# SEATTLE DEPARTMENT OF TRANSPORTATION

# Seattle Trails Upgrade Plan





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# Acknowledgments

Seattle Department of Transportation wishes to thank the many partners, organizations, and individuals who contributed to this project. This was truly a collaborative venture that could not have happened without the input, creativity, and participation of many people. Thank you all.

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# Contents

EXECUTIVE SUMMARY Introduction Vision & Goals Trails Network Implementation Approach
1. INTRODUCTION 1 Plan Purpose Planning Process Elements of the Plan
2. COMMUNITY ENGAGEMENT 3
3. DESIGN GUIDELINES
4. EXISTING CONDITIONS & RECOMMENDED IMPROVEMENTS 13 Overview of Trail Inventory Trail Capacity Study Trail Needs Analysis & Recommended Improvements
5. IMPLEMENTATION PLAN
APPENDIX a. Community Engagement b. Priority at Crossings c. Field Inventory Maps d. Concept Projects

**Acronyms** frequently used in this plan

**SBAB** Seattle Bicycle Advisory Board

**SPAB** Seattle Pedestrian Advisory Board

**BMP** Seattle Bicycle Master Plan

PMP Seattle Pedestrian Master Plan

# **Executive Summary**

### INTRODUCTION

The City of Seattle is taking a proactive approach to upgrading and maintaining their trails following the recommendations in the Seattle Bike Master Plan (BMP), adopted in 2014 for multi-use trail upgrades and maintenance. Multi-use trails provide residents with a low stress facility for recreational and transportation uses, creating key connections between destinations that better accommodate all user groups. The Seattle Trails Upgrade Plan provides a baseline assessment of the Seattle trail network's existing conditions and makes recommendations for site-specific upgrades as well as trail connections to nearby schools and parks via existing and planned Neighborhood Greenways and protected bike lanes. The Plan also provides a set of design guidelines for trails within an urban context.

The planning process included extensive community and stakeholder outreach and engagement. Public feedback from a trail user survey, an interactive web map survey, tabling events at each trail in the network and community events; and two open houses were synthesized with the results of the field inventory to generate recommendations to improve the multi-use trail environment, address near and long term trail needs and strengthen connectivity to and from the city's street network.

### **VISION & GOALS**

The Trails Upgrade Plan is a strategy for improving our multi-use trail network and encouraging trail use. The plan provides an assessment of existing trail conditions and makes recommendations to guide investments in maintenance, connectivity, safety and other trail upgrades. It builds on the foundation laid by other City of Seattle plans to make Seattle one of the most walkable, bikeable and sustainable cities in the nation, including the Seattle Bike Master Plan (BMP), Pedestrian Master Plan (PMP), Vision Zero and the Climate Action Plan.

### **TRAILS NETWORK**

Seattle's 40 miles of multi-use trails (see Figure 1) serve an important role within the transportation network by providing convenient, safe routes for biking and walking that promote the goals of equity, vibrancy, health, and resiliency showcased in the plans noted above. They enable people of all ages and abilities to safely travel for any purpose including commuting, recreation and exercise. Implementing the Trails Upgrade Plan will improve the safety and usefulness of the trail system, providing the continued benefits of a well maintained system.

### Seattle BMP Vision

The vision of the BMP, which signifies an important shift in the way Seattle will accommodate people riding a bicycle, is:

"Riding a bicycle is a comfortable and integral part of daily life in Seattle for people of all ages and abilities."

### **IMPLEMENTATION APPROACH**

Seattle's network of trails are on lands managed by a variety of public agencies, each with a different set of priorities and policies for maintaining and developing trails. As a part of this plan Seattle Department of Transportation (SDOT) initiated discussions about trail maintenance agreements, partnership opportunities for near term improvement projects, and a unified understanding of the long-term vision for Seattle's trail system among stakeholders (SDOT, Seattle Parks and Recreation Department, the University Washington, the Port of Seattle, Seattle City Light and Washington State Department of Transportation).

Upgrading and maintaining Seattle's trail network is critical for the system to meet current and future demands. The Plan used a data driven prioritization process based on criteria adapted from the BMP and PMP to guide the prioritization of trail segment upgrades, connectivity projects, and maintenance improvements. The Plan focuses on improvements to the existing network and does not address opportunities for network expansion.



Figure 1. Seattle Trails Network

### Relationship to Let's Move

The Levy to Move Seattle provides \$930 million toward our streets and bridges. A major goal of the levy is to maintain safe and convenient bike routes for all ages and abilities.

The Trails Upgrade Plan includes a comprehensive, data-driven approach to assess the quality of the city's current trail networks, as well as trail upgrades and new connections.

#### FUNDING

Move Seattle will help fund potential projects identified by the Trails Upgrade Plan moving forward.

# 1. Introduction

### What is a Multi-use Trail?

A multi-use trail allows for two-way, off-street pedestrian and bicycle use. Wheelchairs, joggers, cyclists, skaters and other non-motorized users are also welcome. These trails are frequently found in parks, along waterfronts, in greenbelts, old railroad right of way, or utility corridors where there are few conflicts with motorized vehicles. Seattle's 40 miles of multi-use trails serve an important role within the transportation network by providing convenient, safe routes for biking and walking that promote our goals of equity, vibrancy, health and resiliency. They enable people of all ages and abilities to comfortably travel for any purpose including access to school, work and services. Implementing the Trails Upgrade Plan will improve the safety and usefulness of the trail system, providing the continued benefits of a well maintained system.

### PLAN PURPOSE

The Trails Upgrade Plan is a strategy for improving our multi-use trail network and encouraging trail use. The plan provides an assessment of existing trail conditions and makes recommendations to guide investments in maintenance, connectivity, safety and other trail upgrades. It builds on the foundation laid by other City of Seattle plans to make Seattle one of the most walkable, bikable and sustainable cities in the nation, including the Bike Master Plan, Pedestrian Master Plan, Vision Zero and the Climate Action Plan.

### **PLANNING PROCESS**

The planning process was guided by public and stakeholder input gathered through a range of community outreach activities, presentations to the Seattle Bicycle Advisory Board (SBAB) and the Seattle Pedestrian Advisory Board (SPAB), and inter-departmental coordination with Seattle Parks and inter-agency coordination with King County Parks and Recreation, Port of Seattle, Washington State Department of Transportation and University of Washington.

Analyzing existing trail conditions was one of the first steps in the planning process. To accomplish this, the team reviewed existing information and created a digital base map of the trails network that is tied into SDOT's database. Public comments on the condition of trails and improvements were collected through a survey and interactive web-based map. The team also collected field data for trail attributes including pavement quality, obstacles, amenities and intersection conditions. GIS data was used to identify parks and schools within a short distance of the trails and connections to those destinations. In addition, existing and proposed Neighborhood Greenways and Protected Bike Lanes within close proximity of the trails were identified as opportunities to strengthen the connection between low-stress roadway facilities and trails. All these pieces of information were synthesized into a needs analysis to determine areas where trail conditions and connections to and from trails could be improved. From there, the team developed an initial

list of recommended trail upgrade and connectivity projects.

Building on the foundation laid by the existing conditions needs analysis, the team developed a number of recommendations including design guidelines, evaluation criteria for trail crossings, a prioritized list of recommended improvements, trail maintenance policies and an implementation plan. The trail design guidelines were developed based on the findings of the needs analysis, a review of local and national design standards, and best practices for trails within an urban setting. To improve safety at trail crossings, SDOT developed criteria for determining when motor vehicles or trail users have the right-of-way at trail and roadway intersections. During the planning process, SDOT initiated conversations between city departments as well as partner agencies to discuss policy recommendations related to trail maintenance, management and future trail development projects. Starting with the initial list of trail upgrade and connectivity projects from the needs analysis, projects were prioritized using the same data-driven frameworks used for the BMP and PMP.

Following this work, four concept plans were developed for improvements that could be implemented at a relatively low-cost to enhance trail connectivity and quality.

### **ELEMENTS OF THE PLAN**

This report summarizes the results of the planning process as follows:

**Chapter 2**: Community Engagement describes the public outreach and engagement process and documents public feedback received during the process.

**Chapter 3**: Design Guidelines provides the definition of a shared use path, cites relevant local and national design guidelines for shared use paths, and describes the elements of design for trails within an urban context.

**Chapter 4**: Existing Conditions & Recommended Improvements explains the field inventory process, describes methodology and results of the Trail Capacity Study and describes the existing conditions, needs analysis and recommended improvements for the Seattle Trail Network.

**Chapter 5**: Implementation describes the prioritization process and includes the results of how the recommended trail improvements ranked based on the process. The Implementation Plan also identifies continued coordination with multi-agency partners about trail maintenance agreements and consistent upgrades needed to unify our regional trail network. Finally, the Implementation Plan sets the process for SDOT to make regular progress updates to the SBAB and the SPAB. SDOT anticipates updating the Trails Upgrade Plan every five years to assess current conditions, incorporate new best practices for trails and re-evaluate priorities.

# 2. Community Engagement

### **OVERVIEW**

The project team conducted a community engagement process to inform the public regarding the Seattle Trails Upgrade Plan and to listen to feedback and suggestions to improve the trail experience. Our outreach efforts began with creation of a Public Involvement Plan (PIP) to engage a diverse cross-section of trail users, neighbors and community members. The PIP identified Somali and Vietnamese populations in the project area as meeting the threshold for translation requirements; the project fact sheet was provided in these languages with information about how to provide additional feedback.

We conducted outreach activities during the summer and fall of 2015. To engage as wide a range of individuals as possible, activities were aimed to meet the public where they already were. The feedback we heard helped us understand what currently works well with the trail system, maintenance issues that impact trail use, and how to remove barriers and encourage use of the trail system. This feedback also helped identify priorities for trail improvements.

## **OUTREACH ACTIVITIES**

The following outreach activities were conducted for the Seattle Trails Upgrade Plan:

#### WEBSITE

We created a website to provide public information about the project. The website included a project description, timeline, announcements, materials and list of past outreach events, as well as provided the opportunity for the public to submit comments or questions regarding the project. The materials on the website included a project fact sheet published in Somali and Vietnamese to provide accessible information to people living near Seattle trails who speak those languages.

#### **SOCIAL MEDIA & NEWS MEDIA**

The project first gained media attention from a SDOT blog article featuring the Seattle Trails Upgrade project and how the team used a road bike outfitted with customized accessories by Data Cycle Inventor, Colin Dietrich, to catalog the existing condition of 40 miles of Seattle's paved trails. Subsequently, City Lab and the Smithsonian became interested in the story and published their own articles. The news returned to the local scene when KIRO 7 news covered the story on October 30, 2015.



Series of signs posted along the Interurban Trail to build public awareness and interest in the project



Collecting surveys on the Portside Trail



New Holly residents share their ideas about the trails at a community dinner

#### **TRAIL SIGNS**

During August 2015, we posted signs along all 13 trails to raise awareness of the project and to ask trail users to visit our website and help improve our trails. Signs were also used to support tabling events held on the trails in August and September.

#### SURVEY

We conducted a survey to gather information about how people use the trails, things they like or dislike about them and suggestions for improvements. The survey consisted of three multiple choice questions and one essay question. The survey was available on our website during August and September 2015, and we also asked people to fill it out in person during outreach events. We received 586 survey responses. Survey results are shown in Appendix A.

#### **INTERACTIVE MAP**

To supplement the survey, we created an interactive map that allowed trail users to drop pins and provide information about specific locations in the trail system where they would like to see improvements made. The interactive map was posted on SDOT's website at the same time as the survey and everyone who took the survey was invited via a website link to fill out the interactive map. We received 255 interactive map responses.

#### TABLING

Sixteen tabling events were held to engage trail users at locations on Seattle trails in August and September. One tabling event was held on each of Seattle's trails except for the Burke-Gilman Trail; we held four tabling events on the Burke-Gilman Trail because it is the longest and highest-use trail. During the tabling events we asked trail users to stop by, learn about the project and share their ideas for trail improvements.

#### **OUTREACH AT EVENTS & MEETINGS**

To expand the reach of our outreach efforts we shared project information at the following events and meetings:

Advisory Board Meetings: In June and October we gave briefings at meetings of the Seattle Bicycle Advisory Board, the Seattle Pedestrian Advisory Board and the Seattle Freight Board. The purpose of the briefings was to let attendees know about the project, ask for their input and advice, and ask them to spread the word about the project.

**Center City Bike Network Open House**: We handed out project information to attendees at the Center City Bike Network Open House on July 21.

**New Holly Community Dinner**: On August 11 we attended a community dinner at the New Holly Gathering Hall to engage residents of New Holly Neighborhood, a Seattle Housing Authority Hope VI community, in the planning process. About 40–50 people participated in small group discussions and shared information about how they use Seattle trails and their suggestions for improving trails. Discussions focused on the Chief Sealth Trail and Beacon Ave S Path, which are located next to the neighborhood. We worked with translators to engage Vietnamese and Somali residents in discussions.

**Rainier Valley Heritage Parade**: We handed out project information to attendees at the Rainier Valley Heritage Parade on August 15.

#### **OPEN HOUSES**

SDOT held open houses on October 19 at the Northgate Branch of the Seattle Public Library system and October 21 at the Hillman City Collaboratory. The open houses were held jointly with the Pedestrian Master Plan Update because of the similarities between the two projects. The open houses were held at neighborhood locations in north and south Seattle to encourage attendance from people living throughout the city. Attendees reviewed and discussed initial findings about trail conditions, needed improvements and priorities. The open houses provided the opportunity to ask for public feedback on this information. Approximately 40 people attended the open house at Northgate Library and 20 people attended the open houses via the City's project website with cross postings to the City of Seattle's Facebook, Twitter, and LinkedIn social media outlets, an electronic open house flyer emailed to the Seattle Trails Upgrade Plan and Pedestrian Master Plan Update email distribution lists and door hangers posted on businesses in close proximity of Seattle trails.

### **OUTREACH OUTCOMES**

The public input received through outreach activities was reviewed as part of our existing conditions and needs analysis of the trail system. Based on this review we identified location-specific improvements and general improvements people would like to see for each trail, and general improvements people would like to see system-wide. We used public feedback in combination with trail data to develop an



Location specific trail recommendations provided by public comments

initial list of potential trail improvement projects. The project prioritization process is described in Chapter 6: Implementation Plan.

#### LOCATION-SPECIFIC TRAIL RECOMMENDATIONS

Location-specific trail recommendations provided by public comments on the interactive map helped informed the team's synthesis of the trails need analysis. (See Chapter 5.)

#### **GENERAL TRAIL RECOMMENDATIONS**

General recommendations for improving individual trails based on public comments, such as:

- Enhance trail user experience by marking the trail to clearly separate paths for people who walk and people who bike.
- Increase safety and visibility by addressing overgrown plants at trail crossings.

#### SYSTEM-WIDE RECOMMENDATIONS

The team sorted public comments into eight categories of recommendations for how we could improve the overall trail system. The categories are shown below.

- 1. Trail amenities: benches, trash cans, art
- 2. Trail infrastructure: pavement quality, width, striping, ramps, crosswalks, bollards
- 3. Trail crossings: sight lines, safe transitions, traffic calming, prioritization at intersections
- 4. Connectivity: trail connections to parks, schools, businesses, greenways
- 5. Wayfinding and signage: kiosks, signs, maps, pavement markings
- 6. Security: fences, railroad crossings, vegetation, lighting
- 7. Maintenance: paving, landscape, illegal dumping, removal
- 8. Education: trail etiquette, speed limits, legal compliance, enforcement

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# 3. Design Guidelines

for Shared Use Paths in the City of Seattle

# Introduction

The scope of this document is focused on shared use paths (path) as a subsection of trails in Seattle. A 'shared use path' as defined by AASHTO is a specific type of trail. Shared use paths can then be further broken down to more specific types such as a 'rail trail' similar to the majority of the Burke-Gilman Trail or 'rail-with-trail' such as the Burke-Gilman Trail west of the Ballard Locks to north of Seaview or a 'sidepath' such as the Alki Trail. For the purposes of this document 'path' and 'trail' will be used interchangeably.

Design and construction of shared use paths in the urban environment in a retrofit condition requires "the need for application of sound principles by knowledgeable design or traffic engineering professionals." Guidelines such as AASHTO Guide to Bicycle Facilities, 4th Addition (AASHTO) are provided to present a range of conditions, treatments and design criteria to apply with engineering judgment in the built environment.

The materials for shared use path construction and how to install those materials in Seattle can be found in the *City of Seattle Standard Specifications for Road, Bridge and Municipal Construction, 2017 Edition.* 

The scope of this chapter is to clarify Seattle-specific desired design treatments where applicable and to reference existing design guidance manuals.

# **Elements of Design**

AASHTO guidelines are appropriate as a starting point for basis of design for shared use paths in Seattle related to cross slope, width, clearance, and stopping sight distance.

### SURFACE STRUCTURE

The preferred surface for shared use paths is asphalt concrete pavement. Asphalt provides the smoothest surface for wheeled users including wheelchairs. Cement concrete will be used periodically in unique situations where a shared use path coincides with a sidewalk condition, similar to the Burke-Gilman Trail at Gas Works Park east of Densmore Ave N. The pavement section will vary depending on the context of the trail, sub-grade condition and expected maintenance access or vehicular traffic.

Porous pavement is a powerful solution for meeting drainage requirements for new and replaced sidewalks while providing a paved walking and riding surface. The city has not used porous paving on the trail system to date due to concerns with surface roughness, however the city will continue to review porous paving alternatives in the repair and expansion of the trail system. Porous asphalt pavement installations are becoming more common in the Puget Sound region.

### **BRIDGES AND UNDERPASSES**

Bridge replacement, bridge upgrades and bridge repurposing allow for upgraded or new connections and corridors for the trail system. The I-90 and 520 bridge replacement projects are good examples of replaced bridges which have appropriate investment in incorporating shared use paths. The 20th Ave NE bridge is a great example of a repurposed bridge providing trail and greenway connections. AASHTO 5.2.10 provides guidance for design considerations on bridges and underpasses.

