Pines Road/BNSF Grade Separation Project

US Department of Transportation
Office of the Secretary of Transportation

Rebuilding American Infrastructure with Sustainability and Equity (RAISE) FY 2021 Grant Application

Location: Spokane Valley, Washington

Primary Project Type: Road

Secondary Project Type: Road/Rail Crossing

RAISE Funding Request: $16,239,622

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1 Project Description

In 2020, the Pines Road (SR 27) crossing of the BNSF Railway Company (BNSF) railroad tracks resulted in over 28,000 vehicle hours of delay[1] and the adjacent Pines Road (SR 27) / Trent Avenue (SR 290) intersection experienced 8 recorded collisions.[2] The at-grade crossing is rated Washington State's top Tier 1 road-rail conflict[3] and is located in the center of Spokane Valley's most vulnerable census tracts[4]. The City of Spokane Valley seeks a RAISE Discretionary Grant of $16,239,622 to complete funding for the Pines Road/BNSF Grade Separation Project (GSP) to create a safer and more efficient transportation and freight network that reduces its environmental impacts and equitably improves access and mobility for all users.

1.1 Project Overview

The Pines Road (SR 27) at-grade crossing of the BNSF Railway Company tracks is located 275 feet south of Trent Avenue (SR 290) in the City of Spokane Valley, WA. Pines Road (SR 27) and Trent Avenue (SR 290) are significant rural corridors for local and regional travel and freight movement. Pines Road is a state highway, State Route 27, and is one of Spokane Valley's primary north-south arterial roadways connecting rural eastern Washington with the urbanized greater Spokane region. Pines Road (SR 27) also directly connects Trent Avenue, also a state highway, State Route 290, with Interstate 90 (I-90) to the south, and is a preferred freight route to I-90 between rural north Idaho, Montana and Canada. The BNSF corridor carries freight between western ports and Midwest intermodal facilities as shown in Figure 1. The bottleneck in Spokane Valley has BNSF Railway expanding a second track through the region to meet present and future demands.

Figure 1: BNSF Freight Movement in the Pacific Northwest

The BNSF corridor also hosts Amtrak, with two passenger trains per day.

The Pines Road/BNSF GSP replaces an existing at-grade crossing with an underpass of BNSF's railroad tracks, provides a roundabout at the intersection

[1] 62trains/day (60 freight and 2 passenger) with an average crossing time of 3.55 minutes/train, creating 3.7 hours of roadway blockage due to freight and passenger trains/day (15.3% of the day); with 17,000 vehicles/day (2019 1-day City ADT projected into 2020), 15.3% of vehicles will be affected for an average of 1.78 minutes (including lead/lag time for gate operations), resulting in 77 vehicle hours/day of delay, or 28,061 vehicle hours/year
[2] Analysis of Washington Department of Transportation (WSDOT) Vehicle Crash Data, 2016-2020
[3] FMSIB's *Study of Road-Rail Conflicts – Phase 2 – Development of Project Priorities*, August, 2018
[4] SRTC's *Social Equity Mapping Tool*

of Pines Road (SR 27) and Trent Avenue (SR 290), and adds a shared-use path through the project limits. The underpass will be built to accommodate a total of four tracks. A new trailhead facility will be provided immediately east of the roundabout. Amenities will include restrooms, electric vehicle charging stations and bus parking space. Collectively, the project promotes active transportation by improving access and mobility between the nearby business park and commercial businesses, an elementary school, the Centennial Trail, and the Spokane River. Proposed improvements will reduce the risk of collisions between the existing 17,000 vehicles/day[5] and 62 trains/day[6] at the crossing and help prevent unintended releases of hazardous materials. The existing crossing is shown in Figure 2.

Figure 2: View of Existing Pines Road/BNSF Crossing

Replacement of the existing signalized intersection with a roundabout at the Pines/Trent intersection is predicted to reduce all collisions by at least 21%.[7] Afternoon peak hour intersection delays are anticipated to drop 40 seconds at the time of project completion, improving the intersection level of service from D to A.[8]

Pedestrians and cyclists will be able to safely cross under the BNSF tracks, along with crossing either Pines Road or Trent Avenue, due to the new, accessible facilities that currently do not exist. Also, while the project improves mobility options for the community, a quality of life element is realized as well: train horns through Spokane Valley will be reduced as the 62 daily trains will no longer be necessary to cross Pines Road.

[5] 2020 1-day traffic volume count performed by the City, grown at a 10-yr historical 1.5% rate into 2021
[6] Avg train count provided by email from BNSF to Spokane Valley's Adam Jackson on April 15, 2020 at 10:39 PM.
[7] Crash Modification Factors Clearinghouse: *Convert signalized intersection to modern roundabout*: http://www.cmfclearinghouse.org/detail.cfm?facid=4184
[8] Pines Road/BNSF Grade Separation – Consolidated Traffic and Safety Analysis, October 24, 2018 – Tables 8-9

The improvements support freight movement and regional mobility goals as articulated in various plans including the Horizon 2040, the Metropolitan Planning Organization's (MPO) regional transportation plan and the Inland Pacific Hub Transportation Study, a partnership of public and private agencies dedicated to creating a freight gateway in the region.

Figure 3 illustrates the project configuration, which is the result of a two-year alternative evaluation process that considered the benefits of various project alignments and compared a signalized intersection to a roundabout. The analysis was a coordinated effort with the Washington State Department of Transportation (WSDOT) and BNSF that accommodated a variety of project elements specific to the rail corridor and highway design requirements. Final design elements will accommodate BNSF's current mainline track expansion project and their long-term expansion to 4 mainline tracks. Important to note for the travelling public, the final design allows much of the project to be constructed "offline" which will minimize construction impacts to businesses and vehicle traffic during construction and also help maximize usable, developable land space. To date, the City has secured funding for the preliminary engineering and right of way phases.

Figure 3: Proposed Project Layout

1.1.1 Project Benefits Specific to Climate Change and Environmental Justice

As outline in Section 4 - Selection Criteria, the national- and state-level freight benefits of the project are strongly supported by local benefits that will be realized in the community. The project is centered in Census Tract 117.02, which has many of Spokane Valley's highest rates for vulnerable populations. The project improves access and mobility for these users by improving access to facilities, including a shared use path through the project limits, new access to the Centennial Trail via a trailhead, promoting expanded transit service routes, and by allowing for more timely and reliable connectivity to Valley Hospital, located one mile to the south.

The project also reduces the City's impact on the environment. The project reduces motorists' carbon footprint, saves travel time for users, provides increased transportation options, eliminates train horn noise, and accommodates electrification of the transportation network.

The project also helps connect rural traffic to interstate rail, freeway routes, and urban economic activity centers in the greater Spokane region and greater Pacific Northwest. Consistent with ROUTES, the project improves travel times for passenger and freight users while serving as an economic generator, helping unlock the potential for undeveloped industrial and commercial properties that will help create jobs for both rural and urban populations alike. Due to its location near the City's northern boundary, the project serves as a gateway for freight, goods, and travelers coming to and from rural Washington, Idaho, Montana, and Canada.

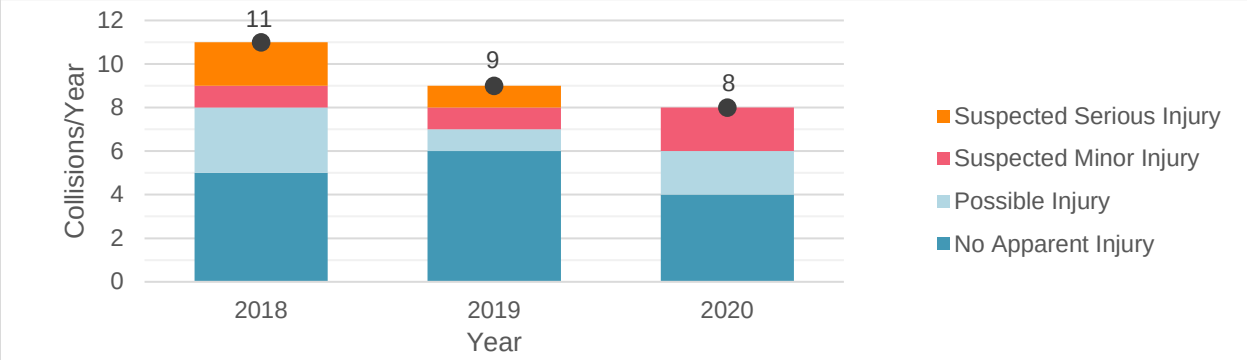
1.2 Transportation Challenges the Project Aims to Address

1.2.1 Safety Risks at and Near the Crossings

At-grade railroad crossings have the potential for fatalities, serious injuries, and hazardous material spills (e.g. Bakken oil), particularly when there are high volumes of rail traffic and roadway traffic. Similarly, incidents at road intersections and at-grade rail crossings could result in fatalities or serious injuries, particularly when there are high volumes of vehicle or rail traffic. The conflicts and risks associated with this project's existing at-grade crossing will continue to grow over time, as both train and vehicle volumes grow. It is projected the number of freight trains on this corridor will increase from 60 trains per day to a potential 102 trains per day by 2040.[9]

Collision history at the Pines Road / Trent Avenue intersection for 2018 to 2020 is summarized in Figure 4. Replacement of the existing signalized intersection with a roundabout will reduce collisions. Since all traffic moves through the roundabout in the same direction, the highest severity collisions associated with left turn and opposing movements will be virtually eliminated.

Figure 4: Collision History - Pines Rd (SR 27) / Trent Ave (SR 290) Intersection & BNSF At-Grade Crossing, 2018-2020



1.2.2 Inefficient Emergency Services Access

Key emergency services (fire, police, medical) are located south of the railroad tracks near I-90. On average, fire and police emergency personnel travelled through the project intersection three

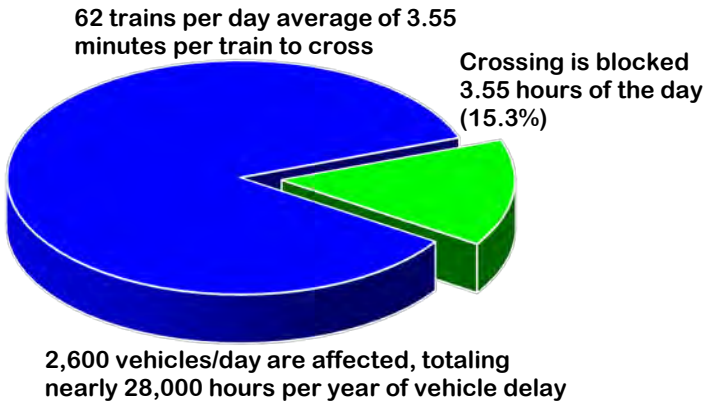
[9] Washington Department of Transportation (WSDOT) Washington State Rail Plan, August 2020: https://wsdot.wa.gov/sites/default/files/2020/08/27/2019-2040-State-Rail-Plan.pdf, Exhibit 5-6 illustrating 102 BNSF trains and two Amtrak trains passing through Spokane-Sandpoint corridor.

times each day when responding to an emergency.[10] Emergency vehicle access through the intersection is likely higher than three per day when accounting for privately-operated ambulance responses that do not access the state-operated intersection signal controls. Valley Hospital, located one mile south of the project location, is one of the five major hospitals in the Spokane Region and the only hospital east of the downtown Spokane urban center. The long and frequent delays at the rail crossing disrupts emergency services which can compromise public welfare. The grade-separated crossing removes this barrier to emergency vehicles, creating more reliable emergency access, while the roundabout provides for a more safe and efficient intersection.

1.2.3 Long Delays at the Crossings and Adjacent Intersections

The current daily freight and passenger train volume is estimated to be 62 trains/day, which means that on average, people and freight are delayed 62 times per day at each roadway-railway crossing. A City survey recorded an average of 3.55 minutes of delay for each train crossing. This average time over 62 crossings per day results in 77 vehicle hours of crossing delays to traffic on Pines Road daily. Delays are further compounded by the time required for the vehicle queues created by the train crossing to dissipate. In addition, queued vehicles may block adjacent intersections, most importantly the Pines/Trent intersection causing delays to through traffic on Trent Avenue. Figure 5 illustrates the delays due to train crossings.

Figure 5: Delays Due to Frequent Train Crossings



The existing Pines / Trent intersection operates at level of service (LOS) D in the afternoon peak hour. Trent Avenue as a corridor operates at LOS E with average delays per vehicle of approximately 60 seconds. By 2040, the PM peak hour delays will further increase to over two minutes per vehicle degrading this intersection to a LOS F if no improvements are implemented. Conversion of this intersection to a roundabout results in significant reduction in delay. With 2040 volumes and a roundabout at the intersection, the average delay per vehicle is forecast to be 8 seconds in the PM peak, as the intersection will operate at LOS A.[11]

1.2.4 Constrained Access to Future Developable Land

Close to 170 acres of mixed-use or commercially-zoned parcels and 56 acres of prime industrially-zoned parcels are undeveloped because property owners and developers cannot afford to mitigate the LOS E conditions at the Pines Road/Trent Avenue intersection.

[10] WSDOT's Opticom Emergency Response Log: 888 traffic preemption occurrences by police and fire personnel between August 26, 2019 and April 15, 2020 (233 days), 2.7 occurrences per day. Record excludes ambulance emergencies because they are operated by private businesses and not permitted to pre-empt traffic signal operations.
[11] Pines Road/BNSF Grade Separation – Consolidated Traffic and Safety Analysis, October 24, 2018 – Table 9

Specifically, the Pinecroft Business Park, located immediately southeast of the project, has capacity to double its employee population from 2,000 to over 4,000, and nearly double its 500,000 square feet of existing buildings space to upwards of 900,000 square feet.[12] These parcels, along with several hundred more acres beyond the city limits, are some of the last undeveloped parcels available for industrial use in the area. The project alignment minimizes construction impacts on freight and businesses and further maximizes area development.

1.2.5 Lack of Community Connectivity

The rail corridor bisects the northern parts of Spokane Valley from the majority of the city south of the railway. On Pines Road, the rail corridor divides underserved neighborhoods, schools, recreation areas, and commercial retail sites located on both sides of the railway. The new grade-separated crossing will provide safe and reliable vehicle and non-motorized access underneath the train tracks, making the route more appealing for all users and modes. In addition to a grade separated crossing of the railroad tracks, the roundabout will create a safer and more comfortable crossing of Trent Avenue. Residents and businesses will have a safer intersection to navigate that promotes expanded transit services and a new access point to the Centennial Trail and Spokane River. Access and mobility to nearby adjacent parks, Plantes Ferry and Mirabeau Parks, will invite more users because the safety and delay risks through the project limits will be alleviated. See Section 4.3 Quality of Life for more information.

1.2.6 Noise Pollution from Train Horns

Spokane Valley residents have long complained about the noise pollution of the train horns. Federal law requires locomotives to sound their horns at 96 to 110 decibels as they approach at-grade crossings and continue blowing the horn until the lead locomotive fully occupies the crossing. The required pattern is two long, one short and one long horn, repeated as necessary until the train clears the crossing. With 62 trains crossing Pines Road, horns are a source of significant public concern in Spokane Valley.[13]

1.3 Project History and Relationship to Other Plans

The following summarizes plans that support the Pines Road/BNSF grade-separation project.

1.3.1 Project Status: Previously Completed Project Components

Significant progress has been made since the project's first submittal to USDOT's BUILD FY18 funding program. To date, engineering design is funded through 60% and the project has received approval of major design milestones: Basis of Design (BOD), Intersection Plan for Approval (IPA), and Intersection Control Evaluation (ICE). Further, the project has acquired its most complicated and highest risk properties. Aside from construction, remaining tasks include final engineering design and low-risk property acquisitions needed for frontage improvements of the new street improvements. See Section 3.1 for more information.

[12] Letter to City of Spokane Valley Council, J. Traeger, JMA Commercial Real Estate, LLC for Pinecroft, LLC (http://www.spokanevalley.org/filestorage/6862/6927/8180/11735/Pinecroft_Business_Park.pdf)
[13] "Spokane Valley, Cheney residents want to silence train whistles." The Spokesman-Review, March 6, 2016

1.3.2 Washington State Joint Transportation Committee

The Joint Transportation Committee (JTC) was created to review and research transportation programs and issues to better inform state and local policymakers. From 2017-2018, the JTC evaluated prominent road/rail conflicts and developed a prioritization process to address the impacts on a statewide level based on mobility, safety and community criteria. Using this process, Pines Road/BNSF GSP was ranked as the top unfunded project in the state out of over 300 crossings reviewed and out of nearly 4,200 total crossings statewide. [14]

1.3.3 Horizon 2040 https://www.srtc.org/horizon-2040/

Horizon 2040 is the Spokane Regional Transportation Council's (SRTC) long-range transportation plan for the Spokane region through 2040. Horizon 2040 identifies the following projects along the BNSF railroad as regionally significant:

- Pines Road (SR 27)/Trent Avenue (SR 290) underpass (planned construction 2020-2030);
- Barker Road/Trent Avenue (SR 290) overpass; and
- Sullivan Road Bridge improvements/Trent Avenue (SR 290) overpass

1.3.4 Great Northern Corridor Coalition http://greatnortherncorridor.org/coalition

The Great Northern Corridor Coalition (GNCC) is a multi-state cooperative of eight northern tier states, several MPOs and ports, BNSF Railway and other interested parties. The Coalition's mission is to promote a premier multi-state corridor by collectively promoting public policy, research and multi-modal infrastructure development that expands commerce and enhances safety on the corridor (see Figure 6). The GNCC has identified this project in its strategic planning documents and continually promotes grade crossing safety improvement projects.

Figure 6: Great Northern Corridor Route (Chicago to West Coast Ports)

1.3.5 Inland Pacific Hub https://www.srtc.org/inland-pacific-hub/

The Inland Pacific Hub (IPH) is a partnership of public and private representatives from northern Idaho and eastern Washington working together to create a multi-modal global gateway to foster

[14] Freight Mobility Strategic Investment Board's *Study of Road-Rail Conflicts – Phase 2 – Development of Project Priorities*, August, 2018 (pdf page 21 of 28), prepared for the Washington State Joint Transportation Committee

increased domestic and international commerce. Phase 2 of the IPH initiative identified priorities to support the IPH vision, including Horizon 2040 and Bridging the Valley programs.[15]

1.3.6 Bridging the Valley https://www.srtc.org/bridging-the-valley/#

Bridging the Valley (BTV) is a 2006 regional plan to separate vehicle traffic from train traffic in the 42-mile corridor between Spokane, Washington, and Athol, Idaho. The corridor includes 75 at-grade rail crossings, 11 of which were recommended to be grade separated. The Pines Road/BNSF project is one of these 11 projects. The original concept required the full acquisition and relocation of several existing businesses, called for a new traffic signal, had steep road grades to cross under the BNSF tracks, was very costly, and ultimately resulted in significant traffic impacts to both Trent Avenue and Pines Road. The proposed layout is a practical solution that resulted from the coordinated evaluation with freight representatives and the Washington State Department of Transportation (WSDOT). The final layout provides the public with the most benefit, minimizing the impacts to property owners and the traveling public both during and after construction.

1.4 Project Parties

The **City of Spokane Valley** is the project applicant and will manage all grant awards, design and construction activities for the project. Spokane Valley is located near the eastern border of Washington and is the ninth largest city in Washington with a population of nearly 100,000.[16] The City will work closely with the WSDOT and BNSF Railway to deliver the project.

WSDOT is responsible for building, maintaining, and operating the state highway system and state ferry system. They are responsible for 26 miles of highway within Spokane Valley, including Pines Road (SR 27) and Trent Avenue (SR 290). If project timing is consistent with WSDOT's staffing demands in its construction management office, there is a high likelihood that the project's construction administration services would be contracted to WSDOT staff, promoting a streamlined delivery process with federal documentation guidelines, saving the project time and money.

BNSF Railway Company is an active and supportive project partner, as indicated in its letter of support. BNSF operates the east-west Class I railway at the heart of this project. Spokane Valley is a convergence of several rail lines on the northern tier of BNSF's network. The Pines Road/BNSF GSP will accommodate up to four tracks to satisfy future BNSF needs and provide for long term growth. It will also help alleviate the bottleneck that exists along the rail corridor illustrated in Figure 6.

[15] Inland Pacific Hub Transportation Investment and Project Priority Blueprint, 2012 (search "Bridging the Valley")
[16] United States Census Bureau https://www.census.gov/quickfacts/spokanevalleycitywashington, July 1, 2019

Avista Utilities provides electricity and natural gas service to over 340,000 customers spanning 4 northwestern states. Committed to addressing climate change and striving to best-serve their customers, Avista Utilities proactively seeks to improve the environment and quality of life for the communities they serve. As a result, Avista Utilities is collaborating with the City regarding the donation of 3.84 acres to be developed as a trailhead to the Centennial Trail and Spokane River. The donation will be completed by December 2021. See Avsita Utilities' letter of support in the 'Partners' section of the project website.

The project partners will coordinate closely and support project delivery as follows:

Project Activity:	Spokane Valley	WSDOT	BNSF Railway	Avista Utilities
Right-of-Way Acquisitions	✓	✓	✓	✓
Manage Funding Allocations	✓			
Procurement	✓			
Project Reviews/Approvals	✓	✓	✓	
Public Involvement	✓	✓		✓
Construction Management	✓	✓		

1.5 Summary of Project Benefits

Construction of this project has both national and regional significance. At the national level, the project supports climate change and environmental justice challenges. Carbon emissions will be reduced and improved transportation options will be made available to some of Spokane Valley's most disadvantaged communities. Further, the project supports USDOT's ROUTES Initiative by improving rural mobility and reliability while reducing risk for freight trains, passenger trains, and freight trucks by eliminating road/rail conflicts. The elimination of the project's at-grade crossing reduces train/vehicle incident risks at the crossing. The BNSF rail corridor carries freight and passenger trains between western ports and Midwest intermodal facilities; serving as a critical link, connecting rural mid-west America with ports and metropolises on the west coast.

At a regional and local-level, the following benefits are realized:

- Elimination of delays at the rail crossing will enhance the mobility of freight trucks traveling to/from Interstate 90 just south of the project
- Proposed alignment also allows for minimal construction delays/impacts
- Improved mobility and safety for all users promotes increased access between homes, businesses, schools, and parks, including new trailhead and parking lot access to the Centennial Trail and Spokane River
- Significantly improving the traffic operations of the intersection
- Maximizing the economic potential of vacant industrial, mixed-use, and commercial land

- Improving the quality of life through noise and emissions reductions
- Improving access and reliability for police, fire and medical providers
- Doubling of the distance between the project intersection and Trent Elementary

The overall project supports regional commerce within the Inland Pacific Hub and achieves regional planning goals that have been in place for more than a decade.

Expected system users that will benefit from this project include:

- Travelers and local residents (automobile drivers/passengers, pedestrians, bicyclists)
- Trucking companies and the companies that use their services for freight transport
- Rail Users: Amtrak, BNSF and freight companies using the railway for transport
- Property owners near the project (businesses, vacant land owners)
- Public Services: Emergency services providers & East Valley School District

Table 1 summarizes the conditions of the proposed crossing with and without the project.

Table 1: Before and After Conditions at Pines Road BNSF Railway Crossings

Conditions	No Project	With Project
At-grade crossings	1	0
Longest segment with no at-grade crossings* (miles)	1.0	2.1
Daily Train Horns at Pines/BNSF Crossing	62	0
Predicted annual collisions** – Pines/Trent intersection	22	17***
Predicted annual incidents (Fatal and Injury) - Pines/Trent intersection	4	3
Predicted annual incidents** - Pines Road/BNSF crossing	2	0
Annual vehicle hours of peak hour intersection delay** - Pines/Trent intersection	13,432	3,454
Annual vehicle hours of railroad crossing delay** - Pines Road/BNSF crossing	38,797	0

** Between Evergreen Road and Vista Road*
*** Based on 2026 (project opening year) volumes and a roundabout at Pines & Trent; number of predicted collisions and delays will increase as volumes increase*
**** The total number of collisions at the Pines/Trent intersection is predicted to drop 5 collisions/year. Due to the project's safety improvements, accidents of all severities are expected to decrease by 21%*

This project will generate key long-term benefits that leverage federal investment by enhancing the mobility and safety of people and freight in the region, while also providing economic opportunities and enhancing the environment and surrounding rural communities. The project outcomes are summarized in Table 2.

Table 2: Expected Project Outcomes

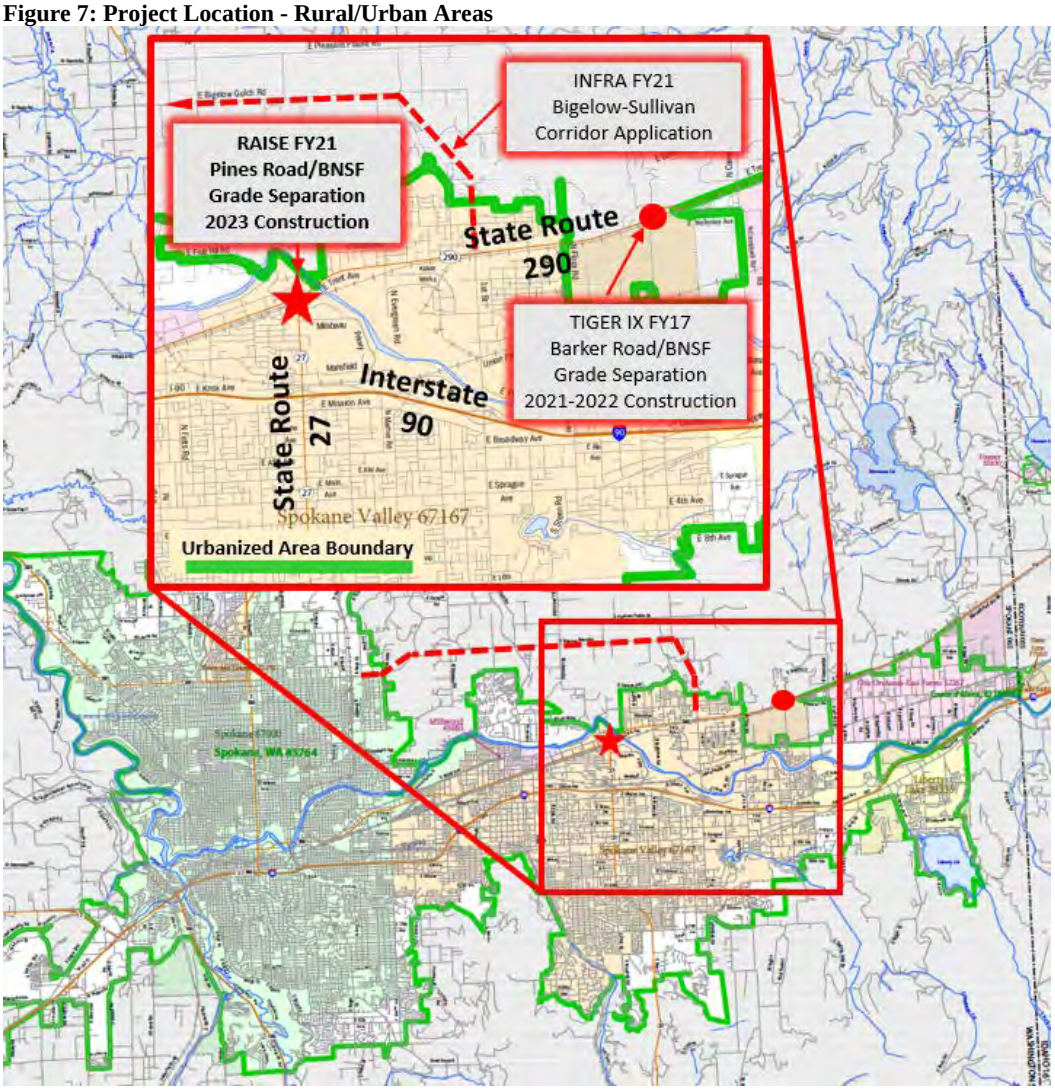
Safety Outcomes	• Eliminates conflict between roadway users and trains by separating uses • Eliminates potential queuing of vehicles stopped for train crossings • Reduces the potential for high severity collisions at the intersection • Adds ADA-accessible active transportation features to increase safety • Improves emergency access for police, fire and medical providers
State of Good Repair	• Improves resilience through new construction of underpass, intersection improvement via roundabout and approaches to current standards • The City of Spokane Valley's various street-related funds have sufficient funding to cover operations and maintenance; there is a Capital Reserve available as a contingency • The City successfully implemented similar projects, like the recent construction of TIGER-funded Barker Road/BNSF GSP and the 2015 reconstruction of the Sullivan Road West Bridge at the Spokane River.
Economic Competitiveness	• Contributes to reliable movement of regional freight by road and rail • Adds capacity for a total of four BNSF tracks at the crossing location • Minimize construction delays/impacts felt by users and businesses • Decrease transportation costs and improve long-term efficiency, reliability, and costs in the movement of workers and goods • Combined with other Horizon 2040 regionally significant projects, creates a 3.6-mile section with only one at-grade BNSF crossing • Maximize the access and reliability to close to 170 acres of prime, buildable industrial-zoned land and 56 acres of residential-zoned land
Environmental Sustainability	• Reduces fuel consumption and tailpipe emissions for idling vehicles • Provides electric vehicle charging stations at new trailhead parking lot • Eliminates the need for train horns for a 2.1-mile section
Quality of Life	• Improves community connectivity between neighborhoods, industrial jobs, and nearby recreational areas • New Centennial Trail trailhead and parking lot access point • Eliminates train horn noise at Pines Road and improves the health and well-being of surrounding residents and businesses[17] • Reduces delay for all modes of travel and improve traffic circulation • Greatly enhance accessibility for active modes by eliminating infrastructure gaps and reducing delay • Moves the intersection away from the school and provides pedestrian facilities for all users, including school children
Partnership and Innovation	• Helps fulfill the vision of the MPO's Horizon 2040 Plan • Maximize land donation from Avista Utilities to provide community amenities (new trailhead and parking lot) • Addresses one of Washington State's highest priority road-rail conflicts. • Supports the BNSF double track expansion project and the Great Northern Corridor Coalition's vision for safe, efficient, and environmentally sound transportation services

[17] "Spokane Valley, Cheney residents want to silence train whistles." The Spokesman-Review, March 6, 2016

2 Project Location

The project is located in the Spokane Valley, WA, in the northeast corner of the state, nearly 9 miles from the Idaho border and 90 miles south of the Canadian border. It is one-quarter mile within the urbanized area (UA) of Spokane Valley (67167) and is located at the intersection of SR 27 (Pines Road) and SR 290 (Trent Ave.), which straddles the north limits of the greater Spokane urban area boundary, as shown in Figure 7. The project in in Census Tract 117.02 and is not an Area of Persistent Poverty. The geographic location is 47°41'21" N, 117°14'22" W.

