

# 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 2022 Grant Application

**Location:** Spokane Valley, Washington

**Primary Project Type:** Road

**Secondary Project Type:** Road/Rail Crossing

**RAISE Funding Request:** \$21,689,221



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# 1 Project Description

In 2021, the Pines Road (SR 27) crossing of the BNSF Railway Company (BNSF) railroad tracks resulted in over 26,000 vehicle hours of delay<sup>1</sup> and the adjacent Pines Road (SR 27) / Trent Avenue (SR 290) intersection experienced nine recorded collisions.<sup>2</sup> The project is in a Historically Disadvantaged Community and the at-grade crossing is rated Washington State’s top Tier 1 road-rail conflict<sup>3</sup> which negatively impacts Spokane Valley’s most vulnerable census tracts<sup>4</sup>. The City of Spokane Valley seeks a RAISE Discretionary Grant of \$21,689,221 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 highway crossing of the BNSF Railway 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, regional, and national 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 connects Trent Avenue, also a state highway, 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.

**Figure 1: BNSF Freight Movement in the Pacific Northwest**



Spokane Valley is the convergence of several rail lines in the northern tier of BNSF’s freight network. Four miles of existing single track create a bottleneck for BNSF and requires an immediate second track through the City to meet present and future demands. Additionally, BNSF tracks 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 of Pines Rd. and Trent Ave., constructs a separated shared-use path under the tracks and through the highway roundabout, connecting to a new trailhead facility serving the adjacent Centennial Trail and Spokane River. The underpass

<sup>1</sup> Based on BCA excel file tab “Crossing Impacts” cell G24 calculated value (See Appendix C).

<sup>2</sup> Analysis of Washington Department of Transportation (WSDOT) Vehicle Crash Data, 2017-2021

<sup>3</sup> [FMSIB’s Study of Road-Rail Conflicts – Phase 2 – Development of Project Priorities, August, 2018](#)

<sup>4</sup> [SRTC’s Social Equity Mapping Tool](#)

will be built to accommodate a total of four tracks. The 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 removes barriers, connects the community, and promotes active transportation by improving access and mobility across the railway and between the adjacent businesses, elementary school, two regional parks, the Centennial Trail, the future River Loop Trail, and the Spokane River. Proposed improvements will reduce the risk of collisions between the existing 15,000 vehicles/day<sup>5</sup> and 67 trains/day<sup>6</sup> at the crossing and help prevent unintended releases of hazardous materials. The new undercrossing will also eliminate the rail crossing traffic queues from backing up into the adjacent intersection, reducing the potential for rear-end and sideswipe collisions. The existing crossing is shown in Figure 2.

**Figure 2. View of Existing Pines Road/BNSF Crossing (at Pines/Trent - looking south)**



Replacement of the existing signalized intersection with a multi-lane roundabout at the Pines/Trent intersection is predicted to reduce all collisions by at least 21%.<sup>7</sup> 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.<sup>8</sup>

Non-motorized users 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 and community connectivity, a quality of life element is realized too: train horns through the City will be reduced as the 67 daily trains will no longer be necessary to cross Pines Road.

The improvements support freight movement and regional mobility goals as articulated in various plans including the Horizon 2045, 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.

<sup>5</sup> Based on 2021 traffic volume count performed by the City. Counts are anticipated to be reduced as a result of the COVID-19 pandemic and existing traffic volumes are expected to be higher than stated.

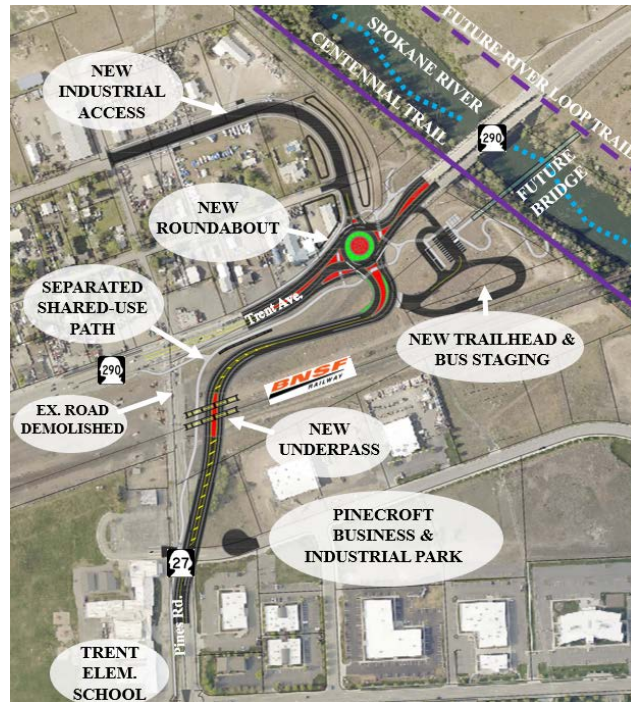
<sup>6</sup> 65-70 BNSF trains/day from BNSF on 03/29/22. "Medium" growth projection was used from WA State Rail Plan (see Footnote 9)

<sup>7</sup> CMF Clearinghouse: *Convert signalized intersection to modern roundabout*: <http://www.cmfclearinghouse.org/detail.cfm?facid=4184>

<sup>8</sup> [Pines Road/BNSF Grade Separation – Consolidated Traffic and Safety Analysis, October 24, 2018 – Tables 8-9](#)

Figure 3 illustrates the new project, which is the result of a two-year evaluation that considered the benefits of various project alignments and compared a signalized intersection to a roundabout. The analysis was coordinated 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 total tracks. Important to note for the travelling public, the final design allows much of the project to be constructed "offline" which will minimize 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 - Merit 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 in Census Tract 117.02, which has many of Spokane Valley's highest rates for vulnerable populations. The project improves access and mobility for all users by improving accessibility and connectivity to multi-modal facilities. A separated shared use path will cross under BNSF tracks and connect to adjacent 10' sidewalks through the roundabout. This will improve accessibility and mobility for the existing paratransit customers in the area while promoting expanded transit service routes for all users. Access to the Centennial Trail and future River Loop Trail via a new trailhead will promote active transportation and recreation that supports quality of life and community connectivity.

The project 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 connects rural traffic to interstate rail, freeway routes, and urban economic activity centers in the Spokane region and Pacific Northwest. Consistent with USDOT's ROUTES initiative, the project improves travel times for passenger and freight while serving as an economic generator, helping unlock the potential for undeveloped industrial and commercial properties that will create jobs for both rural and urban populations alike. The project serves as a

gateway for freight, goods, and travelers coming to and from rural Washington, Idaho, Montana, and Canada.

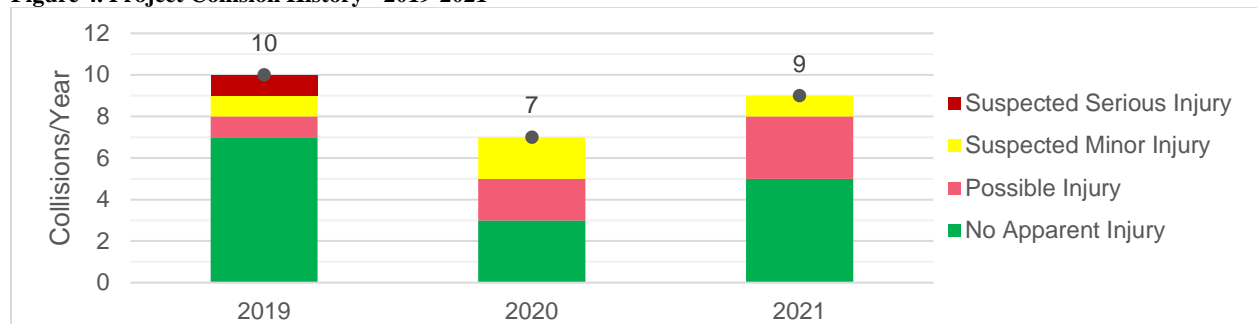
## 1.2 Transportation Challenges the Project Aims to Address

### 1.2.1 Safety Risks at and Near the Crossings

At-grade highway-rail crossings have the potential for fatalities, serious injuries, and hazardous material spills (e.g. Bakken oil). 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 65 trains per day to a potential 107 trains per day by 2045.<sup>9</sup>

Collision history at the Pines Road / Trent Avenue intersection for 2019 to 2021 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. Project Collision History - 2019-2021**



### 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 times each day when responding to an emergency.<sup>10</sup> 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.

<sup>9</sup> Forecasted train counts based on annual growth projections as calculated in the Benefit Costs Analysis (See Appendix C).

<sup>10</sup> 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.

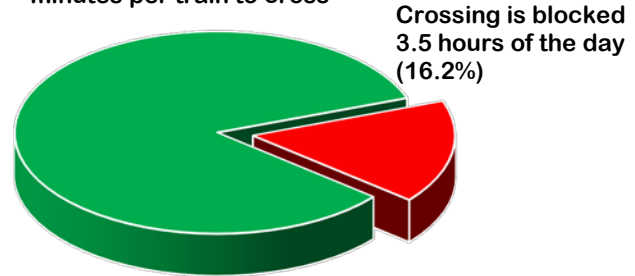
### 1.2.3 Long Delays at the Crossings and Adjacent Intersections

The current daily freight and passenger train volume is estimated to be 67 trains/day, which means that on average, people and freight are delayed 67 times per day at each roadway-railway crossing. The City estimates an average of 3.5 minutes of delay for each train crossing. This average time over 67 crossings per day results in 71 vehicle hours of crossing delays to traffic on Pines Road daily<sup>11</sup>. Figure 5 illustrates this delay due to train crossings.

Delays are further compounded by the time required for the vehicle queues created by the train crossing to dissipate. Queued vehicles block the adjacent intersections of the Pines/Trent causing delays to traffic on Trent Avenue. Given an average train crossing, westbound Trent Ave. vehicles turning southbound on Pines Rd. must wait an additional 2-5 minutes *after* the rail crossing has opened in order to make their left turn. Traffic queues require vehicles wait 2-3 full signal cycles before completing their turning movement clearing the intersection.

**Figure 5. Delays Due to Frequent Train Crossings**

67 trains per day average of 3.5 minutes per train to cross



2,425 vehicles/day are affected, totaling nearly 26,040 hours per year of vehicle delay

The existing Pines/Trent intersection operates at level of service (LOS) D in the afternoon peak hour. Trent Ave. 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.<sup>12</sup>

### 1.2.4 Contributing Factors Exacerbating Current and Future Crossing Delays

The project's at-grade crossing is a rail chokepoint that will continue to worsen. The single track at the crossing has a 35-mph turnout less than 100 feet to the west, limiting train speeds to below 35 mph for those westbound trains entering the turnout. Yard traffic, or other trains holding on either the straight track or west of the turnout, must move eastbound through the crossing from a dead stop, limiting train speeds to 5-25 mph as the train slowly accelerates through the crossing.

Immediately east of the crossing is the single-track BNSF Spokane River rail bridge. When track maintenance and other rail work is performed, a frequent operations tactic is to "flush" multiple trains from the same direction through the crossing, effectively closing the crossing for extended time periods. In addition, BNSF's Hauser refueling facility is 15 miles east of the crossing. This

<sup>11</sup> Estimated for 2021. Daily vehicle hours of delay expected to grow as freight train volumes grow.

<sup>12</sup> [Pines Road/BNSF Grade Separation – Consolidated Traffic and Safety Analysis, October 24, 2018 – Table 9](#)



facility is a major fueling station for east-west rail traffic transiting the Pacific Northwest. Train queues to the fueling facility contribute to the slow-moving rail traffic at the Pines Rd. crossing.

### **1.2.5 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. 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.<sup>13</sup> 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 maximizes developable land potential.

### **1.2.6 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 Rd., the railway divides underserved neighborhoods, schools, recreation areas, and commercial businesses located on both sides of the tracks. There is no transit service through the project because constant train crossings create disruptive delays and would lead to an unreliable service route. Further, there are no accessible routes for non-motorized users to cross the railroad tracks safely and reliably. The new grade-separated crossing will provide both motorized and non-motorized access underneath the train tracks, making the route more safe, reliable, and 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 Ave. 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 schools and Plante's Ferry and Mirabeau Parks will invite more users because the safety risks and travel delays through the project limits will be alleviated. See Section 4.3 Quality of Life and Section 4.4 Mobility and Community Connectivity for more information.

### **1.2.7 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 today's conservative average of 67 trains crossing Pines Rd., horns are a source of significant public concern in Spokane Valley.<sup>14</sup>

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<sup>13</sup> 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/Pinacroft\\_Business\\_Park.pdf](http://www.spokanevalley.org/filestorage/6862/6927/8180/11735/Pinacroft_Business_Park.pdf))

<sup>14</sup> "Spokane Valley, Cheney residents want to silence train whistles." The Spokesman-Review, March 6, 2016

## 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 has received WSDOT approval for 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.

### 1.3.2 Washington State Joint Transportation Committee

The Joint Transportation Committee (JTC) informs 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.<sup>15</sup>

### 1.3.3 Horizon 2045 <https://www.srtc.org/horizon-2045/>

Horizon 2045 is the Spokane Regional Transportation Council's (SRTC) long-range transportation plan for the Spokane region through 2045 and identifies the following projects along the BNSF railroad as regionally significant:

- Pines Road (SR 27)/Trent Avenue (SR 290) underpass (planned construction 2025);
- Barker Road/Trent Avenue (SR 290) overpass; and
- Sullivan Road Bridge improvements/Trent Avenue (SR 290) overpass

### 1.3.4 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 Rd./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 Ave. and Pines Rd. The proposed layout is a practical solution that resulted from the coordinated evaluation with freight representatives, community stakeholders, and WSDOT. The final layout maximizes public benefit while minimizing the impacts to property owners and the traveling public both during and after construction.

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<sup>15</sup> 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

### 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 to create a multi-modal global gateway to foster increased domestic and international commerce. Phase 2 of the IPH initiative identified priorities to support the IPH vision, including Horizon 2045 and Bridging the Valley programs.<sup>16</sup>

### 1.3.6 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)



## 1.4 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 103,000.<sup>17</sup> The



City will work closely with the WSDOT and BNSF Railway to deliver the project. Spokane Valley employees are unionized in Local 270V, of the Washington State Council of County and City Employees, part of AFSCME, AFL-CIO, and support the project, see Section 4.7.1.

**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 Rd. (SR 27) and Trent Ave. (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.



<sup>16</sup> [Inland Pacific Hub Transportation Investment and Project Priority Blueprint, 2012 \(search “Bridging the Valley”\)](#)

<sup>17</sup> United States Census Bureau <https://www.census.gov/quickfacts/spokanevalleycitywashington>, April 1, 2020

**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 Rd./BNSF GSP will accommodate up to four tracks to satisfy future BNSF needs and provide for long term growth. It will also alleviate the bottleneck detailed in Section 1.2.4 and in Figure 6.

The City and BNSF teams are evaluating the option of BNSF to self-perform the project’s bridge design and construction of two railroad bridges and the piers and piles for a future third bridge. This option will create immense time and cost savings during design and construction. If agreed upon, the City would pay BNSF to perform the work directly using its unionized, local forces.

**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 has donated three parcels, totaling 3.84 acres and valued at \$790,000, to be developed by the project as a trailhead to the Centennial Trail and Spokane River. [See Avista’s support letter in the ‘Partners’ section of the 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

At the national level, the project supports climate change and environmental justice priorities. 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. The elimination of the project’s at-grade crossing reduces train/vehicle incident risks. The BNSF rail corridor carries freight and passenger trains between western ports and Midwest intermodal facilities; serving as a critical link, connecting the rural mid-west and west coast ports and cities.

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

- Elimination of delays at the rail crossing will enhance mobility of freight and commuter traffic traveling to/from Interstate 90, just south of the project
- Accommodating BNSF’s 4.3-mile double track project between Barker and Pines Rd.



- Proposed alignment allows for minimal construction delays/impacts
- Improved mobility and safety for homes, businesses, schools, trails and parks.
- Intersection operations in year 2040 improve from level of service F to A
- Maximizing the economic potential of vacant industrial, mixed-use, and commercial land
- Improving the quality of life through noise/emissions reductions & access to trails/parks
- Improving access and reliability for police, fire and medical providers
- Improving reliability and access for existing paratransit customers
- Supports the potential expansion of transit service routes through the project limits
- 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 nearly two decades.