### DRAINAGE

Drainage requirements in Seattle are driven by the City of Seattle 2016 Stormwater Code and Manual addressing erosion control, green stormwater infrastructure, flow control and treatment requirements. Each project's triggers and requirements will depend on the scope, scale and particular drainage basin. The entity maintaining the stormwater infrastructure should be identified and consulted early in project development. Shared use path projects may involve multiple agencies owning and maintaining the drainage infrastructure. Green stormwater infrastructure (GSI) similarly may have one entity maintaining the vegetation and other maintaining the piped systems and structures.

### LIGHTING

The City of Seattle, as a general rule, does not provide lighting along paths. In some situations a partner agency will install, pay for and maintain lighting for a Seattle path. Seattle will review lighting at path and street crossings for pedestrian crossing requirements. In addition to the basic pedestrian lighting, extending lighting back into the path system the equivalent of the stopping sight distance shall be documented during project scoping.

### BOLLARDS

Bollards are used where there is a history of unauthorized motor vehicle access. Signage and striping should be used as an initial deterrent for vehicles entering the facility. If bollards are determined necessary, the center bollard shall be removable per COS Standard Detail 463 and 6 ft clearance provided between the bollards. Bollards shall be installed per COS Standard Details 463 and 432 with hazard striping per AASHTO. Another alternative to bollards, when right of way is available, is to provide a split trail connection.

## FENCING

Fencing along paths shall be installed per COS Std Detail 450, with the exception that all installations will include a top rail and chain link fabric shall be galvanized. Fences 4ft tall and under will include a double top rail with the top rail above the knuckled selvage. The fence height will be determined by the context and site specific design intent. On projects where the fence is serving to discourage access to neighboring property, cut resistant chain link fabric shall be specified. Railing per Std Plan 430 can be used in conjunction with wall systems and in urban environments where chain link is not aesthetically desired.

### **DRIVEWAY CROSSINGS**

Assignment of right of way at typical driveway and alley crossings is addressed by Seattle Municipal Code SMC 11.28.230 "Except as directed otherwise by official traffic-control devices, the driver of a vehicle emerging from any alley, driveway, private property, or building shall stop such vehicle immediately prior to driving onto a sidewalk or onto the sidewalk area extending across any alley or driveway, or onto a public path, and shall yield the right-of-way to any pedestrian or bicyclist as may be necessary to avoid collision, and upon entering the roadway of a street shall yield the right-of-way to all vehicles approaching on the roadway." Where a shared use path crosses a driveway, the path shall be cement concrete per COS Std Plan 430 and remain raised at sidewalk elevation unless otherwise approved.

Private driveway crossings will not have crosswalk striping or truncated domes. The vehicles exiting the driveways will not have a stop bar or stop sign.

## **RETRO-REFLECTIVITY**

All striping and signage shall be retro-reflective and conform to the current MUTCD.

## WARNING STRIPES

Warning Stripes shall consist of three (3), four-inch (4") wide thermoplastic white stripes six inches (6") apart located similarly to COS Standard Detail 432b (updated).



Bollard and striping on Chief Sealth Trail (photo: MIG|SvR)



Fence with top rail above selvage (photo: MIG/SvR)



Example of sign retro-reflectivity at night (photo: Texas A.M.)



Warning stripes on the Burke-Gilman Trail (photo: MIG|SvR)



*Centerline on tight corner (photo: PMiller)* 



Directional bike dot (photo: MIG|SvR)



Signs on Chief Sealth Trail (photo:MIG/SvR)



Burke-Gilman Trail with adjacent trees (photo: MIG/SvR)

## **CENTERLINE AND EDGE STRIPING CENTERLINE STRIPING**

Centerline striping on paths will generally follow the AASHTO design guidelines on page 5-50 with the clarification that the stripe will be 4-inch and painted. Edge striping (4-inch white paint) will be used when a fence or barrier is adjacent to the trail to indicate clear zone. Approach markings for obstructions are addressed on p.5-51 in AASHTO.

### WAYFINDING

While wayfinding for bike networks can be accomplished with several tools such as signs, colored pavement and thermoplastic arrows and wording painted on the path. The Seattle paths will utilize the existing signage protocol included in the City of Seattle Bicycle Master Plan for type, font and identifying major destinations by mileage. When a path crosses a roadway, a sign identifying the name of the path will assist on road cyclists and motorist wayfinding by clarifying the path name.

### LANDSCAPE

The landscape treatments throughout the city will vary due to location, context, whether or not there is green stormwater infrastructure (GSI) and maintenance responsibility. Shared use paths in utility rights of way typically will have seeded lawn, with or without topsoil, to stabilize disturbed areas and provide a cost effective long term maintenance schedule. Another benefit of seeded lawn, on level areas adjacent to a formal path, is the ability for runners and walkers to create a parallel soft surface trail.

The SDOT Trees and Sidewalk Operations Plan (February 2015) is a resource for design, installation and maintenance of the trees along the trail network. Where trees are specified and installed, species should be reviewed closely with the urban forester and placed to allow clear lines of sight and accommodate potential future widening of the path. Trees should be installed with adequate amended soils to support healthy tree and root growth. Root barrier shall be specified when paths are being repaired or replaced in areas of historic root damage or new trees are being planted. Long term canopy growth should allow 10 ft clear to lowest branch over trail area.

If formal landscaping is being planned, maintain 1-foot clearance from edge of trail shoulder to mature vegetation and specify shrubs and ground-cover plant material to maintain an 18-inch max height approaching roadway coordinated with stopping sight distance for driveway and trail intersections. Take into consideration the soft



View of Downtown from West Seattle Bridge Trail (photo: MIG/SvR)

surface running and walking patterns on the specific trail segment when planning formal landscaping. Prior to specifying formal landscape and trees, contact the city department or partnering agency who will be responsible for vegetation and pavement maintenance.

## SHARED USE PATH ROADWAY INTERSECTIONS

### SHARED USE PATH AT SIGNALIZED INTERSECTIONS

The signal and timing controls assignment of right of way. Where a path approaches a signalized intersection the path alignment would direct users to the pedestrian landing area. The landing area will act as a pedestrian bicycle mixing zone which should be reflected in the paving type and treatment by ending the path paving type prior to the landing area. The landing area should be sized to accommodate a mixture of bicycles and pedestrians. Furniture, such as a bicycle waiting rail, can provide clear locations for bicycle riders to wait. Push buttons should be provided for bicycle as well as pedestrians. This allows people riding bicycles to activate the signal without having to block the curb ramp. In pavement bike detection either loops or video should be standard on all new signal systems and be reviewed on signal retrofit conditions. The curb ramps should match the width of the trail and the crossing striping is a COS Std Plan 712 ladder style crosswalk. A sign indicating the name of the trail should be installed parallel to the crossing on the signal cross arm or wires facing both directions. A 'no right on red' phase concurrent with the pedestrian/bike crossing is encouraged. Bollards at signalized intersections are rare considering the spatial needs of mixed groups of pedestrians and cyclists.

### SHARED USE PATH AT STREET CROSSING

The assignment of right of way is dependent on the volume of trail users, volume of vehicular traffic and lines of sight. SDOT has created a document addressing assignment of right of way Appendix B. COS Std Detail 432a and b (updated) address the striping, warning stripes, bollard and hazard striping. Depending on right of way width, roadway width, speed and volumes of vehicles additional warning devices such as rectangular rapid flashing beacons (RRFB) or half signals may be installed with or without refuge islands. Review tree canopy location and elevation in conjunction with signalization and signage. Raised crossings are a powerful tool in lowering vehicle speeds at path crossings regardless of assignment of right of way. Where raised crossings are installed, a 3-inch rise is preferred. Drainage patterns and existing utility castings are a major consideration for feasibility, location, and configuration. Refer to MUTCD for Pavement Markings for Speed Tables.



Rectangular Rapid Flashing Beacon (RRFB) crossing of arterial (photo: MIG/SvR)



Raised mid-block crossing (photo: MIG|SvR)



Bike waiting rail at Burke-Gilman Trail crossing of 25th Ave NE (photo: Seattle Bike Blog)



Rail crossing (photo: MIG|SvR)



Statue along Burke-Gilman Trail (photo: unknown)



*Glow in the dark asphalt pavement (photo: Inhabitat.com)* 

## **GREENWAYS CONNECTIONS TO SHARED USE PATHS**

Greenway connections to Shared Use Paths are an effective tool in getting all ages and abilities residents from their home or neighborhood to the Shared Use Path and then to a park, school or commercial center. Errands and recreation can be completed from home and return without the need of an automobile with a complete system. These connections will be completed through the implementation of Seattle Bicycle Master Plan and Safe Routes to School projects in coordination with the school district, parks and neighborhood greenways organizations.

## SHARED USE PATH RAILROAD CROSSINGS

Each crossing of a rail is a unique condition and requires close coordination with the operator. The rail crossings vary from short line rail operations in city public right of way to national heavy rail in separate dedicated rights of way. The materials, construction, signage, signalization and restrictions are site specific.

## **ART AND FURNITURE**

While art and furniture (benches) are not specifically part of the Seattle Department of Transportation shared use path program, private and non-profit installations are allowed along the network. Each installation is unique and may require approval by the City of Seattle Department of Transportation (SDOT), Seattle Parks Department (Parks and Recreation) or the Port of Seattle. Installations in the right of way or on SDOT property would follow the Street Use Permit requirements (www.seattle. gov/transportation/docs/stuse/AnnualsApplicationFormFILL.pdf). The art and furniture installations would utilize AASHTO clearance and offset requirements for placement.

## INNOVATION

Innovative treatments and materials for Shared Use Paths are being experimented with worldwide. From glow in the dark additives to new asphalt concrete pavement to specialty striping indicating an upcoming intersection, SDOT is encouraged to investigate a short list of experimental new materials and treatments for testing and monitoring. These approaches can be developed by SDOT in coordination with the Seattle Bicycle Advisory Board.

# **Priority at Crossings**

SDOT developed a new methodology to bring an SDOT-specific approach to establishing right-of-way at trail crossings (see Appendix B).

# 4. Existing Conditions & Recommended Improvements

# **Overview of Trail Inventory**

To make informed decisions about trail improvements and upgrades we needed a detailed understanding of the state of the trail system. The project team members created a detailed inventory of Seattle's 40 miles of paved trails. With video cameras mounted on their helmets and riding a specially fitted Data Cycle, equipped with a customized tablet computer, GPS, accelerometers and proximity sensors; team members cataloged a variety of trail attributes including:

Trail pavement quality

Obstacles

Amenities

Intersection conditions

This robust inventory was used to establish baseline conditions and assess trail maintenance and improvement needs. To promote Safe Routes to Schools and Parks, GIS data was used to identify schools within 1,000 feet and parks within 500 feet of trails. In addition, existing and proposed Neighborhood Greenways and Protected Bike Lanes within 1,000 feet of the trails were identified as opportunities to strengthen the connection between low-stress roadway facilities and trails. The team also used GIS data to identify trail segments that could benefit from capacity improvements to reduce congestion and user conflicts.

All these pieces of information were synthesized into a needs analysis to determine areas where trail conditions, gaps and connections to and from trails could be improved. From there, the team developed an initial list of recommended trail upgrade and connectivity projects. Due to the changing nature of trail conditions, a field assessment of current conditions is recommended during the time of project initiation.



The DataCycle, a specially outfitted bicycle was used for gathering existing conditions information

# **Trail Capacity Study**

Field observations and user feedback suggest some of Seattle's trails would benefit from capacity improvements including additional width, separation of users and more gentle curvature. The team reviewed existing trail widths, volume of trail users and curvature geometry to identify locations where capacity improvements could help accommodate trail user volume and flow.

Locations with widths less than the recommended AASHTO standard were flagged as corridors where capacity is likely to be an issue. Areas with tight turns, such as the Alki Trail at the west end of the West Seattle Bridge and portions of the Burke-Gilman Trail, were identified and noted as locations for additional study for future upgrades.

Improvements in these locations could include warning striping, increasing trail width, separating modes, or reconfiguring intersections. Additional pinch points may be added to this list as trail use increases over time.



# **Trail Needs Analysis & Recommended Improvements**

The overall organization and display of the trails within this chapter is from north to south. Where a trail runs north to south, segmentation begins at its northern terminus. Where a trail runs west to east, segmentation begins at its western terminus.

Interurban Trail
Burke-Gilman Trail20
Ship Canal Trail
Elliott Bay Trail
Melrose Connector40
Portside Trail
SODO Trail
Mountains to Sound Trail52
Alki Trail
West Seattle Trail60
Duwamish River Trail64
Beacon Ave S. Path
Chief Sealth Trail72





# **Overview**

The Interurban Trail is part of a regional trail system that follows the alignment of the old Interurban electric railway between Seattle and Everett. The approximately 24-mile trail stitches together a dense residential and commercial patchwork through the communities of Seattle, Shoreline, Mountlake Terrace, Edmonds, Lynnwood and Everett.

Seattle's portion of the Interurban Trail is an approximately one mile trail that runs adjacent to the Washelli Cemetery in northwest Seattle. It connects to the Linden Ave N Protected Bike Lane to the north and the Fremont Ave N Neighborhood Greenway to the south.

### **CHARACTERISTICS**

Length: 0.96 miles

Average Width: 12 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at N 128th St (northern terminus). To the north, the trail connects to the Linden Ave N Protected Bike Lane. Ends at N 110th St (southern terminus). To the south, the trail continues onto the Fremont Ave N Neighborhood Greenway as the Interurban Route marked with sharrows and signage.

Trail Offshoots: 4

Presence of Shoulder: No

Rail Crossings: No

### **OPPORTUNITIES**

- Enhance connections to existing Fremont Ave N Neighborhood Greenway, several proposed neighborhood greenways, Christ the King School and the local residential neighborhood
- Apply consistent treatments for street crossings, study alternative bollard placements and continue vegetation



Trail user passes by trailside public art installation

maintenance especially at intersections and areas with limited sight lines

• Install wayfinding and amenities to enhance trail user navigation and enjoyment

### **EXISTING CONDITIONS**

### **INTERURBAN-1**

This relatively new trail segment provides a pastoral setting as it runs parallel to the Washelli Cemetery. Trail users pass by several trailside art installations, including some depicting a volcano erupting, an elk sprouting horns, and other scenes in a series of sequential signs. At the intersection of N 128th St, the trail transitions to a two-way protected bike lane on Linden Ave N.



Seattle's Interurban Trail has a pastoral landscape setting



Prune vegetation to open up sight lines at intersections

### **INTERURBAN TRAIL**

# **Recommended Upgrades**

- 1 Enhance wayfinding, signage and striping to clarify connection to Linden Ave N Protected Bike Lane
- 2 Formalize connection to proposed N 127th St Neighborhood Greenway
- 3 Improve mid-block crossing on N 125th St
- Enhance north/south connection to Fremont Ave N Neighborhood Greenway by extending the Interurban Trail through the triangular parcel under Seattle City Light's power lines



Provide wayfinding at fork in the trail and formalize connection to N 127th St



Improve mid-block crossing at N 125th St



Extend the trail through triangular parcel to enhance connection to Fremont Ave N

Existing Conditions & Recommended Improvements



# **Recommended Connections**

- **1** LINDEN AVE N Existing Protected Bike Lane
- **2** N 127TH ST

Proposed Neighborhood Greenway



## **3** N 117TH ST

Proposed Neighborhood Greenway

### **4** N 110TH ST

Proposed Neighborhood Greenway





# **Overview**

One of the most popular trails in the region, the Burke-Gilman Trail runs more than 18 miles from its western terminus at Shilshole Bay in Seattle eastward to the City of Bothell where it intersects the Sammamish River Trail. The trail follows a historic railroad route of the Seattle, Lake Shore and Eastern Railway founded by Thomas Burke and Daniel Gilman. In 1978, the first segment of the trail from Seattle's Gas Works Park to Kenmore was opened to the public. Today, the westernmost portion of the trail starts at Golden Gardens Park and continues along Shilshole Bay to the Hiram M. Chittenden Locks. There is a gap between the Locks and the Lake Washington Ship Canal, where the trail resumes along the Fremont Cut, Lake Union, through the University of Washington, then along the northwest shore of Lake Washington. The trail continues north of the city limits, providing access to the cities of Lake Forest Park, Kenmore and Bothell; and a connection to the Sammamish River Trail.



The western portion of the Burke-Gilman Trail runs along Shilshole Bay and the nearby marina

### CHARACTERISTICS

Length: 13.80 miles

Average Width: 11.5 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at Seaview Pl NW/Golden Gardens (western terminus). Ends at NE145th St, the Seattle/Lake Forest Park border (eastern City of Seattle trail terminus). To the east, the trail continues through Lake Forest Park, Kenmore and Bothell and eventually connects to Sammamish River Trail.

Trail Offshoots: 170

Presence of Shoulder: Yes

Rail Crossings: Yes

### **OPPORTUNITIES**

- Create a cohesive regional trail experience with consistent design treatments through collaboration across multiple agencies including SDOT, SPU, Seattle Parks, King County Parks, Washington State Department of Transportation and University of Washington
- Enhance trail pavement quality with tree root removal and repaving projects
- Enhance connectivity with proposed Neighborhood Greenways, Golden Gardens Park, Hiram M. Chittenden Locks, Gasworks Park, the University District, the University of Washington Light Rail Station, University Village, Magnuson Park and Matthews Beach Park



The central portion of the Burke-Gilman Trail runs along the Lake Washington Ship Canal, passing through offices, industrial facilities, and school buildings



The eastern portion of the Burke-Gilman Trail runs through a heavily vegetated corridor that borders the Lake Washington shore

# **Existing Conditions**

### **BURKE-1**

The trail begins at the entrance to Golden Gardens Park and travels along Shilshole Bay. The trail parallels an active railroad and crosses the railroad once within this segment.

### BURKE-2

Transitioning from its greenway setting, the trail runs adjacent to NW 54th St and provides connections to the Ballard Neighborhood. In this segment of the trail, pedestrian travel is directed to walk on a concrete path with pedestrian pavement markings and cyclists are directed to ride on an asphalt path with bicycle pavement markings. The trail is interrupted with many driveway crossings. The trail provides access to the Hiram M. Chittenden Locks.

