AT-GRADE INTERSECTION INVENTORY

EASTSIDE RAIL CORRIDOR REGIONAL TRAIL MASTER PLAN PROJECT

2015-05-12

King County Parks Your Big Backyard King County

The Eastside Rail Corridor Regional Trail Master Plan Project develops a baseline inventory and planning guidelines for portions of the Eastside Rail Corridor owned by King County and Sound Transit.

A variety of uses is possible for the corridor in the future, and various agencies and jurisdictions have ownership interests in the corridor. This document is an internal work product supporting a study for future development of a shared use trail in the corridor.

For more information please visit: Kingcounty.gov/parks/eastsiderailcorridor

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PLANNING AT-GRADE INTERSECTIONS

1. INTRODUCTION

1.1 OVERVIEW

"Our Puget Sound region is blessed with dramatic topography, majestic natural features, and large, picturesque water bodies. While adding immensely to the beauty and quality of life in our region, those same features also create challenges when developing transportation, recreation and utility connections. The Eastside Rail Corridor (ERC) provides a rare and unique chance to develop a major north-south corridor for a variety of important purposes: mobility, utility infrastructure, and recreation."

-Excerpt from the Eastside Rail Corridor Regional Advisory Council report

The Eastside Rail Corridor (ERC) connects some of the King County's largest and fastest-growing communities. As part of the Woodinville Subdivision, a 42-mile rail corridor that stretches from Renton to Snohomish, the ERC passes through Renton, Bellevue, Kirkland, Woodinville, Redmond, and portions of unincorporated King and Snohomish Counties. Originally a rail line, known as the Lake Washington Belt Line, that supported development along the eastern shore of Lake Washington, the corridor has been brought into public ownership to provide a potential route for trail, transit, and utilities. The ERC Regional Trail Master Plan (Master Plan) will develop a strategy to build a non-motorized trail in the corridor without precluding potential future use for transit and utilities. Any future transit or utility uses of the corridor would be considered in separate planning processes.

The ERC includes approximately 42 miles of right-of-way. Currently, only a portion of the ERC is being planned for potential trail use—a segment of the former railroad main line between Renton and Woodinville, and a spur line connecting Woodinville

and Redmond. The cities of Kirkland and Redmond have completed their planning for a trail in the corridor. The Master Plan includes the segments of the ERC between Renton and Kirkland, between Kirkland and Woodinville, and along the spur from Woodinville to Redmond. Throughout the Master Plan, the line between Renton and Woodinville is referred to as the "main line," and the line between Woodinville and Redmond is referred to as the "spur." See Figure 1 for an understanding of the ERC ownership interests considered in the Master Plan.

As part of the baseline inventory of opportunities and constraints for the Master Plan, this study documents at-grade crossings of the proposed trail with public streets and driveways throughout the county and state-owned portions of the corridor. Trail crossings, particularly at-grade crossings, will have a strong influence on trail planning and design to promote safety, comfort and mobility of trail users.

1.2 A STRATEGIC CORRIDOR FOR THE EAST SIDE'S FUTURE

After nearly a century of rail use, in 2003 Burlington Northern Sante Fe (BNSF) began conversations with local jurisdictions about abandoning the rail line. In 2009 a group of public partners, including King County and the Port of Seattle, signed a Memorandum of Understanding that envisioned a regional approach to preserve the corridor for multiple uses. Although no specific projects were in development at that time, the partners recognized the potential value of a continuous corridor linking the east side from north to south as the region continues to develop. To begin that regional effort, the Port of Seattle purchased the 42-mile corridor between Renton and Snohomish. The southern portion of the line between Woodinville and Renton was railbanked, a legal designation that allows certain uses of the corridor while preserving it for potential reinstatement of freight rail. The northern portion, between Woodinville and Snohomish, remained an active freight area.

The jurisdictions and public agencies involved in the acquisition of the corridor envisioned potential future needs for a non-motorized trail, water distribution, sewer, power transmission, and transit in the corridor. Between 2010 and 2013 ownership interests were purchased from the Port of Seattle by the City of Redmond, Puget Sound Energy (utility easement), the City of Kirkland, Sound Transit (primarily transportation-related easements), and King County (see Figure 1). These five entities are now the owners of the corridor between Renton and Woodinville.

1.3 THE ERC REGIONAL ADVISORY COUNCIL—A COLLABORATIVE VISION FOR THE FUTURE OF THE ERC

Recognizing the value of collaboration for future development of the ERC, the owners of the corridor formed a Regional Advisory Council (RAC) as a forum to coordinate planning for the ERC. The RAC summarized the findings of their initial planning effort in the report entitled *Creating Connections – Recommendations on the Eastside Rail Corridor*, which provides a guide for the next steps in collaboratively planning, developing and using the ERC. The RAC vision for the corridor emphasizes its long-term value for the development of transit, utilities, and a trail:

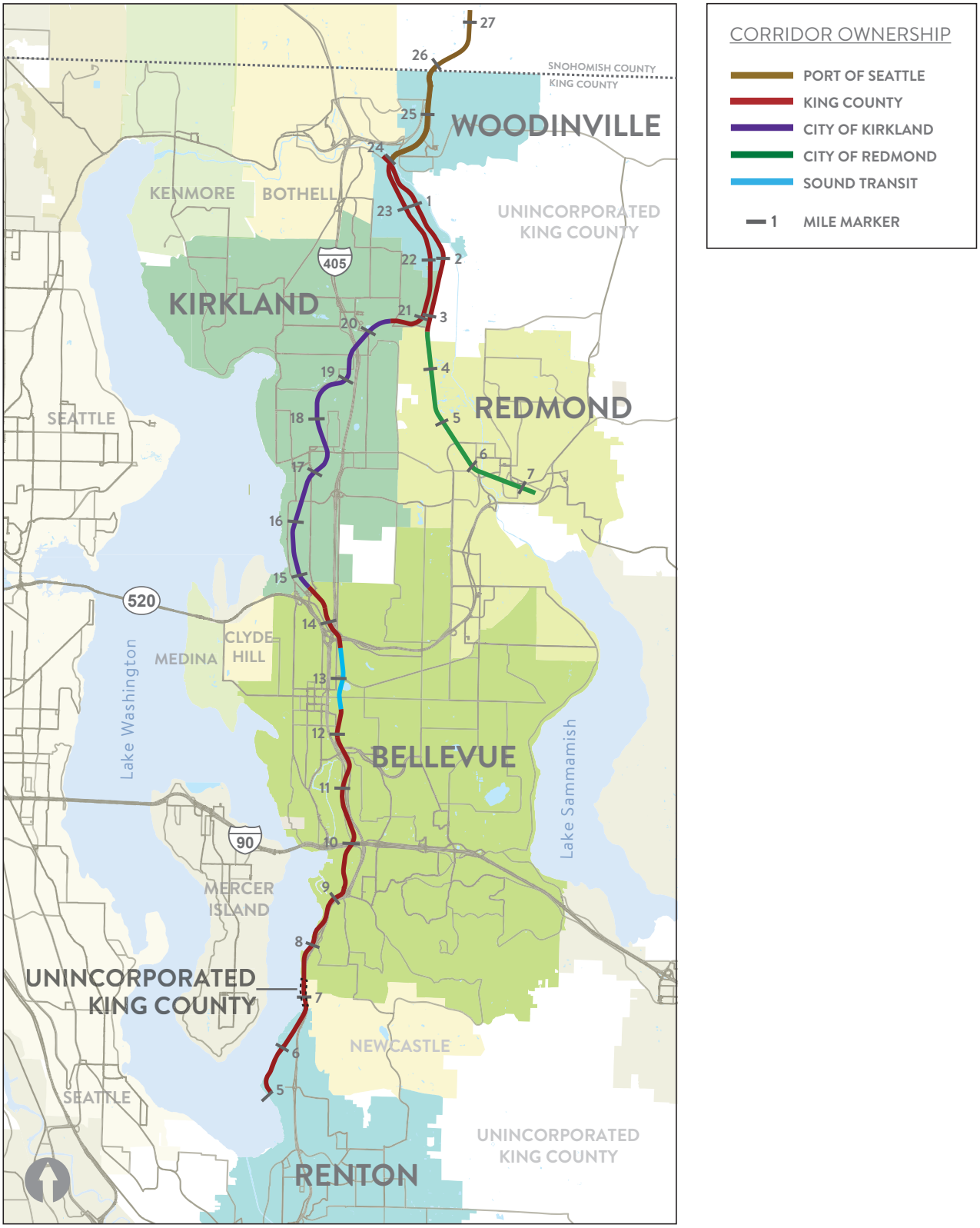

Figure 1 – Eastside Rail Corridor (ERC) Ownership

"Development of the corridor will enhance the mobility of our region by creating a critical north-south transportation corridor that will allow for multimodal connections, including high-capacity transit (e.g. heavy rail, light rail, or other forms of fixed guideway transportation) and nonmotorized trail use. The corridor will help us integrate the pieces of our larger transportation networks. The corridor will enable key utility improvements to help meet the demands of a growing population. The corridor will expand the recreation network, creating equitable access for all residents, and benefiting generations of Puget Sound residents."

