



Trails Plan

FOR THE TUALATIN HILLS PARK & RECREATION DISTRICT



OCTOBER 2006



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Introduction

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Plan Overview

Trails offer numerous aesthetic and recreational opportunities, as well as commuter options for traveling to and from destinations in the Tualatin Hills Park and Recreation District (Park District). Residents who desire to go for a family bicycle ride to the park or library, experience an undeveloped natural area, or bicycle or walk to work will benefit from a system of safe, well-connected trails. Trails often help raise property values, provide common space for social interactions, improve overall community safety, and encourage healthy lifestyles. When designed properly, they also can improve conditions related to over-use in sensitive environmental areas.

A high-quality trail system is a marker of a community where it is pleasant to live, work, and play. The Park District's Trails Plan Update (referred to as *the Plan*) uses the term 'trail' to describe shared-use paths, multi-use trails, and hiking paths designed for non-motorized usage. Sidewalks, paths, and bike lanes on or adjacent to roadways are noted when they provide a link between trails or between a trail and a

destination. Trail users may include but are not limited to: bicyclists, non-motorized scooters, in-line skaters, users of other wheeled devices such as Segways or electric assist-bicycles, roller skaters, wheelchair users (both non-motorized and motorized), strollers, walkers, and runners.

The Park District has many opportunities to enhance its existing trails system. Many of its parks and greenspaces have their own internal circulation trails. Some of them have been formally developed and others have been created by user demand, where people have simply walked and created a path.

As part of the development of the Plan, project staff analyzed the existing trail system and street network. The Plan recommends improvements that will upgrade the existing system where needed, fill in the missing gaps, and connect to significant environmental features, schools, public facilities, local neighborhoods, other parks, and business districts throughout the region.

This Plan builds upon the original 1998 Trails Master Plan, and is intended as a guide for general planning of trail development over the next 25 to 50 years. By taking a long-term view, the Plan includes projects that may be decades away. This long-term view sets forth the vision, the implementation of which depends on District and resident leadership and support. Trail alignment, location, design, and construction will be determined on an individual basis at the appropriate



The regional Fanno Creek Trail connects the Park District with Southwest Portland

time, while also considering funding, topography, natural resources, existing vegetation, maintenance access, and other issues.

Vision

The Park District is committed to developing a multi-use off-street regional trail system that connects to other regional trails in the Portland metropolitan area. The Plan proposes the development of a hierarchical trail system with a core system of regional trails serving as the backbone of the trails network, supported by a complementary system of community trails and neighborhood trails (*Figure 1*). This hierarchical system of trails—explained in more detail in the *Design Guidelines* and *Recommended Trail Network* chapters—gives community members high quality trail

opportunities throughout the Park District and to other parts of the Portland region. The trails system will connect communities, neighborhoods, schools, parks, and other public areas.



Figure 1. Trail Hierarchy

The recommended trail network complements the vision of Elsie Stuhr, who wrote about the formation of the THPRD in her 1996 book:

“In 1953, the City of Beaverton had a population of fewer than 3,000. The surrounding area was experiencing rapid growth. People who worked in Portland were seeking more space, a more peaceful environment, and lower taxes. They were creating suburban areas. Larger industries like Tektronix and Sawyers were making Washington County their home. This also brought more people.”

“Parents soon realized that while there was a more informal atmosphere in the suburbs, there was also a lack of recreational facilities for families, and no one

seemed to be planning for future open space.”

Trails will connect parks, public facilities, open spaces and natural areas, and community centers to richly enhance the quality of life. Additionally, the proposed trail system provides a series of smaller loops so that residents can use trails to travel to work, shop, and recreate.

Benefits of Trails

Updating and implementing the Trails Plan will help Tualatin Hills Park and Recreation District achieve a world-class recreation and transportation system. Improvements to trails facilities result in expanded recreation and mobility options for Beaverton, Tigard, Hillsboro, Washington County, and Portland residents and visitors, especially those who seek to integrate a healthy lifestyle into their daily activities. Given the scenic beauty of the area, trails also offer important recreational opportunities with relatively low impacts to the natural environment.

Access to trail systems and natural environments

further provides opportunities for environmental education and the establishment of a conservation ethic. An understanding of one’s natural environment leads to the future preservation of lands that are ecologically important as well as essential to a tourism industry that specifically relies on the presence of high quality open spaces and wilderness areas.

Widespread concern over national health issues and rates of obesity make opportunities for recreation increasingly important for individuals, communities, and governmental organizations. Studies show that frequency of trail use is directly proportional to the distance that one lives from trail access points. Communities with trail systems have healthier populations.

Recreational opportunities and transportation alternatives are important to the health of all Park District members, not just to those enjoying the trail system. People choosing to ride or walk rather than



The Waterhouse Trail provides excellent recreational opportunities

drive are typically replacing short automobile trips, which contribute disproportionately high amounts of pollutant emissions. Since bicycling and walking contribute no pollution, require no external energy source, and use land efficiently, they effectively move people from one place to another without adverse environmental impacts.

Walking and bicycling are also good choices for families. A bicycle enables a young person to explore his or her neighborhood, visit places without being



Neighborhood connections increase access to the trail system

driven by his or her parents, and experience the freedom of personal decision-making. More trips by bicycle and on foot mean fewer trips by car. In turn, this means less traffic congestion around schools and in the community, and less time spent by parents driving kids around. There are also more opportunities to speak to neighbors and more “eyes on the street” to

discourage crime and violence. It is no accident that communities with low crime rates and high levels of walking and bicycling are generally attractive and friendly places to live.

The extent of bicycling and walking in a community has been described as a barometer of how well that community is advancing its citizens’ quality of life. Streets that are busy with bicyclists and walkers are considered to be environments that work at a human scale, and foster a heightened sense of neighborhood and community. When asked to identify civic places that they are most proud of, residents will most often name places where walking and bicycling are common, such as the Rock Creek Trail, the Fanno Creek Greenway, and the Tualatin Hills Nature Park.

An integrated and consistent trail system can further result in significant economic benefits to Park District communities. This includes improvements in real estate values for homes near quality facilities and ‘pedestrian-friendly’ areas, retention and attraction of quality employees for businesses, and direct expenditures from visitors touring on expanded pedestrian and bicycle routes.

Related Plans & Background Documents

Several adopted planning processes have helped guide the vision and development of this update to the Tualatin Hills Park and Recreation District Trails Master Plan. Following are summaries of the plans and their relevant goals, objectives, and policies:

THPRD 20-Year Comprehensive Master Plan (1997)

The 1997 Comprehensive Plan notes under “Changing Land Use” in the Introduction that, as “the region places more emphasis on transit use, walking, and bicycling, people will need a good system of trails that are well connected and maintained.” Echoing this sentiment was the need for a major north/south pedestrian corridor that emerged as one of the priority issues from workshops held around the District.

The need for a comprehensive trail system was highlighted in Goals 4 and 5 of the Comprehensive Plan. Goal 4 states, “Acquire, conserve, and enhance natural areas and open space within the District.”

Objective 4C is to: “Develop an open space system of key areas and corridors, linking parks, recreational facilities, natural areas, and other community areas by working cooperatively with the City of Beaverton, Washington County, the Beaverton School District, Metro, commercial property owners, and others.”

Goal 5 directly relates to the developing trail system: “Provide a safe and efficient trail system connecting District parks and facilities with schools, other parks and recreation facilities, and other important community destinations.” The supporting Objectives are:

5A. Maintain and periodically update a Pathways and Trail Master Plan to guide the District in the acquisition and development of its recreational trail system.

5B. Develop a recreational trail system with linkages to local and regional corridors, both existing and proposed.

5C. Use the recreational trail system to link parks and other important destinations (such as schools, transit stations, and employment centers) to encourage pedestrian and bicycle travel and recreation.

5D. Design and construct trails with suitable surfaces and width based on location, type of connecting link, and use.

In striving to achieve the above goals and objectives,

the Comprehensive Plan notes the following in a bulleted list of Action Items under “How the District Plans to Reach its Destination:”

“Acquire land for trails, consistent with the Pathways and Trail Master Plan, concentrating on building main trail connections first, then on adding shorter trails to provide connections between and within neighborhoods.”

The updated 2006 Comprehensive Plan includes many of these same goals and objectives. It also incorporates key information, goals, objectives, and priorities from this Plan.

City of Beaverton Transportation System THPRD Trails Master Plan (1998)

The 1998 Trails Master Plan opens with this quote: “We are building a trail system that connects our community by linking neighbors to neighborhoods and neighborhoods to resources and the region. This trail system will reinforce the livability of the community by bringing people together and giving them choices. It will utilize a small portion of our community to provide a far-reaching alternative to motorized transportation. Our success will be measured by the use of these facilities by all ages.”

The Plan identifies the following two primary findings related to trails in the Park District:

- Trails are not presently provided in proportion to the public demand.
- Trails can be one of the most heavily used recreational facilities.

In response to these identified needs, the Trails Plan Concept is to “develop regional trails that connect with other regional trails in the Portland Metropolitan area. These would be supplemented by community and neighborhood trails.”

The Plan outlines a number of goals that will serve as guidance for the implementation of the plan, including:

- The Park District will coordinate trails planning.
- The Park District will review land development projects for local trail needs and connections.
- Additional trail planning will occur for specific routes.
- The Park District will continue to plan and update the Trails Plan.

Washington County 2020 Transportation Plan (2002)

The Washington County 2020 Transportation Plan “addresses the major roadway system (i.e., non-local roadways), transit, pedestrian, and bicycle transportation issues” and focuses on specific and system requirements. The existing and future trails within Washington County are first addressed in the

Pedestrian Element of the Transportation Plan, as well as the Bicycle Element.

The Pedestrian Element notes, “Key elements of the urban pedestrian system are on-street sidewalks, off-street trails, crossing locations, connectivity, illumination and streetscape amenities. On-street sidewalks form most of the pedestrian system in urban Washington County.”

The Plan has this to say about the off-street network, “The off-street pedestrian network consists of existing and planned paved multi-use trails and pathways that are generally located within drainage and utility corridors, parks and other public rights of way (See Figures 12a-f). In unincorporated Washington County, off-street trails are constructed and maintained by trail providers and homeowners’ associations. Trail providers include THPRD and cities. Trails and pathways constructed as part of private development are often maintained by homeowner’s associations. The trails and pathways shown on the Off-Street Trail System include trails from the RTP’s Regional Pedestrian System, Metro’s Greenspaces Master Plan, THPRD’s Trails Master Plan, and Special Area Off-Street Pathways and Trails identified through light rail station area and regional and town center planning efforts. All trail alignments are generalized. Specific alignments will be determined through the development review process or a specific planning

process for a trail.”

One of the strategies identified in the Pedestrian Element is to, “Work, as appropriate, with Metro, Tualatin Hills Park and Recreation District (THPRD), cities, other agencies and organizations, and private development to plan, map, and construct an off-street system of multi-use trails and pathways.”

The Pedestrian Element establishes a number of pedestrian classifications, including:

- **Off-Street Pathways** (includes special area off-street pathways): These paved, multiuse pathways serve an important circulation function in areas not well served by the street system, and provide shortcuts between origins and destinations. An accessway, which provides a short connection between two roadways, is an example of a pathway serving a circulation function. Special area off-street pathways are pathways that are located in a transit-oriented district. Off-street pathways are identified on the Off-Street Trail System Map and the Community Plans.
- **Special Area Trails:** Special area trails are located in transit oriented districts and are intended to serve recreational walking trips (for example, along a stream or through a park). Special area trails are identified on the Off-Street Trail System Maps and in the Community Plans.

The Bicycle Element notes that, “Other agencies, primarily the Tualatin Hills Park and Recreation District, have developed and planned an extensive network of paved, off-street pathways intended to be shared by bicycles and pedestrians. While the primary purpose of these facilities is for recreation, they serve a transportation function as well, providing an alternative means of accessing a variety of destinations. Some, but not all of these facilities are shown as part of the Regional Bicycle System in Metro’s Regional Transportation Plan. The alignments shown on the Off-Street Trails Map have been taken from the Tualatin Hills Park and Recreation District’s *Trails Master Plan* (revised May 2000) and are conceptual; actual alignments and crossing locations at street intersections will be determined via the development review process. For the current official planning status of these trails, consult the most recent version of the Tualatin Hills Parks and Recreation District’s *Trails Master Plan*.”

Fanno Creek Greenway Trail Action Plan (2003)

The proposed Fanno Creek Greenway Trail extends 15 miles from the City of Tualatin to the City of Portland, connecting the mouth of Fanno Creek at the Tualatin River in Tualatin to Portland’s Willamette Park adjacent to the Willamette River.

The trail consists of both on-street and off-street sections, many of which have already been constructed.

Approximately one-half of the trail has been completed. The proposed route begins at the Tualatin River, then heads north for about nine miles through Durham, Tigard, and Beaverton, and unincorporated Washington County. The trail then veers away from Fanno Creek and follows various alignments, heading east for approximately six miles from the Garden Home Recreation Center to the Willamette River. The trail can thus be divided into two distinct segments: the multi-use path segment between the Tualatin River and Garden Home, and the “urban” segment from Garden Home east through built-up southwest Portland neighborhoods to the Willamette River.

For planning purposes, the Fanno Creek Greenway Trail has been divided into 11 “gaps.” Each gap is about one mile in length. These gaps are located along the proposed greenway where the trail is incomplete in terms of the trail segments and/or roadway crossing treatments. Two of the identified gaps occur within the Park District boundaries.

Metro Regional Trails & Greenways (2003)

The Metro Regional Trails & Greenways pamphlet outlines a vision for a regional system of trails and greenways. The pamphlet notes, “The growing popularity of outdoor recreation activities, such as walking and running, cycling, skateboarding and wildlife observation, has increased the need for quality

regional trails. Park and recreation providers, local cities and citizens have teamed up in an ambitious effort to establish a network of trails linking parks and greenspaces to local communities and other area attractions.”

Among the trails identified by the pamphlet are existing trails, proposed trails, water trails, and greenways.

Within the Park District boundaries are several trails identified on Metro’s regional system, including:

- **Westside Trail (formerly the Beaverton Powerline Trail or BPT)**—An electric powerline corridor owned by PGE and BPA. This 25- to 26-mile trail route runs from the Tualatin River near the Tualatin Wildlife Refuge north to Forest Park. Currently some portions of the 10-mile trail in the Park District are complete, totaling more than two miles.
- **Fanno Creek Greenway Trail**—This trail begins at Willamette Park on the Willamette River Greenway, just south of downtown Portland. It stretches 15 miles to the west and south through Beaverton, Tigard, and Durham, and ends at the Tualatin River in Tualatin. Approximately half of the trail is complete; additional sections are under construction (see the Fanno Creek Greenway Trail Action Plan).
- **Bronson Creek Greenway**—From the confluence with Beaverton Creek, this greenway

heads east and crosses the ridge of the Tualatin Mountains linking with the trail system in Forest Park.

- **Beaverton Creek Greenway**—From the confluence of Beaverton and Bronson Creek, the Beaverton Creek Greenway connects with the Fanno Creek Greenway Trail at Highway 217 near Southwest Allen Boulevard.

The pamphlet has this to say regarding greenways:

“Greenways generally follow rivers and streams and may or may not provide for public access. In some cases, greenways may be a swath of protected habitat along a stream with no public access. In other cases, greenways may allow for an environmentally compatible trail.”

City of Beaverton Transportation Element

Chapter 6. Transportation Element, City of Beaverton Comprehensive Plan (2004)

Chapter 6 of the Transportation Element of the City of Beaverton’s Comprehensive Plan incorporates much of what is detailed in both the 2001 TSP Update, as well as the 1997 TSP. One improvement upon the 2001 TSP Update is an updated Bicycle and Pedestrian Action Plan. The action plans were detailed in the 1997 TSP sections specific to mode choice. A number of the projects highlighted in the Pedestrian Action Plan relate to THPRD’s current planning efforts, including:

- US 26 / Bethany Trail Crossings.
- Study US 26 Trail Crossings.
- Study and improve unsignalized trail crossings of roadways.
- Link Fanno Creek Path over ORE 217 at Denney.
- Study Fanno Creek Path.

City of Beaverton Transportation System Plan Update (2001)

The Beaverton Transportation System Plan Update (TSP) reviews the existing condition of the transportation system and provides a framework for transportation improvements in the future. The TSP recognizes the importance of multi-modal travel options and strives to improve the bicycle and pedestrian environment over time. The TSP update does not include detailed chapters on each of the travel modes, as those were adequately addressed in the previous TSP. The following statements reflect transportation policy goals and objectives from the TSP:

Goal 6.2.1 Transportation facilities designed and constructed in a manner to enhance Beaverton’s livability and meet federal, state, regional, and local requirements.

One of the supporting policies to Goal 6.2.1 states, “Locate and design recreational multi-use paths to balance the needs of human use and enjoyment with resource preservation in areas identified on the Natural

Resource Inventory Plan Map for their Significant Natural Resource values.”

Goal 6.2.2 A balanced transportation system.

A supporting policy of Goal 6.2.2 states, “Develop and provide a safe, complete, attractive, efficient, and accessible system of pedestrian ways and bicycle ways, including bike lanes, shared roadways, multi-use paths, and sidewalks according to the pedestrian and bicycle system maps and the *Development Code* and *Engineering Design Manual and Standard Drawings* requirements.”

An action statement for this policy notes the need to continue to coordinate with the Tualatin Hills Park and Recreation District. A second action item identifies the need to maintain the opportunity for resident groups to fund multi-use path improvements through the local improvement district process.

Another supporting policy notes the need to provide connectivity to each area of the city for convenient multi-modal access.

Goal 6.2.3 A safe transportation system.

“Construct multi-use paths only where they can be developed with satisfactory design components that address safety, security, maintainability, and acceptable uses. Multi-use paths should converge at traffic-controlled intersections to provide for safe crossing, although they should be separate and distant from major streets for most of their length.” An action item

notes the need to study trail-crossing treatments for appropriate use at locations where out-of-direction travel by path users to an intersection is significant. When multi-use paths follow rear lot lines, use design treatments to minimize the impacts to private property.

City of Beaverton Transportation System Plan (1997)

Although much of the 1997 Transportation System Plan (TSP) was updated in 2001, detailed chapters on individual travel modes were not updated, as the city and consultants felt that the 1997 TSP sufficiently addressed the specific issues related to Pedestrians (Chapter 5), Bicyclists (Chapter 6), Transit (Chapter 7), Motor Vehicles (Chapter 8), and other modes (Chapter 9).

Chapter 5 of the 1997 Beaverton TSP “summarizes existing and future pedestrian needs in the City of Beaverton, outlines the criteria to be used in evaluating these needs, provides a number of strategies for implementing a pedestrian plan, and recommends a pedestrian plan for the City of Beaverton.”

Chapter 6 of the 1997 Beaverton TSP “summarizes existing and future facility needs for bicycles in the City of Beaverton. The following sections outline the criteria to be used to evaluate needs, provide a number of strategies for implementing a bicycle plan and recommend a bicycle plan for the City of Beaverton.”

Both of these chapters deal almost exclusively with the on-street network, with very little mentioned regarding off-street, multi-use paths. One place where both chapters address off-street paths is in Goal 3, Policy 6, which states:

Construct pathways only where they can be developed with satisfactory design components that address safety, security, maintainability and acceptable pathway use.

Although pathways are encouraged to be separated and distant from major streets for most of their length, they are encouraged to converge at traffic-controlled intersections for safe crossing. New construction of pathways along residential rear lot lines will not be encouraged unless no comparable substitute alignment is possible in the effort to connect common attractors or existing segment links. When pathways do follow rear lot lines, design treatments described in the Beaverton Engineering Design Manual will be followed to minimize the impacts to private property.

Green Trails: Guidelines for Environmentally Friendly Trails (2004)

This guidebook, produced by Metro in 2004, provides a comprehensive source of information about planning, construction, and maintenance of environmentally friendly or “green trails” – trails that avoid or minimize impacts to water resources and fish and wildlife habitat. It focuses on trails in environmentally sensitive areas and recommends strategies for avoiding or limiting the impacts on wildlife, water quality, and water quantity. It also provides an extensive bibliography of other sources that give more specific guidelines for trail planning, design, construction, and maintenance.

Washington County Comprehensive Framework Plan (2005)

The Washington County Comprehensive Framework Plan for the Urban Area contains policies and strategies that are designed to address growth and development inside the UGB. The following policies influence or relate to the Park District:

Policy 10—Biological Resources and Natural Areas. Implementation strategies for the County include: preservation of significant natural areas through fee simple purchase and encouragement of purchase by other concerned agencies and groups (i.e. Park District, Nature Conservancy).

Policy 34—Open Space and Recreation Facilities Location. Implementation strategies for the County include:

- Notifying the Tualatin Hills Park and Recreation District (THPRD) or other appropriate service providers when a development application is accepted for a site, which includes a potential park and recreation area identified in a Community Plan.
- Giving priority to the preservation of lands with the potential for linkage into open space corridors especially for trail systems (hiking, jogging, bicycling, horseback riding).

Oregon Trails 2005-2014: Non-Motorized Trails Plan (2005)

The purpose of this non-motorized trails planning effort was to provide information and recommendations to guide the Oregon Parks and Recreation Department and other agencies in Oregon in their management of non-motorized trail resources. The plan is designed to:

- Assess the needs and opinions of Oregon’s citizens as they relate to non-motorized trail opportunities and management;
- Establish priorities for expenditures from the Federal Recreational Trails Grant Program;
- Develop strategic directions to guide activities for

statewide recreational trails planning;

- Gather additional inventory measurement data for non-motorized trail resources and facilities; and
- Recommend actions that enhance non-motorized trail opportunities to all agencies and the private sector providing trail resources in Oregon.

The top two statewide non-motorized trail issues include:

A need for trail connectivity—“Recreation providers and other workshop attendees consistently reported the need for non-motorized trail connectivity within their regions. According to recreation providers, trail connectivity involves linking urban trails to outlying Federal trail systems; linking neighborhood, community and regional trails; connecting community parks and other recreational and public facilities; and connecting neighboring communities (e.g. Ashland and Medford). Recreation providers strongly felt that increasing non-motorized trail connectivity will result in better use of the state’s existing non-motorized trail infrastructure and provide more trail opportunities.”

A need for trail maintenance—“Recreation providers strongly stated that they are struggling to maintain existing trails due to increasing use levels and declining maintenance budgets. At the same time, providers are being asked by user groups to develop more and more new trails. A common argument made across the state was that additional priority should

be given to maintain what we currently have before adding additional facilities. According to providers, there always seems to be funding available for trail development—but not for routine day-to-day trail maintenance.”

Other concerns included the needs for:

- More trails in close proximity to where people live.
- Additional non-motorized trails.
- Considering public ways proposed for closure or abandonment for non-motorized trail use.
- Regional interagency coordination / cooperation in trail management.

Cooper Mountain Master Plan & Management Recommendations (2005)

Metro purchased 256 acres in the Cooper Mountain Target Area, located on the southwest edge of Beaverton, including 231 contiguous acres near the crest on the southwest slope of the mountain, with 1995 bond measure funds. The preferred site design includes a “3.5-mile trail system, marked by interpretive signs, to accommodate hikers, wheelchair users, and equestrians.” Along with the on-site trails, the master plan highlights the regional context and potential linkages to the natural area.

In discussing trails, the plan notes, “Several off-street trails exist and are planned near the site. One mile east of the natural area, the Westside Trail, a regional north-south trail, is planned to connect a number of other natural areas (i.e. Tualatin Hills Nature Park, Bull Mountain, and potentially the Tualatin River National Wildlife Refuge). The Burlington Northern Trail, a north-south corridor approximately one mile to the west of the natural area, has recently been nominated as a regional trail corridor.” The Cooper Mountain Trail, originally an east-west community trail connecting these two north-south corridors, has also been approved as a regional trail.

Goals & Objectives

This Plan aims to develop a comprehensive network of multi-purpose trails that link important pedestrian generators, environmental features, historic landmarks, schools, public facilities, Town Centers, and business districts. The following goals were derived from existing plans and input from the Park District’s Trail Advisory Committee members, THPRD staff, and Park District residents.

Goal 1: Providing Recreation Opportunities

Provide a connected system of trails giving district residents the option for passive recreational opportunities not typically supplied by parks and facilities, such as jogging, walking, and bicycling.

Goal 2: Trail Development and Regional Connections

Establish and enhance regional trail connections to the adjacent communities of Hillsboro, Tigard, unincorporated Washington County, and the greater Portland metropolitan region. Seamlessly connect regionally-significant trails with local trails and ensure that new development and subdivisions connect to this system. Establish trail connections between fragmented portions of existing trails. Coordinate trail development with other jurisdictions such as the City of Beaverton, Washington County, and Clean Water Services (CWS). A major goal of the Park District's Trails Advisory Committee is to "complete construction of one continuous trail."

Goal 3: Access

Develop a trail system for people of all abilities, pedestrians, bicyclists, and other non-motorized trail users. Link to a complementary system of on-road bicycle and pedestrian routes to provide connections between THPRD facilities where no trail corridor exists. Include access to light and commuter rail facilities, and

address safe crossings at major roadways.

Goal 4: Community Linkages

Link trails to neighborhoods, community facilities such as the library and civic and community centers, parks, schools, athletic facilities, swimming pools, historic districts, the downtown, and other commercial and retail activity centers in Beaverton and Washington County.

Goal 5: Amenities

Locate trailheads at or in conjunction with park sites, schools, and other community facilities to increase local access to the trail system. Furnish trail systems with trailhead improvements that include interpretive and directional signage systems, benches, drinking fountains, parking and staging areas, and other services.

Goal 6: Maintenance and Emergency Access

Develop trail design and development standards that are easy to maintain and access by maintenance, security, and emergency vehicles.

Goal 7: Preservation

Provide trail access to and preserve view corridors and viewsheds at vantage points. Preserve existing public rights-of-way and other easements for future trails and accessways, particularly powerline and utility corridors. Preserve sensitive natural areas by designing,

planning, and constructing trails so that the natural area can be experienced without impacting or degrading the environment.

Goal 8: Funding

Provide adequate funding to develop, enhance, and maintain trails and pathways through a variety of public funding sources while exploring other private funding opportunities within the state, region, and district.

Existing Conditions



Needs Overview

Summary of Existing Conditions

Challenges & Opportunities

Needs Overview

This section provides an overview of user needs identified for the Park District's trails system. The existing trails system currently attracts a variety of users, including walkers, runners, rollerbladers, and recreational and casual bicyclists. Each of these user groups has different needs—bicyclists and rollerbladers prefer smoother, hard surfaced trails, while hikers and runners may prefer a more natural soft surface environment. This will affect planning and design of the trail system. In addition to meeting the needs of different user groups, the trails must appeal to people of all ages—over 30% of District residents are either under the age of 15 or over the age of 65. The District's trails system should be designed to accommodate this variety of uses and people.

Recreational Needs

Recreational use generally falls into one of three categories: exercise, trips to non-work destinations (such as shopping or libraries), and sightseeing. Recreational users have varied needs, since they have a broad range of skill and fitness levels, from a bicycle

racer who does long rides each weekend, to a family with young children who want to ride a couple of miles down a quiet trail, to a weekend rollerblader out for some fun and exercise. Needs and patterns for recreational trail users include:

- Recreational users range from healthy adults to children to senior citizens with a wide variety of abilities and interests.
- Directness of the route is typically less important than the quality of the trail experience. Visual interest, shade, protection from weather, moderate gradients, and other “comfort” features are also very important.
- People exercising or touring often prefer a loop.

Having recreational amenities and features along the route is important for all users, including drinking fountains, shaded areas, picnic tables, interpretive signs, and scenic vistas. Recreational destinations such as parks and schools are also important, as they provide a place to stop, rest, play, and walk around.

Utilitarian Needs

Transportation trips are those that are primarily utilitarian in nature, including trips for reaching school and work commute, shopping, friends, and even to a recreational destination. There are over 70 schools and hundreds of parks and recreational facilities as possible destinations within the District's service area. People making

utilitarian trips, whether in a car, on foot, or on a bicycle, share common attributes in the facilities they seek to use. For potential trail users, these attributes include:

- Trip lengths that range from a few blocks to five or more miles.
- Direct routes where they are required to stop as few times as possible.
- Travel periods that often coincide with peak traffic volumes and congestion, increasing the exposure to potential conflicts with vehicles.
- Places to rest, drink, and store their travel gear at their destination.
- Intersections with no stop signs or signal controls.
- Safe trail crossings over major motorized routes.
- Links to a comprehensive bicycle and pedestrian system.

The Westside Trail (BPT), Beaverton Creek Trail, and Fanno Creek Greenway are all likely to serve a high volume of commuter cyclists along with recreational users. All three of these trails are identified as “regional” trails on Metro's Regional Trails and Greenways Map, meaning they are eligible for federal and regional funding and must be 8–12 feet wide, with an appropriate hard surface.

Connecting Facilities

In order to increase access for a greater number of trail users, connections to the trails must be maximized and integrated into the planning process.

Within the District, strong links and signage between neighborhoods and the trails system are needed to allow trail users to access trails directly from their homes, rather than driving to a trailhead or other access point. Potential trail connections are identified on the trail system map.

On the eastern edge of the District, the trails system connects to existing segments of the Fanno Creek Greenway Trail and the proposed Red Electric Trail in Southwest Portland. Along the western edge, the trails system will connect to the BN Trail and the continuation of the Cooper Mountain Trail and TV Highway Trail. To the south, existing and proposed trails such as the Westside Trail (BPT), the South Johnson Creek Trail, and Fanno Creek Trail will connect to existing and proposed trails in Tigard and Washington County such as the Tonquin Trail. On the northern edge, the Westside Trail (BPT) and Waterhouse Trail will continue into greater Washington County as the District and County continue to experience substantial growth in that area.

Public Input

Trail-related activities are very popular in the Park

District. When asked about trail-related activities in a recent Park District telephone survey conducted as part of the Comprehensive Master Plan update, 84% of respondents identified hiking, biking, and walking trails as either very important or somewhat important to their overall quality of life. When asked to prioritize various services or programs for the District on a scale of 1–10, trails received a mean score of 7.2, just behind parks, aquatic and recreation centers, and open spaces and sports fields.

Identified needs that have merged from discussions with the public and the District's Trails Advisory Committee include:

- Focus on a few primary north/south and east/west trails, such as the Beaverton Creek Trail, Fanno Creek Trail, and the Westside Trail (BPT).
- Make sure that the trails serve a destination. A number of the existing trails seem to exist in a space all their own, with no clear connections to neighborhoods, parks, schools, or commercial centers.
- Complete trail segments. Many of the existing trails are only partially complete, making longer trips more difficult.
- Find and create safe street crossings, particularly across TV Highway, Farmington Road, Hall Boulevard, Walker Road, 185th and Sunset Highway.

Summary of Existing Conditions

Currently, the Park District includes most land in the City of Beaverton, as well as unincorporated areas of Washington County, covering approximately 50 square miles. As the Portland metropolitan area's urban growth boundary is extended in Washington County, these new areas may be brought inside the District's boundaries. Other areas may be added to the Park District in the future through a variety of means.

Downtown Beaverton is recognized as a Regional Center in Metro's 2040 Growth Concept Plan, while Raleigh Hills, Cedar Hills, Aloha, and Murray-Scholls are all recognized as Town Centers.

The District currently has over 16.5 miles of paved trails, including several completed sections of regional trails such as the Westside Trail (BPT), the Rock Creek Trail, and the Fanno Creek Greenway Trail. However, almost all the trails within the Park District are discontinuous, making it more difficult for District residents to utilize and access the full trail system. Many of the existing parks have internal park circulation trails



Joggers on the Fanno Creek Trail

that are or will be connected to the larger trail network, providing excellent destinations and resting points along the trail network.

The Park District also contains a number of major roadways, such as the Sunset Highway (US 26), State Route 217, Beaverton Hillsdale Highway (US 10), Tualatin Valley Highway (US 8), Farmington Road, Hall Boulevard, Murray Boulevard, and others that consistently have higher speeds and traffic volumes, making non-signalized, at-grade crossings difficult or impossible for trail users.

Continued growth and development is one of the most pressing challenges for the Park District. Nearly 213,000 people currently live in the Park District (2005 estimate). In the year 2000, approximately 35% of households in the Park District included children, with people under 20 making up about 27% of the

population and people 65 and over accounting for 7.7 percent. Within the next 20 years, the number of people in the Park District is expected to increase by about 65,000 people.

Existing Trails System

The Park District is mainly concerned with the off-street trails network. On-street connections between parks, trails, schools, community centers and other desirable locations are the primary responsibility of the City of Beaverton and Washington County.

There are three classes of trails in the Park District system: regional trails, community trails, and neighborhood trails. Additional descriptions and recommended designs of the trail types are located in Chapter 3. Design Guidelines. As noted above, the Park District currently has a number of partially completed regional trails that will eventually provide connections to Portland, Hillsboro, Tigard, and portions of unincorporated Washington County. Existing Community trails include: Cedar Mill Trail, Waterhouse Trail, the Hiteon-Conestoga Trail, and others. Neighborhood trails provide linkages to parks, as well as the larger regional and community trail system. These trails may be either a soft surface trail or a paved surface, depending on the type of users and surrounding environment. In addition to the three classes of trails described above, paved and earthen trails are also found throughout many of the District's

parks, providing internal circulation and connections. Some of these parks include:

- Hyland Forest
- Taliesan
- Channing Heights
- Nature Park
- Jenkins Estate
- Hazeldale

Opportunities & Challenges

Limited Trail Development Opportunities

Much of the Park District has been subdivided and developed in the last 30 years. The opportunity to develop trails through most of these neighborhoods has been lost and future trails will rely heavily on undeveloped parcels of land that are slated for development, as well as existing powerline corridors and other utility easements.

Limited Trail-Roadway Crossing Opportunities

As noted above, the Park District contains a number of major roads, including two state highways. Primary crossings of these will occur on through street overpasses utilizing existing bike lanes and sidewalks. Access to these overpasses can be problematic at best, dangerous at worst. At-grade crossings of other major roads within the District, such as Walker Road, Hall Boulevard, Murray Boulevard, and TV Highway also present difficulties due to vehicle speeds and volumes, distance to existing crossings, and roadway width.