# **Recommended Upgrades**

### TRAIL TO NEIGHORHOOD CONNECTION

1 Improve connection to 37th Ave NW via railroad under-crossing

#### ALL AGES & ABILITIES CROSSING IMPROVEMENTS

2 Upgrade crossing at the intersection of Seaview Ave N and 38th Ave NW for all ages and abilities

### IMPROVE PEDERSTIAN AND BICYCLE CIRCULATION

3 Study reconfiguration of existing segment of separated pedestrian and bicycle paths to improve circulation



Improve connection to 37th Ave NW through the railroad undercrossing



Study options for reconfiguring the existing separated pedestrian and bicycle paths



# **Recommended Connections**

1	1.GOLDEN GARDENS PARK
	At entrance
2	37TH AVE NW

At railroad undercrossing

3 NW 57TH ST

Existing Neighborhood Greenway

**HIRAM M. CHITTENDEN LOCK** At entrance

# 5 28TH AVE NW

Proposed Neighborhood Greenway via Market St

# **Existing Conditions**

### **BURKE-3**

In this segment, the trail parallels an active railroad and runs adjacent to Fred Meyer's service area. The trail crosses a driveway to Fred Meyer.

### **BURKE-4**

As the trail passes by a concrete plant as it enters an industrial neighborhood. This trail is generally narrow and runs between fences. The trail crosses many skewed intersections and runs parallel to an active railroad for about half of this segment's length.

#### **BURKE-5**

The trail enters the Fremont Neighborhood as it runs along the Ship Canal and passes by Canal Park. The trail crosses one street under the Aurora Bridge.

#### **BURKE-6**

Beginning at Stone Way N, this trail segment is characterized by a diverse set of land uses including maritime, office space, retail, and residential. The trail provides connections to the Wallingford Neighborhood and direct access to Gas Works Park.

#### **BURKE-7**

The trail follows the old rail corridor between two streets: N Northlake Way and N Pacific St. It is terraced into the heavily vegetated hillside. The trail provides sweeping views of Downtown Seattle across Lake Union. This trail segment has several street crossings.



# PROVIDE MORE SEPARATION FROM STREET AND IMPROVE DRIVEWAY CROSSING

1 Upgrade the trail as a separated path and better define the crossing at the driveway to the Fred Meyer parking lot

# UPGRADE TRAIL SECTION WITH CONSISTENT TREATMENTS

2 Upgrade trail section from 8th Ave NW and 3rd Ave NW with consistent treatments for crosswalks, curb ramps, striping, and signage

### TRAIL CAPACITY IMPROVEMENTS

3 Study feasibility of capacity upgrades to narrow section of trail

# UPGRADE TRAIL CROSSING WITH CONSISTENT TREATMENTS

4 Upgrade trail crossing at Stone Way N with consistent treatment

# ENHANCE TRAIL SECTION ADJACENT TO PARKED VEHICLES

5 Upgrade trail section between Stone Way N and Meridian Ave N near Gas Works Park to better define space between trail and parking vehicles



Define the crossing at the driveway of the Fred Meyer crosswalk



Upgrade trail sections with consistent treatments for crosswalks, curb ramps, striping, and signage



# **Recommended Connections**

- 11TH AVE NW Proposed Neighborhood Greenway
- 6TH AVE NW Proposed Neighborhood Greenway
- 3 2ND AVE NW Proposed Neighborhood Greenway
- PHINNEY AVE N Proposed Neighborhood Greenway

- **WOODLAND PARK AVE N** Proposed Neighborhood Greenway
- 6 DESMOND AVE N Proposed Neighborhood Greenway
- WALLINGFORD AVE N Proposed Neighborhood Greenway

# **Existing Conditions**

### **BURKE-8**

The trail passes under the I-5 Ship Canal Bridge and enters the University District. This trail segment has numerous street crossings. The trail runs through the University of Washington campus.

#### **BURKE-9**

As the trail continues through the University of Washington campus it runs along a former railroad right-of-way on a terraced hillside above Montlake. The trail provides connections to the Montlake Bridge and the University of Washington Light Rail Station.

### BURKE-10

The trail continues through a heavily vegetated corridor with few street crossings. The trail provides connections to the Ravenna neighborhood, University Village, Children's Hospital, and Ravenna Park.



Cyclist riding through a portion of the University of Washington campus near the student housing community

# **Recommended Upgrades**

### UPGRADE TRAIL CROSSING WITH WAYFINDING

1 Improve trail transition across the five-way intersection of NE 40th St and 7th Ave NE with directional signage

### TRAIL CAPACITY IMPROVEMENTS

2 Study feasibility of capacity improvements of narrow section of trail from 7th Ave NE to 24th Ave NE



Improve the transition between Burke-Gilman Trail and the five-way intersection on NE 40th St and 7th Ave NE



The Burke-Gilman Trail follows an old rail corridor on the north side of Lake Union



# **Recommended Connections**

- NE BOAT ST VIA NE PACIFIC ST Proposed Neighborhood Greenway
- **2** 12TH AVE NE
  - Proposed Neighborhood Greenway
- 3 NE 40TH ST
  - Existing Protected Bike Lane via Brooklyn Ave NE
- UNIVERSITY OF WASHINGTON LIGHT RAIL STATION Via Pedestrian/Bike Overpass
- 5 26TH AVE NE Proposed Neighborhood Greenway
- **39TH AVE NE** Proposed Neighborhood Greenway

# **Existing Conditions**

### BURKE-11

As the trail enters a heavily forested ravine, it splits into a high and a low path with trail users directed to keep to the right. Due to its steep hillside setting, there are not very many connections to neighborhood streets in this segment.

### BURKE-12

The trail continues along a forested corridor. The trail provides a connection to Magnuson Park. There are very few street crossings in this segment.



Burke-Gilman Trail becomes a forested corridor after it passes through the University of Washington campus

# **Recommended Upgrades**

# UPGRADE TRAIL CROSSING FOR SAFE ROUTE TO SCHOOL

1 SDOT is working on upgrades to the trail crossing of NE 40th Ave for better sight lines and improved Safe Route to School

### TRAIL CAPACITY IMPROVEMENTS

2 Study capacity improvements for trail section which currently splits into an upper and lower directional paths



Study capacity improvements for a section of trail which currently splits into upper and lower directional paths


### 1 45TH AVE NE

Proposed Neighborhood Greenway

### **2** PRINCETON AVE NE

Proposed Neighborhood Greenway

## **3** MAGNUSON PARK

Via NE 65th St Protected Bike Lane and Neighborhood Greenway

### **4** 58TH AVE NE

Proposed Neighborhood Greenway

# **Existing Conditions**

### BURKE-13

Heading northward, the trail continues through the forested corridor and provides access to Matthews Beach Park.

#### **BURKE-14**

The trail runs along Lake Washington's shoreline and reaches the Seattle/Lake Forest Park border at NE 145th St where it continues as a regional trail along Lake Washington with connections to Lake Forest Park, Kenmore, Bothell and the Sammamish River Trail.



No specific upgrade projects for this trail segment. Refer to Recommended Connections for proposed improvements



Dense vegetation lines both sides of the Burke-Gilman Trail



Several homes have paths that open directly onto the trail



**1** 97TH AVE NE

Proposed Neighborhood Greenway

### **2** NE 123RD ST

Proposed Neighborhood Greenway





The Ship Canal Trail runs along a rail line and the Ship Canal in the neighborhoods of Interbay and Queen Anne. Many Ship Canal Trail users access the Burke-Gilman Trail, bike facilities on Dexter Ave N leading to Downtown Seattle and the Cheshiahud Lake Union Loop by using the using the street network at the eastern terminus of the trail.

### **CHARACTERISTICS**

Length: 1.90 miles

Average Width: 12.5 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at the intersection of W Emerson Pl and 21st Ave W (western terminus). Ends under the Fremont Bridge (eastern terminus).

Trail Offshoots: 27

Presence of Shoulder: Yes

Rail Crossings: Yes

### **OPPORTUNITIES**

• Apply consistent intersection and driveway crossing treatments, widen narrow segments of the trail and study alternative bollard placements to increase flow for trail users

- Continue trail maintenance such as sweeping and vegetation trimming to enhance trail user experience
- Enhance wayfinding and connections to Seattle Pacific University, North Queen Anne, Fremont via the Fremont Bridge, Cheshiahud Lake Union Loop and Downtown Seattle via Dexter Ave N

### **EXISTING CONDITIONS**

### SHIP-1

This segment of the trail follows the alignment of an old railroad corridor and crosses an active railroad. The trail has an industrial character. Only two streets cross this segment of the trail. The trail provides access to Fishermen's Terminal, Seattle Pacific University and the greater North Queen Anne neighborhood. Currently, pedestrian and bicycle access to the Ballard Bridge is challenging.

### SHIP-2

Trail transitions to a more greenway setting as the trail parallels the banks of the Ship Canal. Trail users enjoy this stretch of the trail with no street crossings. The trail provides access to the Nickerson Ave commercial corridor, the Fremont Bridge, Cheshiahud Lake Union Loop and Downtown Seattle via Dexter Ave N.



The Ship Canal Trail has only two street crossings



Cyclist approaching businesses off of Nickerson Ave

# **Recommended Upgrades**

### CONSISTENT RAMP AND CROSSWALK TREATMENTS

1 Apply design guidelines to bring ramps and crosswalks at the intersection of W Emerson Pl and 21 St Ave W up to consistent trail standards

#### **PAVEMENT REPAIRS**

2 Address severe root issues on the trail, especially near Queen Anne Ave N

#### PARK CONNECTIONS

3 Enhance connection to West Ewing Park



*Opportunity to formalize connection to 16th Ave W via proposed Thorndike Trail* 



Address severe root issues on the trail, especially near Queen Anne Ave N



Provide enhanced connections to West Ewing Park



### GILMAN AVE W

Proposed Protected Bike Lane

### **2** 16TH AVE W

Via proposed Thorndike Trail connection to proposed 16th Ave W Neighborhood Greenway



FREMONT BRIDGE, DEXTER AVE N & CHESHIAHUD LAKE UNION LOOP Via signage and street network improvements



The Elliott Bay Trail runs along Elliot Bay from Magnolia to Belltown. It links trail users with Myrtle Edwards Park, Olympic Sculpture Park, Centennial Park and Smith Cove Park. The northern part of the trail is also known as the Terminal 91 Bike Path and is on Port of Seattle property.

### **CHARACTERISTICS**

Length: 3.22 miles

Average Width: 11.5 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at W Garfield St/Magnolia Bridge (western terminus). Ends under the Broad St (eastern terminus).

Trail Offshoots: 42

Presence of Shoulder: No

Rail Crossings: Yes

### **OPPORTUNITIES**

- Upgrade trail striping and markings to improve flow of trail users
- Collaborate with the Port of Seattle, Seattle Parks and the BNSF Railroad to study bringing the northern portion of the trail up to American Association of State Highway and Transportation Official (AASHTO) standards, including widening narrow trail segments to allow shared use travel in two directions

• Enhance connectivity with proposed Neighborhood Greenways, Smith Cove Park, a proposed shared use path on the Magnolia Bridge, and improved bicycle access on and off the trail at the intersection of Broad St and Alaskan Way

### **EXISTING CONDITIONS**

#### ELLIOTT-1

This segment of the trail has a grade separated crossing of the railroad and has an industrial character. Due to limited right-of-way, this segment is flanked with fencing on both sides and narrow pinch points.

### ELLIOTT-2

This segment of the trail runs along Elliott Bay and provides sweeping views of Downtown Seattle and Mt Rainier. The trail provides access to the Helix Bridge and W Thomas St Pedestrian/Bike Overpass and the future Expedia site. The trail has inconsistent pedestrian and bicycle markings and trail speed signage that needs to brought up to consistent trail standards.

### ELLIOTT-3

As the trail nears Downtown Seattle, it passes through Myrtle Edwards Park, the Olympic Sculpture Park, and connects to the Seattle Waterfront.



A narrow section of the Elliott Bay Trail that is flanked by fences on both sides



View of Mount Rainier from the Elliott Bay Trail

### **ELLIOTT BAY TRAIL**

## **Recommended Upgrades**

#### WORK WITH THE PORT OF SEATTLE, SEATTLE PARKS & BNSF RAILROAD TO BRING TRAIL UP TO AASHTO STANDARDS

- 1 Work with the Port of Seattle to evaluate bollard placements for consistency and user flow
- 2 Work with the Port of Seattle to address pavement damage due to tree root intrusion
- 3 Work with BNSF to address areas where the trail narrows and crosses train tracks
- 4 Work with the adjacent development to address the tight turn in the trail
- 5 Work with the Port of Seattle to improve channelization around restroom at the Fishing Pier Restaurant
- 6 Work with Seattle Parks and Recreation to improve circulation in high volume areas through Myrtle Edwards Park



Cyclist passing by the grain silos



Cyclist rides through Myrtle Edwards Park



Trail passes by restroom at the Fishing Pier Restaurant



*Evaluate alternative bollard placements along the trail* 



1	23RD AVE W & W GARFIELD ST
	Via under the Magnolia Bridge connection
2	W MARINA PL

Proposed Neighborhood Greenway

- 3 21ST AVE W Proposed Neighborhood Greenway
- **20TH AVE W** Proposed Neighborhood Greenway

**5** MAGNOLIA BRIDGE

Via working with the community and Port of Seattle on the BMP's vision for a proposed off-street trail

**W THOMAS ST PEDESTRIAN/BIKE OVERPASS** Enhanced wayfinding

BROAD ST & ALASKA WAY Improve bicycle access on/off the trail





Located next to I-5 in Capitol Hill, Melrose Ave E transitions into the Melrose Connector as a short trail segment that connects city streets with pedestrian/bicycle facilities. The trail is part of the community's greater vision for the Melrose Promenade, a gateway that would welcome visitors and neighbors to Capitol Hill.

### **CHARACTERISTICS**

Length: 0.96 miles

Average Width: 12 feet

Type: Shared-Use Path

**Begins/Ends**:Begins at the intersection of Lakeview Blvd. E and Belmont Ave E (northern terminus). Ends at Melrose Ave E (southern terminus) where it transitions to sharrows on Melrose Ave E.

Trail Offshoots: 4

Presence of Shoulder: No

Rail Crossings: No

#### **OPPORTUNITIES**

- Enhance connectivity to Capitol Hill neighborhood by coordinating efforts with the Melrose Promenade vision
- Enhance trail with upgraded ramps, striping, pavement markings, and signage
- Continue regular removal of garbage to maintain a welltended trail environment
- Improve drainage along and across the Melrose Connector

### EXISTING CONDITIONS

#### MEL-1

This hidden gem of a trail gives pedestrians and cyclists who are traveling north to East Lake an alternative to climbing Capitol Hill. At the northern trail terminus, pedestrians and cyclists travelling to/from Lakeview Blvd E navigate through a triangular parking area to the trailhead. At the southern terminus, cars are periodically seen inadvertently entering the trail.



Cyclist riding adjacent to I-5 on the Melrose Connector Trail



Melrose Trail connection to Bellevue Pl E

### **MELROSE CONNECTOR**

## **Recommended Upgrades**

- 1 Enhance northern trailhead with upgraded ramp, restriping, signage and vegetation removal in parking lot area
- 2 Remove grass and soil encroaching along trail edge. Study feasibility of installing trail under drain to address seep
- 3 Improve southern trailhead with upgraded ramp, striping and replacement of damaged sign



Improve the transition and signage at the southern trailhead



*Remove encroaching grass and soil along the trail's edge* 



**1** LAKEVIEW BLVD E At north trailhead

**BELLEVUE PLACE PARK** Via Bellevue Pl E

### **3** MELROSE AVE E

Proposed Neighborhood Greenway







The Portside Trail is a relatively new trail that provides important connections to Pioneer Square and the waterfront's proposed protected bike lane to the north and SODO to the south.

### **CHARACTERISTICS**

Length: 0.62 miles

Average Width: 13 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at S King St (northern terminus). Ends at S Atlantic St (southern terminus)

Trail Offshoots: 1

Presence of Shoulder: Concrete edge

#### Rail Crossings: No

Illumination: Light Poles

### **OPPORTUNITIES**

• Upon completion of the Alaskan Way Viaduct Replacement Project, there will be opportunities to coordinate the connection of the Portside Trail to the Elliott Bay Trail via a proposed protected bike lane

- Enhance connectivity to Utah Ave S Proposed Neighborhood Greenway via S Atlantic St
- Improve wayfinding to/from the trail with signage and pavement markings
- Continue regular vegetation maintenance to provide a welltended trail environment

### **EXISTING CONDITIONS**

#### PORT-1

This relatively new trail runs between fences along Seattle's industrial waterfront. The pavement is in good condition with the exception of one mid trail bump. Light poles illuminate the trail.

Currently, the northern end of the trail terminates in a temporary construction zone for the Alaskan Way Viaduct Replacement Project. In the future, the trail will connect to a proposed protected bike lane along Alaskan Way S.

Trail users have a decision point to go left or right around a structural support of the overpass.



Portside Trail has clear views of the Seattle skyline riding in the northbound direction



Cyclist rides past the right side of an overpass structural support

### **PORTSIDE TRAIL**

## **Recommended Upgrades**

- 1 Coordinate wayfinding for connection to proposed protected bike lane along Alaskan Way S
- 2 Improve wayfinding where trail splits around overpass structural support
- 3 Repair pavement mid-trail



Cyclists approach the transition between Portside Trail and Alaskan Way S



*Improve wayfinding where trail splits around an overpass structural support* 



### 1 ALASKAN WAY S

Proposed Protected Bike Lane

### **2** S ATLANTIC ST

With connection to Utah Ave S Proposed Neighborhood Greenway



The SODO Trail runs through South Downtown adjacent to both Link Light Rail and the SODO Busway. It provides direct connections for trail users to the SODO and Stadium Light Rail Stations. SDOT is currently studying a southern extension of the SODO Trail.

#### **CHARACTERISTICS**

Length: 1.00 miles

Average Width: 10 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at S Royal Brougham Way (northern terminus). Ends at S Forest St (southern terminus)

Trail Offshoots: 10

Presence of Shoulder: No

Rail Crossings: No

#### **OPPORTUNITIES**

- Enhance connectivity at the north trail terminus with proposed bicycle network improvements connection to Downtown, and at the south trail terminus through the proposed extension of SODO trail and connection east on S Forest St to 6th Ave S
- Improve connections with Mountains to Sound Trail and the West Seattle Bridge Trail to increase access for trail users
- Continue regular vegetation maintenance to provide a welltended trail environment



While a majority of the trail is adjacent to industrial building facades, vegetation lines the trail along various portions

#### **EXISTING CONDITIONS**

#### S0D0-1

This relatively new trail was installed at the same time as the Link Light Rail construction. It provides a walking/cycling option to/from the stadiums. Being situated between the Link Light Rail and the SODO Busway, there is limited access to local streets between major intersections.

