



PORTLAND OFF-ROAD CYCLING MASTER PLAN

DISCUSSION DRAFT

October 17, 2017

This draft may contain placeholders for photos and graphics.

Acknowledgments

The Bureau of Planning and Sustainability would like to acknowledge and thank the Project Advisory Committee and the many residents, organizations, businesses, and public stakeholder groups who contributed to this Master Plan.

Bureau of Planning and Sustainability

Michelle Kunec-North, Project Manager
Tom Armstrong
Brandie Dieterle DeLaHoz
Lori Grant

Project Advisory Committee Members

Punneh Abdolhossieni	Adnan Kadir	Nastassja Pace
Kelsey Cardwell	Carrie Leonard	Bob Sallinger
Erin Chipps	Torrey Lindbo	Evan Smith
Matthew Erdman	Kelly McBride	Michael Whitesel
Jocelyn Gaudi	Renee Meyers	
Mike Houck	Jim Owens	

Agency Representatives and Resource Members

The following agency staff provided information, technical advice, and assistance to the project. Those noted with an asterisk (*) also served as resource staff for the Project Advisory Committee.

Portland Parks & Recreation	Maya Agarwal*, Andre Ashley, Lynn Barlow, Lucy Cohen*, Astrid Dragoy (former), Rachel Felice, Brett Horner, Kendra Peterson-Morgan, Emily Roth, Allan Schmidt, Ross Swanson, Jill Van Winkle, Ramiro Villalvazo
--	---

Portland Bureau of Environmental Services	Shannah Anderson*, Jane Bacchieri, Jennifer Devlin*, Mark Ross,
--	---

Portland Bureau of Transportation	Margi Bradway, Roger Gellar, Zan Gibbs, Christine Leon, Michelle Marx, Abra McNair*
--	---

Portland Water Bureau	Mike Saling
------------------------------	-------------

Metro	Dan Moeller, Robert Spurlock*
--------------	-------------------------------

Consultants

Kristen Lohse, Toole Design Group
Adrian Witte, Toole Design Group
Rob Burchfield, Toole Design Group
Sara Schooley, Toole Design Group
Adrienne DeDona, JLA Public Involvement
Nat Lopes, Hilride Progression Development Group
Tim Brooks, Winterbrook Planning

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EXECUTIVE SUMMARY

Pending

SECTION 1. PURPOSE AND PROCESS

Purpose

This Off-road Cycling Master Plan provides the City of Portland with a foundation in local off-road cycling needs and desired experiences, as well as current best management practices for planning, designing, building, and managing successful off-road cycling facilities. It presents a citywide roadmap for developing a connected, citywide system of trails and bicycle parks. This plan is intended to guide the City's investment in off-road cycling facilities over the next 15-20 years.

Ideally, this plan will also serve as a tool for:

- community members interested in the construction and stewardship of natural surface trails and bicycle parks.
- future discussions of the city's recreation and active transportation network generally.
- securing funding for facility construction and management.

This Off-road Cycling Master Plan is conceptual. It does not change or create any City regulations or 'greenlight' any recommended projects. Future projects will require site-specific planning and community engagement, more detailed site analysis and design, environmental reviews, and funding for planning, construction and long-term operations and maintenance.

History

The City of Portland previously undertook several site-specific planning efforts that considered off-road cycling use on public properties, most recently as part of the Riverview Natural Area Management Plan. As a result of these processes, the City recognized the existing and growing need for additional off-road cycling experiences within the City, as a natural complement to the City's other active transportation and recreation systems and plans, including PBOT's Bicycle Plan for 2030 and PP&R's efforts to create a connected system of natural areas, parks and trails.

At the same time, City agencies recognized that City lacked a foundational understanding of off-road experiences, community needs, and potential impacts to human health, the natural environment, and the city's economy. This Plan aims to better understand the potential for Portland to meet the off-road cycling needs of its residents through a connected system of off-road cycling trails and bike parks.

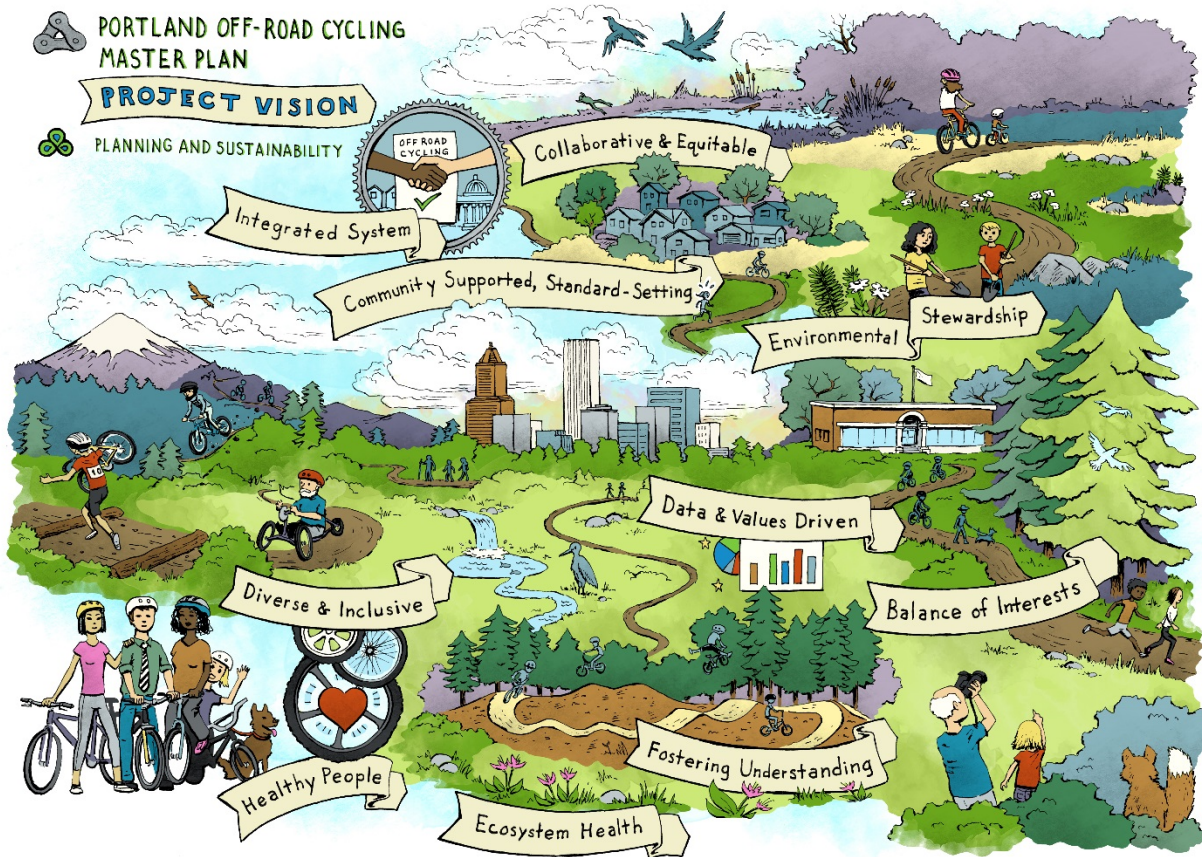
Planning comprehensively to guide future investment

The project was undertaken by the Bureau of Planning and Sustainability, with its partner agencies Portland Parks & Recreation, the Bureau of Environmental Services, the Portland Bureau of Transportation, and the Portland Water Bureau. It reflects a comprehensive approach – in terms of the geography of the plan, the type of needs considered, collaboration among bureaus, and consideration of the City's overarching policy context. The plan provides a comprehensive strategy for the development and management of off-road cycling trails and facilities across the city, as well as citywide policy guidance for implementing the plan.

The overall system plan works to connect off-road cycling trails and facilities to each other to create more varied riding options for all Portlanders. It identifies ways to make it easy for people to access

off-road trails and facilities using the city’s paved bicycle network and transit. It also considers ways to leverage investments in trails and facilities to achieve multiple community goals, such as increasing overall recreational opportunities and access to nature, restoring natural resources and wildlife habitat, enabling more active transportation, and managing stormwater.

Project Vision



Bureau of Planning and Sustainability
Innovation. Collaboration. Practical Solutions.
City of Portland, Oregon
Charlie Bates, Mayor • Susan Anderson, Director



PORTLAND
PARKS & RECREATION
Healthy Parks, Healthy Portland



PBOT
PORTLAND BUREAU OF TRANSPORTATION



Metro

Desired Outcomes

The Portland Off-road Cycling Master Plan Project Advisory Committee, a group of community members convened by the Bureau of Planning & Sustainability, developed the following desired outcomes to guide the planning process:

The Portland Off-Road Cycling Master Plan...

1. Is built on an inclusive, constructive, and transparent planning process that:

- fosters an open, honest, and productive conversation that is easy and fun to participate in and that builds trust in City planning efforts,
- is inclusive, engages historically under-represented groups, and brings people with different perspectives and experiences together,

- engages kids and families,
 - is coordinated across City Bureaus and leadership, and
 - looks to other cities for best practices and tools to create a reasoned and sustainable approach to planning, designing and managing off-road cycling trails and facilities.
- 2. Lays a foundation for how off-road cycling is understood, discussed and planned for in Portland.** The Plan establishes the role of the City and its public spaces in meeting off-road cycling needs and provides a comprehensive framework for successfully meeting community needs. The Plan defines off-road cycling and develops a baseline understanding of who is, or would like to, ride off-road in the city now and in the future.
 - 3. Blends visionary goals with a practical and realistic approach.** The plan is realistic, feasible, and works within the context of community needs and values, City goals, Portland's urban environment and landscape, and regulatory constraints. But, it is also visionary, ambitious, and strives to make Portland a national example for incorporating off-road cycling into healthy communities. The Plan thinks creatively about all opportunities across the City, and within the region. To realize long-term success, the Plan sets a clear course for implementation by addressing funding, design, development, and management.
 - 4. Designs with nature, by enhancing nature in the city and avoiding, limiting then mitigating adverse impacts on wildlife and natural resources, including fish and wildlife habitat and water resources.** The Plan incorporates the City's watershed health goals and reflects best practices in sustainable off-road cycling systems in its policy guidance, siting criteria, design, and management strategies.
 - 5. Promotes the health, safety and enjoyment of trail and park users, including people of all ages and abilities who walk, hike, ride bicycles, and otherwise enjoy the outdoors.** The Plan carefully considers the needs of diverse users of Portland's parks, employs siting and design best practices encourage mutual safety, and establishes a trail and facility system that extends quality recreational opportunities.
 - 6. Identifies a variety of trails and facilities that accommodate different ages, abilities, and riding experiences to meet community needs, while establishing where these facilities are most appropriate.** The Plan envisions opportunities to expand access to recreation and nature across the city, especially for children, people of color and underserved communities. It proposes a bicycle- or transit- accessible system of off-road cycling trails and facilities for recreation and transportation across the city.
 - 7. Builds community ownership and partnerships for the stewardship of Portland's parks, natural areas and other public properties.** The Plan establishes a role for community groups, park users and volunteers – and recognizes their potential contribution – in building, managing and sustaining an off-road cycling system.
 - 8. Plans for responsible design and management of off-road cycling trails and facilities to cost-effectively meet community needs.** In addition, the Plan acknowledges and leverages the potential economic benefits of off-road cycling and of a comprehensive park, trail and recreation system.

Public Process

The project team made a concerted effort to seek out a variety of voices through a variety of engagement formats. Engagement methods were varied in settings, locations across the City, formats, and accessibility in terms of format and language. Methods included meetings at BPS, meetings in the community, large project-specific events, information tables at other community events, multiple web-based input formats, and smaller meetings with targeted audiences and one-on-one listening sessions. Below is a list of outreach methods between 2015 and 2017:

Ongoing

- Regular input from City Bureaus
- A Project Advisory Committee
- Public comment during Project Advisory Committee Meetings
- Comments submitted online and via email
- Project website, to which all project materials were posted

2015

- Stakeholder interviews conducted before the Project Advisory Committee was formed

2016

- A community needs questionnaire, soliciting input online
- An intercept survey conducted at Sunday Parkways and various other summer events, along with other project information
- On-the-ground outreach to underserved audiences conducted by the Community Cycling Center

2017

- Virtual open houses, which featured an on-line map soliciting input on candidate sites
- An on-line questionnaire specifically about off-road cycling opportunities in Forest Park
- Two community events, featuring project information, commenting opportunities, and interactive experiences.
- Seven public open houses, held in various locations across the City
- A second round of on-the-ground outreach conducted by the Community Cycling Center
- A partnership with Community Engagement Liaisons to solicit input from underserved audiences
- Multiple one-on-one listening sessions

Figure 1. Planning and Community Engagement Process

(insert)

SECTION 2. INCORPORATING EQUITY

Equity exists when neighborhood, socioeconomic status, race, language ability, and other demographics do not dictate access to resources needed for health and well-being. These resources include safe neighborhoods, access to natural and green spaces for recreation or alternate means of travel, and efficient and safe transit routes. The Portland Plan's vision for equity relies on input from all Portlanders in public decision-making that affects them or the communities where they reside.

The City of Portland and City Council are committed to striving towards equitable access to the well-being and essential resources for all Portlanders (Portland City Ordinance 184880). The Off-Road Cycling Master Plan strives to promote equity by bringing off-road cycling trails and bike parks to neighborhoods which have traditionally not had immediate community access to such places so that the benefits of outdoor recreation and access to nature can be more widely enjoyed.

Consistent with the City's and the Bureau of Planning and Sustainability's planning policy and protocols, the project used an "equity lens" to promote project outcomes consistent with City goals for health, safety and livability, inclusivity, accessibility, and prosperity. At the master planning level, the following actions were undertaken to address equity:

Evaluated disparate impacts

The project identified under-served or under-represented groups that could be affected by the project, considered how the project could impact those groups, or whether the project might overlook or worsen existing disparities or produce other unintended consequences.

Targeted outreach

The project intentionally involved stakeholders and members of the communities who could be affected by the project, seeking their input at various stage of the project, in multiple formats and at varied venues around the City. Demographic data was used to strategize and tailor the community engagement efforts to reach underserved and target audiences.

Key Definitions

Under-served: People and places that historically and currently do not have equitable resources, access to infrastructure, healthy environments, housing choice, etc. Disparities may exist both in services and outcomes.

Under-represented: People and communities that historically and currently do not have an equal voice in institutions and policy-making, and have not been served equitably by programs and services.

Community Engagement Liaison Outreach

As part of a comprehensive community engagement strategy, the Off-road Cycling Master Plan partnered with the City's Community Engagement Liaison Program to outreach to traditionally under-represented Portlanders. The Liaisons conducted direct outreach in English, Spanish, Russian, and Vietnamese, focusing on residents of East and North Portland. They also provided language interpretation at community events and facilitated listening sessions with community members.

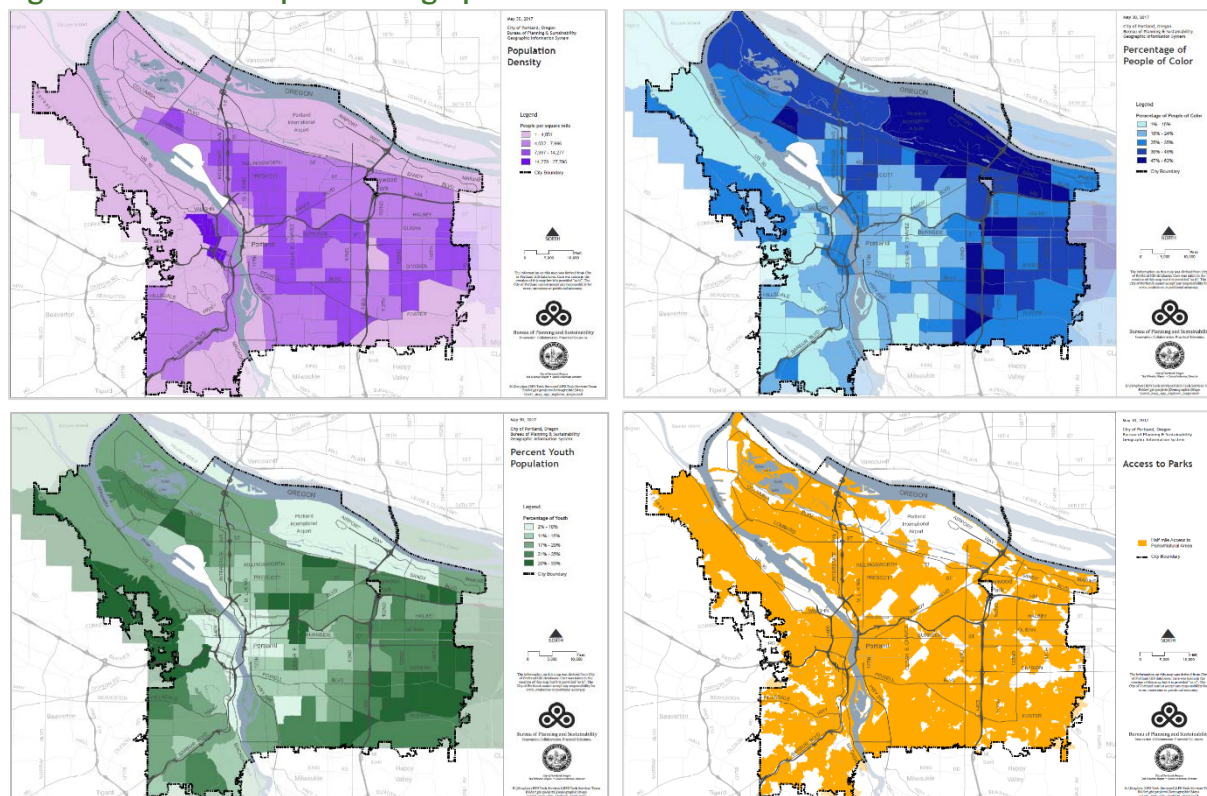
Analyzed geographic distribution

The project used relevant data, including demographic information, to identify and geographically locate underserved and underrepresented populations. It also identified current disparities related to infrastructure and services, specifically areas of park and open space deficiency. See Figure 2.

Identified equitable outcomes

The project identified equitable outcomes for the project, based on the City goals above. It considered how to positively benefit racial, ethnic, or low-income communities, and people with disabilities. The project considered the question “Who benefits most from the project?” repeatedly, and in response, identified ways those benefits could be distributed more broadly across the city in the name of equity. The plan’s final recommendations reflect a concerted intention and priority to meet the needs of underserved populations.

Figure 2. Selected maps of demographic distribution and infrastructure access



Equity in Engagement and Decision-making

As this plan is carried out, future community engagement processes should follow the City of Portland’s Public Involvement Best Practices Program, as well as equity and community engagement principles and methods established by the Office of Equity and Human Rights, Office of Neighborhood Involvement, Portland Parks & Recreation, and the Portland 2035 Comprehensive Plan. The best practices framed in these documents will help ensure that all community members, and particularly those who have been historically under-represented in planning decisions, can influence decisions that may impact their families, neighborhoods and communities.

Related Recommendations

Equity in Engagement and Decision-making

1. Conduct inclusive and transparent community engagement for the planning and design of off-road cycling trails and facilities.
 2. Ensure the voices of diverse community members and historically under-represented groups – including people of color, immigrants and refugee communities, people with disabilities, low-income Portlanders, and youth – are included in the planning process for future facilities.
 3. Engage park users and others who will be directly impacted by any recommendations.
 4. Use existing plans, such as Master Plans and Management Plans, and the community input gathered during these processes, when planning and siting new facilities.
-

Equity in Outcomes

It is critical that the City carry out this plan in a way that extends equitable outcomes – including access to healthy and safe physical activity, active transportation, and nature – for communities of color, people with disabilities, and other historically under-served and under-represented communities in Portland. Achieving this goal will require conscious efforts to prioritize future investments, extend associated benefits, and address any negative impacts in a manner that furthers equity.

Related Recommendations

Equity in Outcomes

1. Use the development of off-road cycling facilities to further equity in the city. In the planning, design and construction process:
 - a) Determine how the project can best meet the needs of potential users, particularly those from the local community.
 - b) Identify ways the project could positively benefit historically under-served populations, including communities of color, low-income communities, and people with disabilities.
 - c) Determine whether there are potential negative consequences, impacts or burdens of the project on racial, ethnic, or low-income communities, or people with disabilities. If so, identify strategies to mitigate these negative impacts.
 2. Ensure the planning and design process supports inclusive, meaningful, and transparent public involvement, particularly for those most impacted and have the least influence. Explore opportunities to support local job creation and economic development opportunities for impacted communities through the construction and operation of the facility.
 3. Use user surveys and other forms of feedback to ensure facility design and management is meeting user and community needs.
 4. Engage community members in stewardship and programming for trails, bike parks, and surrounding parks and natural areas.
-

*In addition to these recommendations, other recommendations throughout this Plan aim to advance equity across the City, such as those in the Foundational Recommendations (p. **), Range of Experiences (p. **), System Planning (p. **), and Accessibility (p. **) sections.*

SECTION 3. OFF-ROAD CYCLING IN CONTEXT

To better serve the City's residents and make a useful and desired off-road cycling network, it is important to understand the local, regional and national context.

What is off-road cycling?

Off-road cycling can include a leisurely bicycle ride along a smooth natural surface trail; a more technically or aerobically challenging ride with more obstacles, climbing, or distance; a session at a pump track or skill park; or participation in a mountain biking or cyclocross race. Mountain biking is a type of off-road cycling, generally on a bicycle with knobby tires and a durable frame.

People might engage in off-road cycling for many reasons – to experience nature, have fun, spend time with friends and family, get exercise, get from one place to another, or to gain more experience riding a bicycle without motor vehicle traffic. As such, off-road cycling or mountain biking, has many different forms.



Benefits of Off-road Cycling

Off-road cycling can provide individuals and communities with both health and economic benefits.

Health Benefits

There is a large body of research in the United States that links physical activity and active outdoor recreation, such as off-road cycling, to improved physical and mental well-being (Outdoor Foundation, 2011; RTSG Neuroscience Consultants and Specialized Bicycles, 2013). Physical activity, at any level, has been shown to improve both physical health and quality of life. Off-road cycling provides all of the three main kinds of physical activity: aerobic activity, muscle strengthening, and bone strengthening. In children and teens, physical activity can improve bone health, cardiovascular and muscular fitness, reduce body fat and the risk of obesity, and decrease rates of illness and recovery time.

The following are key findings from the Impacts and Benefits Assessment:

- Participation in outdoor recreation, including off-road cycling, can improve participants' physical and mental health. A positive recreational experience can inspire more use and benefit.
- Bicycling is one of the top gateway activities that results in increased outdoor activity.
- The frequency of injuries in mountain biking is comparable to that in other outdoor sports and the majority of injuries are minor. Riding within one's ability level, using properly maintained

Impacts and Benefits Assessment

Appendix A presents a survey of studies on the impacts and benefits of off-road cycling and their key findings, related to:

- the environment
- the health and safety of park users
- the City's economic activity and tourism.

bicycles, and wearing helmets and other protective equipment can reduce the risk and severity of injuries.

- Actual and perceived conflicts between different user groups, such as off-road cyclists and hikers, is a potential impact of shared-use trails. Trail education and awareness reduces perceived and actual conflicts between user groups.
- Off-road cycling trails, along with other site improvements, have been successfully used to reduce or eliminate nuisance activities on public properties. Such uses can contribute to real or perceived health and safety threats.

Expanding off-road cycling opportunities in Portland can extend these benefits and potentially improve health outcomes for more residents.

Economic Benefits

The League of American Bicyclists rates Portland as a Platinum Level Bike Friendly Community, the highest rating available, for “providing safe accommodation and facilities for bicyclists and encouraging residents to bike for transportation and recreation.” Accompanying this rating is a recommendation to “ensure better access to city parks and recreation areas for off-road riding.” Infrastructure and programs providing and promoting safe biking coupled with a population mindful of reducing use of fossil fuels and oriented to outdoor activities has resulted in a significant number of bicyclists in Portland, including off-road cyclists.

Bicycling contributes to the state and local economy through the manufacture and sales of bicycle-related products and services, and expenditures by people travelling to and around Oregon to cycle. The availability of bicycling infrastructure and facilities can serve to draw new residents and businesses, further boosting the economic value of the entire bicycle industry to the state. It is estimated that the bicycling industry accounts for approximately 2,700 jobs and contributing nearly \$84 million in wages and \$440 million in sales to the state economy.¹

A survey of studies² of the economic impacts of bicycling at the national, state and local levels provide an estimate of the value of off-road cycling to Oregon and the Portland area, and insights into the economic benefits of increasing access to off-road facilities. Specifically:

- The growing bicycling industry in Portland contributes nearly \$134 million to the local economy. The majority of Portland bicycle-related businesses cite availability of bicycle infrastructure, including off-road cycling facilities, as important to the growth of the industry and their ability to attract top industry talent.
- People traveling to bicycle off-road spend \$28 million annually throughout Oregon. With an average expenditure of \$125 per trip for day off-road cycling trips and \$732 per trip for overnight off-road cycling trips, there is opportunity for increases in travel-related revenues in Portland with increased availability of off-road cycling facilities.

Portland’s economy is already connected to the cycling community. As the system expands, so will the economic impact of users of the system. A well-developed and connected on- and off-road cycling system will also provide additional opportunities for business growth and development.

¹ Statewide Bicycling Industry A 2014 report for Travel Oregon (Runyon). Viewed at http://www.deanrunyan.com/doc_library/ORBicycleIndustry.pdf

² INSERT CITATION

Local Context

Existing Off-road Cycling Locations in Portland

Off-road cycling is currently allowed seven public locations in the City of Portland, all of which are owned by the City of Portland.

Natural surface trails

Forest Park, Mt. Tabor Park and Powell Butte Nature Park, which are managed as natural areas and together provide approximately 13.5 miles of shared-use hiking and biking trails.

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Forest Park
Forest Park includes 0.5 miles of natural surface trails open to off-road cycling. About 28 miles of unpaved access roads and fire lanes are open to cycling in the park.

Mt. Tabor Park
Mt. Tabor Park features 5.5 miles of designated trails open to off-road cycling.

Powell Butte Nature Park
Powell Butte’s trail system includes 8 miles of off-road cycling trails.

Bike Parks

The City current has three bicycle parks, which include pump tracks, jump tracks, and skill parks.

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Gateway Green
Portland’s largest bike park, includes 3 miles of purpose-built off-road cycling trails, a skill park and a pump track.

Ventura Park
Ventura Park includes two dirt pump tracks totaling about 10,000 square feet.

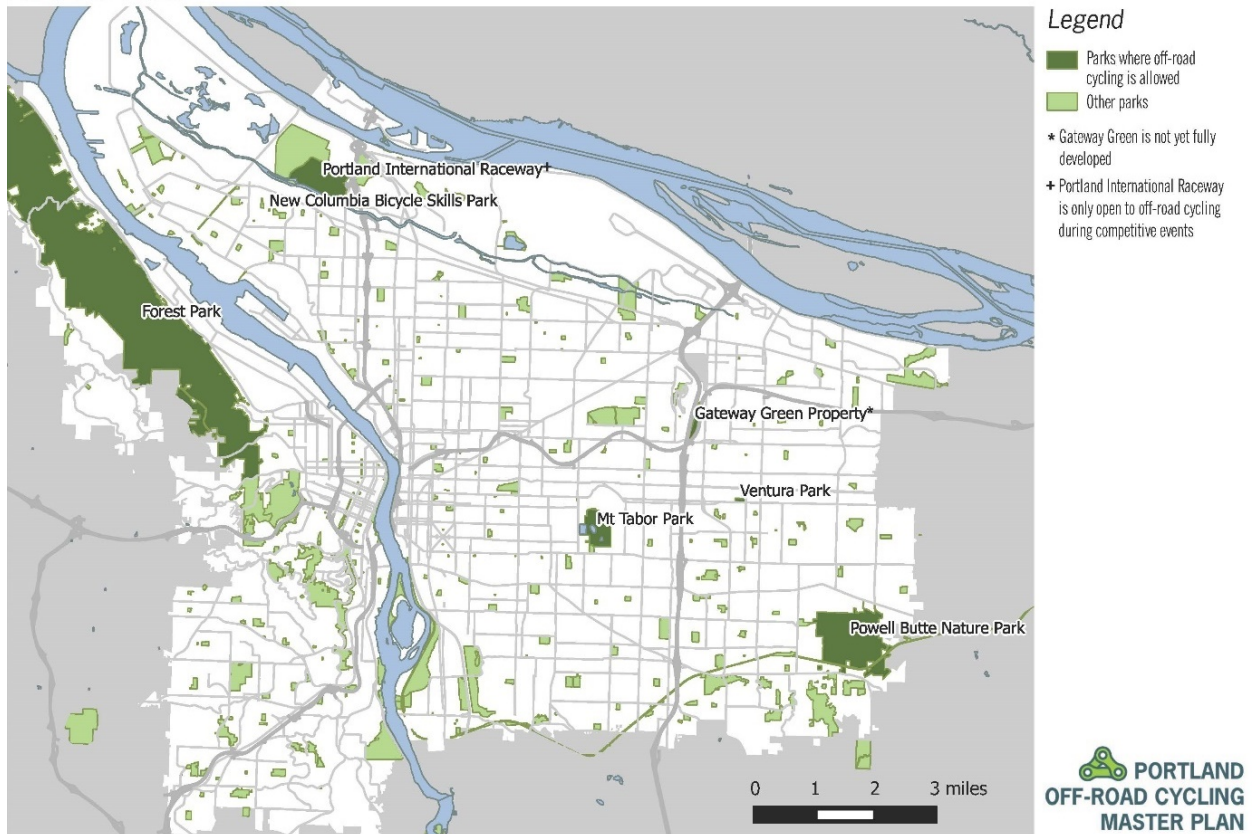
New Columbia Skills Park
An approximately 10,000 square feet youth skills park.

Competition Venue

Portland International Raceway (PIR)

Open to off-road cycling for competitive events, such as short-track mountain biking and cyclocross

Figure 3. Parks where off-road cycling is allowed (2016)



Existing Conditions

While Portland's existing off-road cycling facilities provide close-to-home opportunities for local residents, they offer a limited range of off-road cycling experiences. Notable issues include:

Uneven geographic distribution

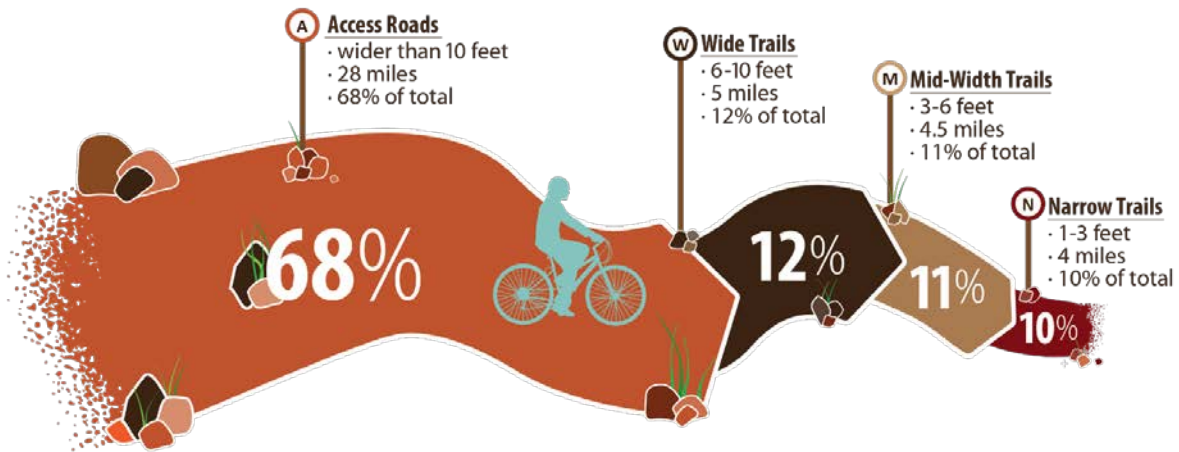
Existing facilities where off-road cycling is sanctioned are predominantly sited in larger parks at the periphery of the city limits, so are not equitably distributed and thereby require many Portlanders to drive to them.

Limited trail experiences

Existing sanctioned off-road cycling trails lack the diversity that off-road cyclists seek in terms of width, alignment, surface, grade, and terrain. Existing facilities primarily provide trail experiences where cyclists mix with pedestrians, mostly on wider trails and fire service/maintenance roads.

Figure 4. Trail Inventory, provides an overview of the types of trail experiences available.