1.4 PLANNING FOR A TRAIL ALONG THE EASTSIDE RAIL CORRIDOR

The Master Plan is focused on implementing the RAC vision for a non-motorized trail in the ERC. The location of the ERC represents a critical link in King County's Regional Trail System, which includes a network of shared-use trails connecting county communities. King County is currently responsible for over 175 miles of regional trails throughout the county. These trails include both paved and soft-surface trails; however, they all share common features of providing a safe and enjoyable trail experience for a variety of users. The ERC provides a rare and unique opportunity to establish a major new component of the county's regional trail system—a component that provides a significant new north-south trail corridor, as well as creating the opportunity to introduce critical connectivity within the county's existing regional trail system and trail systems managed by neighboring communities.

> A regional trail is a shared use path that serves as a component of an extensive network of off road, non-motorized routes connecting all parts of King County. A regional trail accommodates a wider variety and higher volumes of trail users than local trails typically would. Regional trail design aims to safely accommodate non-motorized activities including walking, jogging, bicycling, roller blading, skateboarding, and other uses.

The Master Plan will further several important goals from the RAC recommendations for the ERC and the county's vision for the regional trail system:

- Advance the understanding of opportunities and constraints for development in the corridor
- Engage jurisdictions, agencies, and the public in a planning process to implement a trail as part of the corridor's multi-use vision
- Connect communities and existing trails to expand access and connectivity to King County's Regional Trail System

This document is an important early component of the master planning process and helps to advance the RAC's vision by providing a baseline for evaluation of trail development opportunities and constraints.

This report helps to advance the RAC's vision by providing a baseline for evaluation of trail development opportunities and constraints.

2. PLANNING FOR AT-GRADE INTERSECTIONS

The ERC includes a main line corridor that runs north-south between Renton and Woodinville and a spur corridor that runs north-south between Woodinville and Redmond. The information in this report is organized by jurisdiction as follows:

- South main line: Renton/King County south/Bellevue South of Interstate 90 (I-90)
- Central main line: Bellevue between I-90 and Kirkland
- North main line: King County north/ Woodinville
- Spur: Woodinville/King County north/ Redmond

This report inventories and evaluates at-grade crossings of the proposed trail with public streets and driveways throughout the corridor. Trail crossings, particularly at-grade crossings, will have a strong influence on trail planning and design to promote safety, comfort and mobility of trail users at crossings. This report includes an overview of the at-grade trail crossings throughout the corridor followed by a detailed evaluation of each at-grade crossing, including a description of high emphasis crossings.

2.1 CONTEXT

Between Renton and I-90, the majority of the trail corridor runs adjacent to Lake Washington on the west side of Lake Washington Boulevard North. Much of the land use directly adjacent to the trail corridor is residential. Gene Coulon Park is located at the southern terminus of this area of the corridor.

From I-90 to Kirkland, much of the south portion of the trail corridor runs adjacent to Interstate 405 (I-405) in primarily residential areas. The corridor crosses over I-90 on a bridge and continues adjacent to the west side of I-405 until Mercer Slough, where the corridor crosses I-405 traveling northeast. Currently, the southbound I-405 structure is at-grade and there is no overcrossing or undercrossing for the corridor. The corridor continues northeast and passes below the northbound I-405 structure and continues northbound on the east side of I-405 through Bellevue. Just south of SE 9th Street, the corridor continues onto a bridge to pass over SE 9th Street, SE 8th Street, and the Lake Hills Connector. The alignment continues at-grade for the remaining portion of the corridor, with vehicle overpasses at NE 12th Street, State Route 520 (SR 520), Northup Way, and I-405 in north Bellevue. Land use throughout the corridor is diverse and consists of industrial, residential, and commercial uses.

The majority of the north main line corridor runs parallel to the Sammamish River through primarily light industrial and residential areas. At 128th Place NE in Woodinville, the corridor turns northeast and passes over 131st Avenue NE on a bridge.

The spur corridor also runs parallel to the Sammamish River through primarily industrial areas, including some open space. The entire corridor in this segment is at-grade.

Between Renton and I-90, the majority of the corridor runs adjacent to Lake Washington

Street crossings in the corridor are either at-grade or grade separated. The majority of crossings over high traffic volume or large streets are grade separated with overcrossings or undercrossings. There are also a number of at-grade crossings of the corridor alignment with public streets and private driveways throughout the corridor. At-grade trail crossings with public streets and private driveways create unique design challenges that must be appropriately addressed to ensure safety of trail users and to prevent conflicts with vehicles. These design considerations could influence the final trail alignment through the corridor as well as specific crossing treatments.

Crossing treatments could include the use of warning signs, decreased speed limits, road markings, narrowed travel lanes, and other traffic control devices to enhance the safety of trail users at at-grade crossings.

There are 24 at-grade crossings on the main line corridor and 13 at-grade crossings on the spur corridor for a total of 37 at-grade crossings. In the main line corridor, there are 15 at-grade crossings between Renton and I-90, 4 at-grade crossings between I-90 and Kirkland, and 5 at-grade crossings in the north main line corridor between north Kirkland and Woodinville. There are 13 at-grade crossings in the spur corridor.

2.2 OVERVIEW OF AT-GRADE CROSSINGS

Design solutions for at-grade crossings with public streets will likely be different than those chosen for at-grade crossings with private driveways. This is due to different associated intersection characteristics and required infrastructure standards of different roadways. Typical at-grade corridor crossings with a local street are generally wider with more traffic than crossings with private driveways. At-grade crossings with private driveways are generally narrow.

The following section includes an overview of the crossings throughout the corridor. Detailed inventory information for at-grade crossings is attached.

2.2.1 South Main line: Renton/King County South/Bellevue South of I-90

South of I-90, five of the at-grade crossings intersect with private driveways, and nine at-grade crossings occur on public

Over- or under-crossings are present at most intersections with heavier traffic volumes

Typical at-grade corridor crossing with a local street

streets. One crossing in the south main line corridor occurs at a pedestrian access point to the Kennydale Beach Park. Crossings with private driveways are anticipated to be crossings with relatively low traffic volumes. The intersections on public streets south of I-90 are primarily located on residential streets.

2.2.2 Central Main line: Bellevue between I-90 and Kirkland

There are no crossings with private driveways between I-90 and Kirkland; all five at-grade crossings occur on public streets. The crossings are primarily with commercial streets and arterials, including two high-traffic volume arterials in downtown Bellevue.

2.2.3 North Main line: King County North/Woodinville

North of Kirkland, one at-grade crossing is located on a private driveway. The remaining four at-grade crossings occur on public streets in primarily commercial and light industrial areas.

2.2.4 Spur: Woodinville/King County North/Redmond

Eleven of the at-grade crossings in the spur corridor are located on private driveways. These driveways provide access to light industrial businesses. The remaining two at-grade crossings are located on public streets.

3. AT-GRADE CROSSING DESIGN CONCERNS

Locations where trails cross streets are a significant safety concern. Several different characteristics of a crossing location can influence the performance of a trail crossing, both for safety and for mobility.

Although the Master Plan will not include final design for trail crossings it is important to qualitatively identify potential concerns, and especially to identify crossings where exceptional design elements (for example a grade-separated crossing or new signal) may be required.