Difficult crossing of Hall Boulevard along Fanno Creek

Limited Public Rights-of-Way and Encroachment

Beaverton, like many well-established communities, has the challenge of accommodating and balancing the needs of different roadway users within limited public rights-of-way. Also problematic is the issue of private property encroachment into the Park District right-of-way, such as a property owner placing trees, shrubs, fences, or walls in the public right-of-way. Although it is within the District's right to reclaim this space, it can be challenging to do so.



Encroachment into Park District property

Topography and Rivers

Steep hillsides and sensitive stream corridors with dense vegetation present challenges to trail development and implementation.



Rivers and stream corridors make trail connections challenging

Fragmentation

One of the major problems with the current trail system is a lack of continuity and consistency. As noted earlier, none of the current trails are fully realized.



Rock Creek Trail ends abruptly at West Union

Signage

The Park District currently uses no consistent signage or trail identification system to provide mileage or directional information. The lack of distinct signage can create confusion and a lack of recognition among trail users. However, there are some trails, such as the Fanno Creek Greenway Trail from Garden Home to 92nd Avenue, that have directional signage.

Demand Trails

Demand trails or “desire lines” are footpaths created by people where there are no formal existing facilities. These trails usually indicate that a facility is needed.



Demand trail to Commonwealth Lake Park

Demand trails are often present along roadways without sidewalks or trails, in natural areas without a formal trail system. These trails can be especially problematic in environmentally sensitive areas, where

they can destabilize slopes, promote erosion and channeling, trample sensitive vegetation in riparian areas, and disrupt wildlife nesting and feeding sites.

However, demand trails can be an opportunity for trail development, as the trail has already indicated where people would like to go and provided a route to get there. Demand trails can be difficult to close and rehabilitate once they have been identified as a link. In these cases, it may be best to develop the trail and mitigate any problems that may have developed due to people informally using the area.

The existing Park District trail system is a tremendous resource. In the future, the Park District needs to focus on acquiring new corridors (or built trails) as development occurs while connecting the existing trails.



Design Guidelines

Plan Concept

Definitions of Proposed Trail Types

Trail Designs

Trails & Environmental Permitting

Trail-Roadway Crossings

Plan Concept

This Plan envisions the development of a trail system that integrates regional, community, and neighborhood trails (*Figure 1 on page 3*). This system of trails gives community members a wide variety of options for exercise and recreation, leisure and nature viewing, commuting, and running errands.

Regional Trails

Regional trails connect residents within the Park District to adjacent communities—Hillsboro, Tigard, unincorporated Washington County, and the greater Portland metropolitan region—and to regionally significant features such as the Tualatin Hills Nature Park, Cooper Mountain Natural Area, Jenkins Estate, and the H.M.T. Recreation Complex. There are six identified regional trails in this Plan in the Park District, with existing segments for three of those trails. The following proposed regional trails and greenways are currently in Metro's Regional Transportation Plan (RTP) and are eligible for regional funding:

- **Rock Creek Trail:** From the Tualatin River, this trail parallels Rock Creek and heads northeast through Hillsboro, eventually connecting to the Westside Trail (BPT). Most of the segments in the Park District are completed.
- **Westside Trail (BPT):** An electric powerline corridor owned by PGE and BPA, this trail route runs from the Tualatin River near the Tualatin Wildlife Refuge (where it connects with the Tonquin Trail) north to Forest Park through the Tualatin Hills Park & Recreation District. Currently, some portions of the trail are complete.
- **Fanno Creek Greenway Trail:** This trail begins at Willamette Park on the Willamette River Greenway, just south of downtown Portland. It stretches 15 miles to the west and south through Beaverton, Tigard, Durham, and ends at the Tualatin River in Tualatin. Approximately half of the trail is complete. Within the Park District, there is one short section left to complete between Denney Road and 92nd Avenue.
- **TV Highway Trail (part of the Turf to Surf Rail-with-Trail):** The full length of the Turf to Surf Trail will connect downtown Lake Oswego to the Oregon Coast. In connecting to the coast, the trail will utilize the TV Highway Trail as it heads west through Beaverton and the Park District.
- **Beaverton Creek Greenway:** From the confluence of Beaverton and Bronson Creek, the Beaverton Creek Greenway connects with the Fanno Creek Greenway Trail at Highway 217 near SW Allen Boulevard.
- **Cooper Mountain Trail (pending adoption into RTP):** This trail would start at the Westside Trail (BPT), head west to Cooper Mountain, and then continue west past the Jenkins Estate, eventually connecting to the regional BN Trail. The regional trail is referenced in the 2005 Cooper Mountain Natural Area Study produced by Metro and Mayer/Reed, with a connection shown to the park and a potential trail alignment along an existing service road.

Regional trails generally have their own right-of-way and have minimal conflict with automobile traffic. These trails are designed to meet the Americans with Disabilities Act (ADA) standards, American Association of State Highway and Transportation Officials (AASHTO) standards, Oregon Department of Transportation (ODOT) standards and other state and federal guidelines, which make them eligible for State and Federal transportation funding. Regional trails serve bicyclists, pedestrians, wheelchair users, skaters, and others.

Community Trails

Community trails link important land uses and areas of interest within the Park District, including retail areas, schools, parks, transit centers, churches, employment districts, libraries, and other desirable areas. Community Trails also connect users to adjacent communities and the regional trail system.

Most community trails in the Park District are off-street shared-use paths that meet State and Federal standards. However, some community trails may follow neighborhood streets for a short stretch, in which case pedestrians are accommodated with a sidewalk or shared-use path and bicyclists share the roadway with vehicles.

Neighborhood Trails

Neighborhood trails primarily serve pedestrians with safe and direct connections to local features such as schools, parks, natural areas, and community centers. Some neighborhood trails may also be appropriate for bicycling and skating. While neighborhood trails may have their own right-of-way, others may follow neighborhood streets for a short segment, in which case pedestrians are accommodated with a sidewalk or shared-use path and bicyclists share the roadway with vehicles. There are two classes of neighborhood trails:

- Urban Trails
- Natural Trails

Urban trails are typically paved or made of a smooth surface to accommodate most trail users, and are found in more urban areas to provide an accessible connection to a neighborhood park or other destination.

Natural trails are soft-surface trails typically found in undeveloped parks and natural areas and aim to provide a natural outdoor experience. These trails are usually for pedestrians only.

Definitions of Proposed Trail Types

Trail or Path

A designated land corridor or body of water that provides a marked path with little interruption in travel. The terms are used interchangeably within this Plan. Trails and paths generally fall within the District's Linear Park facility classification, though some trails are found within other types of facilities.

Greenway

Greenways generally follow rivers and streams. Within the Park District, greenways are primarily a swath of protected habitat along streams with limited public

access and a primary goal of environmental protection. However, in some cases, greenways may allow for an environmentally compatible trail or viewpoint.

Shared-Use Path

An 8–12 foot path physically separated from any street or highway. Shared-use paths may be used by pedestrians, bicyclists, skaters, wheelchair users, joggers, and other non-motorized users. These pathways are frequently found in parks, along rivers, and in greenbelts or utility corridors, where there are few conflicts with motorized vehicles.

Unpaved or Soft Surface Path

A 3–8 foot wide path with a surface consisting of gravel, crushed limestone, dirt, or other semi-pervious material. Developed dirt and gravel trails are used primarily by pedestrians but may also serve bicyclists. They provide access in natural areas or open space.

Sidewalk

A paved walkway along the side of a street separated from the street by a raised curb. Sidewalks are generally 4–8 feet wide and cross multiple driveways and intersections. A planting strip may separate the sidewalk from the roadway. Sidewalks are intended to serve pedestrians and wheelchair users. Sidewalks are under the jurisdiction of the City of Beaverton, Washington County, and ODOT.

Bicycle Lane

These are defined as a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. Bicycle lanes are generally found on major arterial and collector roadways and are 4–6 feet wide. Bike lanes are under the jurisdiction of the City of Beaverton and Washington County.

Bicycle Boulevard

Bicycle boulevards are low-traffic neighborhood streets that have been identified and signed as good bicycle routes. Additional engineering steps may also have been taken to provide a safe bicycle journey.

Trail Designs

Master Plan, Metro’s “Green Trails: Guidelines for Building Environmentally Friendly Trails,” the American Association of State Highway and Transportation

Officials (AASHTO), and the Manual of Uniform Traffic Control Devices (MUTCD).

Table 1. Trail Design Types and Standards

	Regional Trail	Community Trail	Neighborhood Trail	
			Urban Trail	Natural Trail
Facility Type	Shared-use path	Shared-use path	Shared-use path/ sidewalk	Soft surface trail
Users	bicyclists pedestrians wheelchairs baby strollers skaters	bicyclists pedestrians wheelchairs baby strollers skaters*	bicyclists pedestrians wheelchairs** baby strollers skaters*	bicyclists pedestrians
Width	10–12 ft 2 ft gravel shoulders	8–10 ft 1–2 ft gravel shoulders	5–8 ft 1–2 ft gravel shoulders (optional)	3–8 ft
Surface	Paved or other smooth-rolling surface to accommodate all trail users	Paved or other smooth-rolling surface to accommodate all trail users	Paved or other smooth-rolling surface to accommodate all trail users	Earth, gravel, wood chips, or other soft surface material

* Depends upon chosen trail surface—inline skates and skateboards will not roll well on surfaces other than asphalt or concrete.

** Paved park trails may still be too steep to safely accommodate wheelchair and other disabled users.

Table 1 provides a quick reference chart for the various types of trails and the accepted standards.

The following cross-sections illustrate standard treatments for most trails in the Park District. This section should be supplemented with other trail design documents, including ODOT’s Bicycle and Pedestrian

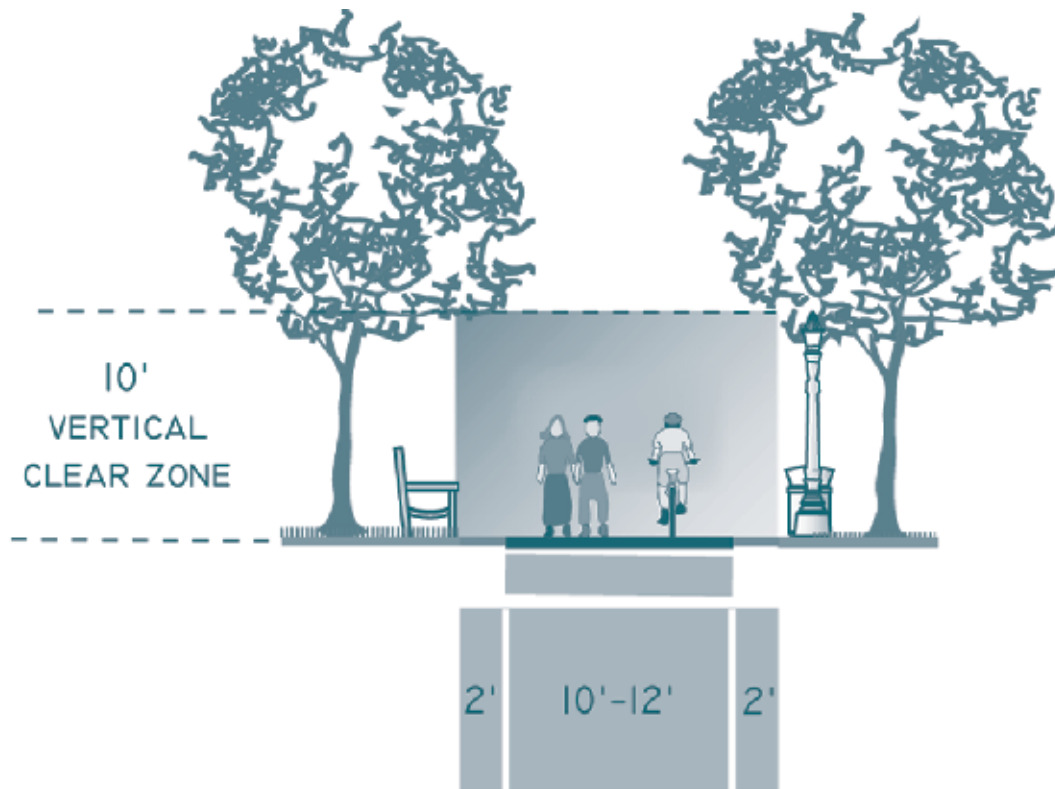


Figure 2. Regional Trail

Regional Trail

Figure 2 illustrates a typical shared-use path design that is appropriate for regional trails and some community trails. This trail is designed to accommodate two-way bicycle and pedestrian traffic, typically has its own right-of-way, and can accommodate maintenance and emergency vehicles. This type of trail is typically paved (asphalt or concrete) but can also be a surface that provides a smooth surface, as long as it meets ADA requirements. Wider gravel shoulders should be provided for runners/joggers if space allows.

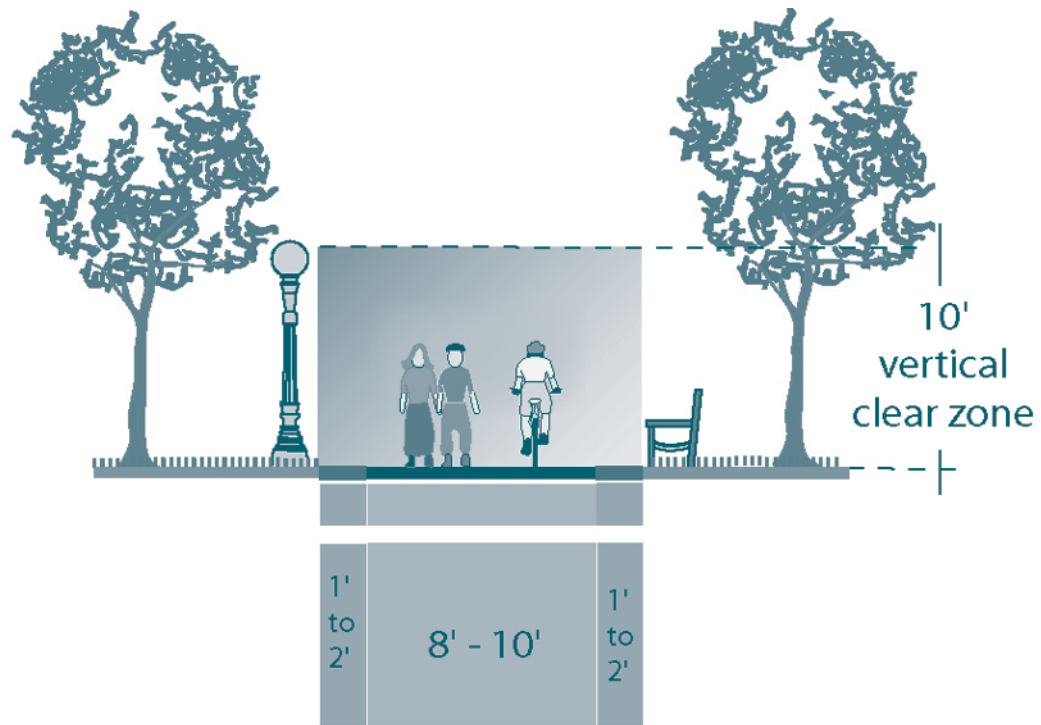


Figure 3. Community Trail

Community Trail

Community trails provide access for most, if not all, trail users within neighborhoods, parks, greenspaces, and other recreational areas. They are similar to regional trails in that they typically have their own right-of-way and serve only non-motorized users. These trails should be at least 8 ft. wide, wider if heavy bicycle use is anticipated. *Figure 3* illustrates a typical community trail design.

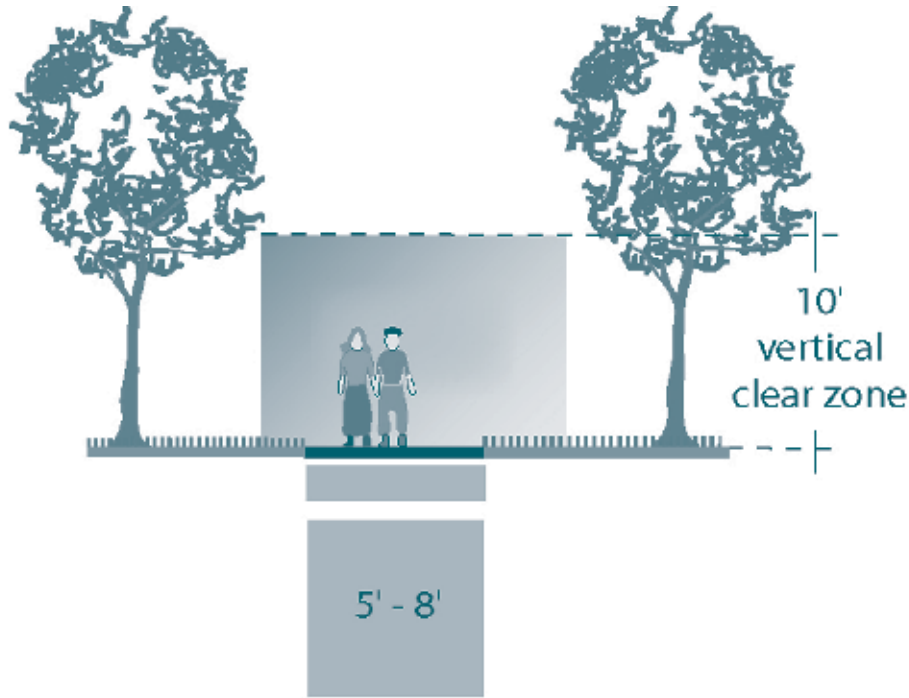


Figure 4. Off-Street Urban Trail

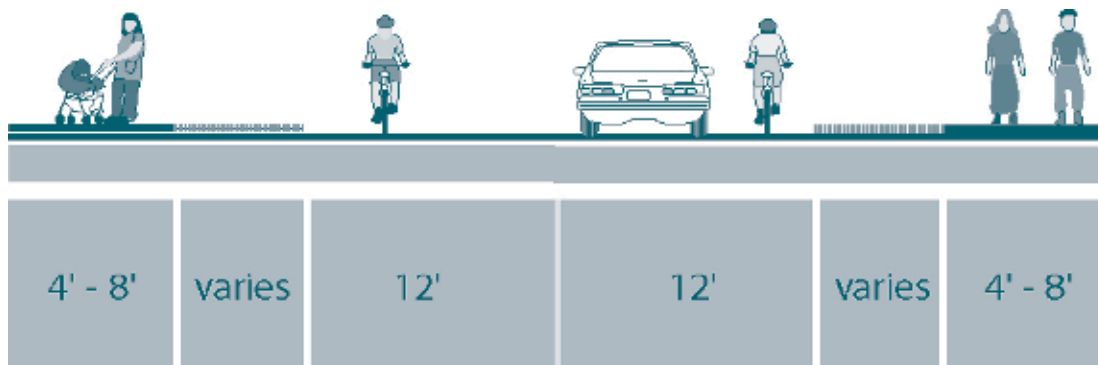


Figure 5. On-Street Urban Trail

Neighborhood Trail

Neighborhood trails primarily serve pedestrians with safe and direct connections to local features. Efforts should be made to ensure that at least one ADA accessible trail is available and serves the most desirable parts of the area (i.e., picnic areas, viewpoints, playground equipment, etc.). As noted earlier, there are two types of neighborhood trails:

- Urban Trails and
- Natural Trails

The Park District has the discretion to decide how and where the two types of neighborhood trails are implemented.

Urban Trail

Urban trails have paved surfaces and are typically 5–8 feet wide with an optional one- to two-foot gravel shoulder. Where they provide a direct connection to a park or other neighborhood attraction, urban trails will generally have their own right-of-way, separated from the street system (Figure 4). In other cases, the urban trail may utilize low traffic/low speed residential and neighborhood streets and consist of on-street segments, with pedestrians using the existing sidewalk and bicyclists sharing the road with motor vehicles (Figure 5).

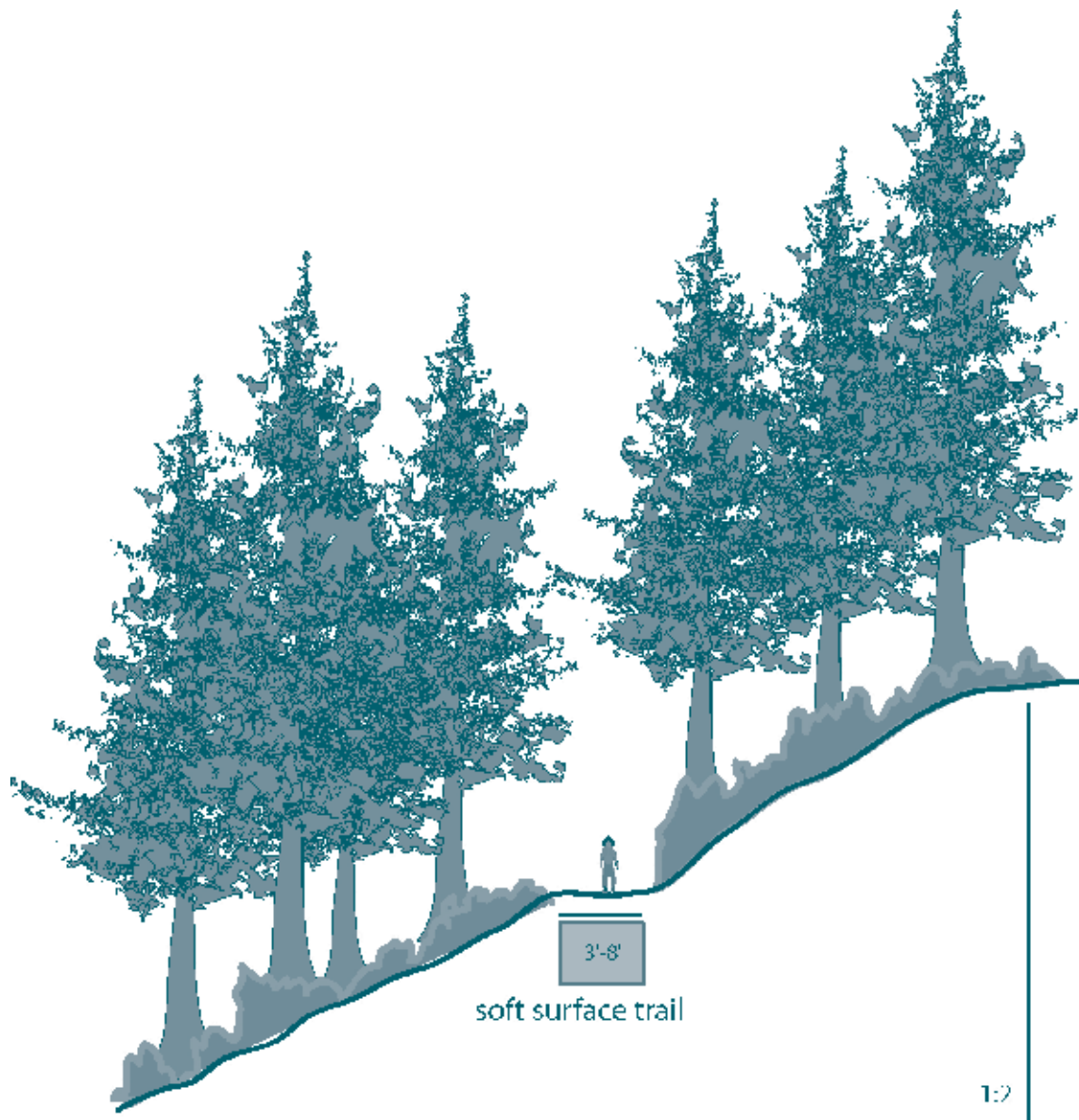


Figure 6. Natural Trail

Natural Trail

Natural trails (Figure 6) are usually considered when a trail is desired next to a natural resource. Trail width will vary depending on the existing topographic and environmental conditions. Natural trails should take into account: drainage; erosion, compaction/impaction from anticipated use; presence of waterways and sensitive riparian areas; habitat areas; environmental guidelines, such as “Green Trails: Guidelines for Environmentally Friendly Trails” by Metro; and regulations such as the Clean Water Services code for trails in water quality resource areas.

Trail width will depend on intended users. For example, narrower widths should be used in environmentally constrained areas with only hiking uses intended. Wider widths are desirable for shared bicycle use. Areas with natural trails (i.e., natural parks and greenspaces) are usually not ADA accessible and, therefore, should have a complimentary accessible route that meets or exceeds ADA standards in addition to the natural trails.

Trail Surfacing Options

Traditionally, asphalt and/or concrete are the most commonly used materials for shared use paths, because they last the longest, meet ADA requirements, and meet the needs of most users. Other possible trail surfacing options (of which there are more every year), include:

- Permeable asphalt and concrete
- Commercial soil stabilizers
- Geotextile confinement systems
- Chip seal
- Crusher fines
- Limestone treated surfaces
- Rubberized surfaces, such as “Nike Grind”
- Organic surfaces, such as bark mulch and wood planer shavings
- Agricultural by-products, such as filbert shells
- Wood, in the form of boardwalks
- Recycled plastic lumber

In arriving at a recommended trail surface, several key criteria should be considered, including:

- **Initial Capital Cost**—Trail surface costs vary dramatically, and dollars to build trails are scarce. Construction costs include excavation, sub-base preparation, aggregate base placement, and appli-

cation of the selected trail surface. Costs can vary from a low of around \$2.00/sf for a bark mulch trail, to \$12.00-13.00/sf for a rubberized surface (in 2006 dollars).

- **Maintenance and Long Term Durability**—The anticipated life of a trail surface can vary from a single year (bark surface in a moist climate) to 25+ years (concrete). Each trail surface has varying maintenance needs that will require regular to sporadic inspections and follow up. Some surface repairs (e.g. bark chip trail) can be made with volunteer effort, while others, such as a concrete surface, will require trained maintenance staff to perform the repair.
- **Existing Soil and Environmental Conditions**—Soil conditions play a critical role in surfacing selection. When considering the use of a permeable concrete or asphalt surface, the success rate of these surfaces is directly correlated to the permeability of the soil and climatic conditions. The lower the permeability and moisture, the greater risk of failure.
- **Availability of Materials**—A great trail surface in one area of the country may prove cost-prohibitive in another area due to availability of materials. For example, limestone-treated trail surfaces are common in the eastern US, but unheard of in the west due to a lack of limestone. There are

also some environmentally appealing ideas such as the use of recycled glass in asphalt (called “Glass-phalt”), but because this is not done on a large scale basis, finding a source for the glass aggregate can be difficult.

- **Anticipate Use/Functionality**—Who are the anticipated users of the trail? Will the trail surface need to accommodate wheelchairs, maintenance vehicles, bicycles, etc.? Shared use paths need to be designed with one surface for the main path, and a different one for the joggers and others preferring a softer material. Each surface also has varying degrees of roughness and therefore accommodates varying users. In-line skates, for example, cannot be used on coarse surfaces like chip seal or most permeable concrete surfaces due to the coarseness of the finished surface.
- **Funding Source**—The funding source for the trail may dictate the trail surface characteristics. If the trail has federal funds and is being administered through ODOT, the funding agency will need to review and approve the selected trail surface.
- **Susceptibility to Vandalism**—Trail surfaces are not usually thought of as being susceptible to vandalism, but the characteristics of the varying surfaces do lend themselves to a variety of vandalism, including movement of materials such as gravel or bark, graffiti on hard surfaces, arson

(wood and rubber surfaces), and deformation.

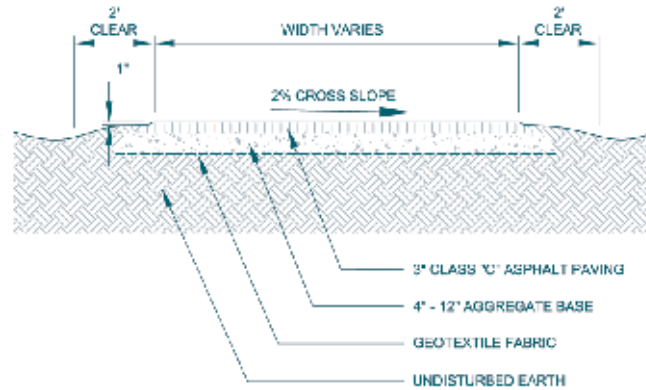
- **Aesthetics**—Each trail surface has varying aesthetic characteristics that should fit with the overall design concept desired for the project.

The trail surfacing matrices in Appendix C provide greater detail regarding potential trail surfacing options.

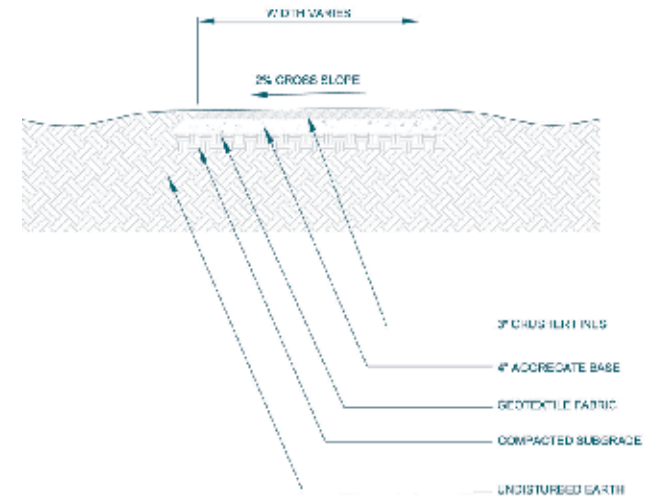
Trail Specifications

The following trail specifications provide construction details on four of the most common types of trail surfacing options chosen for hard and soft surface trails.

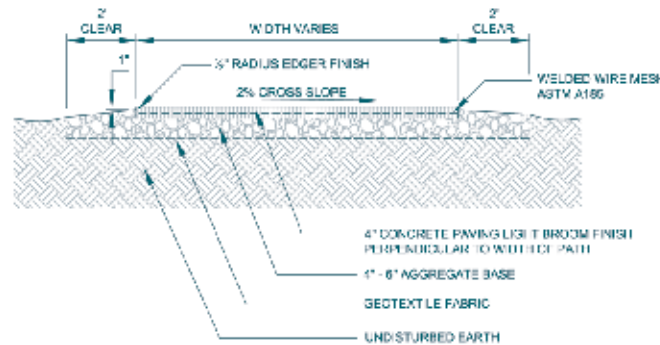
Asphalt Trail



Crusher Fines Trail

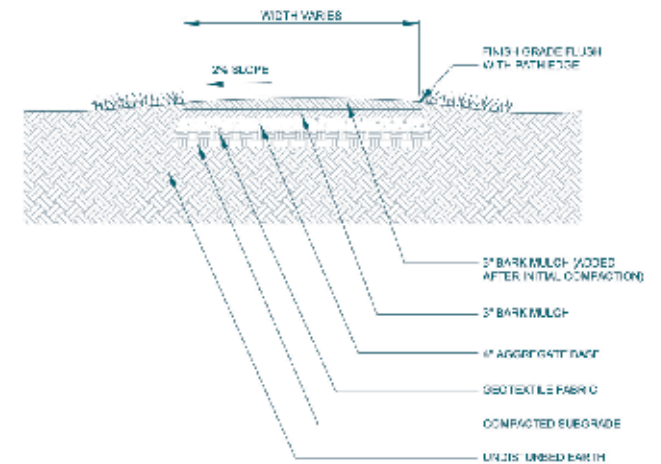


Concrete Trail



NOTES:
 1) TRAIL SECTION CONTINGENT ON GEOTECH REPORT
 2) PLACE SAW CUT CONTROL JOINTS AS SEEN ON PLAN

Bark Mulch Trail



Boardwalk Material and Construction Alternatives

Boardwalks provide the opportunity to place a trail through an environmentally sensitive area with the least amount of impact by the trail or the trail users.

Treated Wood

Studies indicate that pressure treated wood does leach out in the environment, but it is unclear what the effects of toxins are on the natural resource. Arsenic has been determined as the most commonly used pressure treatment CCA off wood products. ACQ uses copper as a preservative, which is potentially harmful to aquatic species; it is therefore still a questionable material to use in wetland or sensitive ecosystem environments.

Initially, constructing a boardwalk out of pressure treated wood is much more cost effective than constructing out of an alternative material. However, when looking at life cycle costs (potential impacts to the environment caused by the facilities materials), alternative materials are cost competitive.

Helical Piers

Helical piers are auger-like anchors that can be screwed in the soil with little disruption to the ecosystem environment. Helical piers are particularly effective where soft soils are over 10 feet deep and can be applied using handheld equipment in the field. Large

piers can be applied using small-automated machinery. Costs for this type of system are based on adequate soil information, and number of piers.



Boardwalk bridge on Rock Creek Trail

Pin Foundation

Pin foundations as patented by Pin Foundations Inc. in Gig Harbor, WA, are a foundation system that uses 4- to 8-foot-long sections of galvanized pipe that are driven into the soil at several diagonal angles. They can be driven into the soil with hand held tools, thus eliminating the use of heavy machinery and eliminating cut and fill. The pins can be pulled up, adjusted, or removed with minimal site disturbance.

Geo-technical information is needed to determine the phi-angle (angle of internal friction) and dry unit weight of the soil. These values will dictate the length and number of pin-foundations needed.

Concrete Foundation

Custom concrete foundation systems are frequently paired with building boardwalk structures. These foundation systems are either poured in place or pre-poured off-site and leveled in the field.

There are two general types of concrete footing systems for building a boardwalk: a Slab or Block-on-grade, and T-foundations. A T-foundation is a footing that is placed below the frost line, and then the walls are added on top. The footing is wider than the wall, providing extra support at the base of the foundation. A post brace is cast into the concrete wall and a post or beam is anchored to the brace

A Slab or Block-on-grade is a single layer of concrete or concrete block, several inches thick. The slab is poured thicker at the edges, to form an integral footing; reinforcing rods strengthen the thickened edge. The slab normally rests on a bed of crushed gravel to improve drainage. Casting a wire mesh in the concrete reduces the chance of cracking. A slab on grade is suitable in areas where the ground doesn't freeze.