Figure 4. Trail Inventory



Less than one-quarter of existing total trail mileage is on narrow or mid-width trails (under 6 feet), while nearly 70% is access roads wider than 10 feet. While these wider trails provide options for beginner riders, intermediate and advanced riders may feel that wider trails lack the physical challenge and visual interest that narrower trails provide. Additionally, the City's inventory of narrower trails includes a number of poorly maintained fire lanes in Forest Park, which tend to be more technically challenging and do not provide a safe and sustainable riding experience.

In addition, existing trails generally provide riding opportunities of 3 to 6 miles, with few options for longer rides.

Lack of signage and information

The City's off-road cycling system lacks consistent wayfinding and trail map symbology. This can cause confusion and result in riders using unsanctioned trails, creating the potential for user conflicts. There is also limited published information about riding opportunities, trail characteristics and levels of difficulty, which reduces trail accessibility.

Few bike park options

Bike parks can offer an accessible way for people of all skills levels to ride and develop their skills. When sited within existing parks with other programming, they can provide safe, family-friendly options for recreation. With only two smaller sites in developed parks, there are very few opportunities for skill progression at skills parks/pump tracks in Portland.

Community Priorities

Community input on the need and opportunities for off-road cycling around the city was a key project component. Development of this Master Plan included opportunities for community engagement and feedback throughout the planning process. A concerted effort was made to seek out a broad range of voices and perspectives through a variety of engagement formats. Engagement methods were varied in terms of settings, locations, formats and accessibility. The feedback collected provides valuable information regarding desired activities, experiences, and potential locations, but does not represent all populations and demographics of people who may be affected by the Plan.

COMMON THEMES	ENGAGEMENT SOURCE					
	<i>Stakeholder Interviews</i>	<i>Needs Questionnaire</i>	<i>Online Map or Questionnaire</i>	<i>Comments via Email and Online Forms</i>	<i>Open Houses and Community Events</i>	<i>PAC Meetings</i>
Access and Equity	X	X	X		X	X
Protection of natural resources	X	X	X	X	X	X
Safety of all trail and park users	X		X	X	X	X
Long-term funding and maintenance strategies	X			X	X	X
Working within the context of City regulatory requirements and constraints	X			X	X	X

The majority of community members who participated in the planning process were supportive of providing a system of off-road cycling facilities. There was broad support for trails and trail connections that provided opportunities for youth and families to access nature. Connections to schools, neighborhoods and transit were particularly important. However, there were mixed opinions about expanding, enhancing or establishing new trails in Forest Park and Riverview Natural Area.

Some common themes about the project or overall system were:

Access

Respondents generally felt that having local access within neighborhoods and near schools was important. Facilities should be accessible by bike, on foot or via transit.

Equity

Facilities should be distributed equitably across the City. All ages and skill levels, particularly youth and beginner riders, as well as people using non-traditional bicycles, should have opportunities to

ride and experience nature. The Plan should also provide more opportunities for walkers to be active outdoors, including families with strollers.

Natural Resources

Most participants in the process value protecting and enhancing the natural environment and wildlife habitat and avoiding adverse impacts on natural resources. This was true regardless of whether they supported the expansion or enhancement of off-road cycling facilities.

Safety

Safety and appropriate design and management practices were listed as important considerations when shared use trails are recommended.

Funding

Funding to establish new facilities and long-term maintenance were listed among stakeholder concerns. Several people mentioned the opportunity to partner with cycling groups to coordinate work parties and trail maintenance efforts.

Best practices

Many people mentioned best practice examples in other communities as examples to strive for. Look to best practices and tools across the nation to create a visionary, yet reasoned approach to planning, designing and managing off-road cycling trails and facilities.

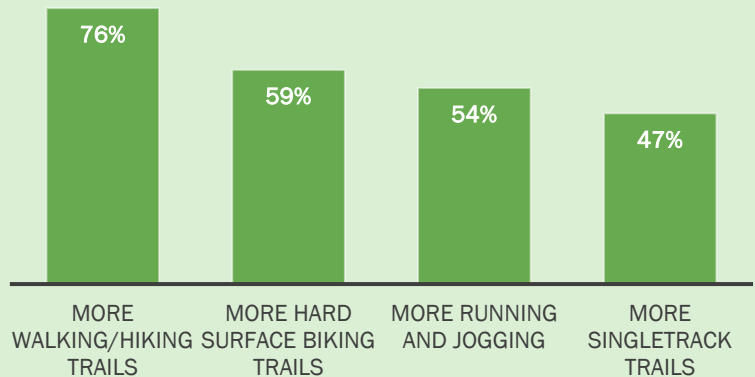
Regulatory constraints

Some people cited concerns with regulatory constraints on some properties. Working within the context of City regulatory requirements will be important.

Local Trail Priorities

Creating additional unpaved dirt trails for walking and hiking is the highest non-motorized trail priority both statewide and in the Portland region. Yet nearly half (47%) of residents in the Portland region place a moderate or high priority on creating additional trails for singletrack bicycling, the highest level of support statewide.³

Figure 5. Local Trail Priorities

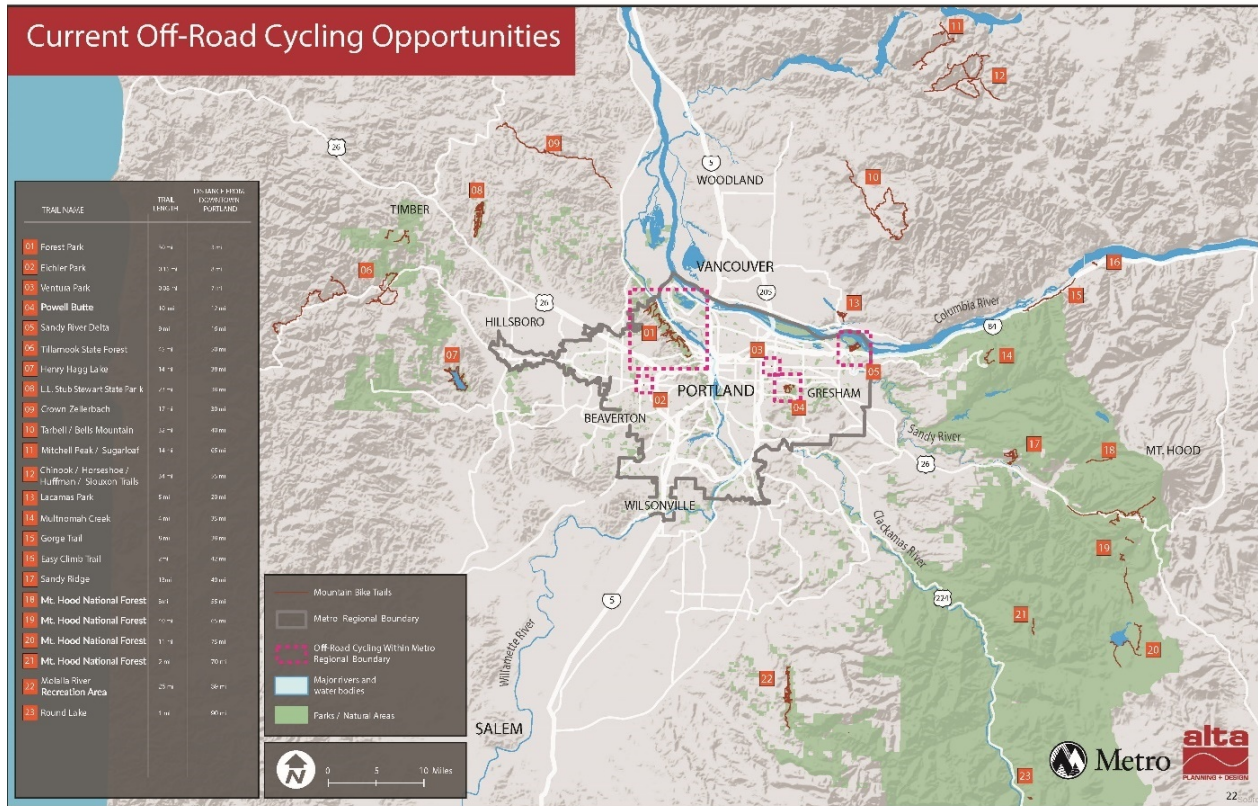


³ Oregon Parks and Recreation Department. (2016). Oregon Trails 2016: A Vision for the Future. Retrieved from http://www.oregon.gov/oprd/Trail_Programs_Services/Documents/2016OregonStatewideTrails_Plan.pdf

Regional Context

Northwest Oregon and Southwest Washington offer several high-quality off-road cycling options – longer trails, single track, and varied terrain - within a one to two-hour drive of Portland. There are close to 20 locations, with more than 300 miles of trail, within a 75-mile drive from the city center, some of which provide “world class” off-road cycling, as shown in Figure 6.⁴ The fact that so many trails exist in the vicinity indicates a strong interest in off-road cycling in the region.

Figure 6. Current Off-road Cycling Opportunities in the greater Portland area



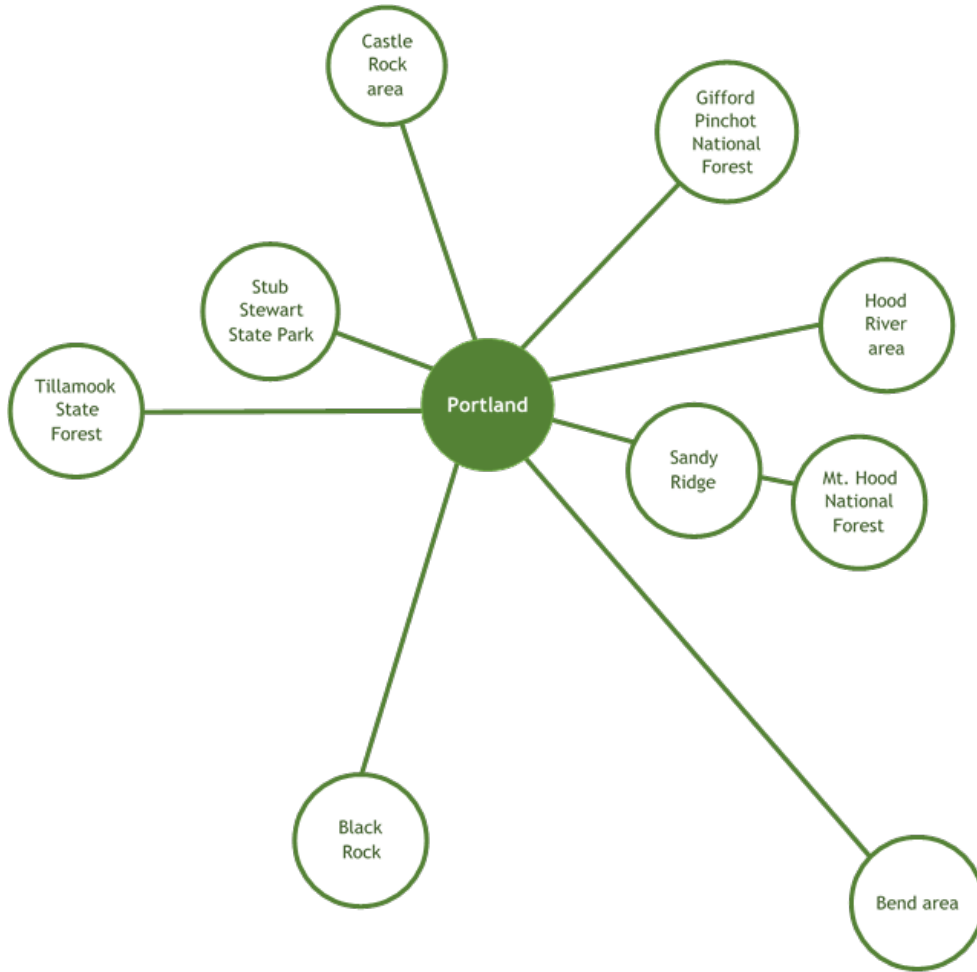
However, the Portland metropolitan region itself has limited off-road cycling opportunities. Metro’s Off-Road Cycling Opportunity Inventory (2016) analyzed the availability of off-road cycling opportunities within the Metro parks and natural area system. The analysis shows the region has 23 miles of single/dual track, 17 miles of multi-use trail, and 21 miles of fire service/maintenance roads, which are not well-distributed.

Metro is planning to build new shared-use and bike-optimized trails on some in some of its parks, including the North Tualatin Mountains (McCarthy Creek and Burlington Creek) and is considering off-road cycling trails as part of the planning for Chehalem Ridge Nature Park and Gabbert Butte.

Even with Metro’s planned off-road facilities, off-road cycling experiences close to the urban core will remain limited, as will options for longer or more challenging rides. Much of the off-road cycling Portlanders do today happens outside Portland. This plan envisions Portland as a hub within the regional off-road cycling network, as show in Figure 7.

⁴ Metro (2016). Off-road Cycling Opportunity Inventory.

Figure 7. Portland as a hub within the regional off-road cycling network



“IT WOULD BE WONDERFUL TO HAVE MOUNTAIN BIKE TRAILS AVAILABLE HERE. THE CITY OF PORTLAND COULD REALLY USE MORE TRAILS AVAILABLE CLOSE TO THE CITY SO INDIVIDUALS WITHOUT CARS CAN ACCESS TRAILS AND PEOPLE WHO HAVE CARS DON'T NEED TO DRIVE TO A BIKE RIDE.”

- COMMUNITY MEMBER

National Context

National Participation

Nationally, the annual *Outdoor Recreation Participation Topline Report* (2016) published by the Outdoor Foundation, found that in 2015, mountain biking, unpaved bicycling, and BMX had over 11 million participants over the age of 6 combined (representing 3.8% of the national population over age 6). These figures reflect a three-year increase in participation of 2.8% for mountain biking and unpaved bicycling and over 7.5% for BMX. (Outdoor Foundation, 2016)

As a comparison, off-road cycling is less popular than day hiking (the most popular trail-based activity) as well as wildlife and bird watching – 10% or more of the nation’s population over age 6 participates in these activities each year, see Table 1. However, off-road cycling/BMX is more popular than trail running (2.7%) and skateboarding (2.2%). Off-road cycling participation rates are also on par with many traditional field sports, including outdoor soccer (4.3%), baseball (4.7%), softball (3.2%), and tackle/touch football (4.3%)⁵. (Outdoor Foundation, 2016)

Americans who ride a bicycle (road cycling, mountain biking, BMX) do so with much greater frequency (63 times per year) than those who participate in hiking (15 times per year). Cycling was the second most frequent activity after jogging and running (average of 91 outings per year). (Outdoor Foundation, 2016)

Comparison to Cities Nationwide

There are few cities with populations comparable to Portland that have notable off-road cycling, in terms of mileage and quality, except Tuscon, Arizona. Table 1 shows some of the more populous cities that boast higher off-road trail mileage, taken from IMBA’s Ride Centers list and “best towns for mountain biking” lists⁶. What is notable about this list is the off-road trail mileage these communities offer in comparison to Portland. The Off-road Cycling Master Plan offers Portland the opportunity to set a national precedent for integrating off-road cycling into an urban environment.

Table 1. Larger Cities with Notable Off-Road Cycling Trail Mileage

City	Population	Population per square mile	Off-Road Cycling Trail Mileage	Mileage per 1,000 residents
Boise-Eagle, ID	241,000	n/a	390	1.6
Chatanooga, TN	173,000	1,210	100+	0.6+
Louisville, Kentucky	253,000	635	100	0.4
Richmond, VA	223,000	3,568	45	0.2
Tuscon, AZ	526,100	2,700	300	0.6
Portland	640,000	4,413	13.5 miles of natural surface trails (shared use)	0.02

⁶ Best Mountain Biking Towns. Accessed from <http://adventure.nationalgeographic.com/adventure/trips/best-mountain-biking-towns/>. Best Mountain Biking Trails Cities. Accessed from <http://www.usatoday.com/story/travel/destinations/2013/10/08/best-mountain-biking-trails-cities/2936039/>

Trends Impacting Off-road Cycling

According to the *Guidelines for a Quality Trail Experience*, the following factors will influence the growth of mountain biking over the next decade⁷:

Bike Technology

Mountain bikes will become increasingly capable of handling the rigors of trail riding. Lighter, stronger, and more efficient bikes will allow riders to push the limits of what is possible. Technological increases for high-end products will trickle down to mid- and low-cost bikes, making increased performance, and enjoyment, available to a broader range of enthusiasts.

Communication Technology

Mountain bikers have proven to be enthusiastic adopters of websites, apps, and other social media tools. From highlighting quality experiences to navigating new trails, riders are sharing and using information to get out more often.

Climate Change

In many parts of the U.S. the rideable season is increasing, with an earlier spring and later autumn. Inclement weather is a major factor in deterring many outdoor sports, including mountain biking, and decreasing snowfall will increase riding opportunities.

Trail Development

Exponential growth in the number of professional and volunteer mountain bike trail builders has influenced the creation of fun, sustainable singletrack. Bringing bike-optimized designs and features to trails is forecast to continue.

Outdoor Recreation Culture

For a new generation of recreationists there has never not been mountain biking. It is part of the range of activities that are expected and anticipated to be a component of one's outdoor adventure, whereas participation in more traditional experiences, such as hunting or camping, is shrinking.

Access

Thanks to the efforts of individuals and organizations such as IMBA, mountain bikers will see an overall trend of increased access to local, state, and federal lands. Easier access to more and better trails will allow more people to become enthusiasts.

Existing Guidance for Off-road Cycling Facilities

Numerous national publications provide guidelines, best practices, and examples for planning, designing, developing, and managing high-quality off-road cycling trails and bike parks. These resources provide guidance that far surpasses this Plan in both depth and breadth. City agencies, partners, and trail advocates should use these resources, as well as future updated publications, to ensure the most current science and best practice is used in future implementation efforts.

⁷ Excerpted from Bureau of Land Management and International Mountain Bicycling Association. (2017). *Guidelines for a Quality Trail Experience*. Retrieved from: <http://gqte.imba.com>



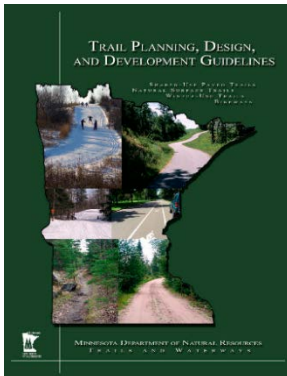
Guidelines for a Quality Trail Experience (2016)

These Guidelines, developed by the Bureau of Land Management in partnership with the International Mountain Bicycling Association (IMBA), are intended to help land managers and trail designers build, construct, and manage trail systems that provide the desired types of riding experiences. The document, which contains numerous images and illustrations, can help define, describe, and communicate trail objectives. Once these objectives are identified, the Guidelines can help determine which trail characteristics and features will best meet these goals.



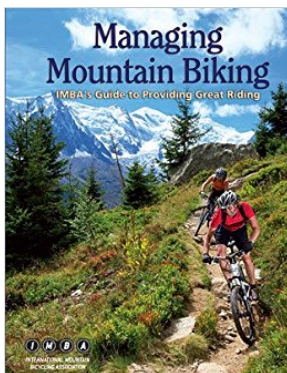
Bike Parks - IMBA's Guide to New School Trails (2014)

This guide provides information on planning, designing, building and operating successful bike parks. It addresses all stages of a project, from developing a community-based vision, to designing, fundraising, contracting and managing a bike park facility.



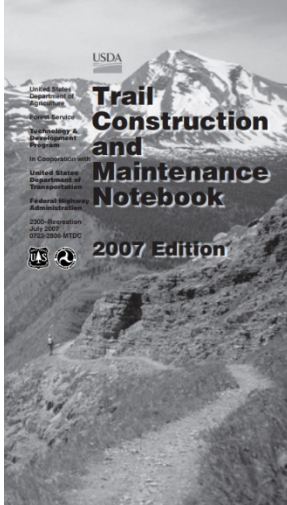
Minnesota Trail Planning, Design, and Development Guidelines (2007)

This guidebook, developed by the Minnesota Department of Natural Resources (DNR), provides a comprehensive "how-to guidebook" for developing all types of recreational trails. The Guidelines address both existing and new trail corridors, paved and natural surface trails, shared and single-use trails; and trails for summer- or winter-use. The Guidelines' best practices, though intended for Minnesota land managers and trail builders, provide useful approaches and examples for planning, designing, and building environmentally sustainable trails.



Managing Mountain Biking: IMBA's Guide to Providing Great Riding (2007)

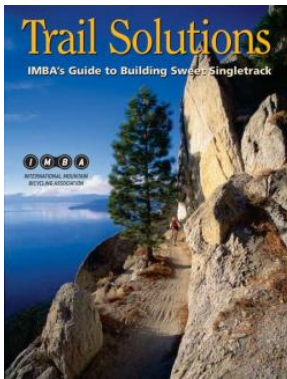
Managing Mountain Biking is IMBA's guide to overcoming user conflict, minimizing environmental impact, managing risk, and providing technically challenging riding for all levels. It focuses on ways to use trail design, partnerships, and management strategies to ensure successful trail systems, and is intended as a companion to Trail Solutions: IMBA's Guide to Building Sweet Singletrack. This guidebook was developed based on input from over fifty land managers, recreation ecologists, professional trail builders, and other experts.



Trail Construction and Maintenance Notebook (2007)

This pocket-sized notebook describes techniques used to construct and maintain trails. It is written for trail crew workers and is intended to be taken along on work projects. The Notebook provides best practices in trail planning and design as well as detailed information about construction techniques and tools, signage installation and maintenance, and trail decommissioning and revegetation practices.

It was developed by the US Department of Agriculture, the US Forest Service, and other federal agencies, in part to reflect the new best practices described in the resources below.



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

Trail Solutions provides guidance on trail planning, design, funding, construction, and maintenance. According to IMBA, "the book has emerged as the leading source of sustainable trailbuilding information. Nearly 10,000 copies have been distributed to over 40 countries, and the guidelines have been adopted as official policy by hundreds of land agencies and recreation providers around the globe." Trail Solutions is intended to complement *Managing Mountain Biking: IMBA's Guide to Providing Great Riding*, which provides guidance on mountain biking management issues.

SECTION 4. PLANNING AN OFF-ROAD CYCLING SYSTEM

The Off-road Cycling Master Plan offers an opportunity to expand off-road cycling opportunities in Portland by creating an off-road cycling network that takes advantage of the city's diverse urban and natural setting. To determine which types of off-road cycling disciplines and facilities are most appropriate in Portland, this Plan considered the following factors, discussed in greater detail throughout this section:

PHYSICAL SETTING	Off-road cycling can take place in a variety of settings, each which creates a specific experience. Settings may include: <ul style="list-style-type: none"> • Natural areas and open spaces • Developed parks and recreation areas • Rights-of-ways and greenways
DISCIPLINE OR STYLE	The first step in planning an off-road cycling facility is determining what discipline(s) or style(s) is most appropriate for the site (e.g. cross-country mountain biking, freeride, BMX, cyclocross, etc.). This knowledge helps determine the rider characteristics, facility type, and appropriate physical setting.
USER CHARACTERISTICS	Off-road cycling can be enjoyed by a wide spectrum of users. When choosing a site of a cycling facility, understanding the number and type of users (age, skill level, riding frequency, riding purpose) is critical.
FACILITY TYPE	Off-road cycling facilities can include: <ul style="list-style-type: none"> • Trails, of various types, lengths, and uses • Bike Parks • Competitive venues
USER EXPERIENCE	The facility's terrain and any natural or manmade features are key factors in a user's experience and are major considerations in facility design and in difficulty ratings.
SERVICE AREA	Facilities should be appropriately sized and scaled to meet the needs of their intended users – whether they are riders from the local neighborhood or from throughout the country.

Physical Setting

Off-road cycling can take place in a variety of settings, each which creates a specific experience. Settings may include:

Natural areas and open spaces

Large natural areas are a frequent location for off-road cycling trail systems. They offer riders an opportunity to experience nature, a key desire of many off-road cyclists. Bike parks are generally not sited in natural areas, though some systems – like Post Canyon in Hood River and the Phil’s Trail System in Bend – do have bike parks located near parking lots or other developed areas to provide a more diverse riding experience.

Natural areas with off-road cycling facilities might be owned and managed by private property owners or companies, local jurisdictions, or state and federal agencies. Many trail systems near Portland are located on lands owned and managed by the U.S. Forest Service or the Bureau of Land Management.



Developed parks and recreation areas

Developed parks and recreation areas, such as community or regional parks, can be excellent locations for natural surface off-road cycling trails and/or bike parks. Such parks generally offer other recreational amenities, like sports fields and courts, swimming areas, and community centers, as well as facilities like parking, restrooms and water fountains. Because they are more commonly located in or near cities, developed parks also tend to be more readily accessible to urban communities.



Rights-of-ways and greenways

Trails and linear bike parks can also be integrated into rights-of-way and greenways to take advantage of underutilized land. Off-road cycling and shared-use trails have been created in road rights-of-way, former railroad corridors, powerline corridors, and along greenways. They can include solely natural surface trails, natural surface trails adjacent to a paved trail or roadway, and/or bike park elements. Rights-of-way and greenways can offer unique opportunities to provide access to urban communities through a variety of terrain and experiences.

Off-road Cycling Disciplines and Styles

Trail-based riding

Trail-based riding includes cross-country, all-mountain, downhill, and freeride biking.



CROSS COUNTRY

Cross Country (XC)

Riding Style: This most common type of mountain biking emphasizes endurance over technical challenge and riders typically cover longer distances than other styles.

Trails: Cross country riders seek out longer routes and varied trails from narrow single track to wider fire roads that provide long climbs and moderate downhill decent and natural terrain features like rocks and roots.

Skill Level: Cross country riding is often the entry point for new riders and beginners while more intermediate and advanced level riders challenge themselves with longer distances and longer steeper climbs.

Bikes: Cross country bikes typically have either no suspension or less suspension travel and are lighter weight than bicycles for other styles of riding, so that riders can cover longer distances and excel on climbs.

Safety Equipment: Cross country riders typically ride with open face style helmets and carry the necessary tools and equipment to be self-sufficient while on the trails.



ALL MOUNTAIN

All Mountain (AM)

Riding Style: This popular style builds on the skills and experiences of cross country riding and emphasizes trails with more varied terrain and fun, challenging descents.

Trails: All Mountain riders seek out trails that provide more varied and technical terrain including steeper climbs and descents and both natural features such roots, rock gardens and off-camber turns as well as technical trail features like berms turns, jumps, drops, and ladder bridges.

Skill Level: All Mountain riding is suitable for more intermediate and advanced level riders that are comfortable with basic cross country riding skills.

Bikes: All Mountain bikes are typically a bit heavier duty and have more suspension travel than cross country bikes to handle the varied and technical terrain conditions.

Safety Equipment: All Mountain riders might wear additional protective equipment including knee or arm pads as they are seeking out more challenging terrain.



FREERIDE

Freeride (FR)⁸

Style: Freeride style riding extends the skills and experiences of All Mountain riding and emphasizes more advanced technical descending, technical terrain, and technical trail features.

Trails: Freeride riders seek out trails that are primarily downhill “gravity-fed” and purpose built to enhance the natural terrain with the addition of technical trail features and structures such as ladder bridges, log rides, wall rides, kickers, jumps, drops, berm turns, or other manmade features.

Skill Level: Freeride requires more advanced riding skills than All Mountain as the trails, terrain and features are bigger, faster and more challenging.

Bikes: Freeride bikes are typically more heavy duty than All Mountain bikes, with more suspension travel to accommodate the bigger jumps, drops, and higher speeds.

Safety Equipment: Freeride riders might wear open face or full face helmets and are more likely to wear protective equipment including: knee guards, arm guards, and spine and neck protection as they are seeking out challenging terrain and technical trail features.



DOWNHILL

Downhill (DH)

Style: Downhill style riding builds on both Cross Country and All Mountain riding skills and emphasizes technical descending with highly varied terrain conditions. Riders often hike or shuttle by car to the top of the descents.

Trails: Downhill may include natural obstacles, steep slopes and rugged terrain including off-camber turns, dirt berms, jumps, rock drops, rock gardens, and other natural features.

Skill Level: Downhill riding requires more advanced riding skills, specialized bikes and safety equipment and thus is usually pursued by intermediate to advanced level riders.

Bikes: Downhill bikes are designed to be stronger, with heavy duty brakes and maximum suspension travel to handle extreme technical descending.

Safety Equipment: Downhill riders typically wear full face helmets and protective equipment including: knee guards, arm guards, and spine and neck protection as they are seeking out the most challenging terrain and the highest speeds.

⁸ Photo credit: Joe Rykowski, Published at TravelOregon.com

Park-based riding

Park-based riding styles are specialized forms of off-road cycling and include riding pump tracks, dirt jumps, skills parks, and BMX.

Pump Tracks

Format: Pump tracks are continuous loop tracks that usually feature a start hill area and a series of rollers (smooth rounded mounds), bermed turns, and different styles of roller jumps that allow a rider to complete the circuit without pedaling. To move forward, the rider must ‘pump’ their upper and lower body up and down on the bike, hence the name.

Construction: Pump tracks are typically built with out of dirt and may be enhanced with a durable surface of asphalt or concrete to minimize maintenance. Prefabricated pump track kits constructed with concrete, fiberglass or wood are also options that provide the benefit of being reconfigurable.

Skill Level: Pump tracks are a great entry point for kids and beginner level riders new to the sport as they provide fun and ‘flowy’ riding experiences with little risk of falling. Pump tracks can also be designed to be more aggressive and technical to provide challenge for intermediate and advanced-level riders.

Bikes: “Hard tail” dirt jump style bikes and BMX bikes that do not have rear suspension are the most ideal for riding pump tracks as the full pumping force is translated through the bike. Bikes with suspension are less ideal as they absorb some of the kinetic energy.



PUMP TRACK

Dirt Jumps

Format: Dirt Jump trails usually include a start hill area and a series of rollers, jumps, bermed turns and might also include other features such as wall rides.

Construction: Dirt jump trails are typically built out of dirt and might include different types of jumps - “table top” or “platform” styles jump which allow riders to roll over at any speed, or more advanced jumps with gaps between the take-off and landing. Jumps can be constructed out of dirt or can include a variety of built or prefab features such “kicker ramps” that are constructed out of wood, or concrete. Common jump types include doubles, whoops, tabletops, and spines.



DIRT JUMP

Skill Level: Dirt jump trails can be built to accommodate beginner level riders by making them ‘rollable’ at any speed. For more advanced riders, the jump can be built bigger and with “gaps” to provide more challenge. Advanced level riders that usually prefer “gap” style jumps as they are better for spotting landings that “table top” style jumps.

Bikes: Dirt jumps typically ride “dirt jump” style bikes or BMX bikes that have minimal rear suspension allow riders to pump the jump take-offs and landings.

Skills Parks

Format: Skills parks usually include a start area and a series of technical trail or skills features such as log rides, ladder bridges, teeter-totters, rock gardens, and sand pits that provide challenging obstacles for riders to navigate.

Construction: Skills parks are typically built out of natural materials like logs, rocks and boulders, etc. They can also incorporate site-built features made from dimensional lumber and/or pre-fabricated features that can be installed and reconfigured.

Skill Level: Skills parks can be designed for very beginner riders to the most advanced. The purpose of a skills park is to provide progressively more challenging features so riders can build skills through practice.

Bikes: Skills parks are ridden by every type of bike from “hard tail” dirt jumpers to BMX to cross-country, all mountain and freeride style bikes.



SKILLS PARK

Skills Trails

Format: Skills trails are similar to skill parks but have a more linear format. They consist of a natural surface trail with a series of technical trail or skills features such as log rides, ladder bridges, teeter totters, rock gardens, and sand pits that provide challenging obstacles for riders to navigate. These features can be built into the main trail, or can be placed alongside a multi-use trail. They can be located in a portion of a park, around the perimeter, or along a linear trail corridor or greenway.

Construction: Skills trails are typically built out of natural materials including logs, rocks and boulders, etc. They can also incorporate site built feature made from dimensional lumber and/or pre-fabricated features that can be installed and reconfigured.

Skill Level: Skills trails can be designed for very beginner riders to the most advanced. The purpose of a skills trail is to provide progressively more challenging features so riders can build skills through practice.

Bikes: Skills trails are ridden by every type of bike from “hard tail” dirt jumpers to BMX to cross-country, all mountain and freeride style bikes.

BMX

Format: BMX riding has many distinct styles including freestyle-park, street, vert, competition racing, and the various off-road styles described above.

Skill Level: BMX riding is often an entry point for younger riders as the bikes are smaller and more affordable than mountain bikes. BMX riders, like other riders, learn skills and progress from beginner to advanced level riding through practice.