During field work to support future planning, information for each at-grade intersection was collected, including:

Typical corridor crossing with a private driveway

- Slope
- Intersection geometrics
- Intersection proximity
- Traffic volume
- Sight distance

Based on qualitative evaluation of the site conditions, these elements were classified as low, medium, or high concern for each intersection along the corridor. The following brief summaries describe how these intersection characteristics affect the performance of trail crossings, and what considerations supported identification of the level of concern for each.

Slope

Sloping crossing locations can cause limited sight distance and require redesign of a roadway to provide a flat trail surface through the crossing.

Crossings with roadway approaches that could impact sight distance were rated as a higher level of concern than crossings that did not have sight distance issues related to the slope angle.

Intersection Geometrics

Intersection geometrics generally refer to the offset angle between the alignment of the trail and the intersecting roadway. It is ideal for intersections to be as close to a right angle as practical to minimize the exposure of crossing trail users and to maximize sight distance. Crossings with skewed approaches were rated as a higher level of concern than crossings that intersect the roadway at a 90-degree angle.

Intersection Proximity

Trail crossings that are either near or within the functional area of adjacent intersections can create several safety concerns:

- It can be difficult for motorists to notice trail users where traffic movement becomes complex.
- Adjacent intersections can limit the ability to introduce new signals at a new trail crossing if necessary to improve safety.
- Closely spaced intersections may not provide adequate queuing distance for vehicles, which can result in blockage of the trail.

Preferred crossing locations are either at an existing intersection, or spaced far enough from an existing intersection that a new crossing has adequate space to function safely.

Crossings that were near existing intersections were rated as a higher level of concern than crossings that occurred either at an existing intersection or with adequate spacing.

The slope of the roadway approaching the crossing can create sight distance issues if too steep

Traffic Volume

In general, crossings at streets with higher traffic volumes will require a higher level of traffic control, or possibly even grade-separation between the trail and roadway.

Crossings at busy streets can cause delay for both trail users and vehicles, and increase the potential for trail-user/vehicle conflicts. In general, crossings at busy streets are more likely to require enhanced crossing features such as signals, signage, and, potentially, grade-separation.

Crossings with higher traffic volumes were rated as a higher concern than crossings with less traffic.

Sight Distance

Sight distance is a key planning consideration for a safe crossing. Sight distance can be affected by slope and intersection geometrics, as described above, and can also be limited by physical obstructions near the intersection.

Vegetation, utilities, and geometrics were used to identify barriers to sight distance that could make crossings inconspicuous or limit visibility between vehicles and trail users. Crossings with sight distance limitations were rated as a higher concern than crossings that had fewer barriers to sight distance.

PLANNING-LEVEL EVALUATIONS

Each at-grade crossing was rated based on its performance using the design criteria above and ranked high (red), medium (orange), and low (green) in terms of the level of emphasis and potential need for additional design treatments. Figure 2 provides a summary of the general criteria used to classify level of concern for each crossing element.

Ratings for individual crossings are included in the attached detailed inventory sheets. Crossing criteria with a high, or red, rating could require additional design considerations and crossing criteria with a low, or green, rating would require few or no additional design considerations. Figure 3 provides a brief overview of the types of design treatments that might be considered to improve the performance of intersections with design concerns.

4. HIGH-EMPHASIS CROSSINGS

Intersections that had three or more design criteria rated at a medium (orange) or high (red) level were categorized as *high-emphasis crossings* that could require additional design considerations and/or engineering modifications as planning and design of the ERC continues.

Four high-emphasis crossings were identified south of I-90; two high-emphasis crossings were identified between I-90 and Kirkland; and two high-emphasis crossings were identified north of Kirkland. No crossings in the spur corridor were identified as high-emphasis crossings. Figure 4 shows the location of the high emphasis crossings throughout the corridor.

AT-GRADE CROSSING DESIGN CONCERNS

Condition

SLOPE

L	less than 10% grade
M	10% - 19% grade
H	20% grade +

INTERSECTION GEOMETRY

Combination of crossing width, roadway width (lane number), approach angles

INTERSECTION PROXIMITY

Intersection proximity and control type

TRAFFIC VOLUME (DAILY)

L	less than 10,000 vehicles
M	10,000 - 20,000 vehicles
H	20,000 + vehicles

SIGHT DISTANCE

Combination of obstructions, geometry, and slopes.

Level of Emphasis

LOW CONCERN - no to little additional treatment to meet trail standards

MEDIUM CONCERN - requires some additional treatment

HIGH CONCERN - requires high level of treatment to meet minimal trail standards

Figure 2 – At-Grade Crossing Concerns Summary

4.1 SOUTH MAIN LINE: RENTON/KING COUNTY SOUTH/BELLEVUE SOUTH OF I-90

In the south main line, one high-emphasis crossing, Driveway 11A-Renton, is located at a private driveway. Three high-emphasis crossings south of I-90 are located on public streets: Mountain View Avenue North, North 37th Street, and 106th Avenue SE.

4.1.1 Mountain View Avenue North

Mountain View Avenue North is located adjacent to Lake Washington Boulevard North near North 33rd Street. This crossing could require additional design considerations because of challenges related to intersection geometrics, intersection proximity, and sight distance. The angles of the several approaches to the trail crossing at this location are skewed, which could create sight distance issues and the need to alter the approach angles.

The nearest intersection, which occurs at Lake Washington Boulevard North, is approximately 50 feet to the east. If vehicles were queued at this intersection, it could block the trail alignment. However, the intersection is a four-way stop and there

The slope and skew of the northwest approach to the Mountain Avenue N crossing could create sight distance issues

High (Red)

- Alter the trail alignment through the intersection to improve safety.
- Alter the angle of the crossing to improve sight distance, access, and safety.
- Provide above- or below-grade separated crossing for bikes and pedestrians.
- Alter trail alignment to relocated crossing and/or reduce number of crossings.

Medium (Orange)

- Provide traffic control or alter signal timing for vehicular movements at trail intersections (e.g. stop sign, traffic light).
- Revise traffic speeds (e.g. 30 to 25 MPH) and/or other strategies for traffic calming such as re-striping.
- Provide traffic control for non-motorized movements at trail intersections (e.g. flashing stop sign, controlled intersection/pedestrian-bike signal).
- Alter grading at trail to improve intersection access and safety.
- Remove vegetation or other obstacles to improve sight distance.

Figure 3 – Additional Design Considerations

would likely be very low traffic volumes on Mountain View Avenue North; therefore queues would not be frequent. Sight distance on the northwest approach at this crossing could also be limited due to the angle of approach, the slope, and the presence of a privacy fence.

4.1.2 Driveway 11-A

Driveway 11A-Renton is located adjacent to Lake Washington Boulevard North between Burnett Avenue N and N 33rd Street in Renton. This crossing could require additional design considerations because of challenges related to slope, sight distance, and intersection geometrics.

The driveway that intersects with the trail corridor has a particularly steep grade of approximately 17 percent on the east approach and 10 percent on the west approach. This could create sight distance concerns between trail users and vehicles accessing the private driveway. The presence of vegetation on the west side of the corridor could also reduce sight distance for trail users traveling southbound.

The nearest intersection to this crossing is within approximately 15 to 20 feet, which would create unsafe conditions for vehicles if they were stopped while trail users cleared the crossing. Stopped vehicles at this crossing could impede free-flow traffic on Lake Washington Boulevard North and result in safety issues. However, it is likely that this crossing would experience low vehicle volumes.

Figure 4 –ERC High Emphasis Crossings

4.1.3 North 37th Street

The North 37th Street crossing is located adjacent to Lake Washington Boulevard North between North 36th Street and North 38th Street. This crossing could require additional design consideration because of issues related to slope, intersection proximity, and sight distance.

There are three approaches to the trail alignment at this crossing, each with a slope greater than 15 percent. This could create sight distance issues between trail and road users. The nearest intersection is approximately 55 feet from the trail crossing; queuing vehicles at this intersection could block the trail crossing. However, it is anticipated that traffic volumes would be minimal at this crossing.