When the site is easily accessible, these systems are relatively inexpensive. The limiting factors to using concrete systems are soil factors and ecological sensitivity of the area. Concrete footings are considered fill within a wetland environment and will impact permitting processes with the agencies.

Recycled Plastic Posts

Where the boardwalk is within three feet from grade, recycled plastic posts that are reinforced with fiberglass can be used as a non-toxic, long lasting material solution. Fiberglass reinforced plastic posts manufactured by US Plastic Lumber have been successfully used at a number of projects for decks and short boardwalks.

Recycled plastic posts can be used as an alternative to pin-foundations or in conjunction with pin foundations, as not to increase the amount of cut needed. Recycled plastic posts come with a 50-year warranty.

Joist and Beams

Treated wood has generally been specified for the beams and joists. Generally, the argument for using treated joist and beams is that they form the structural components to the boardwalk, and treated Fir or Hemlock is structurally very strong. In addition, the treated members are not in contact with the ground, therefore minimizing the chances of ground pollution.

An alternative to using pressure treated wood is using galvanized steel beams. Galvanization and production of steel present environmental problems during manufacturing despite the fact that most steel is recycled.

In developing alternatives for material selection, an in-depth lifecycle comparison between galvanized steel

beams and a treated wood system should be made. Using steel beams is about twice as expensive as a structural system made from pressure treated wood. However, galvanized beams will last for a very long time, and treated wood will have to be replaced after approximately 40 years. The last alternative to using treated wood for joists and beams is using recycled plastics.

Plastic joist and beams are approximately three times as expensive as pressure treated wood (source: US Plastic Lumber). In addition, posts will have to be set four feet on center because of lack of sheer in the strength of the members, instead of the usual 8–10 foot span. These shorter spans between members will double the price of the foundation system.

Decking

The decking experiences more wear and tear than any other part of the boardwalk. Pressure treated wood is not recommend here, even though the decking is not in ground contact. The constant wear will expose untreated inner sections of the planks and the deck will be susceptible to premature rotting. Alternatives to treated wood are indigenous rot resistant woods such as Western Red Cedar, Port Orford Cedar, and Alaskan Yellow Cedar. Additional alternatives are tropical hardwoods such as Ipe, plastic decking, or plastic composite decking and concrete.

Concrete decking will last longer than the structural system of pressure treated joists and beams. When

using concrete, it seems prudent to combine this with a system of galvanized beams. To avoid bringing heavy machinery and trucks into sensitive ecosystem areas, concrete will have to be brought in through a hose and pump system. It is only possible to bring in concrete in this manner over a distance of maximum 400 feet (source: Smooth Move Construction).

Clear grade Western Red Cedar or Port Orford Cedar are approximately twice the price of pressure treated decking. These cedars need to be treated with natural oil, such as linseed oil, every year to keep them water repellent. Every seven years, the decking should be checked for rot and pieces will need to be replaced at that time. Alaskan Yellow Cedar is of a superior quality to Western Red Cedar and Port Orford cedar because this cedar is from a tight-knot quality meaning that it is harvested from old-growth forests. It is expensive—nearly three to four times the cost of pressure treated woods and two times the cost of Western Red Cedar (source: Bear Creek Lumber).

Ipe or Ironwood is a tropical hardwood out of Central and South America. This wood is available though certification of sustainable forest product distributors throughout the United States. The certification programs guarantee that the forest practices used to extract the wood do not contribute to forest or community degradation. This type of wood product is the strongest and most rot resistant wood available.

Ipe is about twice the price of pressure treated decking and similar in price to a good grade Cedar. There are added costs during the installation because Ipe requires the use of stainless steel fasteners. Ipe is guaranteed to last 25 years: portions of the Coney Island boardwalk that were constructed of Ipe have withstood over 40 years of use and exposure with no apparent wear.

Plastic or plastic-composite decking will also be long lasting and maintenance free. The cost of these materials is about twice the price of treated wood and similar in price to a good grade Cedar. However, there have been reports of problems with warping of plastic-composite decking. Plastic-composite decking contains wood fibers mixed in with the plastic. These wood fibers do absorb some water, which might result in mold and mildew growth.

An example of a plastic decking that does not contain any wood material is Trimax Decking. Over the past years, composite decking products have shown that they will stain, fade, discolor, and even suffer termite damage. Unlike composites, Trimax Decking does not contain any wood fibers and is not susceptible to water damage and insects. This material can also be used as structural members in the construction of the boardwalk itself.

Trail Amenities

There are a number of amenities that make a trail system inviting to the user. Below are some common amenities that make trail systems stand out. When possible, it is advisable to use vandal resistant construction and materials.



Interpretive Installations

Interpretive installations and signs can enhance the users experience by providing information about the history of the Park District and the area. Installations can also discuss local ecology, environmental concerns, and other educational information.



Water Fountains and Bicycle Parking

Water fountains provide water for people (and pets, in some cases) and bicycle racks allow recreational users to safely park their bikes if they wish to stop along the way, particularly at parks and other desirable destinations.



Pedestrian Site Amenities

Providing benches at key rest areas and viewpoints encourages people of all ages to use the trail by ensuring that they have a place to rest along the way. Benches can be simple (e.g., wood slates) or more ornate (e.g., stone, wrought iron, concrete). Trash receptacles help keep the trail clean and discourage littering.



Maps and Signage

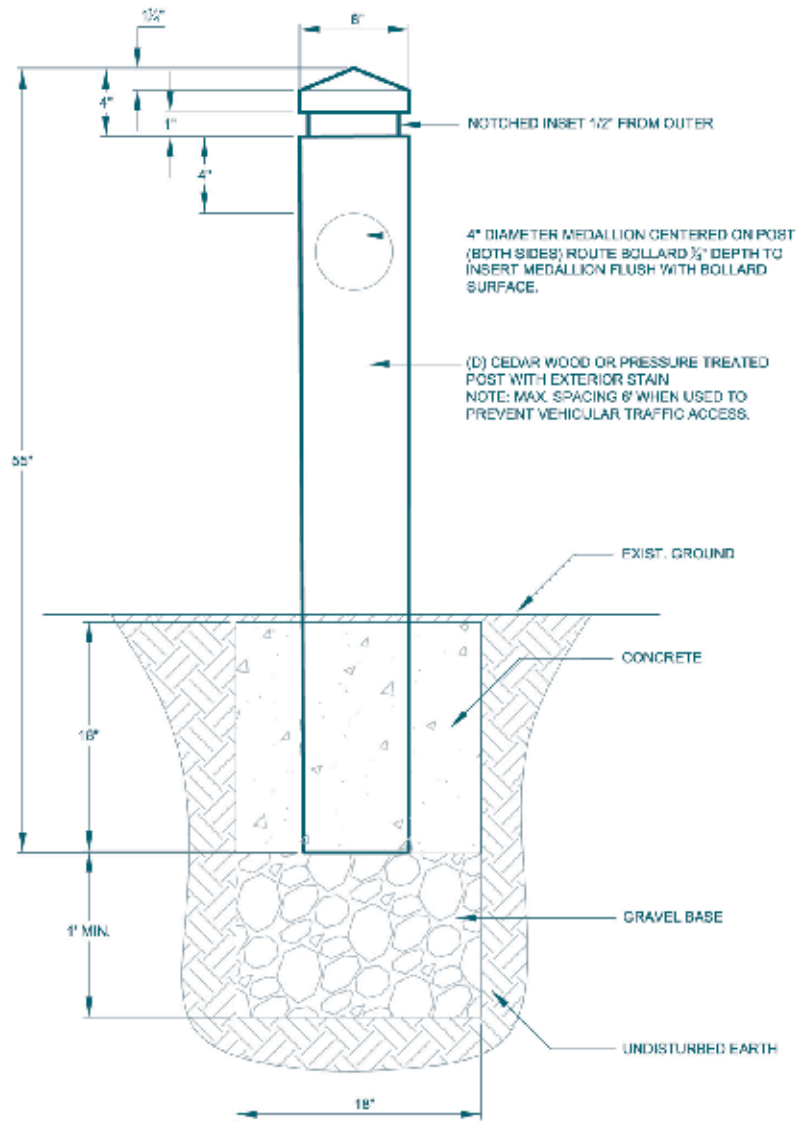
A comprehensive signing system makes a bicycle and pedestrian system stand out. Informational kiosks with maps at trailheads and other pedestrian generators can provide enough information for someone to use the network with little introduction – perfect for areas with high out-of-area visitation rates as well as the local citizens. It is recommended to install an information kiosk at every trailhead, major access point, and other logical locations.



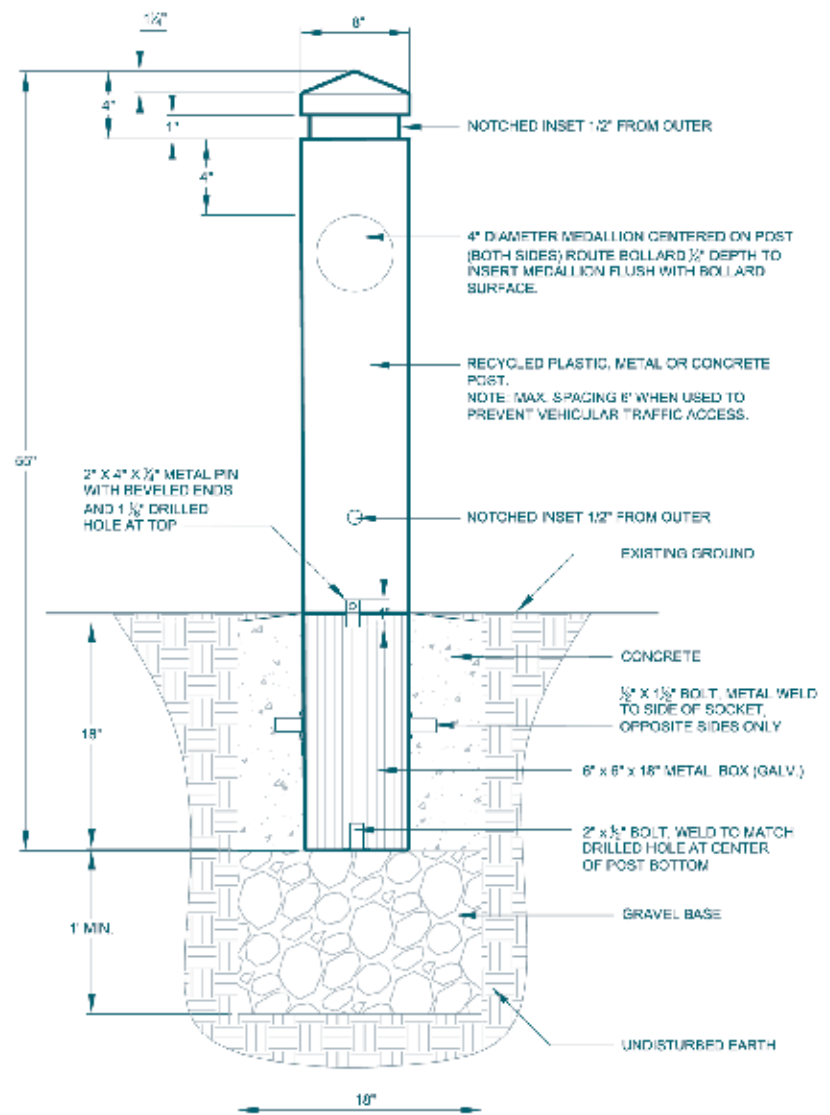
Art Installations

Local artists can be commissioned to provide art for the trail system, making it uniquely distinct. Many trail art installations are functional as well as aesthetic, as they may provide places to sit and play on.

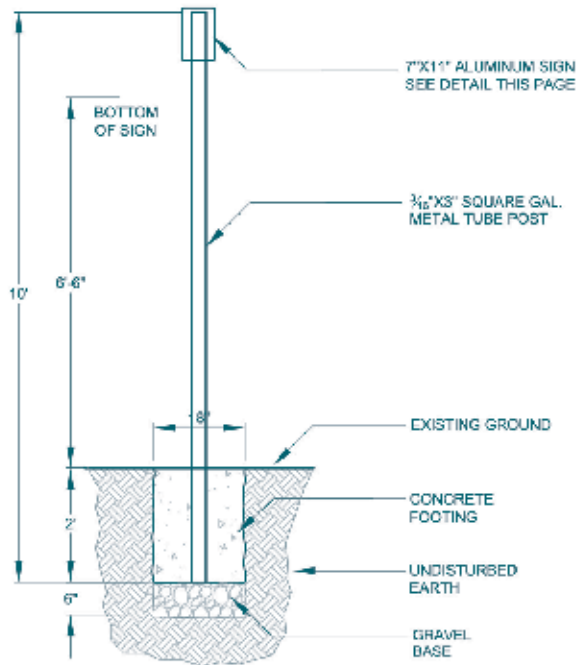
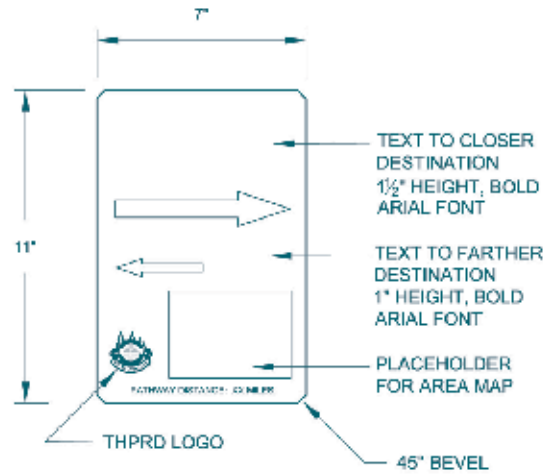
Trail Amenity Specifications



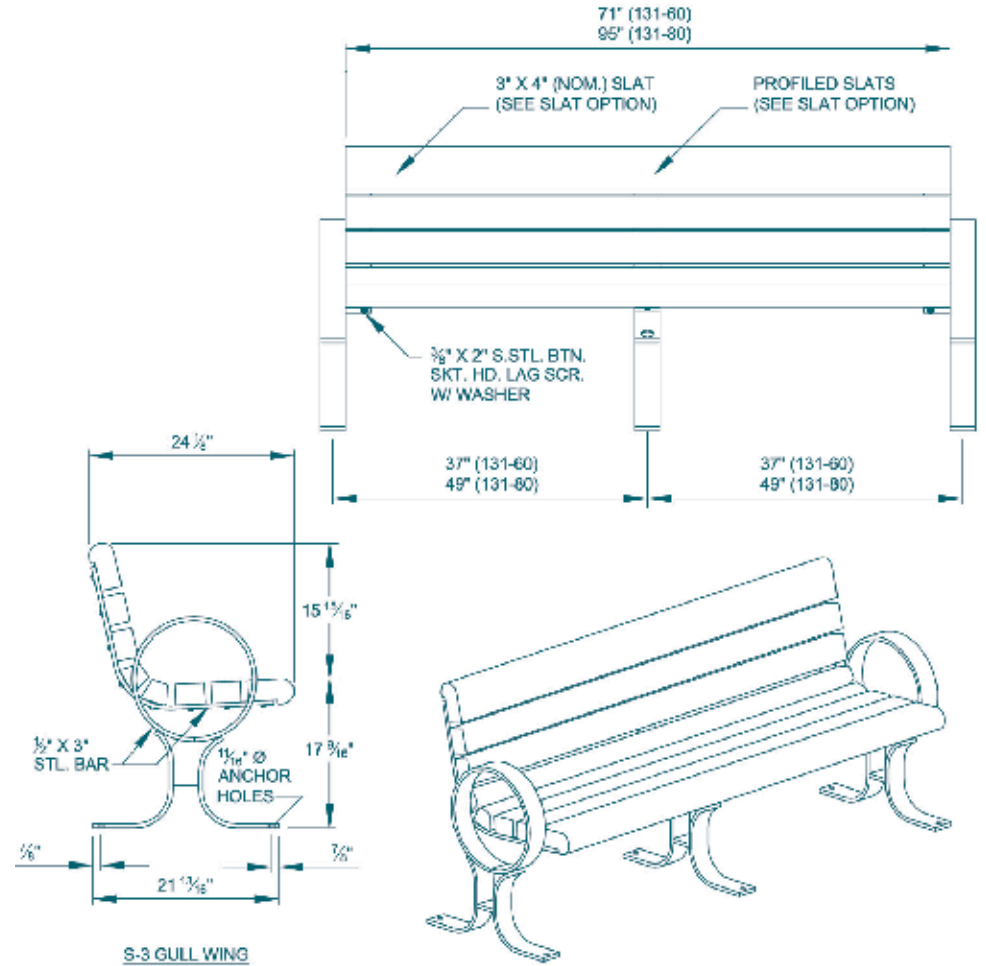
Permanent Bollard



Removable Bollard



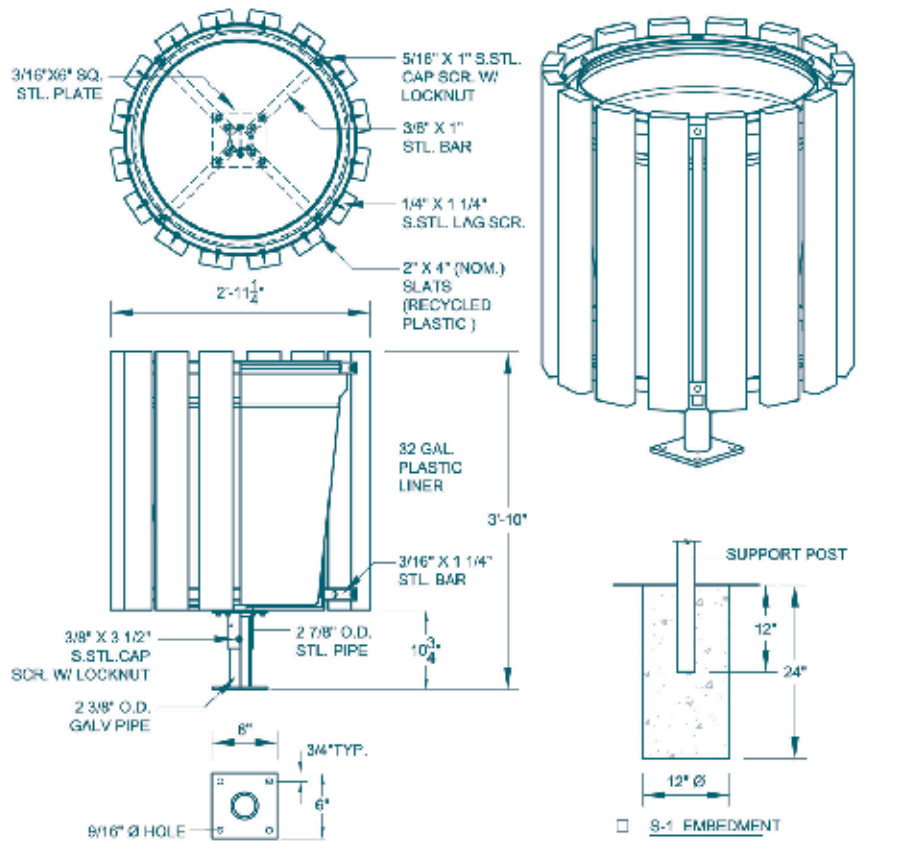
Directional Sign



- NOTES:
 1) ALL STL. MEMBERS COATED W/ ZINC EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
 2) 1/2" X 3 1/2" PLTD. EXPANSION ANCHOR BOLTS PROVIDED, FOR S-2, S-3, & S-4 OPTIONS.

LENGTH: 6'
 SLAT OPTION: "CEDAR" - GREEN RECYCLED PLASTIC

DuMor Bench



NOTES

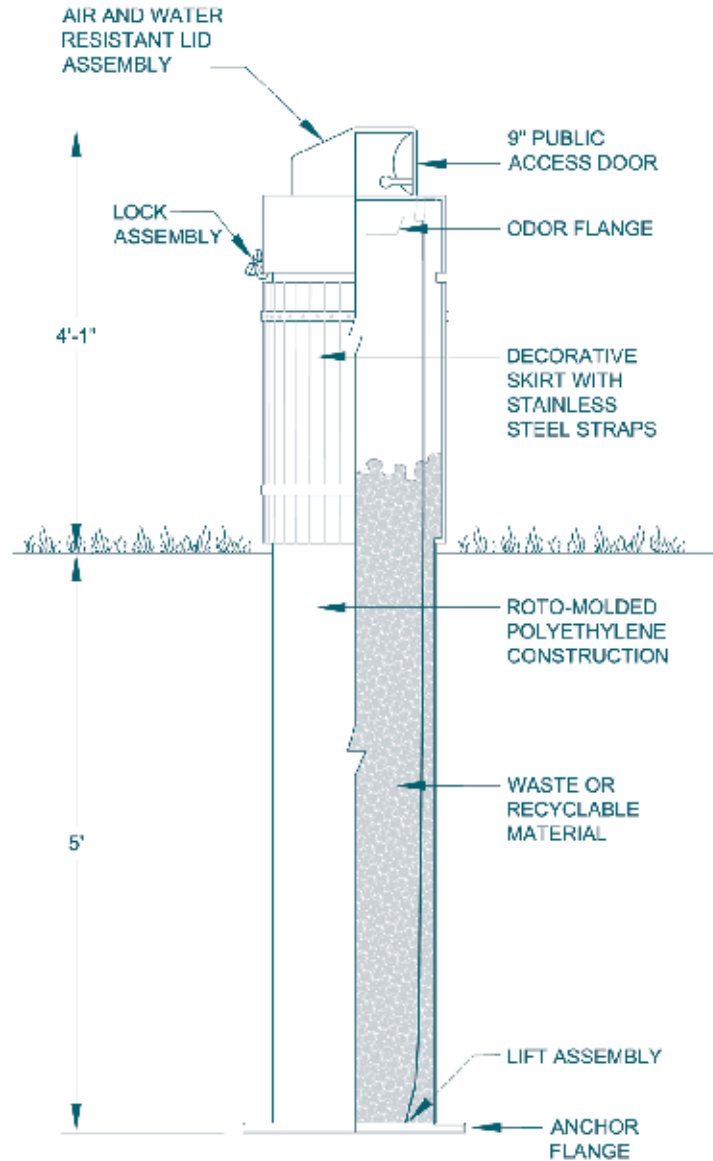
- 1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATED BLACK.
- 2.) 1/2" X 3 3/4" PLTD. EXPANSION ANCHOR BOLTS FOR S-2 OPTION.

SLAT OPTIONS

- *CEDAR* RECYCLED PLASTIC
- *GREEN* RECYCLED PLASTIC
- *GREY* RECYCLED PLASTIC
- *REDWOOD* RECYCLED PLASTIC
- OTHER

 <p>DuMor, inc. P.O. Box 142 Millinow, PA 17059-0142</p>	SCALE: NONE	TITLE: RECEPTACLE	
	DATE DRAWN: 8/2/03	REV. B	DRAWING NUMBER 40-52
	DRAWN BY: AH		SHEET 1 OF 2
	DATE REV.: 1/13/06		

DuMor Trash Receptacle



Syber Tech Trash Receptacle Detail

Universal Access

All public facilities must be built to meet the requirement of the American’s With Disabilities Act (ADA). The act was established to prohibit discrimination on the basis of disability by public accommodations and requires places of public accommodation and commercial facilities to be designed, constructed, and altered in compliance with the accessibility standards established by the ADA. (<http://www.usdoj.gov/crt/ada/stdspdf.htm>).

ADA design standards establish criteria to support universal access. All paths and ramps are to be designed with the least possible slope. The maximum slope allowed by ADA design standard for a walkway in new construction shall be 1:12 or 8.33% of rise, over 30 feet of run (<http://www.access-board.gov/adaag/html/adaag.htm#4.8>). When designing for the maximum slope, landings are needed every 30 inches of rise along with handrails. Paths will have a continuous clear width of 5 feet minimum so that two wheelchairs can pass each other. In order to provide extra traction, decking should be set perpendicular to the walking direction. Standard code requirements state that where the walkway/ boardwalk will be 30 inches or more from the ground, plain guardrails will be added to the design. In areas 30 inches or lower, curbing stops will be constructed to edge the walkway.

It is recognized that constructing trails outdoors may

have limitations that make meeting ADA guidelines difficult and sometimes prohibitive. Prohibitive impacts include: harm to significant cultural or natural resources, a significant change in the intended purpose of the trail, requirements of construction methods that are against federal, state or local regulations, or presence of terrain characteristics that prevent compliance. See *Table 2* for guidelines for development of accessible trails. An excellent resource is the Federal Highway Administration’s “Designing Sidewalks and Trails for Access,” which includes both a review of existing guidelines and practices as well as a best

practice design guide.

Simple details to be considered in the planning and design process can greatly enhance accessibility to and within the planned system. Breaks in long grades, consideration of the user’s eye level, minimizing grades at drainage crossings, providing areas to get off the trail, and appropriately designed seating walls are examples of simple accessible improvements. Consultation with the physically challenged on specific design issues prior to the planning and design of trails or trailhead facilities can be very beneficial and is encouraged for every project.

Table 2. ADA Trail Development Guidelines

Item	Recommended Treatment	Purpose
Trail Surface	Hard surface such as, asphalt, concrete, wood, compacted gravel	Provide a smooth surface that accommodates wheelchairs
Trail Gradient	Maximum of 5% without landings Maximum of 8.33% with landings	Greater than 5% is too strenuous
Trail Cross Slope	2% maximum	Provide positive trail drainage, but avoid excessive gravitational to side of trail
Trail Width	5' Minimum	Accommodate a wide variety of users
Trail Amenities, phones, drinking fountains, ped. actuated buttons	Place no higher than 4' off ground	Provide access within reach of wheelchair users
Detectable pavement changes at curb ramp approaches	Place at top of ramp before entering roadways	Provide visual cues for visually impaired
Trailhead Signage	Accessibility information such as trail gradient/profile, distances, tread conditions, location of drinking fountains and rest stops	User convenience and safety
Parking	Provide at least one accessible parking area at each trailhead	User convenience and safety
Rest Areas	On trails specifically designated as accessible, provide rest areas/widened areas on the trail optimally at every 300 feet	User convenience and safety

Environmental Considerations

Environmental constraints should be considered before choosing construction materials. Often, trails and boardwalks are constructed to minimize impacts to sensitive ecosystems such as wetlands. Material considerations in these areas should mitigate potential long-term impacts to the resource. Steps to consider taking include:

- **Identify and map water resources within 200 feet of the trail system.** Accurately locating wetlands, streams, and riparian areas relative to the trail is an important element of the trail planning. The location of these potential “receiving resources” for trail drainage and associated sediments will affect decisions about placement of trail drainage structures, maneuvering of maintenance equipment, season of work, interception and infiltration of trail drainage, and disposal of earth materials generated during maintenance activities.
- **Minimize crossings of streams and wetlands.** Minimize channel crossings and changes to natural drainage patterns.
- **Minimize trail drainage to streams and wetlands.** Minimize the hydrologic connectivity of trails with streams, wetlands, and other water resources.
- **Keep heavy equipment off wet trails.** Avoid operating heavy equipment on trails when they are wet by using alternate routes.
- **Provide crossing structures where needed.** Where trails traverse wet areas, structures should be provided to avoid trail widening and damage at “go-around” spots. Crossing structures also help protect water quality, wetlands, and riparian areas.
- **Establish vegetative buffers between trails, streams and wetlands.** Retain a buffer between trails and water resources by establishing riparian and streamside management zones (RSMZs), within which trail influences such as drainage, disturbance, and trail width are minimized.
- **Utilize disturbed areas.** Utilize existing disturbed areas and clearings for trails and parking facilities, to the extent that such use does not detract from the area’s scenic quality.
- **Establish vegetative buffers for non-conforming uses.** Industrial and commercial uses adjacent to trails should be screened by means of fully planted native vegetative buffers at least 25 feet wide.
- **Establish riparian and streamside management setbacks (RSMS).** Vegetative disturbances such as thinning, pruning, and felling to improve canopy openings should be allowed as necessary to maintain existing trails in RSMSs. No heavy equipment should operate outside the trail clearing limits. Stormwater discharges from roads and trails to the RSMS should be minimized to the maximum extent possible. Stormwater discharges that cannot be avoided should be designed for maximum treatment, sedimentation, infiltration, and level-spreading before entering the RSMS.
- **Avoid wet areas unless special construction techniques are used.**
- **Perform a tree survey, avoid root zones.** Conduct the survey with the District Natural Resource staff for best management practices.
- **Install water features.** People are attracted to the sound and sight of water features, whether they are streams, creeks, waterfalls, or other features. Water features should minimize environmental impact while capturing the unique qualities and aesthetic values of the landscape.

Trails and Environmental Permitting

In reviewing environmental considerations, permitting will play an important role regarding what can or cannot be accomplished onsite. Permitting agencies with which trail designers should consult are: Army Corp of Engineers, Oregon Division of State Lands, Oregon Department of Environmental Quality, Oregon Department of Fish and Wildlife, Clean Water Services, and the City of Beaverton. The following sections highlight the applicable guidelines in place at the time this Plan was adopted. Standards and guidelines may have changed, and it is recommended to confirm with the pertinent agency.

Clean Water Services (CWS)

Clean Water Services is a public utility providing wastewater and stormwater services to 12 member cities, including Beaverton. CWS is a special service district that works closely with Washington County.

CWS regulates development within Sensitive Areas and Vegetated Corridors. Sensitive Areas include: “existing

and created wetlands; rivers, streams, and springs, whether flow is perennial or intermittent; and natural lakes, ponds and instream impoundments.” Sensitive Areas do not include: “storm water infrastructure; a Vegetated Corridor (a buffer) adjacent to the Sensitive Area; an off-stream recreational lake, wastewater treatment lagoon, fire pond or reservoir, or; drainage ditches.” A Vegetated Corridor is defined as a “corridor adjacent to a Sensitive Area that is preserved and maintained to protect the water quality functions of the water quality Sensitive Area.”

The extent of the Sensitive Area is determined based on an assessment using the following maps for reference: Clean Water Services Prescreen Maps, The National Wetlands Inventory Map, District Stream and Drainage Maps, and locally adopted studies or maps. The complete methodology is outlined in Appendix C of the Cleanwater Services Design Guidelines. (CWS is currently reviewing its Design and Construction Standards and may change or revise the current standards.)

The extent of the Vegetated Corridor may range from 15 to 200 feet wide, measured horizontally, from the defined boundaries of the Sensitive Area.

Trails

Paths 10 feet or less in width are allowed in the Vegetated Corridor upon review and approval by CWS when the impact is minimized through choice of mode,

sizing, and placement. When the path is greater than three feet in width, the square footage of the excess path shall be mitigated at a 1:1 ratio by enhancing additional Vegetated Corridor to a good condition. The following conditions apply to all paths:

- The path shall avoid the Vegetated Corridor where possible. The path shall be located in the outermost 40% of the Vegetated Corridor boundary as it runs near or parallel to the Sensitive Area.
- Paths shall be constructed so as to minimize disturbance to existing vegetation and maintain slope stability.

It is important to note that the Tualatin Hills Park & Recreation District Trails Master Plan process allows flexibility in the design and location of trails in situations where development criteria cannot be met. This should be kept in mind for areas where setback requirements or other criteria are difficult to achieve.

Mitigation for negative impacts to the Vegetated Corridor and/or enhancement of the Vegetated Corridor to a “good” condition (as defined in Table 3.2 in the CWS Design and Construction Standards, March 2004) is required for the construction of any path or trail.

Washington County

In the Washington County Development Code, development is defined as, “Any man-made change to

improved or unimproved real estate, including but not limited to construction, installation or change of land or a building or other structure, change in use of a building or structure, land division, establishment, or termination of right of access, storage on the land, tree cutting, drilling, and site alteration such as that due to land surface mining, dredging, grading, construction of earthen berms, paving, improvements for use as parking, excavation or clearing.” No development shall occur in Washington County without first obtaining a Development Permit as outlined in the Code, with a few exceptions. Trails are not an allowed exception, and qualify as a development.

Greenways

The Washington County Development Code defines greenways (408-3.3) to mean, “any off-street way which is intended for travel use by pedestrian and bicyclists, but also intended for recreational use. Greenways may include linear parks, open space corridors, or multi-purpose corridors, as long as they are particularly intended for travel use by pedestrians and bicyclists.”

In defining the maintenance requirements for greenways (Section 405-4.4), the Code notes that, “maintenance shall insure that there exist no hazards, nuisances, or unhealthy conditions. These greenways may contain bicycle paths, and footpaths. Connecting greenways between residences and recreational areas

are encouraged.”

Floodplain and Drainage Hazard Area Development

The County defines the land subject to floodplain and drainage hazard area standards using the maps entitled “Flood Plain Series, Washington County, Oregon,” the Flood Insurance Rate Maps, and the “Flood Insurance Study for Washington County.” Where the maps are unavailable, the Director may use any base flood elevation and floodway data available from a federal or state source, or any other authoritative source, to determine the boundaries of the flood plain, floodway, and drainage hazard areas of Washington County.

Unless specifically prohibited in the applicable Community Plan, the Rural/Natural Resource Plan Element, Section 422, or the Clean Water Services’s “Design and Construction Standards for Sanitary Sewer and Surface Water Management” (2006) or its successor, a development permit may be approved in a flood area:

- Through a Type I procedure for recreation or nature trails and removal of vegetation down to duff or bare soil provided:
 - The area of disturbance is not designated as a Significant Natural Resource in the applicable Community Plan or the Rural/Natural Resource Plan Element; and

- The applicant obtains a permit for erosion control. (Section 421-4)
- Through a Type II procedure for recreation or nature trails and associated off-street parking, when grading, piping, culverting or bridges are required (Section 421-5).