Expected system users that will benefit from this project include:

- Regional/interstate travelers and local residents (all modes, including recreational users)
- Transit and paratransit customers
- 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**	73	0
Predicted annual collisions** – Pines/Trent intersection	21	17***
Predicted annual incidents (Fatal and Injury) - Pines/Trent	5	4
Predicted annual incidents** - Pines Road/BNSF crossing	2	0
Annual veh. hrs. of railroad crossing delay** - Pines/BNSF Crossing	30,500	0
Annual person. hrs. of railroad crossing delay** - Pines/BNSF crossing	47,851	0

\* Between Evergreen Road and Vista Road

\*\* Based on 2026 (opening year) volumes with roundabout at Pines/Trent; predicted collisions/delays increase as volumes increase

\*\*\* Total collisions at Pines/Trent is predicted to drop 4 collisions/year. 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**

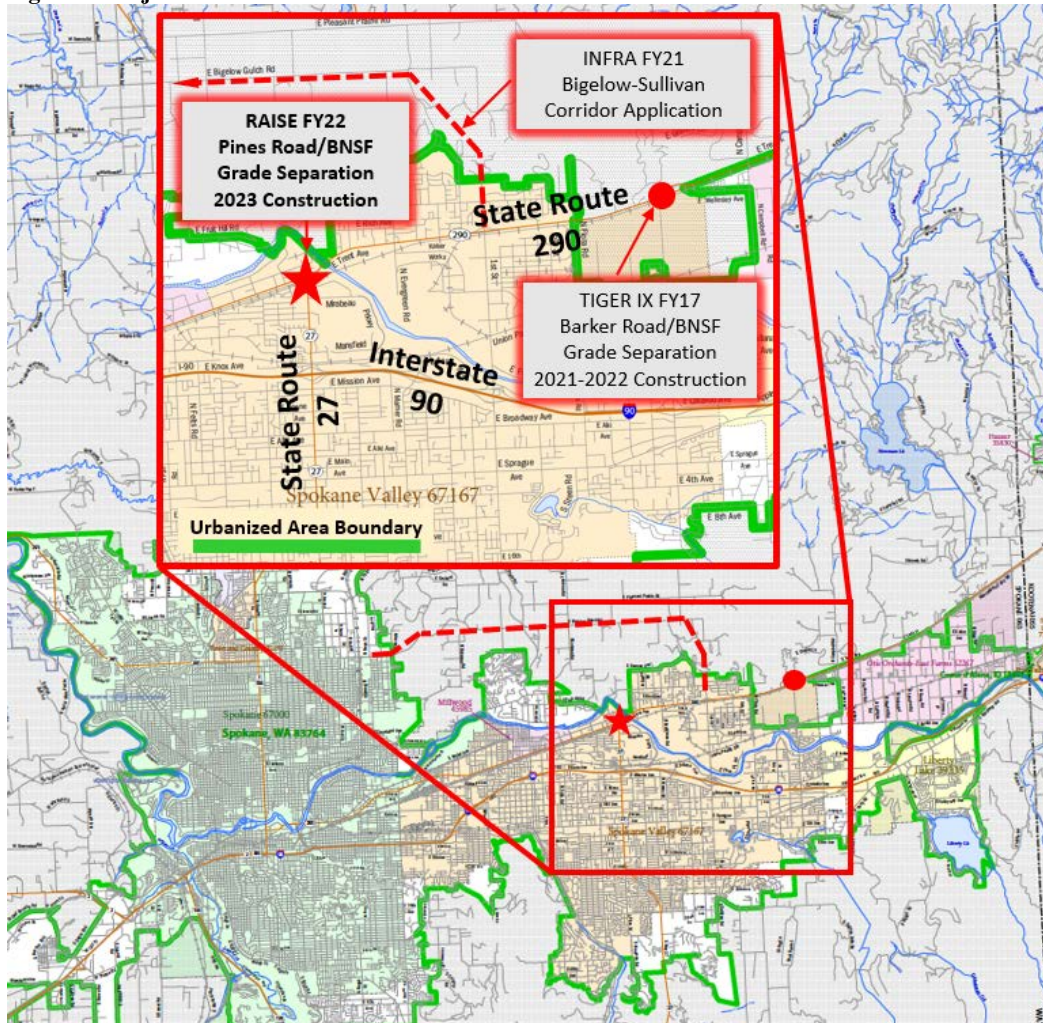
<p>Safety Outcomes</p>	<ul style="list-style-type: none"> <li>• Eliminates conflict between roadway users and trains by separating uses</li> <li>• Eliminates queuing of vehicles stopped at train crossing</li> <li>• Reduces the potential for high severity collisions at the intersection</li> <li>• Improves emergency access for police, fire and medical providers</li> </ul>
<p>Environmental Sustainability</p>	<ul style="list-style-type: none"> <li>• Reduces fuel consumption and emissions for idling vehicles</li> <li>• Provides electric vehicle charging stations at new trailhead parking lot</li> <li>• Eliminates the need for train horns for a 2.1-mile section</li> </ul>
<p>Quality of Life</p>	<ul style="list-style-type: none"> <li>• New Centennial Trail trailhead and parking lot access point</li> <li>• Eliminates train horn noise at Pines Road and improves the health and well-being of surrounding residents and businesses<sup>18</sup></li> <li>• Reduces delay for all modes of travel and improve traffic circulation</li> <li>• Moves the intersection away from the school and provides pedestrian facilities for all users, including school children</li> </ul>
<p>Mobility &amp; Community Connectivity</p>	<ul style="list-style-type: none"> <li>• Adds ADA-accessible active transportation facilities to increase safety</li> <li>• Combined with other Horizon 2045 regionally significant projects, creates a 3.6-mile section with only one at-grade BNSF crossing</li> <li>• Improves connectivity between neighborhoods, industrial jobs, and nearby recreational areas in a Historically Disadvantaged Community</li> <li>• Greatly enhance accessibility for active modes by eliminating infrastructure gaps and reducing delay</li> <li>• Increases paratransit service reliability and promotes expansion of existing transit service routes for all users</li> </ul>
<p>Economic Competitiveness</p>	<ul style="list-style-type: none"> <li>• Contributes to reliable movement of regional freight by road and rail</li> <li>• Adds capacity for a total of four BNSF tracks at the crossing location</li> <li>• Minimize construction delays/impacts for users and businesses</li> <li>• Decrease transportation costs and improve long-term efficiency, reliability, and costs in the movement of workers and goods</li> <li>• Maximize the access and reliability to close to 170 acres of prime, buildable industrial-zoned land and 56 acres of residential-zoned land</li> </ul>
<p>State of Good Repair</p>	<ul style="list-style-type: none"> <li>• Improves resilience with new underpass and roundabout</li> <li>• City funds have sufficient capacity to cover on-going operations and maintenance; there is a Capital Reserve available as a contingency</li> <li>• Ability to deliver: City has delivered similar projects: 2021-2022 TIGER-funded Barker Road/BNSF GSP and the 2015 reconstruction of the Sullivan Road West Bridge at the Spokane River.</li> </ul>
<p>Partnership and Innovation</p>	<ul style="list-style-type: none"> <li>• Helps fulfill the vision of the MPO’s Horizon 2045 Plan</li> <li>• Maximize land donation from Avista Utilities to provide community amenities (new trailhead and parking lot)</li> <li>• Addresses one of Washington State’s highest priority road-rail conflicts</li> <li>• Supports the BNSF double track expansion project and the Great Northern Corridor Coalition’s vision for safe, efficient, and environmentally sound transportation services</li> </ul>

<sup>18</sup> “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 nine 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 is in Census Tract 117.02, which is a Historically Disadvantaged Community but 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 1.3.4.

Figure 8. Project Locations and Connections to Existing Transportation Infrastructure

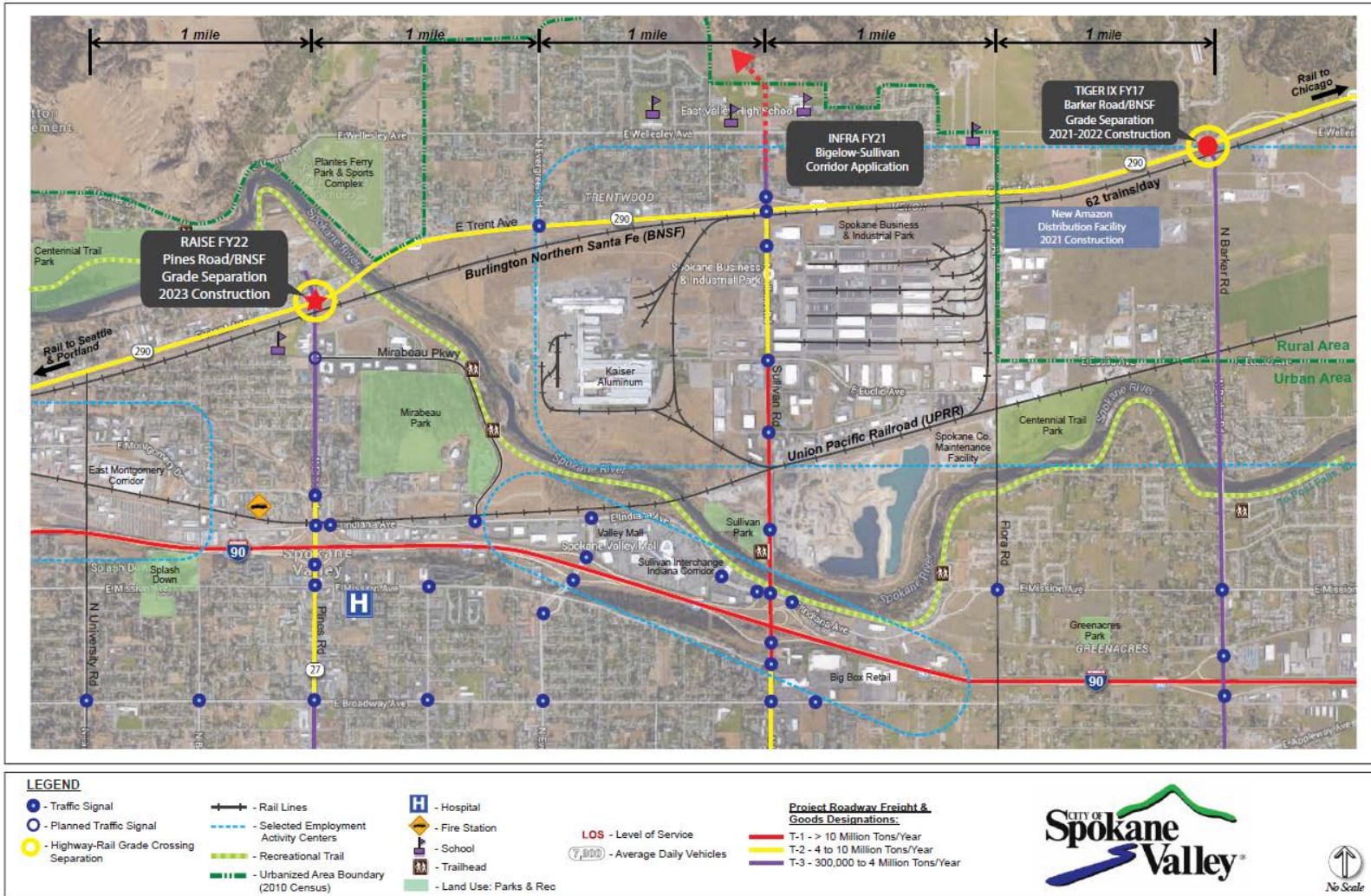


Figure 8 includes the proposed project location and surrounding area. Key features shown include:

- 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 **\$21,689,221 in RAISE grant funds**, which is **69%** of the **\$31,300,371** total future eligible cost. The project is in a Historically Disadvantaged Community and is eligible for a Federal cost share above 80%. 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 \$35,178,385, which includes \$3,878,014 of previously incurred costs. The project has made great progress since RAISE FY21. Portions of the secured engineering and right of way funds have been authorized and are not eligible for consideration in RAISE FY22. These previously incurred costs cover 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) program for 60% engineering and NEPA, both of which are expected to be approved in summer 2022. CRISI funds were authorized in 2020. The project has received approval of its BOD, IPA, and ICE.
- Right-of-way acquisition included a 2015 city-funded acquisition and a portion of Surface Transportation Block Grant (STBG) funds, which were authorized for the only business requiring relocation and the remaining purchase of two vacant parcels. These STBG acquisitions were completed in 2021 and were the project’s highest risk properties.

**Table 3: Previously Incurred Project Costs (YOE\$)**

Previously Incurred Project Costs	Total (\$)	Total (%)
<b>Federal Funding</b>		
2006 <i>Bridging the Valley</i> Preliminary Engineering Study	\$ 394,385	10.17%
Preliminary Engineering (CRISI Funds)	\$1,000,000	25.79%
2020 Early ROW Acquisition (STBG Funds)	\$855,000	22.05%
<b>Subtotal</b>	<b>\$2,249,385</b>	<b>58.00%</b>
<b>Non-Federal Funding</b>		
Preliminary Engineering (City Match for CRISI Funds)	\$1,000,000	25.79%
2015 ROW Acquisition (City Funds)	\$ 495,190	12.77%
2020 Early ROW Acquisition (City Match for STBG Funds)	\$ 133,439	3.44%
<b>Subtotal</b>	<b>\$1,628,629</b>	<b>42.00%</b>
<b>Total Previously Incurred Project Costs</b>	<b>\$3,878,014</b>	<b>100.00%</b>

### 3.2 Project Budget: Committed and Expected Funding

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 (YOES)**

Status	Source	Amount (\$)	Amount (%)
<b>Federal Funding</b>			
Requested	RAISE Program	21,689,221	69.29%
Committed	STBG Program (Remaining STBG funds)	2,940,000	9.39%
	<b>Subtotal</b>	<b>\$24,629,221</b>	<b>78.69%</b>
<b>Non-Federal Funding</b>			
Committed	City of Spokane Valley	2,431,917	7.77%
Available	City of Spokane Valley	3,149,232	10.06%
Required	BNSF* (Estimated Required Contribution)	300,000	0.96%
Committed	Avista Utilities (Land Donation)	790,000	2.52%
	<b>Subtotal</b>	<b>\$6,671,149</b>	<b>21.31%</b>
	<b>Total</b>	<b>\$ 31,300,371</b>	<b>100%</b>

\* Per 23CFR 646.210, BNSF must contribute 5% of the bridge costs. Actual amount is to be determined.

Proposed funding in Table 4 accounts for the required non-Federal commitments required for RAISE and STBG programs: a 20% non-Federal match for RAISE and a 13.5% non-Federal match for STBG. Non-Federal match is covered by the listed non-Federal funds.

Committed City funds are from the Capital Reserve and Grade Separation Project funds. If awarded RAISE, the City’s needed “Available” funds can come from accounts in the City’s general fund that are earmarked to lower priorities or from its non-voted limited tax general obligation (LTGO) bonds, which are secured by the City’s full faith, credit and taxing power. Because the project is located in a Historically Disadvantaged Community, the Secretary may also choose to fund beyond the 80% Federal cost share, which would allow the \$3,149,232 of non-Federal “Available” City funds to be funded via the RAISE program, see Section 3.4.

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

- BNSF will determine its estimated contribution as design nears 90% completion and a construction agreement is finalized. BNSF has acknowledged this financial participation in its [April 9, 2021 letter of support](#), estimated to be \$300,000.
- Avista Utilities has donated three land parcels, totaling 3.84 acres and valued at \$790,000, immediately east of the project’s roundabout for trailhead facilities. This



donation amplifies the local commitment to improve equitable transportation options for the underserved populations surrounding the project, see [Avista’s letter of support](#).

In 2000, the Washington State Freight Mobility and Strategic Investment Board (FMSIB) awarded WSDOT \$3,360,000 for project construction. However, due to inactivity and WSDOT’s transfer of project ownership to the newly incorporated City of Spokane Valley, in 2007 FMSIB placed the 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 FY22 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 are expected to carry into the construction phase.