Figure 7: Project Location - Rural/Urban Areas



The Pines Road/BNSF grade separation project is four miles west of the City's Barker Road/BNSF grade separation project and two miles west of the Sullivan Road/SR 290 interchange reconstruction project included in the INFRA FY21 Bigelow-Sullivan Freight Mobility & Safety Project (Figure 8). The Barker Road/BNSF project was awarded over $9 million from the TIGER IX program and is currently under construction. The Pines Road/BNSF GSP is a continuation of the regional *Bridging the Valley* goal discussed in Section 1.3.6.

Figure 8: Project Locations and Connections to Existing Transportation Infrastructure

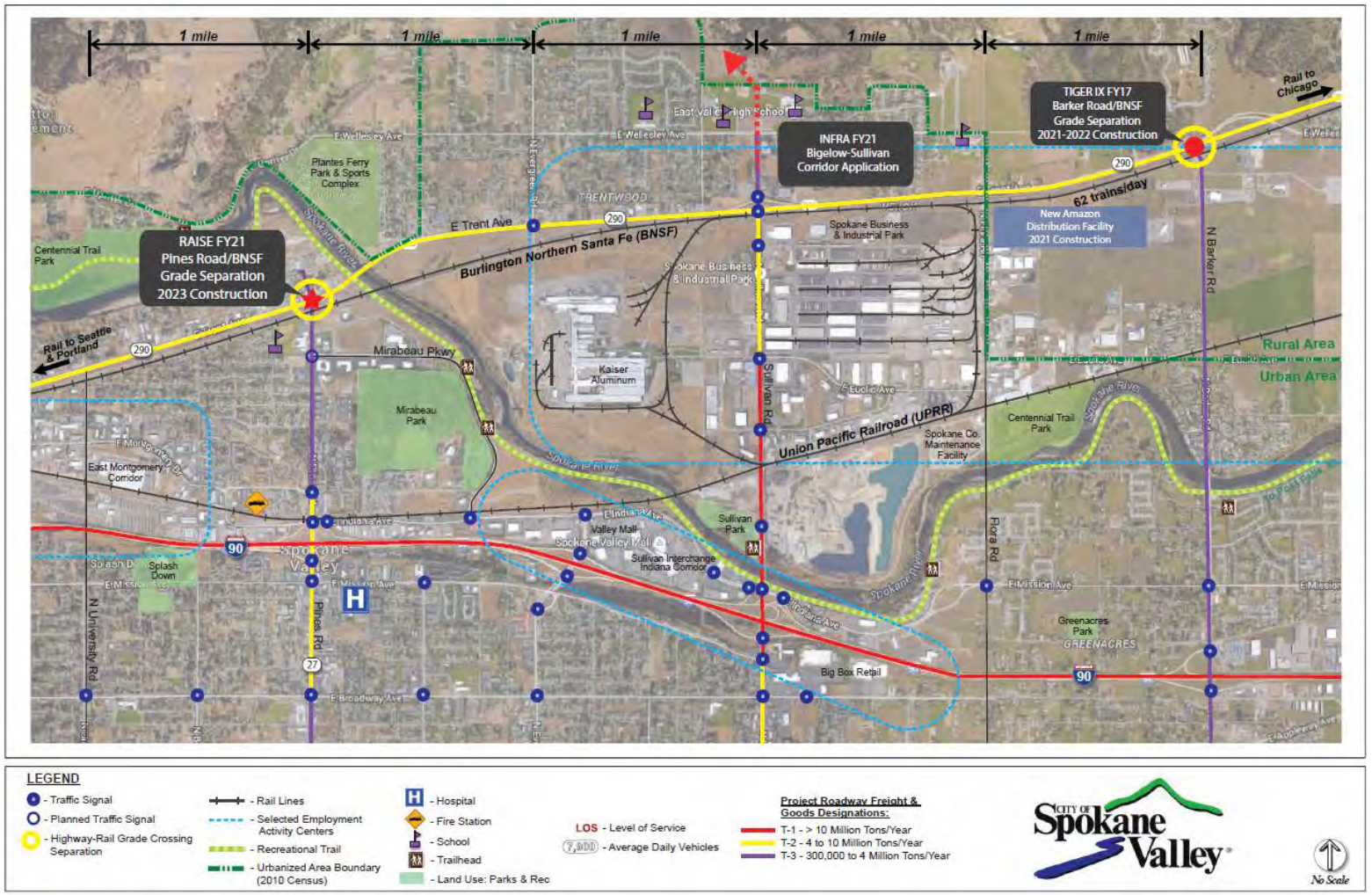


Figure 8 includes the proposed project location and surrounding area. Key features shown include:

- *Pines Road/BNSF Grade Separation Project: highway-rail crossing improvements on the BNSF rail line: Grade separation at Pines Road (SR 27)*
- *TIGER IX-Funded Barker Road/BNSF grade separation project and closure of Flora Road/BNSF at-grade crossing (2021 Construction)*
- *INFRA FY21 Project Application: Bigelow-Sullivan Freight Mobility & Safety Project*
- *Freight Rail Routes: BNSF and UPRR lines*
- *Land Use: key industrial areas, parks and recreation areas, schools, and vacant land*

3 Grant Funds, Sources & Uses of Project Funds

The City of Spokane Valley is requesting **$16,239,622 in RAISE grant funds**, which is **67.79%** of the **$23,956,810** total future project cost. This section discusses previously incurred costs, committed and expected funding, and the allocation of funds, including RAISE funds.

3.1 Previously Incurred Project Costs

The total project cost is $28,784,385, which includes $4,827,575 of previously incurred costs. The project has made great progress since BUILD FY20 and some engineering and right of way funds have been authorized and are not eligible for consideration in RAISE FY21. These previously incurred costs cover any expenses expected to be incurred between time of award and obligation of RAISE funds. Table 3 describes the previously incurred project costs to date:

- Planning and preliminary engineering work consists of the 2006 study titled *Bridging the Valley*, which provided 30% design plans, cost estimates for the preliminary concept development and environmental documentation (initial NEPA approval in 2006).
- Engineering work includes city-funded concept evaluation and FRA's Consolidated Railroad Infrastructure and Safety Improvements (CRISI) grant program for 60% preliminary engineering and NEPA phase. CRISI funds were authorized in 2020. As a result, in spring 2021, the project received approval of its BOD, IPA, and ICE.
- Right-of-way acquisition includes a 2015 city-funded acquisition and a portion of the Federal Highway Administration's Surface Transportation Block Grant (STBG) funds, which have been authorized for the project's only property requiring relocation and the remaining full acquisition of two vacant parcels. These three acquisitions were all completed by June 2021 and were the project's highest risk acquisitions.

Table 3: Previously Incurred Project Costs

Previously Incurred Project Costs	Total ($)	Total (%)
Federal Funding		
2006 *Bridging the Valley* Preliminary Engineering Study	$ 394,385	8.17%
Preliminary Engineering (CRISI Funds)	$1,246,500	25.82%
2020 Early ROW Acquisition (STBG Funds)	$1,249,925	25.89%
Subtotal	**$2,890,810**	**59.88%**
Non-Federal Funding		
Preliminary Engineering (City Match for CRISI Funds)	$1,246,500	25.82%
2015 ROW Acquisition (City Funds)	$ 495,190	10.26%
2020 Early ROW Acquisition (City Match for STBG Funds)	$ 195,075	4.04%
Subtotal	**$1,936,765**	**40.12%**
Total Previously Incurred Project Costs	**$4,827,575**	**100.00%**

3.2 Project Budget: Committed and Expected Funding

Secured funding represents valuable contributions at the federal level and elevate the importance of the project to the regional and national scale. Table 4 identifies the federal and non-federal funding sources that comprise the future eligible project costs. Appendices A and D include the local agency endorsement form and secured and expected funding documentation, respectively.

Table 4: Future Eligible Costs by Funding Source

Status	Source	Amount ($)	Amount (%)
Federal Funding			
Requested	RAISE Program	16,239,622	67.79%
Committed	STBG Program (Remaining STBG funds)	2,545,075	10.62%
	Subtotal	**$18,784,697**	**78.41%**
Non-Federal Funding			
Committed	City of Spokane Valley	2,441,917	10.19%
Expected	City of Spokane Valley	1,715,197	7.16%
	BNSF*	300,000	1.25%
	Avista Utilities (Land Donation)	715,000	2.98%
	Subtotal	**5,172,114**	**21.59%**
	Total	**$ 23,956,810**	**100%**

** Per 23CFR 646.210, BNSF will determine funding commitment as the 60% design and cost estimates are brought to current standards.*

The project's two applicable grant programs in Table 4 require non-federal commitments:

- Requested RAISE funding complies with the minimum required 20% non-federal match, as indicated by the listed contributions from the City, BNSF, and Avista Utilities.
- Committed STBG funding requires a 13.5% non-federal match, which is covered by a respective portion of committed local funds.

The City's committed funds are from the Capital Reserve and Grade Separation Project funds. If awarded RAISE funding, the City's expected funds may be made available in one of two readily available methods. First, funds can be made available from accounts in the City's general fund that are currently earmarked to lower priority projects. Second, the City has available debt capacity from its non-voted limited tax general obligation (LTGO) bonds which are secured by the City's full faith and credit and taxing power.

The project's two other expected funding commitments represent the strong public-private partnerships that this project has garnered in the region:

- BNSF will be determine its financial contribution as design nears 90% completion and a construction agreement is finalize. BNSF has acknowledged this financial participation in its April 9, 2021 letter of support, estimated to be $300,000.

- The City is finalizing its agreement with Avista Utilities for the land donation of 3.84 acres immediately east of the project's roundabout to allow for trailhead facilities. This donation amplifies the local commitment to improve equitable transportation options for the underserved populations surrounding the project limits, see Avista's letter of support.

In 2000, the Washington state Freight Mobility and Strategic Investment Board (FMSIB) **awarded the project $3,360,000**. However, due to inactivity, in 2007 FMSIB placed its committed funds into "deferred" status. As a "deferred" award, the project is eligible for FMSIB funding but must wait until FMSIB's next call for projects.

Parallel to this RAISE FY21 request, the City will continue to pursue additional non-Federal funds through various programs such as Washington State Transportation Improvement Board (TIB), Washington State Legislative Direct Appropriation (LDA), or City contributions.

3.3 Project Budget: Funding Sources by Project Phase

The future eligible project costs cover the project's final engineering design, remaining right of way acquisition efforts, and all construction activities, see Table 5. STBG funds are not limited to a specific phase of the project but are allocated predominately to the right-of-way phase. Unused STBG funds from the right-of-way phase will carry into the construction phase.

Table 5: Allocation of Future Eligible Project Costs by Project Phase

Project Phase	Previously Incurred Costs	Future Eligible Costs				Total Project Costs
		RAISE	Other Federal	Non-Federal	Subtotal	
Engineering	$2,887,385	$ 405,600	$ -	$ 101,400	$ 507,000	$ 3,394,385
(% by Phase)		*80.00%*	*0.00%*	*20.00%*	*100%*	
Right-of-Way	$1,940,190	$ -	$2,169,256	$1,053,554	$ 3,222,810	$ 5,163,000
(% by Phase)		*0.00%*	*67.31%*	*32.69%*	*100%*	
Construction	$ -	$15,834,022	$ 375,819	$4,017,159	$20,227,000	$20,227,000
(% by Phase)		*78.28%*	*1.86%*	*19.86%*	*100%*	
TOTAL	$4,827,575	**$16,239,622**	**$2,545,075**	**$5,172,114**	**$23,956,810**	$28,784,385
(% by Funding Type)		*67.79%*	*10.62%*	*21.59%*	*100%*	*Note

*Note: If the 2006 *Bridging the Valley* cost of $394,385 is removed from the previously incurred engineering costs, the total estimated project cost becomes $28,390,000, which matches the cost estimate included in Appendix B.

3.4 RAISE Funding Allocation

As indicated in Table 5, awarded RAISE funding will be expended on the project's final engineering design phase and construction phase. The right of way phase is fully funded with other federal and non-federal funds and should not warrant the use of RAISE funds.

4 Selection Criteria

This section provides a summary of how the project meets the merit selection criteria for outcomes related to safety, state of good repair, economic competitiveness, environmental protection, quality of life, innovation, partnership, and non-Federal revenue for transportation infrastructure investment.

4.1 Safety

The BNSF rail crossing and highway intersection are both high volume corridors and present significant safety hazards for vehicle, pedestrian, and bicyclist traffic. The project construction maximizes safety by minimizing the impacts on the travelling public during construction by building most of the improvements "offline," limiting delays and work zone conflicts. See Table 1 in Section 1.5 for a summary of safety benefits. BNSF freight growth projections plan for 104 daily trains in the future, or four to five trains every hour on average. As the City grows, the safety risks associated with the at-grade crossing will increase.

As discussed in Section 1.3.1, the Pines Road/BNSF grade separation project is ranked the state's number one unfunded, road-rail conflict priority. To illustrate the magnitude of shipments, the Washington State Department of Ecology estimates that over 2.8 billion gallons of Bakken oil travels through Spokane Valley annually.[18] This project eliminates the risk of fatalities, serious injuries, and commodity spills that can happen at road/rail at-grade crossings.

In addition to the positive outcomes of the roadway-railway grade separation, the project offers additional safety benefits by replacing traffic signal at SR 27 & SR 290 with a roundabout. As discussed in Section 1.1, it is expected that a roundabout will result in a 21% reduction in collisions. Table 6 summarizes the expected collision reduction for the railroad crossing and Pines/Trent intersection in 2040 horizon year (2040 is the MPO's future planning year).

Table 6: Annual Collision Reduction, 2040 Horizon Year

Location	All Collisions	Fatal and Injury Collisions
Pines / BNSF RR Crossing	2.0	0.7
Pines / Trent Intersection	6.0	1.1
Total	8.0	1.8

The grade separation project also improves emergency access and provides enhanced detour/evacuation routes to residents, businesses, and schools by eliminating the delay impact resulting from crossing trains or incidents on the tracks. Additionally, improved access to Trent Avenue enhances the highway's role as a good alternate route to I-90 and Highway 95 in Idaho.

Students at Trent Elementary are not allowed to walk to school through the project intersection because of its associated hazards. This project will improve pedestrian accessibility through the

[18] As of March 31, 2020, 42 gallons per barrel x 680 barrels per car x 24,596 cars per quarter x 4 quarters = 2.81 billion gallons: https://fortress.wa.gov/ecy/publications/documents/2008006.pdf

highway intersection and under the railroad crossing. The school further supports the project because it moves the physical intersection almost one-quarter mile farther from the school, twice its current distance. The safety of active modes will be enhanced with the addition of ADA-accessible sidewalks throughout the project which currently lacks any pedestrian or bicycle facilities at the rail crossing. A new shared-use path along the south project limits also provides a non-motorized route for users to safely pass under the BNSF rail crossing.

4.2 Environmental Sustainability

The proposed project has multiple environmental benefits across a variety of genres. Spokane Valley's Resolution #16-010 is the City's Greenhouse Gas Emissions Reduction Policy and serves as a baseline for preliminary project considerations. Supportive of this policy, the project elements (grade separated rail crossing, dual-lane roundabout, shared-use path, new trailhead facility) have the following quantified environmental benefits:

- Eliminate 4.5 million person-hours of delay at the rail crossing
- Reduce gasoline, diesel, and oil consumption by over 700,000 gallons
- Reduce over 5,300 tons of greenhouse gas emissions (CO2, NOx, VOC, PM, SO2)
- Save $71 million in reduced travel time costs
- Save $82 million in safety and avoided crash costs
- By 2040, PM peak hour intersection delays drop 40 seconds/vehicle at roundabout.[19] These savings equate to nearly 40 hours of daily time savings.[20]
- Increase reliability and resiliency, particularly for emergency responders and freight
- Promotes clean transportation options with new electric vehicle charging stations
- Reduced noise pollution with the elimination of required train horns at crossing
- Promotes expanded transit routes to reduce reliance on single occupant vehicle trips and improve transportation options for disadvantaged populations
- Promotes the use of recycled materials in project construction, as specified in the WSDOT 2021 Standard Specifications Section 1-06.6 – Recycled Materials
- Improved stormwater facilities to treat highway runoff consistent with the Spokane Regional Stormwater Manual, a region-specific stormwater design manual focused on preserving the integrity of the region's US EPA-designated sole-source aquifer: the Spokane Valley-Rathdrum Prairie Aquifer. The aquifer is the only feasible source of drinking water available to the region and provides drinking water for over 500,000 people. The project will eliminate the existing drywells that discharge runoff directly from the streets into the aquifer and replace them with appropriate treatment facilities. Further, the project will incorporate drought resistant plans along the shared-use path and trailhead and will include drip irrigation systems to minimize water usage.
- Promotes reduction of Particulate Matter (PM10) and Carbon Monoxide (CO), in Spokane County, which is identified by the EPA as a "maintenance area."

[19] Pines Road/BNSF Grade Separation – Consolidated Traffic and Safety Analysis, October 24, 2018 – Table 8 &9
[20] PM Peak Hour assumes 10% of intersection ADT of 35,000 vehicles (based on most recent City volume counts)
Roundabout: 40 seconds/vehicle x 10% x 35,000 vehicles / 3600 seconds/hour = 38.9 hours

4.3 Quality of Life

The Pines Road/BNSF Grade Separation project will substantially contribute to the improved livability for the region by enhancing community connectivity and accessibility while reducing the negative impacts caused by trains and highways that bisect the community.

The area north of Trent Avenue is largely residential but has commercial businesses fronting Trent Ave. Plantes Ferry Park & Sports Complex is a 95-acre regional sports complex, located northeast of the project, with sporting fields, trails, picnic areas, and playgrounds. Trent Elementary School, Pinecroft Business & Industrial Park, and Mirabeau Park Centre Place Regional Events Center are all located south of the Pines Road/BNSF crossing. The majority of the City's commercial, employment, and residential uses lie south of the BNSF corridor and Trent Avenue, including I-90 and Valley Hospital. This project will help knit together the northern and southern sectors of the community by eliminating barriers that impede mobility.

The proposed improvements most closely benefit Spokane Valley's most disadvantaged populations. Per SRTC's *Social Equity Mapping Tool*, Census Tract 117.02 includes populations that have disproportionately high rates when compared to the rest of the city: poverty (20%), minority (21%), youth (15%), disability (20%) and non-English speakers (14%).

The project will provide the following improved transportation options:

- Expanded transit service connecting the Pines Rd. corridor to the growing business and industrial properties along Trent Ave., Sullivan Rd., and Barker Rd.
- New shared-use path for pedestrians and bicyclist located on the east side of Pines Rd., connecting Mirabeau Parkway to the new trailhead facility at the Centennial Trail & Spokane River, and also through the new roundabout at Trent Ave.
    - The 37.5-mile paved, mixed-use Centennial Trail runs along the Spokane River between Spokane, WA and Coeur d'Alene, ID. It connects several amenities and includes multiple crossings of the Spokane River. South of Trent Ave., Mirabeau Parkway provides access to Mirabeau Park from Pines Road, with trail access.
- Reliable north-south access under the BNSF crossing, eliminating delays for users and ensuring timely access to emergency services, schools, parks and commercial corridors
- Improved, ADA-compliant sidewalks throughout the new roundabout intersection that provides pedestrians and bicyclists with street-crossings that include curbed medians and increased signage that reduce crossing distance and increase visibility of users
- Electric vehicle charging station to promote clean transportation options on highways

In June 2021, the City completed its first Title VI plan in accordance with Title VI of the Civil Rights Act of 1964. This plan reaffirms the processes already performed by the City, but ensures that no person shall, on the grounds of race, color, and national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination in any operation of Spokane Valley.

4.4 Economic Competitiveness

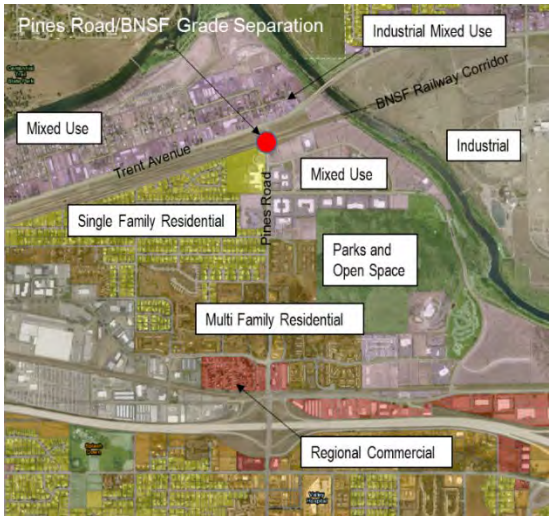
The smooth flow of trade, vital to U.S. economic competitiveness, is facilitated by addressing key deficiencies across the system. The Pines Road grade separation of the BNSF mainline provides an opportunity to target a local deficiency that effectively ripples through the rest of the transportation system and improving long-term system efficiency, reliability, and the regional economy. The BNSF mainline through Spokane Valley is part of a broad rail network that moves freight between international marine ports and terminals on the west coast, and points across the western half of the U.S. All three of Washington's east-west freight lines are owned by BNSF and they all funnel through the Spokane rail corridor.[21] The BNSF railway also serves interstate passenger rail service via Amtrak's Empire Builder route between Seattle and Chicago.

Currently, the BNSF line carries an average of 60 freight and two passenger trains daily, and usage is projected to reach up to 102 freight trains and two passenger trains daily.[22] Upon completion, there will be 2.1 miles of rail corridor that will be unencumbered by at-grade crossings. When combined with the other Horizon 2040 regionally significant projects (Barker Road/BNSF Grade Separation and Sullivan Road Bridge Reconstruction), the only remaining at-grade crossings between Harvard Road and Vista Road would be at Evergreen and University Roads.

The Pines Road grade separation also has a significant benefit to trade facilitated by trucking. Pines Road serves as a primary arterial to Interstate 90. The project promotes improved interstate freight movement to/from Canada and Idaho through Spokane County/Kootenai County by reducing vehicle-train conflicts as envisioned in the 2006 Bridging the Valley Plan.

The project improves regional economic vitality by improving reliability and accessibility to 170 acres of mixed-use or commercially-zoned and 56 acres of prime industrially-zoned parcels shown in Figure 9. The City is expected to accommodate an additional 20,000 residents[23] and the Pines/Trent/I-90 area will remain a centralized corridor for growth (See Figure 10). This project contributes significantly to supporting and managing this economic growth by building transportation infrastructure necessary to attract, retain, and expand businesses.

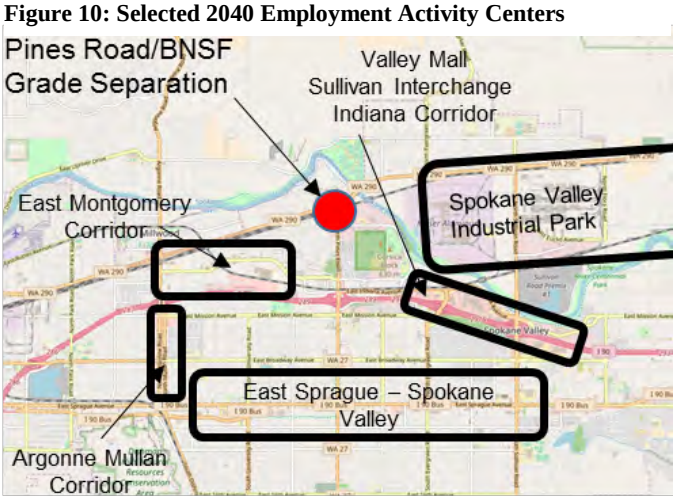
Figure 9: Current Zoning



[21] Washington Department of Transportation (WSDOT) Washington State Rail Plan, August 2020: https://wsdot.wa.gov/sites/default/files/2020/08/27/2019-2040-State-Rail-Plan.pdf, Section 6.1, PDF page 88.
[22] Ibid. Exhibit 5-6 illustrating 102 BNSF trains and two Amtrak trains passing through Spokane-Sandpoint corridor.
[23] Exhibit 2: Residential Land Capacity, *Existing Conditions-Housing and Economic Trends*

The investment to expand the capacity of the transportation network will allow the land to support economic development at a much higher intensity. The economic and tax impacts of that higher level of development stemming from the construction and occupation of industrial developments are estimated as follows[24]:

Figure 10: Selected 2040 Employment Activity Centers



- $1.3 billion in total economic output in Spokane County ($686 million in direct spending)
- 8,719 new jobs supported in the county (4,312 direct jobs)
- $8.2 million in new general fund taxes to the city (25 year present value at 4%)
- $101.9 million in new general fund taxes to the state (25 year present value at 4%)

4.5 State of Good Repair

The proposed project will install a new roundabout, improve the pavement condition on two state highways, and construct new bridge structures with enough capacity for up to four tracks. The improvements increase the resilience of the National Highway System and if left unimproved, the at-grade crossing will continue to be a safety risk that negatively effects the national and regional economy and hinders the local quality of life and connectivity. Without the proposed improvements, at-grade road-rail conflicts will increase as freight volumes and populations grow. Traffic signal levels of service will continue to drop, and transportation mobility will continue to limit the available options for the disadvantaged populations in the project area.