Significant Natural Resources

The purpose of the Significant Natural Resources standards is to permit limited and safe development in areas with significant natural resources while providing for the identification, protection, enhancement, and perpetuation of natural sites, features, objects, and organisms within the County, here identified as important for their uniqueness, psychological or scientific value, fish and wildlife habitat, educational opportunities, or ecological role.

Land subject to this section of the Code are those areas identified in the applicable Community plan or the Rural/Natural Resource Plan Element. Significant Natural Resources have been classified in the Community Plans or the Rural/Natural Resource Plan Element by the following categories:

- **Water Areas and Wetlands**—100 year flood plains, drainage hazard areas and ponds, except those already developed.
- **Water Areas and Wetlands and Fish and Wildlife Habitat**—Water areas and wet-

lands that are also fish and wildlife habitat.

- **Significant Natural Areas**—Sites of special importance, in their natural condition, for their ecological, scientific, and educational value.

No new or expanded alteration of the vegetation or terrain of the Riparian Corridor (as defined in Section 106) or a significant water area or wetland (as identified in the applicable Community Plan or the Rural/Natural Resource Plan Element) shall be allowed with some notable exceptions, including wildlife viewing areas and recreation or nature trails.

Steep Slope

Washington County regulates development on steep slopes and unstable soils. Policy 8 of the Comprehensive Framework Plan states the County will, “Regulate new development in flood plain areas identified as being subject to flooding in the event of a 100-year flood (a flood with a 1% chance of occurrence in any year) as identified in the latest H.U.D. or Corps of Engineers flood area studies. Such regulations shall discourage new development in flood plains and alterations of existing identified flood plains.” The policy guidelines require an engineering analysis for slopes greater than 20%. Trail development standards and potential mitigation requirements on steep slopes should be clarified with the County during development review.

City of Beaverton

In 1984, an inventory of Beaverton’s natural resources was done to determine their quality and quantity. The City adopted a map layer entitled: Significant and Important Natural Resources and Other Important Natural Resources. In 2000, a Local Wetland Inventory (LWI) was completed. The LWI is one of the City’s Goal 5 resource inventories comprising Volume III of the Comprehensive Plan. A list of locally significant wetlands is found in Comprehensive Plan Volume III, Local Wetland Inventory Text, Appendix A Table 5.

Significant Natural Resources

The City relies on its site development permitting process as the mechanism to balance the needs of development with natural resource protection.

For properties located within significant natural resource areas, the City may consider relaxation of its development standards where necessary to accomplish protection of riparian and wetland areas. Such standards include, but are not limited to, setbacks, building height, street width, location of bike paths, etc.

Oregon State Regulations

Proposed trail construction that requires the fill or removal of more than 50 cubic yards of material in Waters of the State (i.e. streams and wetlands) requires

a permit from the Department of State Lands (DSL). Waters of the State are defined as “natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and non-navigable, including that portion of the Pacific Ocean that is in the boundaries of this state.” For streams that are designated “essential salmon habitat” by DSL, a permit is required if any fill or removal is proposed within the Ordinary High Water Mark (OHWM). A stream with essential salmon habitat in the THPRD service area is Fanno Creek (DSL, 2005).

Oregon’s Removal-Fill Law allows the agency to grant, by administrative rule, General Authorizations (GA) for removal and fill activities that would cause only minimal individual and cumulative environmental impacts, and would not result in long-term harm to water resources of the state.

In order to qualify for a General Authorization, the project must meet all the criteria and the lead agency must agree to abide by all conditions specified. General Authorizations are available for a number of different project types, including certain transportation-related structures (OAR 141-089-0170).

To be eligible for this GA, a project must be for the following purposes, including:

- Widening for new roadside embankments, curbs, trails, sidewalks, rail crossings, additional passing

lanes, turn lanes and refuges and travel lanes.

- Widening, realigning or removing existing roads, railroad beds, bridges (including replacement), bicycle, pedestrian, or other lanes or trails.
- Constructing new bicycle, pedestrian, or other lanes or trails.

The GA allows the fill or removal of up to 5,000 cubic yards in waters of the state or the fill of up to 0.5 acres of wetland. If more than 5,000 cubic yards of fill/removal or more than 0.5 acres of wetland fill/removal are proposed, then the project would require an individual permit from DSL. The individual permit process is similar to a GA permit, but it takes longer to process and includes an application fee.

Compensatory mitigation is required for either a GA permit or an individual permit from DSL. For non-wetland waters, there are no standardized mitigation ratios. Mitigation is established on a case-by-case basis for impacts to non-wetland waters of the state but may include planting native vegetation, day-lighting a portion of a stream, removing a culvert, or improving fish habitat. Pre-mitigation is not recognized by DSL as a means to reduce mitigation requirements.

Stream crossings requiring work below the OHWM should be reviewed by the Oregon Department of Fish and Wildlife (ODFW) as part of the DSL permit process and are subject to in-water work guidelines.

If stream crossings can be completed without any fill or removal in wetlands or below the ordinary high water mark of streams, or without any in-water work, then the project does not need a permit from DSL or concurrent review by the ODFW.

Federal Regulations

In 2006, both the DSL and the Corps have jurisdiction over proposed activities in wetlands and a permit application needs to be submitted to both agencies. The application form is the same for both agencies and is available on-line. The Corps, however, does not regulate “isolated” wetlands as of 2002.

Proposed trail development that requires fill in Waters of the U.S. (e.g. wetlands) requires review and permitting by the Corps. Depending on the amount of fill proposed (if less than 0.25 or 0.5 acres), the project may qualify for a Nationwide Permit, a programmatic permit. If impacts are greater than 0.5 acres, then an individual permit and alternatives analysis is required. The issuance of a federal permit will likely require informal consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) under Section 7 of the Endangered Species Act. Informal consultation with the agencies also is required if federal funding or an equivalent federal nexus is necessary to construct the proposed trails.

Trail-Roadway Crossings

General Crossing Design Treatment

Like most trails in built urban areas, the Park District trails must cross roadways at certain points. While at-grade crossings create a potentially high level of conflict between trail users and motorists, well-designed crossings have not historically posed a safety problem, as evidenced by the thousands of successful trails around the United States with at-grade crossings.

The current practice is an unmarked, unsignalized crossing, at which a trail user would wait for a gap in traffic to cross. The lack of markings or signals at most crossings can be very intimidating for trail users, and may be challenging enough to suppress potential trail usage. However, in most cases, trail crossings can be properly designed at-grade to a reasonable degree of safety and meet existing traffic and safety standards.

Grade separated crossings are recommended in certain situations, which are discussed further. The conversion of existing at-grade trail crossings to grade-separated

crossings is a difficult and expensive undertaking and should be considered where other traffic control measures have failed, where the natural topography lends itself to a grade-separated crossing, or where persistent safety issues exist.

Trail-roadway crossings should comply with the Association of American State Highway and Transportation Officials (AASHTO) Guide for the Development of Bikeway Facilities, Oregon Department of Transportation (ODOT), and Manual of Uniform Traffic Control Devices (MUTCD) standards.

Evaluation of trail crossings involves analysis of vehicular and trail user traffic patterns, including speeds, street width, traffic volumes (average daily traffic, peak hour traffic), line of sight, and trail user profile (age distribution, destinations). This study identifies the most appropriate crossing options given available information, which must be verified and/or refined through the actual engineering and construction document stage. Identification, evaluation, and construction of potential crossing facilities requires coordination with Washington County and the City of Beaverton, who are ultimately responsible for these types of crossings.

At-Grade Crossing Prototypes

The proposed intersection approach that follows is based on established standards,¹ published technical reports,² and the experiences from cities around the country.³ At-grade THPRD trail-roadway crossings will fit into one of four basic categories:

- Type 1: Marked/Unsignalized, Type 1+: Marked/Enhanced
- Type 2: Route Users to Existing Intersection
- Type 3: Signalized/Controlled
- Type 4: Grade-separated crossings

Type 1: Marked/Unsignalized Crossings

A marked/unsignalized crossing (Type 1) consists of a crosswalk, signing, and often no other devices to slow or stop traffic. The approach to designing crossings at midblock locations depends on an evaluation of vehicular traffic, line of sight, trail traffic, use patterns, vehicle speed, road type and width, and other safety issues such as the proximity of schools. The following thresholds recommend where unsignalized crossings may be acceptable:

- 1 MUTCD, AASHTO Guide for the Development of Bicycle Facilities, Oregon Pedestrian and Bicycle Guide.
- 2 Federal Highway Administration (FHWA) Report, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations."
- 3 In particular, the recommendations in this report are based in part on experiences in cities like Portland (OR), Seattle (WA), Tucson (AZ), and Sacramento (CA), among others.

Maximum traffic volumes:

- $\leq 9,000$ -12,000 Average Daily Traffic (ADT)
- Up to 15,000 ADT on two-lane roads, preferably with a median.
- Up to 12,000 ADT on four-lane roads with median.

Maximum travel speed:

- 35 mi/h

Minimum line of sight:

- 25 mi/h zone: 155 feet
- 35 mi/h zone: 250 feet
- 45 mi/h zone: 360 feet



Type 1 crossing

If well designed, crossings of multi-lane higher volume arterials over 15,000 ADT may be unsignalized with

features such as a combination of some or all of the following: excellent sight distance, sufficient crossing gaps (more than 60 per hour), median refuges, and/or active warning devices like flashing beacons or in-pavement flashers. These are referred to as Type 1 Enhanced (Type 1+). Such crossings would not be appropriate, however, if a significant number of school children used the trail. Furthermore, both existing and potential future trail usage volume should be taken into consideration.

On two-lane residential and collector roads below 15,000 ADT with average vehicle speeds of 35 mi/h or less, crosswalks and warning signs (“Trail Xing”) should be provided to warn motorists, and stop signs and slowing techniques (bollards/geometry) should be used on the trail approach. Curves in trails that cause the trail user to face oncoming traffic are helpful in slowing trail users and making them aware of oncoming vehicles. Care should be taken to keep vegetation and other obstacles out of the sight line for motorists and trail users. Engineering judgment should be used to determine the appropriate level of traffic control and design.

On roadways with low to moderate volumes of traffic (< 12,000 ADT) and a need to control traffic speeds, a raised crosswalk may be the most appropriate crossing design to improve pedestrian visibility and safety.

The crosswalks are raised 75 mm above the roadway pavement, similar to speed humps, to an elevation that

matches the adjacent sidewalk. The top of the crosswalk is flat and typically made of asphalt, patterned concrete, or brick pavers. Brick or unit pavers should be discouraged because of potential problems related to pedestrians, bicycles, and ADA requirements for a continuous, smooth, vibration-free surface. Tactile treatments are needed at the sidewalk/street boundary so that visually impaired pedestrians can identify the edge of the street. Costs can range from \$5,000 to



Raised crosswalk

\$20,000 per crosswalk, depending on the width of the street, the drainage improvements affected, and the materials used for construction.

On roadways with higher traffic volumes, a flashing yellow beacon may be used, preferably one that is activated by the trail user rather than operating continuously. The costs will range between \$5,000 and

\$15,000 depending on the need for poles with arms and overhead mounted signals. These can be activated by trail users tripping video or motion detectors on the trail. This equipment, while slightly more expensive, helps keep motorists alert.

Type 2: Route Users to Existing Intersection

Crossings within 250 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection for safety purposes. For this option to be effective, barriers and signing may be needed to direct trail users to the signalized crossings. In most cases, signal modifications would be made to add pedestrian detection and to comply with the ADA.

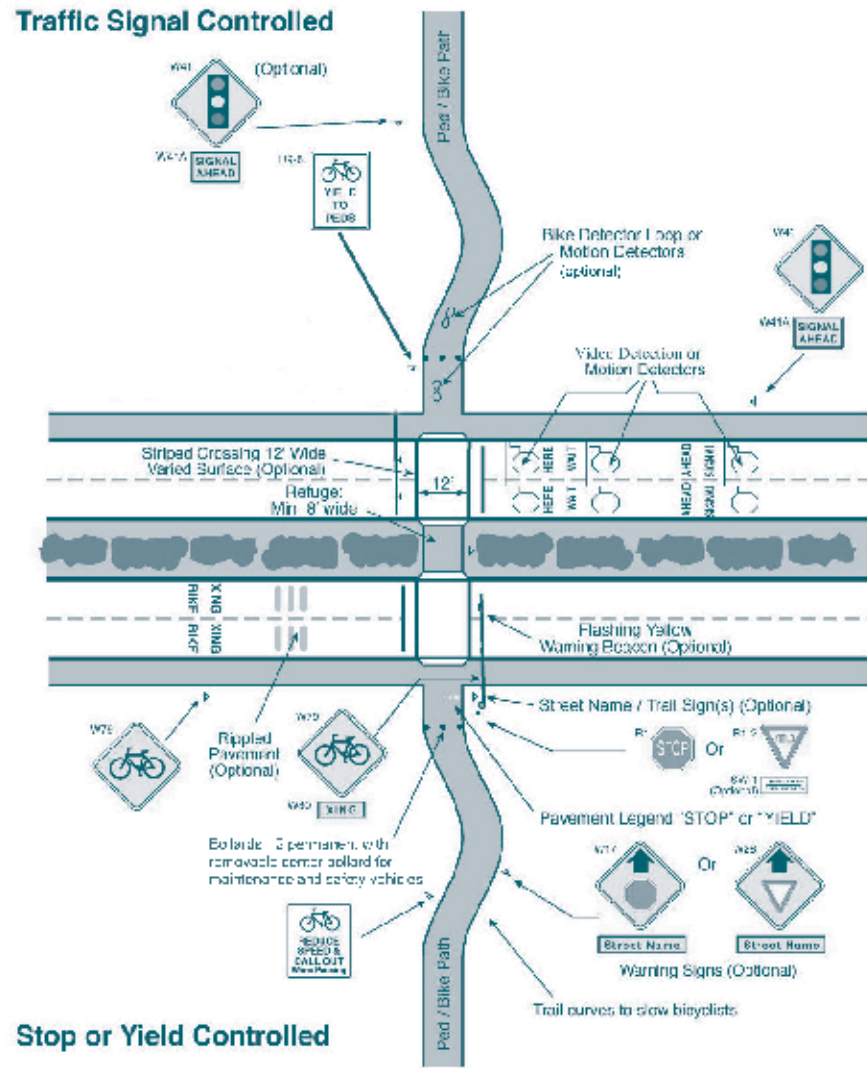


Figure 8. Type 1+ Without Signal or Type 3 With Signal Crossing Treatment

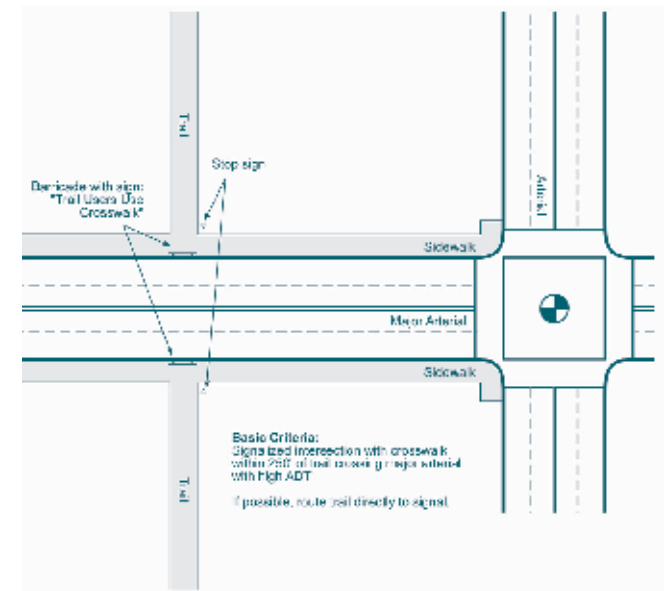


Figure 9. Type 2 Roadway Crossing Treatment

Type 3: Signalized/ Controlled Crossings

New signalized crossings may be recommended for crossings that meet pedestrian, school, or modified warrants (see pp. 44–48), are located more than 250 feet from an existing signalized intersection, and where 85th percentile travel speeds are 40 mi/h and above, and/or ADT exceeds 15,000 vehicles. Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.

Trail signals are normally activated by push buttons, but also may be triggered by motion detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street. The signals may rest on flashing yellow or green for motorists when not activated, and should be supplemented by standard advanced warning signs. Typical costs for a signalized crossing range from \$150,000 to \$250,000. However, there are additional signal choices, such as “half-signals,” that are discussed on pages 47-49.



Type 3 crossing

Type 4: Grade-separated Crossings

Grade-separated crossings may be needed where ADT exceeds 25,000 vehicles, and 85th percentile speeds exceed 45 mi/h. Safety is a major concern with both overcrossings and undercrossings. In both

cases, trail users may be temporarily out of sight from public view and may have poor visibility themselves. Undercrossings, like parking garages, have the reputation of being places where crimes occur. Most crime on trails, however, appears to have more in common with the general crime rate of the community and the overall usage of the trail than any specific design feature.

Design and operation measures are available which can address trail user concerns. For example, an undercrossing can be designed to be spacious, well lit, equipped with emergency cell phones at each end, and completely visible for its entire length prior to entering.

Other potential problems with undercrossings include conflicts with utilities, drainage, flood control, and maintenance requirements. Overcrossings pose potential concerns about visual impact and functional appeal, as well as space requirements necessary to meet ADA guidelines for slope.

Signals and Signal Warrants

Full Signalized Crossings

The federal government has provided guidance to determine where traffic control signals should be considered for installation. The Pedestrian Volume signal warrant is intended for the application where the traffic volume on a major street is so heavy that

pedestrians experience excessive delay in crossing the major street. Section 4C.05 of the Manual on Uniform Traffic Control Devices details Warrant 4, Pedestrian Volume. For signal warrant analysis, a location with a wide median, even if the median width is greater than 9 m (30 ft), should be considered as one intersection.



Type 4 grade-separated undercrossing



Type 4 grade-separated overcrossing

Warrant 4, Pedestrian Volume

Support: The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Standard: The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:

- A. The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour;
- B. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular travel.

At non-intersection crossings, the traffic control signal should be pedestrian-actuated, parking and other sight obstructions should be prohibited for at least 30 m (100 ft) in advance of and at least 6.1 m (20 ft) beyond the crosswalk, and the installation should include suitable standard signs and pavement markings if a traffic control signal is justified by both this signal warrant and a traffic engineering study.

The criterion for the pedestrian volume crossing the major roadway may be reduced as much as 50 percent if the average crossing speed of pedestrians is less than 1.2 m/sec (4 ft/sec).

In most of the THPRD service area, it will be unlikely that trail crossings will meet this warrant for criterion A, because trail usage has not increased to this point. However, this may be attributed in some part to the lack of intersection protection, among other issues.

Some jurisdictions, such as Portland (OR), have found success in installing traffic signals at trail/roadway crossings by identifying the trail as a minor roadway— since it serves as a major non-motorized transportation corridor—and applying Warrant

2, Four-Hour Vehicular Volume of the MUTCD.

Portland's Springwater Corridor, for example, crosses three major roadways, at which signals were installed after a Warrant 2 Analysis/Projection.

There are four locations—SE 82nd Ave, SE Foster Road, SE 122nd Ave, and Eastman Parkway along the Springwater Corridor where the trail crosses a major roadway of above 15,000 ADT. In all four cases, the crossing width was greater than 60 feet, the nearest intersection more than 350 feet away, and all had

anticipated trail user volumes of greater than 100 per hour. Trail designers felt that new signalized crossings would be necessary to facilitate safe travel, and thus developed a signal warrant analysis that projected use through trail user numbers from the Burke Gilman Trail in Seattle, and user counts on a 1-mile built portion of the Springwater Corridor in Gresham. Each location was also analyzed for sight lines, impacts on traffic progression, timing with adjacent signals, capacity, and safety.

Trail users activate the signal as follows:

- Pedestrians: push button
- Cyclists: loop detector in pavement

At SE 82nd, SE Foster Road, and SE 122nd Avenue, the crossing includes a median island to reduce the crossing distance, signal activation in the median for those unable to cross the entire roadway in one movement, and advance warning signs for motorists. Other crossing features follow the guidelines provided for diverting users to an existing signal as described earlier.

RESULTS

The signalized crossings have been effective and functional. Since their installation in 1995, there have been no reported collisions, with an estimated 500,000 annual users. Trail users note that although they must activate the signal and wait for a green light, motorists have gotten used to the signal and frequently stop

Warrant 2, Four-Hour Vehicular Volume

Support: The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic¹ is the principal reason to consider installing a traffic control signal.

Standard: The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in *Figure 10* for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these 4 hours.

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 70 km/h or exceeds 40 mi/h or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, *Figure 11* may be used in place of *Figure 10*.

¹ According to the MUTCD, "Traffic shall be defined as pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel."

before they get the red light. Traffic engineers report minimal interference with nearby signals, given the relatively distant spacing from the nearest signalized intersections. They also report no problems.

Warrants for the application of Traffic Control Devices (TCD) are a series of guidelines— not absolute values—that should be used in evaluating a situation. The satisfaction of a warrant is not proof that a TCD is needed, and failure to fully satisfy any specific warrant does not guarantee that the device could not serve a useful purpose. The application of warrants is effective only when combined with sound engineering judgment.

For many of the trail-roadway crossings in the



Signalized crossing at 82nd Ave and 122nd Ave includes: 2 marked crosswalks (one for each movement); landscaped median with signal activation; pedestrian push button activation; bicyclist loop detector signal activation; good sight lines; advance warning signs for motorists.

Park District, utilization of Warrant 2 would allow application of *Figure 11*, as many of the roadways have posted or 85th percentile speeds greater than 40 mi/h. In those situations, only 60 vehicles (a combination of pedestrians and bicyclists) per hour for a four hour period would be required to trigger the installation of a traffic signal if the location is determined appropriate by local engineers.

Warrant 5, School Crossing, is a third signal warrant that has applications in the Park District. Cities like Sacramento have modified their usage projections by upwardly accounting for youth, disabled, and elderly

populations through the Equivalent Adult Units factors:

Equivalent Adult Units	
Type	Factor
Child	2
Senior	1.5
Disabled	2

- 40 pedestrians cross during a one-hour period or 25 cross per hour for four consecutive hours using the Equivalent Adult Units system.⁴
- Fewer than five gaps in traffic during the peak five minute period.⁵

⁴ Use of a system of Equivalent Adult Units is recommended in order to recognize intersections that require special attention due to the presence of seniors or children, even if they don't meet the volume requirement. These two groups are disproportionately represented in collision and fatality statistics.

⁵ Average number of gaps per five-minute period = total usable gap time in seconds divided by pedestrian crossing rate at four feet per second, multiplied by 12.

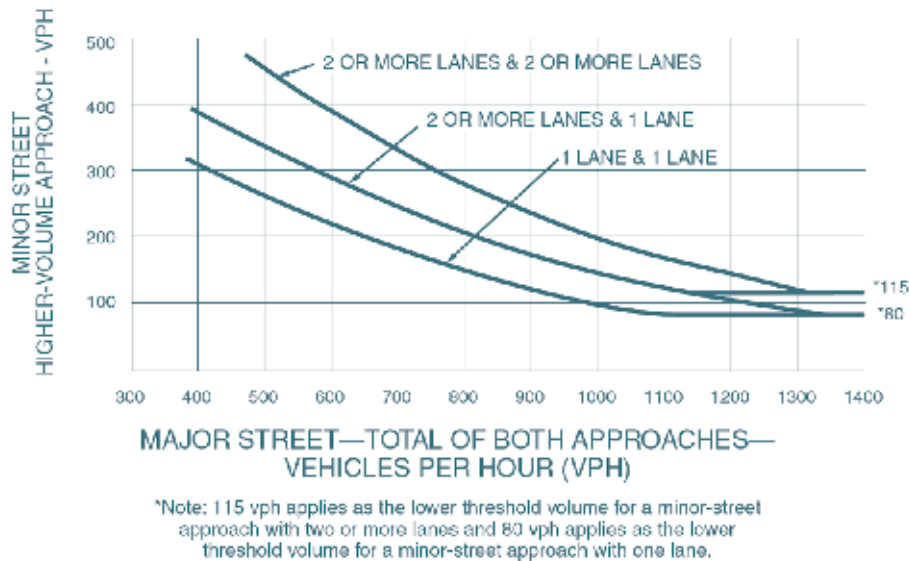


Figure 10. Warrant 2, Four-Hour Vehicular Volume (COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)

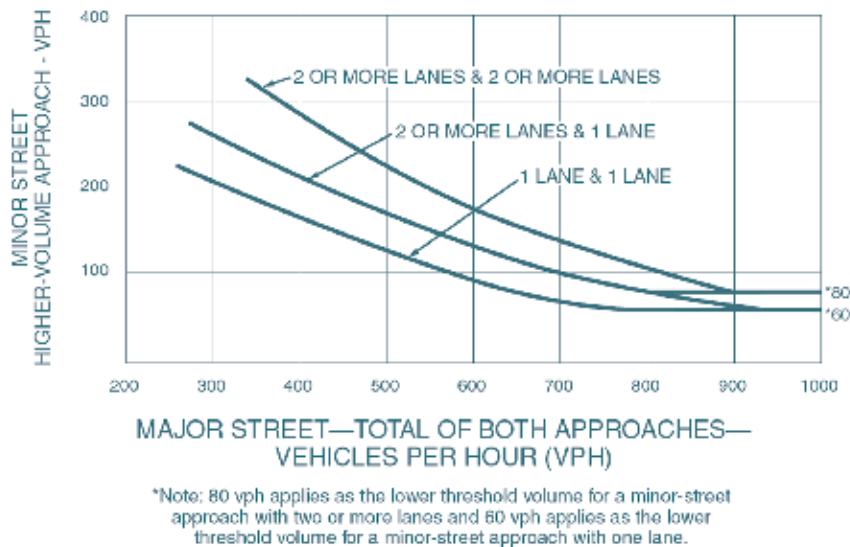


Figure 11. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

Half Signalized Crossings

In situations where there are few “crossable” gaps and where vehicles do not stop for pedestrians waiting to cross (or because of multiple lanes, it is unsafe to cross in front of a stopped vehicle), there are a number of innovative pedestrian traffic signals that do not operate as full signals that might be installed. Many of these models have been used successfully for years overseas, and their use in the United States has increased dramatically over the last decade.

PELICAN

A Pelican (**P**edestrian **L**ight **C**ontrol **A**ctivated crossing) signal incorporates a standard red-yellow-green signal light that rests in green for vehicular traffic until a pedestrian wishes to cross and presses the button. The signal then changes to yellow, then red, while Walk is shown to the pedestrian. The signal can be installed as either a one-stage or two-stage signal, depending on the characteristics of the street. In a two-stage crossing, the pedestrian crosses first to a median island and is then channelized along the median to a second signalized crossing point. At that point, the pedestrian then activates a second crossing button and another crossing signal changes to red for the traffic while the pedestrian is given a Walk signal. The two crossings only delay the pedestrian minimally and allow the signal operation to fit into the arterial synchronization, thus reducing the potential for stops, delays, accidents, and air quality environmental issues.

Warrant 5, School Crossing

Support: The School Crossing signal warrant is intended for the application where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.

Standard: The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period (see Section 7A.03¹) and there are a minimum of 20 students during the highest crossing hour.

Before a decision is made to install a traffic control signal, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing.

The School Crossing signal shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Guidance: If this warrant is met and a traffic control signal is justified by an engineering study, then:

- A. If at an intersection, the traffic control signal should be traffic-actuated and should include pedestrian detectors.
- B. If at a non-intersection crossing, the traffic control signal should be pedestrian-actuated, parking and other sight obstructions should be prohibited for at least 30 m (110 ft) in advance of and at least 6.1 m (20 ft) beyond the crosswalk, and the installation should include suitable standard signs and pavement markings.
- C. Furthermore, if installed within a signal system, the traffic control signal should be coordinated.

¹ “Alternate gaps and blockades are inherent in the traffic stream and are different at each crossing location. For safety, students need to wait for a gap in traffic that is of sufficient duration to permit reasonably safe crossing. When the delay between the occurrence of adequate gaps becomes excessive, students might become impatient and endanger themselves by attempting to cross the street during an inadequate gap.”

A Pelican crossing is quite effective in providing a pedestrian crossing at midblock locations when the technique can be accommodated into the roadway design.

PUFFIN

A Puffin (**P**edestrian **U**ser **F**riendly **I**ntelligent) crossing signal is an updated version of a Pelican crossing. The signal consists of traffic and pedestrian signals with push-button signals and infrared or pressure mat detectors.

After a pedestrian pushes the button, a detector verifies the presence of the pedestrian at the curbside. This helps eliminate false signal calls associated with people who push the button and then decide not to cross. When the pedestrian is given the Walk signal, a separate motion detector extends the Walk interval (if needed) to ensure that slower pedestrians have time to cross safely. Conversely, the signal can also detect when the intersection is clear of pedestrians and return the green signal to vehicles, reducing vehicle delay at the light. Puffin signals are designed to be crossed in a single movement by the pedestrian, unlike the Pelican signal, which can be designed to cross in either one or two stages.



Pelican signal in Tucson, AZ



Puffin signal

HAWK

A Hawk (**H**igh-Intensity **A**ctivated **C**ross**w**alk) signal is a combination of a beacon flasher and traffic control signaling technique for marked crossings. The beacon signal consists of a traffic signal head with a red-yellow-red lens. The unit is normally off until activated by a pedestrian. When pedestrians wish to cross the street, they press a button and the signal begins with a flashing yellow indication to warn approaching drivers. A solid yellow, advising the drivers to prepare to stop, then follows the flashing yellow. The signal is then changed to a solid red, at which time the pedestrian is shown a Walk indicator. The beacon signal then converts to an alternating flashing red, allowing the drivers to proceed after stopping at the crosswalk, while the pedestrian is shown the flashing Don't Walk signal.



Hawk signal

Summary of At-Grade Recommendations

In summary, Table provides guidance on how to implement at-grade trail-roadway crossings in the THPRD service area.

Table 3. Summary of Trail-Roadway Intersection Recommendations¹

Roadway Type (Number of Travel Lanes and Median Type)	Vehicle ADT ≤9,000			Vehicle ADT > 9,000 to 12,000			Vehicle ADT > 12,000 to 15,000			Vehicle ADT > 15,000		
	Speed Limit **									≤30 mi/h	35 mi/h	40 mi/h
	≤30 mi/h	35 mi/h	40 mi/h	≤30 mi/h	35 mi/h	40 mi/h	≤30 mi/h	35 mi/h	40 mi/h			
2 Lanes	1	1	1/1+	1	1	1/1+	1	1	1+/3	1	1/1+	1+/3
3 Lanes	1	1	1/1+	1	1/1+	1/1+	1/1+	1/1+	1+/3	1/1+	1+/3	1+/3
Multi-Lane (4 or more lanes) with raised median ***	1	1	1/1+	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3
Multi-Lane (4 or more lanes) without raised median	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3

* General Notes: Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices. Adding crosswalks alone will not make crossings safer, nor will they necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g., raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions), as needed, to improve the safety of the crossing. These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.

For each trail-roadway crossing, an engineering study is needed to determine the proper location. For each engineering study, a site review may be sufficient at some locations, while a more in-depth study of pedestrian volume, vehicle speed, sight distance, vehicle mix, etc. may be needed at other sites.

** Where the speed limit exceeds 40 mi/h (64.4 km/h), marked crosswalks alone should not be used at unsignalized locations.

*** The raised median or crossing island must be at least 4 ft (1.2 m) wide and 6 ft (1.8 m) long to adequately serve as a refuge area for pedestrians in accordance with MUTCD and AASHTO guidelines. A two-way center turn lane is not considered a median.

1 = Type 1 Crossings. Ladder-style crosswalks with appropriate signage should be used.

1/1+ = With the higher volumes and speeds, enhanced treatments should be used, including marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

1+/3 = Carefully analyze signal warrants using a combination of Warrant 2 or 5 (depending on school presence) and EAU factoring. Make sure to project trail usage based on future potential demand. Consider Pelican, Puffin, or Hawk signals in lieu of full signals. For those intersections not meeting warrants or where engineering judgment or cost recommends against signalization, implement Type 1 enhanced crosswalk markings with marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

¹ This table is based on information contained in the U.S. Department of Transportation Federal Highway Administration Study, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations," February 2002.

Recommended Trail Network



Recommended Strategy

Selection Criteria

Project Priorities & Phasing

Trail Descriptions

Priority Project Sheets

Estimated Long-Term Costs

Recommended Strategy

The recommended trail network fulfills the vision and goals of this Plan. It provides a comprehensive trail network that provides numerous recreation opportunities while connecting to neighborhoods, schools, parks, community centers, and business districts. The Regional Trails provide connections to the Park District's immediate neighbors: Hillsboro, Tigard, Portland, and portions of unincorporated Washington County. The trail network serves multiple users, multiple interests, and improves access for residents of varying physical capabilities, ages, and skill levels.

The following details of the network should be noted:

- The conceptual **Trails Plan Map** includes both existing (shown as solid lines) and recommended trails (shown as dashed lines). Some of the recommended facilities exist in previous planning documents, such as the 1998 Trails Master Plan, or the Fanno Creek Greenway Action Plan, while others are being recommended for the first time in this plan.
- The conceptual Trails Plan Map shows a number

of on-street connections. These connections were identified as key links between trails and recreational facilities. Care was taken to ensure that the on-street connections were identified in the Washington County and City of Beaverton Transportation System Plans (TSP) as bicycle and pedestrian facilities. These on-street connections are only shown to present a more complete picture of the potential links between Park District trails and facilities. The Park District is not in any way responsible for the maintenance of the on-street connections, as they are the responsibility of the governing jurisdiction. However, it is recommended that the Park District (or trail supportive community group) partner with the City and County to provide consistent signage along the identified routes, as well as identify any additional key connections.

- The trails shown are largely conceptual; however, care was taken to locate potential trails on public property wherever possible. Many need to be further studied and designed. The location of the trail may change as a result.
- "Accessways," which provide a direct connection from cul-de-sacs and other disconnected developments, will be determined by the City and County through development review and permitting processes. Since accessway locations cannot be known until the development applicant provides

a site plan, most accessways are not shown on the map. However, a number of existing accessways are identified as neighborhood trails on the map.