**Table 5: Allocation of Future Eligible Project Costs by Project Phase (YOE\$)**

Project Phase	Previously Incurred Costs	Future Eligible Costs				Total Project Costs
		RAISE	Other Federal	Non-Federal	Subtotal	
Engineering (% by Phase)	\$2,394,385	\$ 257,600 80.00%	\$ - 0.00%	\$ 64,400 20.00%	\$ 322,000 100%	\$ 2,716,385
Right-of-Way (% by Phase)	\$1,483,629	\$ - 0.00%	\$2,692,201 68.99	\$1,210,170 31.01%	\$ 3,902,371 100%	\$ 5,386,000
Construction (% by Phase)	\$ -	\$21,431,621 79.15%	\$ 247,799 0.92%	\$5,396,579 19.93%	\$27,076,000 100%	\$27,076,000
<b>TOTAL</b> (% by Funding Type)	<b>\$3,878,014</b>	<b>\$21,689,221</b> 69.29%	<b>\$2,940,000</b> 9.39%	<b>\$6,671,149</b> 21.31%	<b>\$31,300,371</b> 100%	<b>\$35,178,385</b> *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 \$34,784,000, 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.

Should the Secretary acknowledge the project’s Historically Disadvantaged Community with RAISE funding exceeding the 80% Federal share, the additional \$3,149,232 of “Available” City funds that help make up the “Non-Federal” funds for the “Construction” phase may be reduced and the “RAISE” share of the “Construction” phase may be increased commensurately. If this occurs, the maximum Federal share could be 88.75% of the total future eligible project cost.

## 4 Merit Criteria

This section demonstrates how the project satisfies RAISE’s designated merit selection criteria.

### 4.1 Safety

The BNSF rail crossing and highway intersection present significant safety hazards for all modes. Project construction maximizes safety by minimizing the impacts on the travelling public 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 project is the state’s top unfunded, road-rail conflict. Illustrating the magnitude of shipments, the state’s Department of Ecology counted 1.8 billion gallons of Bakken oil travelled by rail through Spokane Valley in 2021.<sup>19</sup> The project reduces the risk of fatalities, serious injuries, and material spills that occur 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 2045 horizon year.

**Table 6: Annual Collision Reduction, 2045 Horizon Year**

Location	All Collisions	Fatal and Injury Collisions
Pines / BNSF RR Crossing	2.0	0.7
Pines / Trent Intersection	6.5	1.1
Total	8.5	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 and bicycle 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 an ADA-accessible shared-use path throughout the project, which currently lacks any

<sup>19</sup> WA Publications 21-08-011, -015, -018 and 22-08-001 (18,599+16,287+14,000+12,835=61,721 cars per year x 680 barrels/car x 42 gallons/barrel = 1.76B): <https://apps.ecology.wa.gov/publications/documents/2208001.pdf>

pedestrian or bicycle facilities at the rail crossing. The new, separated shared-use path through the project limits provides non-motorized users a safe route 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) have the following environmental benefits based on the undiscounted benefits from the BCA:

- Eliminate 1.5 million person-hours of delay at the rail crossing (by 2045)
- Reduce gasoline, and diesel consumption by over 492,000 gallons (by 2045)
- Reduce almost 4,600 metric tons of emissions (CO<sub>2</sub>, NO<sub>x</sub>, VOC, PM, SO<sub>2</sub>) (by 2045)
- Save \$29.1 million in reduced travel time costs (by 2045)
- Save \$62.9 million in safety and avoided crash costs (by 2045)
- By 2040, PM peak hour intersection delays drop 40 seconds/vehicle at roundabout.<sup>20</sup> These savings equate to nearly 40 hours of daily time savings<sup>21</sup>
- 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 the use of recycled materials in project construction, as specified in the [WSDOT 2021 Standard Specifications Section 1-06.6 – Recycled Materials](#)
- Improve water quality by providing stormwater facilities that treat highway runoff consistent with the region's unique stormwater design manual focused on preserving the US EPA-designated sole-source aquifer: [Spokane Valley-Rathdrum Prairie Aquifer](#). The aquifer is the source of 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 plants along the shared-use path and trailhead and will include drip irrigation systems to minimize water usage
- Reduce Particulate Matter (PM10) and Carbon Monoxide (CO), in Spokane County, which is identified by the EPA as a "maintenance area"

## 4.3 Quality of Life

The project will contribute to the improved livability for the region by enhancing equity and accessibility by reducing the impacts of trains and highways that bisect the Historically Disadvantaged Community. The 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 compared to the rest of the city: poverty (20%), minority (21%), youth (15%), disability (20%) and non-English speakers (14%).

<sup>20</sup> [Pines Road/BNSF Grade Separation – Consolidated Traffic and Safety Analysis, October 24, 2018 – Table 8 & 9](#)

<sup>21</sup> 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

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.

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.
- Reliable, separated, north-south access under the tracks, reducing safety risks and time delays for all modes, ensuring access to emergency services, schools, parks & businesses
- Electric vehicle charging station to promote clean transportation options on highways

#### 4.4 Mobility and Community Connectivity

The project will increase mobility and expand community connectivity with its non-motorized facilities that allow people to move freely through the project limits while maximizing opportunity for the community can live, work, and play without barriers (Figure 9).

The area north of Trent Avenue is largely residential but has commercial businesses fronting Trent Ave. Plante’s 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, Pineroft Business & Industrial Park, and Mirabeau Park CenterPlace 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.

Figure 9. Multi-Modal Connectivity Flow Graphic



The project will provide the following improved transportation options:

- Supports the existing paratransit services for the 124 customers living near the project
- Promotes expanded transit routes to reduce reliance on single occupant vehicle trips and improve transportation options for disadvantaged populations
- Reliable, north-south access under the tracks, reducing safety risks and time delays
- Improved ADA-compliant facilities at the roundabout, including medians refuge islands and increased signage that reduce crossing distance and increase visibility of users

- New, separated shared-use path connecting to: businesses, residences, Mirabeau Park, and elementary school to the south, new trailhead to the Centennial Trail & Spokane River and the future bridged connection to the River Loop Trail to the east, through the new roundabout at Trent Ave., and to the businesses, and Plante’s Ferry Park to the north
  - 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.

## 4.5 Economic Competitiveness and Opportunity

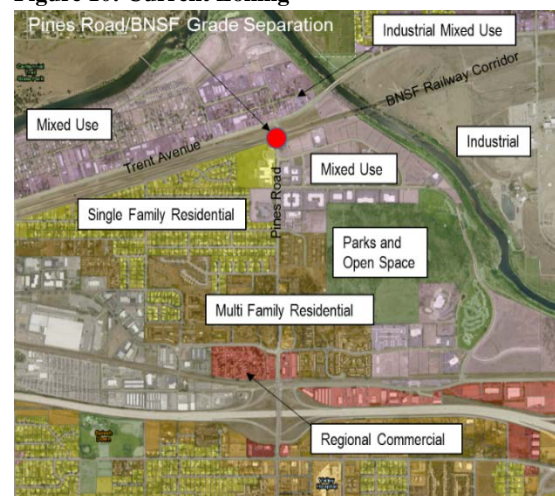
The smooth flow of trade, vital to U.S. economic competitiveness, is facilitated by addressing key deficiencies across the system. The Pines Road grade separation of the BNSF mainline provides an opportunity to target a local deficiency that effectively ripples through the rest of the transportation 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.<sup>22</sup> 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 65 freight and two passenger trains daily, and usage is projected to reach up to 102 freight trains and two passenger trains daily.<sup>23</sup> 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 2045 regionally significant projects (Barker Road/BNSF Grade Separation and Sullivan-Trent Interchange), 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.

Figure 11 illustrates the variety of property uses benefitting from the proposed improvements. The project supports regional economic vitality by

**Figure 10: Current Zoning**



<sup>22</sup> Washington Department of Transportation (WSDOT) Washington State Rail Plan, August 2020:

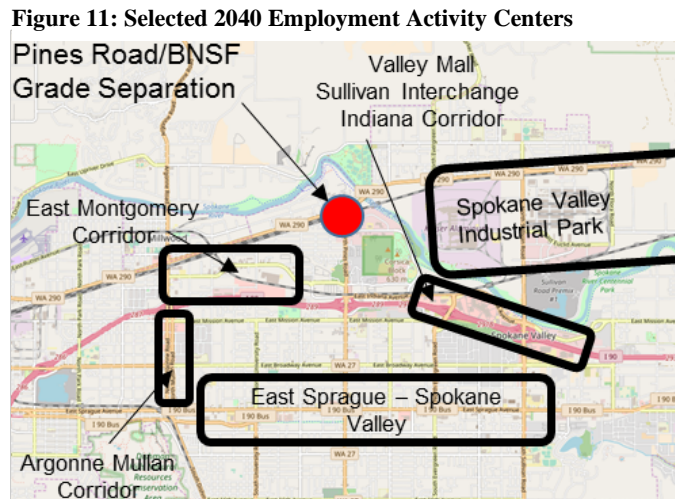
<https://wsdot.wa.gov/sites/default/files/2020/08/27/2019-2040-State-Rail-Plan.pdf>, Section 6.1, PDF page 88.

<sup>23</sup> Ibid. [Exhibit 5-6](#) illustrating 102 BNSF trains and two Amtrak trains passing through Spokane-Sandpoint corridor.

improving reliability and accessibility to 170 acres of mixed-use or commercially-zoned and 56 acres of prime industrially-zoned parcels. The City is expected to accommodate an additional 20,000 residents<sup>24</sup> and the Pines/Trent/I-90 area will remain a centralized corridor for growth. This project contributes significantly to supporting and managing this economic growth by building transportation infrastructure necessary to attract, retain, and expand businesses.

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<sup>25</sup>:

- \$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%)



#### 4.6 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 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. 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.

Design will meet current 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. If BNSF self-performs the installation, it may also elect to assume responsibility for ongoing maintenance. This will ensure the bridges are maintained consistent with the BNSF network and will relieve the City from ongoing bridge maintenance.

<sup>24</sup> Exhibit 2: [Residential Land Capacity, Existing Conditions-Housing and Economic Trends](#)

<sup>25</sup> Fiscal and Economic Benefits of the Pines Road Underpass Project, ECONorthwest 2016; <http://www.spokanevalley.org/PinesBNSF>



Since 2015, the City has managed over \$43 million of grant funds. These figures are documented in the City's annual budget and illustrate the City's ability to act as a good steward of grant funds that deliver valuable capital projects for the community. The primary 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 2019 and 2020, reported no Significant Deficiencies or Material Weaknesses. The City's financial condition is reported in its comprehensive annual budget and monthly financial reports.<sup>26</sup> The City employs staff with experience in grant management, project management and asset management.

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.

## 4.7 Partnership and Collaboration

Per Section 1.4, the primary partnerships exist with WSDOT, BNSF, and Avista Utilities. The City has an excellent working relationship with WSDOT and collaborate on roughly 10 to 20 projects per year, including traffic impact studies, permits for private developments on state routes, a of capital improvement projects, the regional ITS network and shared traffic signals.

The City coordinates with BNSF regarding all road-rail crossings in the city. The city and BNSF are actively working to construct the Barker Rd./BNSF GSP in 2021 and 2022. Together, the City and BNSF are evaluating the potential for BNSF to self-perform the project's bridge design and construction for the two railroad bridges and the piers and piles for a future third rail bridge. This innovative delivery method is described further in Section 4.8.

This project demonstrates support from numerous public and private partners across the region which actively participated in the Horizon 2045 planning document, and in the previous Bridging the Valley plan and other workshops, stakeholder outreach, and funding initiatives, see Table 7.

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<sup>26</sup> Spokane Valley Budget & Financial Reports: <http://www.spokanevalley.org/content/6836/6902/7156/default.aspx>

**Table 7: Partners in the Project Development**

State and Local Agencies	
<ul style="list-style-type: none"> <li>Washington State Dept. of Transportation</li> <li>WA Freight Mobility Strategic Investment Board</li> <li>State and Federal Delegates</li> </ul>	<ul style="list-style-type: none"> <li>Idaho Transportation Department</li> <li>Washington Utility and Transportation Commission</li> </ul>
Regional Agencies	
<ul style="list-style-type: none"> <li>Spokane Regional Transportation Council</li> <li>Spokane Regional Traffic Management Center</li> <li>Spokane Transit Authority</li> </ul>	<ul style="list-style-type: none"> <li>Kootenai Metropolitan Planning Organization</li> <li>Avista Utilities</li> </ul>
Railroads	
<ul style="list-style-type: none"> <li>BNSF Railway Company</li> </ul>	<ul style="list-style-type: none"> <li>Union Pacific Railroad</li> </ul>
Local Agencies and Districts	
<ul style="list-style-type: none"> <li>Counties: Spokane, Kootenai</li> <li>Cities &amp; Towns: Athol, Rathdrum, Spokane, Spokane Valley, Millwood</li> </ul>	<ul style="list-style-type: none"> <li>Police/Fires/Emergency Responders</li> <li>Area School Districts</li> <li>Freight/Industry Representatives</li> </ul>
Chambers of Commerce	
<ul style="list-style-type: none"> <li>Greater Spokane Valley</li> </ul>	<ul style="list-style-type: none"> <li>Greater Spokane Incorporated</li> </ul>
Unions	
<ul style="list-style-type: none"> <li>Spokane Valley Local 270v, WSCCCE, AFSCME, AFL-CIO</li> </ul>	

#### 4.7.1 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 stakeholder groups. The project minimizes impact to adjacent businesses, minimizes construction impacts and delays, maximizes efficient movement of people and goods, and maximizes developable land. Over half of City staff is unionized (Local 270V) and supports the project. Letters of support are here: <http://www.spokanevalley.org/PinesBNSF>.

#### 4.8 Innovation

The City of Spokane Valley will evaluate innovative bridge construction techniques to reduce the impact on the community and the existing traffic. The preferred innovative delivery option is for the City to reimburse BNSF to self-perform the bridge design and construction with its own unionized labor force. If this occurs, the project will realize great time and cost savings. This allows for a streamlined review and approval process and a BNSF-approved method of construction not available to general contractors otherwise using the design-bid-build process.

The project may consider constructing structures off-site before staging for construction. The project will take advantage of the Spokane Regional Transportation Management Center (SRTMC) Intelligent Transportation Systems (ITS) infrastructure to communicate traveler information about construction 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 use during construction.

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 authorize construction in 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.

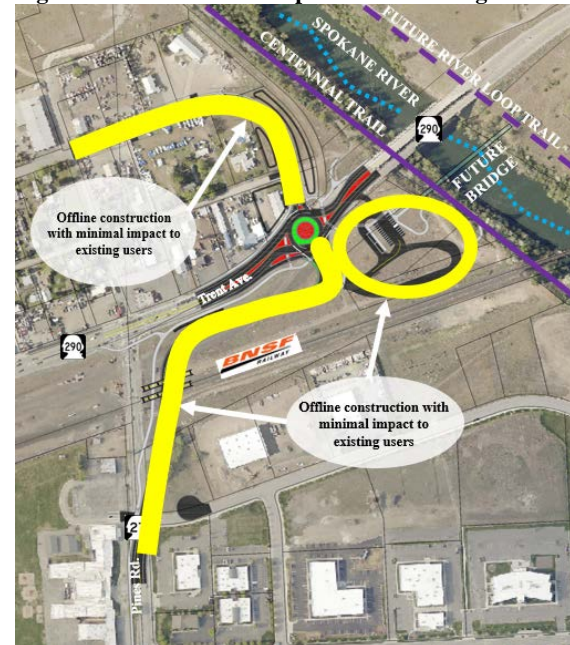
### 5.1 Technical Feasibility

The project’s technical feasibility has been thoroughly established through previous planning and engineering efforts. The 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 system, see Figure 12.

#### 5.1.1 Statement of Work

The Pines Road/BNSF GSP replaces an existing at-grade crossing with an underpass of BNSF’s tracks and provides a roundabout at the intersection of Pines Rd. and Trent Ave. The project installs 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.

Figure 12. Construction Impacts to Travelling Public



The proposed Pines Rd. section 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 for the west side of Pines Rd. and will connect to 10’ 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 on page 25 provides the detailed scope of work for how the design and construction will be achieved for the project.

#### 5.1.2 Design Criteria and Basis of Design

The project is led by the City. Design criteria identified in preliminary engineering efforts 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 April 2022, WSDOT granted approval for the project’s BOD, IPA, and ICE. 60% design and NEPA approvals are expected in summer 2022.