Sight distance on the northwest approach could create some additional design considerations because of the steep slope and intersection skew. Similarly, the southwest approach could have some sight distance issues due to the presence of some vegetation and the intersection skew.

4.1.4 106th Avenue SE

The 106th Avenue SE crossing is located near Newcastle Beach Park just north of Bagley Lane. This crossing was identified as a high emphasis crossing because of design challenges related to intersection geometrics, vehicle volumes, and sight distance.

The approaches to the trail alignment are at approximately 45 degrees, which could require additional design consideration to alter the trail alignment through the intersection to improve safety. The traffic volume on this street could also create safety concerns for trail users. Additional crossing treatments could be necessary to deter vehicle-trail user conflicts. Sight distance could also cause safety concerns because of the slope and angle of the west approach. The roadway intersecting the trail alignment is at approximately a 5 to 7 percent slope; the roadway continues to steepen farther from the crossing, which could create sight distance barriers between roadway and trail users.

Sight distance issues could create additional design concerns at the Driveway 11A - Renton crossing

4.2 CENTRAL MAIN LINE: BELLEVUE BETWEEN I-90 AND KIRKLAND

In the central main line, both of the identified high emphasis crossings are located on public streets. These crossings are identified as SE 1st Street and NE 8th Street.

4.2.1 SE 1st Street

The SE 1st Street crossing is located between Main Street and 116th Avenue SE in Bellevue. This crossing could require additional design considerations because of challenges related to slope, vehicle volumes, sight distance, and intersection geometrics. The slope of SE 1st Street

is approximately 17 percent on both approaches to the trail alignment, which could result in sight distance concerns between trail and roadway users. SE 1st Street also has high traffic volumes, particularly in peak periods.

Based on initial field work evaluations, it is common for vehicles on SE 1st Street to travel faster than the posted speed limit of 25 mph, particularly because of the steep grade of the street. This could lead to safety concerns at this crossing. The roadway intersects with the trail alignment at approximately 45 degrees, which could impact sight distance and could result in

The NE 8th Street crossing in Bellevue has previously been identified for grade separation

additional design considerations to alter the angle of the crossing. The presence of vegetation in the east right-of-way and the roadway angle of SE 1st Street, which curves north prior to the east approach, could also create sight distance issues.

4.2.2 NE 8th Street

The NE 8th Street crossing is located between 116th Avenue NE and 120th Avenue NE near downtown Bellevue. This crossing was identified as a high emphasis crossing because of potential concerns with intersection geometrics, intersection proximity, and vehicle volumes. This crossing was previously identified by the City of Bellevue as a crossing that would require grade separation; therefore, there will not be a specific design emphasis for this crossing in this plan. NE 8th Street has high vehicle volumes and provides a direct connection to I-405. The nearest intersection is approximately 400 feet to the west of the trail crossing. During peak traffic hours, queuing at this intersection can block the corridor crossing. Approximately 800 feet to the east there is an intersection that also experiences long queues that can block the crossing during peak traffic periods. There are a number of driveways to commercial businesses and bus stops in the approximate vicinity of the crossing, which could create safety issues. The overall crossing at this location is also wide at approximately 80 feet due to the width of NE 8th Street, which provides three lanes in each direction.

4.3 NORTH MAIN LINE: KING COUNTY NORTH/WOODINVILLE

There are two high emphasis crossings in the north main line corridor. Both high emphasis crossings north of Kirkland are located on public streets. The first high emphasis crossing is identified as 139th Avenue NE and the second is identified as NE 175th Street.

4.3.1 139th Avenue NE

The 139th Avenue NE crossing is located on 139th Avenue NE/Willows Road NE between 141st Avenue NE and NE 126th Place in unincorporated King County.

This crossing could require additional design considerations because of slope, intersection geometrics, and sight distance concerns. The slope of the west approach to the trail crossing is approximately 11 percent and the slope of the east approach is approximately 10 percent. The location of the trail crossing occurs at a point where 139th Avenue NE/Willows Road NE makes a 180-degree turn, which creates sight distance and safety issues. At the crossing, the east and west approaches are at a 45-degree angle, which could require additional design consideration to improve safety and sight distance.

139th Avenue NE turns 180 degrees at the trail crossing

4.3.2 NE 175th Street

The NE 175th Street crossing is located between 127th Place NE and 131st Street NE in Woodinville. Intersection geometry, sight distance, and vehicle volume issues could require additional design consideration. The roadway approaches the trail alignment from both sides at a 60-degree angle, which could create safety and sight distance issues. The bridge to the northwest of the trail alignment could also block trail users from seeing smaller vehicles traveling eastbound on NE 175th Street. This road also accommodates a higher traffic volume, which could require additional design considerations to ensure safe crossings.

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CROSSING INVENTORY

A detailed inventory of each at-grade crossing in the corridor is included on the following sheets. The inventory includes photographs, crossing design characteristics, and performance ratings. An "at-a-glance" summary for each of the crossings is included with icons for the primary performance indicators of roadway slope, intersection geometrics, intersection proximity, traffic volume, and sight distance. Levels of concern for each of these performance criteria are shown qualitatively as either green for low, orange for moderate, or red for high. Crossings with several red or orange criteria, or high-emphasis crossings, will likely require more focused planning and design attention in the implementation phases for the ERC.

ROADWAY SLOPE

INTERSECTION GEOMETRY

INTERSECTION PROXIMITY

TRAFFIC VOLUMES

SIGHT DISTANCE

LOW CONCERN

MODERATE CONCERN

HIGH CONCERN

SOUTH MAIN LINE: RENTON TO I-90

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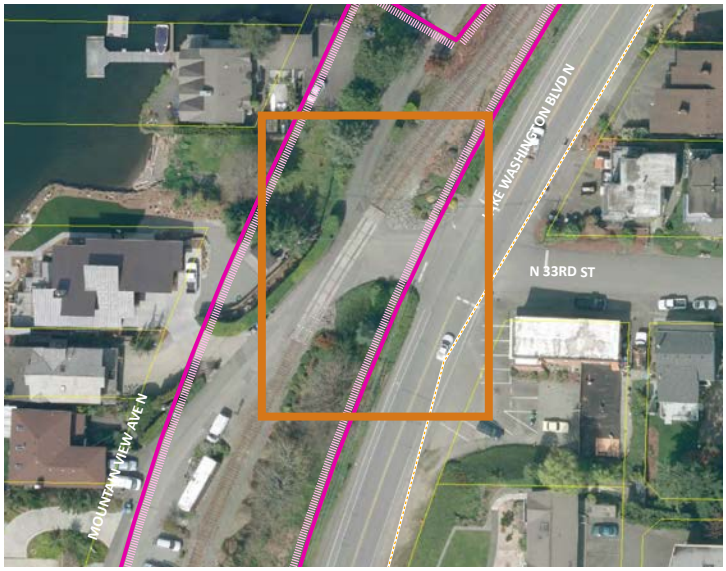
MOUNTAIN VIEW AVENUE NORTH

TILE	LINE	JURISDICTION	CROSSING #
10	Main	Renton	A



OVERVIEW

- The crossing is located on a low volume, residential street.
- The northwest driveway could have limited sight distance of southbound trail users.
- There is use of the west right-of-way as parking.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: One lane in each direction

CROSSING WIDTH: About 90 feet

STRIPING: None

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: NW approach: 45°; E approach: 45°; SW approach: 15°

ESTIMATED SLOPE: E approach: 5%; NW approach: 7-10%

CROSSING CONTROL TYPE: None

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 50-60 feet; 4-way stop control

OTHER: The west side of the right-of-way is used as parking.

SIGHT DISTANCE

VEGETATION

Shrubs and fence on west side of right-of-way

Shrubs and trees on east side of right-of-way

UTILITIES

Overhead power across north approach and on west side of right-of-way; fiber optics

GEOMETRICS

The northwest approach/driveway could have limited sight distance because of angled approach, slope and fence.