Bikes: BMX bikes have smaller frames, smaller wheels, a single gear, and lower seats to allow for extreme maneuvering. Some more advanced riders ride bike without brakes that force them to ride with more commitment and flow.



BMX - FREESTYLE / FREERIDE

Off-road cycling for youth

Riding off-road provides youth with a place to learn to ride where they can be free of interaction with cars. In addition, youth bikes commonly have the upright geometry and knobby wheels that mountain bikes feature, so uneven terrain and soft-surface paths are easily navigable. In appropriate conditions, off-road cycling is an activity that families can enjoy together.



KIDS

Kids Parks, Tracks, and Trails

Format: Kids tracks and trails are typically designed with a start area and a series of rollers and berms, skills features etc. that are specifically designed to be very accessible, low to the ground and safe for smaller younger riders. These facilities are typically separated from other riding areas so that younger riders have a safe place to practice riding and they are usually open so that parents can watch their children from a central location.

Construction: Kids parks can be built with dirt, natural materials like rocks and logs, and/or prefabricated features.

Skill Level: Kids parks are designed specifically for kids and the smaller-sized bikes that kids ride.

Bikes: Children often start out riding bikes with no pedals (called push or strider bikes). These bikes teach basic balance skills. Children then advance to larger bikes with pedals and then with brakes.

User Characteristics

Off-road cycling is a growing outdoor activity, both locally and nationwide. It offers people of all ages, abilities, income levels and backgrounds a chance to recreate in a safe place, to learn and develop bike skills in the sport has a relatively low barrier to entry—one needs only a bicycle to experience nature in the city. Input from the Project Advisory Committee and the public indicates that Portlanders desire a wider range of off-road cycling experiences for all ages and skill levels, with greater accessibility and geographic distribution.

Below is a summary of key participation and demand findings, which inform the Plan’s recommendations.

Total Participation

- Approximately 11 to 12 percent of residents (approximately 73,000 people) ride a bike off-road in Portland at least once a year, more than many other outdoor sports like tennis, field sports, golf and skateboarding.
- Walking and hiking are the most popular uses of unpaved trails locally. Approximately 60 to 65 percent of residents walk or hike on local trails.
- A significant percentage (40 percent) of statewide off-road cycling activity occurs in Multnomah County. Portland is also a major location for competitive off-road cycling events.

Figure 8. Participation in trail-based recreation (Multnomah County, 2011)

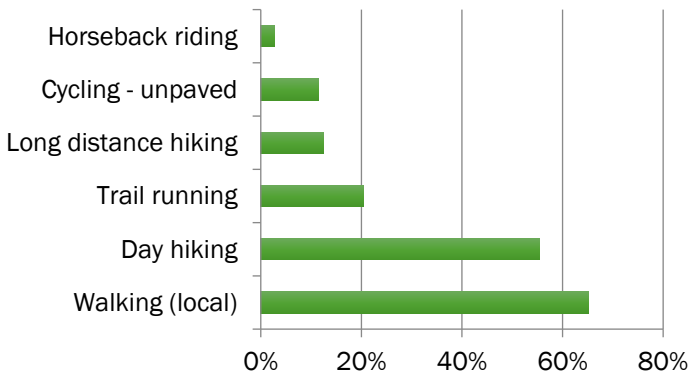
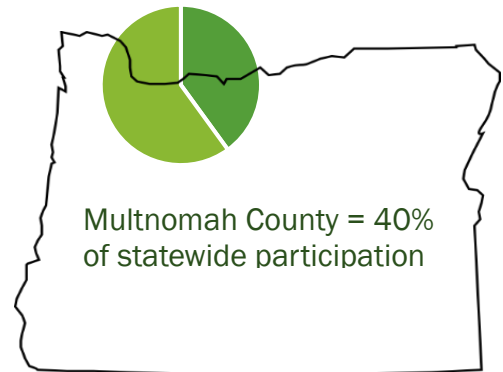


Figure 9. Multnomah County’s participation share



Needs Assessment Report

The key findings presented in this section are based on a comprehensive assessment of current participation in and demand for off-road cycling, see Appendix B.

This assessment is based on:

- A literature review of national, state, and local information about off-road cycling participation, trends, and patterns. To provide perspective, off-road cycling participation rates were examined against other outdoor-based recreation activities and sports, both locally and nationally.
- Results of a community questionnaire, which was conducted to better understand the desired types of facilities and experiences. The questionnaire asked about residents' perceptions, needs and priorities.
- In addition, a major public engagement effort in Spring 2017 resulted in over 5,000 public comments which provide additional input and perspective.

Ridership Trends

The current level of participation is expected to increase given the following factors:

- The population of the City of Portland and surrounding areas continues to grow.
- There is a national trend of increasing participation in off-road cycling.
- Regional participation in off-road cycling is higher than the national trend.
- There is shown to be latent demand in the City that is currently not served by facilities.
- Portland is a major location for competitive off-road cycling events.

Demographics of Off-Road Cyclists

People who ride bicycles off-road are similar, demographically, to people who participate in other trail-based recreational activities. Notably:

- People of all ages participate in off-road cycling. In Oregon, total adult participation is split roughly evenly between people 18-29 years old, 30-39, 40-49, and 50 or older. While limited local data is available for youth participation, the National Outdoor Recreation survey indicates that road, mountain, and BMX biking rank as the most popular outdoor activity for young between ages of 6 and 17.
- People of all income groups also ride off-road. Approximately one-third of participating households have incomes of \$50,000 or less, while 28 percent earn more than \$100,000.
- A slight majority of off-road cyclists are women (51%). Women make up a slight majority of participants in most trail-based activities.
- Trail-based activities, including off-road cycling, tend to have higher participation rates among people who identify as white than the population as a whole.

Skill Level

Statewide, riders are of a variety of skill levels, including beginner, intermediate, advanced and expert. The majority of riders in Oregon identify themselves as intermediate skill-level riders. Current off-road cyclists who responded to the Off-road Cycling Master Plan questionnaire indicated an interest in beginner and moderately challenging trails. This represents a greater desire for beginner-friendly trails than is noted in statewide data, which reports that current off-road cyclists prefer moderate or a varied level of difficulty (73%) for trails within their community.

Frequency of Riding

Some people participate in off-road cycling relatively frequently, even daily, while others are less frequent riders. In Oregon, trail users participate in off-road cycling an average of 3.5 times per year. Approximately one-quarter of trail users ride off-road at least once per year. In the Off-road Cycling Master Plan’s questionnaire, most online respondents who ride off-road did so at least once per week.

Riding Purpose

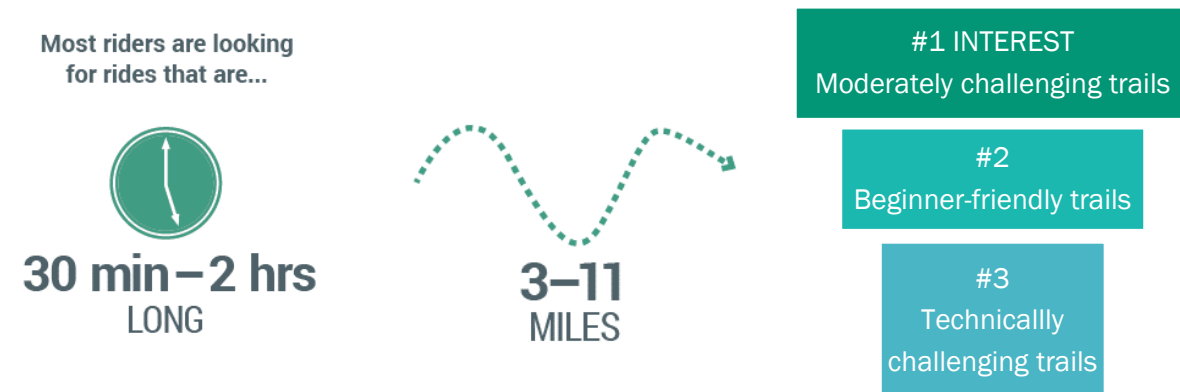
People may ride off-road for recreation, social, transportation, or competition. According to the Off-road Cycling Master Plan questionnaire, the majority of respondents who currently ride bicycles off-road participate in recreational mountain biking. Smaller numbers compete in cyclocross or use unpaved trails for commuting.

Ability to experience nature is a common desire, as indicated in statewide reports and in the project questionnaire. In the Portland region, more than 3 in 4 trail users rate protecting natural features and the ability to experience the natural environment as high priorities. (Oregon Parks and Recreation Department, 2016, pp. 100,104)

Ride Length

Statewide research reports that people engaging in bicycling on unpaved surfaces tend to spend between a half hour to two hours engaged in the activity. In addition, statewide research of off-road cyclists indicated a strong preference for longer mileage experiences. Fifty-three percent preferred lengths of 11 miles or more, while 48% preferred lengths of between three and ten miles, while no respondents expressed interest in rides of less than 3 miles.

Figure 10. Preferred ride time, distance, and level of difficulty



Characteristics Compared to Other Trail Users

Natural surface trails are often designed for and used by multiple types of users. The *Guidelines for a Quality Trail Experience* (BLM/IMBA, 2017) lays out the following characteristics for the types of trail users on Portland’s trails.

Trail User	Unique Important Factors	Common Important Factors
Hikers	<ul style="list-style-type: none"> • Focused on setting and destination • Most mobile user • Capable of cross-country travel 	<ul style="list-style-type: none"> • Natural setting • Narrow or singletrack trail experience • Exercise • Loops, connectivity • Variety
Equestrians	<ul style="list-style-type: none"> • Prefer loops • Less affected by tread condition than other users • Prefer water access • Require longer distances for a valued experience 	
Mountain Bikers	<ul style="list-style-type: none"> • Wide range of desired experiences • Trail itself is generally the primary factor, over setting or destination. Specific trail factors include: <ul style="list-style-type: none"> ○ Trail rhythm ○ Skill progression ○ Technical challenge ○ ‘Play’ experience 	
Trail Runners	<ul style="list-style-type: none"> • Most similar in movement to mountain bikers (speed, distance, preferred trail conditions) • Trail itself is an important factor 	

Related Recommendations

Range of Experiences

1. Provide a range of off-road cycling experiences for people of all ages and abilities, including children and beginner cyclists. This range of experiences can be provided within an overall trail and facility system or, ideally, within each trail system and facility itself.
 2. Base the range and scale of experiences provided on community needs and priorities, participation rates, and trends in off-road cycling.
 3. Plan, design, and maintain all trails, including paved and natural surface trails, with all intended users (such as walkers, cyclists, equestrians, and emergency responders) in mind. Pursue opportunities to expand or improve trail access for multiple user groups.
 4. Incorporate continued assessment of current participation and latent demand for off-road cycling trails and facilities into future planning or surveying for the park and recreation system. Use trail counters and other monitoring techniques to understand use patterns.
-

Facility Types

Off-road cycling facilities include trails, bike parks and competition venues, which each provide a certain cycling experience.

Trails

Trails offer many different types of riding experiences for riders of all ages, skill levels and abilities. Off-road cycling can take place on shared hiking/biking trails, hard- and soft-surface multi-use paths, or on single-use and purpose-built trails. Trails range in width, surfacing, and length, from small neighborhood scale trails that are less than a mile to large scale trail networks that are national destinations.

Many of the better known off-road cycling trails are typically made of dirt, and are considered “natural surface trails.” They are generally used jointly by both people riding bicycles and people walking. In Portland, Powell Butte Nature Park, Mount Tabor Park and Forest Park currently have natural off-road cycling trails.

The following trail characteristics determine the appropriate type of riding and use.

Trail width

Trail width affects user experience and the ease of use. This Plan categorizes natural surface trails into four width categories: Narrow trails (less than 3’ wide), Mid-width (3’ to 6’), and Wide (6’ to 10’), as well as Access Roads (10’ and greater).

Trail grade

The grade of off-road cycling trails can vary greatly – from virtually flat (0-5 percent grade) to steep (over 15 percent grade). The grade of a trail depends on both its design and the underlying land’s topography. Trails can have consistent grades or incorporate rolling or sudden grade changes. While some riders enjoy the challenge that steep topography can provide, many of Oregon’s best-known and most-used trails have relatively consistent or rolling grades. For example, the McKenzie River Trail, one of the most popular mountain biking trails in Oregon, starts at an elevation of 3,000 feet and descends only 1,500 feet over 25 miles.

Trail alignment

The alignment of a trail is determined by the underlying topography and soils, location of natural resources, and the desired trail experience. Planning a trail alignment includes designing the trail’s curves and turns both through the landscape and within the site.

Trail surface

Off-road cycling trails are typically made of natural materials, such as compacted soil, sand or rock.

Off-road Cycling Typologies

An accompanying detailed typology of off-road cycling trail and facility types can be found in Appendix C.

Narrow Trails, Slow Speeds

“Singletrack trails tend to slow mountain bikers – particularly on shared-use trails where they anticipate encountering other visitors. The narrow and frequently rough nature of singletrack demands constant focus and a slow to moderate speed, and its tight and twisty nature is exhilarating on its own... Most mountain bikers are responsible, conscientious trail users who seek an enjoyable experience, no excessive speed.

It’s almost counter-intuitive, but speed and danger tend to increase when mountain bikers are confined to wide roads. Bored and unchallenged, bicyclists quickly attain speeds that can bring them into direct conflict with other visitors.”

- International Mountain Bicycling Association, Trail Solutions

Other surfaces, such as wood and metal, are sometimes used for bridges, boardwalks, or crossings. Trails may include an underlayment, such as gravel, to help improve drainage and limit erosion.

Natural obstacles

Natural obstacles such as rocks, sandy spots, logs, and roots can provide challenge and interest.

Enhanced terrain

Trails can feature manmade features like jumps, drops, bridges, berms, ramps, and other elements. These features can add technical challenge to a trail.

Trail Use Designations

Off-road cycling trails and trail network should designate sanctioned users to minimize user conflicts. Trail use designations may include:

Shared use trails

Shared use trails are open to multiple different types of users, such as pedestrians, cyclists, and/or equestrians. Shared use trails:

- Can be designed to accommodate the needs of most users.
- Are more cost effective to design, build, maintain and manage.
- Can support the largest number of users.
- Require less trail miles, minimize overall trail density across a site, and reduce potential ecological impacts.
- Typically disperse users across a trail system.
- Can help build a trail community by encouraging cooperation and mutual respect between users while building a broader trail stewardship constituency.
- If not well-designed and managed, can lead to conflicts between users of different modes (particularly in high use areas) or speeds (particularly where there is a large speed differential).

Shared-use of crowded trails

According to research by Oregon State Parks, 86% of Oregonians strongly or somewhat prefer creating new trails for off-road cycling, while only 8% prefer maintaining shared use on crowded trails. When asked about alternative options – widening and one-way designation – there was greater support for one-way designation on trails used for singletrack bicycling than for widening trails (which received roughly neutral support).

Single use trails

Single use trails are open to, and typically designed for, use by only one type of user. For example, many trails in the Portland parks system are open only to pedestrians. Single use trails:

- Concentrate users to fewer trails.
- Can provide targeted experiences (e.g. flow, high-speed, or skills trails) and alleviate these pressures on the traditional shared use trails.
- Can require more extensive trail systems to fully meet the needs of multiple user types.
- Can limit conflicts between users.

Single-use trails can be appropriate in certain types of situations, such as where crowded trails or trailheads are limiting the potential for enjoyable experiences for various users; where unique experiences are desired, such as nature trails, ADA accessible trails, or high skill ‘challenge’ trails for off-road cycling.

Preferred Use Trails

Preferred Use Trails are intentionally designed to primarily cater to the experience of one user, though they allow multiple user groups. They are likely to become de-facto single use trails as non-preferred users choose not to use the trail.

HAVING SEPARATE TRAILS FOR BIKING, WALKING, AND EQUESTRIAN USE HELPS BENEFIT ALL BY ALLOWING THE TRAILS TO BE SPECIALIZED TO THE INDIVIDUAL USE (WIDER PATHS FOR EQUESTRIANS, TECHNICAL AND FLOWY TRAILS FOR MOUNTAIN BIKING, EVEN TRAILS FOR RUNNING AND HIKING). THIS WAY ALL USERS ARE ABLE TO GET THE MOST OUT OF THEIR ENJOYMENT, AND IT ALSO PROMOTES ADVOCACY GROUPS TO INVEST MORE IN THOSE DEDICATED TRAILS DUE TO A SENSE OF OWNERSHIP.

- COMMUNITY MEMBER

Directional Trails

Directional, or one-way, trails require some or all users to travel in only one-direction. Directionality can be used to help manage busy shared-use trails that are experiencing user conflict that cannot be managed through trail design or maintenance. Directionality can be designed into trail from its inception or be employed as an adaptive management strategy for existing trails. Directional trails require investment in signage and user education to ensure successful management.

Directional trails can reduce congestion on crowded trails, provide a more predictable experience for users, and reduce the number of passing interactions. However, directional trails limit the experience for users, can be difficult to manage and enforce, and lead to uneven wear on the trail tread.

Directional trail options include:

- **One-way trails for off-road cycling**
These types of trails can allow for narrower trails, with short sightlines or blind turns, as well as the use of directional jumps, drops, or other features.
- **Shared-use trails where off-road cyclists and all other users travel in opposite directions**
These types of trails require clear sightlines but can help reduce conflict by allowing users to better anticipate each other. For example, hikers and cyclists could travel in opposite directions along the trail and pass each other head-on, maximizing sight lines and visual interaction.
- **Shared-use trails where all users travel in the same direction**
These trails can reduce the number of passing interactions, but require faster users to overtake slower users from behind.
- **Shared-use trails where the direction of travel or access changes on certain days**
This approach can be used in situations where the trail cannot support safe and sustainable shared use, and cannot be redesigned to do so. This type of designation can result in management challenges, as users may be confused by, or choose to ignore, the daily use assignments.

Trail Etiquette

Proper trail etiquette helps ensure the safety and enjoyment of all trail users while safeguarding the natural environment. IMBA's Rules of the Trail (see box below) set expectations for off-road cyclists, focusing on responsible and courteous conduct on trails. These trail rules are commonly used in off-road cycling trail networks nationwide – these principles often form the basis for trail signage and public information about trail rules.

*The Stewardship, Management and Enforcement section of this Plan, see page **, discusses a variety of enforcement strategies for unsanctioned trail use or impacts, including IMBA's volunteer mountain bike patrol program.*

IMBA Rules of the Trail

IMBA developed these "Rules of the Trail" to promote responsible and courteous conduct on shared-use trails. Keep in mind that conventions for yielding and passing may vary in different locations, or with traffic conditions.

Ride Open Trails

Respect trail and road closures. Ask the appropriate land manager for clarification if you are uncertain about the status of a trail. Do not trespass on private land. Obtain permits or other authorization as required. Be aware that bicycles are not permitted in areas protected as state or federal Wilderness.

Leave No Trace

Be sensitive to the dirt beneath you and the environment around you. Wet and muddy trails are more vulnerable to damage than dry ones. When the trail is soft, consider other riding options. This also means staying on existing trails and not creating new ones. Don't cut switchbacks. Don't ride around standing water which results in widening the trail. Be sure to pack out at least as much as you pack in. Consider improving the trail experience for those that follow by picking up and removing any litter.

Control Your Bicycle

Inattention for even a moment could put yourself and others at risk. Obey all bicycle speed regulations and recommendations, and ride within your limits. Social conflicts on trails often result when riders are going too fast.

Yield Appropriately

Do your utmost to let your fellow trail users know you're coming – a friendly greeting or bell ring are good methods. Try to anticipate other trail users as you ride around corners. Mountain bikers should yield to other non-motorized trail users, unless the trail is clearly signed for bike-only travel. Bicyclists traveling downhill should yield to all users headed uphill, unless the trail is clearly signed for one-way or downhill-only traffic. In general, strive to make each pass a safe, controlled and courteous one.

Never Scare Animals

Animals such as horses are easily startled by an unannounced approach, a sudden movement or a loud noise. Give animals enough room and time to adjust to you. When passing horses, dismount from your bike, walk around them on the downhill side of the trail, use special care and follow directions from the horseback riders (ask if uncertain). Running cattle and disturbing wildlife are serious offenses.

Plan Ahead

Know your equipment, your ability and the area in which you are riding and prepare accordingly. Strive to be self-sufficient: keep your equipment in good repair and carry necessary supplies for changes in weather or other conditions. Always wear a helmet and appropriate safety gear.

Source: <https://www.imba.com/about/rules-trail>

Best Practices in Trail Design

Trails, whether shared- or single-use, should be designed with several best practices in mind to support user experience and safety. Additional environmental best practices are discussed in Section 7. Designing with Nature.

Sight Lines

Establishing appropriate sight lines improves safety, especially on bi-directional trails, shared use trails and at trail junctions. The wider the trail (and the faster the potential user speed) the longer the sight lines should be. The more twisty the trail (and the slower the potential user speed), the shorter the sight lines can be. On bi-directional trails, blind corners should be designed to rise at both approaches so users meet at slower speeds.

Passing and Regrouping Areas

Passing areas are wider sections of trail that allow riders to safely pass other riders or trail users. Passing and regrouping areas should be designed throughout a trail system to prevent users from straying off the trail and impacting the surrounding habitat. Installing a skills feature at regrouping areas encourages groups of riders to regroup at that point rather than elsewhere along the trail. Passing and regrouping areas should be designed to accommodate both traditional and non-traditional bicycles (such as handcycles).

Signage and enforcement of trail rules – see *Education section*

Stacked loop design

Stacked loop systems, where trails of varying difficulties are ‘nested’ or ‘stacked’ within each other, should be used when possible. These types of systems provide a variety of riding experiences that accommodate many skill levels. Locate shorter loops, beginner level trails, and denser sections of trail near developed areas or trailheads to enhance accessibility and separation of user skill levels for safety.

Trail Costs

In general, trail development and maintenance costs can be estimated based on the facility type, trail width, and usage. Table 2 provides a high-level summary for cost estimation purposes.

Table 2. Planning-level Trail Costs per mile

Facility Type	Trail Type	Width	Surface Type	User Type	User Capacity	Cost per mile	
						Capital	Maintenance
Lower Capacity Shared Use Trail (non-armored)	Narrow	< 3'	Natural surface	Shared	<i>pending</i>	\$10,500	<i>pending</i>
	Mid-width	3-6'	Natural surface	Shared	<i>pending</i>	\$21,120	<i>pending</i>
	Wide	6' +	Natural surface	Shared	<i>pending</i>	\$42,420	<i>pending</i>
High Capacity Shared Use Trail (armored)	Narrow	< 3'	Armored	Shared	<i>pending</i>	\$21,120	<i>pending</i>
	Mid-width	3-6'	Armored	Shared	<i>pending</i>	\$42,420	<i>pending</i>
	Wide	6' +	Armored	Shared	<i>pending</i>	\$63,360	<i>pending</i>
Purpose Built, Bike-specific Trail	Flow Trail	4-8'	Natural surface	Single	<i>pending</i>	\$42,420	<i>pending</i>
	Skill Trail (10 features/mile)	< 4'	Natural Surface/ Pre-fabricated features	Single	<i>pending</i>	\$31,680	<i>Pending</i>

Related Recommendations

Trails

1. Carefully plan and design shared use trails to ensure they provide a quality, enjoyable recreation experience for all intended users. This requires understanding the existing and/or intended user groups, usage patterns, and user desires.
 2. Designate trails as shared use (used by multiple user groups) or single use (one user type allowed) on a site-specific basis, depending on considerations like user safety, impacts on natural and cultural resources, public input, and need.
 3. Use best practices in trail design to provide safe experiences for all users.
-

Bike Parks

Bike parks can incorporate many different types of riding facilities to provide a full spectrum of riding experiences for riders of all ages, skill levels and abilities.

Bicycle parks, such as pump tracks, jump parks and skill trails, are places for people of all riding abilities to practice their riding skills and have fun. These parks can include trails, dirt or concrete tracks, and features like rocks, logs and “skinny” bridges. They can be built on a portion of a property or around the edges of a property with another use. The most common types of bike parks and their associated features include:

- **Kids facilities** – kids pump track, skill trail, race course and cross country trails with level to moderately sloped terrain for younger riders.
- **Pump parks** – pump track with start area, rollers, berm turns, wall rides
- **Skills facilities** – skills park facility, series of features, obstacles, terrain
- **Jump parks** –start area with multiple jump lines: small, medium, large and extra-large jumps for beginner, intermediate, advanced and expert level riders
- **Jump trails** – gravity-fed trail that is short in duration, with a linear sequence of jumps and a start area.
- **BMX track** –start hill, start gate, rollers, jumps, berm turns, rhythm sections, finishing gate,
- **Dual slalom track** – dual track trail, two nearly identical side-by-side tracks where riders compete for time.
- **Terrain park** – built features such as wall rides, kicker ramps, whale tails, dirt jumps, berms
- **Trials** – course of challenging obstacles or features

Bike parks range in size from small neighborhood-scale parks that are less than an acre in size and may feature a single pump track, dirt jump facility or skills building features (such as the Ventura Park Pump Track and the New Columbia Bicycle Skills Park) to large scale multi-acre national destinations featuring multiple riding facilities, trails, competition and event venues (such as Portland International Raceway).

Bike Park Costs

In general, bike park development and maintenance costs can be estimated by determining the facility type, surface material, and expected usage. Table 3 provides a high-level summary for cost estimation purposes.

Table 3. Planning-level Bike Park Costs

Facility Type	Park Type	Size	Surface Type	User Capacity	Cost per square foot		Total Facility Cost
					Capital	Maintenance	
Bike Parks	Small	0-1 acre	n/a	Pending	\$2.25	Pending	\$50-100k
	Medium	1-3 acres	n/a	Pending	\$2.20	Pending	\$150-300k
	Large	3+ acres	n/a	Pending	\$2.10	Pending	\$300k+
Bike Park Features	Kids Tracks	2,500 sf	Dirt	Pending	\$3.00	Pending	\$7,500
			Concrete	pending	\$6.00	pending	\$15,000
	Pump Track	10,000 sf	Dirt	Pending	\$4.00	Pending	\$40,000
			Concrete	Pending	\$8.00	Pending	\$80,000
	Jump Park	10,000 sf	Dirt	Pending	\$4.00	Pending	\$40,000
			Pre-fabricated	Pending	\$8.00	pending	\$80,000
Skills Park (10 features)	10,000 sf	Pre-fabricated	pending	\$3.00	pending	\$30,000	

Competition Venues

Competition event venues can host off-road cycling races and special events. Well-designed competition venues frequently include race areas, training and warm-up areas; parking, restrooms, water, electricity and other infrastructure.

Competitive formats for trail riding include short track mountain biking, cyclocross, cross country, enduro, and downhill. There are many competition types that can occur at bike parks such as trials, slalom; dual slalom; freestyle, slopestyle, and BMX vert, street and park.

While racing represents a small portion of overall off-road cycling participation, Portland hosts many of the largest off-road cycling races and events in the state, including cyclocross and short-track cross country mountain biking events. The Portland International Raceway currently host cyclocross and short-track mountain bike racing. In addition, exhibition cyclocross races and special events have been held at Gateway Green. However, Gateway Green’s current lack of easy vehicle access, parking, restrooms, water fountains, and electricity makes hosting events difficult.

In 2015, there were nearly 12,000 participants in 28 Oregon Bicycle Racing Association (OBRA)-sanctioned off-road cycling races in Portland. These include over 9,140 participants in cyclocross races and about 2,830 in short-track cross country mountain biking. (Oregon Bicycle Association, 2015) Both types of events draw a variety of participants, in terms of gender, age, and skill level, and contribute to tourism and the local economy.

Related Recommendations

Competition Venues

1. Continue to provide location(s) for off-road cycling events and competitions.
 2. If races or competitions are allowed on City facilities, develop an event protocol that provides guidance and balances this use with other park uses, environmental conditions, and the needs of the local community.
-

User Experience

Off-road cyclists – of all levels – are often looking to develop their skills, test their endurance, exercise, reduce stress, and enjoy a feeling of adventure. Designing trails and bike parks that support and promote these experiences leads to greater user satisfaction.

Skill Progression

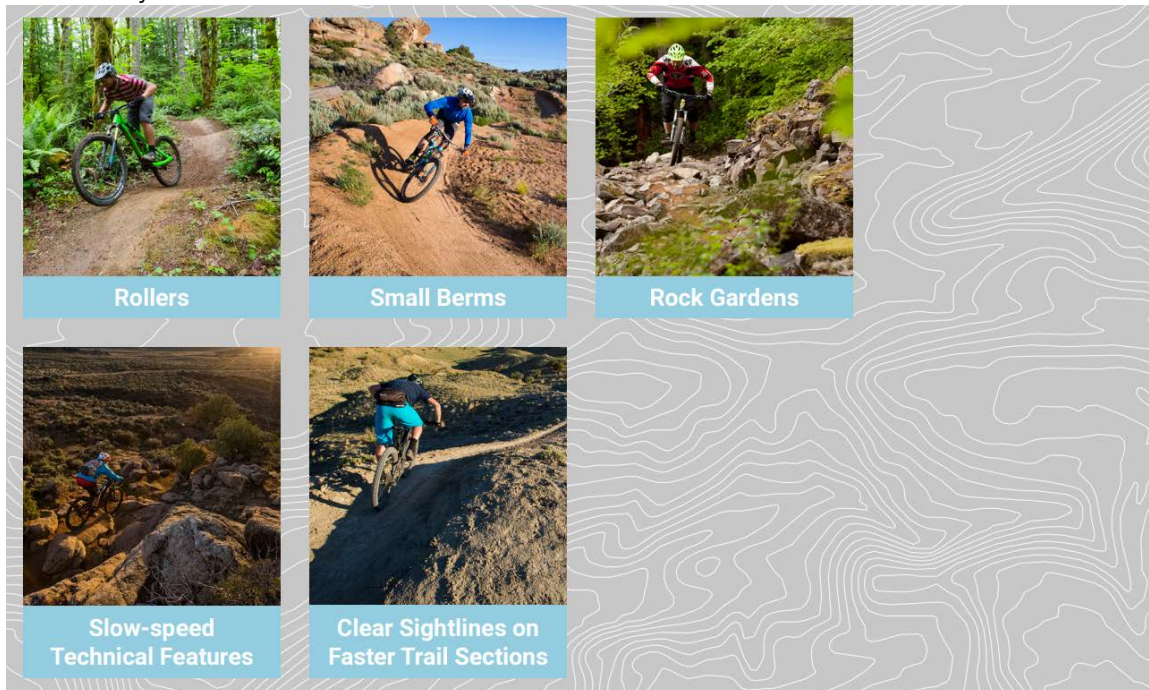
Skills progression is one of the most important aspects in designing dynamic, long-term off-road cycling trails and bike parks. Progression-based facilities provide opportunities for developing new skills and techniques and minimize risk by providing riders opportunities to incrementally improve their skills through repetition. Progression-based facilities can be designed to provide compelling experiences for all levels of users from novice to advanced. They should be designed to promote a community of learning and advancement while providing safe, fun and exciting experiences.

Off-road Cycling Features

Off-road cycling, or bike-optimized, features can be designed or built into trails to specifically enhance the riding experience. Features can add to the technical challenge, speed, risk, flow, or playfulness of a trail segment. Where appropriate, they can be used on shared-use, single-use, or preferred-use trails, see Figures 11 and 12.