**Table 8: Project Scope of Work**

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

### 5.1.3 Basis of Cost Estimate and Contingency Levels

A detailed project cost estimate is included in Appendix B. Costs were developed in 2022 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 18%.

## 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 FY22, contract negotiations, and authorization schedule and ultimately allows for the project to authorize construction in 2023. Table 9 includes the 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	06/2022
Right-of-Way	01/2020	06/2023
CN Ad/Bid/Award	10/2023	12/2023
Construction*	01/2024	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 summer 2022.

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 SRTC and is 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.

##### **WDOT Discussions on NEPA Compliance**

City works with FRA & WSDOT staff, who administer FHWA projects, to ensure compliance.

##### **Public Engagement**

Extensive public engagement has been an on-going effort as part of the Horizon 2045 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/trucking industry representatives and BNSF project managers. Public engagement will continue through engineering and right-of-way phases.

### 5.3.2 State and Local Approvals

The Pines Road/ BNSF GSP is included in the Statewide Transportation Improvement Program (STIP ID WA-10615), Horizon 2045 Metropolitan Transportation Plan, and the Spokane Valley

TIP ([project #31](#)). 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
<b>Engineering Design Milestones – BOD, ICE, IPA</b> <ul style="list-style-type: none"><li>The project received WSDOT approvals in May &amp; June</li></ul>
<b>Detailed Project Work Plan – FRA CRISI Documentation/Coordination</b> <ul style="list-style-type: none"><li>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.</li></ul>
<b>Joint Transportation Committee Prioritization of Rail-Rail Conflicts in WA (Aug. 2018)</b> <ul style="list-style-type: none"><li>Rated the overall top priority grade separation project requiring funding support</li></ul>
<b>City of Spokane Valley – Project Design Alternative Analysis</b> <ul style="list-style-type: none"><li>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.</li></ul>
<b>Bridging the Valley Planning Study</b> <ul style="list-style-type: none"><li>Grade Separation Analysis: consideration of transportation needs and BNSF operations</li><li>Traffic Analysis: evaluation of impacts with alternatives for years 2001 and 2020</li><li>Economic Analysis: benefit-cost analysis of all alternatives</li></ul>
<b>Bridging the Valley 30% Preliminary Engineering</b> <ul style="list-style-type: none"><li>Right-of-Way needs were determined for this project</li><li>Design reports, 30% plans, estimates, and environmental documentation for projects</li></ul>
<b>Inland Pacific Hub Transportation Investment and Project Priority Blueprint</b> <ul style="list-style-type: none"><li>Lists Bridging the Valley projects as priorities with synergy economic benefits</li><li>Support from local partners and identifies a midterm construction period of 2016-2021</li></ul>
<b>Washington State Freight Mobility Plan 2014</b> <ul style="list-style-type: none"><li>Identifies project for future implementation</li></ul>
<b>Horizon 2045 Metropolitan Transportation Plan</b> <ul style="list-style-type: none"><li>Identifies this project and other Bridging the Valley grade separation projects</li></ul>
<b>Spokane Valley Comprehensive Plan</b> <ul style="list-style-type: none"><li>Goal to support passenger and freight rail system in the region and Bridging the Valley</li></ul>
<b>City of Spokane Valley TIP &amp; WA State TIP</b> <ul style="list-style-type: none"><li>Includes project funding for early pre-construction activities</li></ul>
<b>Fiscal and Economic Analysis of Project</b> <ul style="list-style-type: none"><li>Analysis of incremental development, tax revenue benefits, economic output, jobs, and wages showing the significant benefit of implementing this project<sup>27</sup></li></ul>

<sup>27</sup> 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 to secure the “Available” funds to satisfy non-Federal match requirements. Outside of local options discussed in Section 3.2, opportunities including TIB, FMSIB, or state legislative appropriations.
Environmental Approvals	Per CRISI-funded PE phase, the project qualifies for NEPA CE. CE documents are anticipated to be approved by summer 2022. 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 applicable 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 2022, the City has completed the project’s seven highest risk acquisitions: one full relocation and acquisition, two vacant parcel acquisitions, and three donated parcels from Avista Utilities. The 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 29 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, 2020 Dollars**

Project Evaluation Metric	Undiscounted	Discounted
Total Discounted Benefits	\$101.3 M	\$35.8 M
Total Discounted Costs	\$31.9 M	\$25.8 M
Net Present Value	\$69.4 M	\$10.0 M
Benefit / Cost Ratio	3.2	1.4
Internal Rate of Return (%)	10.1%	
Payback Period (years)	11.5	

Considering all monetized benefits and costs, the estimated internal rate of return of the project is 10.1%. With a 3% real discount rate on CO<sub>2</sub>-related impacts and 7% real discount rate on all other impacts, the \$25.8 million investment would result in \$35.8 million in total benefits for a Net Present Value of \$10.0 million and a Benefit/Cost ratio of 1.4.

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). Specifically, GSP would result in a Net Present Value of \$14.3 million (discounted) and a Benefit/Cost ratio of 1.9.

**Table 11: Results of the Grade Separation Component, 2020 Dollars**

Benefit	Undiscounted	Discounted
Reduced Travel Time Costs	\$29.1 M	\$10.1 M
Improved Safety & Avoided Accident Costs	\$49.8 M	\$18.7 M
Avoided Emissions Costs	\$0.5 M	\$0.3 M
Reduced Vehicle Operating Costs	\$1.6 M	\$0.5 M
Residual Value of Infrastructure Asset	\$4.4 M	\$0.8 M
Operations & Maintenance Cost Savings	\$0.2 M	\$0.1 M
<b>Total GSP Benefits</b>	<b>\$85.6 M</b>	<b>\$30.6 M</b>
<b>GSP Capital Expenditures</b>	<b>(\$20.3 M)</b>	<b>(\$16.3 M)</b>
<b>Net Present Value (NPV)</b>	<b>\$65.3 M</b>	<b>\$14.3 M</b>
<b>Benefit Cost Ratio (BCR)</b>	<b>4.2</b>	<b>1.9</b>

Lastly, the roundabout is expected to result in \$15.7 million in undiscounted benefits. With a 7% discount rate, the Benefit/Cost ratio is 0.5. 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, 2020 Dollars**

Benefit	Undiscounted	Discounted
Improved Safety and Avoided Accident Costs	\$13.1 M	\$4.7 M
Improved Traffic Fluidity*	-	-
Residual Value of Infrastructure Asset	\$2.6 M	\$0.5 M
<b>Total RAB Benefits</b>	<b>\$15.7 M</b>	<b>\$5.2 M</b>
<b>RAB Capital Expenditures</b>	<b>(\$11.6 M)</b>	<b>(\$9.5 M)</b>
<b>Net Present Value (NPV)</b>	<b>\$4.1 M</b>	<b>(\$4.3 M)</b>
<b>Benefit Cost Ratio (BCR)</b>	<b>1.4</b>	<b>0.5</b>

*\*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



## 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.

John Hohman, City Manager

Name and Title of Designated Representative

  
\_\_\_\_\_  
Signature of Designated Representative

4-11-2022  
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	GRADE SEPARATION QTY (BOP to 226+80)	INTERSECTION QTY (226+80 to EO EMPIRE; Incl Trailhead)	TOTAL QUANTITY	UNIT PRICE	GRADE SEPARATION COST	INTERSECTION COST	TOTAL COST
<b>SECTION 1: PREPARATION</b>										
	U	CLEARING AND GRUBBING	AC	11	4	15	\$7,500.00	\$82,500.00	\$30,000.00	\$112,500.00
	U	REMOVING DRAINAGE STRUCTURE	EACH		1	1	\$2,000.00	\$0.00	\$2,000.00	\$2,000.00
	U	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	0.5	0.5	1	\$10,000.00	\$5,000.00	\$5,000.00	\$10,000.00
	U	REMOVING CEMENT CONC. PAVEMENT	S.Y.	498	98	596	\$30.00	\$14,940.00	\$2,940.00	\$17,880.00
	U	REMOVING CEMENT CONC. SIDEWALK	S.Y.	1304	476	1780	\$30.00	\$39,120.00	\$14,280.00	\$53,400.00
	U	REMOVING CEMENT CONC. CURB AND GUTTER	L.F.	1680	0	1680	\$10.00	\$16,800.00	\$0.00	\$16,800.00
	U	REMOVING CEMENT CONC. CURB	L.F.	603	1134	1737	\$4.00	\$2,412.00	\$4,536.00	\$6,948.00
	U	REMOVING ASPHALT CONC. PAVEMENT	S.Y.	6639	10791	17430	\$12.00	\$79,668.00	\$129,492.00	\$209,160.00
	U	REMOVING TRAFFIC ISLAND	S.Y.	109		109	\$30.00	\$3,270.00	\$0.00	\$3,270.00
	U	REMOVING GUARDRAIL	L.F.	0	633	633	\$18.00	\$0.00	\$11,394.00	\$11,394.00
	U	REMOVING GUARDRAIL ANCHOR	EACH	0	4	4	\$600.00	\$0.00	\$2,400.00	\$2,400.00
	U	REMOVING PAINT LINE	L.F.	0	1589	1589	\$2.00	\$0.00	\$3,178.00	\$3,178.00
	U	REMOVING PAINTED TRAFFIC MARKING	EACH		6	6	\$50.00	\$0.00	\$300.00	\$300.00
	U	REMOVING PAINTED CROSSWALK LINE	S.Y.		504	504	\$3.00	\$0.00	\$1,512.00	\$1,512.00
	U	REMOVING CHAIN LINK FENCE	L.F.	0	1055	1055	\$10.00	\$0.00	\$10,550.00	\$10,550.00
<b>SECTION 2: GRADING</b>										
	U	ROADWAY EXCAVATION INCL. HAUL	CY	73836	16693	90529	\$17.00	\$1,255,212.00	\$283,781.00	\$1,538,993.00
	U	EMBANKMENT COMPACTION	CY	102	383	485	\$6.50	\$663.00	\$2,489.50	\$3,152.50
<b>SECTION 3: STOCKPILING</b>										
						0				
<b>SECTION 4: DRAINAGE</b>										
						0				
<b>SECTION 5: STORM SEWER</b>										
	U	STORM SEWER PACKAGE PUMP STATION, COMPLETE	EACH	1		1	\$250,000.00	\$250,000.00	\$0.00	\$250,000.00
	U	DITCH EXCAVATION INCL. HAUL	CY	0	3483	3483	\$10.00	\$0.00	\$34,830.00	\$34,830.00
	U	QUARRY SPALLS	CY		500	500	\$80.00	\$0.00	\$40,000.00	\$40,000.00
	U	CATCH BASIN TYPE 1	EACH	16	25	41	\$2,500.00	\$40,000.00	\$62,500.00	\$102,500.00
	U	TYPE 2 GRATE INLET	EACH	6		6	\$8,500.00	\$51,000.00	\$0.00	\$51,000.00
	U	CURB INLET TYPE 1	EACH		5	5	\$500.00	\$0.00	\$2,500.00	\$2,500.00
	U	PRECAST CONCRETE DRYWELL	EACH	4	4	8	\$5,000.00	\$0.00	\$20,000.00	\$20,000.00
	U	CATCH BASIN TYPE 2 48 IN. DIAM.	EACH		2	2	\$4,000.00	\$0.00	\$8,000.00	\$8,000.00
	U	TESTING STORM SEWER PIPE	L.F.	1570	1960	3530	\$5.00	\$7,850.00	\$9,800.00	\$17,650.00
	U	STORM SEWER PIPE 12 IN. DIAM.	L.F.	1570	1960	3530	\$40.00	\$62,800.00	\$78,400.00	\$141,200.00
	U	CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL	S.Y.		500	500	\$5.00	\$0.00	\$2,500.00	\$2,500.00
	U	STORM DRAINAGE OVERFLOW	LS.	1	1	2	\$60,000.00	\$60,000.00	\$60,000.00	\$120,000.00
<b>SECTION 6: SANITARY SEWER</b>										
	U	SEWER MANHOLE	EACH		2	2	\$3,000.00	\$0.00	\$6,000.00	\$6,000.00
	U	TESTING SEWER PIPE	L.F.		550	550	\$8.00	\$0.00	\$4,400.00	\$4,400.00
	U	SEWER PIPE 8 IN. DIAM.	LF		550	550	\$40.00	\$0.00	\$22,000.00	\$22,000.00
<b>SECTION 7: WATER LINES</b>										
	U	GATE VALVE 8 IN.	EACH		1	1	\$2,500.00	\$0.00	\$2,500.00	\$2,500.00
	U	DUCTILE IRON PIPE FOR WATER MAIN 8 IN. DIAM.	L.F.		690	690	\$80.00	\$0.00	\$55,200.00	\$55,200.00
	U	IRRIGATION SERVICE, VAULT, VALVING	LS.		1	1	\$5,000.00	\$0.00	\$5,000.00	\$5,000.00
	U	RESTROOM SERVICE AND VAULT	LS.		1	1	\$10,000.00	\$0.00	\$10,000.00	\$10,000.00
	U	HYDRANT ASSEMBLY	EACH		1	1	\$5,000.00	\$0.00	\$5,000.00	\$5,000.00
	U	SHORING OR EXTRA TRENCH EXCAVATION	CY		229	229	\$1.50	\$0.00	\$343.50	\$343.50
<b>SECTION 8: STRUCTURES</b>										
	U	WORK ACCESS	LS		1	1	\$43,600.00	\$43,600.00		\$43,600.00
	U	TEMPORARY SHORING	LS	1		1	\$76,300.00	\$76,300.00		\$76,300.00
	U	STRUCTURE EXCAVATION CLASS A INCL. HAUL	CY	1453		1453	\$43.60	\$63,350.80		\$63,350.80
	U	FURNISHING AND DRIVING STEEL TEST PILE	EACH	4		4	\$43,600.00	\$174,400.00		\$174,400.00
	U	FURNISHING ST. PILING	L.F.	6200		6200	\$141.70	\$878,540.00		\$878,540.00
	U	DRIVING ST. PILE	EACH	62		62	\$7,085.00	\$438,270.00		\$438,270.00
	U	FURNISHING STEEL PILE TIP OR SHOE	EACH	66		66	\$7,085.00	\$467,610.00		\$467,610.00
	U	PILE SPLICES	EACH	66		66	\$7,085.00	\$467,610.00		\$467,610.00
	U	CONTROLLED DENSITY FILL	CY	66		66	\$212.55	\$14,028.30		\$14,028.30
	U	CONC. CLASS 4000 FOR BRIDGE (BENT ENCASEMENT)	CY	322		322	\$926.50	\$298,333.00		\$298,333.00
	U	EPOXY REINF. BAR FOR BRIDGE (BENT ENCASEMENT)	LB	42700		42700	\$2.51	\$107,177.00		\$107,177.00
	U	PRECAST REINFORCED CONCRETE	LS	1		1	\$414,200.00	\$414,200.00		\$414,200.00
	U	PRESTRESS 42" CONC. DOUBLE CELL BEAM W/ CURB & WALK	LF	765		765	\$1,199.00	\$917,235.00		\$917,235.00
	U	ELASTOMERIC PAD - SUPERSTR.	EACH	40		40	\$2,180.00	\$87,200.00		\$87,200.00
	U	ERECTION OF SUPERSTRUCTURE	LS	1		1	\$141,700.00	\$141,700.00		\$141,700.00
	U	RR BRIDGE SAFETY RAILING	LF	849		849	\$327.00	\$277,623.00		\$277,623.00
	U	STRUCTURAL CARBON STEEL	LS	1		1	\$30,520.00	\$30,520.00		\$30,520.00
	U	BRIDGE DECK WATERPROOFING	SY	740		740	\$228.90	\$169,386.00		\$169,386.00
	U	GRAVEL BACKFILL FOR WALL	CY	478		478	\$40.00	\$19,120.00		\$19,120.00
	U	T-WALL RETAINING WALL	SF			0	\$125.00	\$0.00	\$0.00	\$0.00
<b>SECTION 9: SURFACING</b>										
	U	CRUSHED SURFACING BASE COURSE (CSBC)	TON	6923	12990	19913	\$30.00	\$207,690.00	\$389,700.00	\$597,390.00
	U	CSTC	TON	126	568	694	\$30.00	\$3,780.00	\$17,040.00	\$20,820.00
<b>SECTION 10: LIQUID ASPHALT</b>										
<b>SECTION 11: BITUMINOUS SURFACE TREATMENT</b>										