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Remove or relocate visual obstructions
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 11A - RENTON

TILE	LINE	JURISDICTION	CROSSING #
11	Main	Renton	A

OVERVIEW

- The crossing is located on a private driveway with a narrow right-of-way due to grade on either side of corridor.
- The distance to the nearest intersection could create conflicts with queuing vehicles and traffic on Lake Washington Boulevard North.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane eastbound and westbound

CROSSING WIDTH: About 20 feet

STRIPING: None

SURFACING: Wood and gravel

APPROXIMATE ANGLE OF APPROACH:

E approach: 85°; W approach: 75°

ESTIMATED SLOPE:

E approach: 17%; W approach: 10%

CROSSING CONTROL TYPE: 1-way stop control on east approach

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 15-20 feet; free flowing

OTHER: None

SIGHT DISTANCE

VEGETATION

Mature trees on west side of right-of-way

UTILITIES

Overhead power along east right-of-way; fiber optics; culvert on east side of right-of-way

GEOMETRICS

East approach provides limited space for queuing

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Remove or relocate visual obstructions
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

PEDESTRIAN CROSSING 11 - RENTON

TILE	LINE	JURISDICTION	CROSSING #
11	Main	Renton	B

OVERVIEW

- The crossing is located on a pedestrian crossing that leads to Kennydale Beach Park.
- The right-of-way is narrow because of grading on either side of the corridor.

ROADWAY GEOMETRY

TYPE: Pedestrian crossing

LANES: None

CROSSING WIDTH: About 6 feet

STRIPING: None

SURFACING: Wood and gravel

APPROXIMATE ANGLE OF APPROACH: All approaches: 90°

ESTIMATED SLOPE: Not applicable—stairs are provided

CROSSING CONTROL TYPE: No stop control at crossing

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 20 feet; 4-way stop controlled with a flashing crosswalk beacon

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

None

GEOMETRICS

Narrow right-of-way with grading on either side

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Advance warning signing

NORTH APPROACH

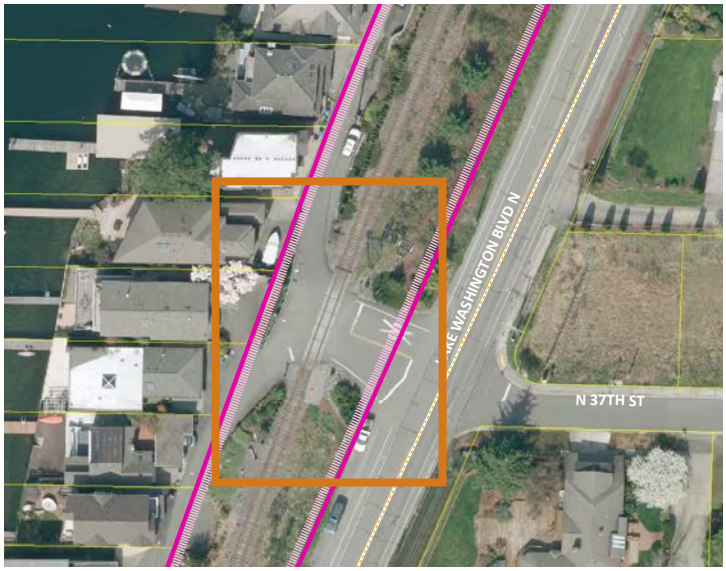
EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NORTH 37TH STREET

TILE	LINE	JURISDICTION	CROSSING #
12	Main	Renton	A



OVERVIEW

- The crossing is located on a residential street.
- There are three approaches to the crossing from the east, northwest, and southwest.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: 1 lane in each direction

CROSSING WIDTH: About 60 feet

STRIPING: Stop bars on all approaches

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: NW approach: 45°; SW approach: 45°; E approach: 90°

ESTIMATED SLOPE: NW approach: 20%; SW approach: 15%; E approach: 16%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 55 feet; 2-way stop controlled (east/west)

OTHER: NE/NW right-of-way used as parking

SIGHT DISTANCE

VEGETATION

Plantings, small shrubs

UTILITIES

Fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

WELLS AVENUE NORTH

TILE	LINE	JURISDICTION	CROSSING #
14	Main	Renton	A

OVERVIEW

- The crossing is located on a residential street.
- There is a sidewalk crossing over the north approach.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: 1 lane in each direction

CROSSING WIDTH: About 40 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°

ESTIMATED SLOPE: E approach: 1-2%; W approach: 1-2%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 70 feet; 1-way stop controlled (west approach)

OTHER: Sidewalk crossing on north approach (5 feet in width)

SIGHT DISTANCE

VEGETATION

Plantings, small shrubs

UTILITIES

Fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NORTH APPROACH SIDEWALK

NORTH 42ND PLACE

TILE	LINE	JURISDICTION	CROSSING #
15	Main	Renton	A

OVERVIEW

- The crossing is located on a residential street.
- There is a sidewalk crossing over the south approach.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: One lane in each direction

CROSSING WIDTH: About 45 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°

ESTIMATED SLOPE: E approach: 2%; W approach: 2%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 80 feet; 1-way stop controlled (west approach)

OTHER: Sidewalk crossing on south approach (5 feet in width)

SIGHT DISTANCE

VEGETATION

Landscape vegetation

UTILITIES

None

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

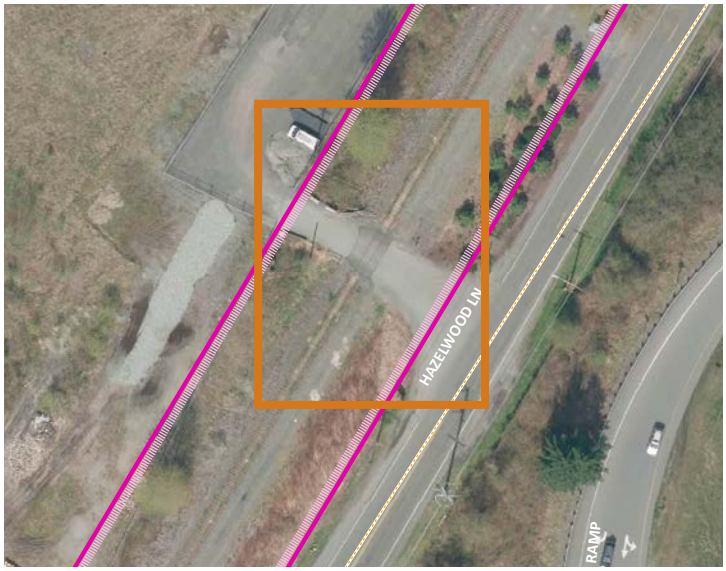
EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 16A - RENTON

TILE	LINE	JURISDICTION	CROSSING #
16	Main	Renton	A



OVERVIEW

- The crossing is located on a private driveway.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane in each direction

CROSSING WIDTH: About 25 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°

ESTIMATED SLOPE: E approach: 2%; W approach: 3%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 75 feet; no control

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Overhead power over north approach; fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 17A - RENTON

TILE	LINE	JURISDICTION	CROSSING #
17	Main	Renton	A

OVERVIEW

- The crossing is located on a private driveway.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: 1 lane east and west

CROSSING WIDTH: About 35 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°

ESTIMATED SLOPE: E approach: 3%; W approach: 7%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 75 feet; no control

OTHER: None

SIGHT DISTANCE

VEGETATION

Some small shrubs

UTILITIES

Overhead power over north approach; fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 18A - RENTON

TILE	LINE	JURISDICTION	CROSSING #
18	Main	Renton	A

OVERVIEW

- The crossing is located on a private driveway.
- There is an additional northwest driveway.
- The west right-of-way is currently used as parking.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane east and west

CROSSING WIDTH: About 30 feet

STRIPING: None

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°; NW approach: 45°

ESTIMATED SLOPE: E approach: 10%; W approach: 3-4%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 90 feet; 1 way stop control (west approach)

OTHER: West right-of-way used as parking

SIGHT DISTANCE

VEGETATION

Shrubs and trees on east side of right-of-way

UTILITIES

Overhead power on both sides of the corridor; fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

106TH AVENUE SE

TILE	LINE	JURISDICTION	CROSSING #
23	Main	Bellevue	A

OVERVIEW

- The crossing is located on a residential street.
- The southeast right-of-way is currently used as parking.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: One lane in each direction

CROSSING WIDTH: About 25 feet

STRIPING: Stop bar on east approach

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH:
E approach: 90°; NW approach: 45°;
SW approach: 45°