- Some local connections are on quasi-public property (e.g., through private open space owned/managed by a neighborhood association).

Selection Criteria

Selection criteria were developed with the goal of helping the Park District focus funding on the highest priority projects. The different classes of trails (Regional, Community, Neighborhood) set forth in the Plan were evaluated against other trail projects in the same class. The criteria used in the rankings are:

Connectivity: To what degree does this alternative fill a missing gap in the trail system?

User Generator: To what degree will the alternative likely generate significant usage based on population, corridor aesthetics, etc?

Regional Benefits: To what degree does the alternative offer potential benefits to the wider,

regional community by creating opportunities for increased connectivity, parks, view points, etc?

Overcomes Barrier: How well does the alternative overcome a barrier in the current network?

Land Uses: How many user generators does the alternative connect to within 1/4–1/2 miles of the project, such as schools, parks, transit centers, employment and commercial districts, etc?

Ease of Implementation: How difficult will it be to implement this project? This criterion takes into account topographical, environmental, political, and economic constraints.

Project Priorities & Phasing

Using the above criteria, the individual projects were ranked based on information obtained from site visits, fieldwork, District staff, and from the public. As a result, the projects have been grouped by classification into Tier 1, Tier 2, and Tier 3 project priorities.

Tier 1 projects are the top priority trail projects for

short-term project implementation.

Tier 2 projects are mid-term projects planned for implementation between ten and twenty-five years.

Tier 3 projects are long-term projects recommended for implementation between the next 25 to 50 years.

The short-, mid-, and long-term schedule may change according to available funds, changing priorities, new roadway projects that coincide, new development and redevelopment opportunities, or other factors.

It should be noted that the purpose of this exercise is to understand the relative priority of the projects so that the District may apportion available funding to the highest priority projects. Medium- and long-term projects also are important, and may be implemented at any point in time as part of a development or public works project. The ranked lists should be considered a “living document” and should be frequently reviewed to ensure they reflect current Park District priorities.

Regional Trails

Tier I	
R1:	Westside Trail (BPT)
R2:	Beaverton Creek Trail
R3:	Fanno Creek Trail
R5:	Rock Creek Trail
Tier II	
R4:	Cooper Mountain Trail

Community Trails

Tier I	
C1:	Waterhouse Trail
C2:	TV Highway Trail
C7:	Cedar Mill Creek Trail
C8:	Willow Creek Trail
Tier II	
C3:	South Johnson Creek Trail
C5:	Summercreek Trail
C6:	North Johnson Creek Trail
C10:	Bannister Creek Trail
C11:	Bethany Terrace Trail
C12:	North Bethany Trail
C13:	Bethany Creek Trail
Tier III	
C4:	Hiteon-Conestoga Trail
C9:	Bronson Creek Trail
C14:	North Bethany #1 Trail
C15:	North Bethany Loop Trail

Trail Descriptions

Segment	From - To	Description	Street Crossings	Length (miles)	Status
R1: WESTSIDE TRAIL (BPT)					
1	Barrows Road to Scholls Ferry Road	This trail segment is within the BPA/PGE utility corridor and passes through the Murray-Scholls Town Center area. It begins at the Tigard City Limits at Barrows Road, where it connects with the Summercreek Community Trail, and goes northward to Scholls Ferry Road.	Barrows, Scholls Ferry	0.39	Proposed
2	Scholls Ferry Road to Weir Road	This segment meanders through the Murrayhill Open Space area. This segment provides a number of connections to surrounding residential areas. The trail begins at Scholls Ferry Road and continues northwest to Weir Road. The trail connects to the future Cooper Mountain Regional Trail at Weir.	Teal, 155th, Weir	1.00	Existing
3	Weir Road to Galena Way	After reaching Weir Road, the trail turns north and extends to Galena Way.	Galena Way	0.26	Existing
4	Galena Way to Rigert Road	From Galena Way the trail continues north along the powerline right-of-way until reaching Rigert Road. (A demand trail currently exists.)	Nora, Flagstone, Rigert	0.64	Proposed
5	Rigert Road to Hart Road	The trail continues north from Rigert Road, crossing Bridle Hills Drive, eventually reaching Hart Road. There are a couple of existing neighborhood connections in the segment.	Bridle Hills, Hart	0.38	Existing
6	Hart Road to Burntwood Way	From Hart Road, the trail extends north along the powerline right-of way until reaching Burntwood Way.	Burntwood	0.26	Existing
7	Burntwood Way to Davis Road	From Burntwood Way north, the terrain becomes very steep and will require a series of switch-backs in order to navigate the hillside. A demand trail currently exists through this segment.	Davis	0.39	Proposed
8	Davis Road to Division Street	This segment begins at Davis Road and extends north along the District's Scheupbach Park to Division Street.	Village, Division	0.42	Proposed
9	Division Street to Farmington Road	From Division Street, the trail continues north along the powerline right-of-way to Farmington Road.	Farmington	0.22	Proposed
10	Farmington Road to Tualatin Valley Highway	Once crossing Farmington Road, the trail continues along the powerline corridor to the Tualatin Valley Highway overpass. As an alternative, the trail could go on-street for a short while and follow Blanton Street to 160th to cross the railroad tracks and TV Highway at a signalized intersection. Once across TV Highway, the trail would head west within the road ROW, and then north along the powerline corridor.	Blanton, railroad tracks, TV Hwy	0.57	Proposed
11	Tualatin Valley Highway to Light Rail Line	From Tualatin Valley Highway, the trail follows the powerline corridor until reaching the Light Rail Line. This proposed trail intersects with the Beaverton Creek Trail, just north of Tualatin Valley Highway. The powerline corridor is flanked by the Tualatin Hills Nature Park on the west and Beaverton Creek Tech Center on the east.	Millikan	0.76	Proposed
12	Light Rail Line to Jenkins Road	After crossing the Light Rail Line, the trail continues north along the corridor to Jenkins Road.	MAX tracks, Jenkins	0.29	Proposed
13	Jenkins Road to Walker Road	After crossing Jenkins Road, the trail extends north along some industrial property until it reaches Jay Street. From here, it crosses Jay Street and continues northeast along the corridor between the Nike Corporation and Sequent Computer Systems, until reaching Walker Road. This trail segments mostly exists. It begins ~ 500 feet north of Jenkins and continues to Walker Road.	Jay, Walker	0.61	Proposed /Existing
14	Walker Road to Sunset Highway	This segment of the trail continues from Walker Road along the corridor until reaching Pioneer Road. It then crosses the road and continues north until reaching Sunset Highway. Pioneer Park, which is located adjacent to the corridor and Pioneer Road, provide neighborhood access.	Pioneer, Greenbrier, Sunset	0.93	Proposed
15	Sunset Highway to Cornell Road	From the south side of Sunset Highway, a bike/pedestrian bridge crosses the highway. From the north side of the freeway, the trail continues north along the corridor until reaching Cornell Rd. This area is currently outside the THPRD service area.		0.31	Proposed
16	Cornell Road to Oak Hills Drive	This segment of trail extends from Cornell Road to NW Hunters Drive, continuing to Oak Hills Drive.	Hunters, Oak Hill	0.36	Proposed
17	Oak Hills Drive to West Union Road	A portion of this corridor is already developed with a variety of trails that meander through the Oak Hills Homeowners Association. The Westside Trail exists until reaching Perimeter.	Perimeter, West Union	0.43	Proposed /Existing
18	West Union to Springville Road	From West Union, the trail continues north along the corridor until reaching Springville. Future connections to Bronson Creek Greenway north of Kaiser, Bethany Terrace Trail north of Wendy, and the Rock Creek Trail at the northern end of the Park District.	Kaiser, 147th, Laidlaw, Lillium, Wendy, Springville	1.81	Proposed
19	Springville Road out of District	To end of THPRD Service Boundary	TBD	TBD	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
R2: BEAVERTON CREEK TRAIL					
1	SW 194th Avenue to SW 185th Avenue	Beginning at a trailhead off SW 194th Avenue, the trail will head into the north, wooded end of Chantal Village Park. The trail will parallel the northern boundary of the park then head south in order to cross Beaverton Creek at a point prior to (west side) the intersection with Willow Creek. The trail will access Whispering Woods Park from the north and tie into the existing trail system, and then exit the park from the southeast corner. The trail will continue east to SW 185th Avenue, crossing to the north side of Beaverton Creek.	185th	0.79	Proposed
2	SW 185th Avenue to SW 170th Avenue	The trail will traverse SW185th Avenue just south of SW Pheasant via a pedestrian refuge or an underpass along the creek (to be determined during design). On the east side of SW 185th Avenue the trail will head south, in order to gain access to Pheasant Park to the east, along the south side of Beaverton Creek. The trail will move along the south boundary of the park until reaching SW Augusta where it will continue, passing Beaver Acres Elementary School and accessing SW 170th Avenue.	170th	0.91	Proposed
3	SW 170th Avenue to Murray Boulevard	To best meet the varying needs of bicycle and pedestrian trail users, at SW 170th Avenue the trail will diverge into a "Commuter Route" and a "Trail Route" then reconnect into one trail at Murray Boulevard. Bicycle Commuter Route: Utilizing bike lanes, the route will head north on SW 170th Avenue then east on SW Merlo to the light rail tracks. On the south side of the light rail tracks the route will parallel the tracks all the way to Murray Boulevard. Pedestrian Trail Route: Crossing SW 170th Avenue with a pedestrian refuge at SW Augusta, the trail will head south on SW 170th Avenue to the Vine Maple Trail entrance of the Tualatin Hills Nature Park. The trail will follow the existing Vine Maple Trail to the Interpretive Center, cross the parking lot and tie into the Westside Trail that aligns with the east property line of the Nature Park. Following the Westside Trail alignment south, the trail will cross the railroad tracks in order to gain access to the existing trail in the Beaverton Creek Wetlands that exits the park at SW 153rd Avenue. The trail will then head north along the east side of SW 153rd Avenue then continue north along the east side of the railroad tracks, crossing SW Millikan Way and then the light rail tracks via a z-crossing.	MAX tracks Millikan, railroad tracks, 153rd, MAX tracks	1.40 2.16	Proposed/ Existing
4	Murray Boulevard to Cedar Hills Boulevard	The trail will cross under Murray Boulevard on SW Terman and continue on the south side of SW Terman, leading into the existing asphalt trail on the west side of SW Shannon Place. The trail will cross Beaverton Creek on the west side of SW Shannon heading south to the Millikan Light Rail Station, crossing SW 141st Avenue north of the light rail crossing. The trail will parallel the light rail tracks on the north side heading east toward the SW Hocken/SW Dawson intersection. Crossing SW Hocken, the trail will move along a widened sidewalk (10-14 foot) on the north side of SW Dawson to Cedar Hills.	Schottky, Hocken, Cedar Hills Blvd	1.13	Proposed
5	Cedar Hills Boulevard to SW Lombard Street	Crossing Cedar Hills Boulevard via a pedestrian refuge and following the future SW Westgate alignment to the northerly extension of Rose Biggi, the trail will then head south on Rose Biggi to Crescent Avenue at The Round to SW Hall. Crossing SW Hall at the traffic signal, the trail will continue east on the north side of Beaverton Creek then the north side of the light rail tracks until reaching SW Lombard.	Hall	0.52	Proposed
6	SW Lombard Street to SW Allen Boulevard	Utilizing existing sidewalks and bike lanes on SW Lombard the trail heads south to SW Farmington Road. From SW Farmington, the trail will parallel the railroad tracks on the east side to SW Allen.	MAX tracks, Canyon, Broadway, Farmington, 5th	1.21	Proposed
7	SW Allen Boulevard to SW Denney Road	Running parallel with the railroad tracks on the east side from SW Allen, the trail will cross the railroad tracks to access SW 110th Avenue. Heading to SW Allen by way of SW 111th Avenue, the trail will connect to the Fanno Creek Trail at Fanno Creek Park.	Railroad tracks, Denney	0.65	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
R3: FANNO CREEK TRAIL					
1	Scholls Ferry Road to Hall Boulevard	This segment of the trail meanders through Greenway Park and provides a number of connections to the abutting residential area to the west and offices to the east.	Scholls Ferry, Hall	1.17	Existing
2	Hall Boulevard to Denney Road	This segment of the trail is existing and meanders through Fanno Creek Park. Connects to the future Beaverton Creek Trail at Denney Road.	Denney	0.70	Existing
3	Denney Road to Beaverton School District Maintenance Shops	Once reaching Denney Road, the trail crosses over Highway 217 using the Denney Road Overpass. After crossing Highway 217, the trail turns north along the east side of Highway 217 adjacent to 105th Avenue, crosses Fanno Creek and follows along the north side of the creek to the Beaverton Maintenance Shops.	105th	0.74	Existing
4	Maintenance Shops to Allen Boulevard	At the Beaverton School District Bus Barn, the trail travels SE following the creek through multiple private properties, as well as Metro owned parcels to the City of Beaverton owned property at Allen and Scholls.	Scholls Ferry, Allen	0.68	Proposed
5	Allen Boulevard Shops to SW 92nd Avenue	The trail is built along Allen Boulevard to Scholls Ferry Road, where the trail tentatively remains on the north side of Allen Boulevard to the existing trail east of 92nd Avenue.	92nd	0.11	Proposed
6	SW 92nd Avenue to Oleson Road	Once reaching the Oregon Electric right-of-way Park, the trail follows an existing trail along the abandoned right-of-way until reaching the Portland Golf Club. Vista Brook Park provides access from the subdivision to the north. From the golf course, the trail meanders along the southern perimeter and connects up with the right-of-way on the east side of the golf course. From here, the trail continues east until reaching Garden Home Recreation Center. There is potential for the trail to continue eastward along a utility corridor to the Washington County line where it can eventually connect to SW Multnomah Boulevard, Portland's 40-Mile Loop/Terwilliger Trail, and the West Willamette Greenway Trail. The City of Portland Parks and Recreation Department has produced a feasibility study for this portion of the Red Electric Trail.	90th, 86th	1.15	Existing

Segment	From - To	Description	Crossings	Length (miles)	Status
R4: COOPER MOUNTAIN TRAIL					
1	BN Powerline to Farmington Road	Following a drainage corridor from the BN Powerline, this trail originates at a point east of 209th Avenue. It continues in a southeast direction until reaching Farmington Road. This area is relatively undeveloped and consists of fairly level terrain.	Farmington Road	0.46	Proposed
2	Farmington Road to Grabhorn Road	After crossing Farmington Road (an arterial roadway), the trail provides a connection to Jenkins Estate while continuing east until reaching Grabhorn Road at Koehler Road. This portion of the trail corridor consists of moderate to steep hillsides and is relatively undeveloped.	Grabhorn Road	1.44	Proposed
3	Grabhorn Road to SW 175th Avenue	After crossing Grabhorn Road, the trail meanders through Metro's Cooper Mountain Natural Area, most likely following an existing service road, until reaching SW 175th Avenue.	175th	1.45	Proposed
4	SW 175th Avenue to Westside Trail	From 175th Avenue, the trail continues east until reaching the Westside Trail (BPT).	160th, 163rd, Mt. Adams, 170th	0.79	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
R5: ROCK CREEK TRAIL					
1	Rock Creek Blvd to 185th Ave	The trail heads east from Rock Creek Blvd and Lenox ES, passing the soccer fields on the north side of the fields. Crossing through the golf course, the trail passes through Bethany Lake Park and heads to 185th. Connects to Regional Rock Creek Trail as well as neighborhood trails through Bethany Lake Park.	Rock Creek Blvd, Neakahnie, 185th	1.32	Existing
2	185th Avenue to West Union Rd	The trail runs through Allenbach Acres Park, and would most likely utilize a widened sidewalk along Kahneeta Drive for about 90 feet before reaching West Union.	Kahneeta, West Union	0.26	Proposed
3	West Union Rd to Waterhouse Trail	From West Union Rd, the trail follows the powerline corridor to connect with the Waterhouse Trail. The trail also connects with a partially existing North Bethany Community Trail that connects to PCC-Rock Creek.	none	1.00	Existing
4	Waterhouse Trail to Kaiser Rd	The trail continues east from the Waterhouse Trail, with an existing spur continuing to Kaiser Rd. A potential trail could go further north through Springville Meadows Park to connect with the northernmost section of the trail.	Kaiser Rd	0.77 (both legs)	Existing/Proposed
5	Kaiser Rd to Westside Trail (BPT)	Currently, the existing segments that intersect with Kaiser Rd are approximately 1,200 feet apart, requiring trail users to utilize Kaiser Rd to make the connection. A northern spur is noted for the previous section, while the trail could also continue east from the existing segment to connect with the Westside Trail (BPT).	Kyle Place	0.88 (both legs)	Existing/Proposed
6	US Hwy 26 to Rock Creek Trail	The trail heads north from an existing underpass, heads through the golf course, and connects with the existing Rock Creek Trail in Bethany Lake Park.	N/A	0.69	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C1: WATERHOUSE TRAIL					
1	Merlo Road to Baseline Road	The trail begins at the SW 158th/Merlo Road MAX station and heads northeast, paralleling the MAX tracks for ~ 1200 feet before heading north along the property line between the PGE and TriMet properties. After crossing Jenkins, the trail continues north to Baseline Rd.	Jenkins, Baseline	0.59	Proposed
2	Baseline Road to Walker Road	The trail continues north through Waterhouse South Park	Estuary, Estuary, Walker	0.49	Existing
3	Walker Road to Willow Creek Nature Park	The trail continues north through Waterhouse Park, where it connects with neighborhood trails through Stonegate Park and the Waterhouse Park & Rose Garden. The trail connects with the Willow Creek Trail in the Willow Creek Nature Park.	Blueridge, Mission Oaks	0.71	Existing
4	Willow Creek Park to Sunset Highway	From Willow Creek Park, the trail continues north to Bethany Ct, where it becomes an on-street signed route. It would follow Bethany Road over the highway.	Willow Creek, Cornell, Sunset Highway	0.48	Proposed
5	Sunset Highway to Joscelyn Street	After crossing the Sunset Highway, the trail heads west along the highway right-of-way for ~ 1200 feet, before heading north again. The trail would continue north through Crystal Creek and Spyglass Park to Joscelyn. The topography is hilly as the trail approaches Joscelyn, and environmental analysis will be necessary for crossing Bronson Creek.	Bronson, Avondale, Audrey, Bronson Creek	0.82	Proposed
6	Joscelyn Street to Stoller Farms Park	The trail continues north through John Marty Park and Waterhouse Trail Park to Stoller Farms Park.	Paisley, Somerset, Charlais, Tucson, West Union	0.89	Existing
7	Stoller Farms Park to West Union Estates Park	Connects to several neighborhood trails. Will require a stream crossing. The terrain in this area is fairly level and is rapidly developing with new residential areas.	stream	0.16	Proposed
8	West Union Estates Park to Springville Road	The trail continues north from West Union Estates Park through Morgans Run Park, Bethany Meadows Park and Ben Graf Park. Connects to the existing regional Rock Creek Trail. A number of opportunities for on-street connections to the surrounding neighborhoods.	Laidlaw, Brandberry, Rock Creek Trail, Graf, Springville	0.66	Existing
9	Springville Road to North Bethany Trail	The trail continues north through the undeveloped North Bethany area that is currently outside the Park District Boundary. The trail connects to another future community trail in the North Bethany area.	Brugger	0.73	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C2: TV HIGHWAY TRAIL					
1	BN Powerline Trail to 185th Avenue	Parallels the highway from the regional BN Powerline Trail to 185th Avenue. The trail would be located off-street but within the highway or railroad right-of-way. A portion of this trail segment (~ 1 mile) is located outside the Park District boundary.	209th (out of district), 198th (out of district), 188th, 185th	0.53 (in-district)	Proposed
2	185th Avenue to Westside Trail	From 185th Avenue, the trail continues heading east until reaching the Westside Trail (BPT).	170th, 160th	1.38	Proposed
3	Westside Trail (BPT) to Murray Road	From the Westside Trail (BPT), the trail continues east until reaching Murray Road.	Murray	0.63	Proposed
4	Murray Road to Schiffler Park	Once reaching Murray Road, the trail continues until reaching downtown Beaverton, and then heads south along Erickson in front of Beaverton High School until reaching Schiffler Park.	142nd, Rose, Farmington, Erickson,	1.42	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C3: SOUTH JOHNSON CREEK TRAIL					
1	Tualatin Valley Highway to Farmington Road	The trail connects to the Beaverton Creek Trail that runs through the Beaverton Creek Wetlands. From the Tualatin Valley Highway, the trail would cross the highway and the railroad tracks and follow the creek corridor south until reaching Farmington Road. This portion of the corridor contains a number of wetland area and may require the construction of a boardwalk system.	TV Highway, TV Highway Trail, railroad tracks, Farmington	0.48	Proposed
2	Farmington Road to Division Street	After crossing Division Street, the trail follows the creek south until reaching Division Street. All of the parcels the trail follows are privately owned.	Division	0.36	Proposed
3	Division Street to Village Lane	From the Division Street crossing, the trail continues south meandering through a privately-owned parcel and then through Brookview Park before reaching Village Lane.	Glenbrook, Village Lane	0.31	Proposed
4	Village Lane to Davis Road	After crossing Village Lane at 152nd, the trail continues south along 152nd until reaching Davis Road.	Trillium, Shallowbrook, New Plymouth, Davis	0.24	Proposed
5	Davis Road to Hart Road	After crossing Davis Road, the trail continues south on 152nd until Daphne, where it heads east and then south again through Brookhaven/Lowami Hart Woods Park until reaching Hart Road. There are several existing neighborhood trails that connect to Brookhaven Park.	Hart	0.85	Proposed
6	Hart Road to Sexton Mountain Drive	At Hart Road, the trail continues south through Vale Park until reaching Sexton Mountain Drive.	Gleneden, Sexton Mountain	0.55	Proposed
7	Sexton Mountain Drive to Beard Road	From Sexton Mountain Drive the trail continues south until reaching Beacon Hill Park, where it follows Turquoise Loop on-street to Beard Road. At Beard, the trail heads east for a short distance to cross at the intersection with Opal Drive/149th Avenue.	Turquoise, Emerald, Beard	0.54	Proposed
8	Beard Road to Murray Road	The trail continues on-street on Opal Drive for a short while before it continues south through Shadow Creek Park. After leaving the park, the trail follows the creek through a wooded portion of the Southywest Bible Church. It leaves the church property and follows 148th Avenue as an on-street route, before heading southeast through the Wood River Murrayhill open space. Alternatively, the trail could continue south on Mockingbird Way to the Hedlund Lane right-of-way, and head east along the unbuilt portion of the road.	Sapphire, Weir, Gull, Murray	0.73	Proposed
9	Murray Road to Scholls Ferry Road	The trail continues heading southeast, passing through private parcels before crossing Davies Road. The trail then passes through Hiteon Meadows Park and exits on to 135th, which it follows to cross Scholls Ferry Rd. This is the Park District boundary.	Davies, Scholls Ferry	0.59	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C4: HITEON-CONESTOGA TRAIL					
1	Brockman Street to 125th Avenue	The trail starts at Hiteon Elementary School and heads southwest along easements owned by the City of Beaverton. The neighborhood houses back up to the trail corridor.	Singletree, 135th, Pimlico, Santa Anita, Weir, 130th, Clydesdale, Tarpan, 125th	1.06	Existing
2	125th Avenue to Scholls Ferry Road	The trail crosses 125th Avenue and heads west along the southern property line of Conestoga Middle School. The trail reaches Boones Bend Drive, where it heads south across Scholls Ferry. On the south side of Scholls Ferry, the trail parallels the roadway heading west, where it connects with a community trail heading south into Tigard.	Pioneer	0.51	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C5: SUMMERCREEK TRAIL					
1	Westside Trail (BPT) to new Barrows Road alignment	This trail follows the old alignment of Barrows Road. The road is being prepared to accommodate the trail.	Horizon, Menlor	0.49	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C6: NORTH JOHNSON CREEK TRAIL					
1	Far Vista Street to Commonwealth Lake Park Loop	The trail starts at the end of Far Vista Street and heads northeast along the edge of Commonwealth Lake Park and the existing soccer field, where it connects with the existing loop trail around the lake. An on-street portion should be signed to connect the HMT Recreation Complex and the Westside Trail (BPT) with this trail.	none	0.19	Proposed
2	Commonwealth Lake Park to Butner Road	A trail loops around Commonwealth Lake, and connects to Butner Road to the north to continue the trail.	Butner	0.76	Existing
3	Butner Road to Peppertree Park	After crossing Butner Road, the trail continues north past the St. Andrews Lutheran Church and into Peppertree Park.	none	0.28	Proposed
4	Peppertree Park to Barnes Road	From Peppertree Park, the trail will have to cross Sunset Highway, a difficult crossing. After crossing, the trail will have to pass through land owned by the Wetlands Conservancy, another difficult task, before reaching Barnes.	Sunset Highway, Corby, Barnes	0.27	Proposed
5	Barnes Road to Valeria View	From Barnes Road, the trail continues in an easterly direction, connecting with the Cedar Mill Creek that loops around the Teufel development. The trail follows the creek alignment through the Peterkort development, where it connects with the Peterkort trail system.	Cedar Hills, Valeria View	0.83	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C7: CEDAR MILL TRAIL					
1	Corby Drive to Cedar Hills / 113th (Foege Park)	This portion of the trail heads west along the north side of Barnes Road for ~ 4/10 of a mile, before heading north towards Cornell Road along the edge of the Teufel development. When the trail reaches Cornell Road, it stays along the southern edge, paralleling the roadway until reaching Foege Park, where it utilizes an existing overcrossing to connect with another leg of the trail.	Cedar Hills	1.16	Proposed
2	Foege Park to Cornell Road	The trail heads north through Foege Park, paralleling Cedar Hills Boulevard for most of the time. It connects with the western leg of the trail at the Foege Park overpass at the Cornell Road / Barnes Road / 113th intersection.	Cedar Hills, Leahy, Cornell	0.49	Existing
3	Cornell Road to Jackie Husen Park	This portion of the trail will either be a separated path parallel to 113th heading north, or utilize on-street facilities to reach Reeves. At Reeves, the trail heads east to Jackie Husen Park.	none	0.25	Proposed
4	Jackie Husen Park to Park District Boundary	From Jackie Husen Park, the trail follows the north fork of Johnson Creek through Jordan Park to the Park District boundary, where there is the potential to connect to trails through into Forest Heights and Portland.	none	0.60	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C8: WILLOW CREEK TRAIL					
1	Willow Creek Drive / Willow Creek Park to MAX line	The trail begins in Willow Creek Park, where a short on-street segment connects it with the Beaverton Creek Trail. The trail heads north through the park, skirting the property line of the mini-mall to the east. After passing the mini-mall, the trail reaches Baseline Rd, where it heads east to cross 185th. After crossing 185th, the trail heads north to cross Baseline Road and the MAX tracks.	185th, Baseline, MAX tracks	0.34	Proposed
2	185th / MAX line to Heritage Parkway	After crossing the MAX tracks the trail heads east for a short segment (~ 160 feet) before heading north through Salix Park. There are numerous opportunities for neighborhood connections through the park to the trail. The trail passes through open space owned by 185th West Association before reaching Heritage Parkway.	Heritage Parkway	0.45	Proposed
3	Heritage Parkway to Walker Road	This portion of the trail has two options. (a) An on-street option where pedestrians use the existing sidewalks and bicyclists ride on the low-traffic streets, and (b) an off-street route. In (a) the trail would follow Heritage Loop to Pioneer Road around to Cambray Street, where it would north to cross Walker Road. This option is provided due to the numerous private properties and wetland issues that will have to be addressed in providing option (b).	Walker Road	(a) 0.48 (b) 0.46	Proposed
4	Walker Road to 173rd Avenue	From Walker Road, the trail follows the creek, passing through Bluegrass Downs Park and Apollo Ridge Park before reaching 173rd Avenue.	173rd	0.33	Proposed
5	173rd Avenue to Waterhouse Avenue	The trail passes through Winthrop Park, Willow Creek Nature Park, and Moshofsky Woods Park before reaching Waterhouse Avenue.	Waterhouse Trail	0.62	Existing
6	Waterhouse Avenue to 153rd Avenue	The trail is extended through the full length of Willow Creek Park, where it goes on-street to head east on Cornell Road and crosses Sunset Highway. After crossing the highway, the trail remains on the south side of the road to 153rd Avenue, where it crosses over Cornell to the north side of the road.	158th, Sunset Highway, Cornell	0.47	Proposed
7	153rd Avenue to 143rd Avenue	From 153rd Avenue, the trail heads east on-street for ~ 450 feet before heading north along the edge of the Dinihanian tree farm to the northern edge of the property line, where the trail heads east again through the Hunters Woods open space.	Westside Trail (BPT), 143rd	0.73	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C9: BRONSON CREEK TRAIL					
1	Cornell Road to Sunset Highway	The trail begins in Bronson Creek Park and heads northeast to the Sunset Highway.	none	0.18	Existing
2	Sunset Highway to 174th Avenue	While a short segment, it will need to cross three roadways, including Sunset Highway. The 1998 plan noted that an undercrossing was the best option, which is not feasible at this point in time.	Sunset Highway, Bronson, 174th	0.09	Proposed
3	174th Avenue to West Union	The trail follows Bronson Creek as it heads northeasterly into Crystal Creek Park. After crossing the Waterhouse Powerline Trail, trail passes through Spyglass Park and the Tokola Wetlands before reaching West Union.	Waterhouse Powerline Trail, West Union	0.99	Proposed
4	West Union to Westside Trail (BPT)	At West Union, the trail crosses at the intersection with Bethany Boulevard before continuing in a northeasterly direction following Bronson Creek. The trail crosses a number of privately-owned parcels in this segment.	Bethany Blvd, Kaiser	0.60	Proposed
5	Westside Trail (BPT) to Laidlaw Road	From the Westside Trail (BPT), the trail continues following Bronson Creek northward until reaching Laidlaw Road, which it parallels for a short time before connecting with the Bannister Creek Trail. The trail passes through mostly privately owned parcels in this segment.	Laidlaw	1.05	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C10: BANNISTER CREEK TRAIL					
1	Laidlaw Road to Bethany Terrace Trail	The trail heads north from Laidlaw, winding through the Bannister Creek development trail in the PGE/BPA easements (on-street) and connects with the Bethany Terrace Trail at its northern end.	Hamel, 126th Terrace	0.63	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C11: BETHANY TERRACE TRAIL					
1	Westside Trail (BPT)/Kaiser Woods Park to Bannister Creek Trail	The trail heads east from the Westside Trail (BPT)/Kaiser Woods Park along the edge of Bethany Terrace Meadows development to a connection with the Bannister Creek Trail	none	0.75	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C12: NORTH BETHANY TRAIL					
1	Rock Creek Park to Reindeer Drive	The trail spurs off the Rock Creek Trail heading north along a boardwalk through the Rock Creek Trail Park.	Reindeer	0.13	Existing
2	Reindeer Drive to PCC-Rock Creek	The trail continues heading north through College Park towards the Portland Community College Rock Creek campus.	Springville	0.26	Proposed
3	PCC-Rock Creek to Waterhouse Trail	Once at the PCC-Rock Creek campus, the trail heads east and then north along the campus edge. The trail heads northeast before heading northwest, and then looping around to connect with the Waterhouse Trail.	Brugger	2.19	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C13: BETHANY CREEK TRAIL					
1	Ben Graf Park to Springville Road	This trail stays north of Springville, paralleling a stream corridor through the North Bethany area.	Springville, Kaiser, Springville	1.37784	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C14: NORTH BETHANY LOOP #1					
1	Bethany Creek Trail to North Bethany Loop	The trail connects the Bethany Creek Trail with the North Bethany Loop while providing a recreational corridor in the eastern portion of the recently added North Bethany Area. The trail also connects to the Westside Trail (BPT) as it continues northward.	none	0.64	Proposed

Segment	From - To	Description	Crossings	Length (miles)	Status
C15: NORTH BETHANY LOOP TRAIL					
1	North Bethany Trail to North Bethany Trail	The North Bethany Loop begins and ends at the North Bethany Trail. Located in the northernmost section of the Bethany area to be incorporated into the UGB, the trail passes through a conceptual park location, providing a connection from the North Bethany Trail and PCC-Rock Creek.	Kaiser Road (twice)	1.49	Proposed