**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	GRADE SEPARATION QTY (BOP to 226+80)	INTERSECTION QTY (226+80 to EO EMPIRE; Incl Trailhead)	TOTAL QUANTITY	UNIT PRICE	GRADE SEPARATION COST	INTERSECTION COST	TOTAL COST
<b>SECTION 13: CEMENT CONCRETE PAVEMENT</b>										
U		CEMENT CONC. PAVEMENT (PCC)	CY	0	0	0	\$300.00	\$0.00	\$0.00	\$0.00
U		TEXTURED AND PIGMENTED CEMENT CONCRETE TRUCK APRON	CY	0	680	680	\$125.00	\$0.00	\$85,000.00	\$85,000.00
U		TEXTURED AND PIGMENTED CEMENT CONCRETE TRAFFIC ISLAND	SY	280	1656	1936	\$115.00	\$32,200.00	\$190,440.00	\$222,640.00
<b>SECTION 14: HOT MIX ASPHALT</b>										
U		PLANING BITUMINOUS PAVEMENT	S.Y.			0	\$6.00	\$0.00	\$0.00	\$0.00
U		HMA CL. 3/8 IN. PG 64V-28	TON	4765	6805	11570	\$120.00	\$671,800.00	\$816,600.00	\$1,488,400.00
U		JOB MIX COMPLIANCE PRICE ADJUSTMENT	CALC	12866	18374	31240	\$1.00	\$12,866.00	\$18,374.00	\$31,240.00
U		COMPACTION PRICE ADJUSTMENT	CALC	8577	12249	20826	\$1.00	\$8,577.00	\$12,249.00	\$20,826.00
U		JOINT ADHESIVE FOR BITUMINOUS PAVEMENT	L.F.	3205	8594	11799	\$2.00	\$6,410.00	\$17,188.00	\$23,598.00
<b>SECTION 15: SEAL COAT</b>										
<b>SECTION 16: IRRIGATION AND WATER DISTRIBUTION</b>										
U		IRRIGATION SYSTEM	LS	0.5	0.5	1	\$60,000.00	\$30,000.00	\$30,000.00	\$60,000.00
<b>SECTION 17: EROSION CONTROL AND ROADSIDE PLANTING</b>										
%		LANDSCAPING	LS	0.5	0.5	1	\$70,000.00	\$35,000.00	\$35,000.00	\$70,000.00
U		PLANT ESTABLISHMENT - SECOND YEAR	EST	0.5	0.5	1	\$35,000.00	\$17,500.00	\$17,500.00	\$35,000.00
U		ESC LEAD	DAY	150	150	300	\$100.00	\$15,000.00	\$15,000.00	\$30,000.00
U		INLET PROTECTION	EACH	22	32	54	\$100.00	\$2,200.00	\$3,200.00	\$5,400.00
U		STABILIZED CONSTRUCTION ENTRANCE	S.Y.	250	250	500	\$20.00	\$5,000.00	\$5,000.00	\$10,000.00
U		SILT FENCE	L.F.	3530	4732	8262	\$5.00	\$17,650.00	\$23,660.00	\$41,310.00
U		EROSION/WATER POLLUTION CONTROL	EST	0.5	0.5	1	\$40,000.00	\$20,000.00	\$20,000.00	\$40,000.00
U		SEEDING, FERTILIZING, AND MULCHING	ACRE	4.47	3.39	8	\$17,880.00	\$17,880.00	\$13,560.00	\$31,440.00
U		TOPSOIL TYPE B	ACRE	4.47	3.39	8	\$12,500.00	\$55,875.00	\$42,375.00	\$98,250.00
U		WEED BARRIER	S.Y.		1000	1000	\$7.00	\$0.00	\$7,000.00	\$7,000.00
U		BIO-INFILTRATION TREATMENT SOIL MIX	C.Y.		0	0	\$60.00	\$0.00	\$0.00	\$0.00
U		COSV BIO-INFILTRATION TREATMENT SOIL MIX	C.Y.		1332	1332	\$60.00	\$0.00	\$79,920.00	\$79,920.00
<b>SECTION 18: TRAFFIC</b>										
U		ROUNDBOULT SPLITTER ISLAND NOSING CURB	EACH		4	4	\$300.00	\$0.00	\$1,200.00	\$1,200.00
U		ROUNDBOULT CEMENT CONCRETE CURB AND GUTTER	L.F.		4427	4427	\$35.00	\$0.00	\$154,945.00	\$154,945.00
U		CEMENT CONC. TRAFFIC CURB	L.F.	538	952	1490	\$35.00	\$18,830.00	\$33,320.00	\$52,150.00
U		CEMENT CONC. TRAFFIC CURB AND GUTTER	L.F.	2850		2850	\$35.00	\$99,750.00	\$0.00	\$99,750.00
U		CEMENT CONCRETE PEDESTRIAN CURB	L.F.		50	50	\$35.00	\$0.00	\$1,750.00	\$1,750.00
U		ROUNDBOULT CENTRAL ISLAND CEMENT CONCRETE CURB	L.F.	0	227	227	\$100.00	\$0.00	\$22,700.00	\$22,700.00
U		ROUNDBOULT TRUCK APRON CEM. CONC. CURB AND GUTTER	L.F.		795	795	\$45.00	\$0.00	\$35,775.00	\$35,775.00
U		COSV CURB AND GUTTER TYPE B	L.F.	254	2283	2537	\$35.00	\$8,890.00	\$79,905.00	\$88,795.00
U		BEAM GUARDRAIL TYPE 31	L.F.		688	688	\$35.00	\$0.00	\$24,080.00	\$24,080.00
U		BEAM GUARDRAIL TRANSITION SECTION TYPE 24	EACH		4	4	\$3,000.00	\$0.00	\$12,000.00	\$12,000.00
U		BEAM GUARDRAIL ANCHOR TYPE 10	EACH		4	4	\$1,800.00	\$0.00	\$7,200.00	\$7,200.00
U		TUBULAR MARKER	EACH		50	50	\$180.00	\$0.00	\$9,000.00	\$9,000.00
U		FLEXIBLE GUIDE POST	EACH		30	30	\$150.00	\$0.00	\$4,500.00	\$4,500.00
U		PLASTIC LINE		3822	4027	7849	\$3.00	\$11,466.00	\$12,081.00	\$23,547.00
U		GROOVED PLASTIC LINE	L.F.	6271	8043	14314	\$5.50	\$34,490.50	\$44,236.50	\$78,727.00
U		PLASTIC WIDE LANE LINE	L.F.	100		100	\$8.50	\$850.00	\$0.00	\$850.00
U		GROOVED PLASTIC WIDE DOTTED EXTENSION LINE	L.F.		125	125	\$18.00	\$0.00	\$2,250.00	\$2,250.00
U		GROOVED PLASTIC WIDE DOTTED ENTRY LINE	L.F.		255	255	\$18.00	\$0.00	\$4,590.00	\$4,590.00
U		GROOVED PLASTIC CROSSWALK LINE	S.F.		1100	1100	\$19.00	\$0.00	\$20,900.00	\$20,900.00
U		GROOVED PLASTIC YIELD LINE SYMBOL	EACH		123	123	\$190.00	\$0.00	\$23,370.00	\$23,370.00
U		PLASTIC TRAFFIC ARROW	EACH		4	4	\$1,100.00	\$0.00	\$4,400.00	\$4,400.00
U		GROOVED PLASTIC TRAFFIC ARROW	EACH		16	16	\$1,100.00	\$0.00	\$17,600.00	\$17,600.00
U		ADA SYMBOL	EACH		1	1	\$500.00	\$0.00	\$500.00	\$500.00
U		PERMANENT SIGNING	LS	0.4	0.6	1	\$100,000.00	\$40,000.00	\$60,000.00	\$100,000.00
U		CANTILEVER SIGN STRUCTURE	LS	0	2	2	\$120,000.00	\$0.00	\$240,000.00	\$240,000.00
U		ILLUMINATION SYSTEM	LS	0.4	0.6	1	\$400,000.00	\$160,000.00	\$240,000.00	\$400,000.00
U		PORTABLE CHANGEABLE MESSAGE SIGN	DAY	40	40	80	\$150.00	\$6,000.00	\$6,000.00	\$12,000.00
U		PROJECT TEMPORARY TRAFFIC CONTROL	LS	0.3	0.7	1	\$200,000.00	\$60,000.00	\$140,000.00	\$200,000.00



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ITEM NO.	Contingency Code (%) or Unit	ITEM	UNIT	GRADE SEPARATION QTY (BOP to 226+80)	INTERSECTION QTY (226+80 to EO EMPIRE; Incl Trailhead)	TOTAL QUANTITY	UNIT PRICE	GRADE SEPARATION COST	INTERSECTION COST	TOTAL COST
<b>SECTION 19: OTHER ITEMS</b>										
U		MIN BID REQ - TYPE B PROGRESS SCHEDULE	L.S.	0.5	0.5	1	\$10,000.00	\$5,000.00	\$5,000.00	\$10,000.00
U		WATER	MGAL	70	60	130	\$50.00	\$3,500.00	\$3,000.00	\$6,500.00
U		STRUCTURE SURVEYING	L.S.	1	1	1	\$50,000.00	\$50,000.00	\$0.00	\$50,000.00
U		ROADWAY SURVEYING	L.S.	1	1	1	\$65,000.00	\$0.00	\$65,000.00	\$65,000.00
U		ADA FEATURES SURVEYING	L.S.	1	1	1	\$10,000.00	\$0.00	\$10,000.00	\$10,000.00
U		BOLLARD TYPE 2	EACH	24	24	24	\$1,000.00	\$0.00	\$24,000.00	\$24,000.00
U		CEMENT CONC. SIDEWALK	S.Y.	522	2841	3363	\$70.00	\$36,540.00	\$198,870.00	\$235,410.00
U		CEMENT CONC. DRIVEWAY ENTRANCE TYPE R-110	S.Y.	119	310	429	\$95.00	\$11,305.00	\$29,450.00	\$40,755.00
U		CEMENT CONC. CURB RAMP TYPE SINGLE DIRECTION	EACH	3	23	23	\$3,500.00	\$10,500.00	\$70,000.00	\$80,500.00
U		DETECTABLE WARNING SURFACE	S.F.	64	426	490	\$50.00	\$3,200.00	\$21,300.00	\$24,500.00
U		COATED CHAIN LINK FENCE TYPE 3	L.F.	1690	1690	1690	\$90.00	\$0.00	\$152,100.00	\$152,100.00
U		END, GATE, CORNER, AND PULL POST FOR CHAIN LINK FENCE	EACH	10	10	10	\$800.00	\$0.00	\$8,000.00	\$8,000.00
U		DOUBLE 14 FT. COATED CHAIN LINK GATE	EACH	2	2	2	\$4,000.00	\$0.00	\$8,000.00	\$8,000.00
U		DOUBLE 20 FT. BNSF PIPE GATE	EACH	2	2	2	\$12,000.00	\$24,000.00	\$0.00	\$24,000.00
U		LANDSCAPE BLOCK WALL	S.F.	0	0	0	\$40.00	\$0.00	\$0.00	\$0.00
U		ADJUST MANHOLE	EACH	2	2	2	\$2,000.00	\$0.00	\$4,000.00	\$4,000.00
U		ADJUST EXISTING WATER VALVE	EACH	2	2	2	\$900.00	\$0.00	\$1,800.00	\$1,800.00
U		ADJUST EXISTING GAS VALVE	EACH	2	2	2	\$900.00	\$0.00	\$1,800.00	\$1,800.00
U		ADJUST METER BOX	EACH	5	5	5	\$950.00	\$0.00	\$4,750.00	\$4,750.00
U		VERIFY UTILITY	EACH	5	5	10	\$600.00	\$3,000.00	\$3,000.00	\$6,000.00
U		SPCC PLAN	L.S.	0.5	0.5	1	\$3,000.00	\$1,500.00	\$1,500.00	\$3,000.00
U		MAILBOX SUPPORT TYPE 1	EACH	8	8	8	\$1,250.00	\$0.00	\$10,000.00	\$10,000.00
U		TRAINING	HR	400	400	800	\$10.00	\$4,000.00	\$4,000.00	\$8,000.00
U		RETAINING WALL	S.F.	2340	0	2340	\$125.00	\$292,500.00	\$0.00	\$292,500.00
U		RETAINING WALL (GRAVITY)	S.F.	495	495	990	\$50.00	\$24,750.00	\$0.00	\$24,750.00
U		RETAINING WALL (AVISTA)	S.F.	180	180	360	\$125.00	\$22,500.00	\$0.00	\$22,500.00
U		UTILITIES - POWER & GAS RELOCATION-AVISTA	LF	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00
U		UTILITIES - WATER LINE RELOCATION-IRVIN	LF	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00
%		UTILITIES - GAS MAIN RELOCATION-AVISTA	LS	0	0	0	\$15,000.00	\$0.00	\$0.00	\$0.00
U		UTILITIES - FIBER OPTIC RELOCATION LUMEN + AT&T	LF	3550	3550	7100	\$200.00	\$710,000.00	\$0.00	\$710,000.00
U		UTILITIES - TELECOMMUNICATION RELOCATION T-MOBILE	LF	400	400	800	\$250.00	\$100,000.00	\$0.00	\$100,000.00
U		UTILITIES - PHILLIPS 66 YELLOWSTONE PIPELINE RELOCATION	LS	1	1	1	\$1,000,000.00	\$1,000,000.00	\$0.00	\$1,000,000.00
%		Trailhead for Centennial Trail parking Lot	LS	0	0	0	\$150,000.00	\$0.00	\$0.00	\$0.00
%		Trailhead Prefabricated Restroom Building	LS	0	1	1	\$125,000.00	\$0.00	\$125,000.00	\$125,000.00
U		Shoofly Grading and Embankment	LS	1	1	1	\$90,500.00	\$90,500.00	\$0.00	\$90,500.00
U		Shoofly Track Construction incl. Subballast and Ballast	LS	1	1	1	\$435,200.00	\$435,200.00	\$0.00	\$435,200.00
U		Lineover Track	LS	1	1	1	\$107,000.00	\$107,000.00	\$0.00	\$107,000.00
U		Relocate Turnout	LS	1	1	1	\$164,500.00	\$164,500.00	\$0.00	\$164,500.00
U		Relocation of Pines Xing Protection	LS	1	1	1	\$300,000.00	\$300,000.00	\$0.00	\$300,000.00
U		Remove Track (shoofly upon completion of work)	LS	1	1	1	\$25,000.00	\$25,000.00	\$0.00	\$25,000.00
U		Railroad Flagging	Day	220	220	220	\$1,800.00	\$396,000.00	\$0.00	\$396,000.00
		<b>BNSF 3rd party inspection</b>								
		1 day per week for the duration of the project when working either outside the BNSF ROW to the south or within the WSDOT permanent easement.	Day	40						
		3 to 5 days per week when working between the WSDOT permanent easement and 25' north of the railroad track. Unless equipment could foul the main line.	Day	80						
		5 days per week when working within the BNSF ROW to the south and 25' north of the railroad track.	Day	100						
U		Daily charge would be \$50/hour x 10 hours/day x 3.0 multiplier = \$1,500 / day + \$130 / day for expenses = <b>\$1,630 / day</b>	Day	220	220	220	\$1,630.00	\$358,600.00	\$0.00	\$358,600.00
1		Construction Subtotal						\$11,895,540	\$4,793,205	\$16,688,744
2		Mobilization				10%		\$1,189,553.96	\$479,320.45	\$1,668,874.41
3		<b>Subtotal</b>						<b>\$13,085,094</b>	<b>\$5,272,525</b>	<b>\$18,357,619</b>
4		Unit Price Contingencies		\$15,493,744	\$10,860,540	\$4,633,204.50	20.0%	\$2,172,108	\$926,641	\$3,098,749
5		Percentage Item Contingencies		\$1,195,000	\$1,035,000	\$160,000.00	20.0%	\$237,108	\$958,641	\$3,337,749
4		<b>Contingencies</b>				<b>18.2%</b>		<b>\$15,464,201</b>	<b>\$6,231,166</b>	<b>\$21,695,367</b>
6		Sales Tax (N/A included in unit costs)						\$0	\$0	\$0
7		<b>Subtotal</b>						<b>\$15,464,201</b>	<b>\$6,231,166</b>	<b>\$21,695,367</b>
8		Total Construction Subtotal						\$15,464,201	\$6,231,166	\$21,695,367
9		Design Engineering								
		HDR						\$785,787	\$785,787	\$1,571,574
		F&P						\$75,000	\$75,000	\$150,000
		Simpson						\$75,000	\$75,000	\$150,000
		Wisener & Associates						\$75,000	\$75,000	\$150,000
		City Engineering Costs						\$150,000	\$150,000	\$300,000
9A		<b>Subtotal</b>						<b>\$1,160,787</b>	<b>\$1,160,787</b>	<b>\$2,321,574</b>
10		RIGHT-OF-WAY						\$2,331,643	\$2,871,643	\$5,203,285
11		Construction Engineer and Inspection				16.5%		\$2,551,593	\$1,028,142	\$3,579,736
12		<b>TOTAL PROJECT COST (DESIGN, CONSTRUCTION, CONSTRUCTION ENGINEERING)</b>						<b>\$21,508,224</b>	<b>\$11,291,738</b>	<b>\$32,799,962</b>
		<b>CONCEPTUAL ESTIMATE TOTAL</b>						<b>\$21,508,224</b>	<b>\$11,291,738</b>	<b>\$32,799,962</b>
								66%	34%	
		Phase	Cost	Year of Expenditure	Inflated Cost (@3.5%)					
		Construction (2023-2025)	\$21,695,367	2024	\$23,241,000					
		Design Engineering (2020-2022)	\$2,321,574	2022	\$2,322,000					
		Right of Way (2022-2023)	\$5,203,285	2023	\$5,386,000					
		Construction Engineering (2023-2025)	\$3,579,736	2024	\$3,835,000					
		<b>Total</b>	<b>\$32,799,962</b>		<b>\$34,784,000</b>					