At the southern terminus of the trail, users head east on S Forest St, a major truck access route to/from I-5, to connect with 6th Ave S. Trail users headed to the West Seattle Bridge Trail access S Spokane St via 6th Ave S.



SODO Trail is located next to both SODO and Stadium Light Rail Stations



A cyclist passes a large mural on the Sodo Trail

## **Recommended Upgrades**

- 1 Coordinate connections to proposed protected bikeway on S Royal Brougham Way as well as proposed bicycle network improvements per Seattle Bicycle Master Plan Implementation Plan
- 2 Continue studying SODO Trail extension to the south



*Coordinate a connection between the trail and the proposed protected bikeway on S Royal Brougham Way* 



Continue studying SODO Trail expansion to the south, past the light rail underpass



**1** S ROYAL BROUGHAM WAY

Proposed Protected Bike Lane

### **2** S HOLGATE ST

With connection to Mountains to Sound Trail

### **3** S FOREST ST

With connection to 6th Ave S



The Mountains to Sound Trail runs along I-5 and I-90 and continues east on I-90 outside of city limits, providing connections to Mercer Island, Bellevue and the regional trail system known as Mountains to Sound Greenway. Within Seattle, it travels through many city neighborhoods and parks that provide trail users access to several amenities. The Mountains to Sound Greenway has a vision to eventually connect to Elliott Bay.

### **CHARACTERISTICS**

Length: 3.70 miles

Average Width: 13 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at Beacon Ave S (western terminus). Ends at I-90 Bridge (eastern terminus)

Trail Offshoots: 25

Presence of Shoulder: No

Rail Crossings: No

### **OPPORTUNITIES**

- Apply consistent treatments for street crossings and study alternative bollard placements
- Creating a connection to Downtown and the SODO trail would increase trail access for users as well as the number of destinations that can be reached via the trail

- Enhance connectivity with proposed Neighborhood Greenways, Lake Washington Blvd S and Rainier Valley Greenways, Central Park Trail in Judkins Park
- Collaborate with WSDOT to provide a new connection across I-5

#### **EXISTING CONDITIONS**

#### M2SD-1

The trail passes through forested areas from S Holgate St, to Jose Rizal Park at the 12th Ave S crossing and then through Sturgus Park with a sweeping view of Rainier Valley and the backdrop of the Cascade Mountains. Until the Seattle Bicycle Master Plan's long term vision for an I-5 crossing is implemented, access from the trail to Seattle's waterfront is via on-street facilities.

#### M2SD-2

This segment of the trail provides access to North Beacon Hill, Rainer Valley, several neighborhood parks and Thurgood Marshall Elementary School.

### M2SD-3

Eastward from 23rd Ave S, trail users pass through a series of neighborhood parks and then can continue east to the trail along I-90 via a tunnel or connect with the Lake Washington Blvd S for an on-street route along Lake Washington.



Mountains to Sound Greenway and Seattle BMP have a shared vision of implementing a new trail connection across 1–5



Mountains to Sound Trail connects a network of parks and other city green spaces

# **Recommended Upgrades**

**1** Review bollard placement and upgrade crossing



Existing trail crossing at 23rd Ave S



The Mountain to Sound Trail leading to the I-90 Bridge



1 NORTH BEACON HILL

Via Seattle's BMP proposed on-street facilities

PROPOSED TRAIL CONNECTION ACROSS I-5 Per shared vision of Mountains to Sound Greenway and Seattle BMP

### **3** JUDKINS PARK

Via enhanced connections and wayfinding to the "Central Park Trail" LAKE WASHINGTON BLVD S
 Proposed Neighborhood Greenway

5 24TH AVE S / 25TH AVE S Proposed Neighborhood Greenway



The Alki Trail traces the northern shore of West Seattle. Connecting from the West Seattle Bridge Trail, this path provides access to Alki Beach, Jack Block Park and is a popular destination for walkers, joggers, rollerbladers, and cyclists. The trail accommodates tourists and residents alike, and offers unprecedented views of the Puget Sound, the Olympic Mountains and Downtown Seattle.

### **CHARACTERISTICS**

Length: 4.23 miles

Average Width: 11.5 feet

Type: Shared-Use Path with some sections of protected bike lane

**Begins/Ends**: Begins at Alki Ave SW (western terminus). Ends at West Seattle Bridge Trail (eastern terminus)

Trail Offshoots: 28

Presence of Shoulder: Yes

Rail Crossings: No

### **OPPORTUNITIES**

- Reconfigure King County Metro loading/unloading zones in relation to trail user access and circulation
- Reimagine lane markings and trail division to accommodate the Alki Trail's wide range of users

- Improve trail access and flow with wayfinding, ramp upgrades, consistent driveway crossing treatments and review of alternative bollard placements
- Enhance connectivity with proposed Neighborhood Greenways, Jack Block Park, Seacrest Ferry Dock and the West Seattle Bridge Trail

### **EXISTING CONDITIONS**

#### ALKI-1

This section of trail passes by Alki's commercial center, Alki's bath house, Alki Beach activities such as beach volleyball, fire pits, and sandcastle building. Local peddle power rentals provide visitors with spontaneous wheels for the trail. In this trail segment, the pedestrian and bicycle facilities are separated.

#### ALKI-2

The trail transitions to a shared-use path that offers expansive views of Elliott Bay and Seattle's city sky line. The trail provides access to the public boat launch, the water taxi at Seacrest Ferry Dock and Jack Block Park.

### ALKI-3

This section of the trail parallels Harbor Ave SW as it passes by a small commercial area and then connects directly to the West Seattle Bridge Trail.



Existing driveway crossing



Example segment of separated pedestrian and bicycle paths

# **Recommended Upgrades**

### **DEFINE BUS LOADING ZONES & IMPROVE ADA ACCESS**

- 1 Separate bus loading from the trail at multiple King County Metro bus stops along the existing protected bike lane
- 2 Convert segment of parking and the protected bike lane along Alki Ave SW to a shared-use path

### **IMPROVE CIRCULATION**

3 Study potential reconfiguration of existing segment of separated pedestrian and bicycle paths as a shared-use path to improve access and circulation.

### IMPROVE FLOW OF TRAIL ADJACENT TO BUSINESSES

Improve access and flow of the trail along adjacent business frontages. Continue coordination with businesses.

### **ENHANCE CONNECTIVITY TO/FROM TRAIL**

Enhance the connection between the trails and north/south on-street facilities with improved sight lines, potentially increasing the trail width at the corner, and providing wayfinding. Current Neighborhood Street Fund (NSF) Project (2017).



Opportunity to improve connectivity between Alki and West Seattle Bridge trails as well as access and flow to local streets. Current NSF Project (2017)



Enhance connection to Jack Block Park at SW Florida St/Terminal-5



Enhance connection to the Seacrest Ferry Dock, the docking site for the West Seattle–Downtown Water Taxi



Alki Trail runs along adjacent business frontages on Harbor Ave SW



- BEACH DRIVE SW
  Proposed Neighborhood Greenway
- 61ST AVE SW Proposed Neighborhood Greenway
- **3** 59TH AVE SW
  - Proposed Neighborhood Greenway

- **WEST SEATTLE DOWNTOWN WATER TAXI** At Seacrest Ferry Dock
- 5 FAIRMOUNT AVE SW Proposed Neighborhood Greenway
- **JACK BLOCK PARK** At SW Florida St/Terminal 5





The West Seattle Bridge Trail runs through an industrial area under the West Seattle Bridge, providing access for bicyclists and pedestrians over the Duwamish River. The trail is a major route for West Seattle commuters to get downtown. Its west terminus connects with the Alki Trail.

### CHARACTERISTICS

Length: 0.97 miles

Average Width: 10.5 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at the eastern terminus of Alki Trail (western terminus). Ends at E Marginal Way S (eastern terminus)

### Trail Offshoots: 14

Presence of Shoulder: Yes

Rail Crossings: Yes

### **OPPORTUNITIES**

• Improve trail access and flow with ramp upgrades, consistent driveway crossing treatments and wayfinding especially at the ends of trail and at Harbor Island

- Leverage recent improvements to Chelan Ave SW intersection with Seattle BMP's long term vision of grade separated trail
- Continue regular vegetation maintenance especially at tight turns to increase trail user's sight lines
- Enhance connectivity with proposed Neighborhood Greenways in the Delridge neighborhood, the Duwamish River Trail and on-street bicycle facilities at both ends of the trail

### **EXISTING CONDITIONS**

### W.SEA-1

This section of the trail connects directly with the Alki Trail and provides on-street connections to the Delridge Neighborhood, Pigeon Point and the Duwamish River Trail.

### W.SEA-2

This section of the trail passes by Harbor Island and continues to its eastern terminus at E Marginal Way where trail users transition onto on-street bicycle facilities and a sidewalk to reach the Portside Trail or continue onto S Spokane, then 6th Ave S to connect to the SODO Trail.



Develop north (E Marginal Wy) and east (S Spokane St) connections on the east terminus of the West Seattle Bridge Trail



Clarify and extend wayfinding south towards Delridge Wy SW and proposed 21st Ave SW Greenway

### WEST SEATTLE TRAIL

## **Recommended Upgrades**

- 1 Review options for improving sight lines when approaching the intersection of SW Avalon and Harbor Ave SW where the West Seattle Bridge and Alki Trails connect
- 2 Continue to study long term solutions for crossing improvements at Terminal 5 access/Chelan Ave SW intersection
- 3 Review options for enhancing the bicyclist crossing at SW Spokane St and 11th Ave SW
- 4 Evaluate driveway crossings to create consistent treatments throughout trail network
- 5 Review upgrading paving and planter configuration to improve trail user flow and comfort



*Review options for improving sight lines at the transition between Alki Trail and West Seattle Bridge Trail* 



Continue to study solutions for crossing improvements at the five-way Terminal 5 access/Chelan Ave SW intersection



*Review options for enhancing the bicyclist crossing at SW Spokane St and 11th Ave SW* 



*Evaluate driveway crossings to create consistent treatments throughout the trail* 



## **1** SW AVALON WAY/HARBOR AVE SW

### INTERSECTION

Improvements under current Neighborhood Street Fund (NSF) Project (2017)

### **2** CHELAN AVE SW

Via long term vision for improved connections to proposed 21st Ave SW Neighborhood Greenway and Pigeon Point and Delridge Neighborhoods **3** DUWAMISH RIVER TRAIL

Enhance connectivity between trails

EASTERN TERMINUS OF WEST SEATTLE BRIDGE Per Seattle BMP's proposed improvements for E Marginal Way S (multi-modal transportation study underway) and S Spokane St




# **Overview**

The Duwamish River Trail runs along the Duwamish River in Southwest Seattle. Over half of the trail runs adjacent to a rail line through an industrial area. From the trail's northern terminus, trail users connect to the W Seattle Bridge Trail and the Alki Trail via the on-street Duwamish Route along W Marginal Way SW. At the end of S Portland St, the trail turns south and shifts to an on-street segment along 8th Ave S and then resumes at S Trenton St. From the trail's southern terminus, trail users connect to the South Park Neighborhood. From of regional trail network perspective, King County is studying a connection from the Duwamish River Trail to the Green River Trail.

#### **CHARACTERISTICS**

Length: 2.64 miles

Average Width: 8.5 feet

Type:Shared-Use Path with segments of on-street routes.

**Begins/Ends**: Begins just north of Herring's House Park on W Marginal Way SW (northern terminus). Ends at S Henderson St (southern terminus).

Trail Offshoots: 23

Presence of Shoulder: No

Rail Crossings: Yes

#### **OPPORTUNITIES**

- Enhance the overall trail user experience by studying the application of trail design guidelines for trail widenings, railroad and street crossings, repaving, restriping, signage and ongoing vegetation maintenance
- Upgrade Duwamish Route to All Ages & Abilities facility to connect to the West Seattle Bridge Trail

• Enhance connections to proposed Neighborhood Greenways, Protected Bike Lane, Herring's House Park, 1st Ave S Bridge and Concord International School

#### **EXISTING CONDITIONS**

#### DUWAM-1

Pedestrians and cyclists access the trail from the north via the Duwamish Route along W Marginal Way SW. The trail provides access to Herring's House Park on the Duwamish River. The trail turns sharply, then parallels the Duwamish River, then runs adjacent to a railway through an industrial shipping area with several driveway crossings, then curves onto Highland Park Way SW.

#### DUWAM-2

In this section, trail users connect to the 2nd Ave SW onward the 1st Ave S Bridge to Georgetown or continue south through an industrial area, crossing several driveways and ending at S Holden St.

#### DUWAM-3

The trail directs users onto S Portland St and continues through an industrial area then turns south onto 8th Ave S where it transitions to on-street facilities. The BMP identifies 8th Ave S as a proposed protected bike lane.

#### DUWAM-4

Trail users access this short trail section from the north via 8th Ave S. This trail section parallels Highway 99 and has an important connection to Concord International School via pedestrian bridge over Highway 99 that connects to S Henderson St.



Enhance connection to Duwamish Route, which is an on-street facility along W Marginal Way SW



Enhance connection to Herring's House Park near Terminal 107

# **Recommended Upgrades**

#### APPLY CONSISTENT DESIGN TREATMENTS

1 Study the global application of trail design guidelines to improve the function and aesthetics of the trail through an industrial neighborhood

#### UPGRADE PAVEMENT

2 Address significant pavement buckling caused by large tree at the intersection of W Marginal Way SW and 1st Ave S



Enhance connection to proposed S Henderson Neighborhood Greenway



Enhance connection to 1st Ave S Bridge at Highland Park Way SW

#### **UPGRADE TRAIL SEGMENT**

3 Improve segment of trail between S Trenton St and S Henderson St to enhance connection to the South Park Neighborhood

#### ENHANCE TRAILHEAD

4 Enhance trailhead and connection to pedestrian footbridge leading to Concord International School and surrounding neighborhood



Address buckling pavement due to large tree at intersection of W Marginal Way SW and 1st Ave S



Enhance trail and footbridge connection to Concord International School



# **Recommended Connections**

- ENHANCED DUWAMISH ROUTE
   Via W Marginal Way SW
- 2 HERRING'S HOUSE PARK Near Terminal 107
- **3 1ST AVE S BRIDGE** Via Highland Park Way SW

- 8TH AVE S
   Proposed Protected Bike Lane
- 5 SHENDERSON ST Proposed Neighborhood Greenway
- 6 CONCORD INTERNATIONAL SCHOOL Via pedestrian bridge over Highway 99



# **BEACON AVE**



# **Overview**

The Beacon Ave S Path runs along the center median of Beacon Ave S providing pedestrians and bicyclists an off-street connection through Southeast Seattle. The path's setting changes back and forth from a path adjacent to a parking median to a landscape median. The trail offers regional views to the west and certain trail sections offer views of Mt Rainier to the southeast. The trail intersects with Chief Sealth Trail at S Dawson St.

#### **CHARACTERISTICS**

Length: 3.77 miles

Average Width: 8.5 feet

Type: Path

**Begins/Ends**: Begins at the intersection of Beacon Ave S and S Columbian Way (northern terminus). Ends at the intersection of Beacon Ave S and 39th Ave S (southern terminus).

Trail Offshoots: 37

Presence of Shoulder: No

Rail Crossings: None

#### **OPPORTUNITIES**

- Create consistent treatments for signage, striping, crosswalks and ramps to increase accessibility and flow for trail users
- Widen sections of path to meet Shared Use Path standards
- Enhance connectivity with proposed Neighborhood Greenways and protected bike lanes, VA Medical Center, Jefferson Park, Chief Sealth Trail and Martin Luther King Jr Way S
- Extend the trail from its southern terminus at S Barton St to Martin Luther King Jr Way S by formalizing an existing east/west foot path

#### **EXISTING CONDITIONS**

#### **BEACON-1**

The path begins just south of the S Columbian Way and runs along Beacon Ave S's center median parking area through a business district. At S Ferdinand St, the center parking median transitions to a landscape median with the path running through it all the way to S Orcas St.

#### BEACON-2

At S Orcas St, the path continues through a landscape median. S Orcas St provides an important connection for school children walking/biking between the path and Dearborn Park Elementary as well as for trail users commuting between the Chief Sealth Trail and Beacon Ave S Path. Just to the north of S Graham St, the path switches back to a parking median setting as it moves through a small business district.

#### **BEACON-3**

Just to the south of S Graham St, the path runs along the western edge of a parking median and then transitions to meandering path through a landscape median all the way to S Myrtle St.

#### **BEACON-4**

Just south of S Myrtle St, the path runs adjacent to a median parking lot then transitions to meander through a landscape median with several street crossings until it reaches its southern terminus at 39th Ave S. Pedestrians and cyclists can depart from the path and head east on S Myrtle St to access the Van Asselt Community Center, New Holly, and Chief Sealth Trail. S Kenyon St provides an important connection for school children walking/biking between the path and Wing Luke Elementary School. Continuing south, the path provides access to Van Asselt Elementary School on Beacon Ave S. To the south, the path terminates at 39th Ave S, but trail users can continue on an informal, tree-lined path just east of S Barton St to connect to Martin Luther King Jr Way S.



Beacon Ave S Path running adjacent to center parking median



Beacon Ave S Path traveling through landscape median

# **Recommended Upgrades**

#### UPGRADE AT SIGNALIZED CROSSING

1 Apply design guidelines for crossings at signalized intersections to upgrade pedestrian/bicycle access and mobility through the S Columbian Way intersection

#### STRENGTHEN TRAIL TO TRAIL CONNECTIVITY

2 Improve connectivity between Beacon Ave S Path and Chief Sealth Trail by studying curb ramps placements, striping and signage

#### UPGRADE AT UN-SIGNALIZED CROSSING

3 Apply design guidelines for crossings at unsignalized intersections to upgrade pedestrian/ bicycle access and mobility through the S Eddy St intersection path



Improve connectivity between Beacon Ave S path and Chief Sealth Trail

#### UPGRADE AT MID-BLOCK CROSSING & CONNECTION TO PROPOSED NEIGHBORHOOD GREENWAY

Apply design guidelines for mid-block crossing to upgrade pedestrian/bicycle access and mobility from S Morgan St (proposed Neighborhood Greenway) to path

# WIDEN PATH TO MEET CURRENT SHARED USE PATH STANDARDS

5 Study increasing entire path's width (existing 8.5 feet width) to meet Shared Use Path standards

#### TRAIL EXTENSION

6 Study trail extension by formalizing tree-lined path just east of S Barton St to connect to Martin Luther King Jr Way S



Upgrade pedestrian and bicycle access and mobility through S Columbian Way intersection.