Figure 11. Features appropriate for Shared/Preferred Use trails⁹

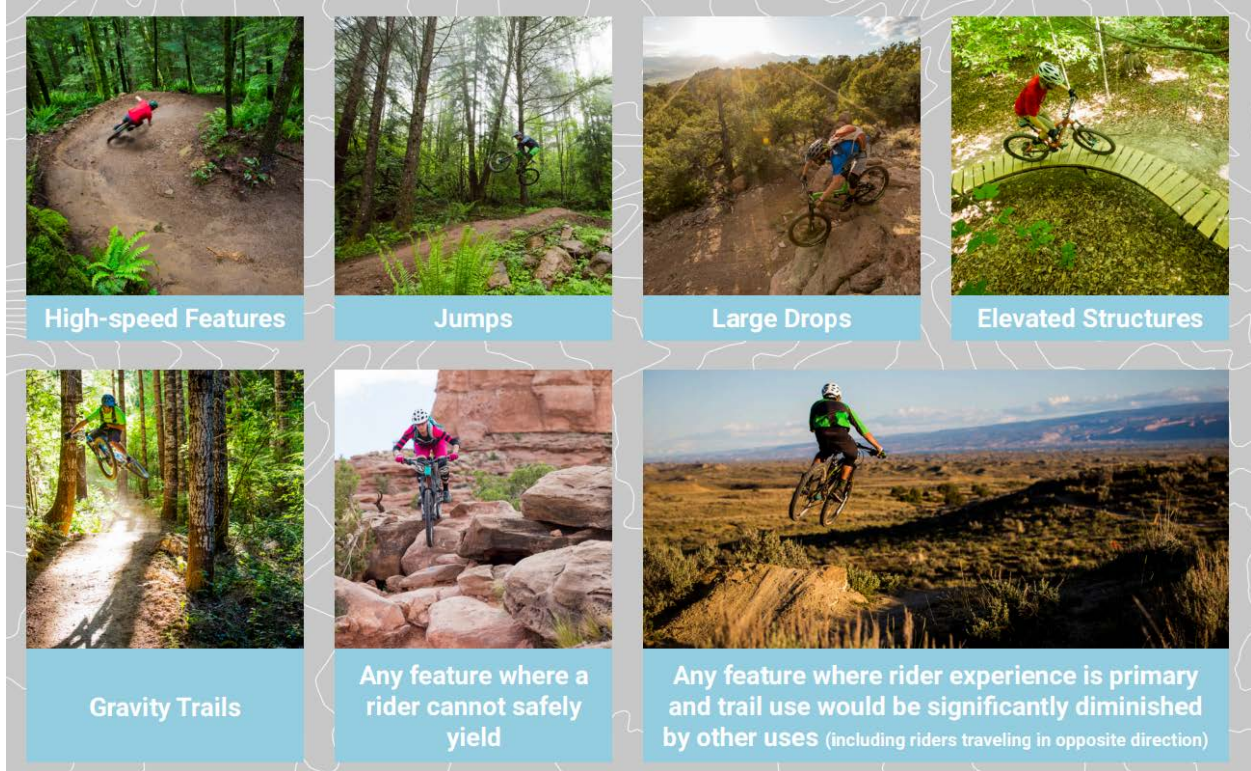
“Bike-optimized features can be appropriate for shared or preferred-use trails depending on their amplitude and frequency. A small feature placed strategically within the corridor would be enjoyed by riders but could go unnoticed by other trail users.”



⁹ Text and photos excerpted from Bureau of Land Management and International Mountain Bicycling Association. (2017). Guidelines for a Quality Trail Experience. Retrieved from <http://gqte.imba.com>

Figure 12. Features appropriate for Single-Use (Cycling) trails, not appropriate for Shared-Use⁹

These features can impede other users ability to enjoy a trail (for example, a hiker or equestrian may not be able to easily cross the feature) or can pose safety risks by increasing rider speed or making it more difficult to yield to other users.



Bike-Optimized Trails

Bike-optimized trails are intentionally designed and constructed to improve the experience for off-road cyclists. These trails take advantage of the unique qualities of riding a bicycle – momentum; the interplay between the rider’s position, center of gravity, and the tires’ friction on the ground; and the ability of a rider to control their speed through the mechanics of the bicycle. A bike-optimized trail might accomplish this by incorporating features like bermed turns, rollers, or manmade technical features.

Bike-optimized trails can be shared, preferred, or single-use, depending on its intended users and desired outcomes. When other users (e.g. hikers and equestrians) are also allowed, the trail should be designed to support their safety and enjoyment as well. For example, bermed turns can include a flatter interior tread that is comfortable for hiking and horses; technical features, like rock gardens, can be designed into one side of the trail or optional routes can be incorporated.

Example: Bermed Turns



“Berms take advantage of the motion and momentum of the bike, keeping rider forces perpendicular to the tread surface, changing direction in a manner most efficient and least likely to cause soil displacement. Most important for the rider experience is that the feeling of riding a berm is exhilarating and playful.

A hiker or equestrian cannot take advantage of a berm; indeed, these users may find them difficult to negotiate without slipping and more obtrusive in the landscape than a switchback or at-grade turn...

A shared-use, bike-optimized trail would need to provide a flat area through the turn for other users—a hybrid-style turn often referred to as a “switchberm” to accommodate multiple user modes.”

Excerpted from BLM/IMBA. (2017). Guidelines for a Quality Trail Experience. Retrieved from <http://gqte.imba.com>

Level of Difficulty Ratings

The International Mountain Bicycling Association (IMBA), a nonprofit educational association focusing on best practices for planning, designing, and managing successful off-road cycling networks, developed a rating system for trails, based on trail features. The rating system uses symbols similar to ski trails, with easiest trails marked with green circles, intermediate trails marked with blue squares, and the most difficult trails marked with single or double black diamonds.

Factors incorporated in trail ratings:

- Trail width – narrower trails are more difficult
- Trail surface – variable surfaces are more difficult
- Maximum and average trail grade - steeper trails are more difficult
- Natural obstacles and technical trail features – larger obstacles are more difficult

The level of difficulty rating does not include the length or elevation change on a trail. These factors influence the level of physical exertion that may be required, rather than the level of technical difficulty, and should be reported separately.

Rating trail difficulty can provide useful information to multiple types of trail users, while helping improve their outdoor experience. The designated Trail Difficulty Rating for a trail should be relative to local trails and consistent across the City’s system. Ratings, along with trail length, should be included in trail signage and maps.

The trail itself, and any trail features, should be designed and maintained in a way that is appropriate to the intended level of difficulty. Poorly designed and maintained trails can become more challenging (like when a poorly maintained trail becomes rutted or soil around roots erodes) or less challenging (such as when a narrow trail segment is widened by users, or when users avoid features by creating unsanctioned routes around them).

Figure 13. Trail Difficulty Rating System¹⁰

Trail Ratings	 Easiest	 Easy	 More Difficult	 Very Difficult	 Extremely Difficult
Your Rating 					
Trail Width	 6 feet +	 3 feet +	 2 feet +	 1 foot +	 6 inches +
Average Trail Grade	 Less than 5% Max 10%	 5% or less Max 15%	 10% or less	 15% or less	 20% or less
Roots/Rocks (Unavoidable)	None	 2 inches tall or less	 8 inches tall or less	 15 inches tall or less	 15 inches tall +
Bridges (Unavoidable)	None	3 feet wide +	2 feet wide +	2 feet wide +	Less than 2 feet wide
Other Features			Air bridges (2 feet high or less)	Air bridges (4 feet high or less) Loose rocks/sand	Air bridges (4 feet high or more) Loose rocks/sand
				Some sections exceed	Many sections exceed

¹⁰ Singletracks.com, based on IMBA skill level ratings

Promoting Rider Safety

The City can help ensure riders choose trails that are appropriate for their ability and promote rider safety through:

- **Signage:** Clear signage communicates the technical difficulty of trails and features.
- **Filters:** Filters require riders to overcome an obstacle (such as a rock garden) at the beginning of more technical trail segments.
- **Optional lines:** Optional lines allow riders to opt-out of challenging natural or manmade obstacles.
- **Safe-fall zones:** Safe-fall zones for features or technical sections reduce the likelihood and severity of falls.

Related Recommendations

Skill Progression and Rider Safety

1. Based on an effective community engagement process, design trails and bike parks to provide desired opportunities for all intended users.
 2. Design trail systems and bike parks to allow skill progression, so riders can use trails and features that are appropriate to their skill level. Progressive facilities minimize risk while providing fun and compelling experiences for a variety of users.
 3. Where appropriate and desired, incorporate natural or prefabricated skill features to skill trails or bike parks to add variety and skill progression opportunities.
 4. Incorporate best practices for rider safety that provide riders with indications of the level of technical difficulty, options for diverting around technical features, and safe-fall zones for technical sections.
-

Service Area

Off-road cycling trail systems or bike parks can be designed to serve small areas, like a local neighborhood, to large statewide or even nationwide areas. The size, level of development, variety, and supporting infrastructure for a trail or bike park should match its intended scale and audience, see Table 4.

Table 4. Typical size of off-road cycling facilities by intended service area

Neighborhood	Community	Regional	State	National
Very small scale, designed primarily for a neighborhood	Small scale, designed for a local community experience	Medium scale, designed to provide recreation for several communities	Large scale, designed as a statewide destination	Largest scale, intended as a national destination
Trails – Typical size and examples				
Less than 1 mile	1 to 4 miles	5 to 15 miles	10 to 50 miles	25+ miles
	Gateway Green, Portland, OR	Powell Butte, Portland, OR	Sandy Ridge, Marmot, OR	North Umpqua Trail, Roseburg, OR
Bike Parks – Typical size and examples				
Under 1 acre	1 to 3 acres	3 to 10 acres	10 to 50 acres	50+ acres
Ventura Park, Portland, OR	Eichler Bike Park, Beaverton, OR	Gateway Green, Portland, OR	Valmont Bike Park, Boulder CO	Northstar Bike Park, CA

SECTION 5. CREATING A SUSTAINABLE SYSTEM

Portland's future off-road cycling system must coordinate with and further the City's environmental preservation efforts, contribute to increased community health of Portland residents (both physical and economic), and last into the future. Achieving these outcomes will require careful planning and intentional management. This section outlines overarching approaches to ensure the City creates a sustainable off-road cycling system.

Foundational Recommendations

A citywide off-road cycling system will depend on supporting the foundational components of a healthy and active community – the City's parks and natural areas, trail networks, and its broader active transportation systems.

Related Recommendations

Foundational Recommendations

1. Support the ongoing protection, restoration, and management of City natural areas. Engage the Portland community in natural area stewardship and educational programs.
2. Support the ongoing maintenance and enhancement of the City's parks.
3. Develop parks and trails in underserved areas, where residents do not currently have safe and convenient access to parks, natural areas or trails.
4. Build the planned active transportation network, with an emphasis on the regional trail network and bikeways that serve people of all ages and abilities, to facilitate access to off-road cycling facilities by foot, bicycle and transit.
5. Expand the City's network of natural surface trails for all users to expand recreational opportunities and meet community demand.

Designing and Building Sustainable Off-road Cycling Facilities

The City should design, plan and build off-road cycling trails and bike parks that achieve all components of sustainability – ecological, social, and economic. Such facilities respond to the site's unique conditions, local user needs, and the financial capacity of the managing agency.

Sustainability Components	Ecological
	Ecologically sustainable off-road cycling trails and bike parks: <ul style="list-style-type: none"> • Achieve a net ecological benefit by: <ul style="list-style-type: none"> • Protecting sensitive natural resources • Avoiding, minimizing, and mitigating impacts on soils, sensitive plant and animal species, and habitat. • Enhancing ecological conditions through restoration. • Build community stewardship for public lands.
	Social
	Socially sustainable off-road cycling trails and bike parks: <ul style="list-style-type: none"> • Provide desired user outcomes (experiences and benefits) for all users at • Reduce user conflict

- Limit unintended risk
- Limit creation of informal, unsanctioned trails or features
- Engage trail users in positive management

Economic

- Limits capital and ongoing maintenance expenses
- Enhances local quality of life
- Contributes the economic well-being of the managing agency and the larger community

Facilities which fail to achieve one component of sustainability will soon become unsuccessful across all components. For example:

- A trail that erodes will not only disturb nearby streams and vegetation, but will also become more difficult to ride or hike (no longer providing desired user outcomes) and cost more to maintain.
- A trail that does not provide a desired user experience (like access to a viewpoint), could result in the creation of demand trails which cause environmental degradation and require the managing agency to act to remediate.
- A trail whose maintenance needs exceed available funding is likely to be poorly maintained, resulting in deteriorating trail conditions, erosion, widened trails, and unmet user outcomes.

Managing Public Properties

The City of Portland owns public land to provide services to the public and to forward important community goals, many of which are related to public and community health, the environment, or economic resiliency. The City of Portland must constantly prioritize available revenues to provide needed services, forward community goals, and properly steward taxpayer dollars.

Public and community health goals might include:

- Providing necessary public services, like drinking water, stormwater or wastewater management, or flood management.
- Providing recreational opportunities or access to nature
- Promoting the health and safety of users of a property
- Limiting nuisance activities on a property or reducing adverse impacts on neighbors.

Environmental goals might include:

- Enhancing wildlife and fish population health
- Preserving and restoring fish and wildlife habitat
- Improving stream and riparian health
- Supporting water quality and sustainable stormwater management

Economic Goals

- Minimizing the cost of construction, maintenance and management

- Minimizing financial liabilities
- Supporting economic development or tourism

The City must weigh these various objectives for each property when deciding the best way to develop (or not develop) and manage each public property. For example,

- Developed parks are designed, constructed, and managed for outdoor recreation. They provide places for people to play and spend time outdoors. Developed parks can contain natural areas that are managed predominantly to protect and enhance their ecological value and functions.
- Utility properties, such as wastewater treatment plants, maintenance yards, or pump stations, are designed, built, and managed primarily to provide a utility service to residents and businesses. On some properties, like hydroparks, compatible recreational use can also be provided. But for many utility properties, recreation is a minor, or even restricted, use.
- Natural areas can be managed for multiple purposes. They might be acquired and managed to preserve particularly high value natural resources (like wetlands, remnant oak habitat, or habitat for special status wildlife or fish species). Or, they may have been acquired and restored to allow streams and rivers to naturally flood without damaging homes or businesses or to protect water quality. Some are acquired with the intention of providing recreational access through trails, water access, or other facilities. Many properties were acquired and are managed for two or all three of these purposes.

The goals for each property help determine the appropriateness of a property for trails or bike parks. They also guide decisions about trail or bike park location, design, and management. These decisions, and a site's physical conditions, then determine what level of investment will be necessary to build, maintain, and manage an off-road cycling facility.

Ideally, investments in trails and bike parks should achieve multiple community goals, such as increasing overall recreational opportunities and access to nature, building community through stewardship, restoring natural resources and wildlife habitat, providing for active transportation, and managing stormwater.

SECTION 6. SYSTEM PLAN

This Plan is an opportunity to implement a system of off-road facilities across the city. To that end, the system was developed to deliver an equitable geographic distribution of off-road cycling opportunities, but also a diversity of experiences, of skill levels, and opportunities for a range of ages. The system is intended to offer experiences citywide for the technical expert to the casual rider to families and kids. In this way, the system will reflect the diversity of experiences off-road cycling offers.

The existing off-road cycling conditions assessment, the benefits and impacts assessment [link to], and needs assessment forms the basis for identifying gaps in the network, geographic inequalities, and lack of facilities for identified user groups. Public engagement conducted throughout the project also informed decision-making, indicating strongly that the system should create a range of off-road cycling experiences and plan for off-road cyclists with varying levels of experience.

Related Recommendations

System Planning

1. Distribute facilities equitably. Provide experiences across the city so that all residents can access close-to-home riding opportunities. Prioritize areas that are currently underserved by parks, trails, or other safe places to ride a bicycle. Focus on serving youth, communities of color, and lower income residents.
 2. Use a scaled approach.
 - a) At the **citywide** scale, provide a few large anchor sites.
 - b) At the **district** scale, provide multiple mid-sized opportunities.
 - c) At the **neighborhood** scale, provide locally-accessible smaller opportunities.
 3. Provide a range of facility types and riding experiences for riders of different ages and skill levels. However, to best meet community needs with limited resources, prioritize trails, both natural and urban, and beginner to intermediate, family-friendly riding options.
 4. Connect the system. Create a connected system of well-distributed trails and bike parks, accessible by bike and transit, to offer urban experiences and access to nature for all.
-

Level of Service Goals

Developing an off-road cycling system requires siting facilities across the city in a manner consistent with the City’s vision and objectives. Level of service (LOS) goals provide an established approach to:

- Reflect the needs and priorities of a community
- Ensure equitable distribution across population, and geographic, political, socioeconomic boundaries
- Determine future needs to accommodate anticipated growth
- Benchmark, measure progress and compare results to other communities.

Few standardized level of service approaches exist for providing off-road cycling trails and facilities across a city. As such, this Plan includes a unique set of level of service goals developed to meet recreational needs, protect natural resources, work within a finite supply of public land, and reflect the project vision and objectives. They are based on existing Portland Parks & Recreation approaches and standards, comparison with other jurisdictions that are providing off-road cycling facilities, research into alternative LOS considerations and methodologies, and community input.

Types of Level of Service Goals

Level of service goals for parks and recreation facilities can take a variety of forms, such as:

Target of developing a facility within a certain distance of residents

For example, Portland Parks & Recreation has a target of providing a developed park or trail within a ½ mile of every Portlander.

Number or total size of facilities desired per 1,000 residents

For example, many communities set goals to provide a certain number of park acres, community centers, playgrounds, sports fields, or other recreation facilities per 1,000 residents.

Resource based standards

For example, the Portland Natural Area Acquisition Strategy sets targets for acquiring or otherwise protecting Portland’s most ecologically valuable natural areas.

Connectivity-based standards

For example, the City’s Recreational Trail Strategy and Bicycle Master Plan set goals for a system of bicycle routes and trails that work together as a connected system.

Table 5. Level of Service Goals

Scale	Trail Target*	Bicycle Park Target*
Citywide	<ul style="list-style-type: none"> • 2 to 3 trail experiences of at least 10 miles, urban or natural • Trails should provide a mix of beginner, moderate, and technically challenging experiences • Urban trail corridors link districts 	<ul style="list-style-type: none"> • 1 citywide facility that includes beginner, moderate, and technically challenging options • 1 regionally-serving event facility
District	<ul style="list-style-type: none"> • 1+ trail experience of at least 3-5 miles per district • Focus on beginner-moderate challenge 	<ul style="list-style-type: none"> • 2-3 facilities per district • Size can vary from small neighborhood options (2,500 – 8,000 sf) to larger (up to 1 acre) facilities • Focus on beginner to moderate challenge
Neighborhood	Short connector opportunities or skill trails – see bicycle parks	<ul style="list-style-type: none"> • Could include skill trails or bicycle parks

* Existing facilities are included in meeting level of service targets

Strategies for meeting the interest in trails

As the needs assessment indicated a higher demand for trail experiences, the LOS guidelines considered how to address that interest. Considerations for incorporating trails into the system, include:

- Focus on beginner-intermediate trails; with fewer technical trails
- Focus on narrow to mid-width cross-country trails to provide higher quality trail experience
- Need for both local, short experiences and options for moderate length rides
- Desire for connection with nature

Also, public engagement indicated that people prefer longer experiences. A typical cross-country ride is approximately 10 miles, yet many of the opportunity sites are small and may not be able to support that kind of trail mileage. Best practices suggest creating loop and stacked loop systems within a single site. Another option is to link smaller facilities in along trails and in nearby parks to create longer and more varied riding options.

Community input showed a moderate interest in skills parks and pump tracks, offering a variety of experiences, features and designs for all ages. These kinds of off-road facilities can meet a portion of the demand for trail experiences.

Site Selection Process

To identify sites for off-road cycling trails and parks, the City analyzed opportunities on all City-owned properties. The process included six general steps:

1. Fatal Flaw Screening

First, the project team screened out properties that would not be appropriate for off-road cycling for an easily identifiable reason (such as properties that were very small, very steep, fully developed, predominantly wetland, or designated as industrial land or archaeologically significant).

2. Off-road Cycling Assessment

Next, the team categorized remaining sites as potentially suitable for off-road cycling trails, parks, both, or neither, based on considerations like slope, size, and the extent of existing natural areas.

3. Initial Opportunity Mapping

As a third step, the project team, the Project Advisory Committee, and agency partners identified initial sites that might offer good opportunities to provide a connected network of diverse off-road cycling experiences.

4. Desktop Site Assessment

Initial opportunity sites were then examined in greater detail, considering factors like:

- a) Existing regulatory restrictions that prevent or limit recreational use.
- b) Environmental factors, such as habitat, soils, and waterways.
- c) Other existing or planned recreational facilities on the property.
- d) Community priorities and other guidance established in existing master and management plans.

5. Community Feedback

Then, as part of a broader community engagement strategy, community members were asked to

comment on all potential off-road cycling sites via an online interactive map and in-person outreach. Sites that were screened out in previous steps were also be displayed and identified as such. Community members were asked to help shape the plan by voicing their priorities for Portland's parks and trails; commenting on potential sites; identifying ways to create a varied off-road cycling system that meets community needs; and noting potential management opportunities or challenges that should be explored further.

6. On-the-ground Site Assessment

Finally, specialists in environmental conservation and off-road cycling facility design completed field assessments of potential sites that have unique features or challenges. This step confirmed suitability for the types of riding experiences proposed based on environmental conditions and other site-specific factors.

Figure 14 provides more information on each of these steps and the specific criteria used to evaluate sites.

Recommended Locations

This Plan recommends improvements at all existing off-road cycling facility locations as well as the development of 19 additional trail and bike park locations and three urban off-road cycling trail corridors, see Figure 15. These locations were selected based on community input, the needs assessment and level of service goals, site screening process, and technical analysis.

Figure 14. Site Selection Process



How is the project identifying proposed off-road cycling sites?

The diagram below describes the process for screening City-owned properties and developing a draft map. The draft map will show a proposed system of off-road cycling trails and parks that provide will variety of high-quality off-road cycling experiences in a safe and sustainable way.

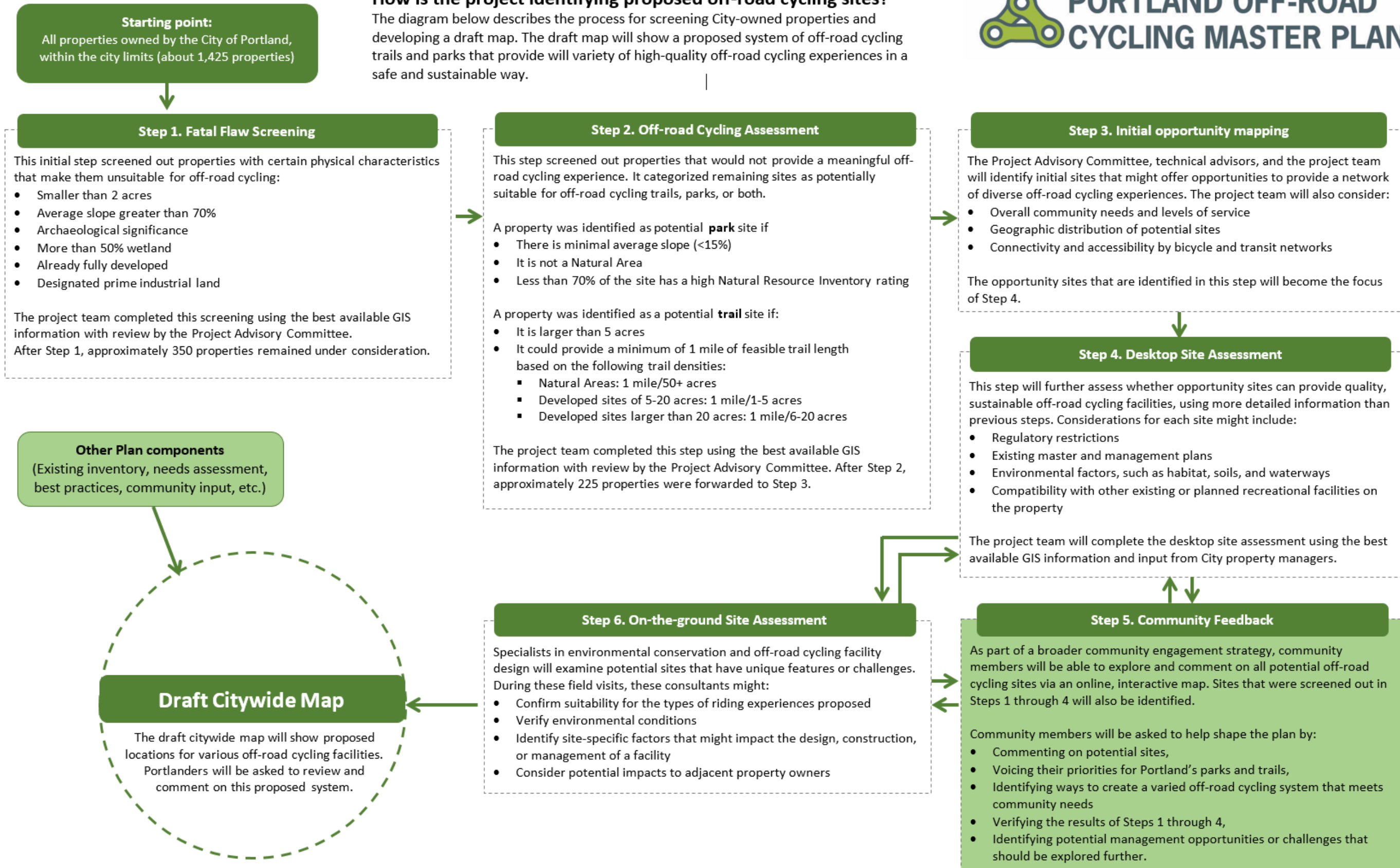


Figure 15. Recommended Off-road Cycling Locations

The Portland Off-road Cycling Master Plan includes recommended locations for three different types of places for off-road cycling:

- Natural surface trails
- Urban trail corridors
- Bicycle parks

These locations were chosen using a site screening process because they:

- Distribute opportunities equitably across the city
- Provide a range of riding experiences appropriate for various skill levels and ages
- Connect the entire city by bike or transit

BICYCLE PARKS

Bike parks, such as pump tracks, jump parks, and skill trails, are dedicated places for people of all riding abilities to practice their riding skills and have fun. They can be built on a portion of a property, or around the perimeter. For this master plan, bike parks were only be considered in developed parks, not in natural areas.

Parks with existing bicycle parks

Improvements are recommended at these parks.

- A. Gateway Green
- B. Ventura Park
- C. New Columbia Bicycle Park

Recommended future locations

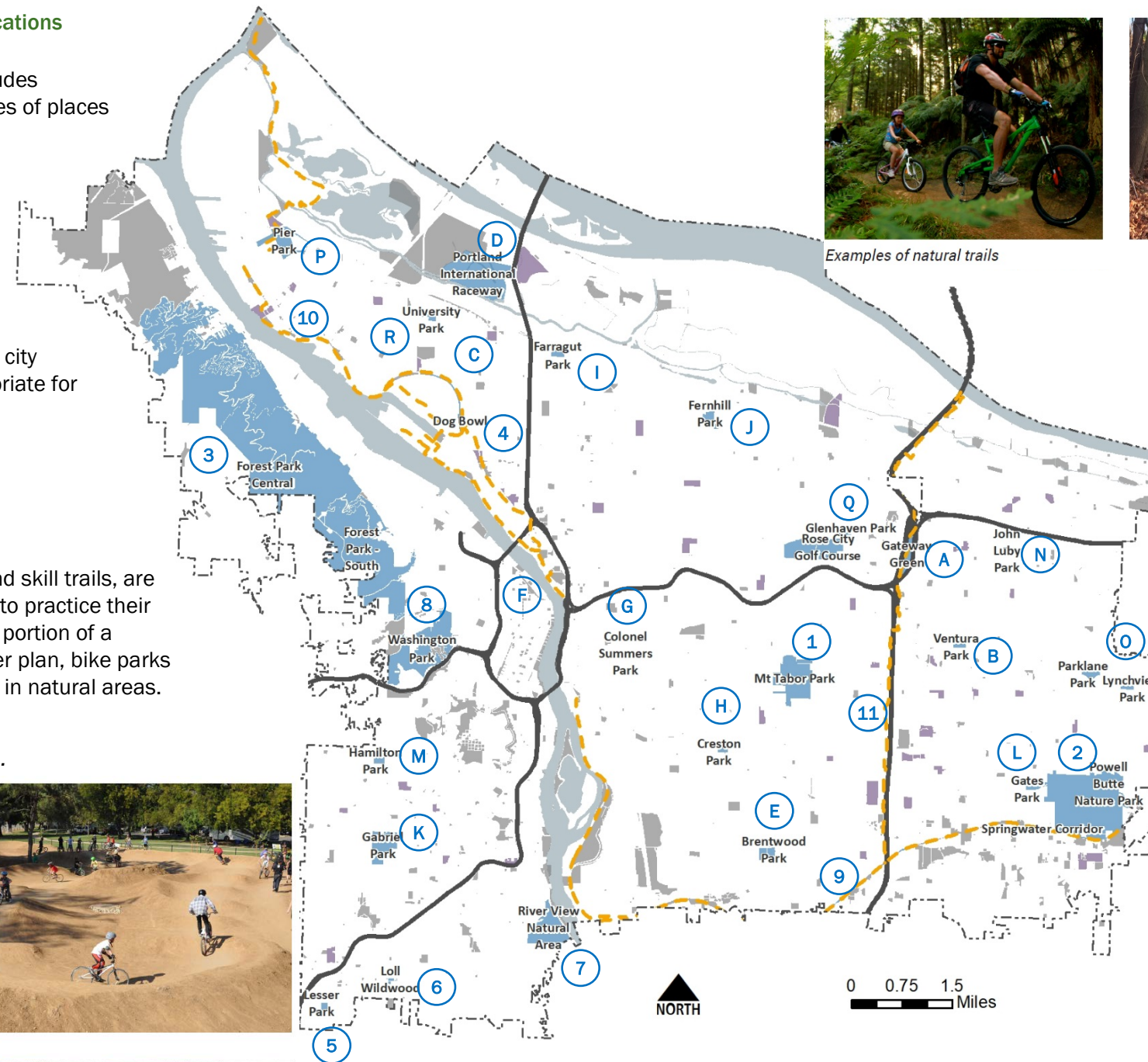
- D. Brentwood Park
- E. Central City
- F. Colonel Summers Park
- G. Creston Park
- H. Farragut Park
- I. Fernhill Park
- J. Gabriel Park
- K. Gates Park
- L. Hamilton Park
- M. John Luby Park
- N. Parklane Park or Lynchview Park
- O. Pier Park
- P. Rose City Golf Course or Glenhaven Park
- Q. University Park



Pump track



Skill trail



Examples of natural trails



NATURAL OFF-ROAD CYCLING TRAILS

Dirt trails in parks or natural areas could be designed exclusively for people biking, or for both biking and walking. The plan requires that trails be designed according to best practices for user safety and environmental sustainability.

Parks with existing natural off-road cycling trails

Improvements are recommended at these parks.

- A. Gateway Green
- 1. Mt. Tabor Park
- 2. Powell Butte Nature Park
- 3. Forest Park

Recommended future locations

- 4. "Dog Bowl" at N. Willamette and N. Jessup
- 5. Lesser Park
- 6. Loll-Wildwood Natural Area
- 7. River View Natural Area
- 8. Washington Park

URBAN OFF-ROAD CYCLING TRAILS

Urban trail corridors could combine paved and unpaved trails to create longer and more varied riding experiences. Urban trails could include new unpaved trails or skill features parallel to trails or in adjacent parks.

Recommended future locations

- 9. Springwater Corridor
- 10. North Portland Greenway
- 11. I-205 Trail from the Springwater Corridor to Gateway Green



Natural surface trails

Natural surface off-road cycling trails are typically made of dirt and can vary in width from less than a foot to over 8 feet. They are generally used by both people riding bicycles and walkers. Powell Butte Nature Park, Mount Tabor Park and Forest Park currently have natural off-road cycling trails. This section proposes both safety and sustainability improvements to these existing trails as well as new natural surface trails throughout the city. If built, trails should be designed and constructed according to the best practices for user safety and environmental sustainability described elsewhere in this Plan.

Recommended Trail Improvements

This plan recommends trail improvements or construction, as well as complementary planning and natural area enhancements, at the parks and natural areas listed in Table 6.

Table 6. Recommended trail improvements and complementary actions

	Create		Unpaved trails		
	Management or Master Plan	Restore natural areas	Remove & replant demand trails	Improve existing	Build new trails
East Portland					
Powell Butte Natural Area	<i>Already exists</i>	✓	<i>n/a</i>	✓	X
North Portland					
“Dog Bowl” at N. Willamette and N. Jessup	✓	✓	✓	<i>n/a</i>	✓
Southeast Portland					
Mt. Tabor Park	<i>Already exists</i>	✓	✓	✓	X
West Portland					
Forest Park	<i>Already exists</i>	✓	✓	✓	✓
Lesser Park	✓	✓	✓	<i>n/a</i>	✓
Loll-Wildwood Natural Area	✓	✓	✓	<i>n/a</i>	✓
River View Natural Area	<i>Already exists</i>	✓	✓	X	✓
Washington Park	<i>Already exists</i>	✓	✓	X	✓
Citywide					
Identification of a suitable site for a purpose-built, stacked loop trail system	✓	✓	<i>n/a</i>	<i>n/a</i>	✓

East Portland

Powell Butte Nature Park

The more than 600-acre Powell Butte Nature Park located in East Portland has approximately 12 miles of trail with 8 miles designated as shared-use hiking and biking trails (1.6 miles of narrow trail, 1.9 miles of mid-width trail, 1.8 miles of wide trail, and .5 mile of access road). For cyclists, the system provides a modest network of well-designed trails with moderate grades ideal for beginner and intermediate level riders.