# Appendix C

## Benefit Cost Analysis



**Benefit-Cost Analysis Technical  
Memorandum**  
RAISE Discretionary Grant Program

## **Pines Road/BNSF Grade Separation**

City of Spokane Valley

April 7, 2022



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# 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. Spokane Valley is the convergence of several rail lines in the northern tier of BNSF's freight network. The project's at-grade crossing is a rail chokepoint that will continue to worsen and further contribute to current and future crossing delays. The project is in a Historically Disadvantaged Community and the at-grade crossing is rated Washington State's top Tier 1 road-rail conflict<sup>1</sup> which is located in the center of Spokane Valley's most vulnerable census tracts<sup>2</sup>. In addition to safety concerns, extended delays at the project location result in inefficient emergency services access, lack of community connectivity, noise pollution from train whistles, inefficient freight truck movements along a primary arterial road, and a worsening Level of Service (LOS) at the Pines Rd. and Trent Ave. intersection projected to reach 'F' in future years due to high traffic volumes.

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 of Pines Rd. and Trent Ave., constructs a separated shared-use path under the tracks and through the highway roundabout, connecting to a new trailhead facility serving the adjacent Centennial Trail and Spokane River. The underpass will be built to accommodate a total of four tracks and the new trailhead facility will be provided immediately east of the roundabout. Trailhead amenities will include restrooms, electric vehicle charging stations, and bus parking space. Overall, the project will increase mobility and expand community connectivity with its non-motorized facilities that allow people to move freely through the project limits while maximizing opportunity for the community to live, work, and play without barriers.

The improvements support freight movement and regional mobility goals as articulated in various plans such as Horizon 2045, 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.

Collectively, the project removes barriers, connects the community, and promotes active transportation by improving access and mobility across the railway and between the adjacent businesses, elementary school, two regional parks, the Centennial Trail, the future River Loop Trail, and the Spokane River. Proposed improvements will reduce the risk of collisions between the existing (2022) 15,000 vehicles/day and 67 trains/day at the crossing and help prevent unintended releases of hazardous materials. Removing the crossing will also reduce noise pollution from the 67 daily trains that no longer need to cross Pines Rd.

Non-motorized users 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. 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 located in a Historically Disadvantaged Community and will directly improve 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

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<sup>1</sup> Federal Mobility Strategic Investment Board, Study of Road-Rail Conflicts. Phase 2 – Development of Project Priorities. August 2018

<sup>2</sup> SRTC Social Equity Mapping Tool

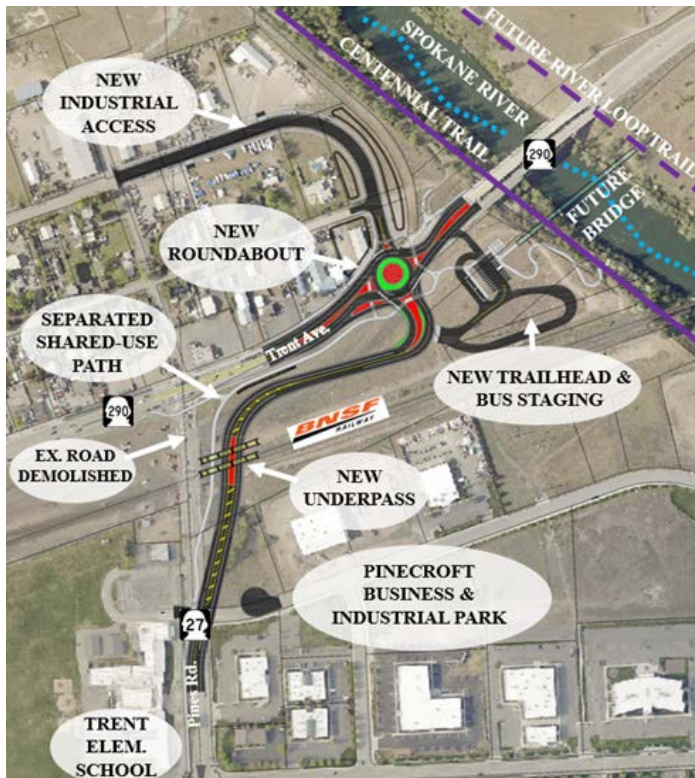
compared to the rest of the city: poverty (20%), minority (21%), youth (15%), disability (20%) and non-English speakers (14%).<sup>3</sup> The project improves access and mobility for these users by increasing transportation options including expanding transit service routes, improving access to facilities 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 \$21,689,211 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. Since the project is located in a Historically Disadvantaged Community, the Secretary may also choose to fund beyond the 80% Federal cost share. This would allow the \$3,149,232 of non-federal “Available” City funds allocated for the “Construction” phase to be reduced and the “RAISE” share of the “Construction” phase would be increased commensurately. If this occurs, the maximum federal share would be 88.75% of the total future eligible project cost.

The proposed concept is illustrated in Figure 1.

**Figure 1: Pines Road/BNSF Grade Separation Project**



<sup>3</sup> Ibid



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 (Base Scenario) & Problems to be Addressed	Changes to Baseline (Alternative Scenario)	Types of Impact	Population Affected by Impacts	Economic Benefits	Summary of Results (2020\$, Discounted)
<p>With increasing growth in freight train traffic, the Pines Road grade crossing is becoming increasingly difficult for motorists, pedestrians, and other users. The project is located in a Historically Disadvantaged Community and the at-grade crossing is rated Washington State's top Tier 1 road-rail conflict which negatively impacts Spokane Valley's most vulnerable census tracts .</p> <p>In addition to safety concerns, extended delays at the project location result in inefficient emergency services access, lack of community connectivity, noise pollution from train whistles, inefficient freight truck movements along a primary arterial road, and a worsening Level of Service (LOS)</p>	<p>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 Rd. and Trent Ave., constructs a separated shared-use path under the tracks and through the highway roundabout, connecting to a new trailhead facility serving the adjacent Centennial Trail and Spokane River.</p>	<p>Improved safety and avoided accident costs from grade separating the Pines Road grade crossing.</p>	<p>Motorists, shippers, local businesses, and residents</p>	<p>Improved Safety from Grade Separation</p>	<p><b>\$18.7 M</b></p>
	<p>Improved safety from intersection improvements.</p>	<p>Motorists</p>	<p>Improved Safety from Intersection Improvements</p>	<p><b>\$4.7 M</b></p>	
	<p>Collectively, the project removes barriers, connects the community, and promotes active transportation by improving access and mobility across the railway and between the adjacent businesses, elementary school, two regional parks, the Centennial Trail, the</p>	<p>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.</p>	<p>Local residents</p>	<p>Improve Pedestrian Accessibility</p>	<p><b>Not Monetized</b></p>
	<p></p>	<p>Reduced vehicle delay at the grade crossing due to grade separation.</p>	<p>Motorists, shippers, local businesses, and residents</p>	<p>Reduced Vehicle Idling Time</p>	<p><b>\$10.1 M</b></p>
	<p></p>	<p>Reduced vehicle operating costs as a result of a reduction in vehicle idling at the grade crossing.</p>	<p>Motorists, shippers, local businesses, and residents</p>	<p>Reduced Vehicle Operating Costs</p>	<p><b>\$0.5 M</b></p>
	<p></p>	<p>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.</p>	<p>Motorists, shippers, local businesses, and residents</p>	<p>Improved Travel Time Reliability</p>	<p><b>Not Monetized</b></p>



Current Status (Base Scenario) & Problems to be Addressed	Changes to Baseline (Alternative Scenario)	Types of Impact	Population Affected by Impacts	Economic Benefits	Summary of Results (2020\$, Discounted)
<p>at the Pines Rd. and Trent Ave. intersection projected to reach 'F' in future years due to high traffic volumes.</p> <p>Spokane Valley is the convergence of several rail lines in the northern tier of BNSF's freight network; the project's at-grade crossing is a rail chokepoint that will continue to worsen and further contribute to current and future crossing delays.</p>	<p>future River Loop Trail, and the Spokane River.</p> <p>The improvements support freight movement and regional mobility goals as articulated in various plans such as Horizon 2045, 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.</p> <p>The elimination of delays at the rail crossings will improve the mobility of freight trucks traveling 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</p>	<p>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 Rd. / Trent Ave. 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.</p>	<p>Motorists, shippers, local businesses and residents, local/state/federal governments</p>	<p>Improved Access to Economic Development Potential</p>	<p><b>Not Monetized</b></p>
		<p>Avoided greenhouse gas emissions (GHG) costs from vehicles idling at the grade crossing.</p>	<p>Local residents and residents across the country</p>	<p>Reduced Air Emissions - GHG</p>	<p><b>\$0.2 M</b></p>
		<p>Avoided criteria air contaminants (CAC) emissions costs from vehicles idling at the grade crossing.</p>	<p>Local residents and residents across the country</p>	<p>Reduced Air Emissions - CAC</p>	<p><b>\$0.1 M</b></p>
		<p>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.</p>	<p>Local residents and residents across the country</p>	<p>Promoting Electrification</p>	<p><b>Not Monetized</b></p>
		<p>Reduction in ongoing infrastructure maintenance cost.</p>	<p>Motorists, shippers, local businesses, and residents</p>	<p>Change in O&amp;M</p>	<p><b>\$0.1 M</b></p>
		<p>Residual value of capital assets.</p>	<p>Project sponsors</p>	<p>Residual Value of Capital Assets</p>	<p><b>\$1.3 M</b></p>
		<p>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.</p>	<p>Pedestrians, cyclists, local businesses, and residents.</p>	<p>Improved Connectivity</p>	<p><b>Not Monetized</b></p>
		<p>Grade separation will reduce noise pollution from train whistles.</p>	<p>Pedestrians, cyclists, local businesses, and residents.</p>	<p>Reduced Noise Pollution</p>	<p><b>Not Monetized</b></p>





Current Status (Base Scenario) & Problems to be Addressed	Changes to Baseline (Alternative Scenario)	Types of Impact	Population Affected by Impacts	Economic Benefits	Summary of Results (2020\$, Discounted)
		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	<b>Not Monetized</b>
		The City of Spokane Valley will evaluate innovative bridge construction techniques to reduce the impact on the community and the existing traffic. The preferred innovative delivery option is for the City to reimburse BNSF self-perform the bridge design and construction with its own unionized labor force. If this occurs, the project will realize great time and cost savings. This allows for a streamlined review and approval process and a BNSF-approved method of construction not available to general contractors otherwise using the design-bid-build process.	Motorists, shippers, local businesses, and residents	Innovative Bridge Construction	<b>Not Monetized</b>
		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. Other ITS technologies, such as work zone queue management and speed management systems, will be evaluated for use during construction.	Motorists, shippers, local businesses, and residents	Intelligent Transportation Systems	<b>Not Monetized</b>
		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 2045, and in the previous Bridging the Valley plan and other workshops, stakeholder outreach, and funding initiatives to further this effort.	Class I Railroads, local businesses, and project sponsors	Support from Public and Private Partners	<b>Not Monetized</b>



The period of analysis used in the estimation of benefits and costs is 29 years, including 9 years of construction and planning and 20 years of operation. The total future project costs include \$27.9 million dollars (2020\$) or \$31.3 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	2020\$	YOE
Construction	\$21,044,088	\$23,241,000
Right of Way	\$4,576,800	\$5,386,000
Construction Engineering	\$3,420,943	\$3,835,000
Preliminary Engineering	\$497,647	\$394,385
Final Engineering	\$1,874,513	\$2,322,000
<b>Total Project Costs</b>	<b>\$31,413,990</b>	<b>\$35,178,385</b>
<b>Total Future Project Costs</b>	<b>\$27,911,143</b>	<b>\$31,300,371</b>

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 \$35.8 million in discounted benefits and \$25.8 million in discounted costs, using a 3 percent real discount rate for CO<sub>2</sub>-related impacts and a 7 percent real discount rate for all other impacts. Therefore, the project is expected to generate a Net Present Value of \$10.0 million and a Benefit/Cost Ratio of 1.4.

**Table ES-3: Overall Results of the Benefit Cost Analysis, 2020 Dollars**

Evaluation Metrics	Undiscounted	Discounted
Total Benefits	\$101.3 M	\$35.8 M
Total Costs	\$31.9 M	\$25.8 M
Net Present Value (NPV)	\$69.4 M	\$10.0 M
Return on Investment (ROI)	217%	39%
Benefit-Cost Ratio (BCR)	3.2	1.4
Payback Period (years)	7.1	11.5
Internal Rate of Return (IRR)	10.1%	

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**

Impact Categories	NPV Over 20 Years of Operations	
	Undiscounted	Discounted
<b>Benefits</b>		
Improved Safety from Grade Separation	\$49.8 M	\$18.7 M
Reduced Vehicle Idling Time	\$29.1 M	\$10.1 M
Reduced Air Emissions - GHG	\$0.3 M	\$0.2 M
Reduced Air Emissions - CAC	\$0.2 M	\$0.1 M
Reduced Vehicle Operating Costs	\$1.6 M	\$0.5 M
Change in O&M	\$0.2 M	\$0.1 M
Residual Value	\$4.4 M	\$0.8 M
<b>PV Benefits</b>	<b>\$85.6 M</b>	<b>\$30.6 M</b>
<b>Costs</b>		
Capital Cost	\$20.3 M	\$16.3 M
<b>PV Costs</b>	<b>\$20.3 M</b>	<b>\$16.3 M</b>
<b>NPV</b>	<b>\$65.2 M</b>	<b>\$14.3 M</b>
<b>BCR</b>	<b>4.2</b>	<b>1.9</b>



The grade separation results in undiscounted benefits of \$85.6 million and a benefit cost ratio of 4.2. The component results in a discounted net present value of \$14.3 million and a benefit cost ratio of 1.9.

Lastly, as an individual component, the roundabout has a discounted benefit cost ratio of 0.5. This result is conservative since improved traffic fluidity and reduced queuing from vehicles that must wait 2-3 full signal cycles before turning are not estimated in the absence of detailed traffic modelling.