ESTIMATED SLOPE: E approach: 7%;
W approach: 15%

CROSSING CONTROL TYPE: 1 way stop controlled (east approach)

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: No nearby intersections

OTHER: Southeast right-of-way used as parking

SIGHT DISTANCE

VEGETATION

Shrubs and trees on east side of right-of-way

UTILITIES

Fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Remove or relocate visual obstructions
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

PARKING IN SOUTHEAST RIGHT-OF-WAY

PLEASURE POINT LANE SE

TILE	LINE	JURISDICTION	CROSSING #
26	Main	Bellevue	A

OVERVIEW

- The crossing is located on a residential street.
- Northwest and southwest approaches to the crossing are possible.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: One lane in each direction

CROSSING WIDTH: About 25 feet

STRIPING: None

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°

ESTIMATED SLOPE: E approach: 2%; W approach: 5%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 70 feet; yield control (west approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

Minimal shrubs and trees

UTILITIES

None

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

SE 50TH PLACE

TILE	LINE	JURISDICTION	CROSSING #
29	Main	Bellevue	A

OVERVIEW

- The crossing is located on a residential street.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: One lane in each direction

CROSSING WIDTH: About 40 feet

STRIPING: Stop bar (west approach)

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: E approach: 75°; W approach: 75°

ESTIMATED SLOPE: E approach: 6%; W approach: 8%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 100 feet; 1 way stop control (west approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

Minimal shrubs and trees

UTILITIES

Fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

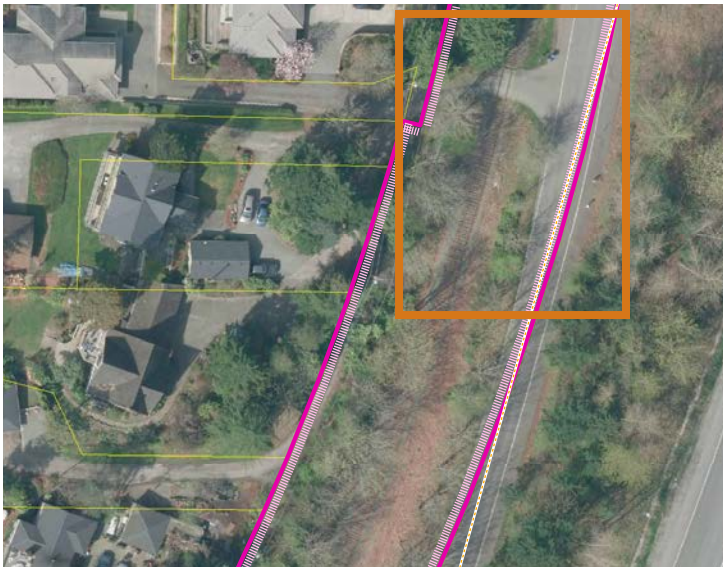
EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 30A - BELLEVUE

TILE	LINE	JURISDICTION	CROSSING #
30	Main	Bellevue	A



OVERVIEW

- The crossing is located on a private driveway.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane in each direction

CROSSING WIDTH: About 15 feet

STRIPING: None

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°

ESTIMATED SLOPE: E approach: 7%; W approach: 15%

CROSSING CONTROL TYPE: All way stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 25 feet; no control

OTHER: None

SIGHT DISTANCE

VEGETATION

Minimal shrubs and trees

UTILITIES

Fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

BAGLEY LANE

TILE	LINE	JURISDICTION	CROSSING #
31	Main	Bellevue	A

OVERVIEW

- The crossing is located on a residential street.
- The northwest right-of-way is used for parking.

ROADWAY GEOMETRY

TYPE: Residential street

LANES: One lane in each direction

CROSSING WIDTH: About 15 feet

STRIPING: None

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: E approach: 90°; W approach: 90°

ESTIMATED SLOPE: E approach: 5%; W approach: 16%

CROSSING CONTROL TYPE: 1-way stop controlled (west approach)

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 40 feet; no control

OTHER: Northwest part of right-of-way used as parking

SIGHT DISTANCE

VEGETATION

Trees

UTILITIES

Overhead power in west side of right-of-way, fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

PARKING IN NORTHWEST
RIGHT-OF-WAY

106TH AVENUE SE

TILE	LINE	JURISDICTION	CROSSING #
32	Main	Bellevue	A

OVERVIEW

- The crossing is located on an arterial.
- The crossing provides access to Newcastle Beach Park.
- The posted speed limit is 25 MPH.
- The geometrics of the roadway of the west approach could create sight distance issues.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: Two lanes in each direction

CROSSING WIDTH: About 45 feet

STRIPING: Lane markings

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: E approach: 45°; W approach: 45°

ESTIMATED SLOPE: E approach: 5%; W approach: 7%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: No nearby intersections

OTHER: None

SIGHT DISTANCE

VEGETATION

Shrubs and trees

UTILITIES

Overhead power on west side of right-of-way

GEOMETRICS

West approach could create sight distance issues

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Roadway restriping
- Stop control/intersection priority
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

CENTRAL MAINLINE: I-90 THROUGH BELLEVUE

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SE 5TH STREET

TILE	LINE	JURISDICTION	CROSSING #
54	Main	Bellevue	A

OVERVIEW

- The crossing is located on a minor arterial.
- The posted speed is 25 MPH.
- The right-of-way is used for parking.

ROADWAY GEOMETRY

TYPE: Minor arterial

LANES: One lane in each direction

CROSSING WIDTH: About 50 feet

STRIPING: Lane lines

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH:

W approach: 85°; E approach: 85°

ESTIMATED SLOPE: E approach: 5%;

NW approach: 3%

CROSSING CONTROL TYPE: None

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 100 feet; 1 way stop control (east approach)

OTHER: Parking in right-of-way

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Overhead power; fiber optics

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

RIGHT-OF-WAY

SE 1ST STREET

TILE	LINE	JURISDICTION	CROSSING #
56	Main	Bellevue	A

OVERVIEW

- The crossing is located on an arterial with higher traffic volumes.
- The posted speed is 25 MPH; vehicles traveling westbound down the hill drive fast.
- There are sidewalk crossings over the north and south approach.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: One lane in each direction

CROSSING WIDTH: About 50 feet

STRIPING: Lane lines

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: W approach: 45°; E approach: 45°

ESTIMATED SLOPE: E approach: 17%; NW approach: 17%

CROSSING CONTROL TYPE: None

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 400 feet; signal control

OTHER: Sidewalk crossings over north and south approaches. Westbound vehicles were observed to exceed speed limit down the hill.

SIGHT DISTANCE

VEGETATION

Shrubs and trees on east right-of-way

UTILITIES

Fiber optics

GEOMETRICS

Roadway curves before east approach

POTENTIAL CROSSING TREATMENTS

MAJOR MODIFICATIONS

- User-activated active warning
- Reconstruct roadway to improve geometrics

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Remove or relocate visual obstructions
- Stop control/intersection priority
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NORTH SIDEWALK CROSSING

SOUTH SIDEWALK CROSSING

NE 8TH STREET

TILE	LINE	JURISDICTION	CROSSING #
60	Main	Bellevue	A

OVERVIEW

- The crossing is located on an arterial with high traffic volumes.
- The posted speed is 30 MPH.
- There are sidewalk crossings over the north and south approaches.
- There is a bus stop at the near-east approach.
- There is parking in the right-of-way and numerous driveways near the crossing.
- Queuing at nearby intersections blocks the crossing.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: Three lanes in each direction

CROSSING WIDTH: About 80 feet

STRIPING: Lane lines

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH:

W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E/W approach: 2-3%

CROSSING CONTROL TYPE: None

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 400 feet; Signal control

OTHER: Heavy traffic; sidewalk crossings over north and south approaches; bus stop near crossing; vehicle queuing at intersections to the west and east blocks crossing; parking in the right-of-way.