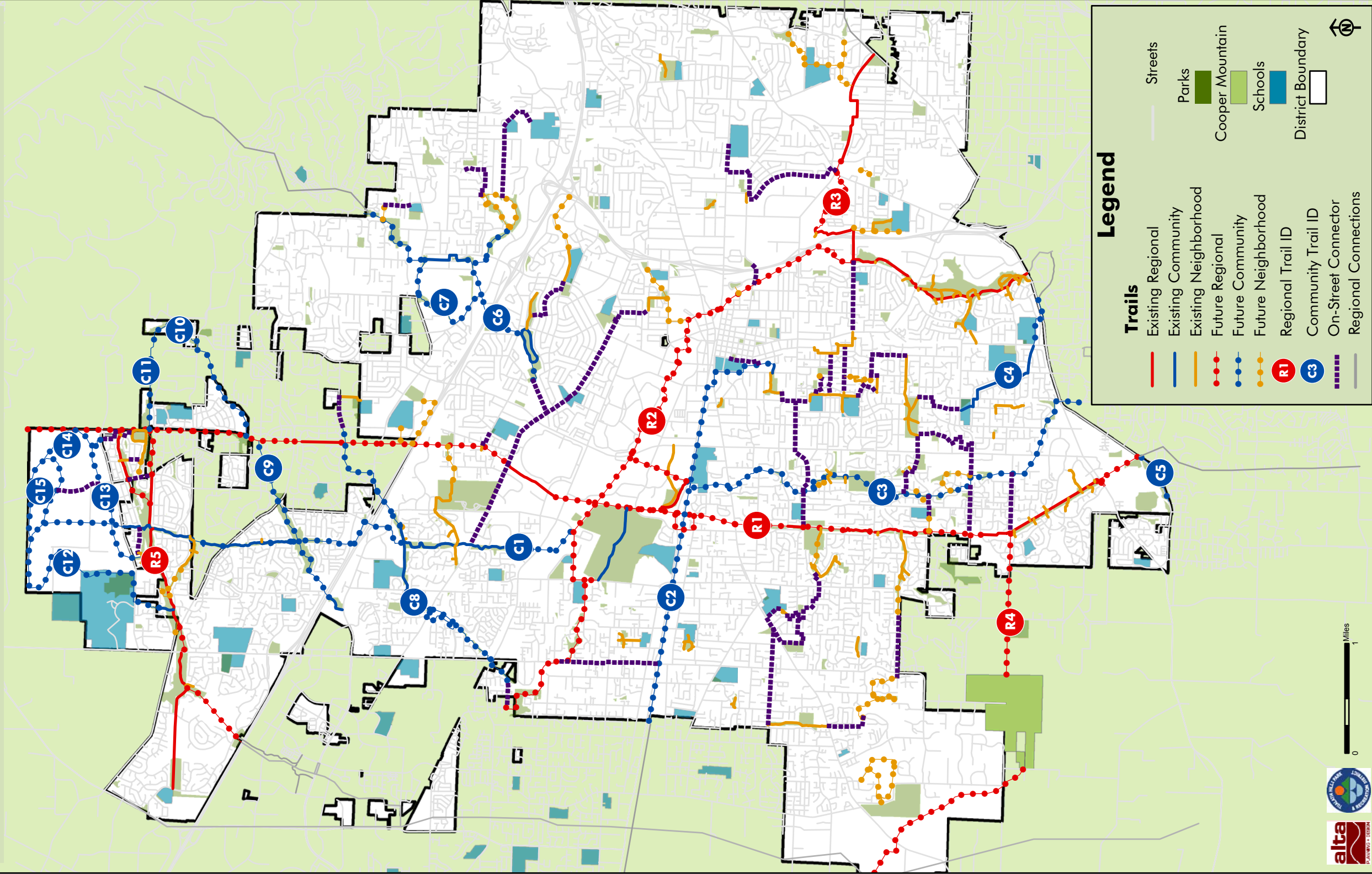
Existing and Proposed Trail Mileage: Regional Trails

Trail	Existing Miles	Proposed Miles	Total Miles
R1: Westside Trail	2.94	7.09	10.03
R2: Beaverton Creek Trail	0.41	8.36	8.77
R3: Fanno Creek Trail	3.76	0.79	4.55
R4: Cooper Mountain Trail	0	4.14	4.14
R5: Rock Creek Trail	3.46	1.46	4.92

Existing and Proposed Trail Mileage: Community Trails

Trail	Existing Miles	Proposed Miles	Total Miles
C1: Waterhouse Trail	2.75	2.78	5.53
C2: TV Highway Trail	0	3.96	3.96
C3: South Johnson Creek Trail	0	4.65	4.65
C4: Hiteon-Conestoga Trail	1.06	0.51	1.57
C5: Summercreek Trail	0	0.49	0.49
C6: North Johnson Creek Trail	0.76	1.57	2.33
C7: Cedar Mill Creek Trail	0.49	2.01	2.5
C8: Willow Creek Trail	0.62	2.8	3.42
C9: Bronson Creek Trail	0.18	2.73	2.91
C10: Bannister Creek Trail	0	0.63	0.63
C11: Bethany Terrace Trail	0	0.75	0.75
C12: North Bethany Trail	0.13	2.45	2.58
C13: Bethany Creek Trail	0	1.38	1.38
C14: North Bethany #1	0	0.64	0.64
C15: North Bethany Loop Trail	0	1.49	1.49

THPRD Trails Plan



Regional Trails



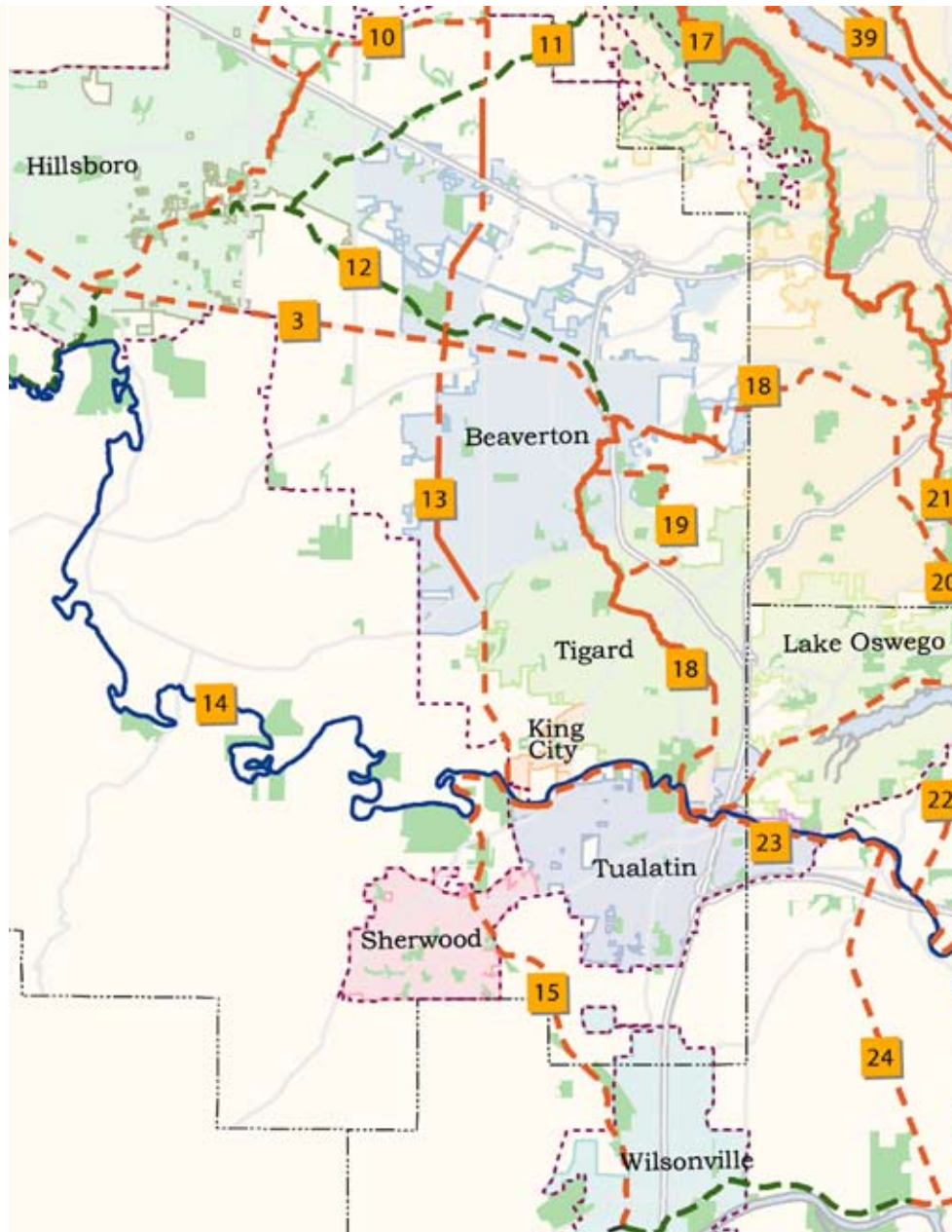
Regional Parks and Greenspaces
 600 Northeast Grand Avenue | Portland, Oregon 97232-2736
 TEL (503) 797-1850 | FAX (503) 797-1849
 metroparks@metro.dst.or.us | www.metro-region.org/parks

Legend

- 3. TV Highway Trail
- 10. Rock Creek Trail
- 11. Bronson Creek Greenway
- 12. Beaverton Creek Greenway
- 13. Westside Trail (formerly Beaverton Powerline Trail)
- 15. Tonquin Trail
- 18. Fanno Creek Greenway Trail
- 19. Washington Square Regional Center Trail

The regional trails map can be accessed and downloaded online at:

<http://www.metro-region.org/article.cfm?ArticleID=3419>



LEGEND

- Regional Trails
 - Existing
 - - - Proposed
- Water
 - Existing Inter-Regional Trail
 - - - Proposed Inter-Regional Trail
 - - - Proposed Greenway Corridor
- Urban Growth Boundary
- Existing Public Parks and Open Space

Priority Project Sheets

All the projects on the previous map are important to the growth and success of the Park District Trail System. The following projects have been identified as high priority projects based on input from residents, TAC members, and District staff.

Roadway Crossings



Roadway Crossings

Waterhouse Trail @ Walker Road

Walker Road is a high volume arterial road with sidewalks, bike lanes, and five lanes of traffic signed at 35 mph.

At this location there are no existing curb cuts, no traffic control devices, or refuges. The trail crossing is nearly 300 feet from the uncontrolled intersection of Delta Drive and Walker Rd, and twice that distance from the signalized intersection at Schendel Ave/ Walker Road.

Given the distances from existing intersections, and the absence of driveways in the immediate area, the preferred solution for improving this crossing is to mark the crossing, install a median refuge in the existing center turn lane, and provide curb cuts at both sides of the trail/roadway intersection.

Westside Trail (BPT) @ US 26

Highway 26 is currently being widened in several sections to provide more vehicle capacity. The highway is also one of the greatest barriers to trail completion within the Park District. Four trails currently are shown as crossing US 26, along with the existing undercrossing on the Rock Creek Trail in the NW corner of the Park District. These trails utilize on-road crossings wherever possible. However, the nearest intersections to the Westside Trail are Cornell Road, over half a mile to the west, and Murray Road, over half a mile to east.

The preferred solution is to install a bicycle and pedestrian bridge that will provide a safe and direct connection for trail users.

Fanno Creek Trail @ Hall Boulevard

This crossing resembles the Waterhouse Trail/Walker Road crossing, with the trail intersecting a high-volume 5-lane roadway with no provisions for trail users to get down or across Hall Boulevard. This site is complicated by nearby driveways for the adjacent business parks and Albertsons. There is a signalized crossing about 400 feet to the west at Greenway, while the Creekside/Hall intersection ~ 600 feet to the east is currently uncontrolled. Currently, trail users are directed to the signal at Greenway.

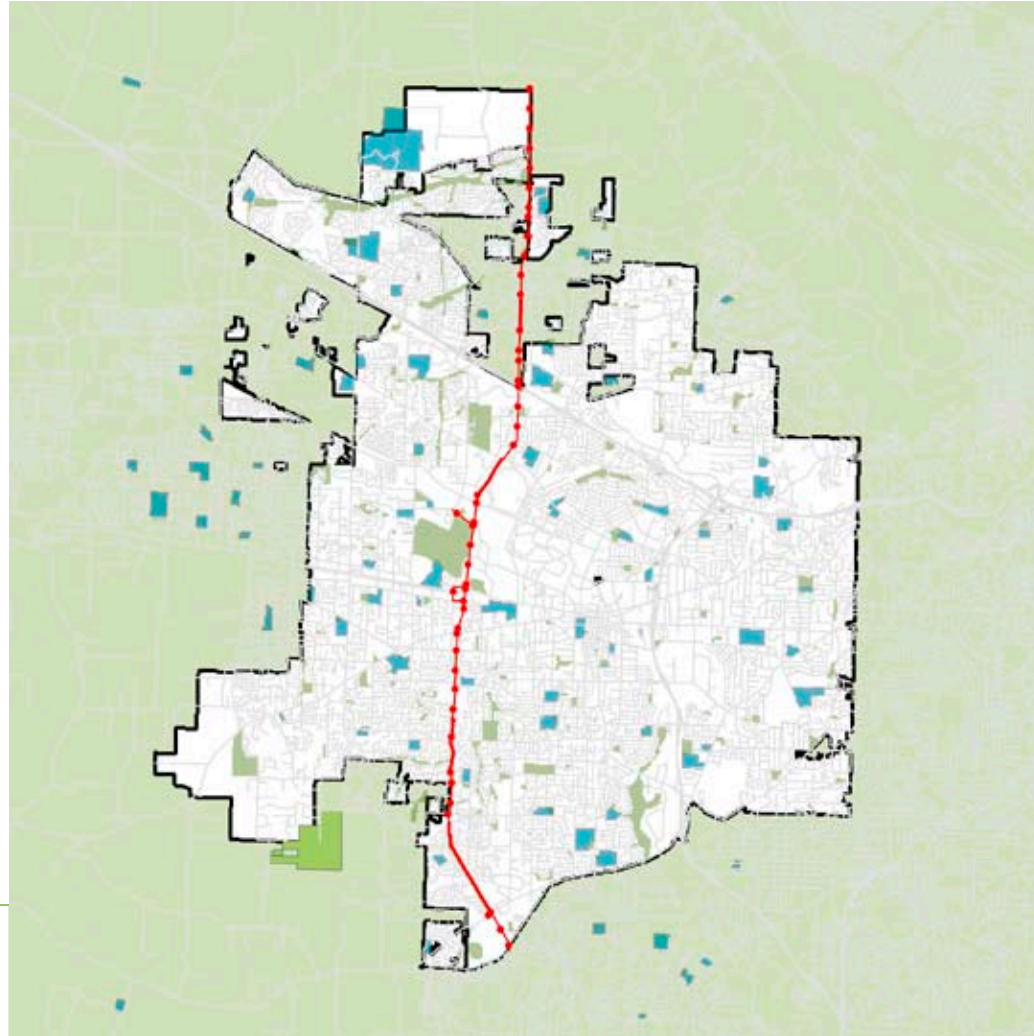
A potential solution for improving this crossing is to mark the crossing, install a median refuge in the existing center turn lane, and provide curb cuts at both the sides of the trail/roadway intersection. This will still provide over 60 feet for the left turn pockets to the west and east of the refuge for motor vehicles to access the business parks and the Albertsons parking lot. The Fanno Creek Greenway Action Plan provides additional crossing alternatives.

Westside Trail (BPT) MAX Crossing near Beaverton Creek Station

The Westside MAX trail connects with the Beaverton Creek Trail at this location, and must pass over the existing MAX tracks (three in the main corridor) as well as the set of tracks owned by TriMet but used by Burlington Northern for carrying freight.

A potential solution is to provide at-grade track crossings for trail users with appropriate signage and warning devices. A temporary solution would be to divert Westside Trail (BPT) users along the Beaverton Creek Trail to 153rd Drive and have them utilize the existing at-grade roadway crossing before reconnecting with the trail through the PGE property and continuing north.

R1: Westside Trail



Key

-  Existing Trail
-  Proposed Trail

R1: Westside Trail

Description	Key Land Uses / Destinations
<p>The Westside Trail (formerly known as the Beaverton Powerline Trail) follows an electric powerline corridor owned by PGE and BPA. The trail route runs from the Tualatin River near the Tualatin Wildlife Refuge (where it connects with the proposed Tonquin Trail) north to Forest Park. Portions of the trail already exist, with segments completed north of US 26, just south of the HMT Complex adjacent to the Nike campus, near Mt. Williams, and through Murrayhill Park to Scholls Ferry Road.</p>	<ul style="list-style-type: none"> ● Murray-Scholls Town Center ● Murrayhill Powerline Park ● Tualatin Hills Nature Park ● Sexton Mountain Elementary School ● Chehalem Elementary School ● Schuepbach Park ● HMT Recreation Complex ● Sunset High School ● Rock Creek Trail ● Nike ● Beaverton Creek Trail ● TV Highway Trail ● Neighborhoods throughout the Park District
Trail Details	Issues
<p>10–12 feet wide with a paved surface of either asphalt or concrete. Currently, there are almost 3 miles of existing trail with nearly 9 miles of trail left to complete within the District.</p>	<p>Crossings – particularly US 26, TV Highway, RR tracks and MAX line</p> <p>Terrain and topography along segments of the proposed trail alignment</p> <p>Environmental considerations</p>
Ownership	Planning Level Cost Estimate
<p>BPA and PGE, with easements granted to the Park District for the trail corridor.</p>	<p>\$7,000,000 – \$10,000,000</p>

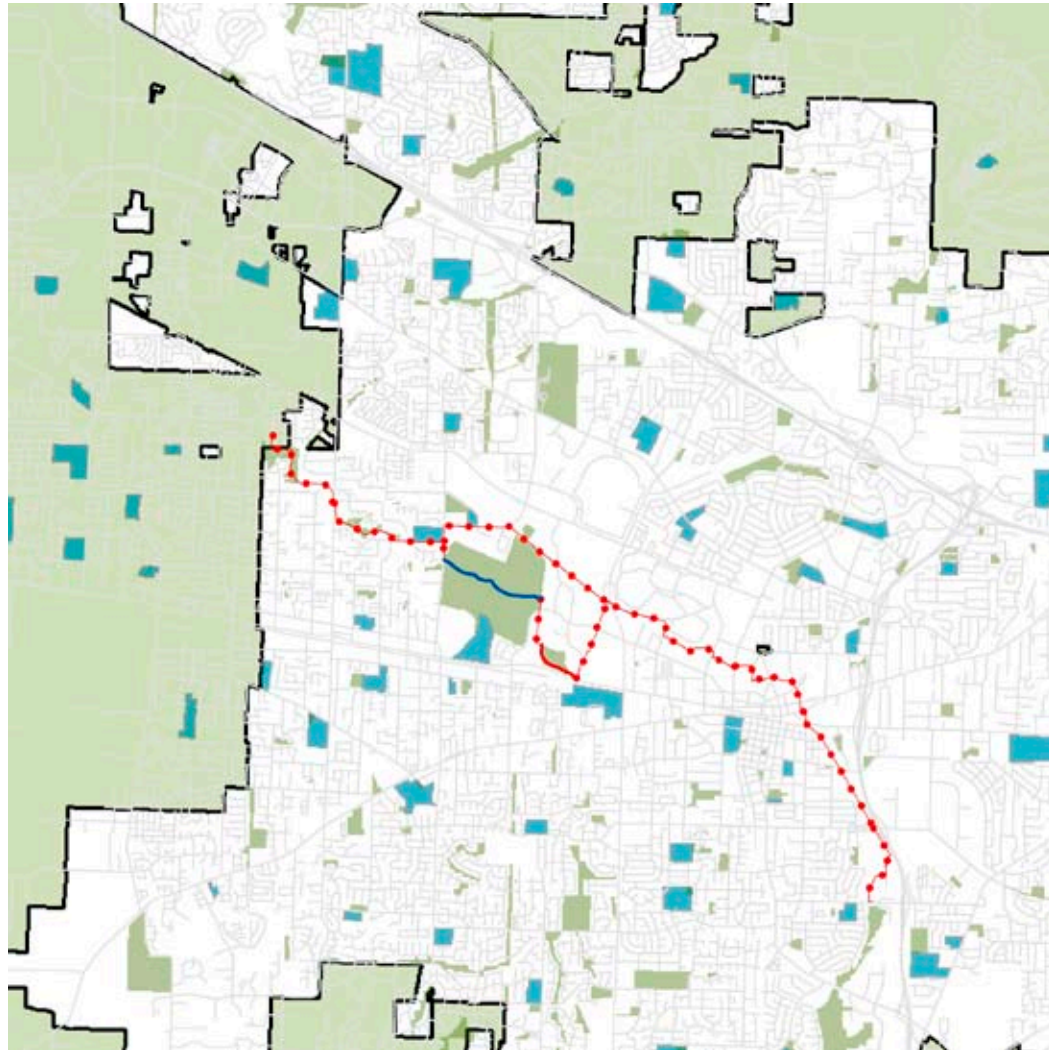


Existing Westside (BPT) Trail



Existing trail and future corridor looking north

R2: Beaverton Creek Trail



Key

-  Existing Trail
-  Proposed Trail

Note: Indicating and encouraging pedestrian travel through the Nature Park will need to be discussed further with District staff and the Nature Park advisory committee.

R2: Beaverton Creek Trail

Description	Key Land Uses / Destinations
<p>The Beaverton Creek Trail provides a critical east-west connection through Beaverton and the Park District for recreation and commuting opportunities. The trail is identified as a greenway on the regional trails map, which indicates that there are some serious environmental issues that will have to be addressed. Currently, the Park District is producing a feasibility study/action plan in cooperation with the Trails Advisory Committee. When completed, the trail will connect Hillsboro and Beaverton with Portland through the Fanno Creek Trail.</p>	<ul style="list-style-type: none"> ● Hillsboro ● Willow Creek Trail ● Chantal Village Park ● Beaver Acres Elementary School ● Tualatin Hills Nature Park ● Westside Trail ● Beaverton Creek Tech Center Park ● Tektronix ● Beaverton Round ● Beaverton Transit Center ● Beaverton City Hall ● Fanno Creek Trail
Trail Details	Issues
<p>10–12 feet wide with a paved surface of either asphalt or concrete wherever possible. The trail will involve some on-road portions. The regional trail alignment shown is conceptual, and travels along the northern boundary of the Nature Park. An alternate community route for pedestrians is shown through the Nature Park. In addition, a portion of the regional trail through Beaverton Creek Wetlands is completed.</p>	<p>Negotiating with the various stakeholder groups, including CWS and the railroad</p> <p>Providing suitable on-street connections through downtown Beaverton</p> <p>Crossings, particularly the railroad tracks in multiple locations and across multiple creeks</p> <p>Working with the Nature Park and the advisory board to designate one of the trails as a regional pedestrian trail</p>
Ownership	Planning Level Cost Estimate
<p>Numerous landowners, both public and private, with whom easements will have to be negotiated.</p>	<p>\$5,000,000 - \$7,000,000</p>

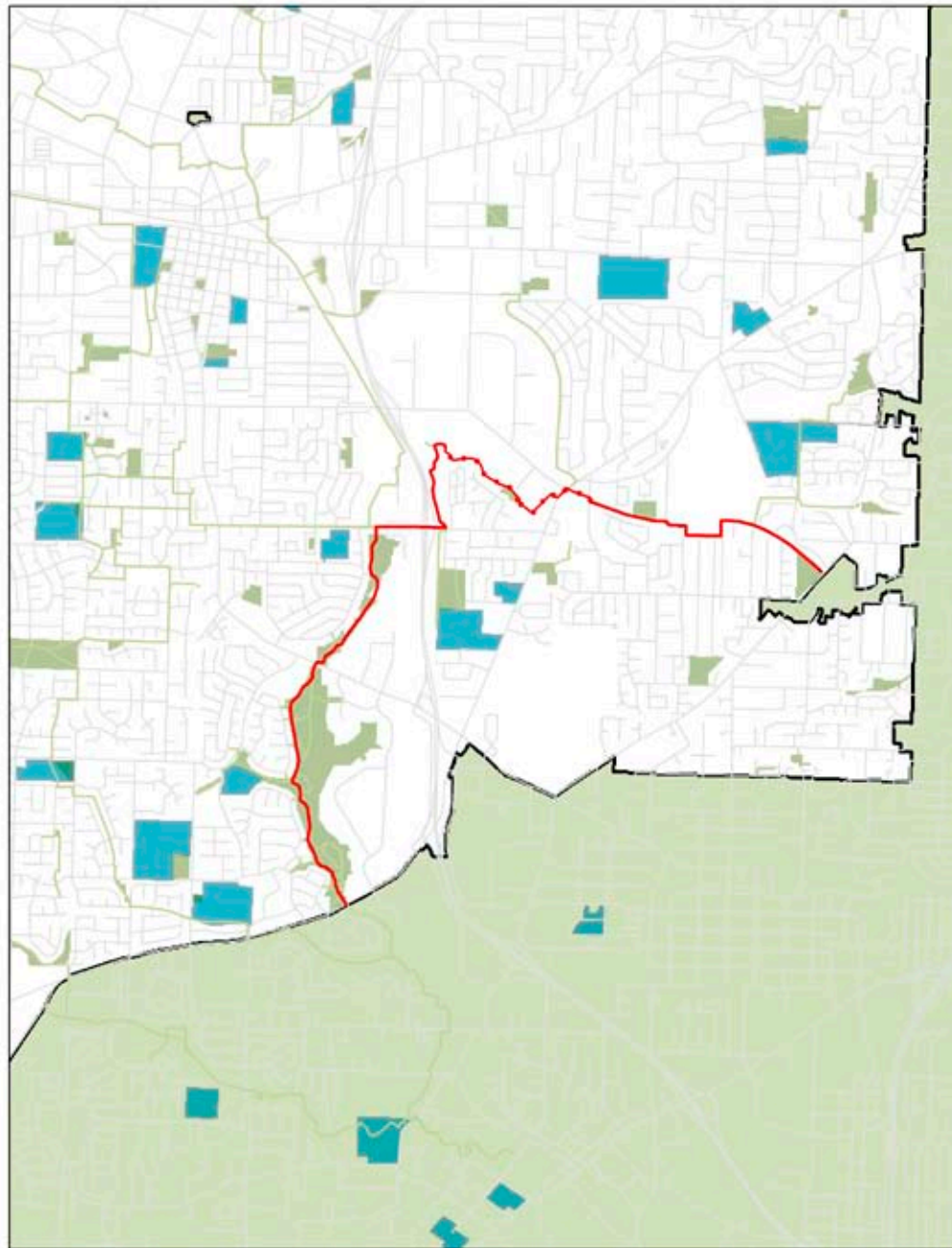
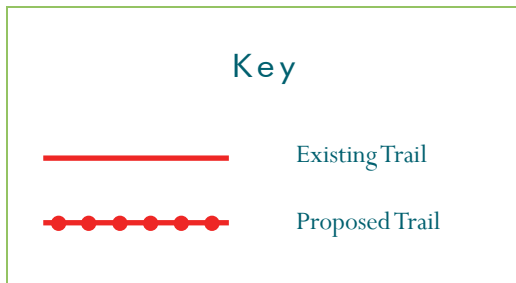


Existing trail through wetlands



Potential trail corridor south of MAX tracks

R3: Fanno Creek Trail



R3: Fanno Creek Trail

Description	Key Land Uses / Destinations
<p>The Fanno Creek Trail is a mostly completed trail in the Southeast portion of the Park District that connects Beaverton, Tigard, and communities to the south with Portland through this regional trail. The trail utilizes a portion of the old Red Electric streetcar line, and the City of Portland Parks Bureau recently completed a feasibility study to create a Red Electric Trail connecting the Portland waterfront with the Fanno Creek Trail at the Garden Home Recreation Center.</p>	<ul style="list-style-type: none"> ● Tigard ● Fanno Creek Farmhouse ● Vose Elementary School ● Greenway Elementary School ● Southridge High School ● Conestoga Recreation Center ● Garden Home Recreation Center ● Oregon Episcopal School ● Washington Square Commuter Rail Station
Trail Details	Issues
<p>As a regional trail, the trail will be 10 feet wide with a paved surface of either asphalt or concrete. The trail will be 8 feet wide behind private properties, due to environmental constraints. Currently, most of the trail through the Park District is completed; with nearly 4 miles of existing trail and just under a mile of trail left to complete within the district.</p>	<p>Completing the missing segment will require negotiating with multiple land owners</p> <p>Environmental considerations</p> <p>Crossing Scholls Ferry Road/Allen Blvd to complete missing segment</p> <p>Crossing Hall Boulevard</p> <p>Crossing State Route 217</p>
Ownership	Planning Level Cost Estimate
<p>Most of the corridor is owned by THPRD and operated as Greenway Park and Fanno Creek Park. The missing section has multiple owners, including Metro and the City of Beaverton, as well as private owners.</p>	<p>\$1,000,000 - \$5,000,000</p>

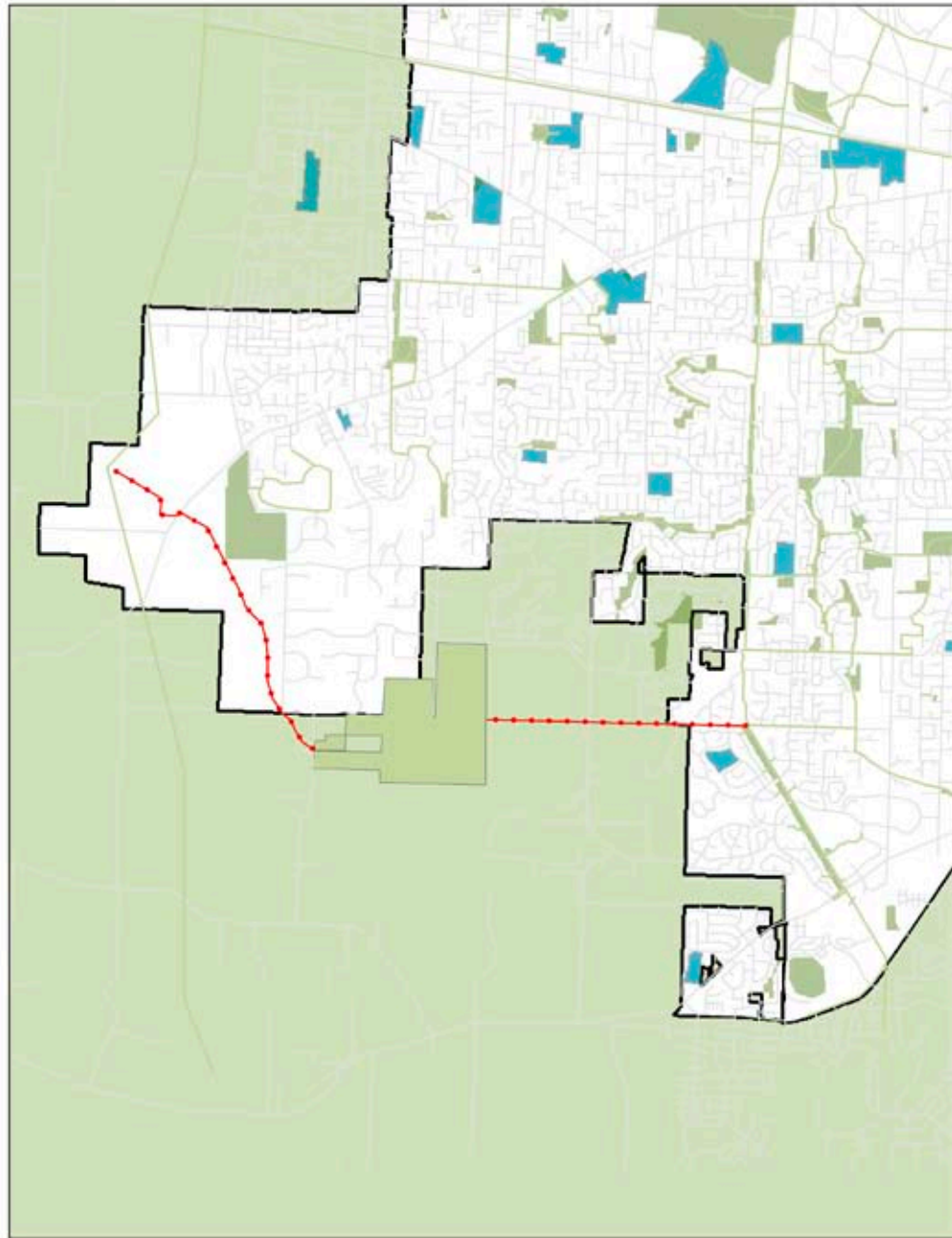
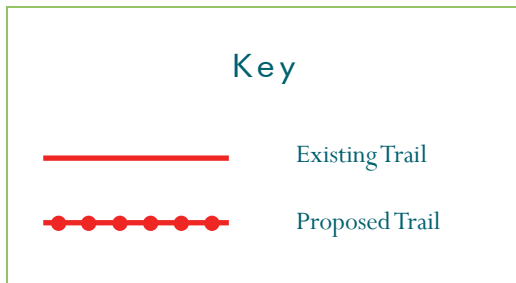


End of Fanno Creek Trail at Allen and 92nd



Scholl's Ferry & Allen intersection with future trail connection in distance

R4: Cooper Mountain Trail



R4: Cooper Mountain Trail

Description	Key Land Uses / Destinations
Previously identified as a community trail, the proposed trail alignment has been modified as well as elevated to a regional trail standard. The trail will connect two regional trails—the Westside Trail (BPT) and the BN Trail, the regional Cooper Mountain Natural Area, and Jenkins Estate. The trail also provides additional connections to Aloha.	<ul style="list-style-type: none"> ● Westside Trail ● Cooper Mountain Trail ● Jenkins Estate ● Aloha ● BN Trail ● Hillsboro
Trail Details	Issues
10 feet wide with a paved surface of either asphalt or concrete. There are no existing segments at this time. The exact location of the trail through Cooper Mountain Park has not been decided. The Cooper Mountain Natural Area Master Plan adopted by Metro showed a potential regional trail connection utilizing an existing service road, however the trail was not outlined within the plan itself.	<p>Defining an alignment for the regional trail, particularly through the Natural Area</p> <p>Crossing Farmington Road</p> <p>Creating a suitable connection with Jenkins Estate given the surrounding topography</p> <p>Environmental conditions</p>
Ownership	Planning Level Cost Estimate
BPA and PGE, with easements granted to the Park District for the trail corridor.	\$1,000,000 - \$4,000,000