# **Recommended Connections**

- CHEASTY BOULEVARD S
   Proposed Neighborhood
   Greenway
- 2 S COLUMBIAN WAY Proposed Protected Bike Lane
- 3 CHIEF SEALTH TRAIL At the intersection of Beacon Ave S Path and Chief Sealth Trail
- S DAWSON ST Proposed Neighborhood Greenway
- 5 S MORGAN ST Proposed Neighborhood Greenway
- **S MYRTLE ST** Proposed Protected Bike Lane
- S KENYON ST Proposed Neighborhood Greenway
- 8 MARTIN LUTHER KING JR WAY S Trail extension from S Barton St to Martin Luther King Jr Way S





# **Overview**

The Chief Sealth Trail runs under the Seattle City Light power lines through Southeast Seattle and connects with the Beacon Ave S Path. This trail traverses several ridges and valleys providing views of Lake Washington, Mt Rainier, and Downtown Seattle. The trail was constructed in conjunction with the Sound Transit Link Light Rail implementation. Community members use the trail for recreation and access to light rail stations, schools, parks, and community centers.

#### **CHARACTERISTICS**

Length: 3.44 miles

Average Width: 10 feet

Type: Shared-Use Path

**Begins/Ends**: Begins at S Angeline St (northern terminus). Ends at S Gazelle St (southern terminus).

Trail Offshoots: 38

Presence of Shoulder: No

Rail Crossings: Yes

#### **OPPORTUNITIES**

- Upgrade crossings and add wayfinding especially in places where the trail transitions to on-street facilities.
- Provide areas for shade and rest especially at viewpoints along the trail
- Enhance connections to existing and proposed Neighborhood Greenways, Beacon Ave S Path, John C. Little Sr. Park, New Holly neighborhood campus, Othello and Rainier Beach Light Stations, nearby schools, and Kubota Gardens



Chief Sealth Trail connects with Beacon Ave S Path at S Dawson St



Opportunity to apply center lines along curves to improve circulation



Opportunity to improve trail crossings and wayfinding

# **Existing Conditions**

#### CHIEF-1

Starting at S Angeline St, the segment of the Chief Sealth Trail is often used by school children on their way to and from Mercer Middle School to the north. The trail provides a sweeping view of west. Heading eastward, the trail passes by a large community P-Patch and then intersects with the Beacon Ave S Path at S Dawson St.

#### CHIEF-2

Continuing eastward, this trail segment meanders through a relatively flat residential neighborhood and terminates at S Brandon St.

#### CHIEF-3

From S Brandon St, the trail descends down a slope and passes the Dearborn Park Elementary School. Heading south, the trail crosses S Orcas St. It should be noted that the several tight turns within this trail segment help to manage the speed of cyclists as they roll down the hillside trail. This section of the trail ends at S Juneau where the trail is routed west on S Juneau St.

# **Recommended Upgrades**

#### STRENGTHEN TRAIL TO TRAIL CONNECTIVITY

1 Improve connectivity between Chief Sealth Trail and Beacon Ave S Path by studying curb ramps placements, striping and wayfinding signage (cross reference Beacon Ave S Path Recommended Upgrades)

#### STRENGTHEN TRAIL TO SCHOOL CONNECTIVITY

2 Enhance connection to Dearborn Park Elementary School

#### WAYFINDING AT TRAIL OFFSET

3 Improve wayfinding for trail offset at S Juneau St



Enhance connection to Dearborn Park Elementary School



# **Recommended Connections**

**1** S DAWSON ST

Proposed Neighborhood Greenway

**2 DEARBORN PARK ELEMENTARY SCHOOL & DEARBORN PARK** Via S Orcas St

# **Existing Conditions**

#### CHIEF-4

From S Juneau St, the trail is routed onto 30th Ave S to cross S Graham. This trail segment ends at S Morgan St (proposed Neighborhood Greenway).

#### CHIEF-5

The trail enters the Holly Park Neighborhood and provides access to New Holly Community Center, Learning Center, Pre-School, and Eastern African Community Services. This section of trail terminates at S Myrtle Place signalized intersection.

#### CHIEF-6

The trail is routed to on-street facilities along S Holly Park Drive and 39th Ave S. There is a partial parallel route that connects to the Wing Luke Elementary and the surrounding Beacon Hill neighborhood.

# 

Potential Safe Route to School project

# **Recommended Upgrades**

#### EXTEND TRAIL AND IMPROVE CROSSING

1 Extend sidewalk/trail along 30th Ave S and improve crossing of S Graham St with upgraded crosswalk and curb bulb-out

# CLOSE GAP IN TRAIL WITH POTENTIAL SOFT SURFACE PATH

2 Study a potential soft surface path between S Myrtle St and S Webster St as a Safe Routes to School project connecting to Wing Luke Elementary School

#### STRENGTHEN TRAIL TO LIGHT RAIL CONNECTIVITY

3 Improve circulation at the intersection of 39th Ave S and S Kenyon St (proposed Neighborhood Greenway)



Enhance connection to proposed S Kenyon St Neighborhood Greenway.



# **Recommended Connections**

S MORGAN ST

S Proposed Neighborhood Greenway

- **2 JOHN C. LITTLE JR. PARK** Via Wayfinding
- OTHELLO ST

Proposed Neighborhood Greenway

OTHELLO LIGHT RAIL STATION Via Enhanced Path through New Holly Neighborhood

#### 5 S KENYON ST

Proposed Neighborhood Greenway

# **Existing Conditions**

#### CHIEF-7

Beginning near Wing Luke Elementary, the trail continues downhill with no street crossings until it reaches S Thistle St.

#### CHIEF-8

From S Thistle St, the trail runs between a large P-Patch to the west and Martin Luther King Jr Way to the east. The trail crosses Martin Luther King Jr Way at S Trenton St and provides direct access to Rainier Beach Light Rail Station. This trail segment ends at S Henderson St.

#### CHIEF-9

Beginning with an uphill climb from S Henderson St, this trail segment connects to S Barton St.

#### CHIEF-10

The trail is routed on S Barton St to 45th Ave S where it rejoins the trail and climbs to the summit of S Fletcher St. The trail is then routed onto Marcus Ave S to S Roxbury St where it rejoins the trail and winds its way to its southern terminus at S Gazelle St.

# **Recommended Upgrades**

#### WAYFINDING & DRAINAGE IMPROVEMENTS

1 Study potential crossing improvements at S Henderson St and explore potential drainage improvements south of the S Henderson St intersection

#### DRAINAGE IMPROVEMENTS

2 Explore potential drainage improvements at the trail's connection to 45th Ave S

#### **CROSSING IMPROVEMENTS**

3 Improve crossing of 51st Ave S at trail's southern terminus



Study the possibility of adding a soft surface path or shoulder connecting the trail to S Roxbury St



# **Recommended Connections**

#### **WING LUKE ELEMENTARY**

Improve Connectivity between Trail and Wing Luke Elementary School

#### 2 S TRENTON ST

Improve Connectivity between Trail and South Shore K-8 and South Lake High School



#### **3** KUBOTA GARDENS

Improve Connectivity between Trail and Kubota Gardens

Existing Conditions & Recommended Improvements

# 5. Implementation Plan

# **Prioritization Process**

The prioritization of trail segment improvements were developed based on the criteria and methodology defined in the Seattle Bicycle Master Plan (BMP), adopted in 2014. The BMP's process includes quantitative scoring based on the plan's five themes and related weighting factors:

- Safety
- Connectivity
- Equity
- Ridership
- Livability

The Seattle Trails Upgrade Plan modified the BMP prioritization criteria (see Table 1) by updating the definition of the connectivity criterion to be germane, adding a maintenance criterion, and removing the livability criterion (which previously applied primarily to new facility construction and catalytic projects). The points assigned to each criterion may be modified in the future to align more closely with the BMP 2016–2020 Implementation Plan.

Criterion	Definition	Points
Safety	Addresses locations with a bicycle collision history and emphasizes vulnerable roadway users.	10
Connectivity	Provides connectivity to schools, parks as well as the existing and proposed network of protected bike lanes and Neighborhood Greenways.	10
Equity	Serves populations that are historically underserved, including areas with a higher percentage of minority populations, households below poverty, people under 18, people over 65 and households without access to a motor vehicle. Also provides a health benefit for people in areas with the great reported health needs, represented by obesity rates, physical activity rates (self-reported) and diabetes rates.	30
Ridership	Provides a connection to a destination cluster and/or area with a high population density	20
Maintenance	The amount of need for maintenance upgrades	30

Table 1. Seattle Trails Upgrade Plan prioritization criteria

The trail upgrades, connectivity improvements, and maintenance needs developed as part of this plan (see Chapter 4.c.Trail Needs Analysis and Recommended Improvements) complement the on-street focus of the BMP by placing a focus on off-street trails. Each trail was divided into smaller segments of improvement packages to allow our city's trail network to improve incrementally based on priority and available funding. Trail segments are grouped into the following priority tiers:

- Tier 1 is made up of the highest scoring trail segments
- Tier 2 is made up of the middle range scoring trail segments
- Tier 3 is made up of the lowest scoring segments

The priority tier for each trail segment is shown in the Trail Segment Prioritization Matrix (Table 2) and is depicted in the Trail Segment Prioritization Map (see Figure XX). The results of prioritization process will be used by SDOT to inform an annual implementation plan. Each trail segment's proposed improvement upgrades and connectivity projects will evolve over time based on project feasibility testing, design development of concept projects and/or changing conditions or opportunities.

# **Trail Segment Prioritization**

The resulting score and tier ranking of each trail segment is shown below. Refer to the Trail Needs Analysis and Recommended Improvements to view the recommended upgrade and connectivity projects within each trail segment.

Tier 1	Score	
BEACON-4	54	
BURKE-10	52	
CHIEF-6	52	
BURKE-12	51	
ELLIOTT-3	49	
BEACON-3	47	

Tier 2	Score
CHIEF-5	46
BURKE-11	45
BURKE-8	43
CHIEF-7	43
M2SD-2	43
M2SD-1	43
ALKI-1	42
ALKI-2	41
BURKE-9	41
PORT-1	40
INTER-1	38
BURKE-7	37
SHIP-2	37
BURKE-5	36
CHIEF-10	36
CHIEF-8	36
SHIP-1	36
SODO-1	35
BURKE-13	34
M2SD-3	34
W. SEA-2	34
M2SD-3	34
CHIEF-9	33
DUWAM-1	33
ELLIOTT-2	33
ELLIOTT-1	33
BEACON-1	32
CHIEF-4	
CHIEF-3	32
CHIEF-1	
DUWAM-4	
CHIEF-2	
ALKI-3	
BEACON-2	
BURKE-6	
BURKE-4	27

Tier 3	Score
MEL-1	26
BURKE-2	24
DUWAM-2	24
W. SEA-1	23
BURKE-3	23
BURKE-14	22
DUWAM-3	20
BURKE-1	18

Table 2. Trail Segment Prioritization Matrix

# **Quick Build Concept Projects**

As part of the Seattle Trails Upgrade Plan, four conceptual upgrade projects (see Appendix D) were developed for near term implementation to build momentum and interest towards implementing other recommendations included in the Plan.

The "Quick Build" approach is a strategy for quickly constructing low cost, high impact trail improvement projects. The premise of this approach is to focus efforts on short term actions that can inform long term change. The Quick Build approach is an implementation tool for demonstrating the design guidelines presented in this document (see Chapter 3 Design Guidelines) and providing concept projects that SDOT can develop and implement while planning the implementation sequence and securing funding for this Plan's recommended improvement projects (see Chapter 4 Existing Conditions & Recommended Improvements).

The Quick Build Concepts will allow SDOT to test new design typologies for trails, make design adjustments as needed and replicate the results to achieve an upgraded trail network that is an integral part of Seattle's All Ages and Abilities network.

The following narratives describe the four concept projects (see Appendix D for more details):

#### BURKE-GILMAN TRAIL: 8TH AVE NW TO 3RD AVE NW

Crossing treatments and signage protocol have evolved over the decades of development of the Burke-Gilman Trail. Suggested improvements include upgrading and retrofitting existing ramps, providing stop signs and stop lines for roadway crossings assigning trail users the right of way at the majority of the crossings in this section, re-striping the crosswalks, adding a trail centerline, and warning stripes.

#### MELROSE TRAIL CONNECTOR

The Melrose Trail Connector is located on the east edge of I-5 between E Roy Street and Belmont Ave E. The Melrose Promenade Vision developed by the neighborhood and supported by Seattle Parks Foundation provides great partnering opportunities for improvements of this area over the coming years.

The south end of the trail has graffiti covered signs and lacks truncated domes. The north end of the trail is routed through a streetend parking lot to the intersection of Lakeview Blvd E and Belmont Ave E. There is little existing directional signage or striping.

This project replaces the signage on the south entrance, provides a centerline, warning stripes and truncated domes signaling users leaving the trail and entering the shared roadway and signaling drivers that this is a trail. Along the trail, there are spot drainage improvements to collect seeps and direct surface drainage to the west side of the trail. At the north end, striping directs bikes to two new ramps replacing the existing single diagonal ramp and a short bike lane transitioning to a shared roadway prior to Lakeview Blvd E.

#### **BEACON AVENUE S PATH: S EDDY ST TO S WARSAW ST**

The Beacon Avenue S Trail was installed in concert with the Beacon Avenue reconstruction. The trail meanders in the center median and has many street crossings. This project recommends installing three raised crossings, improved signage and striping, and upgraded curb ramps. This typology can be applied along the entire corridor as funding and priority crossings are identified. This section was chosen because it is part of a future Neighborhood Greenway project.

#### CHIEF SEALTH TRAIL AT S GRAHAM ST

The majority of the Chief Sealth Trail was designed and constructed in concert with Sound Transit Light Rail along Martin Luther King Jr. Blvd to recycle over 200,000 cubic yards of soil and crushed concrete from light rail construction. Certain sections of the trail are routed on-street to utilize existing street crossings and existing paving, to avoid slopes or due to limited public right of way.

The Chief Sealth Trail at 30th Ave S and S Graham was routed on 30th Ave S (a low volume residential street) for a short distance to the tee intersection crossing of S Graham, a two lane arterial with parking on both sides. Improvements to the crossing include installation of an asphalt sidewalk, upgraded ramps, repair of sidewalk, installation of a rectangular rapid flashing beacon (RRFB), trimming of vegetation to improve sight lines and a curb extension to shorten the trail crossing.

# Partnership Opportunities

#### **OVERVIEW**

Seattle Trails are part of a regional trails network enjoyed by locals and visitors for both short and long walking/cycling trips. As the Puget Sound region grows, the strengthening and expansion of our trail network will help enhance the quality of life for all.

A concerted effort to create a cohesive regional trail experience with consistent design treatments will require continued collaboration across multiple agencies that have purview over various segments of the Seattle trails network and adjoining regional trails, including SDOT, Seattle Public Utilities, Seattle Parks and Recreation, King County Parks, the Port of Seattle, BNSF Railroad, Washington State Department of Transportation and University of Washington.

As a reference tool for continued interagency discussions, an ownership map was created based on King County Assessor's parcel data to determine landowners for each SDOT compkey\* segment of Seattle Trails Network.

#### COORDINATION WITH SEATTLE PARKS & RECREATION DE-PARTMENT

The trails maintenance agreement between SDOT and Seattle Parks (dated 1991 and updated in 2005 for structures) is being examined for potential updates to improve the interdepartmental asset management of the Seattle Trails Network. In general, the Seattle Trails Maintenance Agreement could be improved in the following ways:

- Reference new design guidelines recommended in the Seattle Trails Upgrade Plan
- Clearer definitions of facilities e.g. clarify what is meant by "park-like setting", etc.
- Asset ownership map per trail
- Identification of mutually-agreed upon roles and responsibilities for each agency
- Improved organization of document and map graphics

#### **COORDINATION WITH THE PORT OF SEATTLE**

The City of Seattle and the Port of Seattle will continue to collaborate on maintenance needs and upgrades of the trail system as a part of Port of Seattle development projects and in coordination with adjacent private and public developments. Smith Cove Park, Pier 90/91 and the Expedia Campus Expansion projects are near term opportunities for collaboration.

\* Compkey is the City of Seattle's unique identification code used to track specific roadway or trail data and relate attributes (e.g., width) to a physical location.



Trail Parcel Ownership Map\*

# Implementation

The project delivery process will follow the steps outlined in the Bicycle Master Plan, which include evaluating alternatives, conducting a Complete Streets review, applying the Race and Social Justice Initiative equity toolkit, and engaging the public.

The BMP established where bicycle facilities (including trails and trail extensions) are needed and what type of facility is appropriate. The results of the prioritization process set a framework for sequencing the implementation of projects. Adjustments will be made to the priority improvement projects as part of the annual update process to reflect changes in project schedules, project types, and to add or remove projects. Project schedules can be affected by coordination with other projects, environmental review, and myriad other factors. Project types may change based on the initial evaluation and public outreach, and some projects may begin one year and continue into the next.

SDOT will conduct public outreach and engagement to share additional technical analysis with community members, with a focus on soliciting input to balance community interests. SDOT has developed an effective public engagement process for neighborhood greenways and will adapt this process for trail upgrade projects implemented as part of this plan. As in the past, we'll continue working with the SBAB to identify opportunities to strengthen our public engagement processes.

Finally, the Implementation Plan sets the process for SDOT to make regular progress updates to the SBAB and the SPAB. SDOT anticipates updating the Trails Upgrade Plan every five years to assess current conditions, incorporate new best practices for trails and re-evaluate priorities.