Trails

The trail system is composed of dirt, gravel and paved surfaces which provide access in wet conditions and minimize erosion and soil transport associated from heavy trail use.

The system provides access to the natural area and high quality recreational experiences for beginner to intermediate level riders. More advanced riders may want for more mileage, narrow trails, and dirt-surfaced trails.



Riding at Powell Butte Nature Park (photo: Jason Van Horn).

Mapping and Signage

Powell Butte Nature Park has been undergoing a large-scale environmental restoration effort and reservoir construction.

The posted trail map provides a key indicating which trails are open for cyclists. However, when riding the trail system, wayfinding signage does not indicate the sanctioned users for each trail. This makes it difficult for users to understand which trails are open to people riding bicycles and which are not. In addition, trail signage should include basic information on the trail's level of difficulty or character.



Wayfinding signage at Powell Butte Nature Park showing emergency junction number as most visual aspect of the sign; trail name not legible at distance

Recommendations

- Continued habitat restoration.
- Continued trail repair and improvements to address any unintended environmental impacts or maintenance issues.
- Improved signage to help park users navigate and understand whether trails are open to cyclists, pedestrians, or both. Signage to direct users to the nearby Gates Park, if it is developed with off-road cycling features.

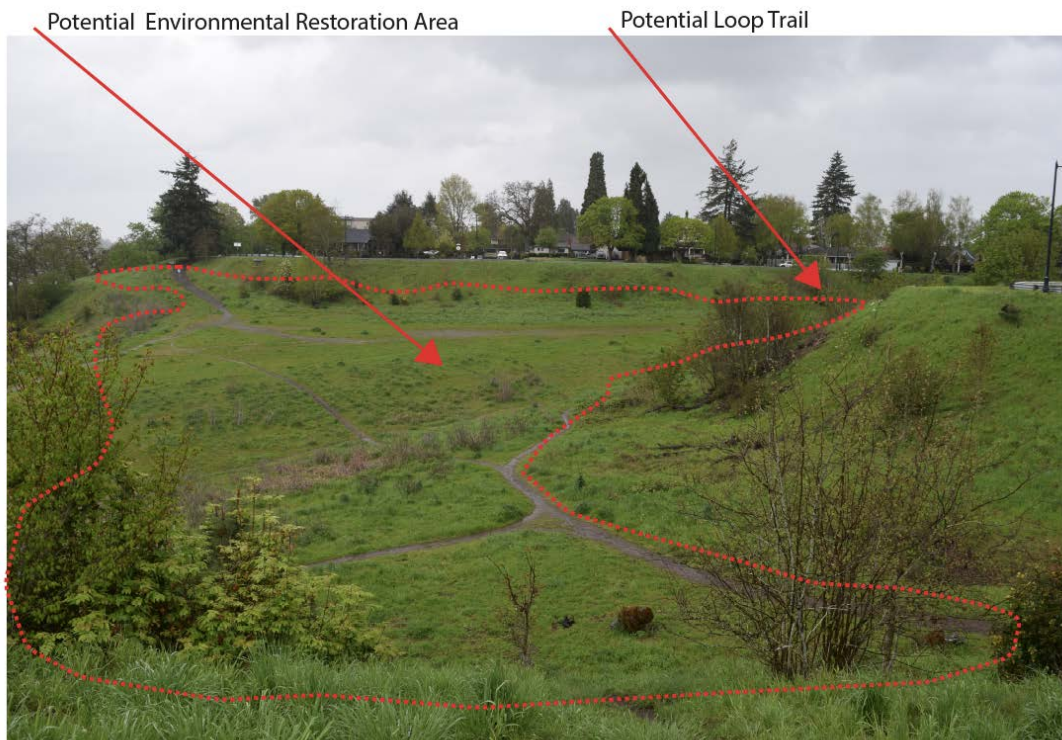
North Portland

“Dog Bowl” at N. Willamette and N. Jessup

This site, owned by the Bureau of Environmental Services, is located along N. Willamette Boulevard at N. Jessup Street. The property is located along the potential upper alignment of the North Portland Greenway. The upper portion of the property, of about 4 acres in size, is environmentally degraded and has several demand trails currently used by walkers, runners, dog-walkers, and cyclists. This portion offers an opportunity for restoration and a sustainable loop trail. The western slope of the property is landslide-prone, contains special habitat (oak woodland), and should be protected and restored.

Recommendations

- Transfer of ownership from the Bureau of Environmental Services to Portland Parks & Recreation is optimal for successful implementation.
- Development of a Master Plan to guide site improvements and environmental restoration.
- Habitat restoration including native plantings and removal of invasive plants.
- Closure and restoration of existing demand trails.
- A natural surface trail network for family-friendly cycling, walking, running and enjoyment of nature. This trail network should remain on the upper, flatter portion of the site and protect oak and other special habitat.
- Building a trail here will require additional planning, community input, and consideration among other needed or desired park improvements.



Southeast Portland

Mt. Tabor Park

Located in southeast Portland, the 194-acre Mt. Tabor Park features several large open water reservoirs, historical monuments, and architectural structures, stairs, and pathways. Built at the turn of the century, these features are constructed in grand fashion. The park, which encompasses an extinct volcano, rises up to an elevation of 500' and provides dramatic vistas of the city.

Trails

Mt. Tabor includes approximately 5.5 miles of shared-use trails where off-road cycling is allowed. The sprawling network of designated and demand trails and pathways crisscrosses the entire park and provides little context for users nor logic in wayfinding.

The trail network and off-trail use at the park have had rather extensive impacts. Some trails have been widened to more than 15 feet and entire hillside areas are devoid of vegetation.

Mapping and Signage

Entering through the main entrance of the park, there is no signage or park map. The trails are not clearly marked or named and lack a cohesive route around the park. The absence of trail names or routes through the park or clear indication of sanctioned users allowed on each trail creates a confusing experience. Signage that is in place is not consistent with other trail signage used in the park system.

Recommendations

- Habitat restoration including native plantings and removal of invasive plants.
- Closure and restoration of demand trails.
- Trail network improvements to make trails more sustainable, reduce redundant trail segments, and connect existing sanctioned off-road cycling trails into a loop.
- Improved signage to help park users navigate and understand whether trails are open to cyclists, pedestrians, or both.



Example of a trail intersection at Mt. Tabor.



Text based signage at the Mt. Tabor Park, directing "Bicyclists on Foot Trail Only", is confusing and inconsistent with signage at other parks in the city

West Portland

Forest Park

At 5,172 acres, Forest Park is the City's most significant – and the nation's largest – public urban natural area. Connected to the Pacific Coast Range, the park stretches for nearly eight miles along the northeast slope of the Tualatin Mountains. The park makes up some of the city's most valuable wildlife habitat and is home to multiple species of animals, birds, trees and plants. It helps filter our air and water and provides countless opportunities for recreation, solitude and learning. Because of Forest Park's unique natural resources, preservation and restoration of ecological function is critical and is the highest management priority for the park. The park is also a destination for nature-based recreation, including hiking, cycling, trail running, wildlife watching, and nature education.

The Forest Park Conservancy, a nonprofit organization that advocates for and assists with stewardship of the park, works closely with the Portland Parks & Recreation to monitor trail conditions and organize volunteer restoration efforts.

Overarching Plans

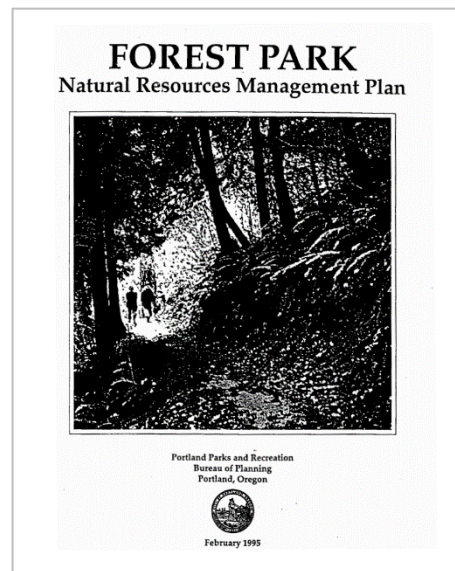
A variety of Forest Park plans and studies set goals, standards, or strategies for recreational improvements in the park.

The Forest Park Natural Resource Management Plan, adopted by City Council ordinance in 1995, guides land management decisions within the park, and balances goals within three management units: South, Central and North. The plan also includes unique trail design guidelines that supersede the citywide trail design guidelines, and sets management priorities for different units of the park. The full text of the Forest Park Natural Resource Management Plan can be found at <http://www.portlandoregon.gov/bps/article/103939>.

The Natural Resource Management Plan establishes environmental review as the process for considering improvements not explicitly allowed in the Management Plan, see next page.

The City and its partners have also developed a variety of surveys, reports and initiatives to support the management and enhancement of the park. For example, the City has established Desired Future Conditions for the park and uses Ecological Prescriptions as well as the Forest Park Project Objective Screening Tool to guide and select proposed park management activities and improvements.

These plans, reports and initiatives provide guidelines for trail construction or improvements. However, there is no comprehensive trail plan for the park. Community input through this planning process daylighted the need for comprehensive community engagement and planning for the entire trail system. Such planning could address the needs of all user groups, update trail planning to current best practices, and propose trail improvements to improve both the Park's ecological function and recreational opportunities.



The Forest Park Natural Resource Management Plan guides land management decisions within the park.

Environmental Review

The Forest Park Natural Resource Management Plan designates environmental review as a mechanism for assessing and (potentially) approving changes not anticipated in the Management Plan. The goal of environmental review is to safeguard natural resources.

Implementing any changes to trails in Forest Park, including changing allowed users, improving or changing the alignment of trails, closing trail segments, or building new trails, will require Type II or Type III environmental review pursuant to the Implementation Procedures identified in the Forest Park Natural Resource Management Plan and codified in the Portland Zoning Code. Chapter 8. Implementation Procedures of the Forest Park Natural Resource Management Plan establishes the applicability and criteria for these reviews.

For example, construction of a new trail (a minor amendment) must demonstrate that there is:

- a) a need for the proposal;
- b) that the proposal is consistent with the Forest Park Natural Resources Management Plan Goals and Strategies;
- c) that alternative locations and design modifications were evaluated to show that the proposal has the least significant detrimental environmental impact of the practicable alternatives; and
- d) that a construction management plan and a mitigation plan will minimize impacts on resources and restore adjacent disturbed areas.

Ongoing Investment Initiatives for Forest Park

RENEW Forest Park

Recognizing the need for a multi-pronged strategic investment vision Portland Parks & Recreation created the RENEW Forest Park initiative. This \$20+ million, 20-year investment initiative that looks holistically at ecology, recreation and access. It consists of three critical parts:

- **Restore Forest Park:** An effort to transform the Park's ecological health by removing invasive plant species and restoring native plantings in their place.
- **Rebuild Forest Park:** An effort to rebuild several bridges and culverts in the Park.
- **Reconnect Forest Park:** An effort to create a recognizable entry point for visitors to discover information about the park's rich ecology, trails, plus opportunities to engage in stewardship and educational programs.

The Greater Forest Park Conservation Initiative

The Greater Forest Park Conservation Initiative is the Forest Park Conservancy visionary roadmap to restore and protect not just Forest Park, but its entire surrounding ecosystem totaling more than 15,000 acres. The Initiative's sixteen public and community partners work together to identify key projects, collaborate on solutions and bring individual resources to bear to help accomplish specific GFPCI goals. These efforts range from invasive species removal and native re-vegetation projects, to environmental quality monitoring and public education and outreach.

Existing Trails

Over 70 miles of natural surface trails, fire lanes, and access roads traverse the park, providing opportunities for hiking, trail running, off-road cycling, wildlife watching, and other nature-based activities.

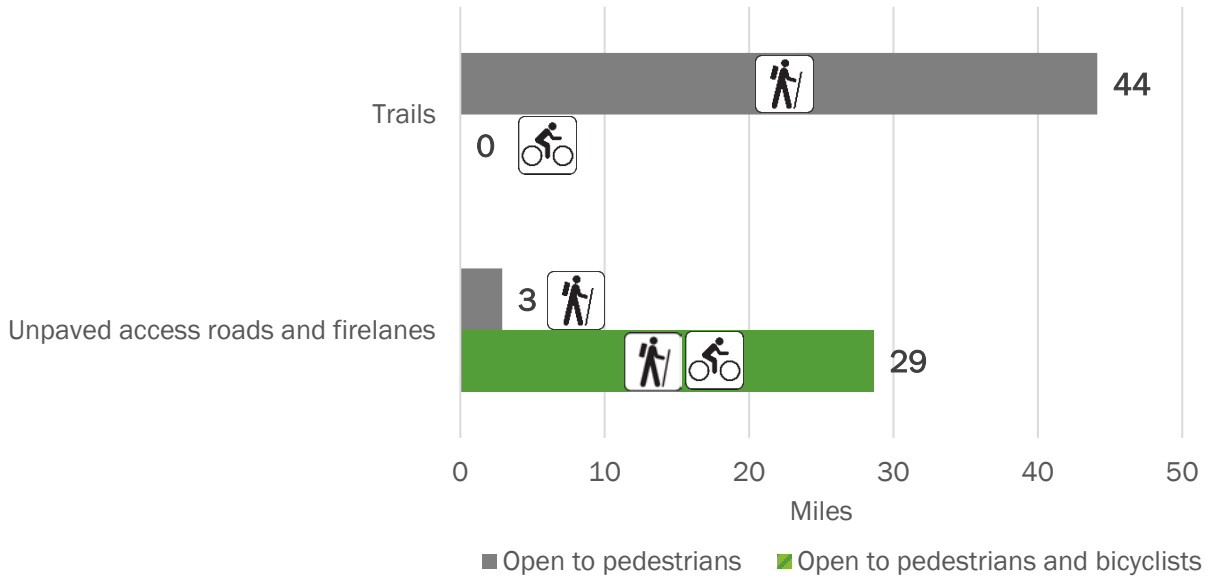
Less than 0.5 miles of Forest Park's natural surface trails, as well as 28.5 miles of service roads and fire lanes are currently open to off-road cycling, see Figure 13. However, these park's access roads and fire lanes offer a limited experience and do not follow current best practices off-road cycling and resource management. For instance:

- Nearly all off-road cycling 'trails' are actually fire lanes or service roads. People can currently ride a bicycle on gravel access roads (like Leif Erikson Drive) and on some wide trails within Forest Park. This was intended in the 1995 Forest Park Natural Resource Management Plan, which limited off-road cycling to trails over 8 feet wide. However, people who enjoy riding bicycles on dirt trails are generally looking for narrower trails, which provide a more engaging riding experience. In addition, wide trails may have greater environmental impacts and can increase cyclist speeds, posing potential safety hazards.
- Many of the trails and fire lanes open to cycling are fall-line trails, meaning they run directly down a hill rather than contouring across it. Fall-line trails do not meet current best practices and frequently have erosion problems, resulting in environmental damage and an unenjoyable experience for people using the trail. Their poor design also makes them more challenging to ride safely.
- People riding off-road are generally looking for rides of 30 minutes to 2 hours in length, or about 3 to 15 miles. Other than on Leif Erikson, opportunities to ride longer distances in the park are limited, as many of the routes sanctioned for off-road cycling are less than 1.5 miles in length and do not connect to each other.



A fall-line trail in Forest Park

Figure 16. Current mileage accessible to pedestrians and cyclists in Forest Park



Implementation Process

Any future trail project will require environmental review and multiple approval and refinement steps before it can be built or implemented, see below. Community input is a critical component of each step. Trail design, construction and management would follow current best practices, which promote safety, sustainability and positive user experience.

1. Funding

Portland Parks & Recreation (PP&R) and the City would consider recommended trail improvement projects for funding through the capital improvement and budget processes. In this step, they would be measured against PP&R goals and against other park, recreation and citywide needs and priorities. Both the PP&R and City budget processes include opportunities for community input.

2. Design

If a project is funded, the City could begin to design the project. Design work would involve detailing the proposed trail improvement, gathering community input, assessing environmental impacts (such as on wildlife, habitat and water), designing for the needs and safety of intended trail users, and identifying any needed mitigation strategies.

3. Permitting

As part of the permitting process, the project would go through environmental review. The Forest Park Natural Resource Management Plan designates environmental review as the way that new projects are assessed and (potentially) approved. The goal of environmental review is to safeguard natural resources and the ecological health of the park. It also requires public notification of proposed changes and allows for public comments and appeal of the decision.

4. Construction

If the project is successfully permitted, construction or implementation can begin.

5. Ongoing management

Managing existing or any new trails involves continuous maintenance; monitoring for unintended negative impacts on wildlife, water, habitat, or users; enforcing trail rules; and addressing any recurring problems.

Trail Improvements

Many off-road cyclists enjoy experiencing nature on natural surface trails of various levels of difficulty. The Off-road Cycling Master Plan recommends a variety of ways to create these types of riding experiences across the city. Forest Park, as the largest natural park in the region, offers the potential to provide off-road cycling experiences that cannot be created elsewhere.

The Off-road Cycling Master Plan proposes two high priority, two medium priority, and one conditional trail improvement to expand off-road cycling access in Forest Park while advancing restoration goals. These recommendations focus on:

- Achieving a net ecological benefit. This means improving the ecological condition of the park compared to what it is today. This would involve avoiding negative impacts to the park's healthiest and most critical habitat and natural resources – the Northern Unit, interior forest, the Balch Creek and Miller Creek Watersheds – and restoring degraded habitat or improving existing unsustainable trails.
- Creating narrow- to mid-width contour trails (i.e., trails up to 6 feet wide and that cut across hills rather than running straight down them) for off-road cycling. These types of trails best match the types of riding experiences desired, follow nationally accepted best practices, and have lower environmental impacts than the wider, steeper trails currently available.
- Connecting off-road cycling trails into longer riding loops.
- Preserving high-use pedestrian trails for walkers and hikers.

Implementing any of these improvements would require significant additional planning, community involvement and robust environmental review.

Recommendations

Forest Park

Note: All system-wide recommendations throughout this Off-road Cycling Master Plan also apply.

Management

1. Expand and enhance a comprehensive education and outreach program regarding trail rules and etiquette for all trail users. Improve signage for wayfinding and trail use expectations.
2. Increase resources and partnerships for restoration, management, enforcement and trail maintenance.
3. Monitor impacts of trails and recreation use on vegetation, wildlife and users.
4. Practice adaptive management, including trail closures, to address unintended negative impacts. Decommission unsanctioned trails.

Planning

5. Develop a comprehensive trail plan that addresses pedestrian, cyclist, equestrian, emergency responder, and maintenance access needs; trail maintenance and restoration, trailhead access and facilities; and identifies desired future improvements.

Design and Development

6. Recognize the role of Forest Park as a regionally significant ecological, recreational, and educational resource. Recognize that the unique natural quality of Forest Park makes it popular and cherished place to recreate, learn and reflect.
7. Design and develop any trail changes in ways that align with the goals and strategies in the Forest Park Natural Resource Management Plan, including the Goals for Trail Management, the Northwest Hills Management Plan, and the Greater Forest Park Conservation Initiative.
 - a) Use the Management Units (which divide the park into North, Central, and South management units) and the vision for each unit to guide planning and recommendations. Manage recreational use intensity on a gradient ranging from the most intense in the South unit to the least intense in the North unit.
 - b) Adhere to implementation procedures and approval criteria established in the Natural Resource Management Plan.
8. Design and develop any improved off-road cycling access in Forest Park in ways that meet multiple community and ecological goals and foster improved environmental and recreational conditions in the park.

Environmental Preservation and Restoration

9. Achieve a net ecological benefit through implementation of Plan recommendations.
10. Pursue opportunities to pair enhanced recreational access with restoration of habitat and water resources, particularly as established in the park's Desired Future Conditions and Ecological Prescriptions.
11. Avoid adverse impacts to areas of park with highest ecological function and value, including the North unit, interior forest, the Balch and Miller Creek Watersheds, the Newton Wetlands and Doane Lake, and rare plant and animal communities. In other areas, plan any new trail alignments or trail management activities to result in the least adverse impact to sensitive habitat areas.

Off-road Cycling Access

12. Continue to allow off-road cycling where currently allowed, except where the Off-road Cycling Master Plan recommends decommissioning trails for environmental reasons.

13. Recognize cycling as a recreational activity that is appropriate within Forest Park, if provided sustainably, responsibly and in accordance the park's management goals.
14. Enhance and expand appropriate opportunities to ride a bicycle off-road within Forest Park, see *Trail Improvement Concepts below*.
 - a) Enhance cross-country cycling experiences, which are best suited to the topography and character of the park, ideally on longer contoured trails.
 - b) Focus on opportunities to create narrow to mid-width cross-country trails, which are currently limited.
 - c) Create loops, ideally stacked loops, to provide a variety of riding options and lengths. *Note, the length of a typical cross-country ride is approximately 10 miles.*
15. Support and build partnerships with park users and community organizations (including the Forest Park Conservancy, the Forest Park Alliance, and the Northwest Trail Alliance) for trail construction and maintenance, park restoration and enhancement, and education.

Pedestrian Access

16. Recognize the need for pedestrian-only trail experiences. The Trail Improvement Concepts maintain the highest use pedestrian-only trails (the Wildwood Trail, Maple Trail, and all pedestrian-only trails in the Southern management unit) as pedestrian-only.
17. Consider the need or desire for pedestrian access when determining the design and designation (e.g. shared-use versus single-use) of future trail improvements.

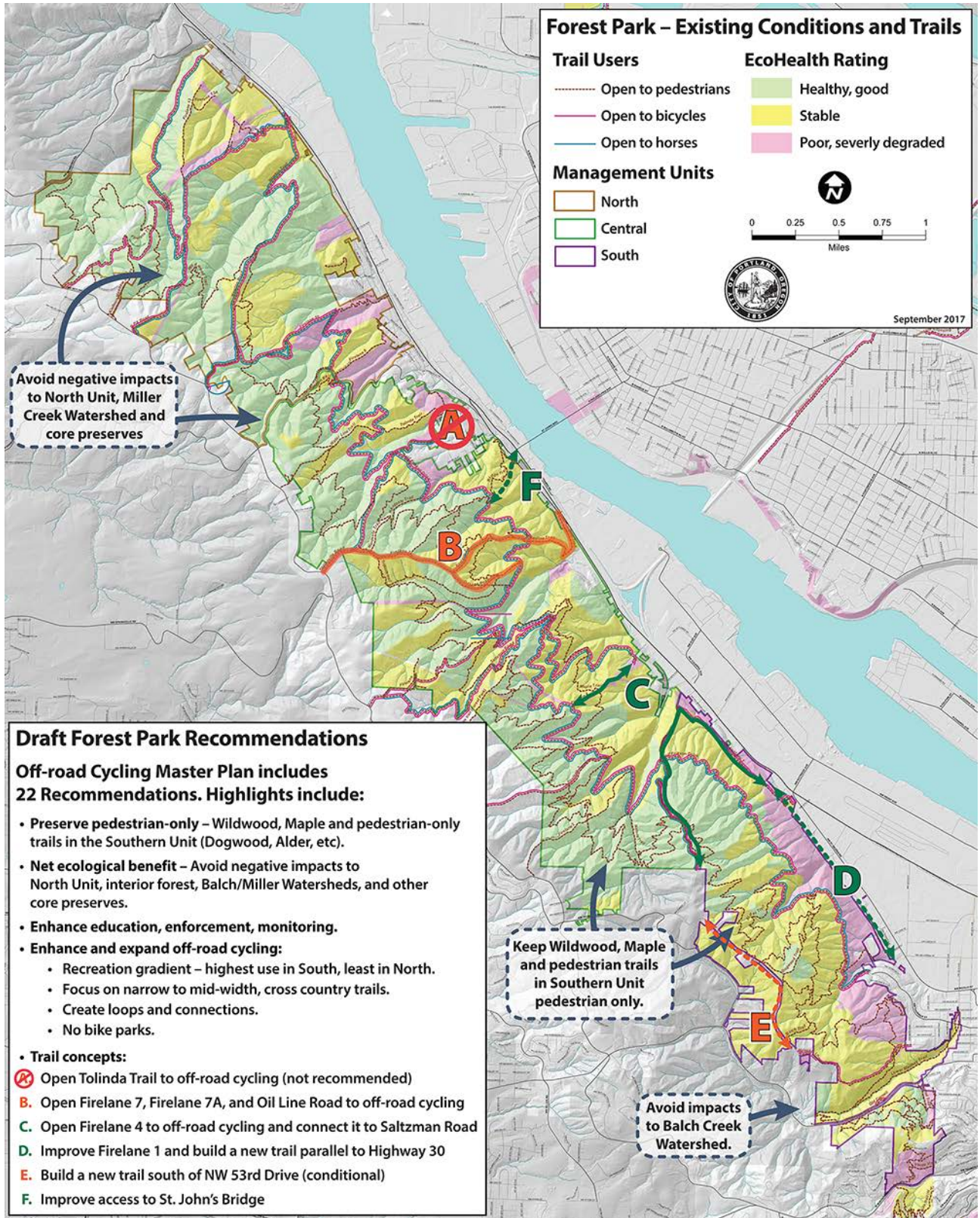
Emergency response and maintenance access

18. Maintain maintenance and emergency access routes in the Park.
19. Recognize that fire lanes and maintenance access road (Trail Type N) were designed, constructed, and intended for use by emergency and maintenance vehicles, which impacts the grade, width, and surface of these routes. Although various walkers, runners, cyclists, and equestrians also use these trails, they are intended for access by park maintenance and first responder vehicles.
20. Consider fire lanes and maintenance access roads separately from the inventory of trails because of the differences in purpose, built characteristics, and management responsibility.
21. Improve the contouring, surface, width, and clearing of fire lanes and maintenance access roads to provide a safer and more sustainable experience for all sanctioned users. Prioritize improvements to fire lanes that require ATV-only access, as the lower width and clearance requirements for these fire lanes are more compatible with the narrow trail experience preferred by most recreational users (compared to fire lanes that are designated for brush- or truck-access).

Trail Improvement Concepts

The Off-road Cycling Management Plan recommends five conceptual trail improvements (including one conditional recommendation) to improve off-road cycling access, see Figure 17. These recommendations focus on initial areas where a) off-road cycling trail access could be improved in ways that meet the goals outlined above; b) impacts to other users would be minimized; c) habitat and natural resources could be protected or enhanced. The Trail Improvement Concepts described below do not include broader efforts or recommendations to improve existing off-road cycling routes (such as additional fire lanes). These concepts would require further design refinement, robust environmental review, and community input prior to approval and construction.

Figure 17. Trail Improvement Concepts for Forest Park



Concept D. Improve Firelane 1 and build a new trail parallel to Highway 30 (High Priority)

Firelane 1 travels 2.5 miles from NW Forest Lane, across Leif Erikson Drive to a trailhead on Highway 30 in the Southern Unit of the park. It is a wide trail that is open to cyclists, pedestrians and equestrians. Nearby habitat is in poor-to-good condition.

This concept would improve Firelane 1 and create a new trail parallel to Highway 30/St. Helens Road along the park boundary. These changes would create an approximately 6-mile loop with neighborhood streets and Leif Erikson Drive, or a longer loop if combined with Concept E.

Concept D received the highest level of support during the Plan's community outreach. Construction of Concept D as a shared-use trail would provide pedestrians and cyclists, whether travelling from North Portland or Northwest Portland, a safe alternative to Highway 30/St. Helen's Road. It also offers opportunities to provide a connection from Northwest Portland to the proposed Forest Park Entrance and Nature Center and would offer a low-elevation trail experience for visitors.

As part of this concept:

- Maintain emergency fire access on Firelane 1.
- Re-align and re-contour existing Firelane 1 to reduce erosion and improve user experience, safety and sustainability.
- Connect Firelane 1 to the proposed Forest Park Entrance and Nature Center on NW St. Helens Road.
- Build a new trail that would connect from Firelane 1 and travel southeast along the park boundary, paralleling Highway 30/St. Helens Road. Portions of this trail could be located in easements outside the park. This trail could be narrow to mid-width (2-to-6-foot wide) contour trail and purpose-built for cycling. This new trail would be designed and built based on national best practices for safety and sustainability.
- Restore degraded habitat around the trail. This could involve planting native trees, shrubs and plants and removing invasive species.



The alignment of Concept D's potential new trail parallel to St. Helens Road would pass through degraded habitat in need of restoration.

Concept C. Improve Firelane 4 and open it to off-road cycling (High Priority)

Firelane 4 travels 0.55 miles east from Leif Erikson Drive and connects Leif Erikson to the Saltzman Road Trailhead in the Central Unit. It is a narrow trail that is currently open only to pedestrians. Though called a “firelane”, Firelane 4 is not an established fire access route. It is located in a power line corridor, and nearby habitat is degraded. This concept would create an approximately 3-mile loop with Saltzman Road and Leif Erikson Drive with access from the Saltzman Trailhead.

As part of this concept:

- Rebuild the trail as a contoured trail that follows modern trail building best practices. The trail could be contoured to cut across the three powerline corridors, within the existing area of disturbance. Trail improvements would improve user experience and safety and reduce erosion and resulting impacts on streams.
- Restore degraded habitat around the trail. This could involve planting native trees, shrubs and plants, and removing invasive species.
- Allow people on bicycles to use Firelane 4. The trail could be designed as a purpose-built off-road cycling trail or as a shared-use trail.



Site visit of Firelane 4

Concept B. Open Firelane 7, Firelane 7A and Oil Line Road to off-road cycling (Medium Priority)

These fire lanes connect from Springville Road to Leif Erikson Drive in the Central Unit of the park. Currently, they are open to pedestrians and equestrians and must remain relatively wide for emergency fire access. The habitat around these trails is in stable or healthy condition.

This concept is recommended as a lower priority than Concept D and Concept C as the fire lanes involved are open to additional user groups (pedestrians, equestrians, and emergency response/maintenance vehicles) and adjacent habitat is generally in healthy condition and would be impacted by building a new alignment.

This concept would improve the lower portions of Firelane 7A and Oil Line Road for all users (cyclists, pedestrians, equestrians, and emergency responders). It would create an approximately 2.75-mile ‘lollipop’ loop from Springville Road, as well as other connections. It involves:

- Allowing people on bicycles to use these fire lanes. Improving the trail for safe and sustainable shared use.
- Limiting negative impacts to healthy habitat and restoring adjacent degraded habitat. Improving sections of Firelane 7A and Oil Line Road near Leif Erikson to improve fire access.
- Closing the Lower Gasline Trail from Leif Erikson Drive to Highway 30. This section of trail is unsustainable and prone to landslides
- Explore ways to improve the trailhead for Firelane 7.

Concept F (NEW). Improve cycling access to the park from the St. John's Bridge (Medium Priority)

Community members expressed a desire for improved cycling connections between Forest Park and North Portland, via the St. John's Bridge. Existing pedestrian-only access via the 0.4-mile Ridge Trail is steep, eroding, and needs improvement. Current cycling access is via Springville Road, an additional 1.8 miles from the uphill point of the Ridge Trail. This concept could include:

- Improvements to the Ridge Trail for pedestrians
- Creating a new shared-use trail that is contoured across the slope for greater usability and sustainability.
- Closing and restoring the Gas Line trail, which is a fall-line trail, for sustainability and to reduce trail redundancy.

Concept E. Build a new trail south of NW 53rd Drive (Conditional)

This new trail would be located parallel and south of NW 53rd Drive in an area with no existing official trails. It would connect Holman Lane and Firelane 1 in the Southern Unit of the park. Nearby habitat is in poor-to-stable condition.

This trail has potential to create an approximately 8-mile trail loop with Concept D, providing a longer and more easily accessible off-road cycling route than exists today. However, this Plan recommends implementing Concept E only if Concept D (Firelane 1) is successfully implemented and Holman Lane is improved, as:

- Holman Lane is an uphill directional trail. Building Concept D without a full directional loop may encourage riders to descend Holman Lane.
- Holman Lane needs improvements for trail sustainability
- The area of SW 53rd is within the Balch Creek Watershed, which may limit the feasibility of any trail connection, as impacts on the Watershed must be avoided.



Erosion on Holman Lane

This concept involves:

- Building a new directional trail in park land south of NW 53rd Drive. This trail could be a narrow to mid-width (3- to 6-feet wide) contour trail that is designed with cyclists in mind but open to pedestrians as well. This new trail would be designed and built based on national best practices for safety and sustainability.
- Limiting negative impacts to healthy habitat and restoring adjacent degraded habitat.
- Closing existing unsanctioned trails in this section of the park, which would improve the environment.