All design will be to current design standards to provide a robust finished product that will have long term resilience greater than the current infrastructure. WSDOT has responsibility for maintenance of Pines Road and Trent Avenue and has the resources to implement and properly maintain the asset for the design life of all elements.

The financial condition of the City of Spokane Valley is reported in their comprehensive annual budget and monthly financial reports.[25] The City employs staff with experience in grant management, project management and asset management.

The City successfully manages approximately five to eight million dollars in grants (federal and non-federal) on an annual basis and documents these figures in the annual budget. The primary

[24] Fiscal and Economic Benefits of the Pines Road Underpass Project, ECONorthwest 2016; http://www.spokanevalley.org/PinesBNSF
[25] Spokane Valley Budget & Financial Reports: http://www.spokanevalley.org/content/6836/6902/7156/default.aspx

source of the City capital funding for transportation projects comes from the City's Real Estate Excise Tax (REET) Revenue. Transportation operations funding comes from state gas tax revenue and a utility tax on telephones. The City's Street Fund has sufficient funding to cover operations and maintenance of the project. The City has a Capital Reserve Fund as a contingency for capital projects, and the General Fund may be used as a contingency for operating costs. Independent Audit Opinions are performed annually for the City of Spokane Valley under the U.S. Office of Management and Budget (OMB) Circular A-133. The two most recent, for fiscal years 2018 and 2019, reported no Significant Deficiencies or Material Weaknesses.

The project creates opportunities to provide access to currently undeveloped land by creating excess capacity within the Pines/Trent intersection. Further economic activity in the area creates opportunities for direct developer contribution to future upgrading, and adds to the City's tax base, both of which can further support long-term management of the infrastructure.

The City continues to demonstrate its ability to implement comparable projects. In 2021, the City started construction on the Barker Road/BNSF Grade Separation Project, which was the recipient of a $9 million TIGER IX award from USDOT. The project is federally funded at 64% and non-federally funded at 36%. It includes three federal funding sources, two state funding sources, one private contribution and a local city match. Construction is schedule to be complete in 2022.

4.6 Partnership

This project demonstrates support from numerous public and private partners across the region which actively participated in the Horizon 2040 planning document, and in the previous Bridging the Valley plan and other workshops, stakeholder outreach, and funding initiatives, see Table 7. Per Section 1.4, the primary partnerships exist with WSDOT, BNSF, and Avista Utilities.

Table 7: Partners in the Project Development

State and Local Agencies	
• Washington State Dept. of Transportation • WA Freight Mobility Strategic Investment Board • State and Federal Legislators	• Idaho Transportation Department • Washington Utility and Transportation Commission
Regional Agencies	
• Spokane Regional Transportation Council • Spokane Regional Traffic Management Center • Spokane Transit Authority	• Kootenai Metropolitan Planning Organization • Avista Utilities
Railroads	
• BNSF Railway Company	• Union Pacific Railroad
Local Agencies and Districts	
• Counties: Spokane, Kootenai • Cities & Towns: Athol, Rathdrum, Spokane, Spokane Valley, Millwood	• Police/Fires/Emergency Responders • Area School Districts • Freight/Industry Representatives
Chambers of Commerce	
• Spokane Valley	• Greater Spokane Incorporated

The City of Spokane Valley has an excellent working relationship with WSDOT, and collaborate on roughly 10 to 20 projects per year. WSDOT and the City have delivered several ITS projects together, and WSDOT operates and maintains City traffic signals and ITS infrastructure on the state highways within the City through a long-standing Interlocal Agreement. The City and WSDOT collaboratively review traffic impact studies and permits for properties on Trent Avenue and Pines Road.

The City coordinates with BNSF regarding all road-rail crossings in the city. The city and BNSF are actively working to deliver the Barker Rd./BNSF GSP in 2021 and 2022. Currently, the proposed project design is underway as a coordinated effort with WSDOT. As required by CFR 646.210, BNSF will evaluate its funding contribution when the project reaches 60% design.

4.6.1 Letters of Support

The City has conducted extensive public outreach to the general public, elected officials, school districts, emergency responders, and freight & industry representatives to gain input on the most practical and effective improvements that would best serve the community. Further, the City has requested support through its website and at local gatherings like public meetings or presentations to groups like Washington State Congressmen or the Spokane Valley Chamber of Commerce. The proposed project configuration minimizes the impact to adjacent businesses, minimizes construction impacts and delays, maximizes the efficient movement of goods through the intersection and maximizes developable land. Letters of support are posted to the City's website: http://www.spokanevalley.org/PinesBNSF

4.7 Innovation

The City of Spokane Valley will evaluate innovative bridge construction techniques to reduce the impact on the community and the existing traffic. This may include constructing the structures off-site before staging for construction. The project will also take advantage of the Spokane Regional Transportation Management Center (SRTMC) Intelligent Transportation Systems (ITS) infrastructure to communicate traveler information about construction activities and expected delays throughout the project using SRTMC's website and 511 telephone system. Other ITS technologies, such as work zone queue management and speed management systems, will be evaluated for applicability during project engineering.

The project also promotes expansion of transit services and the installation of a shared use path along with a new trailhead equipped with electric vehicle charging stations. Collectively, these improvements help increase transportation options that are not currently available. See Spokane Transit Authority's letter of support.

5 Environmental Risk Review

With RAISE funding, the Pines Road/BNSF GSP can begin construction by 2023. This project readiness section provides a summary of the technical feasibility, project schedule, required approvals needed, and mitigations for anticipated scope, schedule, and budget risks.

5.1 Technical Feasibility

The technical feasibility of the proposed improvements has been thoroughly established through previous planning and preliminary engineering efforts. The proposed alignment was selected to help minimize impacts to the travelling public while maximizing construction efficiencies by allowing much of the project to be constructed "offline" of the current highway system, see Figure 11.

Figure 11: Construction Impacts to Travelling Public

5.1.1 Statement of Work

The Pines Road/BNSF GSP replaces an existing at-grade crossing with an underpass of BNSF's railroad tracks and provides a roundabout at the intersection of Pines Road and Trent Avenue. The project also connects a shared-use path along Pines Rd. to a new trailhead facility equipped with electrical vehicle charging stations and provides access to the Centennial Trail and Spokane River.

The proposed section for Pines Road consists of four travel lanes with a shared center turn lane. The location of the shared-use path has been coordinated with WSDOT and is planned to be on the west side of Pines Rd. and will at the sidewalk surrounding the roundabout. A 6-foot-wide sidewalk will be placed along the length of frontage of the new trailhead facility. The sidewalk and shared use path will be separated from the roadway by a swale when necessary for drainage. The Trent alignment and typical section remains the same. Table 8 provides the detailed project scope of work pertaining to how the design and construction will be achieved for the project.

5.1.2 Design Criteria and Basis of Design

The project will be led by the City of Spokane Valley. Design criteria was identified in the Bridging the Valley preliminary engineering effort and includes national, City, AASHTO, WSDOT, and BNSF standards. The process will follow WSDOT's project development and delivery procedures and standards supplemented with City procedures and standards as needed. As of June 2021, WSDOT granted approval for the project's BOD, IPA, and ICE.

Table 8: Project Scope of Work

Engineering	Bid Letting & Construction
Procurement of Engineering Services Task 1: Surveying & Mapping Task 2: Utility Coordination Task 3: 30% Plans and Estimate Update* Task 4: 60% PS&E Task 5: 90% PS&E Task 6: Final PS&E Task 7: Local Agency Permits Task 8: Public Involvement Task 9: Project Management Task 10: Quality Management Task 11: Project Team Meetings Tasks 1 through 6 will be completed in the order shown, while Tasks 7 through 11 will be ongoing throughout the course of the engineering.	Final PS&E Review by FHWA, WSDOT, Spokane Valley, and BNSF Advertisement and Bid Letting Procurement of Contractor Notice to Proceed Shop Drawings and Submittal Reviews Fabrication of Structural Supports Mobilization and Erosion Control Temporary Traffic Control Utility Demarcation Bridge Structure Construction Roadway and Rail Construction Site Visits and Inspection Record ("As Constructed") Drawings Meetings

*Although 30% plans and costs were developed in 2004, they will need to be updated to current standards (including all required railroad clearances) and to account for current conditions and unit prices. This update will also include geotechnical updates.

5.1.3 Basis of Cost Estimate and Contingency Levels

A detailed project cost estimate is included in Appendix B. Costs were developed in 2019 dollars and inflated at 3.5% annually to the start of each respective phase. Various contingencies are identified in the cost estimate. As an average, the overall contingency amount is 24%.

5.2 Project Schedule

The project has had several reviews with USDOT, WSDOT and BNSF, all of which have led to the selected road and intersection configuration that minimizes construction delays and maximizes business access and developable land. The project's timing aligns with RAISE FY21, contract negotiations, and authorization schedule and ultimately allows for the project to begin construction in 2023. Table 9 includes the major milestones for engineering, right-of-way, and construction. It demonstrates that the project meets the required RAISE program deadline.

Table 9: Project Schedule

Phase	Begin	End
Design Engineering	09/2017	12/2022
Environmental Documents (NEPA)	06/2020	12/2021
Right-of-Way	01/2020	03/2023
CN Ad/Bid/Award	06/2023	09/2023
Construction*	09/2023	10/2025

*Substantial Completion Date. Construction contract finalization by 06/2026.

5.2.1 Minimizing Impacts to the Travelling Public

The project's selected alignment and intersection configuration promotes a safe and efficient construction schedule, as shown in Figure 11. The BNSF underpass and much of the associated

roadway elements can be constructed with minimal impacts to existing travelers and adjacent businesses. This improves work zone safety during construction and supports a faster construction sequence, leading to a more efficient project delivery.

5.3 Required Approvals

This section provides a summary of all required approvals related to environmental permits and reviews, state and local approvals, and state and local planning.

5.3.1 Environmental Permits and Reviews

The project has completed the environmental process as follows:

Environmental Process & Completed Efforts
National Environmental Policy Act (NEPA) and State EPA (SEPA) Status FRA has determined that the project qualifies for NEPA Categorical Exclusion (CE). The City is anticipating CE documentation approval by December 2021. The Bridging the Valley project received NEPA Class II Categorical Exclusion and SEPA Categorical Exemption per WAC 197-11- 800 on August 22, 2006.
Reviews, Approvals, and Permits by other Agencies The NEPA approval documentation provides a full list of all required permits and reviews. The Bridging the Valley stakeholders listed in Section 1.4 participated in reviews. This included reviews by the City of Spokane Valley, WSDOT, and BNSF.
Environmental Studies and other Documents Full environmental documentation in hard copy is on file at the Spokane Regional Transportation Council (SRTC). Copies are available upon request. The project was found to have no effect for most environmental components. Where there are small environmental impacts, mitigation measures have been identified and include procedures for hazmat disposal, erosion control, and stormwater treatment facilities.
WDOT Discussions on NEPA Compliance The City coordinates all documentation with FRA and WSDOT Local Programs staff to ensure compliance with all agencies.
Public Engagement Extensive public engagement has been an on-going effort as part of the Horizon 2040 and the previous Bridging the Valley efforts. Efforts included public open houses, alternatives workshops, site visits with neighborhoods at crossing locations, mailings, and outreach. Public support has been overwhelmingly positive. Since 2020, the City conducted over 20 public meetings and stakeholder interviews discussing the project alternatives and its selected configuration. Stakeholders included State Legislators and local representatives from police & fire departments, school districts, freight industry representatives and BNSF project managers. Public engagement will continue through engineering and right-of-way phases of this project.

5.3.2 State and Local Approvals

The Pines Road/ BNSF GSP is included in the Statewide Transportation Improvement Program (STIP ID WA-10615 and WA-12522), Horizon 2040 Metropolitan Transportation Plan, and the Spokane Valley TIP. Additional right-of-way, engineering, and construction approvals will be obtained from the City, WSDOT, and BNSF throughout the project.

5.3.3 Federal transportation Requirements Affecting State and Local Planning

Significant planning and engineering work has been completed and reinforces the overwhelming support of all project partners, the community, the region, and beyond.

Planning or Design Effort with Supporting Project Elements
Detailed Project Work Plan – FRA CRISI Documentation/Coordination • A detailed description of the steps necessary to complete project, including project management approach, quality assurance/control, project schedule, a detailed project budget, and an environmental class of action recommendation memorandum.
Joint Transportation Committee Prioritization of Rail-Rail Conflicts in WA (Aug. 2018) • Rated the overall top priority grade separation project requiring funding support
City of Spokane Valley – Project Design Alternative Analysis • 2017-2019: Coordinating with WSDOT, BNSF, and public input, the City selected a project alignment and a roundabout for the intersection design that minimizes construction impacts and maximizes developable business property.
Bridging the Valley Planning Study • Grade Separation Analysis: consideration of transportation needs and BNSF operations • Traffic Analysis: evaluation of impacts with alternatives for years 2001 and 2020 • Economic Analysis: benefit-cost analysis of all alternatives
Bridging the Valley 30% Preliminary Engineering • Right-of-Way needs were determined for this project • Design reports, 30% plans, estimates, and environmental documentation for projects
Inland Pacific Hub Transportation Investment and Project Priority Blueprint • Lists Bridging the Valley projects as priorities with synergy economic benefits • Support from local partners and identifies a midterm construction period of 2016-2021
Washington State Freight Mobility Plan 2014 • Identifies project for future implementation
Horizon 2040 Metropolitan Transportation Plan • Identifies this project and other Bridging the Valley grade separation projects
Spokane Valley Comprehensive Plan • Goal to support passenger and freight rail system in the region and Bridging the Valley
City of Spokane Valley TIP & WA State TIP • Includes project funding for early pre-construction activities
Fiscal and Economic Analysis of Project • Analysis of incremental development, tax revenue benefits, economic output, jobs, and wages showing the significant benefit of implementing this project[26]

[26] Fiscal and Economic Benefits of the Pines Road Underpass Project, ECONorthwest 2016; http://www.spokanevalley.org/PinesBNSF

5.4 Assessment of Project Risks and Mitigation Strategies

The City has identified the following potential project risks and the mitigation measures:

Potential Risks	Mitigation Measures
Design Coordination	The approved configuration accommodates USDOT, WSDOT and BNSF requirements and WSDOT has approved the project's Basis of Design, Intersection Control Evaluation, and Intersection Plan for Approval.
Project Funding	The City has multiple options for meeting the project's remaining financing needs. The City plans to pursue other funding opportunities including TIB, FMSIB, state legislative direct appropriations, or annual City contributions.
Environmental Approvals	Per CRISI-funded PE phase, the project qualifies for NEPA CE. CE documents are anticipated to be approved by December 2021. The selected project configuration minimizes exposure by reducing its excavation limits and reduces its impact to neighboring properties. Much of the project can be built "offline" of existing highways and the project more closely matches the existing ground level's surrounding the project limits. Other design alternatives required the lowering of Trent Avenue by 12', creating extensive walls and large earthwork impacts, increasing exposure to utility conflicts and closing down existing businesses or disturbing culturally significant properties. With this in mind, the BNSF undercrossing still requires the project to excavate nearly 20' below the existing track elevation. The City has no records of previous work to this depth and unexpected discoveries may occur. Section 106 documentation will be completed in the PE phase and will identify any application action.
Right-of-Way Acquisition	The proposed alignment minimizes the property acquisition impacts. In 2015, the City purchased the project's first vacant property (Pinecroft) before it could be developed for industrial use. Now in 2021, the City has completed the project's three largest, highest risk properties: one full relocation and acquisition, and two vacant parcel acquisitions (all three of which are located at the north limits of the roundabout). The project's remaining acquisitions are strip-acquisitions for frontage improvements along the north side of the project (along Trent or Empire).
Utility Conflicts	The project requires coordination with 12 separate utilities, each of which have a franchise agreement and/or easement that identifies prior rights and proposed work responsibilities. As the City works to complete project design, utility relocation plans will be developed. Phillips 66 Pipeline owns a 10" high pressure petroleum line located at the south edge of BNSF's right of way. Relocation of the pipeline is anticipated to take up to one year to complete. The PE phase will identify necessary relocation plans and continued coordination is required.
Water Table at Pines Road	The project is near the Spokane River. Sometimes the water table is low near rivers. The nearby Argonne Road/BNSF Grade Separation project constructed an underpass of the rail line and did not run into any water table issues. Similar construction techniques will be used for excavation and if necessary, permanent drainage infrastructure can be provided.

6 Benefit Cost Analysis

6.1.1 Benefit-Cost Assessment Summary

Table 10 summarizes the BCA findings identified in Appendix C. Annual costs and benefits are computed over the lifecycle of the project (estimated at 39 years). As stated earlier, construction is expected to be completed by the end of 2025 with 2026 being the project opening year. Benefits accrue during the full operation of the project.

Table 10: Overall Results of the Benefit Cost Analysis, 2019 Dollars

Project Evaluation Metric	7% Discount Rate	3% Discount Rate
Total Discounted Benefits	$41,198,120	$86,562,428
Total Discounted Costs	$19,500,465	$22,329,598
Net Present Value	$21,697,654	$64,232,829
Benefit / Cost Ratio	2.11	3.88
Internal Rate of Return (%)	12.97%	
Payback Period (years)	5.90	

Considering all monetized benefits and costs, the estimated internal rate of return of the project is 13.0%. With a 7% real discount rate, the $19.5 million investment would result in $41.2 million in total benefits for a Net Present Value of $21.7 million and a Benefit/Cost ratio of 2.11.

The grade separation component of the project generates the majority of the project benefits. Table 11 below provides a summary of the benefits and costs associated with grade separation (GSP). At a 7% discount rate, GSP would result in a Net Present Value of $25.1 million and a Benefit/Cost ratio of 3.45.

Table 11: Results of the Grade Separation Component, 2019 Dollars

Benefit	Undiscounted Net Benefits	Discounted Total Benefits at 3%	Discounted Total Benefits at 7%
Reduced Travel Time Costs	$71,238,395	$36,727,498	$17,122,107
Improved Safety & Avoided Accident Costs	$59,081,619	$32,327,592	$16,284,186
Avoided Emissions Costs	$1,003,377	$540,486	$462,609
Reduced Vehicle Operating Costs	$2,531,515	$1,288,083	$589,570
Residual Value of Infrastructure Asset	$9,952,221	$3,433,839	$871,172
Operations & Maintenance Cost Savings	$330,000	$180,566	$90,955
Total GSP Benefits	**$144,137,126**	**$74,498,063**	**$35,420,600**
GSP Capital Expenditures	**($13,130,758)**	**($11,776,981)**	**($10,276,332)**
Net Present Value (NPV)	**$131,006,367**	**$62,721,081**	**$25,144,268**
Benefit Cost Ratio (BCR)	**10.98**	**6.33**	**3.45**

Lastly, the roundabout is expected to result in $23.0 million in undiscounted benefits. With a 7% discount rate, the Benefit/Cost ratio is 0.63. Significant benefits from improved traffic fluidity are expected to occur as a result of the roundabout improvement. This benefit was not quantified in absence of detailed traffic modeling.

Table 12: Results of the Roundabout Component, 2019 Dollars

Benefit	Undiscounted Net Benefits	Discounted Total Benefits at 3%	Discounted Total Benefits at 7%
Improved Safety and Avoided Accident Costs	$22,992,889	$12,064,365	$5,777,520
Improved Traffic Fluidity*	-	-	-
Total RAB Benefits	**$22,992,889**	**$12,064,365**	**$5,777,520**
RAB Capital Expenditures	**($11,749,793)**	**($10,552,617)**	**($9,224,134)**
Net Present Value (NPV)	**$11,243,096**	**$1,511,748**	**($3,446,614)**
Benefit Cost Ratio (BCR)	**1.96**	**1.14**	**0.63**

**Discussed qualitatively in the absence of detailed traffic modelling*

6.1.2 Cost Share

A community the size of Spokane Valley is greatly challenged to fund a project of this magnitude on its own. With many competing needs for city funds, the financial wherewithal to locally shoulder the entire burden of this project is not possible. With such geographically dispersed benefits generated by this project, federal assistance is not only a necessity but also a wise investment for the broader multi-modal transportation system.

Private funding in the project by BNSF and Avista Utilities help reduce reliance on Federal funding and leverage private investments that will benefit all users in the region. BNSF is expected to contribute funding towards the grade separation elements while Avista Utilities has donated property to the project to accommodate the new trailhead to the Centennial Trail and Spokane River. The City of Spokane Valley has committed $4,700,000 of local funds toward the project and will continue to pursue additional non-Federal funding sources such as TIB, FMSIB, and LDA.

The City of Spokane Valley is sufficiently positioned to financially deliver this project with the assistance of the RAISE funding. The City is able to undertake all necessary long-term maintenance and rehabilitation through funds available from several street funds.

Appendix A

Local Agency Endorsement Form

10210 E Sprague Avenue ♦ Spokane Valley WA 99206
Phone: (509) 720-5000 ♦ Fax: (509) 720-5075 ♦ www.spokanevalley.org

U.S. Department of Transportation

Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Transportation Discretionary Grants Program

Call for Projects

Local Agency Project Endorsement

Project: Pines Road/BNSF Grade Separation Project

The attached project application reflects established local funding priorities consistent with the adopted local plans and programs.

The project described is financially feasible; local match revenue identified in the project application is available and committed to the project. If awarded Federal funds, the City is committed to securing all remaining unsecured non-Federal funds in order to satisfy RAISE program requirements. Costs identified in the application represent accurate planning level estimates needed to accomplish the work described herein.

This project has the full endorsement of the governing body/leadership of this agency or organization. This document must be signed by a person in a position or a representative of a governing body that has the authority to make decisions for the entire organization.

Mark Calhoun, City Manager
Name and Title of Designated Representative

Mark Calhoun
Signature of Designated Representative

7/7/2021
Date

Appendix B

Detailed Cost Estimate

City of Spokane Valley, WA
Pines Road/BNSF Grade Separation Project
Opinion of Probable Construction Cost
Alternative 2 with Roundabout

ITEM NO.	Contingency Code (%) or Unit	ITEM	UNIT	TRENT QUANTITY	PINES QUANTITY	TOTAL QUANTITY	UNIT PRICE	ITEM COST
		SECTION 1: PREPARATION						
	%	CLEARING AND GRUBBING	LS			1	$50,000.00	$50,000.00
	%	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS			1	$10,000.00	$10,000.00
	U	REMOVING ASPHALT CONC. PAVEMENT	SY		4500	4500	$4.00	$18,000.00
	%	CONSTRUCTION SURVEYING	LS			1	$15,000.00	$15,000.00
	%	SPCC PLAN	LS			1	$4,000.00	$4,000.00
	%	TRAFFIC CONTROL	LS			1	$152,000.00	$152,000.00
	%	SURVEYING	LS			1	$150,000.00	$150,000.00
	%	RECORD DRAWING (MIN BID $10,000 LS)	LS			1	$10,000.00	$10,000.00
	%	MINOR CHANGE, UNEXPECTED SITE CONDITIONS	LS			1	$50,000.00	$50,000.00
	%	CONTRACTING AGENCY FIELD OFFICE	LS			1	$10,000.00	$10,000.00
	%	PROPERTY RESTORATION	LS			1	$10,000.00	$10,000.00
	%	UTILITY POTHOLING	LS			1	$10,000.00	$10,000.00
		SECTION 2: GRADING						
	U	ROADWAY EXCAVATION INLC. HAUL	CY		117420	117420	$10.00	$1,174,200.00
	U	COMMON BORROW INLC. HAUL	CY			0	$10.00	$0.00
		SECTION 3: STOCKPILING						
		SECTION 4: DRAINAGE				0		
		SECTION 5: STORM SEWER				0		
	U	CATCH BASIN	EACH			0	$2,500.00	$0.00
	U	STORM SEWER PIPE18 IN. DIAM.	LF			0	$60.00	$0.00
	U	SEWER MANHOLE	EACH			0	$3,000.00	$0.00
		SECTION 6: SANITARY SEWER						
	U	SEWER MANHOLE	EACH			0	$3,000.00	$0.00
	U	SEWER PIPE X IN. DIAM.	LF			0	$60.00	$0.00
		SECTION 7: WATER LINES						
		SECTION 8: STRUCTURES						
	U	WORK ACCESS	LS		1	1	$25,000.00	$25,000.00
	U	TEMPORARY SHORING	LS		1	1	$50,000.00	$50,000.00
	U	STRUCTURE EXCAVATION CLASS A INCL. HAUL	CY		1267	1267	$25.00	$31,675.00
	U	FURNISHING AND DRIVING STEEL TEST PILE	EACH		4	4	$17,000.00	$68,000.00
	U	FURNISHING ST. PILING	LF		6400	6400	$100.00	$640,000.00
	U	DRIVING ST. PILE	EACH		64	64	$4,500.00	$288,000.00
	U	FURNISHING STEEL PILE TIP OR SHOE	EACH		68	68	$500.00	$34,000.00
	U	PILE SPLICES	EACH		68	68	$500.00	$34,000.00
	U	CONTROLLED DENSITY FILL	CY		66	66	$150.00	$9,900.00
	U	CONC. CLASS 4000 FOR BRIDGE (ENCASEMENT)	CY		326	326	$650.00	$211,900.00
	U	ST. REINF. BAR FOR BRIDGE (ENCASEMENT)	LB		32400	32400	$1.25	$40,500.00
	U	PRECAST REINFORCED CONCRETE	LS		1	1	$190,000.00	$190,000.00
	U	ELASTOMERIC PAD - SUPERSTR.	EACH		32	32	$1,500.00	$48,000.00
	U	ERECTION OF SUPERSTRUCTURE	LS		1	1	$200,000.00	$200,000.00
	U	RR BRIDGE SAFETY WALKWAY & RAILING	LF		752	752	$200.00	$150,400.00
	U	STRUCTURAL CARBON STEEL	LS		1	1	$12,480.00	$12,480.00
	U	STRUCTURAL LOW ALLOW STEEL (FURNISH FOB)	LS		1	1	$1,509,408.00	$1,509,408.00
	U	BRIDGE DECK WATERPROOFING	SY		720	720	$160.00	$115,200.00
	U	T-WALL RETAINING WALL	SF		8700	8700	$50.00	$435,000.00
		SECTION 9: SURFACING						
	U	CRUSHED SURFACING BASE COURSE (CSBC)	CY		488	488	$20.00	$9,760.00
	U	CRUSHED SURFACING TOP COURSE (CSTC)	CY		2476	2476	$60.00	$148,560.00
		SECTION 10: LIQUID ASPHALT						
		SECTION 11: BITUMINIOUS SURFACE TREATMENT						
		SECTION 13: CEMENT CONCRETE PAVEMENT						
	U	CEMENT CONC. PAVEMENT (PCC)	CY		5295	5295	$300.00	$1,588,500.00
		SECTION 14: HOT MIX ASPHALT						
	U	HMA Plantmix Pavement	TON		1395	1395	$110.00	$153,450.00
		SECTION 15: SEAL COAT				0		
		SECTION 16: IRRIGATION AND WATER DISTRIBUTION						
	%	IRRIGATION SYSTEM	LS			1	$20,000.00	$20,000.00
		SECTION 17: EROSION CONTROL AND ROADSIDE PLANTING						
	%	EROSION/WATER POLLUTION CONTROL	LS			1	$150,000.00	$150,000.00
	U	SEEDING, FERTILIZING, AND MULCHING	ACRE		2	2	$5,000.00	$10,000.00
	%	LANDSCAPING	LS			1	$100,000.00	$100,000.00
		SECTION 18: TRAFFIC						
	U	CEMENT CONC. TRAFFIC CURB	LF		7620	7620	$33.00	$251,460.00
	U	PRECAST CONCRETE BARRIER	LF		200	200	$50.00	$10,000.00
	U	PERMANENT IMPACT ATTENUATOR	EACH			0	$25,000.00	$0.00
	U	PAINT LINE	LF		13600	13600	$0.25	$3,400.00
	%	MISC PLASTIC STRIPING	LS			1	$5,000.00	$5,000.00
	%	PERMANENT SIGNING	LS			1	$20,000.00	$20,000.00
	%	ILLUMINATION SYSTEM COMPLETE	LS			1	$100,000.00	$100,000.00
	%	TRAFFIC SIGNAL SYSTEM	LS			0	$300,000.00	$0.00
	%	ITS SYSTEM COMPLETE	LS			1	$50,000.00	$50,000.00
		SECTION 19: OTHER ITEMS						
	U	UTILITIES - GAS MAIN RELOCATION	LF			0	$200.00	$0.00
	U	UTILITIES - WATER LINE RELOCATION	LF		300	300	$100.00	$30,000.00
	U	UTILITIES - FIBER OPTIC RELOCATION Centrury Link	LF			0	$200.00	$0.00
	U	UTILITIES - TELECOMMUNICATION RELOCATION	LF		300	300	$150.00	$45,000.00
	U	CEMENT CONCRETE SIDEWLAK	SY		4020	4020	$50.00	$201,000.00
		UTILITIES - YELLOWSTONE PIPELINE RELOCATION						
	U	CENTENNIAL TRAIL TRAILHEAD (PARKING, LIGHTING, RESTROOM)	LS		1	1	$100,000.00	$100,000.00
	%	Shoofly	LS			1	$860,000.00	$860,000.00
	U	Railroad Flagging	Day			400	$1,000.00	$400,000.00

