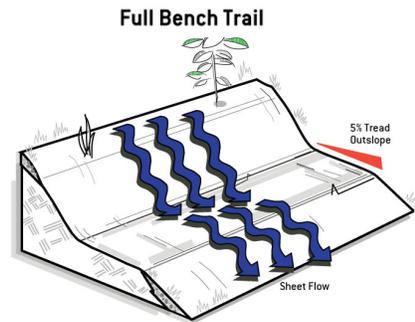
Establish and don’t exceed the Maximum Sustainable Trail Grades - Except for very short distances and other special sustainable conditions (typically 15-25%).

Implement Rolling Contour Trails with Grade Reversals – Grade reversals force water to exit the trail at the low point before it can gain more volume and momentum and erosive power.



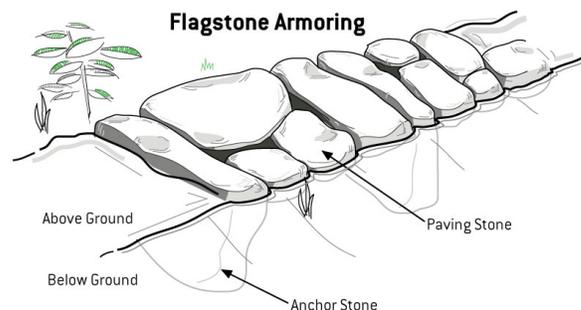
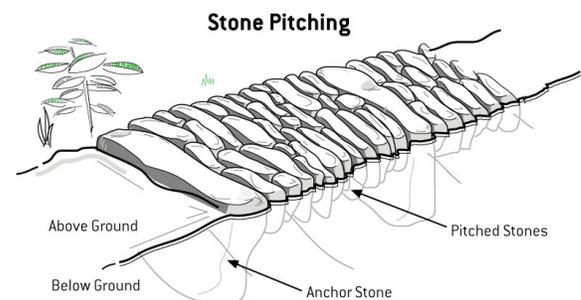
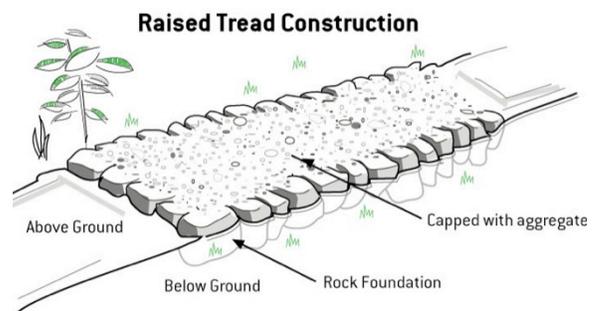


Slope the trail tread - Outslope encourages water to sheet across and off the trail instead of funneling down its center. Insloping the trail tread to sump areas also keeps water from funneling down the center of the trail. However, too much outslope (>10%, except at drainage dips) can cause the tread to be undefined for users, degrade user experience, and lead to tread creep. Due to highly compactible silt loam soils found at Newell Creek Canyon, newly constructed tread will require maintenance to maintain 5-8% outslope.



Trail Surface -

- The trail tread should be full bench when constructed on slopes.
- Constructed tread should average 24-30” in width, with a minimum width of 18” and a maximum width of 42”.
- Surface should be firm and stable.
- The tread should be slightly wider in curves, climbs, and alongside trail features.
- The trail should not include mud holes, puddles, or any muddy segments whatsoever.
- Imported surfacing material should be used to achieve the intended surface character if necessary.
- All trail subgrades, trail treads, and trail-surfacing materials should be compacted according to commonly accepted best





practices and in a manner that will support the intended use.

- All tread should be constructed using techniques and materials that will allow for 4-season use. This will require importing stone, wood and aggregate materials to armor or raise the tread when conditions require.

For additional trail design, construction, and maintenance techniques, refer to *Trail Solutions: IMBA's Guide to Building Sweet Singletrack*. These guidelines are appropriate for any hike, bike, or equestrian trail.