Considered but not recommended

Concept A. Open Tolinda Trail to off-road cycling

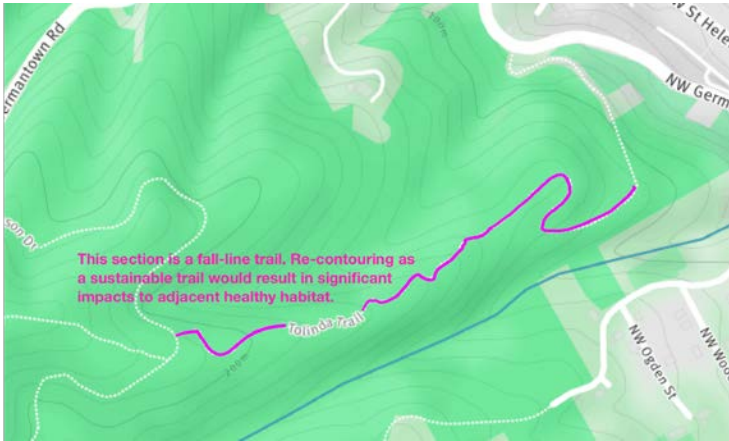
The Tolinda Trail connects Leif Erikson Drive to NW Germantown Road. It is a narrow, steep 0.8-mile trail currently open only to pedestrians. The trail is in a degraded area of the park in the Central Management Unit.

This concept involves:

- Allowing people on bicycles to use the trail, possibly only in an uphill direction. Improving the trail for safe and sustainable shared use.
- Restoring degraded habitat around the trail. This could involve planting native trees, shrubs and plants and removing invasive species. Trail improvements could also reduce erosion and resulting impacts on streams.
- Closing the Water Line Trail from Leif Erikson Drive west to NW Skyline Blvd. This section of trail is poorly designed, resulting in erosion and other problems.

This concept is not recommended because:

- The majority of the Tolinda Trail is a fall-line trail. This type of trail does not meet modern best practices and can be unsustainable for shared-use and for the environment.
- Recontouring the fall-line section of Tolinda Trail would result in significant impacts to adjacent healthy habitat during construction (see Forest Park Planning Principle # __).
- Opening Tolinda Trail to cyclists would not provide loop opportunities and would require cyclists to ride on Germantown Road, which lacks bike lanes and is rated as a “difficult connection” for cyclists (see Forest Park Planning Principles # __ and __).



Lesser Park

Lesser Park is an 8.4-acre natural area located on SW Haines Street, adjacent to the Portland Community College Sylvania Campus in Southwest Portland. The park is currently undeveloped and in need of environmental restoration to remove invasive species and restore a network of demand trails.

Recommendations

- Restore habitat, including native plantings and removal of invasive plants.
- Close and restore existing demand trails.
- Develop a natural surface trail network for family-friendly cycling, walking, running and enjoyment of nature. This trail network should connect to Natural surface trails at the Portland Community College – Sylvania Campus.

Building a trail here will require additional planning, community input, and coordination with Portland Community College.

Loll-Wildwood Natural Area

Loll-Wildwood is a 17-acre undeveloped natural area in Southwest Portland. Arnold Creek crosses the largely wooded site. Topography is steep adjacent to the creek and along the northern portion of the property. A network of demand trails, including fall-line trails, exists on the site.

Recommendations

- Develop a Management Plan, with community involvement, to guide environmental restoration, stewardship, and recreational access.
- Restore streams and habitat, including native plantings and removal of invasive plants.
- Close and restore existing demand trails.
- Add natural surface trails for family-friendly cycling, walking, running and enjoyment of nature. Trails could include an east-west trail on the north side of the creek, a single bridge crossing, and a loop trail on the south side of the creek. The trails would provide a way to experience the natural area and make it easier to walk and bike to destinations in the neighborhood.

Building a trail here will require additional planning and community input.



Demand trails at Loll-Wildwood Natural Area

River View Natural Area

River View Natural Area is a 146-acre undeveloped forested parcel located in southwest Portland, Oregon, on the west side of the Willamette River. River View is within the Westside Wildlife Corridor, an upland forested corridor that stretches across Portland's West Hills. The City and other regional partners are working to protect remaining wildlife habitat and headwater streams within the Corridor to create a continuous wildlife habitat and migration corridor.

River View Natural Area contains important natural resources that provide key functions for local and regional ecosystem health. The streams, wetlands, and intact forest within the largely undeveloped natural area make it an important site for protection and enhancement. The River View Natural Area was purchased, in part, with ratepayer funding to protect water quality.

River View Natural Area Natural Resource Management Plan

In 2016, City Council adopted the River View Natural Area Management Plan by resolution. The Management Plan “provides a framework for enhancing the ecological functions of the site while facilitating compatible recreational access. The plan documents existing conditions and sets forth considerations, prescriptions, and criteria for restoring the site and creating safe access facilities for nature-based recreation, ecological research, and stewardship.”

The Management Plan restricted, on an interim basis, off-road cycling on the property. However, both the Management Plan and the adopting ordinance specifically called out the potential for future recommendations related to off-road cycling access, based on the recommendations of the Off-road Cycling Master Plan.

Existing Demand Trails

The existing trail system at River View Natural Area is an unplanned and unsanctioned network of demand trails and old logging roads that do not meet City trail standards. The existing unplanned trail system has impacted vegetation and stream health. Many trails cross existing streams and show evidence of erosion. After taking ownership of the site, the City decommissioned some steep, eroding trails as part of its site stabilization efforts.



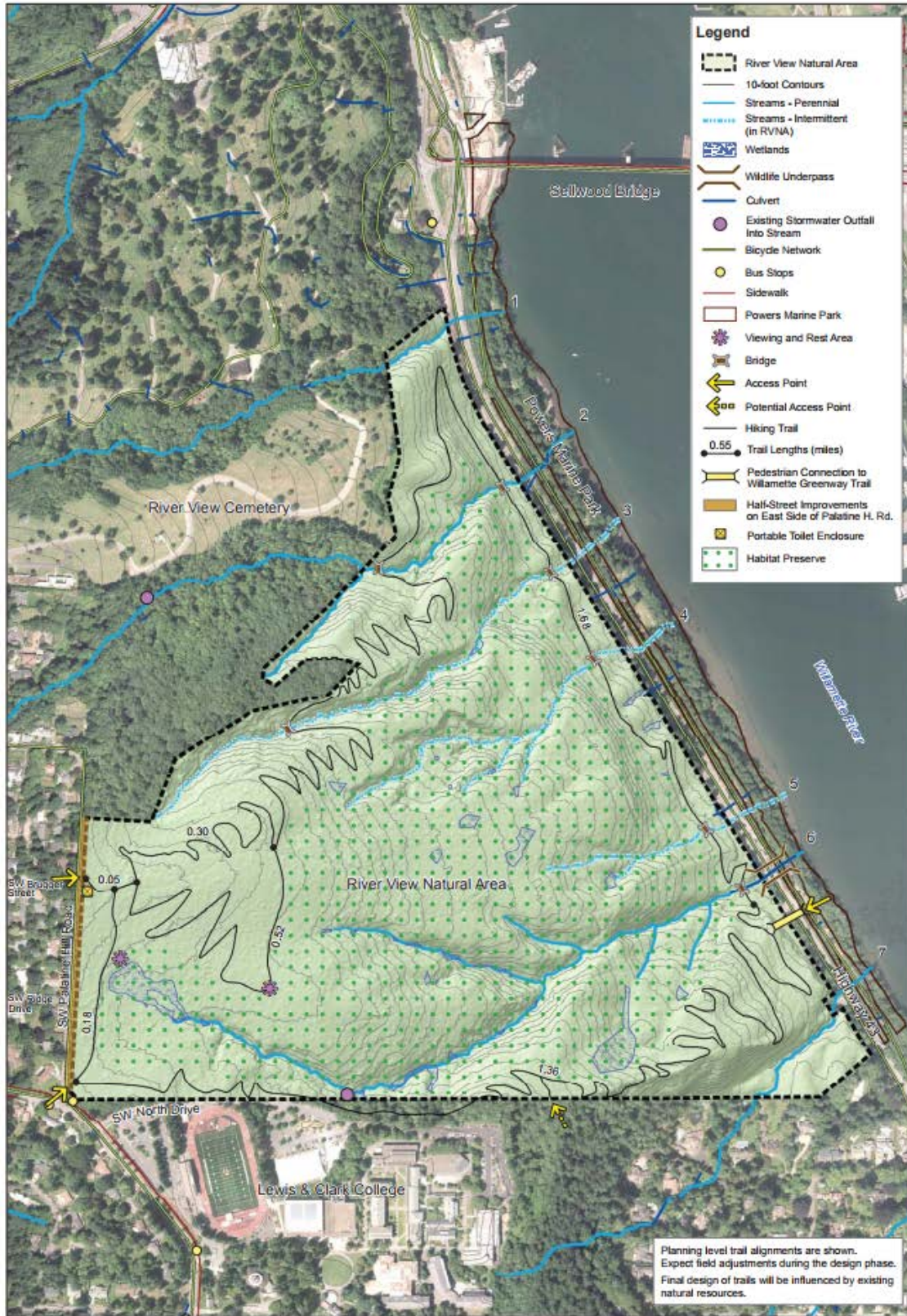
Demand trails at River View Natural Area

River View Natural Resource Management Plan's Access and Management Concept

The proposed access and management concept for River View Natural Area contains a system of trails that creates two loops and connects to key access points. The design and construction of the trail system will be guided by a set of best management practices (BMPs) to create trails that are sustainable from both a maintenance perspective and an environmental perspective. The planning team also developed a concept plan for half-street improvements along the eastern side of SW Palatine Hill Road for public parking. The primary management objectives for the trail system are protecting natural resources, water quality, and creating a safe place for visitors.

Management recommendations include a no-dog policy and seasonal trail closures to maintain water quality and protect wildlife during sensitive periods of their life cycle. Safe and sustainable access will provide nature-based recreation opportunities and will help support stewardship, community connections, and environmental education opportunities.

Figure 18. River View Natural Area Management Plan Access and Management Concept



River View Natural Area
Access and Management Concept

Recommendations

*Note: All system-wide recommendations throughout this Off-road Cycling Master Plan also apply, such as the Design with Nature recommendations (page **).*

Interim Restoration and Trail Management

- Continue to implement the ecological prescriptions of the Natural Resource Management Plan, including continued stream and habitat restoration, to move towards the desired future condition of the natural area.
- Develop interim guidance for the management of existing demand trails until construction of the Access and Management Concept begins. Base this guidance on adopted City policy for the site, best management practices, latest research on ecological impacts of recreational trail use, and the potential for mitigation of impacts through adaptive management techniques (such as trail closures, rerouting, use restrictions, etc.).
- Continue the interim prohibition of off-road cycling until sustainable trails are identified or developed.

Trail Design

- Complete detailed alignment planning and trail design for the natural surface trail loop described in the River View Natural Area Management Plan's Access and Management Concept as a model of a safe and sustainable shared-use trail, for cross-country off-road cycling, walking, running, and enjoyment of nature.
- Design trails to protect core habitat while meeting best practices for sustainable stormwater management, to reduce impacts on streams and important fish and wildlife habitat.
- Determine the detailed trail alignment in consultation with a multi-disciplinary design team, including environmental and natural resource experts, off-road cycling trail designers, and engineers or other technical specialists. Involve community stakeholders, including potential trail users, in the trail design process.
- As part of the trail design process, estimate the anticipated levels of use by pedestrians and off-road cyclists. Use these estimates to inform trail design, construction techniques, and management strategies, including the designation of trails as shared- or single-use.
- Design trails using best management practices appropriate to the natural area's topography, environmental assets, and expected level of use by pedestrians and cyclists. Best practices should include those in the River View Natural Area Management Plan, this Off-road Cycling Master Plan, and Portland Parks & Recreation trail design best management practices.
- If the City cannot identify a sustainable shared-use trail alignment that is consistent with best management practices while meeting site objectives, evaluate alternative approaches and management strategies (such as directional designations, time- and user-based restrictions).

Trail Development

- Prior to development, secure sufficient funding to build a well-designed, sustainable trail that will limit potential negative impacts, reduce maintenance costs, and serve relatively high recreational use. Ongoing investment in trail maintenance will also be required to support user safety and address erosion or other adverse impacts.

- Consider opportunities to build other recommended natural surface trails in western Portland either before, or in concert with, River View trail design and construction to help distribute the latent demand for off-road cycling experiences.

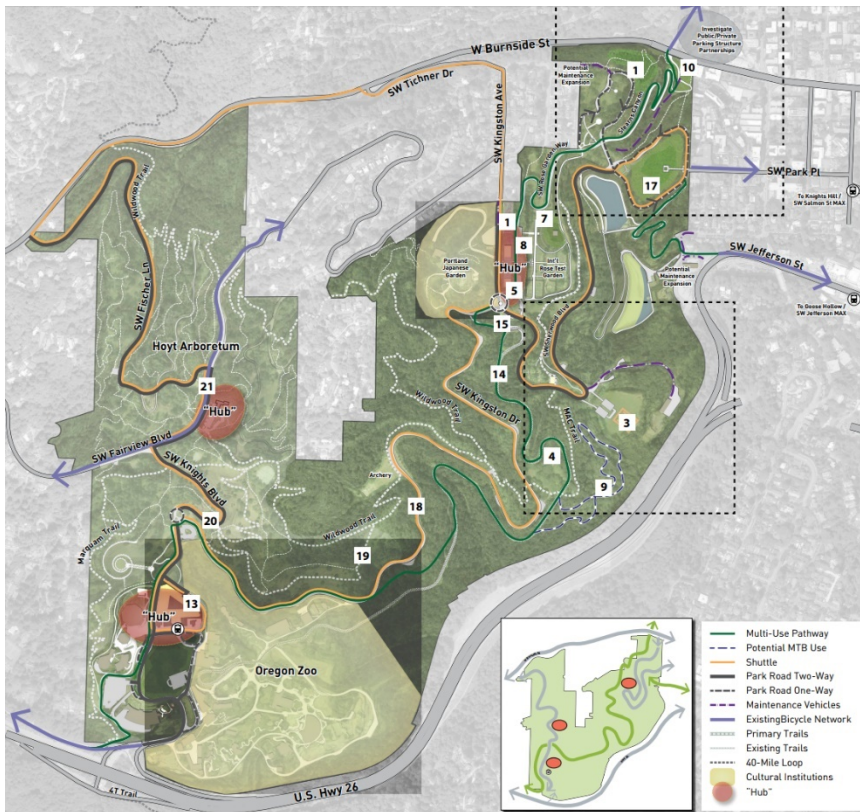
Ongoing Maintenance, Monitoring, and Management

- Develop a maintenance plan for the trail system that identifies who is responsible for performing maintenance activities; thresholds for unacceptable environmental impacts (disturbances) or safety risks; and methods to address these impacts.
- Monitor trail use, including any safety or environmental risks, through on-site observation and/or community reporting.
- Use adaptive management strategies (e.g. seasonal closures, trail improvements, education, conditional or permanent rerouting or closure of trails, use restrictions) to address unsustainable conditions or unacceptable impacts.

Washington Park

Washington Park is one of Portland’s premiere parks, drawing visitors for both its natural areas and trails as well as its unique gardens, museums, and recreational facilities. The park’s over 290-acres are located just west of downtown Portland and are accessible by TriMet MAX light-rail. The park currently contains 15 miles of pedestrian-only natural surface trails as well as on-street bike routes.

Portland Parks & Recreation is currently updating the Washington Park Master Plan, originally developed in 1981. The Master Planning process explored two basic concepts for the future of the park, one of which included a mountain biking trail located east of the MAC Trail. This area slopes towards Highway 26, needs environmental restoration, and contains existing demand trails.



Above: Existing demand trail in potential area for new off-road cycling trail

Left: Multi-hub concept with potential mountain bike trail

Recommendations

- Restore degraded wildlife habitat through native plantings and removal of invasive plants.
- Close and restore existing demand trails.
- Design and build a natural surface off-road cycling trail loop in the area east of Kingston Drive, as envisioned in the Draft Washington Park Master Plan. Trails could include a descending flow trail and an uphill skill trail. Building a trail here will require additional planning and community input.

Citywide

The City should consider the appropriateness of future parkland acquisitions for a stacked loop/tight loop trail system. These systems can maximize trail mileage within a property and could greatly expand opportunities for longer rides within the city. They are ideally suited for sites with limited natural resources or that are environmentally degraded, such as former golf courses and agricultural land outside of the City's industrial sanctuary.

Bike Parks

Bike parks can provide nearby off-road cycling opportunities of varying sizes and challenge levels. They are places where riders of all skill levels can learn and recreate. They provide convenience of location and the potential for a controlled riding environment.

Bike parks can take several forms – pump tracks, jump parks, skill parks, or looped skill trails (see page **). This plan recommends fourteen additional bike parks to provide small, local opportunities for neighborhoods; larger, district-scale parks; and citywide opportunities. The specific needs of each park and the local community should determine what type of facility is appropriate.

Table 7. Summary of Bicycle Park Recommendations

Park	Recommended Bicycle Park Size	and/or Loop Trail	Master Plan	Add. Info.
East Portland				
Gates Park	✓ Large (1-3 acres)	✓ skill	✓	
Gateway Green	✓ Large (1-3 acres)*	✓ skill		✓
John Luby Park		✓		✓
Parklane Park or Lynchview Park	✓ Small (5,000-10,000 sf)	✓		
Ventura Park	✓ Small (5,000-10,000 sf)*	✓		✓
North Portland				
Pier Park	✓ Medium (1 acre)	✓ skill	✓	✓
University Park	✓ Small (5,000-10,000 sf)	✓		✓
Northeast Portland				
Farragut Park	✓ Small (5,000-10,000 sf)	✓		
Fernhill Park	✓ Medium (½ - 1 acre)	✓ skill	✓	✓
Rose City Golf Course & Glenhaven Park		✓ skill		✓
Southeast Portland				
Brentwood Park	✓ Small (5,000-10,000 sf)			
Colonel Summers Park	✓ Small (5,000-10,000 sf)			✓
Creston Park	✓ Small (5,000-10,000 sf)	✓		
West Portland				
Albert Kelly Park or Hamilton Park	✓ Small (5,000-10,000 sf)	✓		
Downtown (ODOT property)	✓ Medium (½ - 1 acre)			✓
Gabriel Park	✓ Medium (¼ - ½ acre)	✓ skill	✓	✓
	* Bicycle Park currently exists			

East

Gateway Green

Accessible via the I-205 regional trail

Gateway Green is a 25-acre park is located just east of Rocky Butte at the intersection of the I-205 regional trail and the future Sullivan's Gulch Trail, and the confluence of two major freeways. The construction of I-205 and I-84 created this previously unused remnant of land with a complicated set of public access challenges. The recently completed Dirt Lab project created about 3 miles of off-road cycling trails and a progressive bike park, including a pump track, skills park, and jump park.

Gateway Green has undergone community visioning efforts to guide the future development of the park. Near term planning will address site constraints, such as access and utilities.



Recommendations

- Restore degraded wildlife habitat through native plantings and removal of invasive plants.
- Improve signage to help park users navigate and understand whether trails are open to cyclists, pedestrians, or both.
- Improve the gravel road more suitable for walking, running, and cycling.
- Designate an area for community events
- Improve access to the park for users as well as maintenance and emergency response vehicles.
- Extend utilities, like water and electricity, to the park.
- Make future improvements to reflect the evolving community and City vision for the park.

Gates Park

SE 136th Ave and Holgate

Gates Park is a currently undeveloped 11-acre park adjacent to Powell Butte to the west. The site is largely flat, in contrast to the steeper terrain of Powell Butte.

Recommendations

- After completion of land acquisition, develop a Master Plan, with community involvement, to guide future improvements to the park.
- Develop a large bicycle park (1 to 3 acres). Bicycle parks have areas for family recreation and skill building.
- Develop a natural surface loop trail (about ½ mile) for family-friendly cycling, walking and running. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Ventura Park

460 SE 113th Avenue

Ventura Park is a 7-acre park in East Portland, featuring a playground, picnic areas, and pump tracks. The park's pump tracks – one for intermediate riders and a second for young children – were the first to be constructed in a Portland public park.

Recommendations

- Continue to improve drainage at the pump track.
- Improve and expand the existing pump tracks.
- Develop a natural surface loop trail for family-friendly cycling, walking and running. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides.

John Luby Park

NE 128th Ave & Brazee St

John Luby Park is a 10-acre park located in the Russell neighborhood of East Portland at NE 128th Ave and NE Brazee St. It is a developed park with many large trees, a play area and paved paths. Residents can access the park via multiple north-south and east-west low traffic bike routes. Russell Academy, a public elementary school, and Portland Christian Junior/High School (private) border the park.

Recommendations

- Develop a natural surface loop trail (about ½ mile) for family-friendly cycling, walking and running. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides.
- Consider a potential partnership with the adjacent elementary school.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Parklane Park or Lynchview Park

SE 155th Ave & Main St and SE 165th Ave & Market St

These two largely undeveloped parks are located in the Centennial neighborhood of east Portland, on either side of E 162nd Avenue. Parklane Park is 26 acres and partially developed. Lynchview Park is 8 acres and undergoing master planning. Both parks are located adjacent to elementary schools, offering an opportunity to provide off-road cycling skill building facilities for students and their families. Of these two potential locations, Parklane Park may be better suited due to its larger size and location along the Mill/Main St. Neighborhood Greenway.



Recommendations

- Develop a small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building.

and/or

A natural surface loop trail for family-friendly cycling, walking and running. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides.

- Explore ways to partner with the adjacent elementary school.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

North

Farragut Park

N Kerby Ave & Farragut St

Farragut Park is 14-acre park in North Portland with a playground, basketball court, splash pad, and restroom.



Recommendations

- Develop a small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building.

or

A natural surface loop trail for family-friendly cycling, walking and running.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Pier Park

N Lombard St & Bruce Ave

Pier Park is an 87-acre park in North Portland. The park's open area includes sports fields and a large skatepark. The forested portion of the park is home to one of the largest Sequoia Groves in any municipal park, as well as another 20 species of trees. This portion of the park includes a popular disc golf course, tennis courts, picnic areas, and a playground, and is crisscrossed by both sanctioned and demand trails.

Recommendations

- Develop a Master Plan, with community involvement, to guide future improvements to the park.
- Develop a medium-sized bicycle park (about 1 acre). Bicycle parks have areas for family recreation and skill building. The bicycle park could be located near the popular skate park.

and/or

A natural surface loop trail for family-friendly cycling, walking, running and enjoyment of nature. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides. Care should be taken to avoid potential conflicts with disc golf course.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

University Park

9009 N Foss Avenue

University Park is a 11-acre park in North Portland. It features a play area, sports fields, restrooms, and off-street parking. The eastern portion of the park is currently undeveloped.



Recommendations

- Develop a small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building. The bicycle park would be located outside the sports fields.

and/or

A natural surface loop trail for family-friendly cycling, walking and running. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Northeast

Fernhill Park

NE 37th Ave & Ainsworth St

Fernhill is a 27-acre park in Northeast Portland. It features a sports fields and courts, including a track, a playground, an unfenced dog off-leash area, and restrooms. The park is a frequent location for cross-country running training and events held by local high schools and colleges.



Recommendations

- Develop a Park Master Plan, with community involvement, to guide future improvements to the park. This Master Plan could also consider an east-west paved and lighted trail to improve park access and connections.
- Develop a natural surface loop trail for family-friendly cycling, walking, running and enjoyment of nature. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides. A well-designed loop of approximately 1 ½ miles could also

provide a better trail for the cross-country running races and training held at the park. Care should be taken to limit potential conflicts with off-leash dog area.

and/or

A medium-sized bicycle park (about 1 acre). Bicycle parks have areas for family recreation and skill building.

Building a bicycle park or trail here will require additional planning and community input, including from neighbors, running groups, off leash dog area users, and other park users, and consideration among other needed or desired park improvements.

Glenhaven Park

NE 82nd Ave & Siskiyou St

Glenhaven Park is 16-acre park in Northeast Portland, adjacent to Madison High School. The park features a skate park, sports fields and courts, a playground, and restrooms, Glenhaven Park is near the Rose City Golf Course and the planned bike/pedestrian connection to Gateway Green.

Recommendations

- Develop a natural surface loop trail for family-friendly cycling, walking, running and enjoyment of nature. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides. The loop trail could provide safe walking access along NE Tillamook and connect neighborhoods to the south of the golf course to Glenhaven Park. Creating a full loop may require on-street segments. Care should be taken to limit potential conflicts with the golf course.

and/or

A small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Rose City Golf Course

2200 NE 71st Ave

Rose City Golf Course is a public, 18-hole golf course in Northeast Portland. Existing demand trails exist along the northern (NE Sacramento) and southern (NE Tillamook) perimeters of the property, which lack sidewalk improvements. Rose City is located near Glenhaven Park, Madison High School, and the planned bike/pedestrian connection to Gateway Green.

Recommendations

- Develop a natural surface loop trail for family-friendly cycling, walking, running and enjoyment of nature. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides. The loop trail could provide safe walking access along NE Tillamook and connect neighborhoods to the south of the golf course to Glenhaven Park. Creating a full loop may require on-street segments. Care should be taken to limit potential conflicts with the golf course. Metro's Glendoveer Golf Course's fitness trail could serve as a model.

and/or

A small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building. Given the continued use of the property as a golf course, the under-utilized slope between NE Sacramento Street and NE 72nd Drive on the northern edge of the property is the most suitable location for a bicycle park.

Building a bicycle park or trail here will require coordination with the Rose City Golf Course and additional planning and community input.

Southeast

Creston Park

SE 44th Ave & Powell Blvd

Creston Park is a 14-acre park in Southeast Portland. The perimeter of the park is sloped and treed, while the central areas include a playground, outdoor swimming pool, restrooms, dog off-leash area, and sports field. The park has two closed tennis courts that are planned for removal.



Recommendations

- Develop a small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building. The bicycle park could replace the closed tennis courts.

and/or

A natural surface loop trail for family-friendly cycling, walking, running and enjoyment of nature.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Colonel Summers Park

SE 17th Ave & Taylor St

Colonel Summers Park is a 6-acre park in inner Southeast Portland. It features a newly renovated pavilion and splash pad, as well as sports courts, a community garden, and a playground.

Recommendations

- Develop a small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Brentwood Park

SE 60th Ave & Duke St

Brentwood Park is a developed 14-acre park in Southeast Portland. It features a playground, sports fields and courts, and a fenced dog off-leash area. It is adjacent to Lane Middle School and the Brentwood-Darlington Community Center

Recommendations

- Develop a small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

West

Gabriel Park

SW 45th Ave & Vermont St

Gabriel Park is a 90-acre park in Southwest Portland. The park is located along a tributary to Fanno Creek and a large portion of the center of the park is set aside for natural area restoration. The park also features many popular recreational amenities, including a community center and pool, large skate park, two dog off-leash areas, a community garden, playground, and sports courts and fields.

Recommendations

- Develop a Master Plan, with community involvement, to guide future improvements to the park.
- Continue natural area enhancements. Gabriel Park's natural areas have undergone significant environmental restoration and pedestrian trail improvements.
- Develop a medium-sized bicycle park (about 10,000 sf to ½ acre). Bicycle parks have areas for family recreation and skill building. The bicycle park could be located near the popular skate park and away from natural areas.

and/or

A shared-use natural surface loop trail (about 1 ½ to 3 miles), outside of the core natural area. This trail could be used by nearby residents for family-friendly cycling, walking, running and enjoyment of nature. Off-road cycling skill features (like rocks, logs, or skinny bridges) could be added along the sides.

- Develop a designated, safe pedestrian and cyclist route along SW 45th Avenue, including crossings.
- Improve signage to help park users navigate and understand whether trails are open to cyclists, pedestrians, or both.

Hamilton Park

SW 45th Ave & Hamilton St

Hamilton Park is a 10-acre park adjacent to Bridlemile Elementary School in Southwest Portland. It includes sports fields and courts and a playground. The southeastern portion of the park is forested.

Recommendations

- Develop a small bicycle park (about 5,000 to 10,000 sf). Bicycle parks have areas for family recreation and skill building.

and/or

A natural surface loop trail for family-friendly cycling, walking, running and enjoyment of nature.

Building a bike park here will require additional planning, community input, and consideration among other needed or desired park improvements.

Central City

The City should explore opportunities to locate and develop a bike park on one of the many public properties located under freeways, overpasses, and ramps within the Central City. These properties are owned by the State of Oregon and generally must be used for transportation purposes. Such a facility could provide a nearby off-road cycling experience for the residents, employees, and visitors to the Central City. Implementing this recommendation would require coordination with the State of Oregon's Department of Transportation.

Urban Off-road Cycling Trail Corridors

Urban off-road cycling trail corridors would combine paved and unpaved trails to create longer and more varied riding experiences. Urban off-road cycling trails could include new unpaved trails or skill features parallel to existing or planned paved trails, or in parks nearby.



Springwater Corridor

The Springwater Corridor is a paved trail that runs for over 12 miles along the Willamette River and Portland's southern boundary. It continues east of the city through Gresham to Boring, OR. The Springwater Corridor provides cycling access for many neighborhoods between downtown Portland and Powell Butte – one of Portland's largest off-road cycling destinations.

By adding segments of parallel unpaved trail and/or skill features along the Springwater, the City could provide an over 10-mile hybrid riding experience. However, such improvements must be sited with care given the corridor's proximity to Johnson Creek and adjacent floodplains and riparian and upland habitat areas. Primary opportunities for parallel trails and skill features exist:

- North of Oaks Bottom Wildlife Refuge
- Between SE 73rd and SE 82nd Avenues
- Between I-205 and Foster Road
- Between SE 136th Avenue and Powell Butte

North Portland Greenway

The planned North Portland Greenway will connect Portland's Central City, North Portland and the major employment areas of Swan Island and the Portland Harbor via a paved multi-use trail. The City should look for opportunities to add segments of parallel unpaved trail and/or skill features adjacent to the main trail. Proposed off-road cycling trail and bike parks at the "Dog Bowl" and Pier Park could serve as larger destinations along the route.

I-205 Multi-Use Path

The I-205 Path is a paved multi-use trail that parallels I-205 from Vancouver, WA to Gladstone, OR. It is primarily located in right-of-way managed by the Oregon Department of Transportation (ODOT). As such, any improvements would require significant coordination and planning with and approval from ODOT. The I-205 Path is part of the Portland region's 40-mile loop trail system and intersects the

Marine Drive and Springwater Corridor regional trails. It is also the primary access to Gateway Green park, home to Portland's largest bike park.

The I-205 Multi-Use Path offers an opportunity to provide adjacent unpaved trails or skill features for off-road cycling, particularly in the segment between the Springwater Corridor and Gateway Green. Such improvements could help connect Gateway Green, the proposed Springwater Corridor urban off-road trail corridor, and Powell Butte into a longer and more varied off-road cycling experience. It could bring nearby off-road cycling options to the many families along the corridor, many of whom have limited park access.



Three examples of natural surface trails located adjacent to roadways and multi-use paths.

Ride-to-Ride Routes

Connecting Portland's off-road cycling trails and bike parks so users can "ride to ride" via bicycle or transit will:

- Make it easy for people to get to off-road trails and facilities using the city's paved bicycle network, existing trail network in parks and natural areas, and transit.
- Create longer and more varied riding options, particularly when combined with the proposed Urban Off-road Cycling Trail Corridors. Community members expressed a desire for nearby, longer riding routes which cannot be readily provided within discrete properties. Publishing map routes and/or signing routes make the system more user-friendly and accessible.
- Encourage Portlanders to "ride to ride" rather than using vehicles, providing health and environmental benefits.

The Figures 19-24 on the following pages illustrate recommended Ride-to-Ride routes. The routes allow riders to use the existing/planned paved bicycle network to connect recommended trail and bike park locations into longer loops. Where possible, these routes use Neighborhood Greenways, off-street multi-use trails, SW Trails, and other low-stress bicycles routes.

In some cases, and particularly in **East Portland**, the routes rely on the completion of neighborhood greenway or other paved bike facilities that are identified in the Transportation System Plan's one to ten-year constrained project list.

In **Southwest Portland**, the route relies heavily on the Southwest Trails System.