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Gas line

GEOMETRICS

Numerous nearby driveways

POTENTIAL CROSSING TREATMENTS

MAJOR MODIFICATIONS

- Grade-separated crossing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NORTH SIDEWALK CROSSING

108TH AVENUE NE

TILE	LINE	JURISDICTION	CROSSING #
74	Main	Bellevue	A

OVERVIEW

- The crossing is located on an arterial.
- The posted speed is 25 MPH.
- There are sidewalk crossings over the north and south approaches.
- There is a bus stop near the east approach.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: One lane in each direction

CROSSING WIDTH: About 50 feet

STRIPING: Lane lines

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 3%; W approach: 1%

CROSSING CONTROL TYPE: None

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 500 feet; signal control

OTHER: Median; bus stop nearby; sidewalk crossings

SIGHT DISTANCE

VEGETATION

Mature trees and shrubs

UTILITIES

Gas Line; fiber optics

GEOMETRICS

Hill on west approach; curve before east approach

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Roadway restriping
- Remove or relocate visual obstructions
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NORTH SIDEWALK CROSSING

NORTH MAINLINE: KIRKLAND, KING COUNTY & WOODINVILLE

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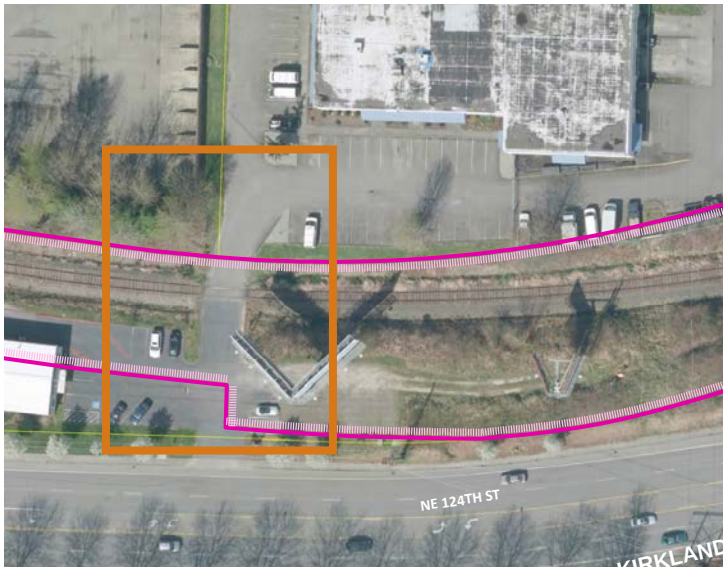
DRIVEWAY 10A - King County

TILE	LINE	JURISDICTION	CROSSING #
119	Main	King County	A



OVERVIEW

- The crossing is located on a private driveway.
- There are driveways and parking nearby.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane in each direction

CROSSING WIDTH: About 25 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: N approach: 90°; S approach: 90°

ESTIMATED SLOPE: N approach: 3%; S approach: 2%

CROSSING CONTROL TYPE: All way stop control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 90 feet; 1-way stop control (north approach)

OTHER: Possible wetlands near crossing

SIGHT DISTANCE

VEGETATION

Small shrubs and trees

UTILITIES

Fiber optics

GEOMETRICS

Small hill near north approach

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Stop control/intersection priority
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

139TH AVENUE NE

TILE	LINE	JURISDICTION	CROSSING #
122	Main	King County	A

OVERVIEW

- The crossing is located on an arterial.
- The roadway makes a 180° turn through intersection.
- The grade of east right-of-way is steep.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: One lane in each direction

CROSSING WIDTH: About 30 feet

STRIPING: Lane markers, stop bar

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: E approach: 45°; W approach: 45°

ESTIMATED SLOPE: W approach: 11%; E approach: 10%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 150 feet; 1-way stop control (west approach)

OTHER: Grade of east right-of-way is steep.

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Overhead power; fiber optics

GEOMETRICS

Roadway does 180° turn through intersection

POTENTIAL CROSSING TREATMENTS

MAJOR MODIFICATIONS

- Grade-separated crossing
- User-activated signal
- Relocate crossing outside of current corridor ownership

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NE 145TH STREET

TILE	LINE	JURISDICTION	CROSSING #
131	Main	Woodinville	A

OVERVIEW

- The crossing is located on an arterial.
- The roadway grade on either side of crossing is steep.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: 1 lane in each direction

CROSSING WIDTH: About 35 feet

STRIPING: Lane markers, stop bars

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH:

E approach: 90°; W approach: 90°

ESTIMATED SLOPE: W approach: 2%;

E approach: 4%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: Driveway about 15 feet, 1-way stop control

OTHER: Sidewalk crossing; roadway grade on either side of crossing is steep.

SIGHT DISTANCE

VEGETATION

Trees and shrubs

UTILITIES

Overhead power over south and west approaches; fiber optics; gas line

GEOMETRICS

Eastbound traffic coming down large hill.

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Remove or relocate visual obstructions
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NORTH SIDEWALK CROSSING

WOODINVILLE-REDMOND ROAD

TILE	LINE	JURISDICTION	CROSSING #
141	Main	Woodinville	A

OVERVIEW

- The crossing is located on an arterial.
- The posted speed limit is 45 MPH

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: One lane in each direction

CROSSING WIDTH: About 50 feet

STRIPING: Lane markings

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH:
E approach: 80°; W approach: 80°

ESTIMATED SLOPE: W approach: 1%; E approach: 1%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 100 feet, 1-way stop control

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Overhead power in east right-of-way

GEOMETRICS

Several nearby driveways

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Roadway restriping
- Remove or relocate visual obstructions
- Advance warning signing

NORTH APPROACH

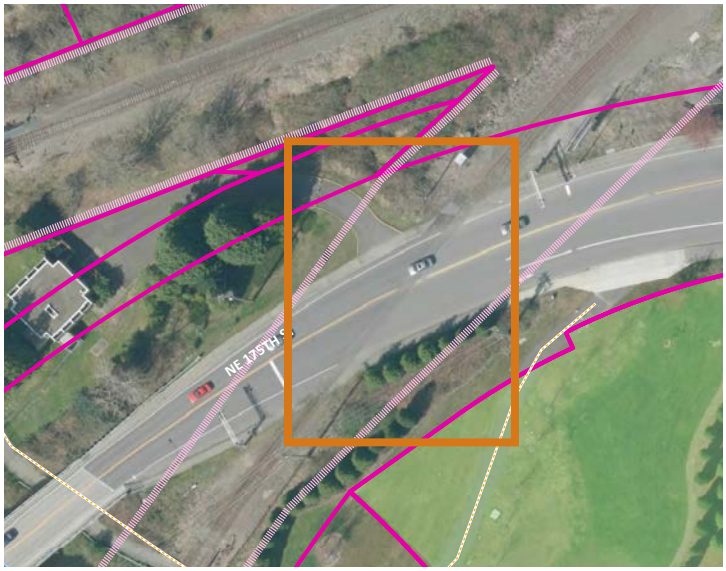
EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NE 175TH STREET

TILE	LINE	JURISDICTION	CROSSING #
142	Main	Woodinville	A



OVERVIEW

- The crossing is located on an arterial.
- The posted speed limit is 35 MPH.
- There is a wide crossing width.
- Potential sight distance issues on east approach.
- On the nearby vehicle overpass west of the crossing, railing could create sight distance issues for northbound trail users.
- This is a high-emphasis crossing.

ROADWAY GEOMETRY

TYPE: Arterial

LANES: One lane in each direction

CROSSING WIDTH: About 120 feet

STRIPING: Lane markings

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH:
E approach: 60°; W approach: 60°

ESTIMATED SLOPE: W approach: 1%; E approach: 1%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 300-400 feet, signal controlled

OTHER: Railing on nearby vehicle overpass west of the crossing could make it difficult for trail users to see small vehicles.