Given that safety benefits account for \$4.7 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**

Impact Categories	NPV Over 20 Years of Operations	
	Undiscounted	Discounted
<b>Benefits</b>		
Improved Safety from Intersection Improvements	\$13.1 M	\$4.7 M
Residual Value	\$2.6 M	\$0.5 M
<b>PV Benefits</b>	<b>\$15.7 M</b>	<b>\$5.2 M</b>
<b>Costs</b>		
Capital Cost	\$11.6 M	\$9.5 M
<b>PV Costs</b>	<b>\$11.6 M</b>	<b>\$9.5 M</b>
<b>NPV</b>	<b>\$4.1 M</b>	<b>(\$4.3 M)</b>
<b>BCR</b>	<b>1.4</b>	<b>0.5</b>

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 (2020\$)	Total Costs (2020\$)	Undiscounted Net Benefits (202\$)	Discounted Total Benefits (2020\$)	Discounted Total Costs (2020\$)	Discounted Net Benefits (2020\$)
2017	1	Workers otherwise unemployed (shadow wage benefit); not quantified	\$ -	-\$918,381	-\$918,381	\$ -	-\$918,381	-\$918,381
2018	2		\$ -	-\$437,001	-\$437,001	\$ -	-\$437,001	-\$437,001
2019	3		\$ -	-\$437,001	-\$437,001	\$ -	-\$437,001	-\$437,001
2020	4		\$ -	-\$1,397,875	-\$1,397,875	\$ -	-\$1,397,875	-\$1,397,875
2021	5		\$ -	-\$312,589	-\$312,589	\$ -	-\$292,139	-\$292,139
2022	6		\$ -	-\$3,830,001	-\$3,830,001	\$ -	-\$3,345,271	-\$3,345,271
2023	7		\$ -	-\$10,533,130	-\$10,533,130	\$ -	-\$8,598,172	-\$8,598,172
2024	8		\$ -	-\$7,014,696	-\$7,014,696	\$ -	-\$5,351,478	-\$5,351,478
2025	9		\$ -	-\$7,014,696	-\$7,014,696	\$ -	-\$5,001,381	-\$5,001,381
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.	\$4,083,621	\$ -	\$4,083,621	\$2,722,874	\$ -	\$2,722,874
2027	11		\$4,137,885	\$ -	\$4,137,885	\$2,578,916	\$ -	\$2,578,916
2028	12		\$4,194,003	\$ -	\$4,194,003	\$2,443,291	\$ -	\$2,443,291
2029	13		\$4,251,465	\$ -	\$4,251,465	\$2,315,106	\$ -	\$2,315,106
2030	14		\$4,311,216	\$ -	\$4,311,216	\$2,194,430	\$ -	\$2,194,430
2031	15		\$4,374,255	\$ -	\$4,374,255	\$2,081,273	\$ -	\$2,081,273
2032	16		\$4,438,027	\$ -	\$4,438,027	\$1,973,900	\$ -	\$1,973,900
2033	17		\$4,503,747	\$ -	\$4,503,747	\$1,872,521	\$ -	\$1,872,521
2034	18		\$4,571,433	\$ -	\$4,571,433	\$1,776,767	\$ -	\$1,776,767
2035	19		\$4,641,103	\$ -	\$4,641,103	\$1,686,293	\$ -	\$1,686,293
2036	20		\$4,713,436	\$ -	\$4,713,436	\$1,601,065	\$ -	\$1,601,065
2037	21		\$4,787,804	\$ -	\$4,787,804	\$1,520,410	\$ -	\$1,520,410
2038	22		\$4,864,731	\$ -	\$4,864,731	\$1,444,261	\$ -	\$1,444,261
2039	23		\$4,943,473	\$ -	\$4,943,473	\$1,372,119	\$ -	\$1,372,119
2040	24		\$5,025,266	\$ -	\$5,025,266	\$1,304,073	\$ -	\$1,304,073
2041	25		\$5,109,797	\$ -	\$5,109,797	\$1,239,811	\$ -	\$1,239,811
2042	26	\$5,196,637	\$ -	\$5,196,637	\$1,178,958	\$ -	\$1,178,958	
2043	27	\$5,287,389	\$ -	\$5,287,389	\$1,121,730	\$ -	\$1,121,730	
2044	28	\$5,380,823	\$ -	\$5,380,823	\$1,067,466	\$ -	\$1,067,466	
2045	29	\$12,442,208	\$ -	\$12,442,208	\$2,299,406	\$ -	\$2,299,406	
<b>Total</b>			<b>\$101,258,321</b>	<b>-\$31,895,371</b>	<b>\$69,362,950</b>	<b>\$35,794,669</b>	<b>-\$25,778,700</b>	<b>\$10,015,969</b>

\*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	Improved Safety from Grade Separation	Reduced Vehicle Idling Time	Reduced Air Emissions	Reduced Vehicle Operating Costs	Improved Safety from Intersection Improvements	Change in O&M	Residual Value
2017	1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2018	2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2019	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2020	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2021	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2022	6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2023	7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2024	8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2025	9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2026	10	\$2,449,650	\$1,011,632	\$19,717	\$48,216	\$543,405	\$11,000	\$ -
2027	11	\$2,454,010	\$1,048,617	\$19,905	\$50,499	\$553,854	\$11,000	\$ -
2028	12	\$2,458,381	\$1,086,955	\$20,240	\$52,922	\$564,504	\$11,000	\$ -
2029	13	\$2,462,764	\$1,126,696	\$20,342	\$55,305	\$575,359	\$11,000	\$ -
2030	14	\$2,467,158	\$1,167,890	\$20,426	\$58,320	\$586,422	\$11,000	\$ -
2031	15	\$2,471,562	\$1,210,592	\$21,134	\$62,268	\$597,698	\$11,000	\$ -
2032	16	\$2,475,978	\$1,254,857	\$21,863	\$65,138	\$609,191	\$11,000	\$ -
2033	17	\$2,480,405	\$1,300,741	\$22,613	\$68,083	\$620,905	\$11,000	\$ -
2034	18	\$2,484,844	\$1,348,303	\$23,385	\$71,057	\$632,844	\$11,000	\$ -
2035	19	\$2,489,293	\$1,397,606	\$24,180	\$74,013	\$645,012	\$11,000	\$ -
2036	20	\$2,493,753	\$1,448,714	\$25,224	\$77,331	\$657,415	\$11,000	\$ -
2037	21	\$2,498,224	\$1,501,691	\$26,070	\$80,764	\$670,056	\$11,000	\$ -
2038	22	\$2,502,705	\$1,556,606	\$26,940	\$84,539	\$682,940	\$11,000	\$ -
2039	23	\$2,507,198	\$1,613,532	\$27,834	\$87,838	\$696,072	\$11,000	\$ -
2040	24	\$2,511,702	\$1,672,540	\$28,752	\$91,816	\$709,457	\$11,000	\$ -
2041	25	\$2,516,216	\$1,733,707	\$29,998	\$95,778	\$723,098	\$11,000	\$ -
2042	26	\$2,520,741	\$1,797,113	\$31,296	\$99,485	\$737,002	\$11,000	\$ -
2043	27	\$2,525,276	\$1,862,839	\$32,927	\$104,173	\$751,174	\$11,000	\$ -
2044	28	\$2,529,823	\$1,930,970	\$34,344	\$109,068	\$765,618	\$11,000	\$ -
2045	29	\$2,534,380	\$2,001,595	\$35,819	\$113,498	\$780,339	\$11,000	\$6,965,577
<b>Total</b>		<b>\$49,834,062</b>	<b>\$29,073,196</b>	<b>\$513,009</b>	<b>\$1,550,112</b>	<b>\$13,102,365</b>	<b>\$220,000</b>	<b>\$6,965,577</b>



**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 Fatal Collisions	Avoided Injury Collisions	Avoided PDO Accidents
2017	1	-	-	-	-	-	-	-
2018	2	-	-	-	-	-	-	-
2019	3	-	-	-	-	-	-	-
2020	4	-	-	-	-	-	-	-
2021	5	-	-	-	-	-	-	-
2022	6	-	-	-	-	-	-	-
2023	7	-	-	-	-	-	-	-
2024	8	-	-	-	-	-	-	-
2025	9	-	-	-	-	-	-	-
2026	10	52,783	12,569	4,569	1,161	0.20	1.28	5.03
2027	11	54,713	13,029	4,736	1,203	0.20	1.29	5.11
2028	12	56,713	13,505	4,909	1,247	0.21	1.31	5.18
2029	13	58,787	13,999	5,089	1,293	0.21	1.32	5.25
2030	14	60,936	14,511	5,275	1,340	0.21	1.34	5.33
2031	15	63,164	15,041	5,468	1,389	0.21	1.35	5.41
2032	16	65,474	15,591	5,668	1,440	0.21	1.37	5.49
2033	17	67,868	16,161	5,875	1,492	0.21	1.38	5.57
2034	18	70,349	16,752	6,090	1,547	0.21	1.40	5.65
2035	19	72,922	17,365	6,312	1,604	0.21	1.42	5.73
2036	20	75,589	18,000	6,543	1,662	0.21	1.43	5.82
2037	21	78,353	18,658	6,783	1,723	0.21	1.45	5.90
2038	22	81,218	19,341	7,031	1,786	0.21	1.47	5.99
2039	23	84,188	20,048	7,288	1,851	0.22	1.49	6.08
2040	24	87,267	20,781	7,554	1,919	0.22	1.50	6.17
2041	25	90,458	21,541	7,830	1,989	0.22	1.52	6.27
2042	26	93,767	22,329	8,117	2,062	0.22	1.54	6.36
2043	27	97,196	23,145	8,414	2,137	0.22	1.56	6.46
2044	28	100,751	23,992	8,721	2,216	0.22	1.58	6.56
2045	29	104,436	24,869	9,040	2,297	0.22	1.60	6.66
<b>Total</b>		<b>1,516,932</b>	<b>361,229</b>	<b>131,312</b>	<b>33,357</b>	<b>4.25</b>	<b>28.60</b>	<b>116.0</b>

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 67 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 as well as the project's location at a key rail bottleneck. 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, 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.

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

The project supports 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 that 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.

The City is expected to accommodate an additional 20,000 residents<sup>4</sup> and the Pines/Trent/I-90 area will remain a centralized corridor for growth. This project contributes significantly to supporting and managing this economic growth by building transportation infrastructure necessary to attract, retain, and expand businesses.

### ***Quality of Life***

- ***Improved Mobility and Community Connectivity***

The project will increase mobility and expand community connectivity with its non-motorized facilities that allow people to move freely through the project limits while maximizing opportunity for the community can live, work, and play without barriers. The project is located in a Historically Disadvantaged Community and will directly improve Census Tract 117.02 which has many of Spokane Valley's highest rates for vulnerable populations. 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.

All of the project improvements reduce barriers to disadvantaged populations and improve access and mobility for these users by increasing transportation options including supporting the existing paratransit services for the 124 customers living near the project, improving access to facilities including a shared use path through the project limits, new access to the Centennial Trail via a

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<sup>4</sup> City of Spokane Valley. "Existing Conditions, Housing and Economic Trends." September 2015.

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 Avista Utilities has donated property to the project to accommodate the new trailhead to the Centennial Trail and Spokane River. 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, medical) 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. The required pattern is two long, one short and one long horn, repeated as necessary until the train clears the crossing. With today's conservative average of 67 trains crossing Pines Rd., horns are a source of significant public concern in Spokane Valley. 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. Spokane Valley's Resolution #16-010 is the City's Greenhouse Gas Emissions Reduction Policy and serves as a baseline for preliminary project considerations

### ***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 and bicycle 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 an ADA-accessible shared-use path throughout the project, which currently lacks any pedestrian or bicycle facilities at the rail crossing. The new, separated shared-use path through the project limits provides non-motorized users a safe route pass under the BNSF 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.

### 3 Methodological Framework

The BCA conducted for this Project includes monetized benefits and costs measured using U.S. Department of Transportation (U.S. DOT) guidance, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, as well as the quantitative and qualitative merits of the Project. A BCA provides estimates of the benefits that are expected to accrue over a specified period and compares them to the anticipated costs. Costs include both the resources required to develop the Project and the costs of maintaining the new or improved asset over time. Estimated benefits are based on the projected impacts of the Project on both users and non-users of the facility, valued in monetary terms.<sup>5</sup>

While a BCA is just one of many tools that can be used in making decisions about infrastructure investments, U.S. DOT believes that it provides a useful benchmark from which to evaluate and compare potential transportation investments.<sup>6</sup>

The specific methodology employed for this application was developed using the BCA guidance developed by U.S. DOT and is consistent with the RAISE program guidelines. In particular, the methodology involves:

- Establishing existing and future conditions under the Base Case (No-Build) and Alternative Case (Build) scenarios;
- Assessing benefits with respect to each of the 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 U.S. DOT guidance for the valuation of 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 the U.S. DOT (7 percent); and
- Conducting a sensitivity analysis to assess the impacts of changes in key assumptions.

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<sup>5</sup> U.S. DOT, *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*, March 2022

<sup>6</sup> Ibid.

## 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. Overall, the project will increase mobility and expand community connectivity with its non-motorized facilities that allow people to move freely through the project limits while maximizing opportunity for the community can live, work, and play without barriers.

The project is located in a Historically Disadvantaged Community and will directly improve 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 2045, 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.<sup>7</sup>

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
- **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"

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<sup>7</sup> Freight Mobility Strategic Investment Board's *Study of Road-Rail Conflicts – Phase 2 – Development of Project Priorities*, August, 2018

- **Promoting** expanded transit routes as well as supporting existing paratransit services for the 124 customers living near the project
- **Unlocking** the economic development potential of prime industrial, commercial, and mixed-use land near the Project location. The City is expected to accommodate an additional 20,000 residents and the Pines/Trent/I-90 area will remain a centralized corridor for growth. This project contributes significantly to supporting and managing this economic growth by building transportation infrastructure necessary to attract, retain, and expand businesses.
- **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:

- An estimated Average Annual Daily Traffic (AADT) on Trent Avenue (East of Pines Road) of **27,293** (2022), 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.<sup>8</sup> 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<sup>9</sup> based upon City of Spokane Valley traffic counts.
- An estimated AADT at the Pines Road crossing of **16,758** (2022), growing at a rate of **1.5% per year** derived using the historical 10-year annual average growth rate.<sup>10</sup> 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:
  - **84.9%** passenger vehicles and **15.1%** trucks
- **65** daily freight trains (2022) growing at a rate of **2.2% per year** based on the growth rates from the Moderate Growth scenario in the 2019 WSDOT State Rail System Plan. While the High Growth

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<sup>8</sup> Analysis leverages 2019 traffic volumes to better reflect the resurgence of vehicle traffic from the COVID-19 pandemic. Specifically, it is assumed that 2019 traffic volumes would be a better represent the basis of future demand than applying artificially deflated traffic volumes driven by the pandemic. Moreover, traffic growth is calculated based on AADT data prior to 2020 to also avoid the bias generated by the temporary downward spike in roadway traffic driven by the COVID-19 pandemic.

<sup>9</sup> Traffic growth is calculated based on AADT data prior to 2020 to also avoid the bias generated by the temporary downward spike in roadway traffic driven by the pandemic.

<sup>10</sup> See footnote 8.



scenario better reflects current volumes, the Moderate Growth scenario was selected as a conservative assumption.

- Average freight train of **6,500 feet**, traveling at a speed of **25 miles per hour**
- **2** daily passenger trains (2021) assumed constant throughout the analysis period based on the 2019 WSDOT State Rail System Plan
- Average passenger train of **1,000 feet**, traveling at a speed of **35 miles per hour**
- 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 41 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 65 freight trains per day won't be reached until 2036 while the high growth scenario forecasts 65 freight trains are reached in 2028. Despite the fact that the high growth scenario better reflects the situation, the moderate growth scenario was selected as a conservative assumption and to align with the feedback from comments the City has received from U.S. DOT on previous application submittals to ensure analysis accuracy and conservativeness. 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:

- An estimated AADT on Trent Avenue (East of Pines Road) of **27,293** (2022), 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<sup>11</sup>. Forecasted peak volume AADT is in line with historical trends. The

<sup>11</sup> See footnote 8.