APPENDIX A
Public Engagement

APPENDIX B Priority at Crossings APPENDIX C Field Inventory Maps APPENDIX D
Concept Projects

#### Comment Record Seattle Trails Upgrade Plan October 2015 Open Houses

Comment ID	Meeting Date	Q1 (Of the three project improvement types listed (Connectivity, Upgrades, Maintenance), which would you invest in first (circle one)?	Q2 (Is there a specific trail connection(s) would you like to see improved? Use back of comment sheet if more space is needed.) More sidewalks!				
1	19-Oct-15	Maintenance					
2	19-Oct-15	Maintenance	Sidewalks are key!				
3	19-Oct-15	Connectivity	I live in Ballard/Phinney, so every access opportunity to the Burke-Gilman Trail involves crossing Leary. Almost all of the crossings of Leary are sketchy, so that's where I'd concentrate investment.				
4	19-Oct-15		Maintenance: Burke-Gilman Trail near Sand Point needs bumps smoothed. Connectivity: South end of Interurban Trail.				
5	19-Oct-15	Upgrades	NE 95th access to Burke-Gilman Trail				
6	19-Oct-15	Connectivity	Prioritize 100th greenway west to Greenwood, eventually connect with 8 NW to Ballard.				
7	19-Oct-15	Upgrades	At all trail/roadway crossings: sightlines, logical yield based on volume				
8	19-Oct-15	Connectivity	Ship Canal Trail to Elliot Bay! Access onto Ship Canal Trail.				
9	19-Oct-15	Maintenance	Burke-Gilman Trail: create vegetation management plan, settle maintenance jurisdiction questions (not clear now)				
10	19-Oct-15 19-Oct-15	Connectivity	Ravenna Blvd: How do kids safely get from Burke-Gilman Trail to Ravenna Park? Potential interim solution - low cost curb ramps to allow bikes sidewalk access? (But lots of driveways) Positive Feedback: the paint-only sidewalk on NE Blakely makes a big difference in walking/biking experience, especially with lane of parked cars separating from traffic Low cost sidewalks: low cost curb ramps too? What if survey results are more reflective of annoyances and not true dangers (ex ped/bike interactions vs danger from cars) Trail crossings: please decrease ambiguity, make it clear most vulnerable users have right of way, would love more raised crossings. Safe routes to parks please! My kids are 2, 4, 6, we have been walking and biking to parks and community centers for years, only just now to school Stopping for pedestrians + bikes -, even at unmarked intersections Greenways etc. programs that put users off of arterials need to include ways for people to cross those arterials (even at not official greenways!) Connectivity: 1) E-W connections Melrose Trail and to Lake Union under the freeway at the southern-most end of the colonnades. 2) Connections with rail and Rapid Ride. Other Comment: Getting the most usage for investment is important.				
12	19-Oct-15	Maintenance	Maintenance: Ship Canal Trail. Connectivity: Burke-Gilman Trail missing link				
13	19-Oct-15		Maintenance: Burke-Gilman Trail Bumps Upgrades: lighting on Melrose + mountains to sound				
14	19-Oct-15		On Burke-Gilman Trail: new stairway at 36th Ave NE from NE 45th St up to Burke- Gilman Trail needs runnels on one or both sides to assist bikes up and down.				
15	19-Oct-15	Connectivity	Continue Interurban Trail south of 105th along paver transmission right of way				
16	19-Oct-15	Upgrades	Ship Canal Trail & Fremont Bridge: designate bicycle travel over Fremont Bridge one way - northbound on east side and southbound on west side of bridge. Make better connection from Ship Canal Trail to bike path/walkway on SE corner of bridge. See back (note: drawing on back of comment card).				
17	19-Oct-15	Connectivity	Duwamish Trail - From Trenton to the new segment.				
18	21-Oct-15	Connectivity	Chief Sealth Trail - missing link - can you connect Myrtle with Webster via gravel pathway? - connecting peds to light rail connection				
19	21-Oct-15	Connectivity	<ol> <li>Pave Chief Sealth Trail between S. Webster &amp; Othello (connection to Othello Light Rail Station)</li> <li>Trash cans at key intersections (trash &amp; pet waste)</li> </ol>				
<u> </u>	<u> </u>		Note: Minor edits were made to comment text. Correct spelling was used and trail names wer				
Question 1 Cou	unts		spelled out. Some commenters provided ideas for maintenance and upgrades under question .				

Question 1 Counts	
Maintenance	4
Upgrades	3
Connectivity	8

Note: Minor edits were made to comment text. Correct spelling was used and trail names were spelled out. Some commenters provided ideas for maintenance and upgrades under question 2, these are noted in question 2 with text headings.

# 2015 SDOT Trails Upgrade Plan Updated "Priority at Crossings" Assignment Methodology

#### Introduction

As part of the Seattle Trails Upgrade Plan, SDOT has been tasked with reviewing the current policy for applying right of way at roadway trail crossings. Based on the current approach adopted by SDOT and the attempted harmonization with the Pedestrian and Bicycle Master Plans, it has been determined that the existing establishment of movement priority at crossings is insufficient for the needs of the trail network. In order to finalize this portion of the Trails Upgrade Plan, a new methodology has been developed and tested in order to bring an SDOT-specific approach to establishing right of way.

#### Past Approaches to Right of Way and Proposed Updates

Currently, SDOT's approach to establishing right of way at trail crossings meets the minimum standards set by AASHTO. These standards rely only on giving deference to roadways with higher traffic volume and higher traffic speeds than their crossing counterparts, which is not necessarily valuable for trail crossings. In order to make SDOT's approach more robust, a data-driven approach with physical roadway design influences has been developed using trail use volumes at key locations along the Burke-Gilman trail, which will be used as a pilot for a new "trail arterial" designation. Based on the collected data, the following methodology has been developed to establish "priority at trail crossings:"

- 1. For streets with four or more lanes of travel, trails should be diverted to the nearest intersection and integrated into the signal phase.
  - a. If trail naturally crosses at a signalized intersection, crossing movement should be integrated into the signal phasing regardless of road composition.
  - b. Whether parking lanes or buffered lanes are applicable to this count can be determined on a case-by-case basis.
- 2. For narrower roadways, a "trail arterial" classification can be assigned. This classification should be established during planning and design phases. Arterial trails interact with streets uniquely:
  - a. Trail arterials would have priority when crossing non-arterial roadways.
    - i. Whether non-arterial roadways should have yield or stop controls installed should be determined on a case-by-case basis.
    - ii. Lower volume non-arterial roadways can defer to yield controls assuming that advanced warning is sufficient.
  - b. Trail arterials crossing minor arterials should be given priority when trail volumes exceed those of the roadways.
    - i. Minor arterial roadways should have a stop controls installed at these crossings.
    - ii. In instances where a bike facility connects to a trail crossing, an all-stop control should be implemented to allow trail users turning left onto facilities.
    - iii. When trail volumes are similar to that of the roadway, all way stops may be implemented regardless of nearby bicycle facilities.
  - c. Trail arterials crossing collector or principal arterials should yield right of way to road vehicles.

- i. Principal and collector arterial roadways operate as higher functional classes compared to arterial trails and are therefore designed to operate at higher speeds with higher user volumes.
- ii. Arterials interact hierarchically, so roadways with a lower functional class should inherently defer to those with higher functional classes.
- iii. In situations where collector or principal arterials have line of sight and/or road grade issues that negatively impact driver reaction time or vehicle stopping distances, vehicle speed controls can be implemented on roadways as well.
- d. Trail arterials have complete priority over all driveway crossings.

#### 3. In order to determine when trail arterials supercede the priority of minor arterials:

- a. Bicycle and pedestrian volumes are aggregated and compared to roadway volumes.
  - i. In order to ensure that compared volumes are applicable for permanent crossing priority application, maximized values are to be used.
  - ii. Summertime trail ADT values are used to reflect maximized volumes while roadway employ AWDT values where roads are best represented.
- b. If line of sight for the trail is not sufficient based on speed of roadway, a binary coefficient is added to the trail volumes. Can employ AASHTO formulation to determine if visibility is adequate, otherwise set by design guidelines.

binary line of sight issue 
$$\left\{\frac{yes, l=1}{no, l=0}\right\}$$

c. If road grade impacts the stopping distance of roadway vehicles based on posted speed of roadway, a binary coefficient is added to the trail volumes.

binary road grade issue 
$$\left\{\frac{yes, r = 1}{no, r = 0}\right\}$$

d. Based on the resultant values, the higher score direction(s) of travel get priority at the crossing. When values are comparable, all stops can be implemented based on engineering judgement.

$$Trail\ score = ADT_{ped} + ADT_{bike} * \left(1 + \left(\frac{l+r}{2}\right)\right)$$

#### 4. In instances where a trail does not qualify for trail arterial classification:

- a. Trail yields to all arterial roadways, though full stops can be implemented for trail if there is a line of sight issue, grade issue, or connecting protected bike facility.
- b. Trail volume is compared to non-arterial roadways as per rule 3's interaction between trail arterials and minor arterial roadways.
- c. Non-arterial trails retain complete priority over all driveway crossings.
- 5. In order to increase compliance, at any location where a trail arterial crosses a roadway, it may be beneficial to install advanced warning implementations on both approaches to establish priority of crossing at the trail roadway interface:
  - a. When roadways have the right of way, two sets of signs should be installed.
    - Advanced warning signs indicating an upcoming bicycle and pedestrian trail crossing (W11-155 and W16-9) to be placed along roadway no fewer than 150 feet up stream unless a shorter distance is determined to be more effective.

- At the location of the trail crossing, highly visible signs should be posted identifying the exact locations of both crossing point entrances (W11-155 and W16-7PL)
- b. When either the trail or roadway is expected to yield, a "slow ahead" sign will help mitigate any line of sight and/or stopping distance impediments.
  - i. There is no minimum distance from trail crossings as trail segment lengths vary.
  - ii. Trail markings can be used in place of advanced warning signs when necessary.
- 6. In situations where frequent collisions occur due to geometric limitations of the roadways or non-compliance by road or trail users, crossing priority can be modified after internal review.

For the purposes of this document, the following data will be used for the examples given hereafter. Bicycle and pedestrian volumes were collected during the summer of 2015 when peak trail volumes were expected to be maximized for more applicable trail scores. Roadway volumes employ the most recent volume data collected by SDOT.

Location	Roadway Classification	Vehicle AWDT	Visibility Issue	Grade Issue	Ped ADT	Bicycle ADT	Trail Score
Burke-Gilman Trail at NW 40 <sup>th</sup> St	Non-arterial	434	Yes	No	261	237	617
Burke-Gilman Trail at NE 100 <sup>th</sup> St	Non-arterial	79	No	Yes	187	540	997
Burke-Gilman Trail at NE 65 <sup>th</sup> St	Minor Arterial	3333	Yes	Yes	314	1359	3032
Burke-Gilman Trail at NE 77 <sup>th</sup> St	Minor Arterial	583	Yes	Yes	187	540	1267
Burke-Gilman Trail at 30 <sup>th</sup> Ave NE	Collector Arterial	8025	Yes	No	314	1359	2353
Burke-Gilman Trail at 40 <sup>th</sup> Ave NE	Collector Arterial	4674	No	No	314	1359	1673

## Rule 1

#### Burke-Gilman Trail crossings at 25<sup>th</sup> Ave NE and Stone Way N.

- 25<sup>th</sup> Ave NE is five lanes wide at the trail crossing and is classified as a principal arterial.
  - Roadway has priority due to lane count, road width, and arterial classification.
  - Trail is guided to the intersection of 25<sup>th</sup> Ave NE and NE Blakeley St in order to integrate trail crossing into signal phase for additional protections.



**Left:** Street view of crossing at 25<sup>th</sup> Ave NE, facing south. Trail is directed towards the intersection and integrated into the south crosswalk, which has been widened to accommodate user volumes.

**Right:** Sidewalk view of crossing at 25<sup>th</sup> Ave NE, facing west. Additional amenities, such as a leaning rail and a secondary crossing button for bicycle users have been installed for bicyclists at the trail crossing.

- Stone Way N is four lanes wide at the trail crossing and is classified as a minor arterial.
  - Roadway has priority due to lane count. Minor arterials are not given priority de facto/a priori at arterial trail crossings.
  - Trail guided to the intersection of Stone Way N and N 34<sup>th</sup> St and integrated into the signal phase along the south crosswalk.



**Left:** Street view of crossing at Stone Way N, facing southeast. Posted roadway speeds, visibility issues, and trail user exposure length at the crossing justify diverting trail to a controlled environment.

**Right:** Sidewalk view of crossing at Stone Way N, facing west. Trail crossing has been integrated into signal phase, though additional amenities can be installed at this location to increase trail user level of service.

#### Rule 2a

#### Burke-Gilman Trail crossings at NW 40<sup>th</sup> St and NE 100<sup>th</sup> St.

- NW 40<sup>th</sup> St is a non-channelized non-arterial road with a vehicle AWDT of 434. The trail score at this crossing is 617.
  - The trail is granted crossing priority due to arterial classification, though comparative scores would also meet requirements.
  - Priority is reinforced with roadway stop controls and supported with high visibility warning signs for roadway users.



Left: Street view of trail crossing at NW 40<sup>th</sup> St, facing west. Roadway line of sight for trail users is limited by vegetation and large vehicles parked along edge of roadway.



**Right:** Currently, roadway users have crossing priority and the trail has yield controls applied even though trail score is almost double that of roadway. Road should be given stop control and trail priority should be unimpeded.

- NE 100<sup>th</sup> St is a non-channelized non-arterial roadway with a vehicle AWDT of 79. Trail score is 997.
  - The trail is granted priority due to arterial classification alone, though comparative scores would also meet requirements.
  - Priority given to trail and road would be given stop controls. However, since roadway volumes are local and drastically lower, yield controls may be used on roadway instead.



**Left:** Street view of trail crossing at NE 100<sup>th</sup> St, facing east. Due to very low vehicle volumes on roadway, priority should be granted to trail users. Driver visibility greatly reduced by vegetation and existing structures. West leg approach is at grade and hampers vehicle stopping distances.

**Right:** Trail users currently given yield control despite trail score being almost 14 times greater than that of roadway. Stop controls should be transferred to roadway users, though yield controls may suffice due to low vehicle volumes.

# Rule 2b

#### Burke-Gilman Trail crossings at NE 65<sup>th</sup> St and NE 77<sup>th</sup> St.

- NE 65<sup>th</sup> St is a two lane minor arterial roadway with an associated two way protected bicycle lane connection on the south curb lane.
  - Sight distance and grade factors pose serious concern for trail users at this crossing.
     Engineering judgement can be used to enforce stop controls for roadway users regardless of trail and roadway scores.
  - Since line of sight and road grade issues are present, trail volumes are weighted to a final trail score of 3032. Since this score is comparable to the roadway vehicle ADT value of 3333, all-way stop control is possible, though trail should have some form of control regardless.
  - As there is a connected bicycle facility along the connection, it is expected that southbound bicycles may make left turns across northbound trail users at the crossing. Stops should then be installed for trail, creating a 4-way/all-way stop at crossing.



**Left:** Sidewalk view of trail crossing at NE 65<sup>th</sup> St, facing east. Due to complexity of crossing, competing movement volumes, and geometric conditions of location, an all-way stop has been applied to all approaches.

**Right:** High visibility advanced warning signs for roadway users are installed on each approach to ensure vehicle compliance with stop controls.

- NE 77<sup>th</sup> St is a non-channelized minor arterial roadway.
  - Similar to NE 65<sup>th</sup> St, sight distance and grade factors weight trail the trail score to 1267, which rates higher than the roadway score of 583. The trail is granted priority over the roadway and vehicles should be given stop controls.
  - Since there is no connected bicycle facility at this location, the trail should be uncontrolled at this crossing.



**Left:** Street view of trail crossing at NE 77<sup>th</sup> St, facing east. With line of sight and road grade influence, trail score is triple that of the roadway. Advanced warning signs should be upgraded for both roadway approaches to trial crossing.

**Right:** Current traffic controls require trail users to yield to roadway while vehicles have uncontrolled crossing priority at this location. Traffic controls should shift to roadway and be upgraded to stop signs.

#### Rule 2c

#### Burke-Gilman Trail crossings at 30<sup>th</sup> Ave NE and 40<sup>th</sup> Ave NE.

- 30<sup>th</sup> Ave NE is a two lane collector arterial with parking raised median in the middle of the roadway.
  - Even with a visibility weighting factor for trail users, the roadway score of 8025 greatly outpaces the trail score of 2353. Stop control to be applied to trail.
  - To reduce risk associated with non-compliance by bicyclists, a raised crosswalk and high visibility warning signs were installed to reduce speeds and promote vehicle yield rates.



**Left:** Sidewalk view of crossing at 30<sup>th</sup> Ave NE, facing west. Trail has stop controls due to lower trail user volumes and a lower arterial classification compared to the roadway. Roadway has no traffic controls.

**Right:** Street view of crossing at 30<sup>th</sup> Ave NE, facing south. Since trail users gain right of way once they enter the marked crosswalk and the crossing distance is substantial, visibility of trail is emphasized for roadway users. Crosswalk was raised in 2015 to reduce vehicle speeds and additional high-visibility advanced warning sides were installed to improve yielding rates for drivers.

- 40<sup>th</sup> Ave NE is a two lane collector arterial with parking on both sides of the roadway.
  - No visibility issues and roadway score of 4674 is greater than the 1673 trail score, so trail is given stop controls.
  - High visibility advanced warning signs to be placed at both the trial crossing as well as at a distance upstream of crossing in order to adequately prepare vehicle users. Advanced warning signs to be posted on trail as well to increase compliance rates.
  - If trail user safety concerns persist, crossing may be raised to reduce vehicle speeds or a paved/painted curb bulb may be installed to reduce crossing distance and increase user visibility.



**Left:** Sidewalk view of trail crossing at 40<sup>th</sup> Ave NE, facing east. Trail score is much lower than roadway, so stop controls are applied.