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Overhead power in south and east right-of-way

GEOMETRICS

Angle of the east approach could cause sight distance issues

POTENTIAL CROSSING TREATMENTS

MAJOR MODIFICATIONS

- User-activated active warning
- Reconstruct roadway to improve geometrics

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Roadway restriping
- Remove or relocate visual obstructions
- Stop control/intersection priority
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

SPUR: WOODINVILLE TO REDMOND

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DRIVEWAY 10A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
10	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane in each direction

CROSSING WIDTH: About 30 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 5%; NW approach: 2%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 80 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

Trees and shrubs in west right-of-way

UTILITIES

Overhead power in west and south right-of-way

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 11A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
11	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- East and southeast approaches are possible at this crossing.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane in each direction

CROSSING WIDTH: About 40 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH:

W approach: 90°; E approach: 90°; SE approach: 45°

ESTIMATED SLOPE: E approach: 5%;

W approach: 4%

CROSSING CONTROL TYPE: Stop controlled (west approach)

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 60 feet; 1-way stop control (east approach)

OTHER: Possible wetlands in west right-of-way

SIGHT DISTANCE

VEGETATION

None

UTILITIES

None

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 12A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
12	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane eastbound, two lanes westbound

CROSSING WIDTH: About 50 feet

STRIPING: Lane markings

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 5%; W approach: 1%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 40 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

None

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 13A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
13	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: 1 lane east/west

CROSSING WIDTH: About 30 feet

STRIPING: Stop bars

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 3%; W approach: 5%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 50 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

None

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 14A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
14	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: 1 lane east/west

CROSSING WIDTH: About 50 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 4%; W approach: 5%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 60 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

None

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 15A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
15	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane east/west

CROSSING WIDTH: About 45 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 2%; W approach: 5%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 60 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

None

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Advance warning signing

NORTH APPROACH

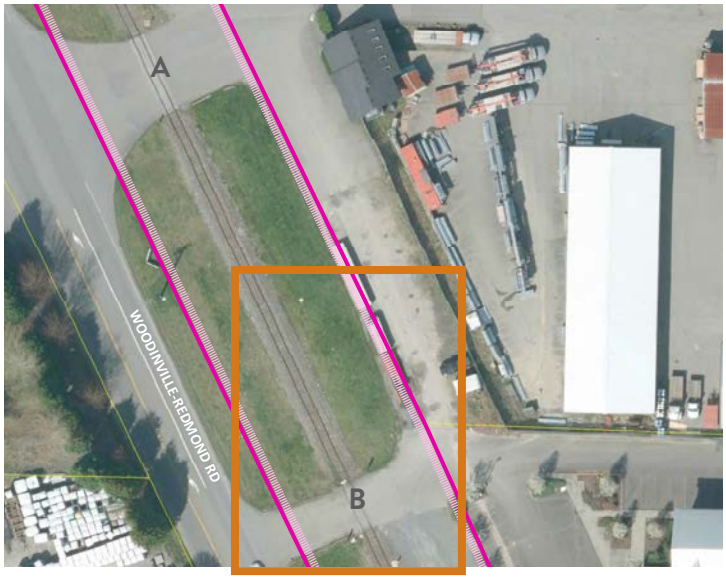
EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 15B - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
15	Spur	Woodinville	B



OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: 1 lane east/west

CROSSING WIDTH: About 25 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 1%; W approach: 1%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 60 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

None

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 16A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
16	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane east/west

CROSSING WIDTH: About 35 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 2%; W approach: 2%

CROSSING CONTROL TYPE: Stop controlled (west approach)

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 60 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Overhead power in north right-of-way

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

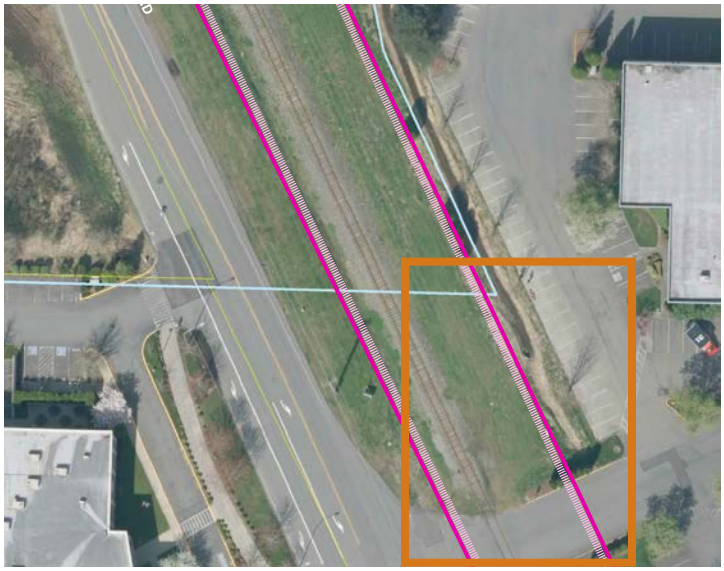
EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 16B - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
16	Spur	Woodinville	B



OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: 1 lane east/west

CROSSING WIDTH: About 55 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 3%; W approach: 3%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 60 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Overhead power in north right-of-way

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Advance warning signing
- Location of crossing within corridor ownership
- Signal timing modification at existing signal

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 17A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
17	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane east/west

CROSSING WIDTH: About 30 feet

STRIPING: None

SURFACING: Asphalt

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 4%; W approach: 4%

CROSSING CONTROL TYPE: Stop controlled

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 60 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Gas line

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

DRIVEWAY 19A - WOODINVILLE

TILE	LINE	JURISDICTION	CROSSING #
19	Spur	Woodinville	A

OVERVIEW

- The crossing is located on a private driveway.
- The right-of-way is narrow in this part of the corridor.

ROADWAY GEOMETRY

TYPE: Private driveway

LANES: One lane eastbound, two lanes westbound

CROSSING WIDTH: About 40 feet

STRIPING: None

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 4%; W approach: 14%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 140 feet; 1-way stop control (east approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

Minimal shrubs and trees

UTILITIES

None

GEOMETRICS

Narrow right-of-way

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

SOUTH SIDEWALK CROSSING

NE 145TH STREET

TILE	LINE	JURISDICTION	CROSSING #
21	Spur	Woodinville	A

OVERVIEW

- The crossing is located on an arterial with heavier traffic volumes.
- There are several nearby driveways.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: One lane east/west and two-way left turn lane

CROSSING WIDTH: About 50 feet

STRIPING: Lane markings, stop bars

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: W approach: 80°; E approach: 80°

ESTIMATED SLOPE: E approach: 2%; W approach: 4%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: About 250 feet; 2-way stop control (east/west approach)

OTHER: None

SIGHT DISTANCE

VEGETATION

None

UTILITIES

Gas pipeline; overhead power over south approach

GEOMETRICS

Several driveways nearby.

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Revise traffic speeds/traffic calming
- Roadway restriping
- Advance warning signing

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

NE 124TH STREET

TILE	LINE	JURISDICTION	CROSSING #
31	Spur	Redmond	A

OVERVIEW

- The crossing is located on an arterial with heavier traffic volumes.
- The crossing is located at a large intersection with multiple turning movements possible.

ROADWAY GEOMETRY

TYPE: Arterial street

LANES: Three lanes westbound, two lanes eastbound

CROSSING WIDTH: About 75 feet

STRIPING: Lane markings

SURFACING: Concrete

APPROXIMATE ANGLE OF APPROACH: W approach: 90°; E approach: 90°

ESTIMATED SLOPE: E approach: 5%; W approach: 5%

CROSSING CONTROL TYPE: No control

NEAREST INTERSECTION DISTANCE/ CONTROL TYPE: Crossing at an intersection, signal controlled

OTHER: None

SIGHT DISTANCE

VEGETATION

Shrubs in west right-of-way near north approach

UTILITIES

Gas pipeline

GEOMETRICS

None

POTENTIAL CROSSING TREATMENTS

MINOR MODIFICATIONS

- Roadway restriping
- Advance warning signing
- Signal timing modification at existing signal

NORTH APPROACH

EAST APPROACH

SOUTH APPROACH

WEST APPROACH

EASTSIDE RAIL CORRIDOR REGIONAL TRAIL MASTER PLAN PROJECT

KING COUNTY DEPARTMENT OF NATURAL RESOURCES AND PARKS
WWW.KINGCOUNTY.GOV/PARKS/EASTSIDERAILCORRIDOR
ERCTRAIL@KINGCOUNTY.GOV

PARAMETRIX

PRR

TOOLE DESIGN GROUP

ESA

ICICLE CREEK ENGINEERS

UNIVERSAL FIELD SERVICES

THE LAW OFFICE OF CHARLES MONTANGE