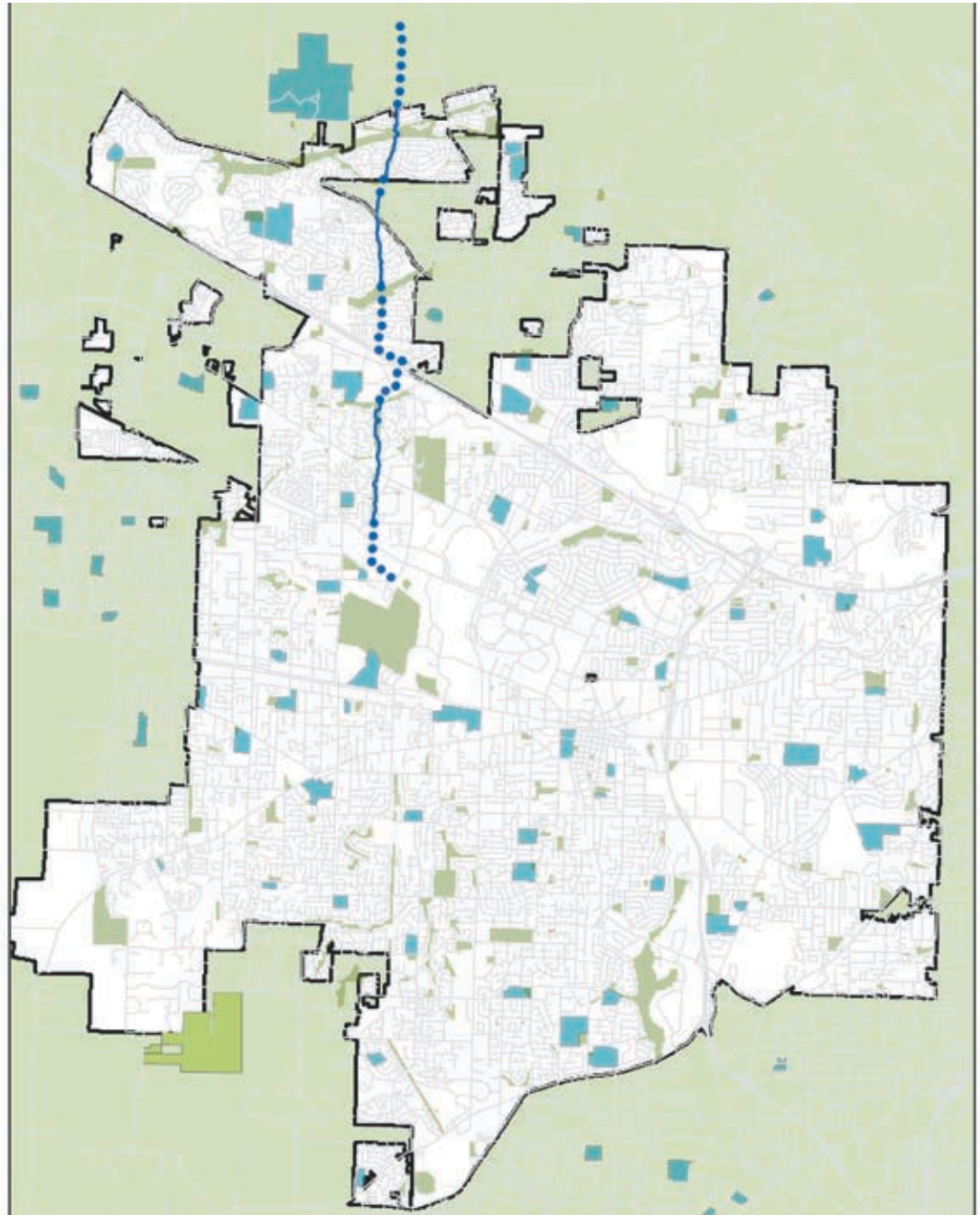


Cooper Mountain open space





Weir Road, potential future trail corridor

C1: Waterhouse Trail



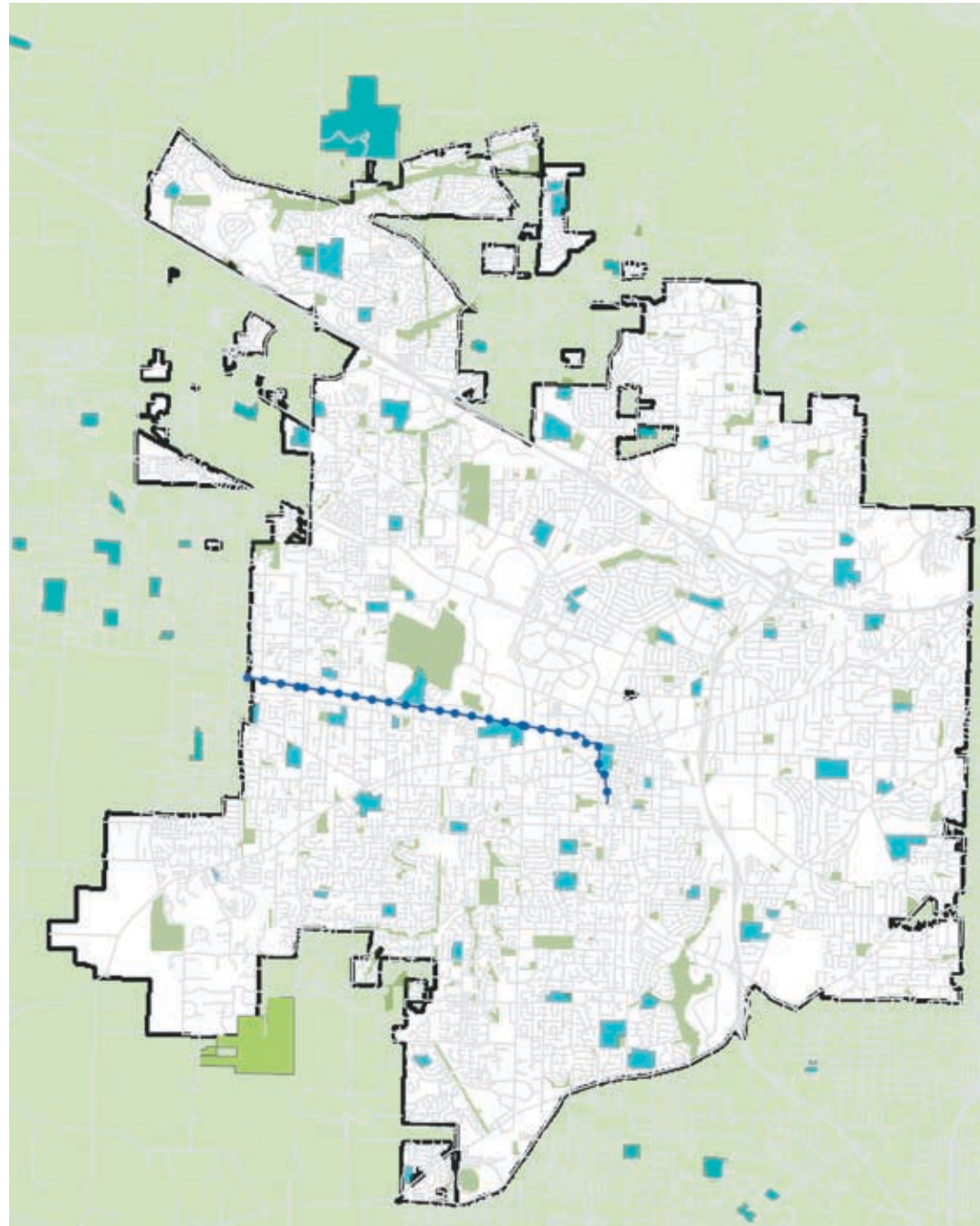
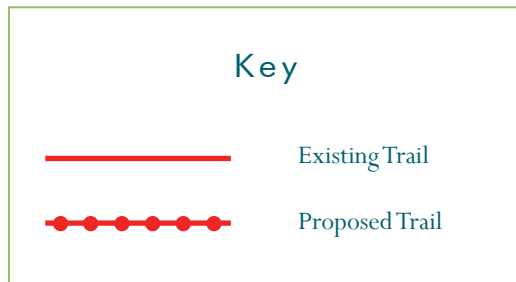
Key

	Existing Trail
	Proposed Trail

C1: Waterhouse Trail

Description	Key Land Uses / Destinations	
<p>The Waterhouse Trail is another north-south trail corridor that parallels the Westside Trail (BPT) from the Tualatin Hills Nature Park to the northern District boundary. Large portions of this trail are already completed, with the major gaps occurring between the Nature Park and Waterhouse Park, and then a second gap (including a US 26 crossing, which is currently on-street along Bethany Road) from Willow Creek Nature Park to Crystal Creek Park.</p>	<ul style="list-style-type: none"> ● Tualatin Hills Nature Park ● SW 158th/Merlo Road MAX station ● Merlo Station High School ● Waterhouse South Park ● Stonegate Park ● Waterhouse Park ● Elmonica Elementary School ● Willow Creek Nature Park ● Five Oaks Middle School ● Crystal Creek Park 	
Trail Details	Issues	
<p>As a community (potentially regional) trail, the trail will be 8-10 feet wide with a paved surface of either asphalt or concrete. Currently, there are almost 3 miles of existing trail with only about 2 miles of trail left to complete within the district.</p>	<p>Crossings – particularly US 26 and Walker Road</p> <p>Terrain and topography along segments of the proposed trail alignment</p> <p>Trail type designation</p> <p>Environmental considerations</p>	
Ownership	Planning Level Cost Estimate	
<p>The powerline corridor is owned by the BPA and PGE, with easements granted to the Park District for a trail corridor. The proposed trail also utilizes some private property.</p>	<p>\$1,000,000 - \$5,000,000</p>	

C2: TV Highway Trail





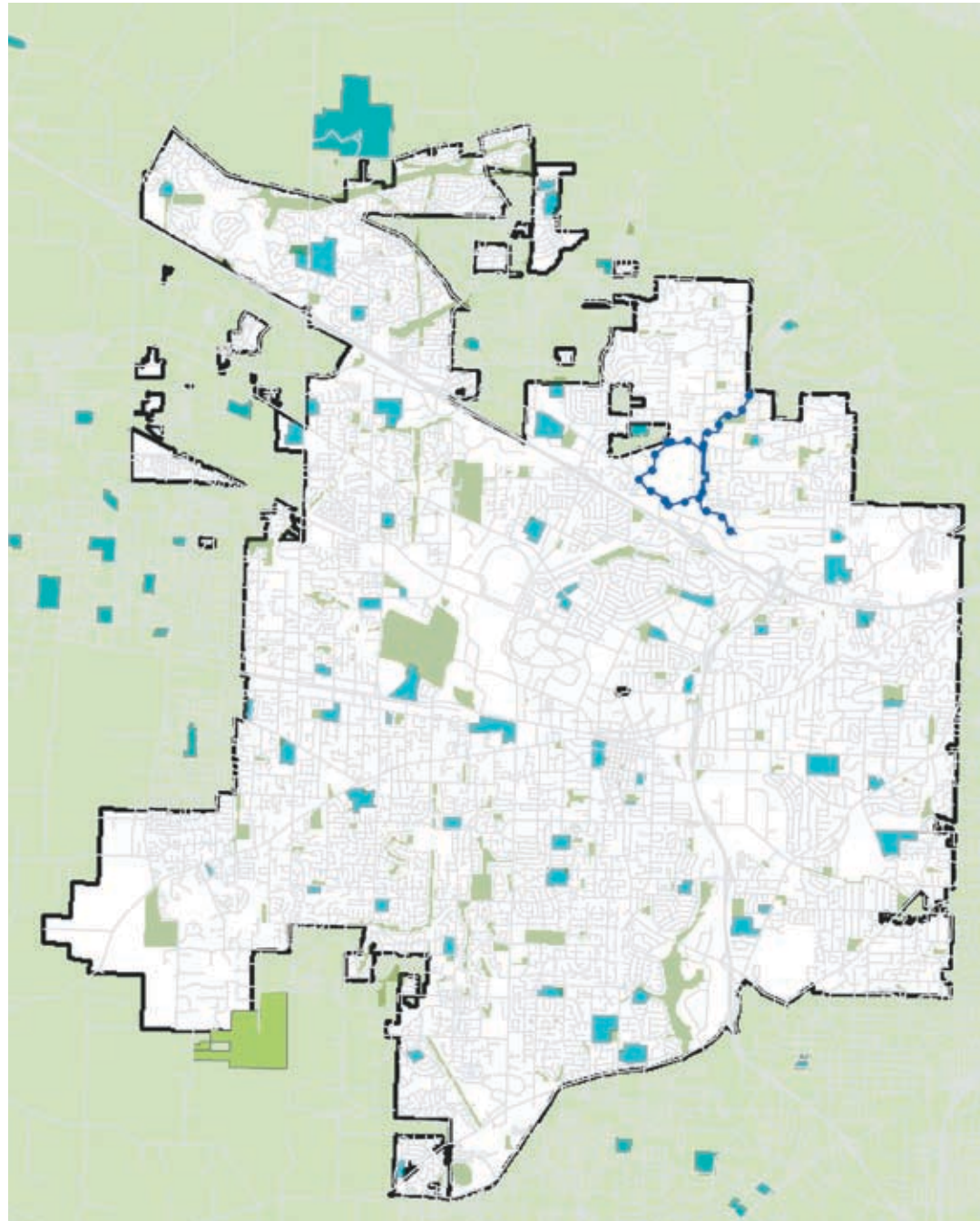
C2: TV Highway Trail

Description	Key Land Uses / Destinations	
<p>The TV Highway Trail is an east-west trail that connects downtown Beaverton with the Westside Trail and continues into Hillsboro to connect with the regional BN Trail. The trail will be located off-street but within the highway or railroad right-of-way.</p>	<ul style="list-style-type: none"> ● Beaverton High School ● Downtown Beaverton ● Barsotti Park ● Westside Trail ● Valley Catholic High School ● Levi Anderson Learning Center ● Hope Christian Elementary School ● Aloha Park Elementary School ● Beaverton Creek Wetlands 	
Trail Details	Issues	
<p>As a community trail, the trail will be 8-10 feet wide with a paved surface of either asphalt or concrete. The trail will parallel the Tualatin Valley Highway (US Hwy 8) through the Park District.</p>	<p>Safety – designing a safe two-way facility parallel to a major roadway and railroad right-of-way.</p> <p>Crossings – The TV Highway Trail will cross a number of roads that intersect with the highway.</p> <p>Negotiating with ODOT and the railroad to secure the necessary easements for locating a trail.</p>	
Ownership	Planning Level Cost Estimate	
<p>The proposed trail will either be located within highway right-of-way controlled by ODOT, or within the railroad right-of-way in portions.</p>	<p>\$2,000,000 – \$3,000,000</p>	

C7: Cedar Mill Creek Trail

Key

	Existing Trail
	Proposed Trail





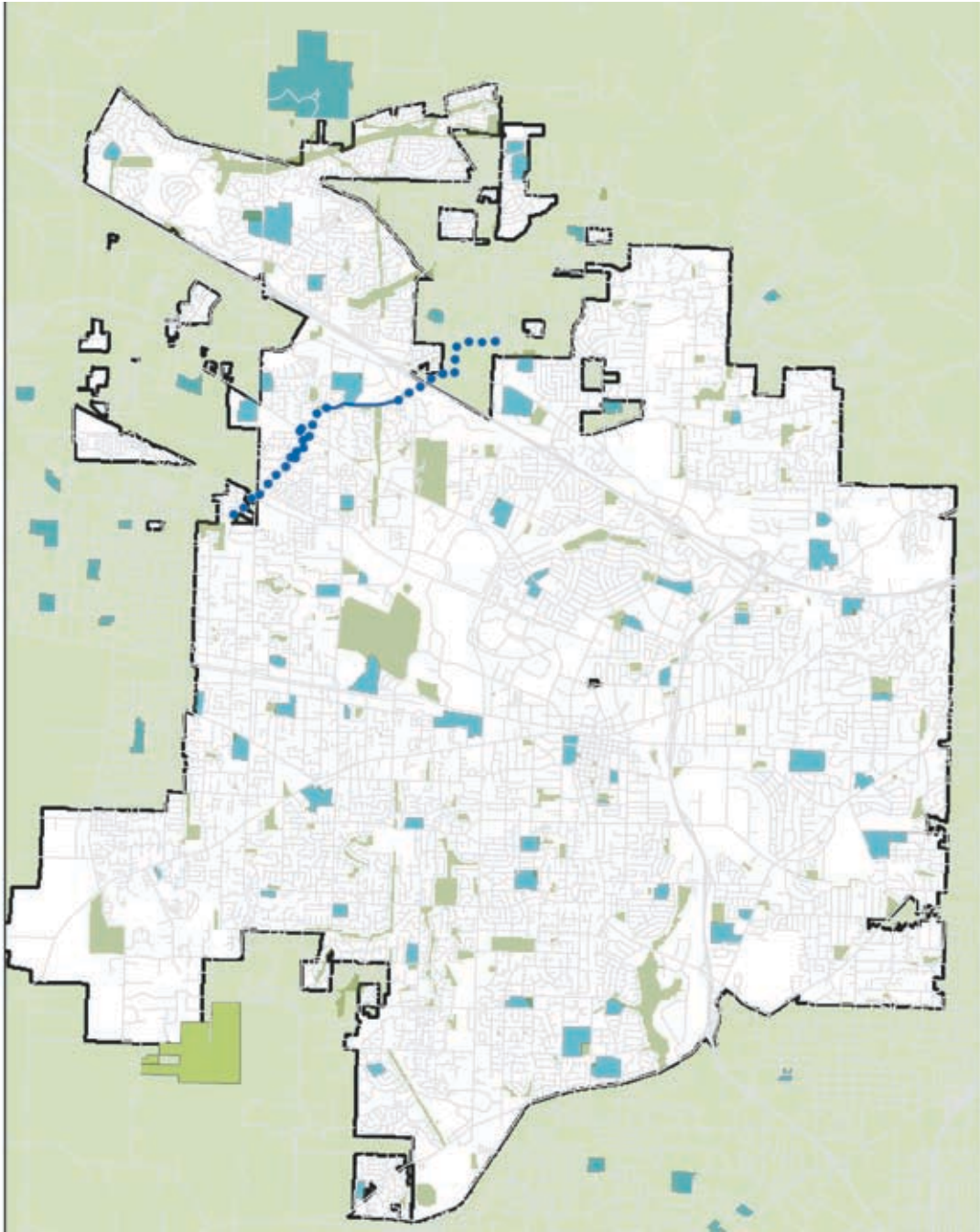
C7: Cedar Mill Creek Trail

Description	Key Land Uses / Destinations	
The Cedar Mill Creek Trail is located on land formerly owned by Teufel Nursery that has recently undergone redevelopment, so portions of this trail are under construction. The trail provides a loop around the Teufel property and then continues north to the Park District boundary, where it can continue north to connect with trails through Forest Heights and into Portland.	<ul style="list-style-type: none"> ● Foegen Park ● Jackie Heusen Park ● Johnson Creek ● Jordan Park ● Neighborhoods 	
Trail Details	Issues	
As a community trail, the trail will be 8-10 feet wide with a paved surface of either asphalt or concrete wherever possible.	<p>Topography</p> <p>Environmental considerations, particularly wetland issues</p> <p>Negotiating with private property owners</p>	
Ownership	Planning Level Cost Estimate	
There are numerous landowners, both public and private, with whom easements will have to be negotiated.	\$1,000,000 – \$3,000,000	

C8: Willow Creek Trail

Key

	Existing Trail
	Proposed Trail



C8: Willow Creek Trail

Description	Key Land Uses / Destinations	
<p>The Willow Creek Trail will connect two major regional trails – the Beaverton Creek Trail and the Westside Trail – creating an excellent recreational loop for trail users. The trail begins in Willow Creek Park and heads northeast following the creek through numerous parks. There is a short segment already completed that runs through Winthrop Park, Willow Creek Nature Park, and Moshofsky Woods Park.</p>	<ul style="list-style-type: none"> ● Willow Creek Park ● Beaverton Creek Trail ● Salix Park ● Bluegrass Downs Park ● Apollo Ridge Park ● Five Oaks Middle School ● Winthrop Park ● Willow Creek Nature Park ● Moshofsky Woods Park ● Westside Trail ● Hunters Wood open space 	
Trail Details	Issues	
<p>As a community trail, the trail will be 8-10 feet wide with a paved surface of either asphalt or concrete wherever possible. Currently, the trail is conceptual, with the exception of the portion of the trail through the trio of parks just to the north of the HMT Complex.</p>	<p>Crossings, including Baseline Road, MAX tracks, Walker Road, and US 26</p> <p>Environmental considerations, particularly wetland issues</p> <p>Negotiating with private property owners</p>	
Ownership	Planning Level Cost Estimate	
<p>There are numerous landowners, both public and private, with whom easements will have to be negotiated.</p>	<p>\$1,000,000 - \$3,000,000</p>	

Estimated Long-Term Costs

The candidate projects are recommended to be implemented over the next 50 years, or as funding is available. Some of the more expensive projects may take longer to implement.

The total implementation cost for the regional and community trails is estimated at approximately \$31.8 – 56.3 million. Between \$15 and 27.5 million is for regional trails, and \$16.8 to 28.8 million is for community trails. A complete breakdown of costs is presented in *Tables 4 and 5*.

Neighborhood trails are typically short trail segments connecting existing trails to parks and neighborhoods, and many of them are on-road connections between facilities. The costs for this type of facility can vary from \$300,000 per mile for a wide paved trail (with most being considerably less than a mile in length) to as low as \$1,500 for signing an on-street facility.

While trail projects built to regional standards and with commuter potential can be funded with federal, state, and regional transportation, safety, and/or air

quality grants, many of the trails are recreational in nature and must be funded by local or private sources. The estimated total costs are listed in today's dollar figures and do not include inflation. It should be noted that federal funding requirements might cause project costs to rise when compared to the total costs when using local funds. Construction costs may also fluctuate based on labor and material costs.

Table 4. Estimated Costs for THPRD's Trail Network: Regional Trails

ID	Trail Name and Segments	Estimate of Total Cost
R1	Westside Trail	\$7 – 10 million
R2	Beaverton Creek Trail	\$5 – 7 million
R3	Fanno Creek Trail	\$1 – 5 million
R4	Cooper Mountain Trail	\$1 – 4 million
R5	Rock Creek Trail	\$1 – 1.5 million
Totals		\$15 – 27.5 million

Table 5. Estimated Costs for THPRD's Trail Network: Community Trails

ID	Trail Name and Segments	Estimate of Total Cost
C1	Waterhouse Trail	\$1 – 5 million
C2	TV Highway Trail	\$2 – 3 million
C3	South Johnson Creek Trail	\$2 – 3 million
C4	Hiteon-Conestoga Trail	\$300,000 – 400,000
C5	Summercreek Trail	\$250,000 – 300,000
C6	North Johnson Creek Trail	\$2 – 3 million
C7	Cedar Mill Creek Trail	\$1 – 3 million
C8	Willow Creek Trail	\$1 – 3 million
C9	Bronson Creek Trail	\$2.8 – 3.5 million
C10	Bannister Creek Trail	\$300,000 – 400,000
C11	Bethany Terrace Trail	\$350,000 – 400,000
C12	North Bethany Trail	\$1 – 1.5 million
C13	Bethany Creek Trail	\$700,000 – 1 million
C14	North Bethany #1 Trail	\$300,000 – 400,000
C15	North Bethany Loop Trail	\$800,000 – 900,000
Totals		\$16.8 – 28.8 million

* Actual cost will depend on ROW issues, drainage issues, surface selected.

Trail Funding Sources & Acquisition Strategies



Funding Sources

Acquisition Strategies

Funding Sources

Public Funding for Bicycle and Pedestrian Facilities

A variety of potential funding sources are available to help pay for future trails, including local, State, regional, and Federal funding programs that can be used to construct or augment bicycle and pedestrian improvements. Most of these involve the completion of extensive applications with clear documentation of the project need, costs, and benefits, and which compete with similar applications from other agencies. Local funding for these projects would typically come from Park District revenues and/or potential future bonds or other partnership with other local service providers.

Table 6 summarizes potential public funding sources for Park District trail projects. Some are restricted to specific types of improvements. It is important to note that many of the funding sources are highly competitive and it is impossible to determine exactly which projects will be funded by which funding sources. It is

also difficult to pinpoint the timing of projects, due to dependence on competitive funding sources, timing of roadway and development projects, and the overall economy.

Other Funding Opportunities

Residents and other community members are excellent resources for garnering support and enthusiasm for bicycle and pedestrian facility improvements, and the Park District should work with volunteers to substantially reduce implementation and maintenance costs. Local schools, community groups, or a dedicated neighbors group may help sponsor projects, possibly working with a local designer or engineer. Work parties can be formed to help clear right-of-way where needed. Local construction companies can be approached to donate or discount services. Other opportunities for implementation will appear over time, such as grants and private funds. The District has been successful in the past in obtaining grants and donations from private parties and in partnering with other agencies in co-development of facilities. The District should look to its residents for additional funding ideas to expedite the completion of the bicycle and pedestrian system.

Private Funding Sources –Volunteer Services

Local businesses can help defray some of the costs

associated with trail and greenway development. Some examples include:

- Cash donations
- Donations of services, equipment, and labor
- Discounted materials
- Contribution of employee volunteer time

Foundations

Some trail elements, particularly if they are related to educational, civic, or environmental goals or projects, can be funded through private foundations. Funding opportunities through local foundations have a higher probability of success and should be approached before pursuing national foundation funds. Some local foundations include the Ford Family Foundation, the Tualatin Hills Park Foundation, and the Meyer Memorial Trust. It is important to keep in mind that many foundations only solicit grant proposals from registered 401c3 nonprofit organizations.

Land Trusts

Land Trusts are local, regional, or statewide nonprofit conservation organizations directly involved in helping protect natural, scenic, recreational, agricultural, historic, or cultural property. Land trusts work to preserve open land that is important to the communities and regions where they operate.

Service Clubs

Community organizations have been very successful holding fundraisers and providing volunteer labor for trail building and maintenance activities. Local examples include 4-H, Boy Scouts of America, Rotary Club, Portland Community College service clubs, and others.

Individual Sponsors

Individuals, businesses, or corporations can contribute donations to sponsor sections of trail or project elements. The Park District has been successful in the past in obtaining grants and donations from private parties to assist in developing other types of park and recreation facilities. Plaques or other forms of recognition are typically placed on constructed pieces in the trail corridor or at a prominent entry point. Sponsorship is a good way to fund trail elements such as benches, trash receptacles, and interpretive areas.

Sections of trail can also be sponsored through a “Buy a Foot” program. Community members can purchase a section of trail at a fixed cost per linear foot and have their names (or dedication) inscribed in the concrete or along the boardwalk.

Table 6. Public Funding Sources for Bicycle, Pedestrian, and Trail Projects

Source	Description	Eligible Projects	Funding Cycle
Metro Transportation Improvement Program Funding (MTIP)	Federal transportation funds coordinated by Metro. Funds can be used for Preliminary Engineering, ROW acquisition and construction.	Regional, Community Trail projects along roadways with regional classifications	2 years
Recreational Trails Grants	Coordinated by Oregon State Parks. Funds can be used for ROW acquisition and construction.	Regional, Community Trails	Annual
Land and Water Conservation Fund (LWCF)	Federal funds coordinated by Oregon State Parks. Funds can be used for ROW acquisition and construction.	Regional, Community Trails	Annual
Measure 66 funds from Oregon State Lottery	Coordinated by Oregon State Parks. Funds can be used for ROW acquisition and construction.	Regional, Community Trails	2 years
Transportation Enhancements	Administered by Oregon Department of Transportation (ODOT). Must serve transportation need.	Regional, Community, some Neighborhood Trails	2 years
Oregon Bike/Ped Grants	Administered by ODOT’s Bicycle and Pedestrian Program. Must be in public ROW.	Regional, Community, some Neighborhood Trails	2 years
System Development Charges (SDCs)	Fees on new construction allocated for parks and public improvements. Where available, funds can be used for ROW acquisition and trail construction.	Community, Neighborhood Trails	Varies
Local/Regional bond measures	Funds can be used for ROW acquisition, engineering, design and trail construction.	Regional, Community, Neighborhood Trails	Varies
Tax Increment Financing/ Urban Renewal Funds	Part of trail project must be located in an urban renewal district which meets certain economic criteria and is approved by a local governing body.	Community, Neighborhood Trails	Varies
Local Traffic Safety Commission	Funding for street crossings and signals.	Community, Neighborhood Trails	Varies
Safe Routes to School Funds	Federal funds for pedestrian and bicycle facilities to improve school safety	Regional, Community, Neighborhood Trails	Pending legislation
Congestion Mitigation and Air Quality (CMAQ) funds	Federal funding for bicycle and pedestrian facilities that reduce travel by automobile. Recreational facilities generally are not funded.	Community Trails	2 years

Acquisition Strategies

Property Control

The relationship of the parties in a shared-use corridor will be driven to a great extent by which entity holds the dominant property interest. The type of property control influences both the ease of implementing the project and the liability burden. There are three types of property arrangement: purchases, easements, and licenses.

Acquisition

To accommodate the concerns of property owners with respect to the location of a trail, the Park District could consider owning the trail corridor itself. This internalizes the liability and coordination efforts. The Park District is treated differently from other property owners due to its unique status as a sovereign entity. This option transfers basic liability to the Park District and would give the District the authority to locate the trail in the corridor.

Easements

In most instances, full ownership acquisition is not

necessary for trail development, and, in many cases, is not really an option. Easements, which come in many forms, typically are acquired when the landowner is willing to forego use of the property and development rights for an extended period. The landowner retains title to the land while relinquishing most of the day-to-day management of the entire property or a portion of the property. The trail manager gets sufficient control for trail purposes. The easement is attached to the property title, so the easement survives property transfer. The table below provides an overview of easement agreement issues.

Easement Agreement

A model easement agreement should:

- Guarantee exclusive use or uses compatible.
- Be granted in perpetuity.
- Include air rights if there is any possible need for a structure.
- Broadly define purpose of the easement and identify all conceivable activities, uses, invitees, and vehicular types allowed to avoid any need to renegotiate with fee interest owner in future.
- State that all structures and fixtures installed as part of a trail are property of grantee.
- Include subsurface rights for use by utility franchises.

It is also understood that major landowners would want an easement agreement to address issues on their side. Through cooperative negotiation, the following issues should be addressed in an easement agreement:

- Access needs related to maintenance, etc.
- Trail management plan.

- Future improvements or modifications to the trail.

Licenses

A license is usually a fixed-term agreement that provides limited rights to the licensee for use of the property. Typically, these are employed in situations when the property cannot be sold (e.g., a publicly-owned, active electrical utility corridor), or the owner wants to retain use of and everyday control over the property. The trail management authority obtains permission to build and operate a trail. But it will have little control over the property, and may be subject to some stringent requirements that complicate trail development and operation. The table below provides an example of model license agreement language.

License Agreement

A model license agreement should:

- Provide an acceptable term length with an option to renew.
- Identify all conceivable activities, uses, invitees, and vehicular types.
- Provide clarity on maintenance responsibilities.
- Specify limits on other uses of license property.

As with easement agreements, property owners would want a license agreement to address issues on their side. Through cooperative negotiation, the following issues should be addressed in a license agreement:

- Access needs related to maintenance, etc.
- Trail management plan.
- Future improvements or modifications to the trail.



Maintenance, Management, & Safety Guidelines

Trail Management

Property Management

Maintenance Guidelines

Trail Safety

Trail Liability

Trail management and maintenance are important factors in trail success. The psychological effects of good maintenance can be a highly effective deterrent to vandalism and littering. When new trails are implemented, the managing agency effectively becomes a new neighbor to adjacent landowners located along the trail corridor. As a neighbor to the various communities the trail passes through, the managing agency has an ongoing relationship with those communities and the state of maintenance along the trail is a significant factor in the success or failure of that relationship. Though statistics show that trails are generally safe places for people, the managing agency of any trail cannot afford to be complacent about maintenance. Trails must be proactively managed and maintained.

Trail Management

Park District Staff

One of the most important tasks facing the Park District will be to establish maintenance standards and to ensure that the Park District and any maintenance partners are aware of and will adhere to such standards.

Continuity and consistency in management is also an important element. There should not be varying degrees of maintenance experienced along the trail corridors. From the public's perspective, as issues and concerns arise along the trail, it must be clear who the public should contact to address these concerns.

The Park District has key staff people who represent the major tasks for trail management of the District's trail system.

Implementation

- Coordinate future development of the trail system.
- Organize, coordinate, and implement trail operations plan.
- Develop and implement maintenance plan and ensure adequate funding.
- Obtain bids and manage contracts for maintenance and improvements.

Management

- Monitor security/safety of the trail system through routine inspections.
- Oversee maintenance and rehabilitation efforts.
- Acquire trail easements and other agreements, where applicable.
- Establish consistency in the trail user regulations with nearby agencies.
- Manage and respond to issues and incidents

throughout the trail system.

- Coordinate routine law enforcement needs.
- Assist in coordination of art in public places programming (if applicable).
- Act as the local trail system spokesperson with the public and elected officials, and respond to the issues and concerns raised by trail users.
- Develop and manage an emergency response system in coordination with local fire and police departments, and park security operations.

Trails Advisory Committee

Currently, the District has a standing Trails Advisory Committee (TAC) that meets monthly with a clearly defined agenda to review the status of any existing or proposed trail projects, discuss priorities for short term trail projects, discuss and identify funding opportunities for the District to pursue, and to act as liaison to the neighborhoods and communities. The TAC takes an active role in feasibility and design studies for new trails within the District. In addition, the TAC leads volunteer trail projects in cooperation with THPRD staff and other THPRD volunteer groups. The TAC's vision for the District's trails is that of an interconnected network of mostly off-street trails that link neighborhoods to one another, the community, green spaces, the region, and beyond. The TAC's goal is to support, enhance, expand, and supplement

THPRD’s trails system and Trails Master Plan. The TAC’s highest priority continues to be connecting existing trail segments together and “finishing at least one trail” within the District.

Community Members

Active and informed community members are a wonderful resource for the Park District. THPRD already has a coordinator of volunteer services, as well as a natural resources volunteer coordinator, both of whom connect interested citizens with volunteer opportunities within the District. Community members already can participate in an Adopt-A-Park program, and expanding this program to trails would create stronger connections to the excellent trail system the District is developing. Additionally, community members can be encouraged to form “Friends” groups, such as the “Friends of the Trolley Trail” or “Friends of the Springwater Corridor.” The “Friends of the Westside Trail” or “Friends of the Rock Creek Trail,” could help instill pride and ownership in these trails.