1	Construction Subtotal			$10,012,793
2	Mobilization		10.0%	$1,001,279
3	**Subtotal**			**$11,014,072**
4	Unit Price Contingencies	$8,236,793	25.0%	$2,059,198
5	Percentage Item Contingencies	$1,776,000	31.0%	$550,560
4	**Contingencies**		**23.7%**	**$2,609,758**
5	**Subtotal**			**$13,623,831**
6	Sales Tax (N/A included in unit costs)			$0
7	**Subtotal**			**$13,623,831**
8	Total Construction Subtotal			$13,623,831
9	Design Engineering		20.6%	$2,800,378
10	RIGHT-OF-WAY			$4,656,000
11	Construction Engineer and Inspection		25.0%	$3,405,958
12				
13	**TOTAL PROJECT COST (DESIGN, CONSTRUCTION, CONSTRUCTION ENGINEERING)**			**$24,486,167**

YEAR 2019 CONCEPTUAL ESTIMATE TOTAL **$24,486,167**

	Phase	2019 Cost	Year of Expenditure	Inflated Cost (@3.5%)
Construction (2023-2025)		**$13,623,831**	**2024**	**$16,181,000**
Design Engineering (2020-2022)		**$2,800,378**	**2021**	**$3,000,000**
Right of Way (2020-2022)		**$4,656,000**	**2022**	**$5,163,000**
Construction Engineering (2023-2025)		**$3,405,958**	**2024**	**$4,046,000**
	Total	**$24,486,167**		**$28,390,000**

Appendix C

Benefit Cost Analysis

Pines Road/BNSF Grade Separation

Benefit Cost Analysis Supplementary Documentation

RAISE Grants Program

City of Spokane Valley

June 30, 2021

Contents

Tables

Figures

1 Executive Summary

With increasing growth in freight train traffic, the Pines Road grade crossing is becoming increasingly difficult for motorists, pedestrians, and other users. The at-grade crossing is rated Washington State's top Tier 1 road-rail conflict[1] and is located in the center of Spokane Valley's most vulnerable census tracts[2]. Extended delays at the project location result in inefficient emergency services access, noise pollution from train whistles, inefficient freight truck movements along a preferred long-haul freight route, and a worsening Level of Service (LOS) projected to reach 'F' in future years due to high traffic volumes.

The Pines Road/BNSF Grade Separation Project replaces an existing at-grade crossing with an underpass of BNSF's railroad tracks and provides a roundabout at the intersection of Pines Road and Trent Avenue.

The improvements support freight movement and regional mobility goals as articulated in various plans such as Horizon 2040, the MPO's regional transportation plan, and the Inland Pacific Hub Transportation Study, a partnership of public and private agencies dedicated to creating a freight gateway in the region. Due to its location near the City's northern boundary, the project serves as a gateway for freight, goods, and travelers coming to and from rural Washington, Idaho, Montana, and Canada.

Pedestrians and cyclists will also be able to safely cross under the BNSF tracks, along with crossing either Pines Road or Trent Avenue, due to the new, accessible facilities that currently do not exist. Improved, ADA-compliant sidewalks will be implemented throughout the new roundabout intersection that provides pedestrians and bicyclists with street-crossings that include curbed medians and increased signage that reduce crossing distance and increase visibility of users. A new shared-use path along the south project limits also provides a non-motorized route for users to safely pass under the BNSF rail crossing.

These improvements also most closely benefit Spokane Valley's most disadvantaged populations. The project is centered in Census Tract 117.02, which has many of Spokane Valley's highest rates for vulnerable populations. Per SRTC's Social Equity Mapping Tool, Census Tract 117.02 includes populations that have disproportionately high rates when compared to the rest of the city: poverty (20%), minority (21%), youth (15%), disability (20%) and non-English speakers (14%).[3] The project improves access and mobility for these users by increasing transportation options including expanding transit service routes, improving access to facilities including a shared use path through the project limits, new access to the Centennial Trail via a trailhead, and by allowing for more timely and reliable connectivity to Valley Hospital, located one mile to the south.

The project also reduces the City's impact on the environment. The project reduces motorists' carbon footprint, saves travel time for users, provides increased transportation options, eliminates train horn noise, and accommodates electrification of the transportation network.

The City of Spokane Valley seeks a RAISE Discretionary Grant of $16,239,622 to complete funding for the Pines Road/BNSF Grade Separation Project to create a safer and more efficient transportation and freight network that reduces its environmental impacts and equitably improves access and mobility for all users.

The proposed concept is illustrated in Figure 1.

[1] Federal Mobility Strategic Investment Board, Study of Road-Rail Conflicts. Phase 2 – Development of Project Priorities. August 2018

[2] SRTC Social Equity Mapping Tool

[3] ibid

Figure 1: Pines Road/BNSF Grade Separation Project

Table ES-1 summarizes the impacts and associated monetary benefits expected from the project. Section 8 summarizes the results for the entire project as well as for its individual components, including both the grade separation and roundabout.

Table ES-1: Summary of Infrastructure Improvements and Associated Benefits

Current Status or Baseline & Problems to be Addressed	Changes to Baseline / Alternative	Type of Impacts	Population Affected by Impacts	Economic Benefits	Summary of Results ($2019, Discounted at 7%)
With increasing growth in freight train traffic, the Pines Road grade crossing is becoming increasingly difficult for motorists, pedestrians, and other users. Extended delays at the project location result in inefficient emergency services access, noise pollution from train whistles, inefficient freight truck movements along a preferred long-haul freight route, and a lack of industrial development potential due to a current Level of Service (LOS) 'E' operating condition, with an LOS 'F' condition expected due to worsening conditions.	The project replaces an existing at-grade crossing with an underpass of BNSF's railroad tracks and provides a roundabout at the intersection of Pines Road and Trent Avenue. The project is centered in Census Tract 117.02, which has many of Spokane Valley's highest rates for vulnerable populations. The project improvements closely benefit Spokane Valley's most disadvantaged populations and improves access and mobility for these users by increasing transportation options including expanding transit service routes, improving access to facilities, including a shared use path through the project limits, new access to the Centennial Trail via a trailhead, and by allowing for more timely and reliable connectivity to Valley Hospital, located one mile to the south. The project also reduces the City's impact on the	Reduced Travel Time Costs from Vehicle Idling and Delay Time at Pines Road Crossing	Motorists, shippers, local businesses, and residents	Reduced Travel Time Costs	**$17,122,107**
		Improved Safety and Avoided Accident Costs from Eliminated Pines Road Grade Crossing	Motorists, shippers, local businesses, and residents	Improved Safety and Avoided Accident Costs	**$22,061,706**
		Avoided Emission Costs from Vehicle Idling and Delay Time at Pines Road Crossing	Local residents and residents across the country	Avoided Emissions Costs	**$462,609**
		Reduced Vehicle Operating Costs from Vehicle Idling and Delay Time at Pines Road Crossing	Motorists, shippers, local businesses, and residents	Reduced Vehicle Operating Costs	**$589,570**
		Residual Value of Infrastructure Asset	Local, state, and federal governments	Residual Value of Infrastructure Asset	**$871,172**
		Reduced Ongoing Infrastructure Maintenance Cost	Motorists, shippers, local businesses, and residents	Operations & Maintenance Cost Savings	**$90,955**
		Fewer rail crossing blockages will improve travel time reliability as there will be a significantly lower chance for drivers to be delayed thus reducing the unpredictability of trips in the area. This also allows both short and long-haul trucks to experience improved delivery timeliness.	Motorists, shippers, local businesses, and residents	Improved Travel Time Reliability	**n/a**

Current Status or Baseline & Problems to be Addressed	Changes to Baseline / Alternative	Type of Impacts	Population Affected by Impacts	Economic Benefits	Summary of Results ($2019, Discounted at 7%)
	environment. The project reduces motorists' carbon footprint, saves travel time for users, provides increased transportation options, eliminates train horn noise, and accommodates electrification of the transportation network. The improvements support freight movement and regional mobility goals as articulated in various plans such as Horizon 2040, the MPO's regional transportation plan, and the Inland Pacific Hub Transportation Study, a partnership of public and private agencies dedicated to creating a freight gateway in the region. The elimination of delays at the rail crossings will improve the mobility of freight trucks traveling from Canada to Interstate 90, unlock the economic potential to develop prime vacant commercial and industrial land, support active pedestrian and bicycle lifestyles, and improving the quality of life through noise and emissions reductions.	Close to 170 acres of mixed-use or commercially-zoned parcels and 56 acres of prime industrially-zoned parcels are undeveloped because property owners and developers cannot afford to mitigate the LOS 'E' operating conditions at the Pines Road /Trent Avenue intersection. These parcels, and several hundred more acres beyond the city limits, are some of the last undeveloped parcels available for industrial use in the area.	Motorists, shippers, local businesses and residents, local/state/federal governments	Unlock Future Development Potential	**n/a**
		Grade separation will provide pedestrian and cycling facilities allowing for greater connectivity and promotion of active lifestyles, in addition to improved access to nearby businesses and other public facilities.	Pedestrians, cyclists, local businesses, and residents.	Improved Connectivity	**n/a**
		Grade separation will reduce noise pollution from train whistles.	Pedestrians, cyclists, local businesses, and residents.	Reduced Noise Pollution	**n/a**
		Fewer rail crossing blockages will improve travel time and reliability for emergency responders that may otherwise not be able to pass or be forced to take a longer route.	Motorists, shippers, local businesses, and residents	Improved Emergency Vehicle Access	**n/a**

The period of analysis used in the estimation of benefits and costs is 39 years, including 9 years of construction and planning and 30 years of operation. The total future project costs include $20.1 million dollars (2019$) or $24.0 million (YOE$) in future capital costs as shown in Table ES-2.

Table ES-2: Summary of Project Costs, Constant and Year of Expenditure Dollars (YOE)

Component	2019$	YOE$
Previously Incurred Costs	$4,827,575	$4,827,575
Construction	$13,623,831	$16,181,921
Right of Way	$2,715,810	$3,222,346
Construction Engineering	$3,405,958	$4,045,480
Preliminary Engineering	$245,903	$405,655
Final Engineering	$61,476	$101,407
Total Project Cost	**$24,880,552**	**$28,784,385**
Total Future Project Cost	**$20,052,977**	**$23,956,810**

Tables ES-5, ES-6 and ES-7 provide various summaries of the relevant data and calculations used to derive the benefits and costs of the project. Based on the analysis presented in the rest of this document, the project is expected to generate $41.2 million in discounted benefits and $19.5 million in discounted costs, using a 7 percent real discount rate. Therefore, the project is expected to generate a Net Present Value of $21.7 million and a Benefit/Cost Ratio of 2.11.

Table ES-3: Overall Results of the Benefit Cost Analysis, 2019 Dollars

Project Evaluation Metric	7% Discount Rate	3% Discount Rate
Total Discounted Benefits	$41,198,120	$86,562,428
Total Discounted Costs	$19,500,465	$22,329,598
Net Present Value	$21,697,654	$64,232,829
Benefit / Cost Ratio	2.11	3.88
Internal Rate of Return (%)	13.0%	
Payback Period (years)	5.90	

When assessing both project components, the grade separation and roundabout result in significant societal benefits. The table below provides a summary of the grade separation component which accounts for the majority of the overall project benefits. It's important to note that each of these components are crucial to the entire project. While the results are disaggregated to aid in understanding of project conditions, the overall project results are best viewed as a whole.

Table ES-4: Summary of the Grade Separation Component Benefits

Benefit	Undiscounted Net Benefits (2019$)	Discounted Total Benefits at 3% ($2019)	Discounted Total Benefits at 7% ($2019)
Reduced Travel Time Costs	$71,238,395	$36,727,498	$17,122,107
Improved Safety and Avoided Accident Costs	$59,081,619	$32,327,592	$16,284,186
Avoided Emissions Costs	$1,003,377	$540,486	$462,609
Reduced Vehicle Operating Costs	$2,531,515	$1,288,083	$589,570
Residual Value of Infrastructure Asset	$9,952,221	$3,433,839	$871,172
Operations and Maintenance Cost Savings	$330,000	$180,566	$90,955
Total Grade Separation Benefits	**$144,137,126**	**$74,498,063**	**$35,420,600**
Grade Separation Benefits Capital Expenditures	**($13,130,758)**	**($11,776,981)**	**($10,276,332)**
Net Present Value (NPV)	**$131,006,367**	**$62,721,081**	**$25,144,268**
Benefit Cost Ratio (BCR)	**10.98**	**6.33**	**3.45**

The grade separation results in undiscounted benefits of $144.1 million and a benefit cost ratio of 11.0. At a 7% discount rate, the component results in a net present value of $25.1 million and a benefit cost ratio of 3.45.

Lastly, as an individual component, the roundabout has a discounted benefit cost ratio of 0.63. This result is conservative since improved traffic fluidity and reduced congestion at the intersection are not estimated in the absence of detailed traffic modelling. Given that safety benefits account for $5.8 million in discounted benefits, it's expected that improved speeds and fluidity at the intersection would result in significant additional societal benefits.

Table ES-5: Summary of the Roundabout Component Benefits

Benefit	Undiscounted Net Benefits (2019$)	Discounted Total Benefits at 3% ($2019)	Discounted Total Benefits at 7% ($2019)
Improved Safety and Avoided Accident Costs	$22,992,889	$12,064,365	$5,777,520
Total Roundabout Benefits	**$22,992,889**	**$12,064,365**	**$5,777,520**
Roundabout Capital Expenditures	**($11,749,793)**	**($10,552,617)**	**($9,224,134)**
Net Present Value (NPV)	**$11,243,096**	**$1,511,748**	**($3,446,614)**
Benefit Cost Ratio (BCR)	**1.96**	**1.14**	**0.63**

The following tables provide various summaries of the relevant data and calculations used to derive the benefits and costs of the whole project.

Table ES-6: Summary of Total Project Benefits and Costs

Calendar Year	Project Year	Direct Beneficiaries	Total Benefits ($2019)	Total Costs ($2019)	Undiscounted Net Benefits ($2019)	Discounted Total Benefits at 7% ($2019)	Discounted Total Costs at 7% ($2019)	Discounted Net Benefits at 7% ($2019)
2017	1	Workers otherwise unemployed (shadow wage benefit); not quantified	$0	-$861,115	-$861,115	$0	-$861,115	-$861,115
2018	2		$0	-$466,730	-$466,730	$0	-$466,730	-$466,730
2019	3		$0	-$466,730	-$466,730	$0	-$466,730	-$466,730
2020	4		$0	-$2,018,730	-$2,018,730	$0	-$1,886,663	-$1,886,663
2021	5		$0	-$2,018,730	-$2,018,730	$0	-$1,763,237	-$1,763,237
2022	6		$0	-$2,018,730	-$2,018,730	$0	-$1,647,885	-$1,647,885
2023	7		$0	-$8,514,894	-$8,514,894	$0	-$6,495,972	-$6,495,972
2024	8		$0	-$5,108,936	-$5,108,936	$0	-$3,642,601	-$3,642,601
2025	9		$0	-$3,405,958	-$3,405,958	$0	-$2,269,533	-$2,269,533
2026	10	Federal and State governments, pedestrians, cyclists, motorists, local residents and businesses, trucking companies, AMTRAK and their passengers, property owners along the project corridor, and other residents across the country.	$4,025,189	$0	$4,025,189	$2,509,151	$0	$2,509,151
2027	11		$4,098,942	$0	$4,098,942	$2,388,443	$0	$2,388,443
2028	12		$4,175,765	$0	$4,175,765	$2,274,517	$0	$2,274,517
2029	13		$4,255,459	$0	$4,255,459	$2,166,793	$0	$2,166,793
2030	14		$4,339,584	$0	$4,339,584	$2,065,595	$0	$2,065,595
2031	15		$4,424,810	$0	$4,424,810	$1,968,896	$0	$1,968,896
2032	16		$4,513,989	$0	$4,513,989	$1,877,707	$0	$1,877,707
2033	17		$4,606,618	$0	$4,606,618	$1,791,420	$0	$1,791,420
2034	18		$4,703,480	$0	$4,703,480	$1,710,061	$0	$1,710,061
2035	19		$4,804,164	$0	$4,804,164	$1,632,970	$0	$1,632,970
2036	20		$4,908,972	$0	$4,908,972	$1,560,016	$0	$1,560,016
2037	21		$5,018,615	$0	$5,018,615	$1,491,113	$0	$1,491,113
2038	22		$5,132,705	$0	$5,132,705	$1,425,843	$0	$1,425,843
2039	23		$5,250,916	$0	$5,250,916	$1,363,863	$0	$1,363,863
2040	24		$5,375,226	$0	$5,375,226	$1,305,431	$0	$1,305,431
2041	25		$5,428,987	$0	$5,428,987	$1,232,775	$0	$1,232,775
2042	26		$5,483,668	$0	$5,483,668	$1,164,370	$0	$1,164,370
2043	27		$5,539,165	$0	$5,539,165	$1,099,748	$0	$1,099,748
2044	28		$5,594,997	$0	$5,594,997	$1,038,694	$0	$1,038,694
2045	29		$5,651,301	$0	$5,651,301	$981,038	$0	$981,038
2046	30		$5,709,784	$0	$5,709,784	$926,866	$0	$926,866
2047	31		$5,768,497	$0	$5,768,497	$875,652	$0	$875,652
2048	32		$5,827,867	$0	$5,827,867	$827,297	$0	$827,297
2049	33		$5,888,780	$0	$5,888,780	$781,856	$0	$781,856
2050	34		$5,949,892	$0	$5,949,892	$738,790	$0	$738,790
2051	35		$6,011,960	$0	$6,011,960	$698,134	$0	$698,134
2052	36		$6,075,012	$0	$6,075,012	$659,771	$0	$659,771
2053	37		$6,139,067	$0	$6,139,067	$623,570	$0	$623,570
2054	38		$6,204,139	$0	$6,204,139	$589,405	$0	$589,405
2055	39		$16,222,466	$0	$16,222,466	$1,428,333	$0	$1,428,333
Total			**$167,130,015**	**-$24,880,552**	**$142,249,464**	**$41,198,120**	**-$19,500,465**	**$21,697,654**

**Total costs used within the benefit cost analysis considered previously incurred costs of $1,028,385*

Table ES-7: Summary of Project Benefits by Benefit Type (Undiscounted 2019$)

Calendar Year	Project Year	Reduced Travel Time Costs	Improved Safety and Avoided Accident Costs	Avoided Emissions Costs	Reduced Vehicle Operating Costs	Residual Value of Infrastructure Asset	Operations and Maintenance Cost Savings
2017	1	$0	$0	$0	$0	$0	$0
2018	2	$0	$0	$0	$0	$0	$0
2019	3	$0	$0	$0	$0	$0	$0
2020	4	$0	$0	$0	$0	$0	$0
2021	5	$0	$0	$0	$0	$0	$0
2022	6	$0	$0	$0	$0	$0	$0
2023	7	$0	$0	$0	$0	$0	$0
2024	8	$0	$0	$0	$0	$0	$0
2025	9	$0	$0	$0	$0	$0	$0
2026	10	$1,395,726	$2,543,029	$33,080	$42,354	$0	$11,000
2027	11	$1,456,084	$2,554,061	$32,895	$44,902	$0	$11,000
2028	12	$1,519,054	$2,565,304	$32,740	$47,668	$0	$11,000
2029	13	$1,584,749	$2,576,764	$32,657	$50,288	$0	$11,000
2030	14	$1,653,289	$2,588,445	$32,680	$54,170	$0	$11,000
2031	15	$1,724,795	$2,600,350	$31,594	$57,071	$0	$11,000
2032	16	$1,799,397	$2,612,484	$30,780	$60,328	$0	$11,000
2033	17	$1,877,229	$2,624,851	$30,204	$63,335	$0	$11,000
2034	18	$1,958,429	$2,637,456	$30,124	$66,471	$0	$11,000
2035	19	$2,043,145	$2,650,303	$29,949	$69,767	$0	$11,000
2036	20	$2,131,528	$2,663,397	$29,939	$73,108	$0	$11,000
2037	21	$2,223,737	$2,676,742	$30,076	$77,060	$0	$11,000
2038	22	$2,319,938	$2,690,343	$30,345	$81,078	$0	$11,000
2039	23	$2,420,304	$2,704,206	$30,736	$84,669	$0	$11,000
2040	24	$2,525,015	$2,718,336	$31,239	$89,636	$0	$11,000
2041	25	$2,561,813	$2,732,737	$31,686	$91,751	$0	$11,000
2042	26	$2,599,147	$2,747,415	$32,484	$93,622	$0	$11,000
2043	27	$2,637,025	$2,762,375	$32,950	$95,815	$0	$11,000
2044	28	$2,675,454	$2,777,623	$33,423	$97,496	$0	$11,000
2045	29	$2,714,444	$2,793,164	$33,905	$98,787	$0	$11,000
2046	30	$2,754,002	$2,809,004	$34,394	$101,383	$0	$11,000
2047	31	$2,794,137	$2,825,150	$34,892	$103,319	$0	$11,000
2048	32	$2,834,857	$2,841,606	$35,398	$105,007	$0	$11,000
2049	33	$2,876,170	$2,858,378	$36,266	$106,966	$0	$11,000
2050	34	$2,918,085	$2,875,473	$36,790	$108,545	$0	$11,000
2051	35	$2,960,610	$2,892,896	$37,326	$110,127	$0	$11,000
2052	36	$3,003,756	$2,910,655	$37,870	$111,732	$0	$11,000
2053	37	$3,047,530	$2,928,754	$38,422	$113,360	$0	$11,000
2054	38	$3,091,942	$2,947,202	$38,982	$115,012	$0	$11,000
2055	39	$3,137,002	$2,966,005	$39,550	$116,688	$9,952,221	$11,000
Total		**$71,238,395**	**$82,074,508**	**$1,003,377**	**$2,531,515**	**$9,952,221**	**$330,000**

Table ES-8: Summary of Pertinent Quantifiable Data

Calendar Year	Project Year	Avoided Person Hours of Delay at Crossing	Avoided Gasoline Consumption (Gallons)	Avoided Diesel Consumption (Gallons)	Avoided Motor Oil Consumption (Quarts)	Avoided Fatalities	Avoided Injuries	Avoided PDO Accidents
2017	1	0	0	0	0	0.00	0.00	0.00
2018	2	0	0	0	0	0.00	0.00	0.00
2019	3	0	0	0	0	0.00	0.00	0.00
2020	4	0	0	0	0	0.00	0.00	0.00
2021	5	0	0	0	0	0.00	0.00	0.00
2022	6	0	0	0	0	0.00	0.00	0.00
2023	7	0	0	0	0	0.00	0.00	0.00
2024	8	0	0	0	0	0.00	0.00	0.00
2025	9	0	0	0	0	0.00	0.00	0.00
2026	10	74,748	10,650	2,346	1,181	0.20	1.68	9.86
2027	11	77,981	11,111	2,447	1,232	0.20	1.70	10.00
2028	12	81,353	11,591	2,553	1,286	0.20	1.72	10.14
2029	13	84,871	12,093	2,663	1,341	0.20	1.74	10.29
2030	14	88,542	12,616	2,778	1,399	0.20	1.76	10.44
2031	15	92,372	13,161	2,899	1,460	0.20	1.78	10.59
2032	16	96,367	13,731	3,024	1,523	0.20	1.80	10.74
2033	17	100,535	14,324	3,155	1,589	0.20	1.82	10.90
2034	18	104,884	14,944	3,291	1,658	0.20	1.84	11.06
2035	19	109,421	15,591	3,434	1,729	0.20	1.87	11.22
2036	20	114,154	16,265	3,582	1,804	0.20	1.89	11.39
2037	21	119,092	16,969	3,737	1,882	0.21	1.91	11.56
2038	22	124,244	17,703	3,899	1,964	0.21	1.94	11.73
2039	23	129,620	18,469	4,067	2,049	0.21	1.96	11.91
2040	24	135,227	19,268	4,243	2,137	0.21	1.99	12.09
2041	25	137,198	19,548	4,305	2,168	0.21	2.01	12.27
2042	26	139,197	19,833	4,368	2,200	0.21	2.04	12.46
2043	27	141,226	20,122	4,432	2,232	0.21	2.07	12.65
2044	28	143,284	20,415	4,496	2,265	0.21	2.09	12.84
2045	29	145,372	20,713	4,562	2,298	0.21	2.12	13.04
2046	30	147,491	21,015	4,628	2,331	0.21	2.15	13.24
2047	31	149,640	21,321	4,696	2,365	0.21	2.18	13.44
2048	32	151,821	21,632	4,764	2,399	0.21	2.21	13.65
2049	33	154,033	21,947	4,834	2,434	0.22	2.24	13.87
2050	34	156,278	22,267	4,904	2,470	0.22	2.27	14.08
2051	35	158,556	22,591	4,976	2,506	0.22	2.30	14.30
2052	36	160,866	22,921	5,048	2,542	0.22	2.33	14.53
2053	37	163,211	23,255	5,122	2,579	0.22	2.36	14.76
2054	38	165,589	23,594	5,196	2,617	0.22	2.40	14.99
2055	39	168,002	23,937	5,272	2,655	0.22	2.43	15.23
Total		**3,815,178**	**543,596**	**119,721**	**60,298**	**6.26**	**60.59**	**369.29**

In addition to the monetized benefits presented in Tables ES-5 to ES-7, the project would generate benefits that are difficult to monetize. A brief description of those benefits is provided below.