4 Comparison to Regional Precedents

Location		Sandy Ridge Trail System	Forest Park	Powell Butte	Newell Creek Natural Area (Conceptual Plan)
Land Manager		Bureau of Land Management	Portland Parks & Recreation	Portland Parks & Recreation	Metro
Annual Visitors	Estimated	60,000+	475,000	No Data	
% MTB Visitors	Estimated	>95%	10%	No Data	Anticipated: 20-50%
Regional Access	Driving distance from Metro center	Less Convenient	Very Convenient	Moderately Convenient	Moderately Convenient
Local Access	Access from neighborhoods	Less Convenient	Very Convenient	Very Convenient	Very Convenient
Total Acreage	Approximate	6,000	5,172	612	219
Miles of singletack trail	Approximate	15	50	9	
% Singletrack Open To MTB	Approximate	100%	0.6%	67%	
Trail Types		Bike Optimized Singletrack	Doubletrack & Traditional Singletrack	Doubletrack & Traditional Singletrack	Traditional and Bike Optimized Singletrack
Trail Users		hike/bike/horse	Bike, hike	Hike, bike, horse	Hike, bike
Designated Use		single-use/preferred use/ shared-use	Preferred Use: Bike	Hike only and shared-use	Hike only and shared-use
Purpose-Built MTB Trail?		Yes/No	Yes	No	Yes
Rider Skill Level		Beginner/Intermediate/Advanced/Expert	Beginner/Intermediate/Advanced/Expert	Beginner/Intermediate	Beginner/Intermediate
Parking Units		Dedicated+Adjacent	40+100	60+	40+25
Key - Visitor Expectations	Exceeds	Meets	Below	To be determined/ No Data	Recommendation

Sources: BLM (TRAFx user data for Sandy Ridge Trail System, 2013); Portland Parks and Recreation



Trail Maintenance

All trails require maintenance in order to ensure that they continue to meet the desired experience they were designed for and minimize any ecological impacts. Trails that are designed and built using sustainable trail guidelines require a minimum of maintenance. It is estimated that trails at Newell Creek Canyon will require the majority of maintenance in the fall just after leaves have dropped from deciduous trees and again in early spring. The majority of the work will be maintenance of drains, clearing downed trees and trimming vegetation in the corridor. These activities require minimal training for effective results.

Newly constructed trails “cure” as tread compacts, adjacent vegetation fills in, and users define the active tread. It is difficult to anticipate all resource-related issues during the initial construction: seeps may appear that were not evident during dry season construction, holes and dips in the tread may appear due to excessive soil compaction. As such, in the first year following construction, additional maintenance is often needed to address tread compaction, muddiness, and other tread fine-tuning to ensure the trail tread and corridor meet sustainable guidelines.

Costs for maintenance will be highest during the initial year as the tread compacts. Successive years will require less effort and reduce costs. Maintenance at Newell Creek Canyon trails should be in the \$2,000-\$2,500 per mile per year range. Building trails that meet sustainability guidelines will minimize maintenance costs. This is demonstrated at Sandy Ridge Trails, which sees relatively high use, but sees minimal maintenance costs because of the attention to sustainable construction techniques.



Visitors

Use of trails at Newell Creek Canyon is expected to be strong throughout the year. More use can be expected during the warmer months with peak visitation occurring on weekday afternoons and weekends. This is similar to visitation at the other regional precedents.

The majority of mountain bicyclists visiting the Newell Creek Canyon trails will be intermediate skill level riders, so the majority of trails should reflect this demand. A smaller percent will be beginner and advanced skill level riders. The split should be approximately 20% beginner trails, 60% intermediate trails, 20% advanced trails. A full range of skill levels is required so that the trail system retains its relevance as users skill levels rise. This is especially true for children and families looking to ride together. Trails that encourage progression keep kids on their bikes and lead to healthy habits.

Currently mountain bicyclists of the Metro area drastically underserved in regards to quality trail experiences within the region. The Sandy Ridge Trail System, which is purpose built for MTB use, has seen its visitor numbers double each year since opening in 2008 (trail miles have been added each year: opening with 3.5 miles the system now hosts 15 miles). Surveys of users at regional parks, such as Forest Park, indicate that singletrack trails open to MTB use are in high demand. Among regional precedents, only Sandy Ridge Trail System is providing the trail facilities that users are seeking. The construction of a purpose-built, high quality trail system at Newell Creek Canyon will help to satiate some of this demand and allow mountain bicyclists to recreate closer to home.

Traffic and Parking Considerations

Based on other metropolitan trail systems, users will access the trail system in a variety of ways. Residents within 10-minute walk or bicycling distance from trail access points will likely use those modes to access the trails. Visitors from outside this radius will likely drive to trailheads. A 2011 survey of Forest Park trail users showed that 79% accessed the park by vehicle (Forest Park Recreation Survey, PP&R, 2011). However, this may not represent an accurate picture of park access for Newell Creek Canyon, as the park is much smaller. Powell Butte offers a better regional comparison, but no user data are available. This implies that a small increase in automobile traffic should be anticipated over current levels in order for people to access the trails. In addition, given the existing limited availability of trails for mountain bicycling in the metro area, this facility is predicted to have some regional draw. Therefore, dedicated parking facilities will be necessary to minimize impacts on the community. The primary access point will be more likely to be accessed via automobile, and utilized by visitors from the greater Metro area because of its proximity to Highway 213 and South Beaver Creek Road. The majority of traffic will be focused here,



which will minimize impacts on the residential areas near the secondary access point. Many users will commute to and from the trails by foot or bicycle and never utilize a car. This will be especially true for the residents of Oregon City.