**Right:** Sidewalk view of trail crossing at 40<sup>th</sup> Ave NE, facing northwest. In situations where trail crossing level of service is exacerbated by proximity to complex turning movements or interaction between parking lanes and trail users, additional designs may be implemented to increase trail user visibility or to reduce roadway user speeds. At this location, a painted or paved curb bulb at the crosswalk may compensate for any deficiencies in the area.
## Rule 2d

### Burke-Gilman Trail crossings along Seaview Ave NW and NW 54<sup>th</sup> St.

- All crossings are at driveways into parking lots along south/west curb lanes of corridor.
- Since driveways are expected to come to a complete stop before entering roadway as is, trail has priority regardless of volumes or arterial classification.
  - If trail user safety concerns are reported or collision patterns develop at specific driveway entrances, traffic controls can be installed along driveways after internal review.
  - Posted signs may be directed at driveway users to either draw attention to the presence of the trail crossing or to enforce stop control on driveway users prior to crossing trail.



**Left:** Driveway crossing on Burke-Gilman Trail along Seaview Ave NW, facing west. As with any trail crossing through a driveway, driveway users are to defer to trail users. **Right:** Driveway crossing on Burke-Gilman Trail along NW 54<sup>th</sup> St, facing north. In situations where driveway volumes are substantial or when trail visibility is limited, it may be beneficial to install signs for driveway users drawing attention to presence of trail crossing or enforcing traffic controls on vehicles.



ALKI BEACH TRAIL & WEST SEATTLE BRIDGE TRAIL **EXISTING CONDITIONS** 

# STREET TYPES ---- COLLECTOR ARTERIAL MINOR ARTERIAL

- PRINCIPAL ARTERIAL
- FREEWAY

# POTENTIAL IMPROVEMENTS

- $\bigcirc$ RAMP  $\bigcirc$ CROSSWALK
- TREAD ISSUE / ROOT  $\bigcirc$
- RAIL CROSSING





# SEATTLE TRAILS UPGRADE PLAN



BURKE GILMAN TRAIL EXISTING CONDITIONS



# SEATTLE TRAILS UPGRADE PLAN





# BURKE-GILMAN TRAIL EXISTING CONDITIONS





# CHIEF SEALTH TRAIL \_\_ & BEACON AVE S PATH \_\_

EXISTING CONDITIONS









DUWAMISH RIVER TRAIL EXISTING CONDITIONS





# ELLIOT BAY TRAIL & SHIP CANAL TRAIL EXISTING CONDITIONS





# INTERURBAN TRAIL **EXISTING CONDITIONS**









# SEATTLE TRAILS UPGRADE PLAN TRAIL WIDTH: 10 FEET MERCER ST AVE RA RO INTERSTATE AUI IRV **E OLIVE WAY** -**DENNY WAY**

# MELROSE TRAIL EXISTING CONDITIONS



# STREET TYPES

- COLLECTOR ARTERIAL
- MINOR ARTERIAL
- PRINCIPAL ARTERIAL
- FREEWAY

# POTENTIAL IMPROVEMENTS

- RAMP
- CROSSWALK  $\bigcirc$
- TREAD ISSUE / ROOT ightarrow
- RAIL CROSSING







# MOUNTAINS TO SOUND GREENWAY EXISTING CONDITIONS





SODO TRAIL & PORTSIDE TRAIL EXISTING CONDITIONS



May 27, 2016





Designed by: ST, Checked: DR

Burke-Gilman Trail; Typical Improvement For Non-Arterial Street Crossing

Sheet #	Category	Existing Condition	Improvement Strategy	Detailed Improvements
C5.01	Warning pad/warning stripes	Warning stripes on north leg. No warning stripes to south.	Restore warning stripes on north leg.	Restore warning stripes on north leg. South leg is a short segment of wide concrete sidewalk not indicating centerline or warning strip due to open condition.
	Bollards	No Bollards	N/A	N/A
	Shared use path center line striping	No centerline striping	Add centerline striping.	Add 4" centerline striping from warning stripes to back of sidewalk on north leg. South leg has clear sightlines to next crossing, hold on installing centerline and warning stripes.
	Ramps	Do not exactly match width of trail; wider than standard ramps. Ramps do not have truncated domes.	Retrofit truncated domes, review replacing ramps.	Retrofit ramps with truncated domes. With guy wire, recommend keeping current ramps. If guy wire is replaced, discuss widening ramps. South ramp would require survey and reviewing ADA path of travel perpendicular to BGT across ramp.
	Crosswalk	Ladder crosswalk	Restore ladder crosswalk	Provide 10 ft. wide ladder cross walk
	Signage	No controls on sidewalk/trail	N/A	Maintain trail ahead sign on 8th. Review signage location along railroad; less that 8.5 ft. from railroad centerline.
Sheet #	Category	Existing Condition	Improvement Strategy	Detailed Improvements
C5.02	Warning pad/warning stripes	Warning stripes on all legs.	Restore warning stripes on all legs.	Restore warning stripes on all legs.
	Bollards	No Bollards	N/A	N/A
	Shared use path center line striping	No centerline striping	Add centerline striping.	Add 4" centerline striping from warning stripes to ramp or stop line.
	Ramps	No truncated domes. Two ramps on north end are wider than standard; less than full trail width.	Retrofit truncated domes, review replacing ramps.	Retrofit two north ramps with truncated domes. Recommend keeping existing ramps. At four level transitions replace with new concrete pad and inset truncated domes.
	Crosswalk	Ladder crosswalks	Restore ladder crosswalks.	Provide ladder cross walk matching width of truncated domes on north ramps and matching width of trail at level crossings.
	Trail Signage	Stop sign at north crossing; yield signs at level crossings.	Provide right of way for trail users where appropriate.	North intersection maintain stop sign for trail users headed north. Remove yield signs for trail users and add stop sign and stop bar for vehicles. Review signage location along railroad; less that 8.5 ft. from railroad centerline.
	Vegetation	Cedars along west side.	Cedars on this section require periodic maintenance.	Trim branches in coordination with property owner to maintain sight lines to signs and keep trail clear.
Sheet #	Category	Existing Condition	Improvement Strategy	Detailed Improvements
C5.03	Warning pad/warning stripes	Warning stripes on all legs.	Restore warning stripes on all legs.	Restore warning stripes on all legs.
	Bollards	No Bollards	N/A	N/A
	Shared use path center line striping	No centerline striping	Add centerline striping.	Add 4" centerline striping from warning stripes to ramp or stop line.
	Ramps	No truncated domes. Level crossings.	Retrofit truncated domes.	At four level transitions replace with new concrete pad and inset truncated domes.
	Crosswalk	Ladder crosswalks	Restore ladder crosswalks.	Provide ladder cross walk matching

Crosswalk	Ladder crosswalks		width of trail at level crossings.
Trail Signage	0	where appropriate.	Remove yield signs for trail users and add stop sign and stop bar for vehicles. Review signage location along railroad; less that 8.5 ft. from railroad centerline.
Vegetation	Trees along western edge of trail.	Trees need to be maintained.	Trim trees in coordination with owner.

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MIG/SvR #15018 May 27, 2016 Designed by: AA/ST, Checked: DR



**Melrose Connector Trail Entrances** 

Location	tor Trail Entrance Category	Existing Condition	Improvement Strategy	Detailed Improvements
Location	Category		Improvement Strategy	
Lakeview Blvd				
	Crossing	Crosswalk striping is faded at the north leg of Lakeview Blvd East crossing.	appropriate legs.	Install crosswalk striping on north, east and south crossings of intersection. No crosswalk striping to be installed on west leg of intersection.
	Vegetation	Existing vegetation (blackberries, ivy, small poplar trees) encroaches in parking area and has covered adjacent guardrail. Tree limbs are overhanging trail entrance.	Limb trees and remove vegetation.	Limb up large overhanging branches over entrance of trail. Remove vegetation along guardrail. Contact Melrose Promenade community group for volunteer work party and potential continued maintenance partnership.
	Pavement	Asphalt pavement in parking area and intersection is cracking. Adjacent to the parking area is a 10' concrete sidewalk with vertical curb.	Monitor and maintain pavement condition for pedestrian and bicycle connections.	N/A
	Signage	Trail and parking signage located at trail entrance has been vandalized.	Replace vandalized signage. Add Object marker both directions in front of catch basin.	Replace vandalized trail and parking signage. Update to current SDOT parking sign protocol. Add Object marker both directions in front of catch basin.
	Ramps	line at the center of the trail entrance.	Install ramps for north and south bound bikes entering and exiting the Melrose Connector.	Install two 4' wide bike trail curb ramps at trail entrance. Maintain existing catch basin and install channelization to direct bicyclists to ramps. Provide 4' minimum wide connection to existing sidewalk for pedestrians.
	Grading	Relatively flat (0-5%)	N/A	N/A
	Roadway	There is an unstriped perpendicular parking area along guardrail.	Formalize and stripe parking area. Install block curb to prohibit illegal parking at path entrance.	Block out a triangular area of the parking area at the trail entrance to prohibit vehicles from blocking trail entrance. This area could be planted in coordination with the Melrose Promenade group. Striping this area will be less effective for parking management.
	Bicycle Facility	No markings in parking area. Bikes use pedestrian curb ramp into trail	Install bike lane and sharrow pavement markings to clarify route and direction of travel.	Install sharrow pavement markings in the parking area to indicate shared use. Install bicycle pavement markings to pavement leading to the proposed bike ramps. Install yellow centerline from sharrows to warning stripes. Install warning stripes.
	Bollard	Bollard previously removed.	N/A	N/A
Mid-span trail				
	Drainage	Water seeps from uphill side of trail.	Install drainage improvements.	Install a French drain on the uphill side of the trail. Coordinate location of French drain with existing lighting conduit. Discharge to downhill side of trail. Remove soil, grass and weeds encroaching on the pavement along the entire length of the trail to allow full width use of the trail and to improve surface runoff.
	Vegetation	Invasive species growing on WSDOT fencing.	Remove vegetation.	Remove invasive vegetation from the WSDOT fence on the west side of the trail.
E Roy St	Signage	"Do Not Enter" sign and no parking signs have been vandalized. No trail signage is present.	Improve signage.	Replace vandalized signs and install trail signage.
	Ramps	No ramp present at trail entrance since trail is flush with road.	Install entrance/exit detection.	Install yellow detectable warning plates at the beginning of trail. Retrofit or sawcut and install in concrete.
	Roadway	Gravel and vegetated area adjacent to trail entrance is being used for parking.	Review parking requirements in this area.	Review the potential for eliminating parking adjacent to the trail entrance or organizing.
	Bollard	Removable bollard base in trail	Maintain removable bollard base.	N/A
	Bicycle Facility	Bike Symbols present on the pathway	Remove bike symbols on path	Remove all bike symbols on pathway. Maintain sharrows on roadway. Add warning stripes and yellow centerline to trail to reinforce this is a trail.

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MIG/SvR #15018 May 27, 2016 Designed by: AA/ST, Checked: DR







Location	Category	Existing Condition	Improvement Strategy	Detailed Improvements
Typical Street Cros	ssing			
	Pedestrian Crossing on Northbound Lane of Beacon Ave	No crosswalks across Beacon Ave S.	N/A: Greenway crossing improvement was omitted from the design as directed. To be improved with a future greenway project.	N/A
	Shared Use Path Crossing Roadway	No crosswalks provided between medians to connect path	Add enhanced raised crossings	Install raised crosswalk with 3" rise, ladder crosswalk striping, widened ramps and associated signage.
	Shared Use Path Pavement	Shared-use-path: 10' wide asphalt pavement path located in median. Asphalt path has some damage from root intrusion.	Repair path pavement. Maintain 10' path width.	Replace asphalt pavement and repair pavement in areas of root intrusion along 10' wide path. A 10' wide path in this area is appropriate due to current low user volumes.
	Signage	Minimal signage with yield signs for vehicular traffic crossing median.		Add trail crossing signs to roadway. Add road crossing signs to trail.
	Curb Ramps	Ramps with no detector plates on median path curb ramps. Width of ramps do not match width of path.	Maintain existing pedestrian	Remove and replace existing curb ramps for path with 10' wide curb ramps and detectable warning plates. Align curb ramps for path with the center of median islands. Existing pedestrian curb ramps to Greenways are to be upgraded for ADA compliance in a future project.
	Grading	relatively flat (0-5%)	Adjust grading of ramps at raised crossings.	Standard slopes of proposed ramps for path will be reduced due to installation of 3" high raised crossing.
	Roadway	One through lane with street parking on either side of median with sharrows.	N/A	N/A
	Bicycle Facility (roadway)	Shared bike lane on both sides of Beacon Ave S. with sharrows	Maintain shared roadway.	N/A
	Bicycle Facility (path)	No centerline markings on shared use path	Add channelization at crossings.	Install yellow solid centerline striping and white solid edge striping along path for approximately 50 feet on either side of crossings.
	Warning Stripes	Concrete warning pad	Install warning stripes.	Install warning stripes on path 50 feet from intersection.
	Vegetation	Vegetation in median consists of grass with trees and shrubs. The asphalt path has some damage from root intrusion.	tree root/paving situation.	Remove trees where path is being realigned. Review tree conditions with urban forester where root intrusion is occurring. Grind or repair pavement in locations of root intrusion. Review potential for root barrier installation.

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### Seattle Department of Transportation, Trail Upgrade MIG/SvR #15018 May 27, 2016 Designed by: AA/ST, Checked: DR Chief Sealth Trail (CST) Midblock Crossing S Graham Street "Intersection Crossings"





Location	Category	Existing Condition	Improvement Strategy	Detailed Improvements
CST and 30th Ave				
	Lighting	Two cobra heads at crossing.	N/A	N/A
	Sidewalk	Trail leads into residential road towards Graham St.	Provide sidewalk from crossing to CST	Add 10' wide low cost asphalt sidewalk on west side of 30th Ave S.
	Vegetation	Grass and depression near power transmission tower (water ponds during heavy rain)	N/A	N/A
	Pavement	10' Asphalt path, with concrete pad at entrance to path, with gravel flaring connecting path to road.	N/A	N/A
	Bollards	Wooden removable bollards (3) at path entrance	Remove Bollards	Remove middle bollard and repair pathway. Install reflectivity on outside bollards.
	Signage	Yield sign at pathway towards 30th Ave S.	Maintain yield and trail sign.	Maintain yield and trail sign.
	Ramps	Flat ramp with yellow detection pad in concrete	Need to relocate.	Existing ramp to be replaced and new ramp to be installed to 10' wide sidewalk.
	Bicycle Facility	No bike symbols present	Add connection to crossing.	Provide 10' wide low cost sidewalk to crossing.
	30th Ave Roadway	No sidewalk on 30th	Roadway width to be reduced by adding 10' sidewalk.	22' wide roadway at the intersection
	Retaining wall	Gravel shoulder and slope west side	sidewalk and install fence/railing.	Block wall and fence installation for 10' wide sidewalk.
	Drainage	Shallow brick drainage structure with rotten wood lid collecting drainage from area.	Replace existing brick/wood lid catch basin with new structure.	Maintaining existing pipe connections. Install Type 240A Catch basin.
Crossing S Graham	n St			
-	Signal	No signal control for crossing Graham St	Install Rectangular Rapid Flashing Beacon (RRFB)	Install RRFB adjacent to crosswalk and curb ramps for both cyclists and pedestrians to use.
	Crosswalk	10' wide crosswalk with faded paint. No curb ramp on south side of S. Graham. Diagonal ramp on southwest corner.	Enhance Crossing	Realign 10' wide crosswalk with new proposed curb ramps. Curb ramp width at trail entrance is 7' due to existing utilities and structures. new ramp for multi-use trail 4' length, 4" climb west of existing driveway, sidewalk have 2" drop. Adding asphalt pathway to merge with driveway.
	Vegetation	Trees on the west side of the intersection block visibility of crosswalk warning signs.	Vegetation Removal	Limb tree branches near crosswalk to increase visibility for RRFB and cross walk. Remove a tree on the south side of Graham near the crosswalk.
	Signage	Pedestrian and bicycle crossing signs, both sides of crosswalk. Tree branches decrease line of sight for the EB warning signs.	RRFB and Traffic Signage Improvements	Trail crossing and arrow with RRFB.
S Graham St to CS	<u>т</u>			
		Drainage issues and ponding	Ponding not critical, field	Adding note to field verify
	Landscape	on and near path in the grassy areas during storm events.	investigate if old culvert can be located and exposed.	existing drainage.
	Driveway	Shared path with driveway to private residence (20' wide)	Bike Sharrows	Add bike Sharrows for both directions from Graham to entrance near private residence.
	Bollards	(3) wooden bollards at path entrance	Remove Bollard	Remove middle wooden bollard and fix asphalt pavement.
	Ramps	Yellow detectable warning on flat concrete pad near bollards at path entrance.	N/A	N/A

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## SIGN TABLE

SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
R1-1	STOP	30x30
W2-1	INTERSECTION WARNING	18x18

## NOTES

4	TRIM TREE BRANCHES FOR SIGHT LINES
(11)	REMOVE EXISTING ARROW SYMBOL (TYP)
(13)	RECONFIGURE EXISTING GUY WIRE FOR TRAIL CLEARANCE
(15)	RESTORE EX LADDER STYLE CROSSWALK, COS STD 712
(19)	RESTORE EXISTING WARNING STRIPES
(21)	RETROFIT DETECTABLE WARNING COS STD 422A
23	MAINTAIN EX STOP SIGN
(24)	MAINTAIN EX STREET NAME SIGNS
26)	MAINTAIN EX TRAIL SIGN
29	MAINTAIN, CLEAN OR REPLACE VANDALIZED EX TRAIL SIGN
35	INSTALL INTERSECTION CROSSING SIGN (W2-1)
36)	INSTALL STOP LINE, COS STD 712
(40)	INSTALL WHITE REFLECTORS ON FENCE POSTS













1	CLEAN EX STOP SIGN GRAFFITI
6	TRIM TREE BRANCHES FOR SIGHT LINES. CO
7	TRIM TREE BRANCHES FOR TRAFFIC SIGNS A
9	REMOVE EX TRAIL CROSSING (W1-15) WITH
10	REMOVE EX YIELD SIGN
11	REMOVE EXISTING ARROW SYMBOL (TYP)
15	RESTORE EX LADDER STYLE CROSSWALK, C
17)	RESTORE EXISTING STOP LINE, COS STD 71.
18)	RESTORE EXISTING 4" SOLID WHITE LINE ED
19	RESTORE EXISTING WARNING STRIPES
21)	RETROFIT DETECTABLE WARNING COS STD 42
23)	MAINTAIN EX STOP SIGN
24)	MAINTAIN EX STREET NAME SIGNS
25	MAINTAIN EX TRAIL CROSSING SIGN
30	INSTALL 4" SOLID WHITE LINE EDGE LINE
32	INSTALL 4" SOLID YELLOW CENTER LINE
34)	INSTALL CURB RAMP
35	INSTALL INTERSECTION CROSSING SIGN (W2-
36	INSTALL STOP LINE, COS STD 712
37)	INSTALL STOP SIGN (R1-1)
38	INSTALL STOP SIGNS IN BOTH DIRECTIONS
40	INSTALL WHITE REFLECTORS ON FENCE POST
41)	RESTORE EX 'YIELD TO PEDS' SIGN
42)	REMOVE EX STRUCTURE (POST/BEAM)