Economic Competitiveness

- ***Improved Travel Time Reliability***

  On average, motorists are delayed 62 times per day at each roadway-railway crossing. With some trains nearly one and a half miles in length, crossings are closed for approximately three to five minutes for each train to pass. Delays are further compounded by the time required for the vehicle queues created by the train crossing to dissipate. Furthermore, the current Pines Road and Trent Avenue intersection operates at a level of service (LOS) of 'E' which is projected to reach LOS 'F' due to worsening conditions. The project would transform the intersection to a LOS 'A', which will improve travel time reliability as there will be a significantly lower chance for drivers to be delayed thus reducing the unpredictability of trips in the area.

  The project also contributes to reliable movement of regional freight by road and rail. Due to its location near the City's northern boundary, the project serves as a gateway for freight, goods, and travelers coming to and from rural Washington, Idaho, Montana, and Canada.

- ***Improved Access to Future Development Potential***

  Close to 170 acres of mixed-use or commercially-zoned parcels and 56 acres of prime industrially-zoned parcels are undeveloped because property owners and developers cannot afford to mitigate the LOS 'E' operating conditions at the Pines Road /Trent Avenue intersection. These parcels, and several hundred more acres beyond the city limits, are some of the last undeveloped parcels available for industrial use in the area.

Quality of Life

- ***Improved Connectivity***

  The project is centered in Census Tract 117.02 which has many of Spokane Valley's highest rates for vulnerable populations. All of the project improvements reduce barriers to disadvantaged populations and improve access and mobility for these users by increasing transportation options including expanded transit routes to reduce reliance on single occupant vehicle trips, improving access to facilities including a shared use path through the project limits, new access to the Centennial Trail via a trailhead, and by allowing for more timely and reliable connectivity to Valley Hospital, located one mile to the south. The majority of the City's commercial, employment, and residential uses lie south of the BNSF corridor and Trent Avenue, including I-90 and Valley Hospital. This project will help knit together the northern and southern sectors of the community by eliminating barriers that impede mobility.

  This project significantly improves connections to many community amenities. The 37.5-mile paved, mixed-use Centennial Trail runs along the Spokane River between Spokane, Washington and Coeur d'Alene, Idaho. It connects several local amenities and includes crossings of the Spokane River. Pines Road is a gateway to the Trail and the City is coordinating with the adjacent property, Avista Utilities, for improvements to this trail connection as part of the project. The project will develop a new parking lot and trailhead facility serving the Centennial Trail and Spokane River. There will be a shared use path along Pines Rd. under the BNSF tracks connecting the residents, school, and businesses to the new trailhead facility which will be equipped with electrical vehicle charging stations.

Pines Road and Trent Avenue are also important routes to Mirabeau Point Park and Plantes Ferry Park and Sports Complex which is a 95-acre regional sports complex, located north of Trent Avenue, with sporting fields, trails, picnic areas, and playgrounds.

The grade separation project will provide pedestrian and cycling facilities allowing for greater connectivity and promotion of active lifestyles, in addition to improved access to nearby businesses and other public facilities. The BNSF Railway bisects the northern parts of Spokane Valley from the main city south of the railway. The project will connect a diverse neighborhood surrounding the Study area including residential, commercial, mixed-use, and industrial areas. The new grade-separated crossing and roundabout will provide ADA-compliant sidewalks, making the route more appealing to pedestrians and bicyclists. In addition to an improved crossing of the railroad tracks, the roundabout will create a safer and more comfortable crossing of Trent Avenue. It will also be improving access and mobility between the nearby business park and commercial businesses, Trent Elementary School , the Centennial Trail, and the Spokane River

- ***Improved Emergency Vehicle Access***

  Key emergency services (fire, police, and EMS) are located south of the railway crossing. The long and frequent delays at the rail crossings causes delays for providing emergency services to the north. Eliminating the Pines Road grade crossing will improve travel time and reliability for emergency responders that may otherwise not be able to pass or be forced to take a longer route.

- ***Reduced Noise Pollution***

  Spokane Valley residents have long complained about the noise pollution of the train whistles. Federal law requires locomotives to sound their horns at 96 to 100 decibels as they approach at-grade crossings and continue blowing the horn until the train clears the crossing. Not only do the horns disturb the peacefulness of the surrounding area, medical studies have linked loud noises, such as train whistles, to stress-related health problems.[4] As part of the broader Bridging the Valley plan, all existing at-grade crossings will be eliminated, which will allow noise from train horns and whistles to be severely reduced. The Pines Road project alone will significantly reduce the amount of train horn and whistle noise and serves as an incremental improvement toward the overall goal of removing all at-grade crossings.

Environmental Sustainability

- ***Promoting Electrification***

  The project reduces motorists' carbon footprint through reduction in vehicle idling at the grade crossing, as well as through providing a new trailhead facility equipped with electric vehicle charging stations which promotes clean transportation options. The project will connect a shared-use path along Pines Rd. to the new trailhead facility which provides access to the Centennial Trail and Spokane River.

Safety

- ***Improve Pedestrian Accessibility***

  Students at Trent Elementary are not allowed to walk to school through the project intersection because of its associated hazards. This project will improve pedestrian accessibility through the highway intersection and under the railroad crossing. The school further supports the project because it moves the physical intersection almost one-quarter mile farther from the school, twice its current distance. The safety of active modes will be enhanced with the addition of ADA-

[4] "Spokane Valley, Cheney residents want to silence train whistles." The Spokesman-Review, March 6, 2016.

accessible sidewalks throughout the project which currently lacks any pedestrian or bicycle facilities at the rail crossing.

2 Introduction

This document provides detailed technical information on the economic analyses conducted in support of the RAISE Grant Application for the Pines Road/BNSF Grade Separation project.

- **Section 1 – Executive Summary**
- **Section 2 – Introduction:** Outlines the BCA document layout and structure to assist USDOT reviewers.
- **Section 3 - Methodological Framework:** Introduces the conceptual framework used in the Benefit-Cost Analysis (BCA).
- **Section 4 - Project Overview:** Provides an overview of the project, including a brief description of existing conditions and proposed alternatives; a summary of cost estimates and schedule; and a description of the types of effects that the Pines Road/BNSF Grade Separation is expected to generate.
- **Section 5 - General Assumptions:** Discusses the general assumptions used in the estimation of project costs and benefits.
- **Section 6 – Demand Projections:** Estimates of travel demand and traffic volumes.
- **Section 7 – Benefits Measurement, Data and Assumptions:** Details the specific data elements and assumptions used to address the goals of the project and to comply with program requirements.
- **Section 8 – Summary of Findings and Benefit-Cost Outcomes:** Estimates the project's Net Present Value (NPV), its Benefit/Cost Ratio (BCR), and other project evaluation metrics.
- **Section 9 – Benefit Cost Sensitivity Analysis:** Provides the outcomes of the sensitivity analysis that evaluates the different assumptions made by the City and the impact that the variability of those assumptions may have on the overall project.
- **Section 10 - Supplementary Data Tables:** Includes a breakdown of all benefits associated with the merit criteria outcomes for the project, including annual estimates of benefits and costs, as well as intermediate values to assist DOT in its review of the application.

3 Methodological Framework

The specific methodology developed for this application was developed using the above BCA principles and is consistent with the USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Applications (February 2021). In particular, the methodology involves:

- Establishing existing and future conditions under the Build and No Build scenarios;
- Assessing benefits with respect to each of the 5 primary and 2 secondary merit criteria identified in the notice of funding opportunity (NOFO);
- Measuring benefits in dollar terms, whenever possible, and expressing benefits and costs in a common unit of measurement;

- Using USDOT guidance for the valuation of travel time savings, safety benefits and reductions in air emissions, while relying on industry best practice for the valuation of other effects
- Discounting future benefits and costs with the real discount rates recommended by USDOT (7 percent, and 3 percent for sensitivity analysis); and
- Conducting a sensitivity analysis to assess the impacts of changes in key estimating assumptions.

4 Project Overview

With increasing growth in freight train traffic, the Pines Road grade crossing is becoming increasingly difficult for motorists, pedestrians, and other users. Extended delays at the project location result in inefficient emergency services access, noise pollution from train whistles, inefficient freight truck movements along a preferred long-haul freight route, and a worsening Level of Service (LOS) projected to reach 'F' in future years due to high traffic volumes.

The Pines Road/BNSF Grade Separation Project replaces an existing at-grade crossing with an underpass of BNSF's railroad tracks and provides a roundabout at the intersection of Pines Road and Trent Avenue. Pedestrians and cyclists will also be able to safely cross under the BNSF tracks due to the proposed facilities that currently do not exist.

The project is centered in Census Tract 117.02, which has many of Spokane Valley's highest rates for vulnerable populations. The project improvements most closely benefit Spokane Valley's most disadvantaged populations and improves access and mobility for these users by increasing transportation options including expanding transit service routes, improving access to facilities, including a shared use path through the project limits, new access to the Centennial Trail via a trailhead, and by allowing for more timely and reliable connectivity to Valley Hospital, located one mile to the south.

The project also reduces the City's impact on the environment. The project reduces motorists' carbon footprint, saves travel time for users, provides increased transportation options, eliminates train horn noise, and accommodates electrification of the transportation network.

The improvements also support freight movement and regional mobility goals as articulated in various plans such as Horizon 2040, the MPO's regional transportation plan, and the Inland Pacific Hub Transportation Study, a partnership of public and private agencies dedicated to creating a freight gateway in the region. In 2018, the at-grade crossing was rated Washington State's top Tier 1 road-rail conflict.[5]

The project will improve the current conditions in the area and in nearby neighborhoods by:

- ***Creating*** an underpass which will foster increased connectivity for all road users, pedestrians, and cyclists by installing new sidewalks and shared-use lanes
- ***Converting*** an existing intersection into an improved roundabout allowing a greater flow of traffic
- ***Improving*** public safety by eliminating rail/vehicle encounters at the Pines Road/BNSF crossing
- ***Improving*** travel time reliability through the elimination of rail crossing blockages, allowing for greater predictability in travel times
- ***Improving*** emergency services access along the Project corridor
- ***Improving*** access and mobility between the nearby business park and commercial businesses, an elementary school, the Centennial Trail, and the Spokane River
- ***Eliminating*** wait times and prolonged queuing both at the crossing and along the Project corridor

[5] Freight Mobility Strategic Investment Board's *Study of Road-Rail Conflicts – Phase 2 – Development of Project Priorities,* August, 2018

- ***Eliminating*** vehicle queuing along Trent Avenue as a result of train crossings
- ***Reducing*** noise pollution arising from train whistles at the Pines Road/BNSF crossing
- ***Reducing*** motorists' carbon footprint
- ***Promoting*** the reduction of Particulate Matter (PM10) and Carbon Monoxide (CO) in Spokane Valley which is identified by the EPA as a "maintenance area"
- ***Promoting*** expanded transit routes to reduce reliance on single occupant vehicle trips and improve transportation options for disadvantaged populations
- ***Unlocking*** the economic development potential of prime industrial, commercial, and mixed-use land near the Project location
- ***Linking*** a large residential neighborhood to the north with the City's commercial and employment hub to the south
- ***Unlocking*** the economic development potential of approximately 170 acres of mixed-use or commercially-zoned parcels and 56 acres of prime industrially-zoned parcels are undeveloped because property owners and developers cannot afford to mitigate the LOS 'E' operating conditions at the Pines Road /Trent Avenue intersection.

4.1 Base Case and Alternative Case

4.1.1 Base Case

The Base Case for the Pines Road Grade Separation project is defined as the No Build scenario. In the Base Case, the lack of grade separation and continued freight train growth continues to delay road users and maintains the LOS 'E' designation. Vehicle queuing along Trent Avenue continues to pose severe safety concerns.

The key assumptions used to define the Base Case (No Build Scenario) are as follows:

- Average Annual Daily Traffic (AADT) on Trent Avenue (East of Pines Road) of **27,213** (2020), growing at a rate of **1.9% per year** which is the historical 10-year annual average growth rate based upon City of Spokane Valley traffic counts. Forecasted peak volume AADT is in line with historical trends. The historical 10-year average annual growth rate at the crossing is validated through comparison with Spokane Regional Transportation Council (SRTC) Travel Demand Model (TDM) outputs.
- AADT on Trent Avenue (West of Pines Road) of **22,693** (2018), growing at a rate of **0.7% per year** which is the historical 10-year annual average growth rate based upon City of Spokane Valley traffic counts.
- AADT at the Pines Road crossing of **16,758** (2019), growing at a rate of **1.5% per year** derived using the historical 10-year annual average growth rate. Forecasted peak volume AADT is in line with historical trends. Through analysis, it was determined that the 10-year growth rate to be most suitable. AADT is broken down by the following modes:
    - **87%** passenger vehicles
    - **12%** trucks, and
    - **1%** transit
- **60** daily freight trains (2021) growing at a rate of **2.8% per year** until 2040 based on the 2019 WSDOT State Rail System Plan. The 2019 state rail plan assumes 3.7% average annual growth rate (High Growth scenario) from 2016 to 2040, however the growth rate between 2021 volumes and the 2040 state rail plan was used in the analysis (2.8% per year). It was conservatively

assumed that freight train volumes would not exceed 102 trains that were forecasted in 2040 by the state rail plan.

- Average freight train speed of **25 miles per hour**
- Average freight train length of **6,500 feet**
- **2** daily passenger trains (2021) assumed constant throughout the analysis period based on the 2019 WSDOT State Rail System Plan
- Average passenger train speed of **35 miles per hour**
- Average passenger train length of **1,000 feet**
- Average lead and lag time for gate closure of **0.6 minutes**

Freight and passenger train forecasts were obtained from the Washington State Rail System Plan which includes mainline track forecasts under 3 unique forecast scenarios as summarized by Table 9.

Table 9: WSDOT Freight Rail Demand Forecast Scenarios

Low Growth Scenario	Moderate Growth Scenario	High Growth Scenario
- Driven by a significant decline in export volumes and the resulting cumulative effects	-Driven by growth in industries requiring long-haul movement of heavy commodities	- Driven by robust growth in export volumes
- Assumes that tariffs imposed by the U.S. and other nations have a substantial, lasting effect on international trade and suppress export activity	- Assumes no long-term effects from tariff and trade tensions	- Assumes that tariffs imposed by the U.S. and other nations have little to no effect on international trade volumes and/or are removed with minimal or no lingering effects
- Assumes high potential negative effects on agricultural imports/exports and international containerized trade, and declined energy exports	- Based on FHWA's FAF 46 growth rates and long-term macroeconomic forecasts derived from REMI model	- Assumes high potential growth in energy exports caused by proposed bulk shipment facilities for coal and oil, and robust potential growth in international containerized trade and agricultural imports and exports

Source: 2019 Washington State Rail System Plan

It's noted that the 2019 moderate growth scenario projects current freight train volumes of 60 freight trains per day won't be reached until 2031 while the high growth scenario forecasts 60 freight trains are reached in 2025. As a result, the high growth scenario was chosen since it better reflects current freight train volumes. Sensitivity analysis (see Section 9) includes assessment of the low and moderate scenarios, both of which result in positive societal outcomes.

4.1.2 Alternative Case

The Alternative Case is defined as the Build scenario. In the Alternative Case, grade separation will eliminate train/vehicle encounters and eliminate wait times at the Pines Road crossing. The existing signalized intersection is converted to a roundabout allowing for greater flow of traffic and reduced collision severity. Traffic congestion and related safety concerns along Trent Avenue [due to train crossings] are

eliminated. Specifically, the new infrastructure and improved process described in the project overview section above will result in the following changes to some key inputs and assumptions:

- Average Annual Daily Traffic on Trent Avenue (East of Pines Road) of **27,213** (2020), growing at a rate of **1.9% per year** which is the historical 10-year annual average growth rate based upon City of Spokane Valley traffic counts. Forecasted peak volume AADT is in line with historical trends. The historical 10-year average annual growth rate at the crossing is validated through comparison with Spokane Regional Transportation Council (SRTC) Travel Demand Model (TDM) outputs.
- AADT on Trent Avenue (West of Pines Road) of **22,693** (2018), growing at a rate of **0.7% per year** which is the historical 10-year annual average growth rate based upon City of Spokane Valley traffic counts.
- AADT at the Pines Road crossing of **16,758** (2019), growing at a rate of **1.5% per year** derived using the historical 10-year annual average growth rate. Forecasted peak volume AADT is in line with historical trends. Through analysis, it was determined that the 10-year growth rate to be most suitable. AADT is broken down by the following modes:
    - **87%** passenger vehicles
    - **12%** trucks, and
    - **1%** transit
- **60** daily freight trains (2021) growing at a rate of **2.8% per year** until 2040 based on the 2019 WSDOT State Rail System Plan. The 2019 state rail plan assumes 3.7% average annual growth rate (High Growth scenario) from 2016 to 2040, however the growth rate between 2021 volumes and the 2040 state rail plan was used in the analysis (2.8% per year). It was conservatively assumed that freight train volumes would not exceed 102 trains that were forecasted in 2040 by the state rail plan.
- Average freight train speed of **25 miles per hour**
- Average freight train length of **6,500 feet**
- **2** daily passenger trains (2021) assumed constant throughout the analysis period based on the 2019 WSDOT State Rail System Plan
- Average passenger train speed of **35 miles per hour**
- Average passenger train length of **1,000 feet**
- Average lead and lag time for gate closure of **0.6 minutes**

As mentioned during the Base Case overview above, freight and passenger train forecasts were obtained from the Washington State Rail System Plan. The high growth scenario was selected due to its alignment with current freight train volumes; however, a sensitivity analysis was performed in Section 9 which provides an assessment of the low and moderate growth scenarios which both show positive societal outcomes.

4.2 Project Cost and Schedule

Table 10 summarizes the total project cost including previously incurred costs and Table 11 shows the project schedule with substantial completion expected at the end of 2025.

Table 10: Total Project Cost Components

Component	2019$	YOE$
Previously Incurred Costs	$4,827,575	$4,827,575
Construction	$13,623,831	$16,181,921
Right of Way	$2,715,810	$3,222,346
Construction Engineering	$3,405,958	$4,045,480
Preliminary Engineering	$245,903	$405,655
Final Engineering	$61,476	$101,407
Total Project Cost	**$24,880,552**	**$28,784,385**
Total Future Project Cost	**$20,052,977**	**$23,956,810**

Table 11: Project Schedule

Phase	Begin	End
Prelim. Engineering (Incl. RW Plans & Prep)	Sep-17	Dec-20
Design Engineering	Sep-17	Dec-22
Environmental Documents (NEPA)	Jan-21	Jun-21
Right of Way Acquisition	Jun-20	Dec-22
CN Ad/Bid/Award	Jan-23	Sep-23
Construction*	Sep-23	Dec-25

**Substantial Completion Date. Construction contract finalization by 12/2026.*

Table 12 summarizes the anticipated funding sources for the project with Table 13 below shows the allocation of project funding.

Table 12: Summary of Anticipated Funding Sources

Status	Source	Amount ($)	Amount (%)
Federal Funding			
Requested	RAISE Program	$16,239,622	67.79%
Committed	STBG Program (Remaining STBG funds)	$2,545,075	10.62%
Total Federal Sources		**$18,784,697**	**78.41%**
Non-Federal Funding			
Committed	City of Spokane Valley	$2,441,917	10.19%
Expected	City of Spokane Valley	$1,715,197	7.16%
	BNSF*	$300,000	1.25%
	Avista Utilities (Land Donation)	$715,000	2.98%
Total Non-Federal Sources		**$5,172,114**	**21.59%**
Total Future Costs		**$23,956,810**	**100%**

Table 13: Allocation of Project Funding

Project Phase	Previously Incurred Costs	Future Eligible Costs				Total Project Costs
		RAISE	Other Federal	Non- Federal	Subtotal	
Engineering	$2,887,385	$405,600	$ -	$101,400	$507,000	**$3,394,385**
(% by Phase)		**80.00%**	**0.00%**	**20.00%**	**100%**	

Project Phase	Previously Incurred Costs	Future Eligible Costs				Total Project Costs
		RAISE	Other Federal	Non- Federal	Subtotal	
Right-of-Way	$1,940,190	$ -	$2,169,256	$1,053,554	$3,222,810	**$5,163,000**
(% by Phase)		**0.00%**	**67.31%**	**32.69%**	**100%**	
Construction	-	$15,834,022	$375,819	$4,017,159	$20,227,000	**$20,227,000**
(% by Phase)		**78.28%**	**1.86%**	**19.86%**	**100%**	
Total Project Costs	**$4,827,575**	**$16,239,622**	**$2,545,075**	**$5,172,114**	**$23,956,810**	**$28,784,385**
(% by Funding Type)		**67.79%**	**10.62%**	**21.59%**	**100%**	

4.3 Effects on Selection

The main benefit categories associated with the project are mapped into the 5 primary and 2 secondary merit criteria set forth by USDOT in the table below.

Table 14: Expected Effects on Merit Criteria Outcomes and Benefit Categories

Merit Criteria	Impact Categories	Description	Monetized	Qualitative
Safety	Improved Safety and Avoided Accident Costs	Improved Safety and Avoided Accident Costs from Eliminated Pines Road Grade Crossing	Yes	-
	Improve Pedestrian Accessibility	Students at Trent Elementary are not allowed to walk to school through the project intersection because of its associated hazards. This project will improve pedestrian accessibility through the highway intersection and under the railroad crossing. The school further supports the project because it moves the physical intersection almost one-quarter mile farther from the school, twice its current distance. The safety of active modes will be enhanced with the addition of ADA-accessible sidewalks throughout the project which currently lacks any pedestrian or bicycle facilities at the rail crossing.	-	Yes
State of Good Repair	Residual Value of Infrastructure Asset	Residual Value of Infrastructure Asset	Yes	-
	Operations & Maintenance Cost Savings	Reduction in maintenance costs for the existing at-grade crossing	Yes	-
Economic Competitiveness	Reduced Travel Time Costs	Reduced Travel Time Costs from Vehicle Idling and Delay Time at Pines Road Crossing	Yes	-
	Reduced Vehicle Operating Costs	Reduced Vehicle Operating Costs from Vehicle Idling and Delay Time at Pines Road Crossing	Yes	-
	Improved Travel Time Reliability	Fewer rail crossing blockages will improve travel time reliability as there will be a significantly lower chance for drivers to be delayed thus reducing the unpredictability of trips in the area. This also allows	-	Yes

Merit Criteria	Impact Categories	Description	Monetized	Qualitative
		both short and long-haul trucks to experience increase in delivery timeliness. The project also contributes to reliable movement of regional freight by road and rail. Due to its location near the City's northern boundary, the project serves as a gateway for freight, goods, and travelers coming to and from rural Washington, Idaho, Montana, and Canada.		
	Improved Access to Economic Development Potential	Close to 170 acres of mixed-use or commercially-zoned parcels and 56 acres of prime industrially-zoned parcels are undeveloped because property owners and developers cannot afford to mitigate the LOS 'E' operating conditions at the Pines Road /Trent Avenue intersection. These parcels, and several hundred more acres beyond the city limits, are some of the last undeveloped parcels available for industrial use in the area.	-	Yes
Environmental Sustainability	Avoided Emissions Costs and Reduced Carbon Footprint	Avoided Emission Costs from Vehicle Idling and Delay Time at Pines Road Crossing	Yes	-
	Promoting Electrification	The project reduces motorists' carbon footprint through reduction in vehicle idling at the grade crossing, as well as through providing a new trailhead facility equipped with electric vehicle charging stations which promotes clean transportation options. The project will connect a shared-use path along Pines Rd. to the new trailhead facility which provides access to the Centennial Trail and Spokane River.	-	Yes
Quality of Life	Improved Connectivity	Grade separation will provide pedestrian and cycling facilities allowing for greater connectivity and promotion of active lifestyles, in addition to improved access to nearby businesses and other public facilities. The project will reduce barriers to disadvantaged populations and improve access and mobility for these users by increasing transportation options including expanded transit routes to reduce reliance on single occupant vehicle trips, improving access to facilities including a shared use path through the project limits, new access to the Centennial Trail via a trailhead, and by allowing for more timely and reliable connectivity to Valley Hospital, located one mile to the south. The new grade-separated crossing and roundabout will provide ADA-compliant sidewalks, making the route more appealing to pedestrians and bicyclists. In addition to an improved crossing of the railroad tracks, the roundabout will create a safer and more comfortable crossing of Trent Avenue. It will also be improving access and mobility between the nearby business park and commercial businesses, Trent Elementary School , the Centennial Trail, and the Spokane River	-	Yes
	Improved Emergency	Fewer rail crossing blockages will improve travel time reliability as there will be a significantly lower chance	-	Yes

Merit Criteria	Impact Categories	Description	Monetized	Qualitative
	Vehicle Access	for drivers to be delayed thus reducing the unpredictability of trips in the area.		
	Reduced Noise Pollution	Grade separation will reduce noise pollution from train whistles.	-	Yes
Innovation	Innovative Bridge Construction	The City of Spokane Valley will evaluate innovative bridge construction techniques to reduce the impact on the community and the existing traffic. This may include constructing the structures off-site before staging for construction.	-	Yes
	Intelligent Transportation Systems	The project will take advantage of the Spokane Regional Transportation Management Center (SRTMC) Intelligent Transportation Systems (ITS) infrastructure to communicate traveler information about construction activities and expected delays throughout the project using SRTMC's website and 511 telephone system.	-	Yes
Partnership	Support from Public and Private Partners	This project demonstrates support from numerous public and private partners across the region. Two states, several regional public entities, multiple cities, and local business organization, as well as two Class I railroads actively participated in the Horizon 2040, and in the previous Bridging the Valley plan and other workshops, stakeholder outreach, and funding initiatives to further this effort.	-	Yes

5 General Assumptions

The BCA measures benefits against costs throughout a period of analysis beginning at the start of project development and including 30 years of operations.

The monetized benefits and costs are estimated in 2019 dollars with future dollars discounted in compliance with RAISE requirements using a 7 percent real rate, and sensitivity testing at 3 percent.

The methodology makes several important assumptions and seeks to avoid overestimation of benefits and underestimation of costs. Specifically:

- Input prices are expressed in 2019 dollars;
- The period of analysis begins in 2017 and ends in 2055. It includes project development and construction years (9) and full years of operations (30).
- A constant 7 percent real discount rate is assumed throughout the period of analysis. A 3 percent real discount rate is used for sensitivity analysis.

6 Demand Projections

Accurate demand projections are important to ensure the reasonable BCA output results. The magnitudes of the long-term benefits accruing over the Pines Road Grade Separation project study period are a function of vehicle traffic at the Pines Road Crossing and Pines Road / Trent Avenue intersection, and freight and passenger train growth.

6.1 Methodology

Recent and historical traffic counts supplied by the City of Spokane Valley were used to calculate historical 10-year annual average growth rates. Additional benefits of avoided detours were not estimated due to a lack of reliable data although motorists may choose to take longer detours to avoid the congested and unreliable crossings which could be avoided in the Alternative Case.

6.2 Assumptions

All assumptions used in the estimation of demand inputs for the Pines Road Grade Separation project are provided in Table 15.