Figure 19. East Portland Ride-to-Ride Routes

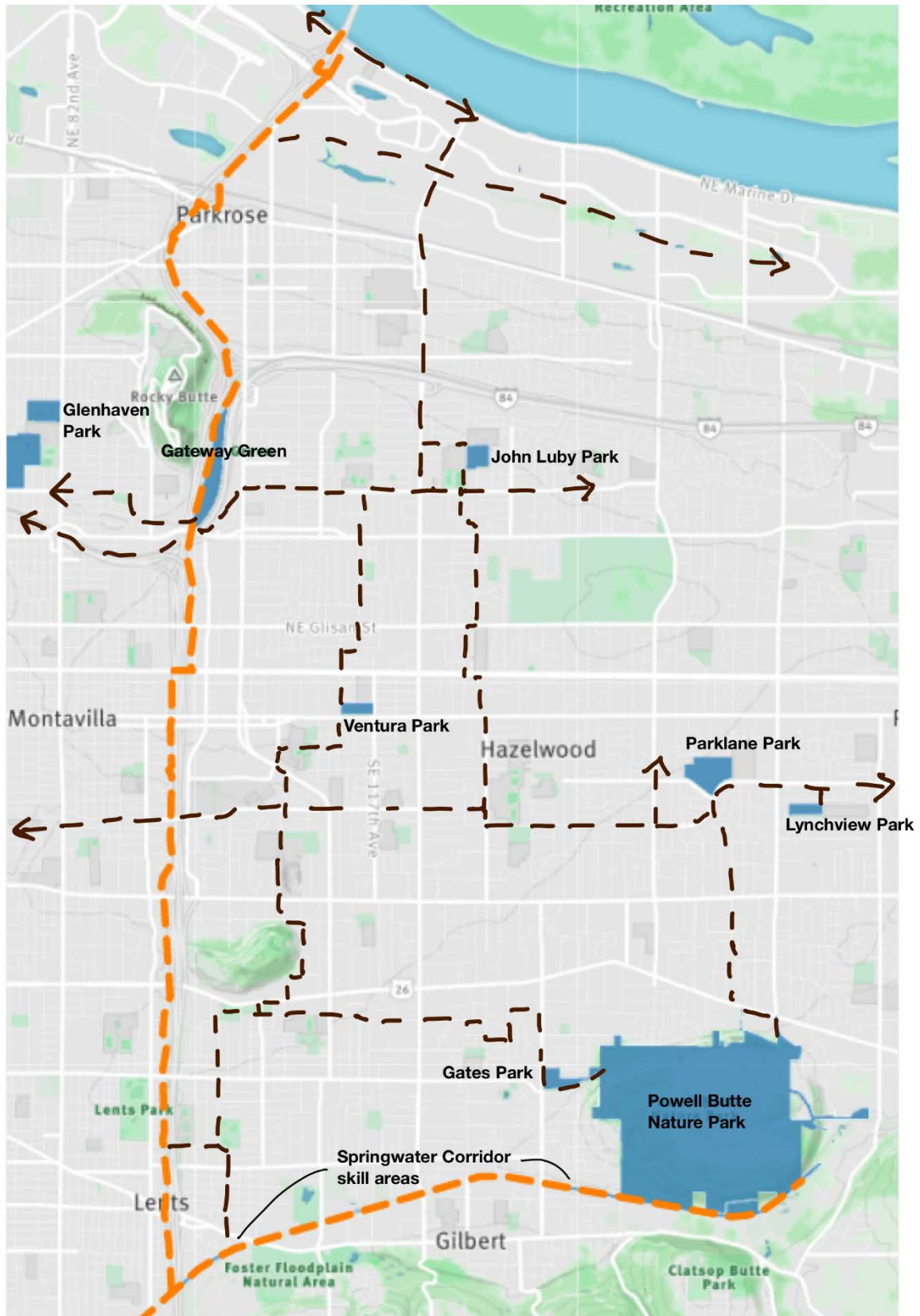


Figure 20. Northeast Portland Ride-to-Ride Routes

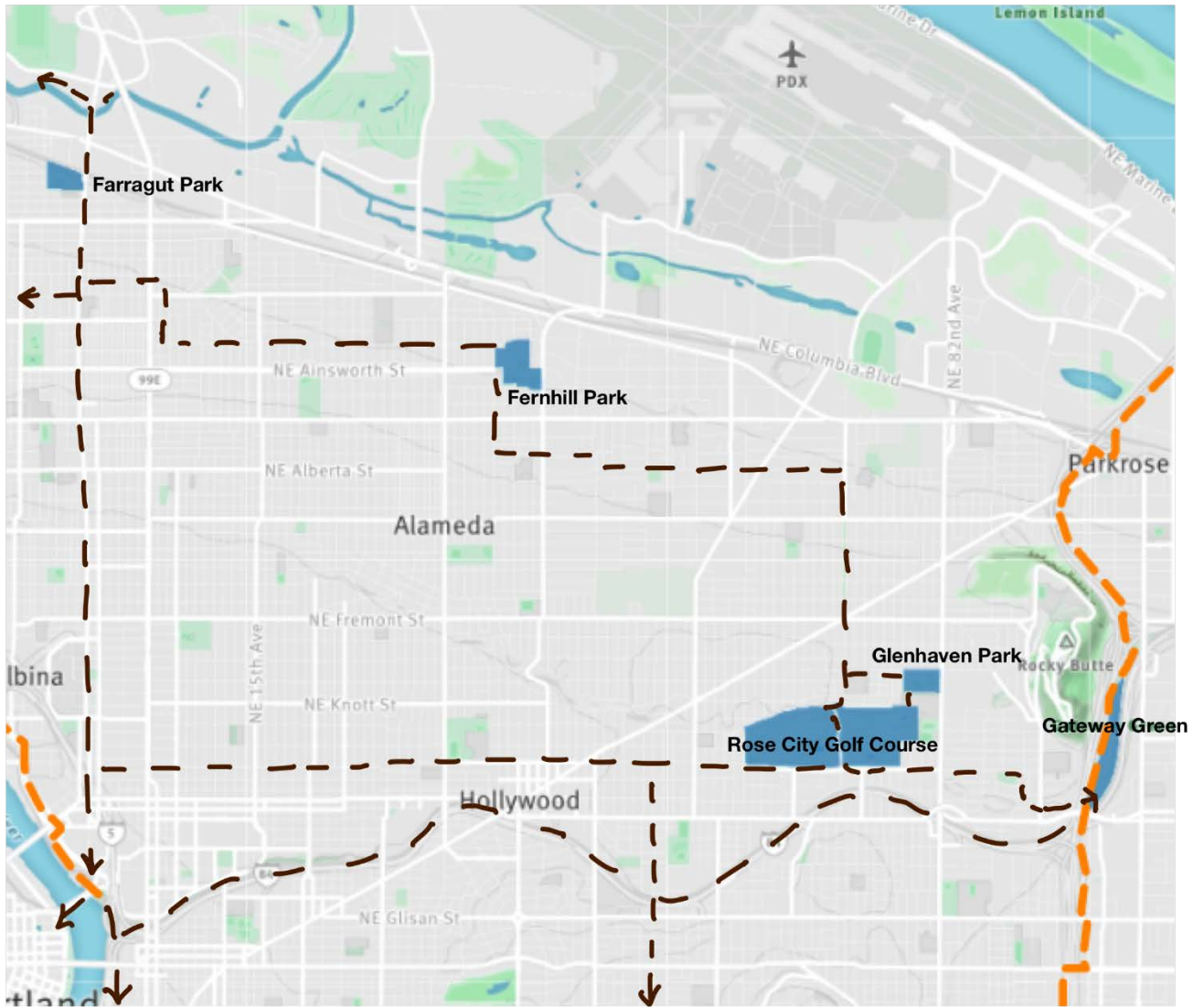


Figure 21. North Portland Ride-to-Ride Routes



Figure 22. Southeast Portland Ride-to-Ride Routes

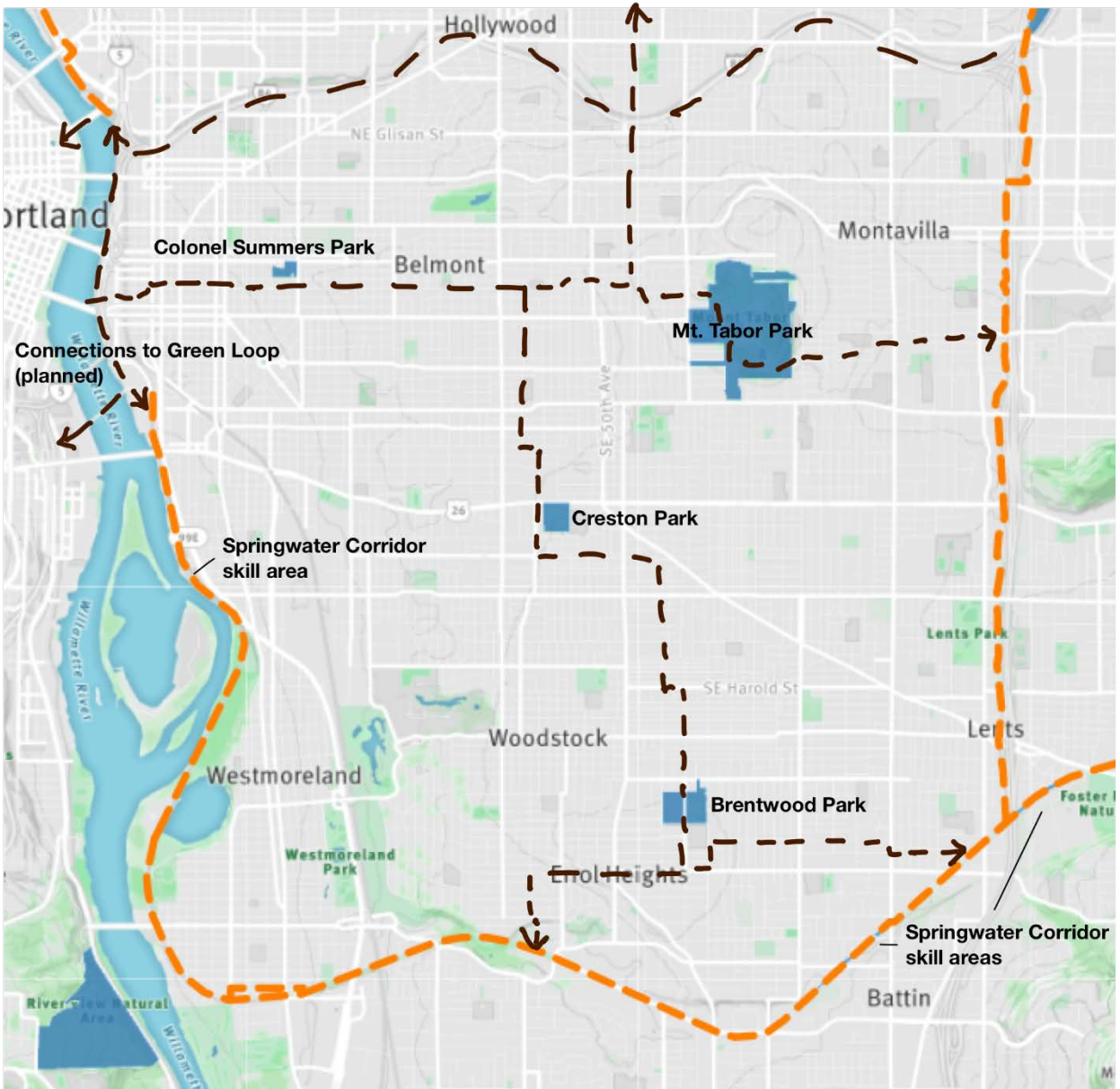


Figure 23. Southwest Portland Ride-to-Ride Routes

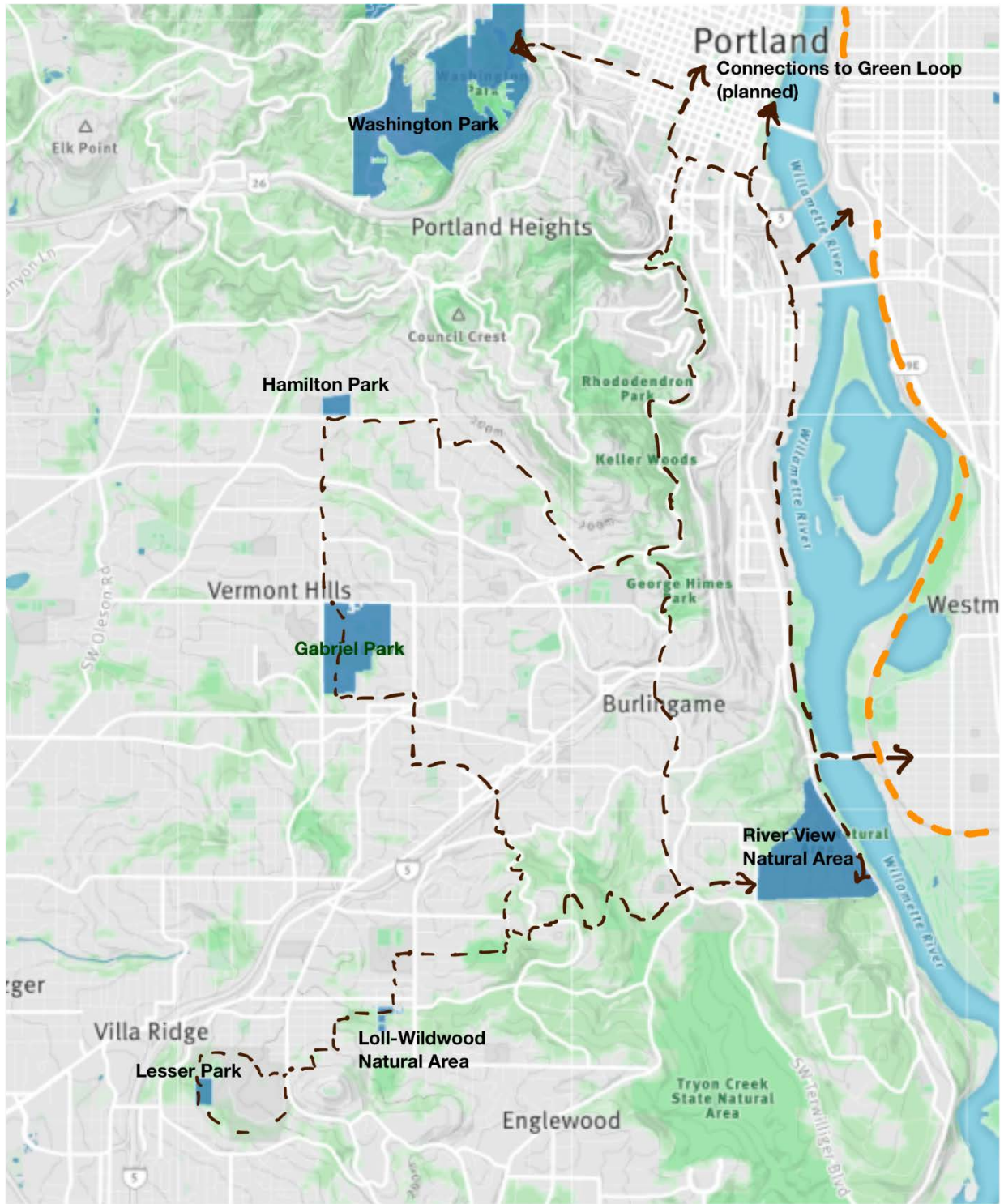
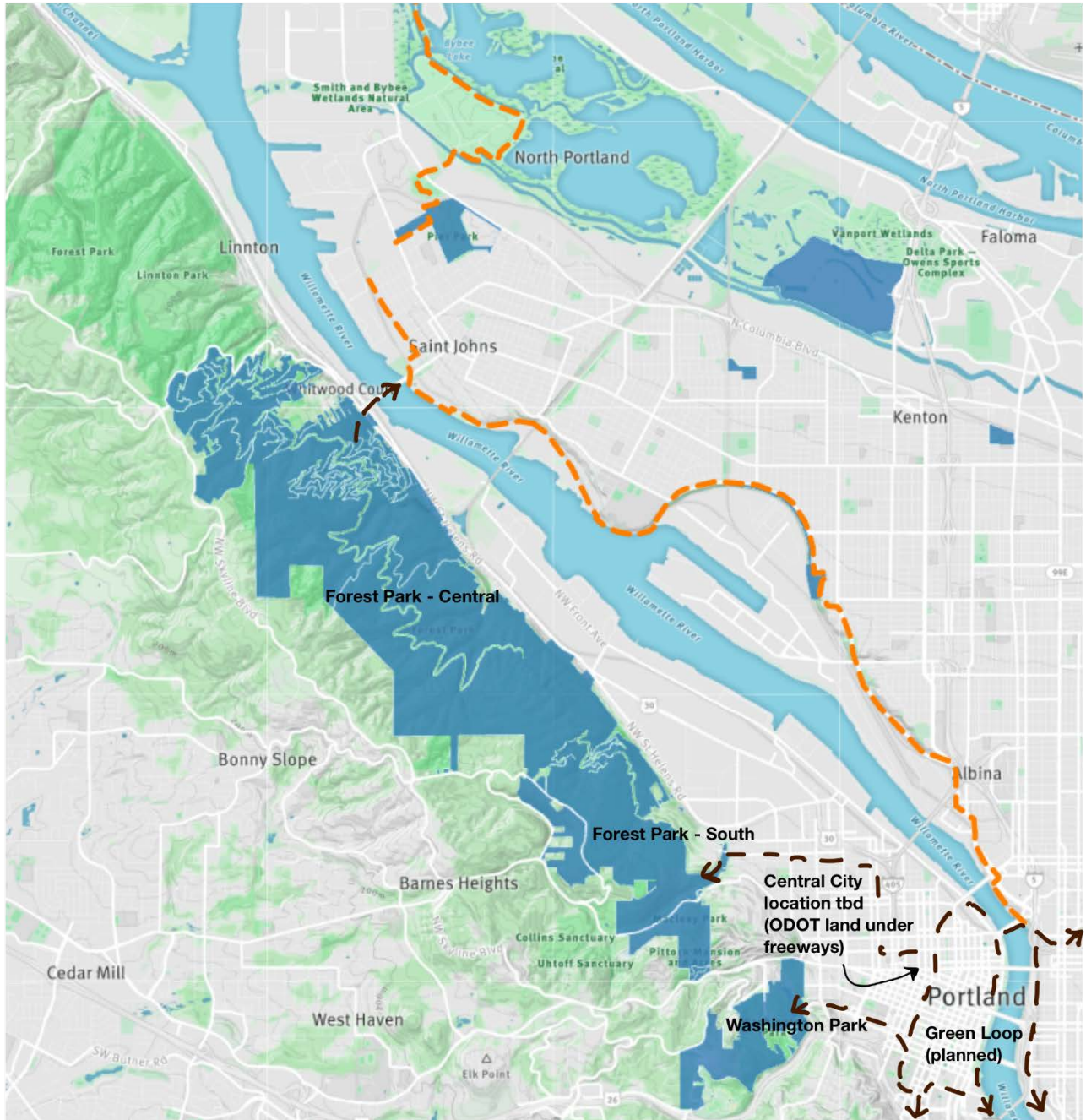


Figure 24. Northwest Portland Ride-to-Ride Routes



Accessibility

Portlanders of all abilities, including those who use adaptive equipment or non-traditional bicycles, should have opportunities to travel, recreate, and experience nature through off-road cycling. To create an off-road cycling system that truly serves all Portlanders, the City will need to address common barriers to access, including both information and physical barriers. The City can also proactively create riding locations accessible to all types of riders to make off-road cycling an accessible outdoor activity.

User Information

Providing easy to access, clear and complete information is a fundamental way that agencies can improve the accessibility of off-road cycling facilities. Such information supports use by everyone, but especially people using mobility devices or adaptive/non-traditional bicycles. The following best practices result in information that many trail users would appreciate, regardless of ability:

- For trails, provide information on each trail segment's level of difficulty through signage and other public information to improve accessibility for riders of all abilities and skill levels. For example, provide information about trail length, surface type, typical and minimum width, typical and maximum slope, and allowed user types.
- For bike parks, provide information on the skill level and type of skill features available.
- For all facilities, provide information on trailhead/park locations, parking availability, accessibility by bicycle and transit, and availability of restrooms and other infrastructure. Consider using links to online information, high contrast signage, and/or tactile signage to further broaden accessibility of information.

Barriers to Access

Barriers include poor signage or information, a lack of accessible parking at trailheads, physical barriers at trail access points, poor trail design (including steep grades), and limited turnaround points.

Accessibility "Hubs"

Accessibility hubs are designated locations that are readily accessible by car, bicycle and transit, and provide access to a range of riding opportunities accessible by both traditional and non-traditional bicycles. The following best practices should be used when designing accessibility hubs:

- Design associated trails and bike parks to be accessible to all riders with necessary skill level, regardless of equipment.
- Explore opportunities to coordinate with the Biketown Adaptive Bicycle rental program, which could offer riding opportunities for users who lack adaptive bicycles or do not have a means of transporting them to the trailhead.
- Trails should be designed to meet best practices related to trail surface, width, obstacles, slopes, and passing areas. Additional considerations for adaptive equipment includes the larger turning radius of some bicycles, the need for turnaround points and/or access at the beginning and end of trail, and wider passing opportunities.

Related Recommendations

Accessibility

1. Involve representatives of all potential types of users – including those using adaptive equipment – in the trail and bike park planning and design process. See also, *Equity in Engagement and Decision-making*
 2. Provide print, online, and/or on-site information about trails and bike parks that follows best practices for user information.
 3. Assess, with public input, and address barriers that limit use of existing off-road cycling facilities by all users. Create and publicize an ongoing and convenient way for users to report accessibility issues for existing and new facilities.
 4. For greatest accessibility, site trailhead and bike parks where they are accessible by car, transit, and bicycle/adaptive equipment.
 5. Use universal design principles in the design of beginner-friendly trails, such as perimeter park loops, to encourage use by a wide variety of users.
 6. Create a 'hub' of accessibility for users with adaptive equipment.
-

SECTION 7. DESIGNING WITH NATURE

This Plan's goal is to create a sustainable system of off-road trails and facilities. However, the placement and use of any trail for any type of user may have ecological impacts.

The best practices in this section are consistent with industry standards established by the U.S. Forest Service and International Mountain Bicycling Association. They also align with the design guidelines and standards for trail construction established in existing Portland Park & Recreation and Bureau of Environmental Services plans and policies. Additional best practices related to construction and stewardship can be found in Section 8. Developing a Successful System.

Mitigation Hierarchy

Siting of trails and facilities should follow the mitigation hierarchy of avoidance of impacts, minimization of unavoidable impacts, and rehabilitation/restoration of resources through mitigation. This is the accepted best practice for protecting and restoring ecological health.

The mitigation hierarchy should be applied at both the system planning and site planning scale. Citywide planning should consider potential impacts, and ways to avoid/minimize/mitigate these impacts at a high-level scale. Site planning efforts should take a more detailed and nuanced approach to avoid/minimize/mitigate impacts to individual features or species on a given site. For each site, application of the hierarchy should be based on the location's particular ecological function and value, the uniqueness of the resource within the City and region, and the area's use by resident and migratory species.

Avoid

A primary approach to achieving such a system is to site facilities to avoid ecologically sensitive areas. Trails and facilities should avoid adverse impacts or result in net ecological benefits in areas with the highest ecological function and value. The City has mapped a variety of natural resources and habitat areas in documents like the Natural Resource Inventory (NRI) and Terrestrial Ecology and Enhancement Strategy (TEES). For example, the TEES defines special habitat areas as including oak woodland; interior forest; riparian, herbaceous and forested wetlands; and prairie. Various agencies and organizations have also identified fish and wildlife species of concern, including Endangered Species Act listed and threatened species, Special Status Species, and other at-risk species lists.

Bike Parks

The best practices in this section focus primarily on design of trails, rather than bike parks. Bike parks are more commonly located in developed park and recreation areas (as opposed to natural areas). Thus, they typically have fewer environmental constraints that demand best management practices. However, bike park design does need to consider potential soil erosion, water resource requirements, and risk management best practices among others.

Where appropriate, the City should prioritize trail development on sites with existing disturbance, such as low value natural areas that have been degraded, over development in higher value resources. Degraded areas offer a potential 'win-win' combination of potential environmental restoration and new compatible recreational access.

Minimize

To limit overall environmental impacts in other ecologically sensitive areas or in areas the City has prioritized for restoration, use best practices that minimize overall trail density. These include the

use of shared-use trails and 'east coast style' tight loop trail systems. Tight loop systems result in high trail densities in a small area, provide longer trail lengths in a minimal area, thereby minimizing the overall area impacted.

In other areas, plan any new trail alignments or trail management activities to result in the least adverse impact to sensitive fish and wildlife and their habitat areas.

Mitigate

Mitigation of unavoidable impacts generally includes efforts to enhance natural resources and functions in adjacent or nearby areas. This might include restoration activities, such as revegetation strategies, creating new habitat, or decommissioning nearby low-performing or unsanctioned demand trails.

PROPERLY DESIGNED AND DEVELOPED TRAILS CAN LIMIT NEGATIVE IMPACTS AND ENHANCE THE NATURAL AREA. THE VALUE OF BEING ABLE TO ACCESS TRAILS WITHOUT THE USE OF SINGLE OCCUPANCY VEHICLES CANNOT BE OVERSTATED.

- COMMUNITY MEMBER

Related Recommendations

Design with Nature

1. Apply ecologically sustainable best management practices and applicable Natural Resource Management Plans to the siting, design, construction, and maintenance of off-road cycling trails and parks.
 2. Site and design trails and facilities according to the mitigation hierarchy of avoiding, minimizing, and then mitigating negative impacts.
 3. Develop and maintain local design and management guidelines and construction specifications that reflect acknowledged best management practices and current science.
 4. Pair enhanced recreational access with restoration of habitat, streams, and other natural resources.
 5. Improve or decommission and restore existing trail segments that are unnecessary, poorly designed, unsustainable, or which negatively impact areas with the highest ecological function and value.
 6. Locate off-road cycling parks (such as pump tracks) in developed parks, ideally in areas with no ecological value.
-

Soil and Water Resources

Available research indicates that off-road cycling, when limited to established trails, has a similar impact on soils to hiking, and a lower impact than horseback riding. Keeping use on established trails is critical – the frequency of unpermitted off-trail activity by users was the greatest cause of adverse soil impacts.

More generally, trail design and landscape factors may have more potential to affect soils than the nature of the trail activity. For example, trails with slopes greater than 12% are strongly correlated with significant increase in impacts to soil and vegetation. Cross-slope trails also have lower erosion and runoff potential than fall line trails.

Erosion can cause trails to introduce soils, nutrients, and pathogens to nearby waterways and can increase water turbidity and sedimentation. Poorly designed trails can also alter the way water drains across the landscape and can divert water that serves important ecological functions.

To avoid and limit impacts to soil and water resources, trails should be planned, designed, and managed based on best practices for natural stormwater management.

Best Practices for Natural Stormwater Management

Trail design can minimize soil erosion and help protect water resources. The following best management practices align with those established by the U.S. Forest Service and those included in the River View Natural Area Management Plan.

Trail Alignment

Trails should be designed to avoid/minimize negative impacts, such as soil erosion, on streams, wetlands and other water resources through careful consideration and design of the stormwater flow path. First, avoid siting trails on level terrain and/or areas with incompatible soil types. Such precautions can prevent trails that easily become muddy, erosive, and challenging to users. Secondly, design rolling contour trails to enhance natural overland drainage and reduce soils erosion.

Tread Width

To reduce potential soil erosion, trail tread width should be kept to a minimum. This may be accomplished by constructing narrower trails or by narrowing existing trails to reduce the overall trail footprint. However, the width of a trail is a key factor that determines the associated recreational trail experience; as such, trail width, desired recreational experience, and soil suitability should all be considered in concert when siting trails.

Rolling Contour Trails

These trails are designed to follow the elevation contours of hillsides to encourage sheet flow of water across the trail. To minimize erosion, facilitate natural drainage patterns, and provide a fun trail experience, trails should maintain a 5-7% average running grade (i.e., the grade longitudinally along the trail) – or no more than half the grade of the side slope – and include frequent grade reversals. Grade reversals are short dips followed by a slight rise to allow water to drain off before it can gain volume and speed. Trail tread (or cross slope) should tip downhill or outslope (about 5 percent). Blending the trail's "backslope" (uphill slope) to the hillside's angle of repose will further encourage proper drainage. Developing rolling contour trails (as opposed to fall-line trails that follow the shortest route down a hill) with the following characteristics is a key element in developing environmentally sustainable trails that provide and enjoyable trail experience for users.

Full Bench-Cut Trail Construction

This type of trail involves cutting the trail tread into the uphill side of the slope and providing a solid, long-lasting and stable trail tread by retaining the lower edge without impacting native compact soils and existing well-rooted plants. Cut slopes soils should be broadcast thinly across the downslope over a larger area so as not to suffocate the roots of existing plants.

Slope rules - half rule and 10% grade, maximum grade

Trails should be aligned parallel to terrain contours, and a trail's grade should not exceed half the grade of the hillside or side slope that the trail traverses (half rule). An average grade of less than 10 percent (ideally 5-7%) should be maintained (10% rule) to minimize erosion of the trail surface, accommodate undulations and to provide the majority of trail users with a rideable trail gradient. Maximum trail grade is typically 15 to 20 percent in relatively low-use areas (lower in high-use areas), however it is site specific and the trail should comply with the half rule and take into consideration variables such as soil type, user density, annual rainfall and difficulty level of the trail. In general, limit maximum grades and sustained grades, and include frequent grade reversals along the trail to provide frequent drainage relief.

Edge Protection

Edge protection involves the placement of rocks or other materials to support the edge of a trail. Edge protection should be provided only when conditions warrant it (such as a steep drop off). In general, edge protection may reduce sheet flow and increase erosion and trail maintenance. If used, edge protection should use native vegetation and natural features such as rocks and logs that blend with the natural environment, installed in a manner to facilitate sheet flow.

Trail Hardening or Armoring

Trails can be hardened to prevent erosion, stabilize steep sections of contour trail, cross low-lying muddy or sandy areas and to toughen high use areas. Each scenario may require a different trail hardening technique. Considerations include whether the erosion is caused by users or water, available materials, access to the site, or trail use patterns (e.g. high traffic vs. low traffic). IMBA's Trail Solutions describes each method of trail hardening. The preferred technique is rock armoring, because it is long-lasting, uses natural materials and is aesthetically pleasing.

Trail hardening in bike park facilities can prevent soil erosion and reduce maintenance requirements, but can also make it harder to update the layout and construction of park features over time.

Related Recommendations

Soil and Water Resources

1. Locate trails to avoid crossing streams, wetlands, and floodplain areas. Where no avoidance alternatives exist, design and construct trails to minimize and mitigate for impacts and follow applicable best management practices.
 2. Site and design trails using best management practices for natural stormwater management to minimize soil erosion and help protect water resources.
 3. Develop and implement specifications for low impact trail crossings of streams and drainages, based on best practices.
-

Vegetation

All trail-based recreational activities have the potential to negatively impact vegetation, especially on unestablished trails.

Most vegetation impacts occur with initial trail construction, as building a trail often requires the removal of vegetation within and adjacent to the planned trail route. Disturbed landscapes can also set the stage for invasive vegetation. Trails should be sited and designed to minimize the removal of native vegetation. When removal cannot be avoided, revegetation strategies should mitigate for this impact.

Once trails are constructed, there is a diminishing increase in vegetation impact with increasing trail use. Instead, accelerated soil erosion becomes the primary impact and trails should be designed to minimize erosion (see Soil and Water Resources, page **). Off-trail use by any type of user can cause also cause trampling or damage to vegetation.

Related Recommendations

Vegetation

1. Pair construction or improvement of trails with vegetation restoration through removal of invasive species and the planting of native vegetation.
 2. Manage vegetation immediately adjacent to trails in concert with recreational access and safety (for example, vegetation may need to be pruned to allow safe clearances for trail users).
 3. Use targeted plantings or fencing to deter trail users from venturing off-trail into sensitive areas.
-

INSERT Gateway Green Example

(paired restoration and trail development)

Wildlife and Habitat

Minimizing wildlife disturbance

Wildlife disturbance from recreational trail use can extend much further into natural landscapes than other forms of trail impacts, which tend to be limited to the narrow trail corridor. Existing research on wildlife impacts focuses on a limited set of bird and mammal species, and the results appear to differ depending on the species studied. For some species, disturbance from mountain biking trail use on foraging and nesting behavior may be minimal, but fragmentation and alteration of habitat by trails may reduce quality of nesting habitat.

Additional research on the impacts of recreational use generally, and off-road cycling specifically, on wildlife and habitat is needed. There also a need for additional research on the cumulative impacts of recreational activities in natural areas, both urban and rural.