Limited space for parking and trail development constraints reduce its potential to serve as a high volume destination trail system. Parking facilities should be constructed at the primary access point. Based on comparisons to several regional facilities it is estimated that approximately 25 parking stalls are recommended at the primary access. This point should be established as a trailhead facility with amenities such as a map kiosk, restrooms, and trash receptacles. A further 10 parking stalls should be constructed at the secondary access. This location should be minimally developed, needing only a map kiosk and trash receptacles. Without sufficient designated parking, some overflow parking along business and residential curbside spaces could be experienced during peak usage.

5 Shared Use trails Vs. Single Use

There are many reasons users and land managers may want to have single-use trails. Many land managers think separate trails will eliminate user conflict. It's commonplace in recreational land management to separate incompatible uses. Responsible bicycle use is compatible in most cases. When users know that a trail is shared use, they expect to encounter others. When users follow trail protocol, they can safely negotiate their trail encounters. There are also cases where single-use trails make more sense.

- **Crowded Trails:** Popular trail systems with very crowded trails can have a blend of shared and single-use routes. Separating visitors helps ensure that they won't have to endure traffic jams every time they go to the trails seeking relaxation and a connection with nature.
- **Crowded Trailheads:** Trail systems can have separate access points that cater to specific users. One entrance can be designated for equestrians and include horse-trailer parking. Another parking area can be designated for hikers and bikers. The trail network can blend shared and single use.
- **Extraordinary Mountain Biking Trails:** The experience of riding a narrow, roller-coaster trail where twists and turns unfold under your wheels in a rocking rhythm



is highly valued by mountain biking diehards. These types of trails envelope riders in a zone of exhilaration and are most successful when they are specifically designated for mountain bikers.

- **High-Speed Trails:** A designated trail can allow advanced runners and riders to race-train at higher speeds without bothering other visitors. These trails are still shared-use, but they are designed to separate visitors by skill level and the experience sought.
- **Nature Trails:** A single-use trail can be created to provide hikers or birdwatchers with the seclusion they desire. Likewise, trails for disabled visitors may benefit from restricted use.
- **Shared use trails** can accommodate the needs of the most users. A generally open system disperses users across all trails.
- **Sharing trails** help build a trail community by increasing the need for all users to cooperate to preserve and protect a common resource. Encountering other users on a trail offers the opportunity to meet and talk. Without that opportunity, it's difficult to establish mutual respect and courtesy.
- **Shared trails** are most cost effective for land managers. They require fewer signs and less staff.
- **Shared trails** enable responsible, experienced users to educate outlaws and novices. Because they share the same trail system, the opportunity for peer regulation is enhanced.
- There are cases where separate trails make good sense. Trails designed with dynamic features that are purpose built for MTB users allow for riders to let loose without worrying about conflict with other user types.

Experience Zones and Preferred-Use Trails

Experience zones and preferred-use trails are cropping up in trail systems around the world. And they are great for mountain bikers. Experience Zones divide management areas into special-use zones designed around specific activities: one zone may be preferred for mountain biking or interpretive and accessible trails. Such zones can provide a variety of



visitor experiences and recreational opportunities that reduce conflict between differing user groups and provide sustainable, long-lasting trails.

Single use challenges the notion that all trails must be all things to all people. In this case, land managers designate certain trails as “preferred” for certain activities. For example, a trail that is single use for mountain bikers might be designed to be fast and flowing through open terrain, with swooping turns and dips. Hiking-preferred trails, meanwhile, might have stairs, sharp switchbacks, short distances, or other qualities that would be less attractive to bikers and equestrians. Visitors will be drawn to routes that match their desired experience.

Each trail system should, of course, include a variety of trails. One way to include numerous types of trails is to have shared-use trails at the beginning of the network near parking lots, with preferred-use trails branching off further along. The number of trails designated for each mode of travel should be based on the habits and needs of the user groups being managed.

6 Conclusion

This document presents the opportunities and constraints in developing a shared-use trail system with bike-optimized elements for the Newell Creek Canyon Natural Area. It is hoped that this trail feasibility assessment will facilitate trail development that meets natural resource goals while addressing local and regional recreational needs.

Many unsustainable trails and roads already exist in the Natural Area. Unplanned and unmanaged use of the site can lead to illegal and illicit use, dumping, trampling native plants, spreading invasive species, and contribute to soil compaction and erosion. Residents desire trail access and enhanced trail experiences for mountain bicycling. Adding a planned trail system allows for a sustainable and managed system, to reduce impacts to the environment and provide better user experiences.