Table 15: Assumptions used in the Estimation of Demand

Variable Name	Unit	Value	Source
Pines Road Crossing			
AADT (2019)	vehicles/day	16,758	2019 actual traffic count data grown by validated historical 10-year average annual growth rate. Validated through comparison with SRTC Travel Demand Model outputs. Share of vehicle counts based upon engineering estimates.
Passenger Vehicles	%	87.0%	
Trucks	%	12.0%	
Buses	%	1.0%	
AADT Growth Rate	%	1.46%	Historical 10-year average annual growth rate at crossing validated through comparison with Spokane Regional Transportation Council (SRTC) Travel Demand Model (TDM) outputs
Freight Trains at Crossing (2021)	trains/day	60	BNSF
Maximum Trains at Crossing	trains/day	125	City of Spokane Valley AADT data
Freight Train Traffic Growth (2021-2040)	%	2.83%	WSDOT 2019 State Rail System Plan .2040 forecast volumes used for comparison against 2021 volumes https://wsdot.wa.gov/sites/default/files/2020/08/27/2019-2040-State-Rail-Plan.pdf
Passenger Trains at Crossing (2021)	trains/day	2	WSDOT 2019 State Rail System Plan https://wsdot.wa.gov/sites/default/files/2020/08/27/2019-2040-State-Rail-Plan.pdf
Passenger Train Traffic Growth	%	0.00%	WSDOT 2019 State Rail System Plan https://wsdot.wa.gov/sites/default/files/2020/08/27/2019-2040-State-Rail-Plan.pdf
Avg. Freight Train Speed	miles/hour	25.0	City of Spokane Valley
Avg. Passenger Train Speed	miles/hour	30.0	HDR assumption
Avg. Freight Train Length	feet	6,500	BNSF
Avg. Passenger Train Length	feet	1,000	HDR assumption
Lead and Lag Time	minutes	0.60	HDR assumption
Trent Avenue Intersection			
AADT, East of Pines Road (2020)	vehicles/day	27,213	City of Spokane Valley AADT data

Variable Name	Unit	Value	Source
AADT, West of Pines Road (2020)	vehicles/day	23,010	
AADT Growth Rate East of Pines Road	%	1.92%	2020 actual traffic count data grown by validated historical 10-year average annual growth rate. Validated through comparison with SRTC Travel Demand Model outputs
AADT Growth Rate West of Pines Road	%	0.70%	

6.3 Demand Projections

The resulting projections for average traffic volumes at the Pines Road crossing and Trent Avenue intersection, as well as train volumes and expected hours of vehicle delay (Base Case) are presented in the table below.

Table 16: Demand Projections

Category	2026	2035	2045	2055
Total Annual Traffic at Pines Road Crossing	6,768,598	7,709,908	8,910,110	10,297,147
Total Annual Traffic at Trent Ave. Intersection	11,135,215	13,217,296	15,990,358	19,345,223
Annual Freight Trains at Pines Road Crossing	25,182	32,378	37,230	37,230
Annual Passenger Trains at Pines Road Crossing	730	730	730	730
Total Vehicle Hours of Delay - Passenger Vehicles	10,873,746	15,917,618	21,147,539	24,439,577
Total Vehicle Hours of Delay - Trucks	1,499,827	2,195,533	2,916,902	3,370,976
Total Vehicle Hours of Delay - Bus Driver and Passenger	124,986	182,961	243,075	280,915

7 Benefits Measurement, Data and Assumptions

This section describes the measurement approach used for each benefit or impact category identified in Table ES-1 and provides an overview of the associated methodology, assumptions, and estimates.

7.1 Safety Outcomes

The project contributes to promoting safety benefits through:

- Eliminating conflict between roadway users and trains by separating uses;
- Eliminating potential queuing of vehicles stopped for train crossings;
- Reducing the potential for high severity collisions at the intersection;
- Adding ADA-accessible active transportation features to increase safety; and
- Improving emergency access for police, fire and medical providers.

The BCA quantifies the safety benefits through accident reductions due to eliminated train/vehicle encounters at the Pines Road grade crossing and intersection improvements.

7.1.1 Methodology

Accident costs, and impacts on life, limb, and property, are a significant component of road user costs. Road safety is a key economic factor in the planning of roads, as well as an important indicator of transportation efficiency, while outside of the economic context, highway safety is often the object of public concern and a leading social issue. Estimating safety benefits requires data on the frequency and severity of accidents for the type of road and area under consideration; in addition, the costs of injuries and fatalities must be monetized. Base Case collisions at the Pines Road crossing were derived using the FRA's collision prediction formulae. Collisions at the Pines Road and Trent Avenue intersection were calculated using crash data actuals provided by the City of Spokane Valley and crash modification factors (CMF) obtained from the US DOT Crash Modification Factor Clearinghouse. The Project team carefully assessed collisions within the Project limits, particularly at the Pines Road and Trent Avenue intersection, to ensure that appropriate incidents are captured in the benefit cost analysis. While PDO (property damage only) accidents occur, only benefits realized from mitigated injury accidents and fatalities were monetized.

7.1.2 Assumptions

The assumptions used in the estimation of safety benefits are summarized in the table below.

Table 17: Assumptions used in the Estimation of Safety Benefits

Variable Name	Unit	Value	Source
Value of a Statistical Life	2019$/fatality	$10,900,000	Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses (2016) https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-on-valuation-of-a-statistical-life-in-economic-analysis
Cost of Serious Injury	2019$/injury	$1,144,500	
Cost of a Minor Injury	2019$/injury	$32,700	
Cost of an Unknown Injury	2019$/injury	$197,600	
Cost of PDO	2019$/injury	$4,500	
Number of Fatalities per Fatal Collision	fatalities/fatal crash	1.00	
Number of Injuries per Fatal Collision	injuries/injury crash	0.35	
Number of Injuries per Possible Injury Collision	injuries/injury crash	1.29	
Number of Injuries per Suspected Minor Injury Collision	injuries/injury crash	1.30	
Number of Injuries per Suspected Serious Injury Collision	injuries/injury crash	1.56	
Number of Injuries per Unknown Injury Collision	injuries/injury crash	1.00	
Number of Vehicles per Crash	vehicles/crash	1.93	
2018 Expected Accident Rate, Crossing	accidents/year	2.0000	HDR Calculations Using FRA Collision Prediction Formulae

Variable Name	Unit	Value	Source
2026 Expected Accident Rate, Crossing	accidents/year	2.0000	
2036 Expected Accident Rate, Crossing	accidents/year	2.0000	
2046 Expected Accident Rate, Crossing	accidents/year	2.0000	
2055 Expected Accident Rate, Crossing	accidents/year	2.0000	
Fatalities as Share of Total Accidents	%	8.33%	HDR calculation using FRA GX Tool
Injuries as Share of Total Accidents	%	25.0%	
PDO as Share of Total Accidents	%	66.7%	
Crash Modification Factor	factor	0.79	US DOT Crash Modification Factor Clearinghouse. "Convert Intersection With Minor-Road Stop Control to Modern Roundabout
Growth in Intersection Accidents	%/year	1.92%	Historical 10-year Average Annual Growth Rate at Crossing

7.1.3 Benefit Estimates

The table below shows the benefit estimates of eliminated train/vehicle encounters. With a 7 percent discount rate applied to the benefits, the estimated present value is $22.1 million. See Section 10.3 and 10.4 for additional information.

Table 18: Estimates of Safety Benefits, 2019 Dollars

	In Project Opening Year	Over the Project Lifecycle	
		In Constant Dollars	Discounted at 7 Percent
Improved Safety and Avoided Accident Costs	$2,543,031	$82,074,608	$22,061,732
Total	**$2,543,031**	**$82,074,608**	**$22,061,732**

Improve Pedestrian Accessibility

Students at Trent Elementary are not allowed to walk to school through the project intersection because of its associated hazards. This project will improve pedestrian accessibility through the highway intersection and under the railroad crossing. The school further supports the project because it moves the physical intersection almost one-quarter mile farther from the school, twice its current distance. The safety of active modes will be enhanced with the addition of ADA-accessible sidewalks throughout the project which currently lacks any pedestrian or bicycle facilities at the rail crossing.

7.2 State of Good Repair Outcomes

7.2.1 Methodology

The proposed project would contribute to the state of good repair by converting an existing intersection into an improved roundabout. Due to the time period considered for the analysis, the remaining (or residual) value of the new infrastructure asset is not fully captured. As a result, the residual value of the new grade separation underpass is monetized. The estimated underpass lifespan was deducted from the benefit cost analysis benefit period to obtain the service life outside the study period. The remaining life as a factor of the estimated asset service life was multiplied by the project capital costs to derive the estimate.

7.2.2 Assumptions

The assumptions used in the estimation of State of Good Repair benefits are summarized in the table below.

Table 19: Assumptions used in the Estimation of State of Good Repair Benefits

Variable Name	Unit	Date	Value	Source
Estimated Asset Service Life	years	2017-2055	50.0	Transportation for America, Bridges Overview. "Expected Lifespan of 50 years."
BCA Benefit Period	years	2017-2055	30.0	HDR Calculations with City of Spokane Valley Consultation
Service Life Remaining	years	2017-2055	20.0	
Project Capital Costs	2019$	2017-2055	$24,880,552	
Annual Maintenance Cost Savings	2019$	2017-2055	$11,000	Estimate based upon long term maintenance of at-grade crossing infrastructure

7.2.3 Benefit Estimates

The table below shows the estimated residual value of the new infrastructure asset. With a 7 percent discount rate, the estimated present value is $0.96 million. See Section 10.5 for more information.

Table 20: Estimates of State of Good Repair Benefits, 2019 Dollars

	In Project Opening Year	Over the Project Lifecycle	
		In Constant Dollars	Discounted at 7 Percent
Residual Value of Infrastructure Asset	$0	$9,952,221	$871,172
Operations and Maintenance Cost Savings	$11,000	$330,000	$90,955
Total	**$11,000**	**$10,282,221**	**$962,128**

7.3 Economic Competitiveness

To quantify the benefits associated with economic outcomes, multiple impacts were considered primarily in relevance to motorists. Specifically, these impacts included travel time costs, vehicle operating costs, and pavement maintenance costs – all of which were monetized.

The project also results in the following additional Economic Competitiveness outcomes:

- Contributes to reliable movement of regional freight by road and rail;
- Adds capacity for a total of four BNSF tracks at the crossing location;

- Minimizes construction delays/impacts felt by users and businesses;
- Decreases transportation costs and improve long-term efficiency, reliability, and costs in the movement of workers and goods;
- Combined with other Horizon 2040 regionally significant projects, creates a 3.6-mile section with only one at-grade BNSF crossing; and
- Maximize the access and reliability to close to 170 acres of prime, buildable industrial-zoned land and 56 acres of residential-zoned land.

7.3.1 Methodology

Travel time savings will be generated for motorists (automobiles, trucks, and transit buses) at the Pines Road crossing. Reduced crossing blockage times will lead to decreased vehicle travel time costs which are monetized using DOT guidance for value of time of automobile drivers and passengers, bus passengers, as well as heavy vehicle truck drivers and bus drivers. Out-of-pocket vehicle operating cost savings will accrue from decreased vehicle wait times and idling as a result of the new underpass across Trent Avenue. The out-of-pocket cost savings were monetized based on the change in delay time and associated fuel and oil used while idling.

Travel time savings in hours between the Base and the Alternative Cases were estimated based on AADT forecasts derived on the City of Spokane's historical traffic counts and the Federal Rail Administration (FRA) database regarding daily train counts, speeds, and lengths. The expected crossing time delay was then derived by applying the probability of delay which is a function of train frequency, speed, length, and lead and lag time.

Value of time for vehicle type, as well as occupancy assumptions for both automobiles and trucks are available in the Benefit-Cost Analysis Guidance for Discretionary Grant Applications published by US DOT. The average transit bus occupancy was derived from consultation with the City of Spokane Valley. The estimate for travel time savings is simply the product of hours of delay, vehicle occupancy, and respective value of time.

The reduction in vehicle idling time at Pines Road crossing will translate into lower vehicle operating costs from reduced fuel and motor oil consumption in the Alternative. The change in vehicle delay time (by vehicle type and by year) is multiplied by the associated vehicle fuel consumption rate to obtain annual estimates of fuel consumption from idling. This multiplied by the cost per unit of fuel provides an estimate of the change in fuel costs. The same methodology is applied to track the change in motor oil consumption and costs. The sum of the two costs produces an estimate for the overall vehicle operating cost impacts due to vehicle delay time at the crossing.

7.3.2 Assumptions

The assumptions used in the estimation of economic outcomes and benefits are summarized in the table below.

Table 21: Assumptions used in the Estimation of Economic Outcomes

Variable Name	Unit	Date	Value	Source
Average Passenger Vehicle Occupancy	persons	2017-2055	1.67	2017 National Household Travel Survey
Average Truck Occupancy	persons	2017-2055	1.00	
Average Transit Bus Occupancy	persons	2017-2055	60.0	City of Spokane Valley

Variable Name	Unit	Date	Value	Source
Value of Time for Automobile Driver and Passenger	2019$/hour	2017-2055	$17.9	Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-valuation-
Value of Time for Truck Driver	2019$/hour	2017-2055	$30.8	
Value of Time for Bus Driver	2019$/hour	2017-2055	$31.7	
Value of Time for Bus Passenger	2019$/hour	2017-2055	$17.9	
Vehicle Fuel Burned at Idle - Automobile	gal/hr	2017-2055	0.36	US DOE: Alternative Fuels Data Center and Argonne National Laboratory, "Idle Reduction Savings Worksheet" (2014) - Average of gasoline passenger vehicles
Vehicle Diesel Burned at Idle - Truck	gal/hr	2017-2055	0.49	US DOE: Alternative Fuels Data Center and Argonne National Laboratory, "Idle Reduction Savings Worksheet" (2014) - Combination Trucks
Vehicle Diesel Burned at Idle - Transit Bus	gal/hr	2017-2055	0.97	US DOE: Alternative Fuels Data Center and Argonne National Laboratory, "Idle Reduction Savings Worksheet" (2014) - Transit Bus
Average Consumption of Motor Oil per Hour	quarts/hr	2017-2055	0.03	Based on US DOT: HERS-ST Highway Economic Requirements System (2002) oil consumption of 1.38qt/1000miles and assuming that "One hour of idle time is equal to approximately 25 miles of driving" (Ford Motor Company, 2011)
Cost of Motor Oil - Automobile	2019$/hour	2017-2055	$10.72	Average oil price sourced from HERS model and inflated to 2019$ by Motor Oil CPI (BLS CUUR0000SS47021)
Cost of Motor Oil - Truck	2019$/hour	2017-2055	$4.29	
Cost of Motor Oil - Bus	2019$/hour	2017-2055	$4.29	
Cost of Diesel	2019$/gallon	2019	$2.45	Energy Information Administration, Annual Energy Outlook 2021. Net of State and Federal taxes.
		2020	$1.90	
		2021	$1.90	
		2022	$2.00	
		2023	$2.22	
		2024	$2.31	
		2025	$2.39	
		2026	$2.45	
		2027	$2.51	
		2028	$2.56	
		2029	$2.60	
		2030	$2.70	
		2031	$2.74	
		2032	$2.79	
		2033	$2.81	
		2034	$2.83	
		2035	$2.85	
		2036	$2.86	
		2037	$2.90	
		2038	$2.93	
		2039	$2.93	
		2040	$2.99	
		2041	$3.02	

Variable Name	Unit	Date	Value	Source
		2042	$3.04	
		2043	$3.08	
		2044	$3.09	
		2045	$3.09	
		2046	$3.13	
		2047	$3.15	
		2048	$3.16	
		2049	$3.18	
		2050	$3.18	
		2051	$3.18	
		2052	$3.18	
		2053	$3.18	
		2054	$3.18	
		2055	$3.18	
Cost of Diesel	2019$/gallon	2019	$2.12	Energy Information Administration, Annual Energy Outlook 2021. Net of State and Federal taxes.
		2020	$1.68	
		2021	$1.77	
		2022	$1.82	
		2023	$1.88	
		2024	$1.89	
		2025	$1.94	
		2026	$1.96	
		2027	$2.00	
		2028	$2.06	
		2029	$2.11	
		2030	$2.24	
		2031	$2.26	
		2032	$2.31	
		2033	$2.34	
		2034	$2.38	
		2035	$2.40	
		2036	$2.44	
		2037	$2.48	
		2038	$2.52	
		2039	$2.53	
		2040	$2.58	
		2041	$2.61	
		2042	$2.63	
		2043	$2.65	
		2044	$2.67	
		2045	$2.65	
		2046	$2.69	
		2047	$2.71	
		2048	$2.73	
		2049	$2.72	
		2050	$2.73	
		2051	$2.73	
		2052	$2.73	
		2053	$2.73	
		2054	$2.73	
		2055	$2.73	

7.3.3 Benefit Estimates

The complete set of economic outcomes is shown in the table below. With a 7 percent discount rate, the estimated present value of benefits over the project life cycle is over $17.7 million. These benefits accrue to many users including motorists, local residents and businesses, and shippers. See Section 10.6 and 10.7 for additional information.

Table 22: Estimates of Economic Benefits, 2019 Dollars

	In Project Opening Year	Over the Project Lifecycle	
		In Constant Dollars	Discounted at 7 Percent
Reduced Travel Time Costs	$1,395,726	$71,238,395	$17,122,107
Reduced Vehicle Operating Costs	$42,354	$2,531,515	$589,570
Total	**$1,438,080**	**$73,769,909**	**$17,711,677**

Improved Travel Time Reliability

On average, motorists are delayed 62 times per day at each roadway-railway crossing. With some trains nearly one and a half miles in length, crossings are closed for approximately three to five minutes for each train to pass. Delays are further compounded by the time required for the vehicle queues created by the train crossing to dissipate. Furthermore, the current Pines Road and Trent Avenue intersection operates at a level of service (LOS) of 'E' which is projected to reach LOS 'F' due to worsening conditions. The project would transform the intersection to a LOS 'A', which will improve travel time reliability as there will be a significantly lower chance for drivers to be delayed thus reducing the unpredictability of trips in the area.
The project also contributes to reliable movement of regional freight by road and rail. Due to its location near the City's northern boundary, the project serves as a gateway for freight, goods, and travelers coming to and from rural Washington, Idaho, Montana, and Canada.

Improved Access to Future Development Potential

Close to 170 acres of mixed-use or commercially-zoned parcels and 56 acres of prime industrially-zoned parcels are undeveloped because property owners and developers cannot afford to mitigate the LOS 'E' operating conditions at the Pines Road /Trent Avenue intersection. These parcels, and several hundred more acres beyond the city limits, are some of the last undeveloped parcels available for industrial use in the area.

7.4 Environmental Sustainability Outcomes

Environmental costs are increasingly considered as an important component in the evaluation of transportation projects and the main environmental impacts of vehicle use and exhaust emissions can impose wide-ranging social costs on people, material, and vegetation. The negative effects of pollution depend not only on the quantity of pollution produced, but also on the types of pollutants emitted and the conditions into which the pollution is released.

The City's Greenhouse Gas Emissions Reduction Policy[6] serves as a baseline for preliminary project considerations. Supportive of this policy, the project elements (grade separated rail crossing, dual-lane roundabout, shared-use path, new trailhead facility) have the following quantified environmental benefits:

- Net reduction in emissions due to reduced vehicle delay time at the Pines Road Crossing;
- Promotes reduction of Particulate Matter (PM10) and Carbon Monoxide (CO), in Spokane County, which is identified by the EPA as a "maintenance area";
- Promotes clean transportation options with new electric vehicle charging stations;
- Promotes expanded transit routes to reduce reliance on single occupant vehicle trips and improve transportation options for disadvantaged populations; and
- Promotes the use of recycled materials in project construction, as specified in the WSDOT 2021 Standard Specifications Section 1-06.6 – Recycled Materials[7]

The BCA quantifies Environmental Sustainability outcomes by estimating and monetizing the net reduction in emissions due to reduced vehicle delay time at the Pines Road Crossing.

7.4.1 Methodology

The change in vehicle delay time at the Pines Road crossing is used to estimate the total fuel consumption while idling by vehicle type. The total estimated vehicle delay times are multiplied by the appropriate emission factors for tons of for CO_2, NO_x VOC, PM, and SO_2 per hour of vehicle idling. Each pollutant is then multiplied by its monetary value to get the total emission cost impact due to vehicle delay time.

7.4.2 Assumptions

The assumptions used in the estimation of environmental sustainability benefits are summarized in the tables below.

Table 23: Assumptions used in the Estimation Environmental Sustainability Benefits – Idling Emissions (Auto)

Emissions per Hour of Vehicle Idling - Passenger Cars and Trucks (grams/veh-hour)						
Year	C02	NOx	PM2.5	SO2	VOC	Source
2017	5,417	5.713	4.944	0.146	0.036	Based on MOVES average annual emission factors for passenger cars and trucks in Spokane County. Moves model run in May 2020.
2020	5,216	4.270	3.206	0.112	0.035	
2025	4,819	1.668	0.945	0.081	0.032	
2030	4,452	0.652	0.278	0.058	0.030	
2035	3,965	0.248	0.113	0.049	0.026	
2040	3,532	0.095	0.046	0.041	0.024	
2045	3,254	0.049	0.035	0.034	0.022	
2050	2,998	0.025	0.027	0.027	0.020	
2055	2,998	0.025	0.027	0.027	0.020	

Table 24: Assumptions used in the Estimation Environmental Sustainability Benefits – Idling Emissions (Truck)

Emissions per Hour of Vehicle Idling - Freight Trucks (grams/veh-hour)						
Year	C02	NOx	PM2.5	SO2	VOC	Source
2017	19,825	198.240	18.514	6.940	0.173	Based on MOVES average annual emission factors for freight trucks in Spokane County,
2020	19,672	156.537	15.906	5.754	0.171	
2025	19,400	98.261	10.551	3.399	0.167	

[6] *https://laserfiche.spokanevalley.org/WebLink/DocView.aspx?id=292645&dbid=0&repo=SpokaneValley&cr=1*

[7] https://wsdot.wa.gov/publications/manuals/fulltext/M41-10/20218.5x5.5.pdf

Emissions per Hour of Vehicle Idling - Freight Trucks (grams/veh-hour)						
Year	C02	NOx	PM2.5	SO2	VOC	Source
2030	19,132	61.680	6.999	2.009	0.162	assuming the average of single and combination unit trucks both long and short haul. Moves model run in May 2020.
2035	18,853	35.435	3.043	0.693	0.159	
2040	18,579	20.358	1.323	0.239	0.155	
2045	18,422	19.961	1.320	0.237	0.154	
2050	18,266	19.571	1.316	0.236	0.152	
2055	18,266	19.571	1.316	0.236	0.152	

Table 25: Assumptions used in the Estimation Environmental Sustainability Benefits – Idling Emissions (Bus)

Emissions per Hour of Vehicle Idling - Transit Bus (grams/veh-hour)						
Year	C02	NOx	PM2.5	SO2	VOC	Source
2017	19,243	268.353	20.783	4.033	0.168	Based on MOVES average annual emission factors for transit busses in Spokane County. Moves model run in May 2020.
2020	19,133	208.214	17.760	2.902	0.166	
2025	18,933	124.713	11.634	1.867	0.163	
2030	18,735	74.699	7.621	1.201	0.159	
2035	18,530	43.151	3.117	0.561	0.156	
2040	18,326	24.927	1.275	0.262	0.153	
2045	18,216	24.762	1.271	0.260	0.152	
2050	18,106	24.599	1.267	0.258	0.151	
2055	18,106	24.599	1.267	0.258	0.151	

Table 26: Assumptions used in the Estimation of Environmental Sustainability - Idling Emissions (Emission Values)

Pollutant	Unit	Year	Value	Source
CO_2 cost per short ton	2019$/metric ton	2020	$50.00	US DOT, BCA Guidance February 2021
		2025	$56.00	
		2030	$61.00	
		2035	$67.00	
		2040	$72.00	
		2045	$78.00	
		2050	$84.00	
		2055	$84.00	
NOx cost per short ton	2019$/metric ton	2020	$15,700	US DOT, BCA Guidance February 2021
		2025	$16,800	
		2030	$18,000	
		2035	$18,000	
		2040	$18,000	
		2045	$18,000	
		2050	$18,000	
		2055	$18,000	
PM cost per short ton	2019$/metric ton	2020	$729,300	US DOT, BCA Guidance February 2021
		2025	$796,600	
		2030	$852,700	
		2035	$852,700	
		2040	$852,700	
		2045	$852,700	
		2050	$852,700	
		2055	$852,700	
SO_2 cost per short ton	2019$/metric ton	2020	$40,400	US DOT, BCA Guidance February 2021
		2025	$44,900	
		2030	$48,200	
		2035	$48,200	
		2040	$48,200	
		2045	$48,200	
		2050	$48,200	
		2055	$48,200	

7.4.3 Benefit Estimates

The table below shows the benefit estimates of reducing vehicle delay times. With a 7 percent discount rate, the estimated present value of benefits over the project life cycle is $0.46 million dollars. See Section 10.8, 10.9, and 10.10 for additional information.

Table 27: Estimates of Environmental Sustainability Benefits, 2019 Dollars

	In Project Opening Year	Over the Project Lifecycle	
		In Constant Dollars	Discounted at 7 Percent
Avoided Emissions Costs	$33,080	$1,003,377	$462,609
Total	**$33,080**	**$1,003,377**	**$462,609**

Promoting Electrification

The project reduces motorists' carbon footprint through reduction in vehicle idling at the grade crossing, as well as through providing a new trailhead facility equipped with electric vehicle charging stations which promotes clean transportation options. The project will connect a shared-use path along Pines Rd. to the new trailhead facility which provides access to the Centennial Trail and Spokane River.

7.5 Quality of Life Outcomes

Improved Connectivity

The project is centered in Census Tract 117.02 which has many of Spokane Valley's highest rates for vulnerable populations.

All of the project improvements reduce barriers to disadvantaged populations and improve access and mobility for these users by increasing transportation options including expanded transit routes to reduce reliance on single occupant vehicle trips, improving access to facilities including a shared use path through the project limits, new access to the Centennial Trail via a trailhead, and by allowing for more timely and reliable connectivity to Valley Hospital, located one mile to the south. The majority of the City's commercial, employment, and residential uses lie south of the BNSF corridor and Trent Avenue, including I-90 and Valley Hospital. This project will help knit together the northern and southern sectors of the community by eliminating barriers that impede mobility.

This project significantly improves connections to many community amenities. The 37.5-mile paved, mixed-use Centennial Trail runs along the Spokane River between Spokane, Washington and Coeur d'Alene, Idaho. It connects several local amenities and includes crossings of the Spokane River. Pines Road is a gateway to the Trail and the City is coordinating the adjacent property, Avista Utilities, for improvements to this trail connection as part of the project. The project will develop a new parking lot and trailhead facility serving the Centennial Trail and Spokane River. There will be a shared use path along Pines Rd. under the BNSF tracks connecting the residents, school, and businesses to the new trailhead facility which will be equipped with electrical vehicle charging stations.

Pines Road and Trent Avenue are also important routes to Mirabeau Point Park and Plantes Ferry Park and Sports Complex which is a 95-acre regional sports complex, located north of Trent Avenue, with sporting fields, trails, picnic areas, and playgrounds.

The grade separation project will provide pedestrian and cycling facilities allowing for greater connectivity and promotion of active lifestyles, in addition to improved access to nearby businesses and other public facilities. The BNSF Railway bisects the northern parts of Spokane Valley from the main city south of the railway. The project will connect a diverse neighborhood surrounding the Study area including residential, commercial, mixed-use, and industrial areas. The new grade-separated crossing and roundabout will

provide ADA-compliant sidewalks, making the route more appealing to pedestrians and bicyclists. In addition to an improved crossing of the railroad tracks, the roundabout will create a safer and more comfortable crossing of Trent Avenue. It will also be improving access and mobility between the nearby business park and commercial businesses, Trent Elementary School , the Centennial Trail, and the Spokane River

Improved Emergency Vehicle Access

Key emergency services (fire, police, and EMS) are located south of the railway crossing. The long and frequent delays at the rail crossings causes delays for providing emergency services to the north. Eliminating the Pines Road grade crossing will improve travel time and reliability for emergency responders that may otherwise not be able to pass or be forced to take a longer route.