Best Practices

Wildlife impacts of recreational trails and activities are species- and site-dependent. As such, it is important to understand the extent and needs of resident and migratory species on a planned site. Wildlife impacts can be reduced by avoiding sensitive or critical wildlife habitats, including riparian corridors and wetlands. Other strategies, such as seasonal closures during migratory, nesting, or mating seasons can reduce impacts during critical times.

Maintaining habitat quality and function

Maintaining habitat quality and function relies on avoiding or minimizing impacts to overall habitat patch size, fragmentation and edge effects.

Best Practices

There are many ways to site and design trails to help maintain habitat quality and function:

- Route trails to avoid particularly sensitive areas.
- Where trails are near habitat, establish habitat buffers – based on the type of resource and presence of wildlife species - to avoid impacts to sensitive ecological and hydrological systems.
- Locate trails at habitat edges, to avoid disturbance to intact interior habitats.
- Restore disturbed edge habitat by replacing invasive plants with natives.

In addition, trail corridors can be narrowed to improve habitat function, where opportunities exist.

Related Recommendations

Wildlife and Habitat

1. Site and design trails using best management practices to maintain and improve habitat connectivity and limit impacts to wildlife.
 2. Use adaptive management strategies, such as seasonal closures during migratory, mating or nesting seasons, where trail use would adversely impact species of concern.
 3. Continue and expand monitoring of natural resources and fish and wildlife populations in the City's parks and natural areas. Use monitoring data to inform trail siting, design, and management.
-

SECTION 8. DEVELOPING A SUCCESSFUL SYSTEM

This plan aims to lay the framework for a citywide network of off-road bike trails and parks for users of all ages and abilities. Creating a system that is successful in the long-term will require intentional planning, design, construction, maintenance, management, and enforcement.

Planning, Design and Construction

While City staff are familiar with a project's life cycle, the process can seem confusing, overly burdensome, and mysterious to community stakeholders. City projects and processes are multi-faceted, and may include a team of staff, multiple bureaus (depending on the location and infrastructure needed for a project), and stakeholder involvement committees. As such, it is important to clarify a projects journey from beginning to end for transparency, as well as being able to review the process to identify unnecessary hurdles and opportunities for efficiencies.

The following graphic and table offers a step-by-step look at how an off-road cycling project goes from a thought to completion (this process could and should be changed as the City completed more off-road cycling projects and gains lessons learned):

Throughout: Community Engagement

Community engagement is integral to any park or trail project. The engagement process should follow applicable City polices and protocols and this Plan's Equity in Engagement and Decision-making recommendations, page **. Engagement during the planning, design and construction of off-road cycling trails and parks might include:

- Initial and ongoing community information and notification, via options like project websites, emails, announcements, and social media.
- Opportunities for community members to engage in, and inform, the project's design and management, potentially through surveys, open houses and community events, stakeholder committees, and online input opportunities.
- Notification of neighbors, the neighborhood association, and district coalition as the planning efforts start, during the input process, and before construction begins.

Step 1. Project Identification and Master Planning

Future project should first be identified in the adopted Off-road Cycling Master Plan and/or an adopted site-specific Master Plan. Ideally, projects listed in this document will be incorporated into Master Plans for each proposed park or natural area. This may require amending an existing Master Plan or, for site that lack plans, adopting a new plan, both with community input.

Initial Master Plans establish the scope, scale, budget and complexity of a project and provide a visual representation of the potential layout of site amenities, including trails and bike parks, as well as infrastructure like parking and restrooms. This Master Plan can be used during initial engagement of public agency partners, neighboring landowners, businesses, park advocates, and the local community and for funding requests.

During this phase of planning, the City should also:

- Explore opportunities for concurrence with other City projects/goals, meeting multi-objective goals (partnership opportunities)
- Review relevant policies and plans to identify requirements in adopted plans, zoning codes, bureau policies, trail guidelines, etc.
- Involve natural resource experts and planners to better respond to site conditions and identify potential enhancement and mitigation opportunities. *See the Design with Nature section for additional recommendations.*
- Identify significant permitting requirements
- Identify relevant design, planning, management best management practices

Step 2. Prioritization and Funding

Once a project is identified, Portland Parks & Recreation (PP&R) and the City would consider the new projects for funding through the capital improvement and budget processes. In this step, they would be measured against PP&R goals and against other park, recreation and citywide needs and priorities. Off-road cycling projects should be prioritized based on factors like:

- Community input and support
- Potential to serve under-served communities
- Ease of implementation
- Opportunity to advance multiple City or community goals.

Both the PP&R and City budget processes include opportunities for community input. Funding for the design and construction may occur in two separate steps, depending on funding source and availability

Step 3. Site Design

If a project is funded, the City could begin to design the project. Design work involves detailing the proposed trail or bike park, gathering community input, assessing environmental impacts (such as on wildlife, habitat and water), designing for the needs and safety of intended users, and identifying any needed mitigation strategies. Site design should be based on site conditions, community and partner feedback, and goals for the site. It is a good idea to involve various experts in the design process to provide expertise. For example, City staff should be included to:

- Parks & Recreation (PP&R) – Provide planning, design and implementation expertise, community outreach, as well as information on recreational programming and education.
- Transportation (PBOT) - Provide insight into the connections to the City's bike network and cycling outreach.
- Environmental Services (BES) - Provide expertise on stormwater requirements, erosion control, and/or other environmental mitigation aspects.
- Development Services (BDS) - Serve as a continuous liaison on permitting issues and requirements.

The design process results in a site plan, which visually represents the proposed facility. This site plan is used for environmental assessments, permitting, fundraising, and the creation of construction documents.

At this step in the process, it is also useful to create an **Operations Plan**. This plan outlines an overall approach, protocols and actions to ensure the highest quality construction, maintenance, operation and management of the facility. Operations Plans should also ensure that comprehensive integrated risk management practices and protocols are established and maintained by all parties for the lifetime of the facility.

The design process should also result in plans for maintenance, operations, staffing, events, and programming to ensure the long-term success of the project.

Step 4. Permitting and Final Plan

Permitting ensures projects are When a project is ready for permitting, the Project Manager brings the site design to the Bureau of Development Services' (BDS) permit center to review the design and identify what permits will be required.

Depending on the reviewer's advice, an Early Assistance Meeting may be required. An Early Assistance Meeting is an opportunity for the project manager and support staff to talk with staff from all the bureaus that may be offering guidance on permitting. This meeting will be especially useful if environmental mitigation is required or substantial topographical change is planned. Early assistance meetings can also be held in the field, so all parties can view site conditions first hand.

Once a permit application is submitted, BDS and other agency staff review it based on established codes and requirements. They may approve the permit outright or offer guidance on changes that are required before a permit can be issued. If required, these changes are incorporated into the Final Site Design and resubmitted for approval.

As part of the permitting process, any project located in an environmental zone would go through environmental review. The goal of environmental review is to safeguard natural resources and the ecological health of the park. It also requires public notification of proposed changes and allows for public comments and appeal of the decision.

Once the permit and site plan is approved, construction can begin.

Step 5. Construction

The project is built to the specifications details in the Final Plan. Care should be taken to limit adverse impacts to soils, nearby vegetation, waterways, and wildlife habitat during construction. When construction is complete, a BDS Inspector completes an on-site review of the project to ensure it was built to specifications and code. Any issues identified by the inspector are then remedied. Upon a successful inspection, the project is complete and ready to use!

Step 6. Ongoing Maintenance and Management

Management of existing or any new trails or bike parks involves continuous maintenance; monitoring for unintended negative impacts on wildlife, water, habitat, or users; enforcing trail rules; and acting to address any recurring problems. Maintenance and Management are discussed later in this section.

Related Recommendations

Planning, Design and Permitting

1. Consider opportunities for off-road cycling facilities in new or updated park master plans for locations recommended by the Off-road Cycling Master Plan.
2. Involve and stakeholders early in the design process to document equity issues as well as existing environmental conditions and to identify potential enhancement and mitigation opportunities.

3. Develop and maintain trail and bike park design guidelines that are based on best practices.
4. Ensure codes and permitting requirements for trails and bike parks forward goals to protect and enhance ecological health, provide recreational opportunities, support equity, public transparency, and steward public funds for facility construction and maintenance.

Construction

1. Develop construction documents and specifications that reflect best practices in trail and bike park design as appropriate to the planned facility and site conditions.
 2. Involve a multi-disciplinary design team in the development of construction documents, such as a bike park/trail designer; civil, structural and/or geotechnical engineers; landscape architects; and environmental and technical specialists. natural resource experts
 3. Use qualified trail or bike park builders to perform or manage facility construction.
 4. Clearly define the boundaries of construction, resource protection areas, staging areas, etc. during construction activities.
 5. Manage construction activities to minimize exposure to disturbed earth during the wet season and near sensitive water resources.
 6. Work within seasonal work “windows” and build trails and bike parks outside of breeding seasons for species using the site (i.e. avoid bird nesting season – see *TEES Guidelines on Avoiding Impacts on Nesting Birds*).
 7. Minimize the spread of ecological/invasive species by cleaning tools, boots and equipment prior to entering the project area and make sure imported soil is weed free.
-

Signage, Education & Programming

Signage & Wayfinding

Clear and consistent signage is at the core of successful off-road cycling facility design and management. Signage should enhance the user experience and minimize risk by informing users of trail conditions including park rules, trail difficulty, enhanced terrain and technical features, trail etiquette, riding technique, appropriate safety equipment and emergency medical services. In the context of a bike park or skills trails, providing recreational interpretation, which shares riding techniques promotes progression and skills improvement and will improve user experiences and safety. Well-thought out signage and wayfinding materials can also improve accessibility for those using handcycles or other adaptive or non-traditional bicycles.

Best Practices

Following these best practices can improve user experience, minimize risk, establish rules and expectations, and promote stewardship:

- Provide public education and signage that supports stewardship off-road cycling facilities and surrounding public lands.
- Install positive wayfinding signage, including mapping kiosks; clear and consistent signage at trail entrances and along trail routes. Use wayfinding best practices like confirmation signs a few hundred feet into the route to ensure cyclists are on the right trail.
- Develop clear and easy to understand graphics to direct cyclist to designated/appropriate trails, and to indicate skill level and what riders might encounter along the trail (shared use, equestrians, etc.).
- Incorporate recreational interpretive signage into bike parks and skill trails. This type of signage provides recreational instruction and techniques for safe and fun riding. It promotes progression and user safety.
- Providing natural, historic and cultural interpretive information for natural and urban trail routes.



This trail sign, at Phil's Trail System in Bend, provides information on the trail's name, allowed users, direction of travel, level of difficulty, and trail etiquette.

Education & Programming

The City of Portland has multiple public and nonprofit educational programs related to off-road cycling or cycling generally, including recreational classes and trips, school-based programs, and public information campaigns aim to provide riders with the knowledge and skills necessary to enjoyably and safely ride in the City. Some of these programs are targeted to traditionally underserved communities (such as people with limited incomes or limited English-language ability), youth, or commuters. Expanding these educational and experience-based programs to incorporate off-road cycling knowledge and skills will help extend the opportunity to more Portlanders.

In addition, the city should explore other ways to address barriers to off-road cycling, such as access to bicycles and other equipment. For example, loaner or rental bicycles, provided through

partnerships with non-profit or private partners, could allow Portlanders without a suitable bicycle to try off-road cycling.

Related Recommendations

Signage & Wayfinding

1. Provide public education that supports stewardship of the trail system and associated parks and natural areas. Recognize and support the need for continued education and enforcement of park and trail rules.
2. Use clear and consistent signage, maps, and public information to enhance user experience, minimize risk, establish rules and expectations, and promote stewardship based on best practices.

Education & Programming

1. Pursue opportunities to partner with public, private, and non-profit organizations to provide educational programs and equipment to expand the accessibility of off-road cycling.
-
2. Prioritize partnerships and programs that increase accessibility for historically under-served communities.
 3. Explore opportunities to expand existing City programs and partnerships, such as recreational classes and trips, Safe Routes to Schools, and the Schools Uniting Neighborhoods (SUN) Program, to incorporate off-road cycling instruction and opportunities.
 4. Develop partnership agreements and protocols that document and support such programs.
-

Maintenance

Off-road cycling facilities require regular, ongoing maintenance. Trail surface and upkeep is a key concern of trail users, as it is critical to both usability and minimizing safety and environmental risks.

Trails maintenance tasks include vegetation pruning, removal of fallen trees/branches, and inspection and maintenance of signage and any edge protection or drainage crossings (bridges, etc).

Typical maintenance tasks at bike park facilities include, but are not limited to watering, compacting, shaping and otherwise maintaining the dirt features. Tasks also include routine inspection and maintenance of signage, clearing potentially hazardous debris from fall zones, inspecting and repairing any damaged hardware on wooden structures, inspecting rock and wood features for structural integrity, and maintaining drainage control features and landscaping.

Staffing

Maintenance can be conducted by staff, volunteers, professional contractors or a hybrid of these options. Ideally, maintenance staff of any kind should have experience or be trained in park maintenance and natural resource protection. Volunteer efforts should be supervised by a qualified and dependable manager and involve a formalized stewardship agreement.

Budgeting for Maintenance

Maintenance costs should be identified and factored into planning and operations budgets. See Table 2 and Table 3 for typical annual maintenance costs for various types of trails and bike parks.

Inventorying Facilities

Maintaining an inventory of off-road cycling trails and facilities, including location and type, supports informed maintenance planning, budgeting, and activities. Such an inventory also provides a way to identify off-road cycling trail segments or facilities that do not meet current design guidelines. These segments should be either improved to standard or decommissioned based on system needs.

Maintenance Plans

Ongoing maintenance is most successful when a Maintenance Plan establishes regular activities, inspections, protocols, and schedules. A site's maintenance plan should identify who is allowed to and responsible for performing maintenance activities. It should also identify thresholds for unacceptable environmental impacts (disturbances) and methods to address the impacts, such as adaptive management strategies (e.g. seasonal closures).

Maintenance Logs

Maintenance activities should be logged and tracked to become the basis for budget and resource planning. Over time, maintenance logs can help in identifying trail segments or riding elements with chronic functional problems or unacceptable environmental impacts, which need to be addressed.

Related Recommendations

Maintenance

1. Create and maintain an inventory of off-road cycling trails and facilities across the City. Identify trail segments or facilities that do not meet current design guidelines and work to either restore or decommission these facilities based on system needs.
2. Identify and incorporate ongoing maintenance costs into planning for sites and operations budgets. Track maintenance activities as a basis for budget and resource planning.

3. Establish inspection and maintenance activity schedules and protocols. Perform regular maintenance on all facilities in compliance with maintenance plan protocols to ensure trails and facilities remain in a safe, rideable condition appropriate to their technical difficulty.
 4. Use maintenance logs to identify trail segments or riding elements with chronic functional problems or unacceptable environmental impacts which should be addressed. For example, remedy or relocate problem trail sections rather than performing continuous maintenance to repair damage.
 5. Use experienced staff, trained volunteers, or professional contractors, or a combination of these options, to conduct maintenance as appropriate.
-

Stewardship, Management and Enforcement

Stewardship

Stewardship is an important strategy for protecting and enhancing natural resources, as demonstrated by the city's Natural Areas Stewardship program. Resource agencies with many acres of open space, like Portland, often rely on volunteers to help maintain large natural areas and open space. Volunteers, in turn, contribute to their community while also spending time outdoors.

Developing a sustainable system of trails and off-road cycling facilities in Portland will require a community that is committed to creating and maintaining off-road cycling facilities and their surrounding public lands, both for their own enjoyment as well as the enjoyment of others.

The off-road cycling community is rooted in a strong communal, grass-roots ethic around the stewardship of trails that extends to the environment in which they are located.

Volunteer Protocols

Where volunteers will be used, the City should establish protocols to ensure their safety. Such protocols may include requiring all volunteers participating in construction, routine maintenance operations or other special events to sign a liability waiver; requiring all volunteers to wear standard safety equipment (e.g. sturdy closed-toe shoes, pants, gloves) during all construction and maintenance operations and activities.

Management

The first step to ensuring effective, long-term management of a trail system or bike park is developing a Risk Management Plan. A facility's Risk Management Plan should address both risks to users and the environment. It should establish effective management protocols and demonstrate an intent to manage the facility responsibly. Risk Management Plans for trails and bike park facilities should, at a minimum, address signage, incident and accident reporting, maintenance and inspection activities, environmental risk, and volunteer activities.

Once a trail or bike park is built, the managing agency should:

- Establish and implement incident and accident reporting protocols that enable the managing agency to record, monitor and respond to safety hazards. Regular evaluation of incidents and accidents should take place to prioritize where maintenance and/or design changes should take place to improve safety.
- Monitor for unanticipated/unintended impacts of trails or other facilities on natural resources, such as excessive erosion and adverse impacts on vegetation, streams and wetlands, habitat, and wildlife.

... COMMUNITY SUPPORT AND VOLUNTEER WORK ...IS AN EXCELLENT WAY TO ENCOURAGE HEALTHY HABITS AND ACTIVITIES AND FOSTER INTEREST IN NATURE FOR FUTURE GENERATIONS.

- COMMUNITY MEMBER

WHAT HAS HAPPENED SO FAR AT GATEWAY GREEN IS A GREAT EXAMPLE OF WHAT THE MOUNTAIN BIKE COMMUNITY CAN DO! GIVEN THIS OPPORTUNITY, THE CYCLISTS CAME TOGETHER AND ARE DEVELOPING GREAT SUSTAINABLE TRAILS. HUNDREDS OF CYCLISTS SHOW UP FOR WORK PARTY DAYS. NO OTHER USER GROUP IN PDX MAINTAINS THEIR TRAILS BETTER THAN CYCLISTS. WE ARE GREAT STEWARDS OF THE LAND AND HOPEFULLY GG SHOWS THIS!

- COMMUNITY MEMBER

Adaptive management strategies, potentially including the improvement or the conditional or permanent closure of trails or facilities, should then be used to address unsustainable conditions (e.g. saturated soil conditions after particularly heavy rains) or unintended negative impacts.

Enforcement

Even with the best of intentions, there may be individuals who do not follow the rules of a bike park, trail system, or other facility. The managing agency should establish enforcement protocols that define the rules for facilities (e.g., use hours, direction of travel, etc.), penalties for not following the rules, and the roles and responsibilities of enforcement agencies.

Unsanctioned Trail Use – Management Hierarchy

Where unsanctioned trail use occurs, despite positive signage and public information on appropriate trail use, use an escalating management hierarchy (outlined below) to reinforce sanctioned trail use and etiquette. More intensive interventions (such as physical barriers and paid patrols) can have drawbacks, including increased system costs and deterrence of other allowed users.

Step 1. Actively maintain trail systems to ensure sanctioned trails remain rideable and signage legible.

Step 2. Close entrances to unsanctioned trails and rehabilitate impacted areas.

Step 3. Use volunteer-based patrols and outreach programs to actively patrol trail systems and encourage desired use. Patrols can also provide educational, skill-building, and stewardship opportunities. The International Mountain Bicycling Association's (IMBA) mountain bike patrol program could serve as a model that educates riders about sustainable trail concepts, stewardship opportunities, and trail etiquette.

Step 4. Install prohibitive signage that announces unsanctioned user groups and directs users to nearby trail opportunities.

Step 5. Install physical structures at the entrance to unsanctioned trails that make access on a bicycle difficult (by, for example, requiring a cyclist to dismount as they pass through). Such barriers can include natural materials, like rocks or logs, or manmade gates. A second barrier, within sight of the first structure, can be used to further discourage access.

Step 6. Expand City Ranger Programs and other paid patrols of trail systems and parks.

IMBA's National Mountain Bike Patrol (NMBP) consists of dedicated volunteers partnering with land managers, landowners and emergency personnel to assist, educate and inform all trail users to enhance their recreational experience. There are over 50 NMBP programs nationwide. Since 1994, the NMBP has provided hundreds of thousands of hours of volunteer service to countless land management agencies and trail users. Patrols operate as a volunteer group for the local land management agency and may or may not be affiliated with an area mountain bike club. Patrollers promote responsible mountain biking through IMBA's philosophy of environmentally sound and socially responsible riding, embodied in the universally recognized IMBA Rules of the Trail.

NMBP volunteers:

- Assist in medical and mechanical emergencies
- Educate trail users of proper etiquette
- Inform land managers, land owners and trail users of trail conditions through monitoring efforts
- Work with land managers to maintain and/or gain trail access for mountain bikers
- Offer volunteer services at outdoor races and events
- Collaborate with local clubs on trail work days, clinics, group rides and Take a Kid Mountain Biking Day

Related Recommendations

Stewardship

1. Support and build partnerships with park users and community organizations for trail and bike park construction and maintenance, park restoration and enhancement, and education.
2. Partner with trail-based organizations with expertise in planning, constructing, maintaining, and programming off-road cycling facilities.
3. Create formal partnership documents, such as Memorandums of Understanding (MOUs), to establish a framework of cooperation between the project owner and volunteer groups or organizations who will be assisting in the construction, maintenance and operation of a facility.
4. Encourage volunteer stewardship activities. Enhance trail stewardship programs, through improvements like increased use of volunteers and partnerships, additional volunteer training, trail adoption programs, tool libraries, and expansion of the City's Youth Conservation Corps.

Management

1. Develop a Risk Management Plan, addressing both user risk and environmental risk, for each facility or type of facility.
2. Monitor trail and bike park use, including any incidents and accidents, and any safety or environmental risks. Encourage community reporting of safety risks. Use adaptive management practices to address any problem areas.

Enforcement

1. Establish enforcement protocols that define the rules for facilities, associated penalties, and enforcement mechanisms.
 2. Use the escalating management hierarchy address unsanctioned trail use and reinforce sanctioned trail use and etiquette.
-

Funding

The Off-Road Cycling Master Plan will not be realized unless there is associated funding to complete the identified efforts and projects. There are multiple sources of funding for cycling efforts from the state, regional government, and private opportunities. This section seeks to provide a preliminary resource of funding sources that can be used to plan for and build Portland's future off-road cycling infrastructure.

Related Recommendations

Funding

1. Develop funding strategies for site development and maintenance. Explore options for creative financing (such as grants, sponsorships and donations) to secure capital funds.

Portland Parks & Recreation Funding Sources

Most of the recommendations in this plan would be carried out by Portland Parks & Recreation, who is the City's provider of park and recreation services. Portland Parks & Recreation is primarily funded through the City's General Fund, which incorporates revenues from property taxes, service charges, bond proceeds, and other sources. Additional funding and support comes by way of grants and financial and in-kind donations. To be built, the off-road cycling improvements envisioned in this plan will need to be recommended for funding through the Portland Parks & Recreation (PP&R) and the City capital improvement and budget processes. As part of this process, they would be measured against PP&R goals and against other park, recreation and citywide needs and priorities. Both the PP&R and City budget processes include opportunities for community input.

Statewide Funding Opportunities

Statewide Transportation Improvement Program (STIP)

[HTTPS://WWW.OREGON.GOV/ODOT/TD/STIP/](https://www.oregon.gov/ODOT/TD/STIP/)

The STIP is Oregon's four-year capital transportation improvement program. It identifies transportation projects for all systems (federal, state, city, and county) as well as multimodal projects. The STIP is divided into two funding buckets – Enhance and Fix-it.

- **Enhance funding** is for projects and activities that “enhance, expand, or improve the transportation system.” In efforts to be multimodal and mode-agnostic, the project list for Enhance funding is created by looking at the system holistically, not by individual modes. ODOT requests local jurisdictions to submit a list of proposed Enhance projects that move “people and goods through the transportation system.”
- **Fix-it** funding is solely for maintenance and preservation of the existing transportation system.

Opportunities for the Off-Road Cycling Master Plan: This is an extremely competitive funding mechanism, both between jurisdictions and within jurisdictions. Projects purely identified for off-road cycling and/or recreational purposes would not be strong competitors for these funding streams. Instead, these funding mechanisms might be more appropriate for the on-road links between off-road cycling areas that will create a more cohesive system.

Connect Oregon

[HTTPS://WWW.OREGON.GOV/ODOT/TD/TP/PAGES/CONNECTOR.ASPX](https://www.oregon.gov/ODOT/TD/TP/PAGES/CONNECTOR.ASPX)

Connect Oregon is a lottery-backed funding source that can be used for all modes of transportation. Public, private, and non-profit entities can apply for Connect funds, which may cover up to 70% of project cost. Connect funds cannot be used on projects that are eligible for the Highway Trust Fund (fuel and motor vehicle tax). While there are six considerations for funding, the three primary ones are:

1. Whether a proposed transportation project reduces transportation costs for Oregon businesses or improves access to jobs and sources of labor;
2. Whether a proposed transportation project results in an economic benefit to this state; and
3. Whether a proposed transportation project is a critical link connecting elements of Oregon's transportation system that will measurably improve utilization and efficiency of the system

Opportunities for the Off-Road Cycling Master Plan

Connect Oregon's restriction not allowing projects that are eligible for gas and fuel tax revenue slims the pool of potential projects. In the past funding cycle, a number of off-street trails were approved, most notable for Portland, a segment of the Red Electric Trail. Access to employment and/or goods movement is a major factor in project selection and should be thoroughly analyzed before a proposal is submitted.

Transportation and Growth Management (TGM)

[HTTPS://WWW.OREGON.GOV/LCD/TGM/PAGES/GRANTS.ASPX](https://www.oregon.gov/lcd/tgm/pages/grants.aspx)

TGM funds assist communities in coordinating land use and transportation planning to create livable, economically vital, and sustainable communities. TGM grants are only available for transit, walking, and bicycling projects. There are two categories of TGM grants:

- Category 1: Transportation System Planning, including TSP updates, to give Oregonians a range of transportation choices and meet requirements of the Oregon Transportation Planning Rule
- Category 2: Integrated Land Use & Transportation Planning, to promote compact, mixed-use development supported by improved pedestrian, bicycle, transit, and multi-modal street facilities

Opportunities for the Off-Road Cycling Master Plan

TGM funds are purely for planning purposes, not for building projects. As such, TGMs might be applicable for a site-planning or neighborhood planning effort which includes transportation to and from an off-road cycling destination. As with other state funding pots, TGM grants are highly competitive, and an off-road cycling project would only be a viable candidate if it were integrated into a transportation/land use focused planning effort.

Regional Transportation Funding

[HTTP://WWW.OREGONMETRO.GOV/PUBLIC-PROJECTS/REGIONAL-FLEXIBLE-FUNDING-TRANSPORTATION-PROJECTS](http://www.oregonmetro.gov/public-projects/regional-flexible-funding-transportation-projects)

Every three years, Metro allocates "regional flexible funds" to improve air quality, relieve congestion, and create more transportation options, and improve transportation system performance. This funding opportunity is unique given that the criteria used to prioritize and select projects is changed (nearly) every cycle by a regionally-representative body, the Joint Portland Advisory Committee (JPACT).

Opportunities for the Off-Road Cycling Master Plan

As with other funding sources, the combination of an off-road project with a greater transportation planning effort would be instrumental in identifying funding. In addition, any efforts that may be considered regionally significant could be an attractor for this funding pot given the regional charge of Metro.

Funding partnerships

Given the competitiveness and limitations of government funding sources, looking to foundations and companies as trail funding sources is recommended. The following foundations and companies were identified as potential funders of off-road cycling projects:

PeopleForBikes Community Grant Program

[HTTP://WWW.PEOPLEFORBIKES.ORG/PAGES/COMMUNITY-GRANTS](http://www.peopleforbikes.org/pages/community-grants)

PeopleForBike Community Grant Program is funded by bicycle industry partners and have funded Portland cycling efforts in the past, most notably the New Columbia Skills Park and Bike Hub. The following can be funded through this program:

- Bike paths, lanes, trails, and bridges
- Mountain bike facilities
- Bike parks and pump tracks
- BMX facilities
- End-of-trip facilities such as bike racks, bike parking, bike repair stations and bike storage

REI Community Partnerships

[HTTPS://WWW.REI.COM/STEWARDSHIP/COMMUNITY/NON-PROFIT-PARTNERSHIPS-AND-GRANTS.HTML](https://www.rei.com/stewardship/community/non-profit-partnerships-and-grants.html)

REI provides funding and assistance for projects in communities where they have stores. There are no specific guidelines for funding, besides having a connection to a store and it's "team members." REI does not accept unsolicited grant applications. Many, if not all, of REI's partnerships focus on protecting the environment in locations that staff, members, and customers recreate.

Partnerships with Health and Fitness Focused Companies

The Portland region is home to many recreation-focused companies. These companies include, among others, Nike, Adidas, Under Armour, Nutcase, and The Clymb. While each company has a different structure for community giving, they all have stewardship and community growth as tenants of their corporation.

In addition, health and medical companies have been interested and willing to fund bicycle-related activities in the past. Most notably is Kaiser-Permanente who sponsors both Sunday Parkways and BikeTown. Other large health care providers, such as OHSU and Legacy should be viewed as potential funders of off-road biking infrastructure and efforts.

Activity and User Fees

While projects may be successfully funded through a one-time grant or allocation, maintenance and operation of any off-road cycling infrastructure must be considered. Some communities charge user fees for their access to park and recreation facilities, although it is doubtful that user fees cover the operational costs of any of these facilities. However, such user fees can result in inequitable access by restricting access to public lands based on visitors' ability and willingness to pay. Examples include:

User Fees and Permits

- **Indiana Department of Natural Resources.** Off-road cyclists riding trails above beginner level are required to have a permit. An annual permit is \$20, and a daily permit is \$5. They can be purchased at recreation offices or online.
- **Phoenix Competitive Tracks**
- **Snoqualmie Forest (Washington).** The Snoqualmie Forest is privately-owned land used for timber production. Each person participating in non-motorized activities on the Snoqualmie Forest is required to have a permit. Annual individual and family permits are \$50, day user permits are \$8 and \$15 for an individual and family, respectively.
- **Raccoon River Valley Trail.** The Raccoon River Valley Trail is an 89-mile paved trail that travels through rural counties west of Des Moines, Iowa. Local conservation boards charge user fees of \$2 per day or \$10 per year to support trail improvements and maintenance. User fees are one of many revenue sources for trail maintenance. Fees are collected on an 'honor system', with permits sold in kiosks along the trail and at local businesses. Trail users under 18 are not required to have a permit. Users who live in cities along the trail are also exempt for trail segments within their city's limits.

Parking Fees

Currently, there are no parking fees at any current off-road cycling locations in Portland. However, the City does charge for parking at Washington Park and for on-street parking adjacent to many downtown parks. Nationwide, many parks that have off-road cycling (and other activities) sell parking passes that serve as partial funding for the upkeep of the property.

For example, Oregon's Sno-Park Permit supports the plowing and maintenance of parking lots for winter recreation. Permits are \$4 daily or \$25 annually. Oregon State Parks also charges vehicle entry fees for many state parks, some of which offer off-road cycling trails (L.L. Stub Stewart State Park, Silver Falls State Park, Milo McIver State Park, among others). Parking fees at Oregon State Parks are \$5 per day or \$30 annually. Visitors who arrive by bicycle are not required to pay parking fees.

Membership Dues

Membership dues, such as for membership in "Friends Of" type groups, are another way to support development and ongoing maintenance of parks and trail systems. For example, membership dues are one of many public and private sources of funding for the Katy Trail, a 3.5-mile paved trail in downtown Dallas, Texas. The Katy Trail is located in a public park but is maintained by the Friends of the Katy Trail, a non-profit organization responsible for raising funds for trail improvement and maintenance.

In 2015, membership dues amounted to nearly 20% of the group's \$865,000 in annual revenue (private donations were an additional 35% of revenue). Membership dues start at \$50 annually and provide members with access to special events and discounts at partnering businesses. Trail memberships are also available for canine "Katy Dogs". Membership dues help pay for regular maintenance, police patrols, and utilities.

Savings through Volunteer Engagement

Volunteer groups, including friends' groups and trail organizations, can become critical components of successful trail funding, through their volunteer work and fundraising. With supervision, volunteers can perform basic trail maintenance and restoration activities. They can also leverage their

membership, and the broader community, to fundraise for trail improvements and management. To maximize the potential of volunteer programs, partnerships should be formalized and documented. In addition, the land managing agency should support sufficient internal staff and the resources needed to oversee volunteer efforts.

SECTION 9. CONCLUSION

The Portland Off-road Cycling Master Plan is an immense step forward for Portland's understanding of off-road cycling opportunities in the city. The Plan's focus on providing a variety of experiences for a range of ages, abilities, and users will, undoubtedly, bring off-road cycling to more residents, many who may have never thought to participate.

The recommendations put forward in this plan are the result of an intensive community effort and will, hopefully, help the broader Portland community realize their vision for off-road cycling.

Glossary

Pending

Appendices

Pending