Property Management

Non-trail use needs arise such as utility installations, private driveway accesses, and roadways that will impact the trail system. A separate set of policies and procedures that outline the details of property management for the planned system should be developed and implemented in order to protect the quality of the user’s experience. Key elements of such a policy are summarized below:

Encroachments

Given the public nature of the planned system, private encroachments should not be overlooked. Resolving encroachment issues to minimize their impact on future trails should be a priority for all affected parties.

Utilities/Shared Usage

Compatible utility and shared usage agreements may be of benefit to both the planned system and the requesting party. For example, underground fiber optic cables will not interrupt use of the trail while providing an annual rental fee for maintenance of the

trail. Utilities should not be granted exclusive use of the right-of-way but would be expected to share use with other compatible and even competing utilities. It is strongly recommended that a utility corridor be defined and conduits running the length of the corridor be installed as each phase of paved trail is built. This will minimize construction and design impacts to the trail as future utilities are installed. Under-grounding of utilities is encouraged whenever feasible.

Trail Regulations

The purpose of trail regulations is to promote user safety and enhance the enjoyment of the trail by all users. Park District staff should review proposed trail regulations with the District’s legal advisor and Security Operations staff for consistency with existing ordinances and enforceability. It may be desirable to pass additional rules and regulations to implement trail regulations.

In general, the initial set of rules proposed for the trail system will stress courtesy and cooperation with others rather than a restrictive set of edicts. The rules, which should be posted at every trailhead and major intersection and crossing, are outlined below:

- Motorized vehicles prohibited except emergency and maintenance vehicles.
- Keep pets on a leash and scoop up after them.
- Stay to the right except when passing.

- Give a clear, audible warning signal before passing.
- As a courtesy to other trail users and neighbors, refrain from loitering near adjacent homes.
- Cyclists yield to pedestrians.
- When entering or crossing the trail, yield to those on the trail.
- Help keep the trail clean.
- Exercise caution and obey all traffic laws at all intersections.
- Trail hours.

A high level of trail maintenance is critical to the overall success and safety of the trail system.

Maintenance Guidelines

Maintenance includes such activities as pavement stabilization, landscape maintenance, facility upkeep, sign replacement, fencing, mowing, litter removal, painting, and pest control. However, the effects of a good maintenance program are not limited to the physical and biological features of the trails:

- A high standard of maintenance is an effective way of helping advertise and promote trails as a regional and state recreational resource.
- The psychological effects of good maintenance can be an effective deterrent to vandalism, litter, and encroachments.
- Good maintenance is necessary to preserve positive public relations between adjacent land owners and government.
- Good maintenance can help make enforcement of regulations on the trails more efficient. Local clubs and interest groups will take pride in “their” trail and will be more apt to assist in protection of the trail system.
- A proactive maintenance policy will help improve safety along the trails.

A successful maintenance program requires continuity and a high level of citizen involvement. Regular, routine maintenance on a year-round basis will not only improve trail safety, but will also prolong the life of the trails. Maintenance activities required for safe trail operations should always receive top priority. The following should be part of the maintenance checklist:

Paved Surface Maintenance

- Cracks, ruts and water damage will have to be repaired periodically. In addition, vegetation con-



Asphalt surface being uplifted by tree roots on Fanno Creek Trail

- Control will be necessary on a regular basis.
- Where drainage problems exist along the trails, ditches and drainage structures will need to be kept clear of debris to prevent wash-outs. Checks for erosion along the trails should be made monthly during the wet season, and immediately after any storm that brings flooding to the local area.
- The trail surface should be kept free of debris, especially broken glass and other sharp objects, loose gravel, leaves and stray branches. Trail surfaces should be swept periodically.

Soft Surface Maintenance

The Park District has a number of soft surface trails—primarily compacted gravel and bark mulch. Soft surface trails are often used in environmentally

sensitive areas, and care must be taken that the trail surfacing material does not spill outside the established width of the trail itself.

Compacted gravel and crusher fines trails need to be swept periodically to ensure that the trail material is not spilling over and to fill in voids along the trail from dislodged gravel and fines.

Bark mulch trails need to be top dressed annually, with particular care paid to the established width of the trail to ensure that the trail remains at the desired width and does not grow wider with the new application of the trail material.



Soft surface trail in Nature Park

Vegetation and Pest Management

In general, visibility between plantings at trailside should be maintained in order to avoid creating the feeling of an enclosed space. This will also give trail

users good, clear views of their surroundings, which enhances the aesthetic experience of trail users. Understory vegetation along trail corridors should not be allowed to grow higher than 36 inches. Trees species selection and placement should minimize vegetative litter on the trail and root uplifting of pavement. Vertical clearance along the trail should be periodically checked, and any overhanging branches over the trail should be pruned to a minimum vertical clearance of 10 feet.

The trail system moves through a variety of landscape settings. Some basic measures should be taken to best protect the trail investment. This includes regularly moving 6–8 feet on each side of the regional and most community trails, and a quarterly mowing 50–100 feet wide along both sides of the trails to prevent invasion of plants into the pavement area where

applicable. Wherever possible, weed control should be accomplished by mechanical means. This is especially true along drainage ways crossing the trail. Innovative weed control methods such as grazing and steaming should be explored. Use of chemical sprays should be limited to use only on those plants that are harmful to the public.

Litter and Illegal Dumping

Litter along the trail corridors should be removed by staff or volunteer effort. Litter receptacles should be placed at access points such as trailheads. Litter should be picked up once a week and after any special events held on the trail, except where specially designed trash cans have been installed throughout the District.

Alternatively, some trails could be signed “pack it in,

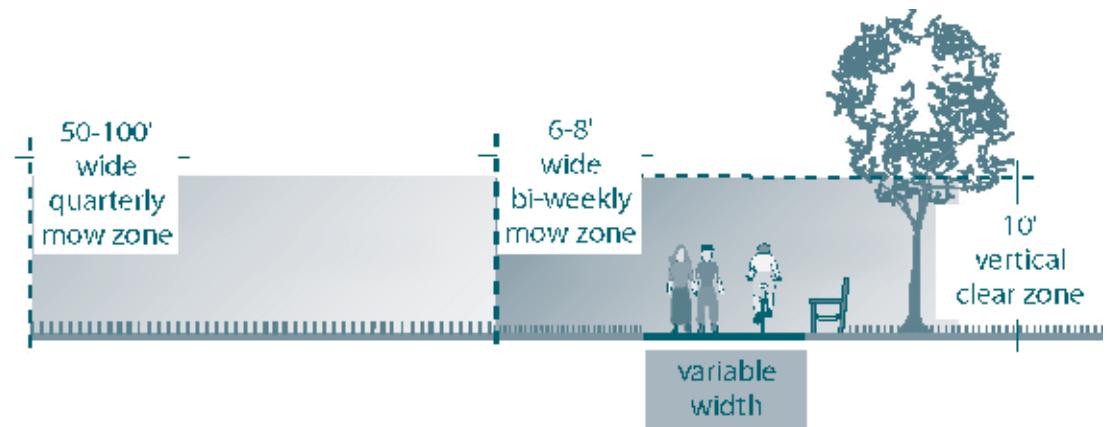


Figure 12. Maintenance Clearance

pack it out.” This technique has been met with mixed results, but if maintenance funds are not available to meet trash removal needs, it is best to remove trash receptacles.

Illegal dumping should be controlled by vehicle barriers, regulatory signage, and fines as much as possible. When it does occur, it must be removed as soon as possible in order to prevent further dumping. Neighborhood volunteers, friends groups, alternative community service crews, and inmate labor should be used in addition to maintenance staff.

Signage

Signage will be replaced along the trail on an as-needed basis. A bi-monthly check on the status of signage should be performed with follow-up as necessary. Signage should include the name of the trail to reinforce the idea of a unified Park District trail system. Signs located at decision points should also include distances to nearby destinations.

Fencing

Use of fencing for border control (for residential security) is strongly discouraged. The first preference will be to plant shrubs and trees, and use temporary fencing to establish privacy. As the need arises, fencing requests should be evaluated on a case-by-case basis. Property lines should be clearly surveyed and field marked in a way that is useful for the maintenance staff

and the trail neighbors.

Trailheads

Trail facilities, especially information kiosks containing a trail map and trail rules, should be located at the beginning and end of each trail and at major points along the trail. The specialized facilities at trailheads will require frequent inspections and maintenance.

If applicable, restrooms must be cleaned on a regular basis, and amenities should be kept in good repair.

Table 7 summarizes a recommended maintenance schedule for the Park District trail system. These guidelines address maintenance on the off-street portions of the system. On-street portions should be maintained per the standards of the District.

Table 7. Recommended Maintenance Schedule

Item	Frequency / Extent
Inspections	Seasonal - at both beginning and end of summer
Signage Replacement	1 - 3 years, inspect bi-monthly
Pavement Markings Replacement	1 - 3 years, inspect bi-monthly
Major damage response (fallen trees, washouts, flooding)	Repair as soon as possible
Pavement Sealing, Potholes	5 - 15 years
Introduced tree and shrub plantings, trimming	Every 1 - 3 years
Culvert Inspection	Before winter and after major storms
Cleaning Ditches	As needed
Trash Disposal	Weekly during high use; twice monthly during low use
Lighting Luminaire Repair (if applicable)	Repair as soon as possible, monitor on a regular basis
Pavement Sweeping/Blowing	As needed, before high use season. Weekly in fall.
Maintaining culvert inlets	Inspect before the onset of the wet season, then again in early fall
Shoulder plant trimming (weeds, trees, brambles)	Twice a year: middle of growing season and early fall. Overhanging branches should be trimmed back to 10' above trail
Site furnishings, replace damaged components	As needed
Graffiti Removal	Weekly, as needed
Fencing Repair	Inspect regularly for holes and damage, repair immediately
Shrub/Tree Irrigation for introduced planting areas	Periodically during summer months until plants are established
Litter Pick-up	Weekly for high use; twice a month for low use
Mowing	6'-8' wide bi-weekly 50'-100' wide quarterly

Table 8. Trail Maintenance Costs

Facility Type	Miles	Cost/mile	Total
Regional Trails	32	\$6,000**	\$192,000
Community Trails	35	\$6,000**	\$204,000
Neighborhood Trails***	10	\$1,000 - \$3,000****	\$10,000 - \$30,000

* Approximate estimation for a built-out system. Actual trail miles will be determined after a detailed planning process and an engineering/survey analysis.

** Lower bound cost estimate based on Portland’s Springwater Corridor Trail. Maintenance costs typically range from \$6,000 - \$10,000 per year. On-street portions of the Regional Trail will undergo routine street maintenance.

*** Many of the neighborhood trails are signed, on-street routes that will be maintained as a regular part of the street maintenance.

**** The cost depends on the type of neighborhood trail: urban trail or natural trail.

Trail Safety

Trail safety is a major concern of both trail users and those whose property is adjacent to a trail. Creating a safe trail environment goes beyond design and law

enforcement and should involve the entire community. The most effective and most visible deterrent to illegal activity on trails in the Park District will be the presence of legitimate trail users. Getting as many “eyes on the corridor” as possible is a key deterrent to undesirable activity. There are several components to accomplishing this as outlined below:

Access to the Trail System

Access ranges from providing conveniently located trailheads along the trail, to encouraging the construction of sidewalks to accommodate access from private developments adjacent to the trail. Access points should be inviting and signed so as to welcome the public onto the trail.



Neighborhood access to the Fanno Creek Trail

Visibility from Adjacent Neighbors

Neighbors adjacent to the trail can potentially provide 24-hour surveillance of the trail and can become the Park District’s biggest ally. Though some screening and setback of the trail is needed for privacy of adjacent neighbors, complete blocking out of the trail from neighborhood view should be discouraged. This eliminates the potential of neighbor’s “eyes on the trail,” and could result in a “tunnel effect” on the trail.



A well-maintained Rock Creek Trail

High Level of Maintenance

A well-maintained trail sends a message that the community cares about the public space. This message alone will discourage undesirable activity along the trail.

Programmed Events

Community events along the trails will help increase public awareness and thereby attract more people to use the trail. Neighbors and residents, as well as a Friends of THPRD Trails group, can help organize numerous public events along the trail that will increase support for the trail. Events might include a daylong trail clean up or a series of short interpretive walks led by long time residents or a park naturalist. The Friends of the Trails can also generate public support for future funding applications.

Community Projects

The support generated by community groups could be further capitalized by involving neighbors and friends of the trail in a community project. Ideas for community projects include volunteer planting events, art projects, interpretive research projects, or even bridge building events. These community projects are the strongest means of creating a sense of ownership along the trail that is perhaps the strongest single deterrent to undesirable activity along the trail.

Adopt-a-Trail Program

Nearby businesses, community institutions, and residential neighbors often see the benefit of their involvement in trail development and maintenance. Businesses and developers may view a nearby trail as an integral piece of their site planning and be

willing to take on some level of responsibility for the trail. Creation of an adopt-a-trail program should be explored to capitalize on this opportunity and build civic pride.

Trail Watch Program

Partnering with local and county law enforcement, a trail watch program should be developed to provide an opportunity for local residents to become actively involved in crime prevention along the trails in the Park District. Similar to the existing Park District Park Watch programs, residents are brought together to get to know their neighbors, and are educated on how to recognize and report suspicious activity.

Design Elements that Improve Trail Safety

Below are common trail safety concerns and how thoughtful design treatments can prevent safety problems along Park District Trails:

Privacy of adjacent property owners

- Encourage the use of neighborhood friendly fencing and also planting of landscape buffers.
- Clearly mark trail access points.
- Post trail rules that encourage respect for private property.



Posting trail operations signs and trash cans improves trail safety

Litter and dumping

- Post trail rules encouraging “pack it in, pack it out” etiquette.
- Place trash receptacles at trailheads.
- Provide good visual access to the trail.
- Manage vegetation within the right-of-way to allow good visual surveillance of the trail from adjacent properties and from roadway/trail intersections.
- Encourage local residents to report incidents as soon as they occur.
- Remove dumpsites as soon as possible.
- Encourage use of yard debris recycling service.

Trespassing

- Clearly distinguish public trail rights-of-way from private property through the use of vegetative buf-

fers and the use of good neighbor type fencing.

- Post trail rules that encourage respect for private property.

Crime

- Manage vegetation so that corridor can be visually surveyed from adjacent streets and residences.
- Select shrubs that grow below 3 feet in height and trees that branch out greater than 6 feet in height.
- Place benches and other trail amenities at locations with good visual surveillance and high activity.
- Provide mileage markers at half-mile increments and clear directional signage for orientation.
- Create a “Trail Watch Program” involving local residents.
- Design the trail so that police vehicles can access the entire corridor.

Intersection Safety



Stop sign for trail users along the Fanno Creek Trail

- Require all trail users to stop at public roadway intersections through posting of stop signs.
- Provide crosswalk striping and trail crossing warning signs for vehicle drivers.
- Manage vegetation at intersections to allow visual access at crossings.

Vandalism

- Select benches, bollards, signage and other site amenities that are durable, low maintenance and vandal resistant.
- Respond through removal or replacement in a rapid manner.
- Keep a photo record of all vandalism and turn over to local law enforcement.
- Encourage local residents to report vandalism.
- Create a trail watch program; maintain good surveillance of the corridor.
- Involve neighbors in trail projects to build a sense of ownership.
- Place amenities (benches, etc.) in well-used and highly visible areas.

Safety Inspections

Regular inspection of the trail and associated amenities is a key factor to trail safety. Periodic visual inspections should be conducted by Park District work crews and can help identify and correct problems before they



A bench placed in a high-traffic, visible area along the Rock Creek Powerline Trail

become an issue. A fallen tree or limb, for example, can be readily removed from the trail or coned off to divert trail users away from the hazard until such time as maintenance crews can remove the hazard. A written record of inspections is recommended and will help create a database of information that can assist the Park District in several ways. Written records can reveal safety trends and use patterns that can assist with prioritizing of maintenance dollars. Written records also can help protect the Park District from potential liability, providing documentation of diligent maintenance practices targeted towards protection of the public. A typical inspection record should include:

- Inspection reports should note any hazards that have been found along the trail along with remedial action. This should note basic items such as debris found on the trail, washouts, or other trail

obstructions.

- Monthly inspections should be conducted of the trail system. These inspections should document the condition of the trails and notes should be made of any potential hazards on the trail (cracks, erosion, overhead vegetation, etc.). Corrective actions should be integrated into the next 30-day work plan.
- Quarterly visual and operational inspections should be made of all park amenities such as benches, signage, drinking fountains, bike racks, etc. Recommended corrective actions should be made and be integrated into a 3-month maintenance work plan.

The Park District should set up a resident response system so that problems with the trail can be systematically recorded if maintenance crews are unable to visit the trail daily.

Trail Closure

Any Park District trail should be closed if any heavy equipment is expected to use the trail, or when any maintenance or construction activities are occurring that could be injurious to the general public. THPRD should take appropriate measures to notify the public of closure of the segment of trail and arrange detours where appropriate.

Liability is an important area of concern for many trail

projects. Liability refers to the obligation of the trail operator or owner to pay or otherwise compensate a person who is harmed through some fault of the trail operator.

Trail Liability

Overview of Concerns

These are the most common liability concerns about the intentional location of the trail near or on private property:

- The concern that the trail users might not be considered trespassers if the property owner invites and permits trail use within a portion of their right-of-way, and if that were the case, the concern that the land owner might therefore incur a higher duty of care to trail users than they would otherwise owe to persons trespassing on their corridor.
- The concern that incidents of trespassing might occur with greater frequency due to the proximity of a trail.
- The concern that trail users might be injured by activities on the private land.

- The concern that injured trail users might sue the property owner even if the injury is unrelated to activities occurring on the property.

Definitions and Laws

As the owners and occupiers of their rights-of-way, property owners have legal duties and responsibilities to persons both on and off their premises. The property owners have a duty to exercise reasonable care on their premises to avoid an unreasonable risk of harm to others on adjacent properties

In most states, the duty of care owed to persons who enter another's property depends on whether the injured person is considered a trespasser, a licensee, or an invitee. A trespasser is a person who enters or remains upon land in possession of another without a privilege to do so, created by the possessor's consent or otherwise. A licensee or invitee is a person on the owner's land with the owner's permission, express or implied. Trespassers are due a lesser duty of care than invitees and licensees. In Oregon, property owners owe no special duty of care to persons trespassing on their premises, other than to refrain from intentional, harmful, or reckless acts.

Unique characteristics of potential trail corridors in the Park District that may affect the extent to which liability is potentially enlarged include:

- Ownership of land by multiple parties.

- Narrow ROW of certain corridors.
- Roadway and railroad crossings.

Available Legal Protections

Potentially offsetting some or all of a landowner's liability are the State-enacted Recreational Use Statutes (RUSs). All 50 states have RUSs, which provide protection to landowners who allow the public to use their land for recreational purposes. A person injured on land made available to the public for recreational use must prove that the landowner deliberately intended to harm him or her. States created RUSs to encourage landowners to make their land available for public recreation by limiting their liability provided they do not charge a fee. Companies, institutions, and individuals that agree to a trail on their property would have limited liability due to these statutes.

In Oregon the following laws and statutes apply:

Recreational Use Statutes (RUS)

Or.Rev.Stat. § 105.672-.700 (2001)

Trail, Rails-to-Trails Program, Recreational Trails System, or Similar Statute

Or.Rev.Stat. § 390.950 et seq. (2001)

Recreational Trails Statute

§ 390.980 permits the state to use funds to indemnify landowners adjacent to recreational trails for damage to their property caused by trail users for which the landowner was unable to recover from the user causing the damage.

Government Tort Liability Act

Or.Rev.Stat. §§ 30.260 to .300. (2001)

§ 30.262 (2) pertains to State and subdivisions

Title 10, Chapter 105: Property Rights Section .672-.700 of the Oregon Revised Statutes, known as the Oregon Recreational Use Statute states:

The Legislative Assembly hereby declares it is the public policy of the State of Oregon to encourage owners of land to make their land available to the public for recreational purposes, for woodcutting and for the harvest of special forest products by limiting their liability toward persons entering thereon for such purposes and by protecting their interests in their

land from the extinguishment of any such interest or the acquisition by the public of any right to use or continue the use of such land for recreational purposes, woodcutting or the harvest of special forest products.

105.682. Liabilities of owner of land used by public for recreational purposes, woodcutting or harvest of special forest products.

(1) Except as provided by subsection (2) of this section, and subject to the provisions of ORS 105.688, an owner of land is not liable in contract or tort for any personal injury, death or property damage that arises out of the use of the land for recreational purposes, woodcutting or the harvest of special forest products when the owner of land either directly or indirectly permits any person to use the land for recreational purposes, woodcutting or the harvest of special forest products. The limitation on liability provided by this section applies if the principal purpose for entry upon the land is for recreational purposes, woodcutting or the harvest of special forest products, and is not affected if the injury, death or damage occurs while the person entering land is engaging in activities other than the use of the land for recreational purposes, woodcutting or the harvest of special forest products.

(2) This section does not limit the liability of an owner of land for intentional injury or damage to a person coming onto land for recreational purposes,

woodcutting or the harvest of special forest products.

105.688. Applicability of immunities from liability for owner of land; restrictions.

(1) Except as specifically provided in ORS 105.672 to 105.696, the immunities provided by ORS 105.682 apply to:

- (a) All public and private lands, including but not limited to lands adjacent or contiguous to any bodies of water, watercourses or the ocean shore as defined by ORS 390.605;
- (b) All roads, bodies of water, watercourses, rights of way, buildings, fixtures and structures on the lands described in paragraph (a) of this subsection; and
- (c) All machinery or equipment on the lands described in paragraph (a) of this subsection.

(2) The immunities provided by ORS 105.682 apply only if:

- (a) The owner makes no charge for permission to use the land;
- (b) The owner transfers an easement to a public body to use the land; or
- (c) The owner charges no more than \$75 per cord for permission to use the land for woodcutting.

105.692. No right to continued use of land if owner of land permits use of land; no presumption of dedication or other rights.

(1) An owner of land who either directly or indirectly permits any person to use the land for recreational purposes, woodcutting or the harvest of special forest products does not give that person or any other person a right to continued use of the land for those purposes without the consent of the owner.

(2) The fact that an owner of land allows the public to use the land for recreational purposes, woodcutting or the harvest of special forest products without posting, fencing or otherwise restricting use of the land does not raise a presumption that the landowner intended to dedicate or otherwise give over to the public the right to continued use of the land.

(3) Nothing in this section shall be construed to diminish or divert any public right to use land for recreational purposes acquired by dedication, prescription, grant, custom or otherwise existing before October 5, 1973.

(4) Nothing in this section shall be construed to diminish or divert any public right to use land for woodcutting acquired by dedication, prescription, grant, custom or otherwise existing before October 3, 1979.

105.696. No duty of care or liability created; exercise of care still required of person using land.

ORS 105.672 to 105.696 do not:

(1) Create a duty of care or basis for liability for personal injury, death or property damage resulting from the use of land for recreational purposes, for woodcutting or for the harvest of special forest products.

(2) Relieve a person using the land of another for recreational purposes, woodcutting or the harvest of special forest products from any obligation that the person has to exercise care in use of the land in the activities of the person or from the legal consequences of failure of the person to exercise that care.

Liability Exposure Reduction Options

In addition to the federally mandated RUSs, there are other available legal protections that reduce risk for adjacent property owners on RWT projects. *Table 9* lists the options for additional measures.

Table 9. Liability Protections

Options	Intent
Trail State statute	Create state legislation that limits liability
Trespassing legislation	Creates state legislation that specifically prohibits trail users from going onto private property outside of the trail
Insurance	Purchase additional insurance to indemnify and provide additional protection to certain land owners.
Transfer of ownership	The City and District enjoys additional limitations of liability for injuries occurring on District-owned property.

Risk Reduction

Visible signage, the use of physical barriers (such as fences, walls, vegetation, grade differences, and ditches) and good design are prudent liability protection strategies. Trail users should be warned at the trailhead and at any other entrances to stay off any private property, particularly in the absence of physical barriers between the trail and the property. If the private property is clearly designed to indicate that it is separate from the trail, trail users injured while on the private property should be considered trespassers to which no special duty of care is owed. A well-designed trail can actually reduce trespassing by channelizing pedestrian crossings to safe locations or by providing separation or security. A well-designed trail should have the effect of reducing both trespassing, as well as risk of being held responsible for injuries sustained by trespassers.

Appendix A

User Count Methodology



User Count Methodology

This trail user count methodology has been developed to attain a consistent bicycle and pedestrian count and analysis procedure so that trends in usage can be documented. The counting strategy outlined in this Appendix is designed to provide an easy and inexpensive method of conducting trail user counts on a regular basis. The level of detail to be extracted during routine counts is kept at a minimum to reduce ambiguity while still proving to be a worthwhile task. This is not unlike the typical traffic count that reveals little more than the type of vehicle, speed, time of day, and direction of travel. Motorist data regarding age, trip purpose, length of trip, etc. are relatively rare.

Reasons for Counting

There are four primary reasons why user counts should be an essential and regular activity:

1. **Conditions and trend analysis** – number of people currently walking and bicycling, how this number is changing over time, characteristics of the cyclists and pedestrians

2. **Network planning** – help prioritize improvements and find locations needing attention
3. **Crash analysis** – develop exposure measures
4. **Demand forecasting** – calibrate models

While City and County engineering and District planning staff have a clear interest in user counts, other groups may also find this data useful. Community health officials are naturally interested in promoting healthy lifestyles. Counts would give them some idea as to how many residents are using the trail system on a regular basis. Counts that include age categories may also be helpful to the health professionals, trying to gauge the level of activity achieved by the growing number of senior citizens. The number of school-aged cyclists and pedestrians would be of interest to school officials, primarily for safe routes to school programs and safety education. Police departments would find value in the data for enforcement and safety reasons.

Location

The Park District should identify numerous locations throughout the jurisdiction for regular counts. Ideal candidates would be streets and pathways that are in a bicycle, pedestrian, or trail plan and on a project list or near existing or proposed activity centers. Popular links between trails should also be considered. Keep in mind that counting sites should not be on curves or hills.

Schedule

When to conduct the counts may depend upon the location of the site. If near a school, counts should be done on weekdays during peak hours. In the morning, forty-five minutes before the first bell to fifteen minutes after the last bell are common. Release peak counting times are fifteen minutes before the first bell to forty-five minutes after the last release. The peak hours of 7:00 a.m.–9:00 a.m. and 4:00 p.m.–6:00 p.m. may be the most beneficial for a majority of locations.

Travel patterns generally vary over the course of the week. Mondays and Fridays should be avoided because travel patterns are rarely typical as people may not be on the roads or sidewalks due to extended three-day weekends, and Fridays often see earlier afternoon peak times and increased evening traffic. Counts should, therefore, be limited to Tuesday through Thursday, and not on a holiday or when schools are not in session. However, if counts will be collected at or near popular recreation destinations, weekend or holiday counts would prove most beneficial.

For all locations, the best times to conduct counts are during the spring and fall months. Cooler conditions in the winter can deter all but the most devoted cyclists and pedestrians. The summer months should be avoided for two reasons: 1) few students attend summer school and 2) many people vacation. Regardless, counts should be taken annually at the same time of year.

Counts should also take place on mild, sunny days. The date and weather conditions should be included on the tally sheets.

Data Collection

According to Bicycle and Pedestrian Data:

Sources, Needs & Gaps by the U.S. Department of Transportation's Bureau of Transportation Statistics, the ideal method of collecting data would include the following:

- Usage patterns would not only be tracked on individual facilities but also aggregates of data across an area, such as total bicycle-miles of travel in the District.
- Data would be collected systematically to enable a comparison of patterns over time.
- Data would be collected in a similar manner throughout a larger area (even nationwide) to allow comparison and aggregation.
- Certain characteristics of the trail user would be obtained, such as age, sex, purpose of the trip and its length, type of facility, etc., where feasible.

Obviously, a high level of detail is nearly impossible to obtain by merely observing passing cyclists. Local entities should consider coupling counts with random survey samplings of passing cyclists and pedestrians, time and resources permitting. Survey questions could include, among other things, trip purpose, trip length,

and income level. Trip purpose would be especially valuable information to gather since the primary goal of the Park District is to provide recreational opportunities for the residents of the district.

For routine manual counts, the information to be recorded will be relatively easy to obtain visually. Count sheets should be given to the counters to record information. These count sheets (see an example on the following page) should contain the following:

- Time intervals
- Direction of travel
- Gender
- Approximate age
- Helmet usage

The sheets could enable the counter to break up the counting session into 15-minute intervals. This helps the counter stay more alert and shows more detailed peak times of usage.

Age categories should not be too detailed, since they could further complicate the tally sheet and probably lead to more inaccurate data. Age categories can be simply divided into these groups: under 18 years, 19 – 64, and 65 years and older. The “under 18” cyclists are likely to be on school commute trips. Cyclists over the age of 65 are likely to be retired and taking trips for leisure or utilitarian purposes. These two groups of

people are also less likely to be driving automobiles, whether due to youth or limiting health issues.

Helmet usage is of interest to those concerned about safety. If children are not wearing helmets, then the laws are not being enforced.

Who Counts?

Park District staff—most likely interns—are the obvious nominees for conducting counts. But other resources are possible if time and people are scarce. Volunteers could be recruited from the community—bicycle clubs or advocacy groups such as the Trails Advisory Committee, statistics classes at PCC, or citizens that are interested in helping the District. If the District has money to spare in the budget, there are firms that specialize in counting.

Video cameras can be used to obtain the same information as a manual count. The advantage to this method is the ability to replay the video for greater accuracy and use for longer time periods. However, technical difficulties and theft are among the disadvantages.

The most basic bicycle counts can be conducted with tube counters. While these are usually used to count cars, the software can be programmed to detect bicycles. This technique is good for purely user counts, can be conducted over long time frames, and requires little manpower. Of course, the rider characteristics

will be absent and theft is often associated with counting units. Also, tube counters often under count cyclists when heavier vehicles cross the tubes at the same time or if cyclists purposely avoid the tubes. Tube counters cannot be used to count pedestrians. Loop detectors can be installed along key routes for continuous counts, as has been done on some in Eugene, Oregon.

Once the data has been collected in the field, the results should be compiled and made readily available to the public.

Summary

Trail user counting should become a standard practice in the Park District. Consistency is the key to this program – counts taken at least annually, during the same time of year, and at the same location. This data should be made readily available to the public so that other agencies and researchers may utilize the data in numerous ways.

TRAIL USER TALLY SHEET

DATE:

WEATHER CONDITIONS:

LOCATION:

TRAIL:

Hour	# Bicyclists	# Pedestrians	Sex		Age			Not Wearing Helmet
			Male	Female	<18	19 - 64	65+	
:00	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						
:15	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						
:30	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						
:45	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						
:00	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						
:15	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						
:30	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						
:45	NB	SB						
	EB	WB						
	NB	SB						
	EB	WB						

OBSERVATIONS:

Appendix B

Performance Measures



Performance Measures

Description of Measures

Performance measures are a means of gauging the effectiveness of the Park District trail system. They can be used as benchmarks to evaluate progress towards adopted goals and objectives. The performance measures should be based on the goals and objectives of the trail program, and based on the following principles:

- The process is policy-driven and can be supported by data.
- The measures reflect the users' experience on the system.
- The measures address multi-modal considerations.
- The results are understandable to the general public.
- The application of the performance measures to programs and projects result in data that can be projected into the future.

The key to a successful benchmarking program is to have data that can be collected within the available resources, that is consistently available over time, and is reported in a format that allows year-to-year comparisons. With careful planning, the data system can serve as a core tool for system management in the long term, both to track performance and to ensure that resources are available and well-managed.

Types of performance measures include:

- **System Performance** – measures to assess the impacts of the alternative investments on the system users and the transportation system itself;
- **Mobility** – measures to assess the impacts of the alternative investments on the movement of people and goods;
- **Safety** – measures to assess the impacts of the investments on minimizing accidents, death, and injury by the public;
- **Geographic Equity** – measures to assess the impacts of aggregate investments on the various divisions of the State and the metropolitan areas therein as opposed to the small urban and rural areas within each division;
- **Cost Effectiveness** – measures of costs to the user and to public agencies and private providers of capital, operating, and maintenance of transportation systems;

- **Environmental Impacts** – measures that address impacts on the environment, local economic conditions, accessibility, and air quality (in terms of costs paid in relation to benefits received); and
- **Community Support** – measures that address community support and/or opposition by the general public, special interest groups, and elected officials.

Description of Measures: “The Community Scorecard”

The performance measures for the trail system can be developed into a Trail System Scorecard (see page 114), with an annual report that summarizes the following benchmarks in a consistent, user-friendly format:

System Completion: The percentage of the system completed relative to the full build out and the number of miles completed each year that can be tracked annually.

User Satisfaction Survey: A baseline user survey can be developed and should be conducted bi-annually, and expanded to provide a scientifically valid instrument for measuring community support and priorities.

Annual Traffic Counts: Achieve a 5% increase annually in bicycle and pedestrian counts at selected

locations taken during time periods established in the National Bicycle and Pedestrian Documentation program.¹

Trail Maintenance / Pavement Conditions:

Measure the percent of the trail system that is in a state of good repair, based on the guidelines developed in the Trail Plan update.

Monitoring Schedule and Methods

The Community “Scorecard” should be updated annually through a partnership of Washington County, the City of Beaverton, and the Park District. While some of the data sources are not reported in current-year formats (traffic safety and public health data, for example, is often delayed for several years before reporting becomes available), initiating the benchmarking process is an integral part of the program management process. Existing partners may also be able to provide data and resources. The key to moving this vital program element forward will be an incremental approach that can start with readily available sources and build a complete monitoring system that evolves along with the growing trail program.

¹ See the report published by Alta Planning + Design at www.altaplanning.com.

Annual Performance Measure Scorecard

Performance Measure	Current Year	Previous Year	Annual Change	Annual Goal	Three Year Change	Average Annual Change	Meeting Targets (y/n)	
							Previous Year	Three-year average
System Completion								
User Satisfaction Survey								
Annual Traffic Counts								
Trail Maintenance / Pavement Conditions								