Reduced Noise Pollution

Spokane Valley residents have long complained about the noise pollution of the train whistles. Federal law requires locomotives to sound their horns at 96 to 100 decibels as they approach at-grade crossings and continue blowing the horn until the train clears the crossing. Not only do the horns disturb the peacefulness of the surrounding area, medical studies have linked loud noises, such as train whistles, to stress-related health problems.[8] As part of the broader Bridging the Valley plan, all existing at-grade crossings will be eliminated, which will allow noise from train horns and whistles to be severely reduced. The Pines Road project alone will significantly reduce the amount of train horn and whistle noise and

7.6 Innovation

The City of Spokane Valley will evaluate innovative bridge construction techniques to reduce the impact on the community and the existing traffic. This may include constructing the structures off-site before staging for construction. The project will also take advantage of the Spokane Regional Transportation Management Center (SRTMC) Intelligent Transportation Systems (ITS) infrastructure to communicate traveler information about construction activities and expected delays throughout the project using SRTMC's website and 511 telephone system. Other ITS technologies, such as work zone queue management and speed management systems, will be evaluated for applicability during project engineering.

7.7 Partnership

This project demonstrates support from numerous public and private partners across the region. Two states, several regional public entities, multiple cities, and local business organization, as well as two Class I railroads actively participated in the Horizon 2040, and in the previous Bridging the Valley plan and other workshops, stakeholder outreach, and funding initiatives to further this effort. Table 28 summarizes the key partners associated with the Pines Road/BNSF grade-separation project and other related projects.

Table 28: Partners in Project Development

State and Local Agencies	
• Washington State Dept. of Transportation • WA Freight Mobility Strategic Investment Board • State and Federal Legislators	• Idaho Transportation Department • Washington Utility and Transportation Commission
Regional Agencies	
• Spokane Regional Transportation Council • Spokane Regional Traffic Management Center • Spokane Transit Authority	• Kootenai Metropolitan Planning Organization • Avista Utilities
Railroads	

[8] "Spokane Valley, Cheney residents want to silence train whistles." The Spokesman-Review, March 6, 2016.

• BNSF Railway Company	• Union Pacific Railroad
Local Agencies and Districts	
• Counties: Spokane, Kootenai • Cities & Towns: Athol, Rathdrum, Spokane, Spokane Valley, Millwood	• Police/Fires/Emergency Responders • Area School Districts • Freight/Industry Representatives
Chambers of Commerce	
• Spokane Valley	• Greater Spokane Incorporated

8 Summary of Findings and Benefit-Cost Outcomes

The tables below summarizes the BCA findings. Annual costs and benefits are computed over the lifecycle of the project (39 years). As stated earlier, construction is expected to be completed by 2025 with 2026 being the project opening year. Benefits accrue during the full operation of the project.

Table 29: Overall Results of the Benefit Cost Analysis, 2019 Dollars

Project Evaluation Metric	7% Discount Rate	3% Discount Rate
Total Discounted Benefits	$41,198,120	$86,562,428
Total Discounted Costs	$19,500,465	$22,329,598
Net Present Value	$21,697,654	$64,232,829
Benefit / Cost Ratio	2.11	3.88
Internal Rate of Return (%)		13.0%
Payback Period (years)		5.90

Considering all monetized benefits and costs, the estimated internal rate of return of the project is 13.0 percent. With a 7 percent real discount rate, the $19.5 million investment would result in $41.2 million in total benefits for a Net Present Value of $21.7 million and a Benefit/Cost ratio of approximately 2.11.

With a 3 percent real discount rate, the Net Present Value of the project would increase to $64.2 million, for a Benefit/Cost ratio of 3.88.

Table 30: Benefit Estimates by Merit Criteria Outcome for the Full Build Alternative, 2019 Dollars

Merit Criteria	Impact Categories	7% Discount Rate	3% Discount Rate
Safety	Improved Safety and Avoided Accident Costs	$22,061,706	$44,391,957
	Improve Pedestrian Accessibility	n/a	n/a
State of Good Repair	Residual Value of Infrastructure Asset	$871,172	$3,433,839
	Operations & Maintenance Cost Savings	$90,955	$180,566
Economic Competitiveness	Reduced Travel Time Costs	$17,122,107	$36,727,498
	Reduced Vehicle Operating Costs	$589,570	$1,288,083
	Improved Travel Time Reliability	n/a	n/a
	Unlock Future Development Potential	n/a	n/a
Environmental Sustainability	Avoided Emissions Costs	$462,609	$540,486
	Promoting Electrification	n/a	n/a
Quality of Life	Improved Connectivity and Reduced Barriers for Disadvantaged Peoples	n/a	n/a
	Improved Emergency Vehicle Access	n/a	n/a
	Reduced Noise Pollution	n/a	n/a
Innovation	Innovative Bridge Construction	n/a	n/a
	Intelligent Transportation Systems	n/a	n/a
Partnership	Support from Public and Private Partners	n/a	n/a
Total Benefit Estimates		**$41,198,120**	**$86,562,428**

As summarized, the project as a whole yields substantial societal benefits. It's important to recognize that its individual components, while both necessary for the entire project, result in positive societal outcomes as well. The grade separation is estimated to result in a discounted net present value of $25.1 million and a benefit cost ratio of 3.45, while the roundabout is expected to result in a benefit cost ratio of 0.63. Results for both components are summarized in the following tables. While the net present value of the roundabout is negative, improved traffic fluidity and reduced congestion at the intersection was not estimated in absence of detailed traffic modelling. It's expected that significant societal benefits would be captured by the roundabout as a result of improved traffic fluidity.

Table 31: Grade Separation Benefits

Benefit	Undiscounted Net Benefits (2019$)	Discounted Total Benefits at 3% ($2019)	Discounted Total Benefits at 7% ($2019)
Reduced Travel Time Costs	$71,238,395	$36,727,498	$17,122,107
Improved Safety and Avoided Accident Costs	$59,081,619	$32,327,592	$16,284,186
Avoided Emissions Costs	$1,003,377	$540,486	$462,609
Reduced Vehicle Operating Costs	$2,531,515	$1,288,083	$589,570
Residual Value of Infrastructure Asset	$9,952,221	$3,433,839	$871,172
Operations and Maintenance Cost Savings	$330,000	$180,566	$90,955
Total Grade Separation Benefits	**$144,137,126**	**$74,498,063**	**$35,420,600**
Grade Separation Benefits Capital Expenditures	**($13,130,758)**	**($11,776,981)**	**($10,276,332)**
Net Present Value (NPV)	**$131,006,367**	**$62,721,081**	**$25,144,268**
Benefit Cost Ratio (BCR)	**10.98**	**6.33**	**3.45**

Table 32: Roundabout Benefits

Benefit	Undiscounted Net Benefits (2018$)	Discounted Total Benefits at 3% ($2018)	Discounted Total Benefits at 7% ($2018)
Improved Safety and Avoided Accident Costs	$22,992,889	$12,064,365	$5,777,520
Total RAB Benefits	**$22,992,889**	**$12,064,365**	**$5,777,520**
RAB Capital Expenditures	**($11,749,793)**	**($10,552,617)**	**($9,224,134)**
Net Present Value (NPV)	**$11,243,096**	**$1,511,748**	**($3,446,614)**
Benefit Cost Ratio (BCR)	**1.96**	**1.14**	**0.63**

9 Benefit Cost Sensitivity Analysis

9.1 Variation in Key Inputs and Assumptions

The BCA outcomes presented in the previous sections rely on a large number of assumptions and long-term projections; both of which are subject to considerable uncertainty.

The primary purpose of the sensitivity analysis is to help identify the variables and model parameters whose variations have the greatest impact on the BCA outcomes: the "critical variables."

The sensitivity analysis can also be used to:

- Evaluate the impact of changes in individual critical variables – how much the final results would vary with reasonable departures from the "preferred" or most likely value for the variable; and
- Assess the robustness of the BCA and evaluate, in particular, whether the conclusions reached under the "preferred" set of input values are significantly altered by reasonable departures from those values.

The outcomes of the quantitative analysis for the Pines Road Grade Separation project using a 7 percent discount rate are summarized in the table below. The table provides the percentage changes in project NPV associated with variations in variables or parameters, as indicated in the column headers.

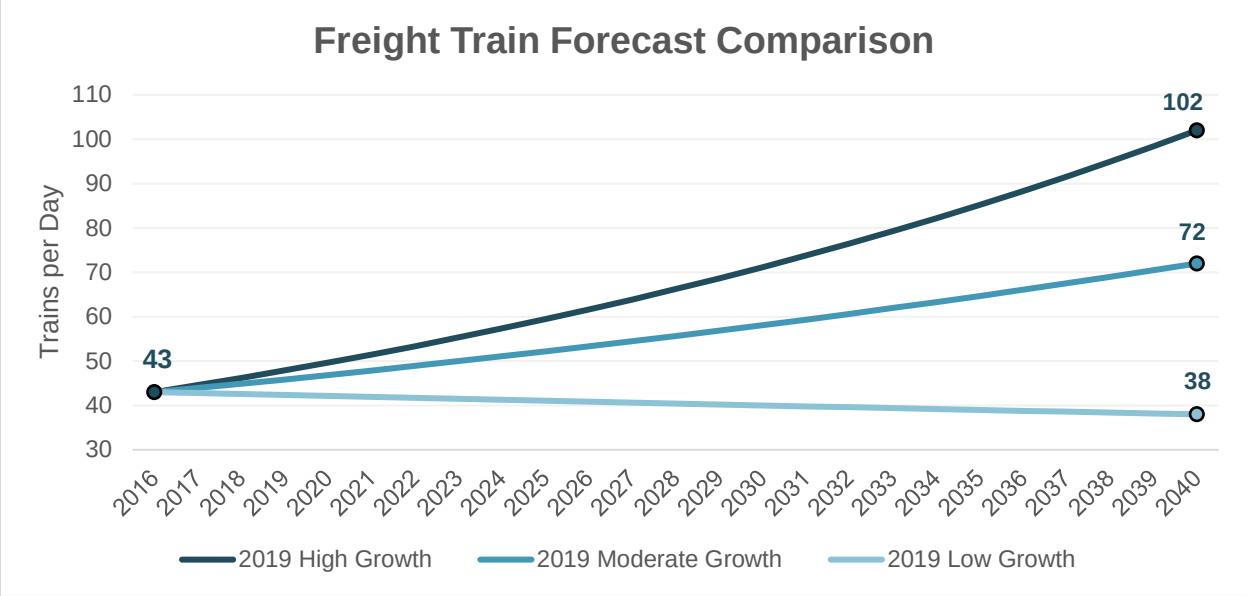
Table 33: Quantitative Assessment of Sensitivity, Summary (Discounted at 7%)

Original NPV (discounted at 7%)	Parameters	Change in Parameter Value	New NPV (discounted at 7%)	Change in NPV	New B/C Ratio
$24,769,839	Capital Expenditures	+25% Costs	$16,822,538	-22.5%	1.69
		-25% Costs	$26,572,771	22.5%	2.82
	AADT Growth Rate	+2% Growth	$30,081,914	38.6%	2.54
		-2% Growth	$16,194,422	-25.4%	1.83
	Freight Train Growth Rate	WSDOT Moderate Growth	$17,591,242	-18.9%	1.90
		WSDOT Low Growth	$12,520,614	-42.3%	1.64

As to be expected, lowering the growth rates for both traffic and freight train growth reduce the net present value of the projects. Traffic growth provides significant variation, with a 2% increase or decrease resulting in the net present value increasing by $8.3 million to decreasing by $5.5 million respectively.

Varying the growth scenario of the freight train forecasts, particularly the low growth scenario, significantly affects the BCR. As discussed in Section 4, it's noted that the 2019 moderate growth scenario projects current train volumes of 60 freight trains per day won't be reached until 2031 while the high growth scenario forecasts 60 freight trains are reached in 2025. As a result, the high growth scenario was chosen since it better reflects current freight train volumes. Figure 2 compares the growth scenarios under the 2019 state rail plan. Despite the negative growth rate assumed by the low growth scenario, the project BCR remains resilient with a BCR of 1.64.

Figure 2: Freight Train Forecast Comparison



Sources: 2019 Washington State Rail System Plan

Decreasing or increasing capital costs by 25% results in the BCR ranging between 1.69 and 2.82. The sensitivity analysis indicates that the Pines Road Grade Separation project is robust across the changes, with the benefit cost ratio exceeding 1.64 (WSDOT low growth scenario) in each of the cases examined, resulting in beneficial impacts to stakeholders and society.

10 Supplementary Data Tables

This section breaks down all benefits associated with the merit criteria outcomes (State of Good Repair, Economic Competitiveness, Quality of Life, Safety, and Environmental Sustainability) in annual form for the Pines Road Grade Separation project. Supplementary data tables are also provided for some specific benefit categories.

10.1 Annual Estimates of Total Project Benefits and Costs

Calendar Year	Project Year	Total Benefits ($2019)	Total Costs ($2019)	Undiscounted Net Benefits ($2019)	Discounted Net Benefits at 7%	Discounted Net Benefits at 3%
2017	1	$0	-$861,115	-$861,115	-$861,115	-$861,115
2018	2	$0	-$466,730	-$466,730	-$466,730	-$466,730
2019	3	$0	-$466,730	-$466,730	-$466,730	-$466,730
2020	4	$0	-$2,018,730	-$2,018,730	-$1,886,663	-$1,959,932
2021	5	$0	-$2,018,730	-$2,018,730	-$1,763,237	-$1,902,846
2022	6	$0	-$2,018,730	-$2,018,730	-$1,647,885	-$1,847,424
2023	7	$0	-$8,514,894	-$8,514,894	-$6,495,972	-$7,565,373
2024	8	$0	-$5,108,936	-$5,108,936	-$3,642,601	-$4,407,013
2025	9	$0	-$3,405,958	-$3,405,958	-$2,269,533	-$2,852,436
2026	10	$4,025,189	$0	$4,025,189	$2,509,151	$3,272,847
2027	11	$4,098,942	$0	$4,098,942	$2,388,443	$3,235,743
2028	12	$4,175,765	$0	$4,175,765	$2,274,517	$3,200,376
2029	13	$4,255,459	$0	$4,255,459	$2,166,793	$3,166,461
2030	14	$4,339,584	$0	$4,339,584	$2,065,595	$3,135,008
2031	15	$4,424,810	$0	$4,424,810	$1,968,896	$3,103,473
2032	16	$4,513,989	$0	$4,513,989	$1,877,707	$3,073,807
2033	17	$4,606,618	$0	$4,606,618	$1,791,420	$3,045,517
2034	18	$4,703,480	$0	$4,703,480	$1,710,061	$3,018,985
2035	19	$4,804,164	$0	$4,804,164	$1,632,970	$2,993,796
2036	20	$4,908,972	$0	$4,908,972	$1,560,016	$2,970,009
2037	21	$5,018,615	$0	$5,018,615	$1,491,113	$2,947,907
2038	22	$5,132,705	$0	$5,132,705	$1,425,843	$2,927,110
2039	23	$5,250,916	$0	$5,250,916	$1,363,863	$2,907,305
2040	24	$5,375,226	$0	$5,375,226	$1,305,431	$2,889,449
2041	25	$5,428,987	$0	$5,428,987	$1,232,775	$2,833,347
2042	26	$5,483,668	$0	$5,483,668	$1,164,370	$2,778,529
2043	27	$5,539,165	$0	$5,539,165	$1,099,748	$2,724,902
2044	28	$5,594,997	$0	$5,594,997	$1,038,694	$2,672,202
2045	29	$5,651,301	$0	$5,651,301	$981,038	$2,620,478
2046	30	$5,709,784	$0	$5,709,784	$926,866	$2,570,482
2047	31	$5,768,497	$0	$5,768,497	$875,652	$2,521,276
2048	32	$5,827,867	$0	$5,827,867	$827,297	$2,473,034
2049	33	$5,888,780	$0	$5,888,780	$781,856	$2,426,099
2050	34	$5,949,892	$0	$5,949,892	$738,790	$2,379,880
2051	35	$6,011,960	$0	$6,011,960	$698,134	$2,334,667
2052	36	$6,075,012	$0	$6,075,012	$659,771	$2,290,439
2053	37	$6,139,067	$0	$6,139,067	$623,570	$2,247,174

Calendar Year	Project Year	Total Benefits ($2019)	Total Costs ($2019)	Undiscounted Net Benefits ($2019)	Discounted Net Benefits at 7%	Discounted Net Benefits at 3%
2054	38	$6,204,139	$0	$6,204,139	$589,405	$2,204,848
2055	39	$16,222,466	$0	$16,222,466	$1,428,333	$5,597,277
Total		**$167,130,015**	**-$24,880,552**	**$142,249,464**	**$21,697,654**	**$64,232,829**

10.2 Annual Demand Projections

Calendar Year	Project Year	Total Annual Traffic at Pines Road Crossing	Total Annual Traffic at Trent Ave. Intersection	Annual Freight Trains at Pines Road Crossing	Annual Passenger Trains at Pines Road Crossing	Total Vehicle Hours of Delay - Passenger Vehicles	Total Vehicle Hours of Delay - Trucks	Total Vehicle Hours of Delay - Bus Driver and Passenger
2017	1	16,128	27,074	60.0	2.00	22,540	3,109	259
2018	2	16,440	27,374	60.0	2.00	22,976	3,169	264
2019	3	16,758	27,293	60.0	2.00	23,421	3,230	269
2020	4	17,002	27,213	60.0	2.00	23,762	3,278	273
2021	5	17,250	27,736	60.0	2.00	24,108	3,325	277
2022	6	17,501	28,270	61.7	2.00	25,151	3,469	289
2023	7	17,756	28,813	63.4	2.00	26,238	3,619	302
2024	8	18,015	29,367	65.2	2.00	27,373	3,776	315
2025	9	18,278	29,932	67.1	2.00	28,556	3,939	328
2026	10	18,544	30,507	69.0	2.00	29,791	4,109	342
2027	11	18,814	31,094	70.9	2.00	31,079	4,287	357
2028	12	19,089	31,692	73.0	2.00	32,423	4,472	373
2029	13	19,367	32,301	75.0	2.00	33,826	4,666	389
2030	14	19,649	32,922	77.1	2.00	35,289	4,867	406
2031	15	19,935	33,555	79.3	2.00	36,815	5,078	423
2032	16	20,226	34,201	81.6	2.00	38,407	5,298	441
2033	17	20,521	34,858	83.9	2.00	40,069	5,527	461
2034	18	20,820	35,529	86.3	2.00	41,802	5,766	480
2035	19	21,123	36,212	88.7	2.00	43,610	6,015	501
2036	20	21,431	36,908	91.2	2.00	45,496	6,275	523
2037	21	21,743	37,618	93.8	2.00	47,465	6,547	546
2038	22	22,060	38,341	96.5	2.00	49,518	6,830	569
2039	23	22,382	39,078	99.2	2.00	51,660	7,126	594
2040	24	22,708	39,830	102.0	2.00	53,895	7,434	619
2041	25	23,039	40,596	102.0	2.00	54,681	7,542	629
2042	26	23,374	41,376	102.0	2.00	55,477	7,652	638
2043	27	23,715	42,172	102.0	2.00	56,286	7,764	647
2044	28	24,061	42,983	102.0	2.00	57,106	7,877	656
2045	29	24,411	43,809	102.0	2.00	57,938	7,992	666
2046	30	24,767	44,652	102.0	2.00	58,783	8,108	676

Calendar Year	Project Year	Total Annual Traffic at Pines Road Crossing	Total Annual Traffic at Trent Ave. Intersection	Annual Freight Trains at Pines Road Crossing	Annual Passenger Trains at Pines Road Crossing	Total Vehicle Hours of Delay - Passenger Vehicles	Total Vehicle Hours of Delay - Trucks	Total Vehicle Hours of Delay - Bus Driver and Passenger
2047	31	25,128	45,510	102.0	2.00	59,639	8,226	686
2048	32	25,494	46,385	102.0	2.00	60,509	8,346	696
2049	33	25,866	47,277	102.0	2.00	61,390	8,468	706
2050	34	26,243	48,186	102.0	2.00	62,285	8,591	716
2051	35	26,625	49,113	102.0	2.00	63,193	8,716	726
2052	36	27,013	50,057	102.0	2.00	64,114	8,843	737
2053	37	27,407	51,020	102.0	2.00	65,048	8,972	748
2054	38	27,806	52,001	102.0	2.00	65,996	9,103	759
2055	39	28,211	53,001	102.0	2.00	66,958	9,236	770
Total		**846,699**	**1,475,857**	**3,355**	**78**	**1,744,673**	**240,645**	**20,054**

10.3 Safety Outcomes: Pertinent Quantifiable Impacts

Calendar Year	Project Year	Fatalities Avoided	Injuries Avoided	PDO Avoided
2017	1	0.00	0.00	0.00
2018	2	0.00	0.00	0.00
2019	3	0.00	0.00	0.00
2020	4	0.00	0.00	0.00
2021	5	0.00	0.00	0.00
2022	6	0.00	0.00	0.00
2023	7	0.00	0.00	0.00
2024	8	0.00	0.00	0.00
2025	9	0.00	0.00	0.00
2026	10	0.20	1.68	9.86
2027	11	0.20	1.70	10.00
2028	12	0.20	1.72	10.14
2029	13	0.20	1.74	10.29
2030	14	0.20	1.76	10.44
2031	15	0.20	1.78	10.59
2032	16	0.20	1.80	10.74
2033	17	0.20	1.82	10.90
2034	18	0.20	1.84	11.06
2035	19	0.20	1.87	11.22
2036	20	0.20	1.89	11.39
2037	21	0.21	1.91	11.56
2038	22	0.21	1.94	11.73
2039	23	0.21	1.96	11.91
2040	24	0.21	1.99	12.09
2041	25	0.21	2.01	12.27
2042	26	0.21	2.04	12.46

Calendar Year	Project Year	Fatalities Avoided	Injuries Avoided	PDO Avoided
2043	27	0.21	2.07	12.65
2044	28	0.21	2.09	12.84
2045	29	0.21	2.12	13.04
2046	30	0.21	2.15	13.24
2047	31	0.21	2.18	13.44
2048	32	0.21	2.21	13.65
2049	33	0.22	2.24	13.87
2050	34	0.22	2.27	14.08
2051	35	0.22	2.30	14.30
2052	36	0.22	2.33	14.53
2053	37	0.22	2.36	14.76
2054	38	0.22	2.40	14.99
2055	39	0.22	2.43	15.23
Total		**6.26**	**60.6**	**369.3**

10.4 Safety Outcomes: Annual Benefit Estimates

Calendar Year	Project Year	Improved Safety and Avoided Accident Costs	Total Safety Benefits	Total Discounted Benefits at 7%	Total Discounted Benefits at 3%
2017	1	$0	$0	$0	$0
2018	2	$0	$0	$0	$0
2019	3	$0	$0	$0	$0
2020	4	$0	$0	$0	$0
2021	5	$0	$0	$0	$0
2022	6	$0	$0	$0	$0
2023	7	$0	$0	$0	$0
2024	8	$0	$0	$0	$0
2025	9	$0	$0	$0	$0
2026	10	$2,543,031	$2,543,031	$1,583,672	$2,067,717
2027	11	$2,554,063	$2,554,063	$1,486,488	$2,016,201
2028	12	$2,565,307	$2,565,307	$1,395,357	$1,966,094
2029	13	$2,576,767	$2,576,767	$1,309,898	$1,917,357
2030	14	$2,588,448	$2,588,448	$1,229,753	$1,869,950
2031	15	$2,600,353	$2,600,353	$1,154,588	$1,823,835
2032	16	$2,612,487	$2,612,487	$1,084,089	$1,778,976
2033	17	$2,624,854	$2,624,854	$1,017,964	$1,735,338
2034	18	$2,637,459	$2,637,459	$955,937	$1,692,885
2035	19	$2,650,307	$2,650,307	$897,751	$1,651,583
2036	20	$2,663,401	$2,663,401	$843,165	$1,611,401
2037	21	$2,676,746	$2,676,746	$791,953	$1,572,306
2038	22	$2,690,347	$2,690,347	$743,903	$1,534,267
2039	23	$2,704,210	$2,704,210	$698,819	$1,497,256
2040	24	$2,718,340	$2,718,340	$656,515	$1,461,241

Calendar Year	Project Year	Improved Safety and Avoided Accident Costs	Total Safety Benefits	Total Discounted Benefits at 7%	Total Discounted Benefits at 3%
2041	25	$2,732,741	$2,732,741	$616,816	$1,426,197
2042	26	$2,747,419	$2,747,419	$579,559	$1,392,094
2043	27	$2,762,379	$2,762,379	$544,594	$1,358,907
2044	28	$2,777,627	$2,777,627	$511,775	$1,326,610
2045	29	$2,793,168	$2,793,168	$480,971	$1,295,177
2046	30	$2,809,008	$2,809,008	$452,055	$1,264,585
2047	31	$2,825,153	$2,825,153	$424,909	$1,234,809
2048	32	$2,841,609	$2,841,609	$399,425	$1,205,827
2049	33	$2,858,381	$2,858,381	$375,497	$1,177,615
2050	34	$2,875,476	$2,875,476	$353,031	$1,150,153
2051	35	$2,892,899	$2,892,899	$331,935	$1,123,420
2052	36	$2,910,658	$2,910,658	$312,124	$1,097,394
2053	37	$2,928,758	$2,928,758	$293,518	$1,072,057
2054	38	$2,947,206	$2,947,206	$276,044	$1,047,388
2055	39	$2,966,008	$2,966,008	$259,631	$1,023,369
Total		**$82,074,608**	**$82,074,608**	**$22,061,732**	**$44,392,010**

10.5 State of Good Repair: Annual Benefits Estimates

Calendar Year	Project Year	Residual Value of Infrastructure Asset	Operations and Maintenance Cost Savings	Total State of Good Repair Benefits	Total Discounted Benefits at 7%	Total Discounted Benefits at 3%
2017	1	$0	$0	$0	$0	$0
2018	2	$0	$0	$0	$0	$0
2019	3	$0	$0	$0	$0	$0
2020	4	$0	$0	$0	$0	$0
2021	5	$0	$0	$0	$0	$0
2022	6	$0	$0	$0	$0	$0
2023	7	$0	$0	$0	$0	$0
2024	8	$0	$0	$0	$0	$0
2025	9	$0	$0	$0	$0	$0
2026	10	$0	$11,000	$11,000	$6,850	$8,944
2027	11	$0	$11,000	$11,000	$6,402	$8,684
2028	12	$0	$11,000	$11,000	$5,983	$8,431
2029	13	$0	$11,000	$11,000	$5,592	$8,185
2030	14	$0	$11,000	$11,000	$5,226	$7,947
2031	15	$0	$11,000	$11,000	$4,884	$7,715
2032	16	$0	$11,000	$11,000	$4,565	$7,490
2033	17	$0	$11,000	$11,000	$4,266	$7,272
2034	18	$0	$11,000	$11,000	$3,987	$7,060
2035	19	$0	$11,000	$11,000	$3,726	$6,855
2036	20	$0	$11,000	$11,000	$3,482	$6,655

Calendar Year	Project Year	Residual Value of Infrastructure Asset	Operations and Maintenance Cost Savings	Total State of Good Repair Benefits	Total Discounted Benefits at 7%	Total Discounted Benefits at 3%
2037	21	$0	$11,000	$11,000	$3,255	$6,461
2038	22	$0	$11,000	$11,000	$3,042	$6,273
2039	23	$0	$11,000	$11,000	$2,843	$6,090
2040	24	$0	$11,000	$11,000	$2,657	$5,913
2041	25	$0	$11,000	$11,000	$2,483	$5,741
2042	26	$0	$11,000	$11,000	$2,320	$5,574
2043	27	$0	$11,000	$11,000	$2,169	$5,411
2044	28	$0	$11,000	$11,000	$2,027	$5,254
2045	29	$0	$11,000	$11,000	$1,894	$5,101
2046	30	$0	$11,000	$11,000	$1,770	$4,952
2047	31	$0	$11,000	$11,000	$1,654	$4,808
2048	32	$0	$11,000	$11,000	$1,546	$4,668
2049	33	$0	$11,000	$11,000	$1,445	$4,532
2050	34	$0	$11,000	$11,000	$1,351	$4,400
2051	35	$0	$11,000	$11,000	$1,262	$4,272
2052	36	$0	$11,000	$11,000	$1,180	$4,147
2053	37	$0	$11,000	$11,000	$1,102	$4,026
2054	38	$0	$11,000	$11,000	$1,030	$3,909
2055	39	$9,952,221	$11,000	$9,963,221	$872,135	$3,437,634
Total		**$9,952,221**	**$330,000**	**$10,282,221**	**$962,128**	**$3,614,404**