SIGN TABLE			
	SIGN DESIGNATION	SIGN DESCRIPTION	
	R1-1	STOP	
	W2-1	INTERSECTION WARNING	









SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
R1-1	STOP	30x30
W2-1	INTERSECTION WARNING	18x18





NOTES	
2	CLEAN PLANTING STRIP AND REMOVE
3	CLEAR GRASS AND SHRUBS FOR SIG
7	TRIM TREE BRANCHES FOR TRAFFIC
8	REMOVE EX TRAIL CROSSING (W1-1
(10)	REMOVE EX YIELD SIGN
(12)	REMOVE EXISTING PEDESTRIAN & BI
(15)	RESTORE EX LADDER STYLE CROSSV
24	MAINTAIN EX STREET NAME SIGNS
28	MAINTAIN EXISTING CURB RAMP
32	INSTALL 4" SOLID YELLOW CENTER I
33	INSTALL 'ALL USERS KEEP RIGHT' S
35	INSTALL INTERSECTION CROSSING SIG
36	INSTALL STOP LINE, COS STD 712
37)	INSTALL STOP SIGN (R1-1)
39	INSTALL WARNING STRIPES (3 - 4"

SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
R1-1	STOP	30x30
W2-1	INTERSECTION WARNING	18x18











NO	<b>TES</b>

2	CLEAN PLANTING STRIP AND
3	CLEAR GRASS AND SHRUBS
8	REMOVE EX TRAIL CROSSING
(12)	REMOVE EXISTING PEDESTRIA
(15)	RESTORE EX LADDER STYLE
20	RESTORE DAMAGED SIGN PO
23	MAINTAIN EX STOP SIGN
27)	MAINTAIN EX TRUCK CROSSIN
28	MAINTAIN EXISTING CURB RA
32	INSTALL 4" SOLID YELLOW C
(33)	INSTALL 'ALL USERS KEEP F
(35)	INSTALL INTERSECTION CROS
(36)	INSTALL STOP LINE, COS ST
37)	INSTALL STOP SIGN (R1-1)
(39)	INSTALL WARNING STRIPES (
(44)	REPAIR CONC CURB

SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
R1-1	STOP	30x30
W2-1	INTERSECTION WARNING	18x18









SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
R8-3	NO PARKING	12x12



15c





S MORGAN ST Z

SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
W11-15	COMBINATION BIKE AND PED CROSSING	30x30
W11-159ALX[1]	1 [CROSS ROAD] [PED/BIKE—XING LEFT]	30x30
W16-7P	DIAGONAL ARROW (PLAQUE)	24x12
W2-1	INTERSECTION WARNING	18x18









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# NOTES KEY

1	PROTECT TREE
2	REMOVE TREE
3	REPAIR DAMAGED PAVING SURFACE
4	RESTORE ASPHALT PAVING
5	RESTORE EXISTING YIELD LINE
6	RESTORE EX NO RIGHT TURN SIGN
$\overline{7}$	RESTORE WITH SEEDED LAWN
8	MAINTAIN EX SHARROW
9	MAINTAIN EX STOP, NO LEFT TURN AND NO PARKING SIGNS
(10)	MAINTAIN EX STREET NAME SIGNS
(11)	MAINTAIN YIELD AND NO RIGHT TURN SIGNS
(12)	INSTALL 10' WIDE RAISED CROSSWALK (3" TABLE, 3" DROP)
(13)	INSTALL 4" SOLID WHITE LINE EDGE LINE
(14)	INSTALL 4" SOLID YELLOW CENTER LINE
(15)	INSTALL ASPHALT PATCH
(16)	INSTALL PED/BIKE CROSSING AT CROSS ROAD SIGN (W11–159ALX [1])
(17)	INSTALL TRAIL CROSSING (W1-15) WITH ARROW (W16-7P) SIGNS
(18)	INSTALL WARNING STRIPES (3 – 4" WHITE THERMOPLASTIC)
(19)	INSTALL ASPHALT PAVING SHARED USE PATH
20	INSTALL INTERSECTION CROSSING SIGN (W2-1)
(21)	INSTALL YIELD LINE (MUTCD 3B.25)
22	INSTALL SPEED HUMP MARKING (MUTCD 3B.25)

# SIGN TABLE

SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
W11-15	COMBINATION BIKE AND PED CROSSING	30x30
W11-159ALX[1]	1 [CROSS ROAD] [PED/BIKE—XING LEFT]	30x30
W16-7P	DIAGONAL ARROW (PLAQUE)	24x12
W2-1	INTERSECTION WARNING	18x18

1. REVIEW TREE REPLACEMENT WITH URBAN FORESTER. COORDINATE WITH SPU WATER.

2. EAST-WEST GREENWAY CROSSINGS INCLUDED IN FUTURE PROJECT.

CONCEPT P	LAN CO	1.02
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# SDOT TRAIL UPGRADES

BEACON AVE S. PATH S WARSAW ST TO S EDDY ST 



SIGN DESIGNATION	SIGN DESCRIPTION	SIZE
R1-2	YIELD	30x30
W11-15	COMBINATION BIKE AND PED CROSSING	30x30
W16-7P	DIAGONAL ARROW (PLAQUE)	24x12
W16-9P	AHEAD (PLAQUE)	24x12
R8-3	NO PARKING	12x12



















MIG S v R 1205 SECOND AVE. SUITE 200 SEATTLE, WA 98101 T 206.223.0326 F 206.223.0125 www.svrdesign.com





TRAIL	SECTION	C04.03
	SDOT TRAIL UPGRADES	
ent tion	CHIEF SEALTH TRAIL 30TH AVE S TO S GRAHA MIG SVR # 15018	M ST MAY 2016





Burke Gilman Trail (typical intersection-crossing non-arterial street roadway) crossing 7th Ave NW

### Planning Level Estimate of Probable Cost for Construction of Bicycle Facilities

MIG|SvR 15018 SDOT Trail Upgrade

ltem #	Item Description	Cost/Unit	Unit	Quantity	Cost	Note
0-1	Mobilization (7% of construction cost)	\$1,100.00	LS	1	\$1,100.00	
0-2	Traffic control	\$5,000.00	LS	1	\$5,000.00	
	SITE PREPARATION SUB-TOTAL				\$6,100.00	
1-1	Remove existing asphalt pavement	\$16.00	SY	15	\$240.00	
1-2	Trim tree branches	\$1.00	LF	100	\$100.00	
1-3	Sawcut	\$6.00	LF	68	\$408.00	
1-4	Remove pavement marking/striping/symbol, thermoplastic	\$50.00	EA	1	\$50.00	
	DEMOLITION SUB-TOTAL				\$798.00	
2-1	Curb ramps and detectable warning plate	\$3,000.00	EA	2	\$6,000.00	Non-standard curb ramps
	PAVEMENT SUB-TOTAL				\$6,000.00	
3-1	Crosswalk stripes	\$6.00	LF	130	\$780.00	
3-2	Warning stripes	\$200.00	EA	2	\$400.00	
3-3	Stop line	\$12.00	LF	20	\$240.00	
3-4	Yellow center line	\$3.00	LF	100	\$300.00	
	CHANNELIZATION SUB-TOTAL				\$1,720.00	
4-1	Remove traffic sign	\$220.00	EA	4	\$880.00	
4-2	Install traffic sign and post	\$450.00	EA	2	\$900.00	
	TRAFFIC SIGNS SUB-TOTAL				\$1,780.00	
	TOTAL [Burke Gilman Trail (typical intersection-crossing non-arterial street roadway) cr		ve NW]		\$16,398.00	
					\$17,000.00	A typical crossing improvement cost
	Burke Gilman Trail project section: 9 crossings					9 x A ypical crossing improvement cost
	Design contingency (25%)				\$38,300.00	
	TOTAL			\$191,000.00		

Assumptions:

The above does not include mark-ups, allowance for indeterminate, overhead, profit and soft costs.



### Melrose Trail Parking Reconfiguration

## Planning Level Estimate of Probable Cost for Construction of Bicycle Facilities

MIG|SvR 15018 SDOT Trail Upgrade

Item #	Item Description	Cost/Unit	Unit	Quantity	Cost	Note
1-1	Mobilization (7% of construction cost)	\$2,500.00	LS	1	\$2,500.00	
1-2	Traffic control	\$5,000.00	LS	1	\$5,000.00	
1-3	Remove existing curb	\$11.00	LF	25	\$275.00	
1-4	Remove existing sidewalk	\$18.00	SY	12	\$216.00	
1-5	Remove existing asphalt pavement	\$16.00	SY	23	\$368.00	
1-6	Clearing and grubbing	\$2,000.00	LS	1	\$2,000.00	
1-7	Sawcut	\$6.00	LF	35	\$210.00	
1-8	Remove bollard	\$120.00	EA	2	\$240.00	
1-9	Remove striping	\$1.00	LF	100	\$100.00	
1-10	Remove pavement marking/striping/symbol, thermoplastic	\$50.00	EA	2	\$100.00	
1-11	Remove sign	\$100.00	EA	2	\$200.00	
	SITE PREP & DEMOLITION SUB-TOTAL				\$11,209.00	
2-1	Excavation	\$40.00	CY	6	\$240.00	
2-2	Bike curb ramps	\$350.00	SY	16	\$5,600.00	
2-3	Curb	\$23.00	LF	37	\$851.00	
2-4	Curb and gutter	\$39.00	LF	44	\$1,716.00	
2-5	Sidewalk cement concrete	\$40.00	SY	22	\$880.00	
2-6	Curb Island, stamped/colored ACP or concrete	\$35.00	SY	35	\$1,225.00	
2-7	Asphalt pavement restoration	\$60.00	SY	60	\$3,600.00	
2-8	Subsurface drain pipe, PVC, 6-inch	\$36.00	LF	45	\$1,620.00	
2-9	Drain rock, Type 26	\$50.00	CY	6	\$300.00	
2-10	DI pipe, 6-inch	\$75.00	LF	16	\$1,200.00	
2-11	Geotextile	\$3.00	SY	33	\$100.00	
2-12	Landscaping (based on community preference)	\$0.00	SY	0	\$0.00	
	IMPROVEMENTS SUB-TOTAL				\$17,332.00	
3-1	Painted parking lines, white paint, 6-inch	\$3.50	LF	180	\$630.00	
3-2	Helmeted bicyclist symbol, thermoplastic	\$150.00	EA	9	\$1,350.00	
3-3	Specialty thermoplastic, yellow paint, 6 -inch	\$3.50	LF	100	\$350.00	
3-4	Crosswalk striping	\$6.00	LF	290	\$1,740.00	
3-5	Traffic control Sign	\$370.00	EA	1	\$370.00	
3-6	Detectable warning plate retrofit	\$100.00	SF	50	\$5,000.00	
	CHANNELIZATION SUB-TOTAL				\$9,440.00	
	TOTAL				\$37,981.00	
	Design contingency (25%)					
	TOTAL				\$9,500.00 \$47,500.00	

Assumptions:

The above does not include mark-ups, allowance for indeterminate, overhead, profit and soft costs.

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Beacon Ave S Path crossing S Eddy Street (typical intersection-cross-road)

Planning Level Estimate of Probable Cost for Construction of Bicycle Facilities

MIG|SvR 15018 SDOT Trail Upgrade

ltem #	Item Description	Cost/Unit	Unit	Quantity	Cost	Note
0-1	Mobilization (7% of construction cost)	\$2,700.00	LS	1	\$2,700.00	
0-2	Traffic control	\$5,000.00	LS	1	\$5,000.00	
	SITE PREPARATION SUB-TOTAL				\$7,700.00	
1-1	Remove existing curb	\$11.00	LF	55	\$605.00	
1-2	Remove existing asphalt pavement	\$16.00	SY	190	\$3,040.00	
1-3	Remove existing concrete pavement	\$30.00	SY	11	\$330.00	
1-4	Remove existing tree	\$600.00	EA	2	\$1,200.00	
1-5	Clearing and grubbing	\$2,000.00	LS	1	\$2,000.00	
1-6	Sawcut	\$6.00	LF	50	\$300.00	
	DEMOLITION SUB-TOTAL				\$7,475.00	
2-1	10' asphalt pathway (2" HMA/6" Base)	\$39.00	LF	180	\$7,020.00	
2-2	2' gravel shoulder	\$2.20	LF	180	\$396.00	
2-3	Curb ramps and detectable warning plate	\$3,000.00	EA	2	\$6,000.00	Non-standard
2-4	Pavement - concrete panels	\$125.00	SY	56	\$7,000.00	
	PAVEMENT SUB-TOTAL				\$20,416.00	
3-1	Trail center lines	\$3.00	LF	100	\$300.00	
3-2	Crosswalk stripes	\$6.00	LF	184	\$1,104.00	including yield lines
3-3	Warning stripes	\$200.00	EA	2	\$400.00	
	CHANNELIZATION SUB-TOTAL				\$1,804.00	
4-1	Install traffic sign and post	\$450.00	EA	6	\$2,700.00	
4-2	install additional sign or plaque	\$370.00	EA	2	\$740.00	
	TRAFFIC SIGNS SUB-TOTAL				\$3,440.00	
	TOTAL [Beacon Ave S Path crossing S Eddy Street (typical intersection-cross-road	)]			\$40,835.00	
					\$41,000.00	A typical crossing improvement cost
	Beacon Ave S Path Total: Three (3) crossings at S Eddy St, S Morgan St & S Warsa	aw St			\$123,000.00	3 x A typical crossing improvement cos
	Design contingency (25%)				\$30,800.00	
	TOTAL				\$153,800.00	

### Assumptions:

The above does not include mark-ups, allowance for indeterminate, overhead, profit and soft costs.

cost		



Chief Sealth Trail Crossing South Graham Street

### Planning Level Estimate of Probable Cost for Construction of Bicycle Facilities

MIG|SvR 15018 SDOT Trail Upgrade

Item #	Item Description	Cost/Unit	Unit	Quantity	Cost	
0-1	Mobilization (7% of construction cost)	\$3,700.00	LS	1	\$3,700.00	
0-2	Traffic control	\$5,000.00	LS	1	\$5,000.00	
0-3	Remove existing curb	\$11.00	LF	41	\$451.00	
0-4	Remove existing sidewalk	\$18.00	SY	19	\$342.00	
0-5	Remove existing asphalt pavement	\$16.00	SY	45	\$720.00	
0-6	Clearing and grubbing	\$1,000.00	LS	1	\$1,000.00	
0-7	Sawcut	\$6.00	LF	240	\$1,440.00	
0-8	Remove bollard	\$120.00	EA	2	\$240.00	
0-9	Remove sign	\$100.00	EA	2	\$200.00	
	SITE PREPARATION & DEMO SUB-TOTAL				\$13,093.00	
1-1	10' Asphalt pathway (2" HMA/6" base)	\$39.00	LF	75	\$2,925.00	
1-2	Modular walls	\$70.00	LF	80	\$5,600.00	
1-3	Extruded curb	\$17.00	LF	75	\$1,275.00	
1-4	Curb ramps and detectable warning plate	\$3,000.00	EA	2	\$6,000.00	
1-5	Pavement - concrete Panels	\$125.00	SY	35	\$4,375.00	
1-6	Sidewalk concrete	\$40.00	SY	9	\$360.00	
1-7	4-ft chain link fence	\$30.00	LF	80	\$2,400.00	
1-8	Adjust existing water valve box	\$475.00	EA	1	\$475.00	
1-9	Remove existing catch basin	\$500.00	EA	1	\$500.00	
1-10	Catch basin Type 240B	\$2,850.00	EA	1	\$2,850.00	
1-11	Trim tree branches	\$600.00	EA	1	\$600.00	
	NORTH SIDE ASPHALT TRAIL AND RETAINING WALL SUB-TOTAL				\$27,360.00	
2-1	Curb ramps and detectable warning plate	\$3,100.00	EA	1	\$3,100.00	
2-1	5' asphalt sidewalk (2" HMA/6" base)	\$19.50	LF	0	\$0.00	
2-2	10' asphalt pathway (2" HMA/6" Base)	\$39.00	LF	20	\$780.00	
2-3	Remove tree	\$600.00	EA	1	\$600.00	
2-4	Asphalt shim/grinding	\$30.00	LF	30	\$900.00	
	SOUTH SIDE PAVEMENT SUB-TOTAL				\$5,380.00	
3-1	Flashing beacon with push bottoms	\$7,000.00	EA	1	\$7,000.00	
3-2	Painted double lines	\$2.00	LF	112	\$224.00	
3-3	100' crossing 6' wide green paint	\$2,250.00	EA	0.44	\$990.00	
3-4	Vertical mounted traffic barrier (flexible reflective guideposts every 5')	\$10.00	LF	56	\$560.00	
3-5	Crosswalk strips	\$6.00	LF	140	\$840.00	
	CHANNELIZATION & SIGNAGE SUB-TOTAL				\$9,614.00	

Note	9	

ltem #	Item Description	Cost/Unit	Unit	Quantity	Cost	Note
4-1	Relocate traffic sign	\$200.00	EA	2	\$400.00	
4-2	Remove bollard	\$120.00	EA	3	\$360.00	
4-3	Traffic control sign MUTCD crosswalk (arterial)	\$370.00	EA	2	\$740.00	
	SOUTH SIDE DRIVEWAY / TRAIL SUB-TOTAL				\$1,500.00	
	TOTAL				\$56,947.00	
	Design contingency (25%) TOTAL				\$14,300.00	
					\$71,300.00	

### Assumptions:

The above does not include mark-ups, allowance for indeterminate, overhead, profit and soft costs.