10.6 Economic Competitiveness: Pertinent Quantifiable Impacts

Calendar Year	Project Year	Avoided Person Hours of Delay at Rail Crossings	Avoided Gasoline Consumption (Gallons)	Avoided Diesel Consumption (Gallons)	Avoided Motor Oil Consumption (Quarts)
2017	1	0	0	0	0
2018	2	0	0	0	0
2019	3	0	0	0	0
2020	4	0	0	0	0
2021	5	0	0	0	0
2022	6	0	0	0	0
2023	7	0	0	0	0
2024	8	0	0	0	0
2025	9	0	0	0	0
2026	10	74,748	10,650	2,346	1,181
2027	11	77,981	11,111	2,447	1,232
2028	12	81,353	11,591	2,553	1,286
2029	13	84,871	12,093	2,663	1,341
2030	14	88,542	12,616	2,778	1,399
2031	15	92,372	13,161	2,899	1,460
2032	16	96,367	13,731	3,024	1,523
2033	17	100,535	14,324	3,155	1,589
2034	18	104,884	14,944	3,291	1,658
2035	19	109,421	15,591	3,434	1,729
2036	20	114,154	16,265	3,582	1,804
2037	21	119,092	16,969	3,737	1,882
2038	22	124,244	17,703	3,899	1,964
2039	23	129,620	18,469	4,067	2,049
2040	24	135,227	19,268	4,243	2,137
2041	25	137,198	19,548	4,305	2,168
2042	26	139,197	19,833	4,368	2,200
2043	27	141,226	20,122	4,432	2,232
2044	28	143,284	20,415	4,496	2,265
2045	29	145,372	20,713	4,562	2,298
2046	30	147,491	21,015	4,628	2,331
2047	31	149,640	21,321	4,696	2,365
2048	32	151,821	21,632	4,764	2,399
2049	33	154,033	21,947	4,834	2,434
2050	34	156,278	22,267	4,904	2,470
2051	35	158,556	22,591	4,976	2,506
2052	36	160,866	22,921	5,048	2,542
2053	37	163,211	23,255	5,122	2,579
2054	38	165,589	23,594	5,196	2,617
2055	39	168,002	23,937	5,272	2,655
Total		**3,815,178**	**543,596**	**119,721**	**60,298**

10.7 Economic Competitiveness: Annual Benefit Estimates

Calendar Year	Project Year	Reduced Travel Time Costs	Reduced Vehicle Operating Costs	Total Economic Competitiveness Benefits	Total Discounted Benefits at 7%	Total Discounted Benefits at 3%
2017	1	$0	$0	$0	$0	$0
2018	2	$0	$0	$0	$0	$0
2019	3	$0	$0	$0	$0	$0
2020	4	$0	$0	$0	$0	$0
2021	5	$0	$0	$0	$0	$0
2022	6	$0	$0	$0	$0	$0
2023	7	$0	$0	$0	$0	$0
2024	8	$0	$0	$0	$0	$0
2025	9	$0	$0	$0	$0	$0
2026	10	$1,395,726	$42,354	$1,438,080	$895,564	$1,169,291
2027	11	$1,456,084	$44,902	$1,500,986	$873,588	$1,184,892
2028	12	$1,519,054	$47,668	$1,566,721	$852,193	$1,200,761
2029	13	$1,584,749	$50,288	$1,635,038	$831,170	$1,216,621
2030	14	$1,653,289	$54,170	$1,707,459	$811,202	$1,233,505
2031	15	$1,724,795	$57,071	$1,781,866	$791,170	$1,249,765
2032	16	$1,799,397	$60,328	$1,859,725	$771,720	$1,266,382
2033	17	$1,877,229	$63,335	$1,940,563	$752,584	$1,282,941
2034	18	$1,958,429	$66,471	$2,024,901	$733,917	$1,299,707
2035	19	$2,043,145	$69,767	$2,112,912	$715,716	$1,316,697
2036	20	$2,131,528	$73,108	$2,204,636	$697,931	$1,333,841
2037	21	$2,223,737	$77,060	$2,300,797	$680,723	$1,351,476
2038	22	$2,319,938	$81,078	$2,401,016	$663,901	$1,369,266
2039	23	$2,420,304	$84,669	$2,504,973	$647,333	$1,386,943
2040	24	$2,525,015	$89,636	$2,614,651	$631,473	$1,405,504
2041	25	$2,561,813	$91,751	$2,653,564	$598,944	$1,384,875
2042	26	$2,599,147	$93,622	$2,692,769	$568,031	$1,364,404
2043	27	$2,637,025	$95,815	$2,732,840	$538,770	$1,344,376
2044	28	$2,675,454	$97,496	$2,772,951	$510,914	$1,324,377
2045	29	$2,714,444	$98,787	$2,813,232	$484,426	$1,304,481
2046	30	$2,754,002	$101,383	$2,855,386	$459,518	$1,285,463
2047	31	$2,794,137	$103,319	$2,897,456	$435,784	$1,266,411
2048	32	$2,834,857	$105,007	$2,939,864	$413,236	$1,247,520
2049	33	$2,876,170	$106,966	$2,983,136	$391,886	$1,229,012
2050	34	$2,918,085	$108,545	$3,026,629	$371,588	$1,210,613
2051	35	$2,960,610	$110,127	$3,070,737	$352,340	$1,192,481
2052	36	$3,003,756	$111,732	$3,115,488	$334,088	$1,174,621
2053	37	$3,047,530	$113,360	$3,160,890	$316,782	$1,157,028
2054	38	$3,091,942	$115,012	$3,206,954	$300,373	$1,139,698
2055	39	$3,137,002	$116,688	$3,253,690	$284,813	$1,122,629
Total		**$71,238,395**	**$2,531,515**	**$73,769,909**	**$17,711,677**	**$38,015,580**

10.8 Environmental Sustainability: Pertinent Quantifiable Impacts (1 of 2)

Calendar Year	Project Year	Annual Emissions Avoided - CO_2 (tons)	Annual Emissions Avoided - NOx (tons)	Annual Emissions Avoided - PM (tons)	Annual Emissions Avoided - SO_2 (tons)
2017	1	0.0	0.000	0.000	0.000
2018	2	0.0	0.000	0.000	0.000
2019	3	0.0	0.000	0.000	0.000
2020	4	0.0	0.000	0.000	0.000
2021	5	0.0	0.000	0.000	0.000
2022	6	0.0	0.000	0.000	0.000
2023	7	0.0	0.000	0.000	0.000
2024	8	0.0	0.000	0.000	0.000
2025	9	0.0	0.000	0.000	0.000
2026	10	141.3	0.041	0.002	0.001
2027	11	145.1	0.036	0.002	0.001
2028	12	149.0	0.031	0.002	0.001
2029	13	153.0	0.027	0.002	0.001
2030	14	157.1	0.023	0.002	0.001
2031	15	160.1	0.020	0.002	0.001
2032	16	163.3	0.017	0.002	0.001
2033	17	166.4	0.015	0.002	0.001
2034	18	169.6	0.013	0.002	0.001
2035	19	172.9	0.011	0.002	0.001
2036	20	176.3	0.009	0.002	0.001
2037	21	179.7	0.008	0.002	0.001
2038	22	183.2	0.007	0.002	0.001
2039	23	186.7	0.006	0.002	0.001
2040	24	190.4	0.005	0.002	0.001
2041	25	190.0	0.005	0.002	0.001
2042	26	189.6	0.004	0.002	0.001
2043	27	189.3	0.004	0.002	0.001
2044	28	188.9	0.003	0.002	0.001
2045	29	188.5	0.003	0.002	0.001
2046	30	188.2	0.002	0.002	0.001
2047	31	187.8	0.002	0.002	0.001
2048	32	187.5	0.002	0.002	0.001
2049	33	187.1	0.002	0.002	0.001
2050	34	186.7	0.002	0.002	0.001
2051	35	189.5	0.002	0.002	0.001
2052	36	192.2	0.002	0.002	0.001
2053	37	195.0	0.002	0.002	0.001
2054	38	197.9	0.002	0.002	0.001
2055	39	200.7	0.002	0.002	0.001
Total		**5,353**	**0.30**	**0.06**	**0.04**

10.9 Environmental Sustainability: Pertinent Quantifiable Impacts (2 of 2)

Calendar Year	Project Year	Avoided Vehicle-hours of Delay Time
2017	1	0
2018	2	0
2019	3	0
2020	4	0
2021	5	0
2022	6	0
2023	7	0
2024	8	0
2025	9	0
2026	10	34,243
2027	11	35,723
2028	12	37,268
2029	13	38,880
2030	14	40,562
2031	15	42,316
2032	16	44,146
2033	17	46,056
2034	18	48,048
2035	19	50,126
2036	20	52,295
2037	21	54,557
2038	22	56,917
2039	23	59,380
2040	24	61,948
2041	25	62,851
2042	26	63,767
2043	27	64,697
2044	28	65,639
2045	29	66,596
2046	30	67,566
2047	31	68,551
2048	32	69,550
2049	33	70,564
2050	34	71,592
2051	35	72,635
2052	36	73,694
2053	37	74,768
2054	38	75,857
2055	39	76,963
Total		**1,747,756**

10.10 Environmental Sustainability: Annual Benefit Estimates

Calendar Year	Project Year	Avoided Emissions Costs	Total Environmental Sustainability Benefits	Total Discounted Benefits at 7%	Total Discounted Benefits at 3%
2017	1	$0	$0	$0	$0
2018	2	$0	$0	$0	$0
2019	3	$0	$0	$0	$0
2020	4	$0	$0	$0	$0
2021	5	$0	$0	$0	$0
2022	6	$0	$0	$0	$0
2023	7	$0	$0	$0	$0
2024	8	$0	$0	$0	$0
2025	9	$0	$0	$0	$0
2026	10	$33,080	$33,080	$20,600	$26,897
2027	11	$32,895	$32,895	$19,145	$25,968
2028	12	$32,740	$32,740	$17,808	$25,092
2029	13	$32,657	$32,657	$16,601	$24,300
2030	14	$32,680	$32,680	$15,526	$23,609
2031	15	$31,594	$31,594	$14,028	$22,159
2032	16	$30,780	$30,780	$12,773	$20,960
2033	17	$30,204	$30,204	$11,714	$19,968
2034	18	$30,124	$30,124	$10,918	$19,335
2035	19	$29,949	$29,949	$10,145	$18,663
2036	20	$29,939	$29,939	$9,478	$18,113
2037	21	$30,076	$30,076	$8,898	$17,666
2038	22	$30,345	$30,345	$8,391	$17,306
2039	23	$30,736	$30,736	$7,943	$17,018
2040	24	$31,239	$31,239	$7,545	$16,792
2041	25	$31,686	$31,686	$7,152	$16,537
2042	26	$32,484	$32,484	$6,853	$16,460
2043	27	$32,950	$32,950	$6,496	$16,209
2044	28	$33,423	$33,423	$6,158	$15,963
2045	29	$33,905	$33,905	$5,838	$15,721
2046	30	$34,394	$34,394	$5,535	$15,484
2047	31	$34,892	$34,892	$5,248	$15,250
2048	32	$35,398	$35,398	$4,976	$15,021
2049	33	$36,266	$36,266	$4,764	$14,941
2050	34	$36,790	$36,790	$4,517	$14,716
2051	35	$37,326	$37,326	$4,283	$14,495
2052	36	$37,870	$37,870	$4,061	$14,278
2053	37	$38,422	$38,422	$3,851	$14,064
2054	38	$38,982	$38,982	$3,651	$13,854
2055	39	$39,550	$39,550	$3,462	$13,646
Total		**$1,003,377**	**$1,003,377**	**$268,357**	**$540,486**

Appendix D

Secured Funding Letters

SRTC SPOKANE REGIONAL TRANSPORTATION COUNCIL
421 W. RIVERSIDE AVE. SUITE 500 • SPOKANE WA 99201 • 509.343.6370 • WWW.SRTC.ORG

2018 STBG Funding Award - $1,890,000 for ROW

December 20, 2018

The Honorable Rod Higgins
City of Spokane Valley
11707 E Sprague Ave
Spokane Valley WA 99206

Project: Pines Grade Separation – Right of Way Phase
Award Amount: $1,890,000
Program: Urban Surface Transportation Block Grant (STBG)

Dear Mayor Higgins;

Congratulations! On November 8, 2018, the Spokane Regional Transportation Council (SRTC) Board of Directors selected City of Spokane Valley's Pines Grade Separation-Right of Way Phase project for funding as part of the 2018 SRTC Call for Projects. Thank you for you and your staffs' hard work.

SRTC is excited to offer City of Spokane Valley a partial funding award of $1,890,000 from the Urban STBG program.

This project will be included in the 2019-2022 SRTC Transportation Improvement Program (TIP) amendment for Board consideration at the January 18, 2019 Board meeting. Once the TIP Amendment is approved, it will be included in the State Transportation Improvement Program (STIP.) After the funding is programmed into the STIP, you may seek obligation of the federal funds through WSDOT Local Programs consistent with the funding policies outlined in the most current SRTC TIP Guidebook.

Attached is an Acceptance of Funding Agreement outlining conditions of the award that must be signed by an official having authority. **Please the attached agreement no later than January 16, 2018**. Again, congratulations and we look forward to working with the City of Spokane Valley. If you have any questions, please do not hesitate to contact me at (509) 343-6370 or at sminshall@srtc.org.

Sincerely,

Sabrina C. Minshall

Sabrina C. Minshall, AICP
Executive Director, Spokane Regional Transportation Council

cc: Arne Woodard, Council Member, City of Spokane Valley
Adam Jackson, City of Spokane Valley
Keith Martin, WSDOT-Eastern Region Local Programs

SRTC SPOKANE REGIONAL TRANSPORTATION COUNCIL
421 W. RIVERSIDE AVE. SUITE 500 • SPOKANE WA 99201 • 509.343.6370 • WWW.SRTC.ORG

2018 STBG Funding Award - $1,890,000 for ROW

Agency:	City of Spokane Valley
Address:	11707 E Sprague Ave, Spokane Valley, WA 99206
Project:	Pines Grade Separation – Right of Way Phase
Award Amount:	$1,890,000
Partial Award:	Yes
Program:	Urban Surface Transportation Block Grant
Elected Official Contact:	Mayor Rod Higgins
SRTC Board Member(s)	Council Member Arne Woodard
Staff Member:	Adam Jackson

Conditions of Award:

- All programming is subject to the SRTC TIP Guidebook. The TIP Guidebook is updated yearly.
- Eligible activities and conditions are subject to all federal, state, and laws, regulations, and Board guidance
- The project must be delivered in its entirety per the description in the original application unless scope or other changes are approved in writing by SRTC.
- If a partial award, the applicant is responsible for securing all additional funds on the project in addition to local match. If the award is a full award, the applicant is responsible for securing all required match.
- Availability of local funds must be demonstrated for the year the project is programmed.
- If a project receives a partial funding award, and is unable to secure additional, non-local funds for the project prior to delivery, programming may be delayed upon request with approval of the SRTC Board, and agencies can re-submit under a subsequent call for projects; additional funding is not guaranteed.
- Any change of use of SRTC funds for phases (PE, ROW, CN), or geographical segments of a project must be approved in writing and in advance of changes so administrative modifications or amendments can be made. This applies to changes necessitated by reasons such as but not limited to the securing of additional fund sources, costs savings or increases, or design modifications.

Agreed to and Approved:

Mark Calhoun

~~Mayor Rod Higgins~~ Mark Calhoun
City of Spokane Valley City Manager

1/1/2019
Date

Sabrina C. Minshall, AICP, Executive Director
Spokane Regional Transportation Council

12-20-18
Date

SRTC SPOKANE REGIONAL TRANSPORTATION COUNCIL
421 W. RIVERSIDE AVE. SUITE 500 • SPOKANE WA 99201 • 509.343.6370 • WWW.SRTC.ORG

February 13, 2020

2020 STBG Funding Award - 1,905,000 for ROW

The Honorable Ben Wick
City of Spokane Valley
10210 E Sprague Ave
Spokane Valley WA 99206

Project: Pines Grade Separation RW
Award Amount: $1,905,100
Program(s): Urban Surface Transportation Block Grant (STBG)

Dear Mayor Wick;

Congratulations! On February 13, 2020, the Spokane Regional Transportation Council (SRTC) Board of Directors selected City of Spokane Valley's Pine Grade Separation RW project for funding as part of the SRTC contingency funding process. This project previously received funding in the 2018 SRTC Call for Projects and was awarded partial funding of $1,890,000. This supplemental funding completes the award request for this project.

SRTC is excited to offer City of Spokane Valley an award of $1,905,100 from the Urban STBG program.

This project will be included in the 2020-2023 SRTC Transportation Improvement Program (TIP) amendment for Board consideration at the April 9, 2020 Board meeting. Please submit your project record into Secure Access Washington (SAW) by March 6, 2020. Once the TIP Amendment is approved, it will be included in the State Transportation Improvement Program (STIP.) After the funding is programmed into the STIP, you may seek obligation of the federal funds through WSDOT Local Programs consistent with the funding policies outlined in the most current SRTC TIP Guidebook.

Attached is an Acceptance of Funding Agreement outlining conditions of the award that must be signed by an official having authority. **Please sign and return the attached agreement no later than February 29, 2020**. Again, congratulations and we look forward to working with the City of Spokane. If you have any questions, please do not hesitate to contact me at (509) 343-6370 or at sminshall@srtc.org.

Sincerely,

Sabrina C. Minshall

Sabrina C. Minshall, AICP
Executive Director, Spokane Regional Transportation Council

cc: Gloria Mantz, City of Spokane Valley
Adam Jackson, City of Spokane Valley
Keith Martin, WSDOT-Eastern Region Local Programs

SRTC SPOKANE REGIONAL TRANSPORTATION COUNCIL
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2020 STBG Funding Award - 1,905,000 for ROW

Agency: City of Spokane Valley
Address: 10210 E Sprague Ave
Project: Pines Grade Separation RW
Award Amount: $1,905,100 1,905,000 AJ
Partial Award: No
Program(s): Urban Surface Transportation Block Grant (STBG)
Elected Official Contact: Mayor Ben Wick
SRTC Board Member(s): Mayor Ben Wick
Staff Member: Gloria Mantz

Conditions of Award:

- All programming is subject to the SRTC TIP Guidebook. The TIP Guidebook is updated yearly.
- Eligible activities and conditions are subject to all federal and state laws and regulations, and SRTC Board guidance.
- The project must be delivered in its entirety per the description in the original application unless scope or other changes are approved in writing by SRTC.
- If a partial award, the applicant is responsible for securing all additional funds on the project in addition to local match. If the award is a full award, the applicant is responsible for securing all required match.
- Availability of local funds must be demonstrated for the year the project is programmed.
- If a project receives a partial funding award, and is unable to secure additional, non-local funds for the project prior to delivery, programming may be delayed upon request with approval of the SRTC Board, and agencies can re-submit under a subsequent call for projects; additional funding is not guaranteed.
- HIP funding must be obligated no later than September 30, 2022.
- Any change of use of SRTC funds for phases (PE, ROW, CN), or geographical segments of a project must be approved in writing and in advance of changes so administrative modifications or amendments can be made. This applies to changes necessitated by reasons such as, but not limited to, the securing of additional fund sources, costs savings or increases, or design modifications.

Agreed to and Approved:

Mark Calhoun
~~Mayor Ben Wick~~ MARK CALHOUN CITY MANAGER
City of Spokane Valley

2/23/2020
Date

Sabrina C Minshall
Sabrina C. Minshall, AICP, Executive Director
Spokane Regional Transportation Council

2-19-2020
Date

2019 CRISI award email - $1,246,500 for PE/NEPA - no formal FRA documents have been issued to date.

Adam Jackson

From: Kniss, Valarie (FRA) <Valarie.Kniss@dot.gov>
Sent: Thursday, June 13, 2019 7:53 AM
To: Mark Calhoun; Adam Jackson
Cc: Maldonado, Leonardo (FRA)
Subject: Pines Road/BNSF Grade Separation Project (FY18 CRISI) - Notification of Award

Importance: High

Hello,

Congratulations on your recent award for the **Pines Road/BNSF Grade Separation** (Project), under the Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program.

Federal Railroad Administration Announces More Than $326 Million in Grants to Support Railroad Infrastructure (June 12, 2019): https://railroads.dot.gov/newsroom/federal-railroad-administration-announces-more-326-million-grants-support-railroad

The Federal Railroad Administration's Office of Railroad Policy and Development (RPD) is responsible for overseeing this Project. More information on the Office is available here: https://www.fra.dot.gov/Page/P0031

Please find our contact information below:

- **FRA Regional Manager** (Primary Point of Contact)
  - Valarie Kniss
  - 202.493.0616
  - valarie.kniss@dot.gov
- **FRA Grant Manager**
  - Leo Maldonado
  - 202-493-6369
  - leonardo.maldonado@dot.gov

Next Steps

- **Point of Contact:** Please provide contact information (name, email, phone number) for the primary point of contact/project manager for this Project.
- **Project Kickoff Meeting:** A kickoff meeting will be scheduled to review the grant obligation process. I will send a follow-up email identifying potential dates for your selection.
- **Statement of Work Review / Development:** Please send me the Statement of Work that was included in your Application as a Word document so that FRA can begin preparing the SOW for obligation.

We are looking forward to getting started on this exciting project! Please let me know if you have any questions.

Best,
Valarie

Valarie Kniss
Northwest Regional Manager

Office of Program Delivery (RPD-15)
Federal Railroad Administration
O: 202.493.0616 | C: 202.430.9643
valarie.kniss@dot.gov

2019 CRISI award email - $1,246,500 for PE/NEPA - no formal FRA documents have been issued to date.

FMSIB Funding: 2000 Award, currently in deferred status.

FMSIB Priority Ranking D

Current Estimated Cost (09/15/04)

Total Project Cost: $ 11,719

Dollars (in thousands)

FMSIB Share: $ 3,360

Project: SR 27 Pines Rd BNSF Grade Crossing
Location: Spokane Co
Lead Agency: WSDOT - Eastern
Geog. Area: EW

Scope: The project is located on SR 27 (Pines Rd) immediately south of SR 290 in Spokane County. The project will separate the railroad and roadway grades by constructing a railroad bridge over SR 27 and lowering the SR 27 grade. The project is designed to reduce truck and train delays by means of a railroad grade separation on a Spokane Valley arterial. This crossing is an intergral part of Spokane's Bridging the Valley Tranportation Study which identifies this location as a high priority grade separtion project.

Original Approved Amount

Freight Mobility	**$3,360**	**30%**
Partnership	$7,840	70%
TOTAL Project Cost	$11,200	100%

Partnerships:

	Anticipated	Committed	Dollars
WSDOT Funds**	X		7,714
BNSF	X		645
Partnership Total			**8,359**

	Total	PE	RW	CN
FMSIB	***3,360***			***3,360***
WSDOT Funds**	*7,714*	*1,000*	*1,075*	*5,639*
	-			
BNSF	*645*		*215*	*430*
	-			
Need	*11,719*	*1,000*	*1,290*	*9,429*
Total	**11,719**	**1,000**	**1,290**	**9,429**
Tentative timeframe	Ad-2008 CN start-2008	Complete 8/08	Complete 6/08	Complete 10/09

Cash Flow Needs:

Dollars (in thousands)	Prior	03 - 05	05 - 07	07 - 09	09 - 11	11 - 13	TOTAL
P.E. Phase Total			448	552			1,000
Freight Mobility							**0**
R.W. Phase Total			353	937			1,290
Freight Mobility							**0**
CN. Phase Total				7,259	2,170		9,429
Freight Mobility				**1,680**	**1,680**		**3,360**

Freight Mobility TOTAL	**$3,360**	**29%**
Partnership TOTAL	$8,359	71%
TOTAL Project Cost	$11,719	100%

** WSDOT funding for this freight mobility project is dependent on future new revenue to be authorized by the State Legislature. The project start date can be adjusted to coincide with funding.

FMSIB Funding: 2000 Award, currently in deferred status.

STATE OF WASHINGTON

FREIGHT MOBILITY STRATEGIC INVESTMENT BOARD

1063 Capitol Way, Rm. 201 • PO Box 40965 • Olympia, WA 98504-0965 • (360) 586-9695 • FAX (360) 586-9700

November 27, 2000

Mr. Harold White
WSDOT Eastern Region
2714 N. Mayfair Street
Spokane, WA 99207

Dear Mr. White,

The Freight Mobility Board thanks you for submitting a project for consideration during the 2000 call for projects. The scoring has been completed and the project selection committee made a recommendation to the full FMSIB.

The Board adopted the 10 highest scoring new projects to be added to the existing list of 33 freight mobility projects. These projects will become projects 34-43. These projects will retain their status even after a future call adds additional projects.

An additional 9 projects were added to make a total of 19 new freight mobility projects.

The FMSIB share of these projects is shown in the revised request column and total $132.8 M. or 32.7 % of total project costs.

Some projects that were not on a strategic freight corridor were evaluated as to whether they represented an emerging corridor. Two projects were accepted as emerging and five were not accepted as meeting the threshold criteria.

Two projects were studies, and the board determined that at this time, studies would not be considered since our resources were so limited.

One project was deemed to not have incremental value to freight movement, and appeared to return freight capacity to what existed before passenger rail service, thus mitigating the impact of passenger rail. The board did not believe this was the role of the Freight Mobility program.

FMSIB Funding: 2000 Award, currently in deferred status.

If your project was one of the top 19, congratulations, I look forward to working with you as we build the improvements in your area.

If your project was not one of the 19 selected, we want to thank you again for submitting your project for the board's consideration. We hope that in the future we will have a chance to approve a corridor or chokepoint project in your area. Corridors, and multiple partners, especially private sector financial commitments, score well in our process when considering a future submission. I would be happy to work with you if you have a project developing that is beneficial to freight movement.

Thank you again for your interest in our Freight Mobility Program.

Cordially,

Karen Schmidt

Karen Schmidt
Executive Director

Enc. – Project Selection Recommendation list

FMSIB Funding: 2000 Award, currently in deferred status.

If this relates to the Burlington Northern Pines Road Bridging the Valley separation that includes a FMSIB $3.36 million match of the approx $26 million estimate, we do not have funding in our current program, or for the next few years, for construction. If it is FMSIB's intent to move this money to another project, may I suggest the Havana or Park Road structures that are also within your program.

From: Gehring, Marsha
Sent: Wednesday, October 17, 2007 4:13 PM
To: Lenzi, Jerry C
Subject: Pines Road Project
Importance: High

I would like to set up a meeting **on October 29** to discuss the status of the Pines Road FMSIB project. I am interested in a status report on the progress of the project and the current funding plan. Please coordinate a time that would work for you with Marsha in my office (360) 586-9695 and I will leave it to you to decide who on your staff should be part of the meeting.

Thanks,

Karen

Karen Schmidt
Executive Director

1063 Capitol Way, Room 201
P.O.Box 40965
Olympia, WA 98504-0965
360 586-9695