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.<sup>12</sup>
- An estimated AADT at the Pines Road crossing of **16,758** (2022), growing at a rate of **1.5% per year** derived using the historical 10-year annual average growth rate.<sup>13</sup> 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:
  - **84.9%** passenger vehicles and **15.1%** trucks
- **65** daily freight trains (2022) growing at a rate of **2.2% per year** based on the growth rates from the Moderate Growth scenario in the 2019 WSDOT State Rail System Plan. While the High Growth scenario better reflects current volumes, the Moderate Growth scenario was selected as a conservative assumption.
- Average freight train of **6,500 feet**, traveling at a speed of **25 miles per hour**
- **2** daily passenger trains (2021) assumed constant throughout the analysis period based on the 2019 WSDOT State Rail System Plan
- Average passenger train of **1,000 feet**, traveling at a speed of **35 miles per hour**
- 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 moderate growth scenario was selected for this analysis; however, a sensitivity analysis was performed in Section 9 which provides an assessment of changing this assumption impacts the overall results.

## 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	2020\$	YOE
Construction	\$21,044,088	\$23,241,000
Right of Way	\$4,576,800	\$5,386,000
Construction Engineering	\$3,420,943	\$3,835,000
Preliminary Engineering	\$497,647	\$394,385
Final Engineering	\$1,874,513	\$2,322,000
<b>Total Project Costs</b>	<b>\$31,413,990</b>	<b>\$35,178,385</b>
<b>Total Future Project Costs</b>	<b>\$27,911,143</b>	<b>\$31,300,371</b>

**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

<sup>12</sup> See footnote 9.

<sup>13</sup> See footnote 8.



Phase	Begin	End
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. Since the project is located in a Historically Disadvantaged Community, the Secretary may also choose to fund beyond the 80% Federal cost share, which would allow the \$3,149,232 of non-federal “Available” City funds to be funded via the RAISE program.

**Table 12: Summary of Anticipated Funding Sources**

Future Eligible Project Costs	Source	Amount (\$)	Percent of Total Cost
<b>Federal Funding</b>			
Requested	RAISE Program	\$21,689,221	69.3%
Committed	STBG Program (Available Remaining STBG Funds)	\$2,940,000	9.4%
<b>Total Federal Sources</b>		<b>\$24,629,221</b>	<b>78.7%</b>
<b>Non-Federal Funding</b>			
Committed	City of Spokane Valley	\$2,431,917	7.8%
Expected or In-Progress	City of Spokane Valley	\$3,149,232	10.1%
	BNSF*	\$300,000	1.0%
	Avista Utilities (Land Donation)	\$790,000	2.5%
<b>Total Non-Federal Sources</b>		<b>\$6,671,149</b>	<b>21.3%</b>
<b>Total Future Eligible Project Cost</b>		<b>\$31,300,371</b>	

**Table 13: Allocation of Project Funding**

Project Phase	Previously Incurred Costs	Future Eligible Costs			Subtotal	Total Project Costs
		RAISE	Other Federal	Non-Federal		
Engineering*	\$2.4 M	\$0.3 M	\$ -	\$0.1 M	\$0.3 M	\$2.7 M
<b>(% by Phase)</b>		<b>80.0%</b>	<b>0.0%</b>	<b>20.0%</b>	<b>100.0%</b>	
Right-of-Way Acquisition	\$1.5 M	\$ -	\$2.7 M	\$1.2 M	\$3.9 M	\$5.4 M
<b>(% by Phase)</b>		<b>0.0%</b>	<b>69.0%</b>	<b>31.0%</b>	<b>100.0%</b>	
Construction	\$ -	\$21.4 M	\$0.2 M	\$5.4 M	\$27.1 M	\$27.1 M
<b>(% by Phase)</b>		<b>79.2%</b>	<b>0.9%</b>	<b>19.9%</b>	<b>100.0%</b>	
<b>TOTAL</b>	<b>\$3.9 M</b>	<b>\$21.7 M</b>	<b>\$2.9 M</b>	<b>\$6.7 M</b>	<b>\$31.3 M</b>	<b>\$35.2 M</b>
<b>(% by Funding Type)</b>		<b>69.3%</b>	<b>9.4%</b>	<b>21.3%</b>	<b>100.0%</b>	

### 4.3 Effects on Selection

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

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

Merit Criteria	Benefit Category	Description	Monetized	Qualitative
<b>Safety</b>	Improved Safety from Grade Separation	Improved safety and avoided accident costs from grade separating the Pines Road grade crossing.	Yes	-





Merit Criteria	Benefit Category	Description	Monetized	Qualitative
	Improved Safety from Intersection Improvements	Improved safety from intersection improvements.	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
<b>Economic Competitiveness</b>	Reduced Vehicle Idling Time	Reduced vehicle delay at the grade crossing due to grade separation.	Yes	-
	Reduced Vehicle Operating Costs	Reduced vehicle operating costs as a result of a reduction in vehicle idling at the grade 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 both short and long-haul trucks to experience improved delivery timeliness.	-	Yes
	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
<b>Environmental Sustainability</b>	Reduced Air Emissions - GHG	Avoided greenhouse gas emissions (GHG) costs from vehicles idling at the grade crossing.	Yes	-
	Reduced Air Emissions - CAC	Avoided criteria air contaminants (CAC) emissions costs from vehicles idling at the grade 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
<b>State of Good Repair</b>	Change in O&M	Reduction in ongoing infrastructure maintenance cost.	Yes	-



Merit Criteria	Benefit Category	Description	Monetized	Qualitative
	Residual Value of Capital Assets	Residual value of capital assets.	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.	-	Yes
	Reduced Noise Pollution	Grade separation will reduce noise pollution from train whistles.	-	Yes
	Improved Emergency Vehicle Access	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.	-	Yes
Partnership	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. The preferred innovative delivery option is for the City to reimburse BNSF self-perform the bridge design and construction with its own unionized labor force. If this occurs, the project will realize great time and cost savings. This allows for a streamlined review and approval process and a BNSF-approved method of construction not available to general contractors otherwise using the design-bid-build process.	-	Yes

## 5 General Assumptions

The BCA measures benefits against costs throughout a period of analysis, beginning at the start of construction and including 20 full years of operations<sup>14</sup>.

The monetized benefits and costs are estimated in 2020 dollars, with future dollars discounted in compliance with U.S. DOT RAISE requirements.

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

- Input prices are expressed in 2020 dollars;
- The period of analysis begins in 2017 and ends in 2045; it includes project development and construction years (2017–2025) and 20 full years of operations (2026–2045); and
- A constant 3 percent real discount rate for carbon dioxide (CO<sub>2</sub>)-related benefits and 7 percent real discount rate for all other benefits are assumed throughout the period of analysis.

Additionally, the assumptions considered within the analysis incorporates the U.S. DOT feedback on previous application submittals. This was conducted to ensure the analysis accuracy and conservativeness. Specifically, the assumptions used within the analysis based on the U.S. DOT feedback includes a 20-year operational period, moderate freight train growth assumptions, as well as the omission of bus passengers<sup>15</sup>.

<sup>14</sup> The use of 20 years of benefits was applied for this BCA analysis to align with the feedback the City has received from U.S. DOT regarding previous application submittals to ensure analysis accuracy and conservativeness.

<sup>15</sup> There is currently paratransit that serves 124 customers who live within three quarter of a mile from the Pines Road and Trent Avenue intersection. However, these volumes were not included in absence of long-term historical data to remain conservative.



Additionally, as mentioned previously, a sensitivity analysis was conducted on the freight train growth assumption to assess how the results would vary under varying growth rates.

## 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. In particular, the historical growth rates were calculated based on vehicle traffic from 2010 and 2019<sup>16</sup>. This was done to avoid incorporating the temporary impact that COVID-19 pandemic had on travel onto the long-term projections. Specifically, by including the impacts from COVID-19, it would result in a severely underestimated traffic volume from what is likely to be the traffic demand in the region.

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
<b><i>Pines Road Crossing</i></b>			
AADT (2022)	vehicles/day	16,758	Assumes that in 2022 traffic would reflect pre-COVID level traffic (2019). Traffic data provided by the City of Spokane Valley.
Share of Passenger Vehicles	%	84.9%	City of Spokane Valley. <i>Large Vehicles: Percentage of ADT</i> . December 02, 2021.
Share of Trucks	%	15.1%	
Share of Buses	%	0.0%	
AADT Growth Rate	%	1.5%	Based on historical 10-year average annual growth rate at crossing from 2010 to 2019. Data years selected to exclude the bias generated during the COVID-19 pandemic.
Freight Trains at Crossing (2022)	trains/day	65.0	BNSF
Maximum Trains at Crossing	trains/day	125.0	City of Spokane Valley
Freight Train Growth	%	2.2%	Calculated based moderate growth scenario in the 2019 State Rail Plan for Washington State. <sup>17</sup>

<sup>16</sup> Growth rates for traffic on Trent Ave, west of Pines Rd were estimated based on historical traffic from 2009 – 2018 as 2018 was the most recent data point for that traffic segment.

<sup>17</sup> Washington Department of Transportation (WSDOT) Washington State Rail Plan, August 2020: <https://wsdot.wa.gov/sites/default/files/2021-10/2019-2040-State-Rail-Plan.pdf>, Exhibit 5-5 illustrating 72 BNSF trains and 2 Amtrak trains passing through Spokane-Sandpoint corridor. “Medium” growth projection was selected for conservativeness and to reflect comments made by US DOT on previous application submittals.



Variable Name	Unit	Value	Source
Passenger Trains at Crossing (2022)	trains/day	2.0	Washington State Department of Transportation. 2019 State Rail System Plan.
Passenger Train Traffic Growth	%	0.0%	
Average Freight Train Speed	mph	25.0	City of Spokane Valley
Average Freight Train Length	feet	6,500	
Average Passenger Train Speed	mph	35.0	HDR Assumption
Average Passenger Train Length	feet	1,000	
Lead and Lag Time	minutes	0.6	HDR assumption based on industry standards.
<b>Trent Avenue Intersection</b>			
AADT, East of Pines Road (2022)	vehicles/day	27,293	Assumes that in 2022 traffic would reflect pre-COVID level traffic (2019). Traffic data provided by the City of Spokane Valley.
AADT, West of Pines Road (2018)	vehicles/day	22,693	City of Spokane Valley AADT data
AADT Growth Rate East of Pines Road	%	1.9%	Last year of 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	%	0.7%	

### 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	2030	2035	2045
Total Annual Traffic at Pines Road Crossing	6,481,098	6,867,239	7,382,425	8,531,648
Total Annual Traffic at Trent Ave. Intersection	11,002,899	12,152,456	13,759,740	17,640,161
Annual Freight Trains at Pines Road Crossing	25,853	28,173	31,366	38,881
Annual Passenger Trains at Pines Road Crossing	730	730	730	730
Total Vehicle Hours of Delay - Passenger Vehicles	28,567	32,979	39,466	56,522
Total Vehicle Hours of Delay - Trucks	5,077	5,861	7,014	10,045

## 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

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 the economic context, highway safety is often the subject of public concern.

The Project would help promote U.S. DOT’s long-term safety outcome through reducing potential accidents by avoiding the need to transport both freight and passengers using roadway transportation modes.



The program is expected to generate substantial benefits in line with the “Safety” merit criteria, with the specific benefits described below. The safety benefits are monetized using the assumptions presented in Table 17.

**Table 17: Assumptions used to Monetize Safety Benefits**

Variable Name	Unit	Value	Source
Value of a Statistical Life	2020\$/fatality	\$11,600,000	US DOT, BCA Guidance March 2022; Treatment of the Economic Value of Preventing Fatalities and Injuries in Preparing Economic Analyses (2021) <a href="https://www.transportation.gov/officepolicy/transportation-policy/reviseddepartmental-guidance-on-valuation-of-a-statistical-life-in-economic-analysis">https://www.transportation.gov/officepolicy/transportation-policy/reviseddepartmental-guidance-on-valuation-of-a-statistical-life-in-economic-analysis</a>
Cost per Crash Injury (Unknown Severity)	2020\$/injury	\$210,300	
Cost of Fatal Crash	2020\$/fatal crash	\$12,837,400	
Cost of Injury Crash	2020\$/injury crash	\$302,600	
PDO Crash Cost	2020\$/vehicle	\$4,600	US DOT, BCA Guidance March 2022; The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (revised May 2015), Page 12, Table 1-2, Summary of Unit Costs, 2000” Inflated to 2020 dollars using the GDP deflator.

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 Improved Safety from Grade Separation

#### Methodology

The Project is expected promote safety impacts through eliminating conflict between roadway users and trains by separating the uses, as well as eliminating incidents caused by the potential queuing of vehicles stopped for train crossings. Under the Base Case, collisions at the Pines Road crossing were derived using the FRA’s collision prediction formulae. These projected accidents were estimated based on the traffic forecasts for both rail and vehicle, as well as the grade crossing characteristics, and then adjusted based on historical accidents around the grade crossing based. Under the Alternative Case, as the roadway and railway will be separated, it is assumed that these accidents could be avoided.

#### Assumptions

Assumptions used in the estimation of improved safety from grade separation are presented in the table below.

**Table 18: Assumptions used in the Estimation of Improved Safety from Grade Separation**

Variable Name	Unit	Value	Source
Historical Accidents (2015 - 2020)	collisions	9	Based on historical accidents in the project area. Data provided by the City of Spokane Valley.



## 7.1.2 Improved Safety from Intersection Improvements

### Methodology

The Project is expected to reduce the number of accidents at the intersection of Pine Rd. and Trent Ave. by converting the existing signalized intersection into a roundabout. The impact was estimated based on the frequency and severity of accidents for the type of road and area. Specifically, 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.

### Assumptions

Assumptions used in the estimation of improved safety from intersection improvements are presented in the table below.

**Table 19: Assumptions used in the Estimation of Intersection Improvements**

Variable Name	Unit	Value	Source
Crash Modification Factor (CMF) for Intersection Improvements	factor	0.79	Obtained from the US DOT Crash Modification Factor Clearinghouse. "Convert signalized intersection to modern roundabout"
Intersection Accident Growth (2022 - 2045)	%	1.9%	Based on the total traffic growth on Trent Ave. AADT data provided by City of Spokane Valley.
<b>Historical Accident Rates</b>			
Fatal Collisions	fatal collisions/year	0.10	Data based on historical accidents in the project area and in the City of Spokane Valley. Data from the City of Spokane Valley.
Collisions with No Apparent Injuries	PDO/year	15.66	
Collisions with Possible Injury	injury collisions/year	2.79	
Collisions with Suspected Minor Injuries	injury collisions/year	0.63	
Collisions with Suspected Major Injuries	injury collisions/year	0.05	
<b>Historical Accident Rates</b>			
Number of Fatalities per Fatal Collision	fatalities/fatal collision	1.03	Data based on Spokane Valley roadway accidents. Data provided by City of Spokane Valley.
Number of Injuries per Fatal Collision	injuries/fatal collision	0.46	
Number of Injuries per Possible Injury Collision	injuries/possible injury collision	1.28	
Number of Injuries per Suspected Minor Injury Collision	injuries/suspected minor injury collision	1.33	
Number of Injuries per Suspected Serious Injury Collision	injuries/suspected serious injury collision	1.49	
Number of Vehicles per Crash	vehicles/crash	1.89	



### 7.1.3 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 and bicycle 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 an ADA-accessible shared-use path throughout the project, which currently lacks any pedestrian or bicycle facilities at the rail crossing. The new, separated shared-use path through the project limits provides non-motorized users a safe route pass under the BNSF rail crossing.

### 7.1.4 Benefit Estimates

The table below highlights the benefits generated by the Project. The estimated present value of discounted benefits over a 20-year period is \$23.5 million.

**Table 20: Estimates of Safety Benefits**

Values in 2020\$	Over the Study Period	
	Undiscounted	Discounted
Improved Safety from Grade Separation	\$49,834,062	\$18,747,315
Improved Safety from Intersection Improvements	\$13,102,365	\$4,744,769
<b>Total</b>	<b>\$62,936,427</b>	<b>\$23,492,084</b>

## 7.2 Economic Competitiveness

This project is expected to improve the economic competitiveness of the region through eliminating the vehicle idling time at the grade crossings, and thereby reducing vehicle operating costs, improving travel time reliability, and improve access to future developments. 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 2045 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. The City is expected to accommodate an additional 20,000 residents and the Pines/Trent/I-90 area will remain a centralized corridor for growth.

### 7.2.1 Reduced Vehicle Idling Time

#### Methodology

Travel time savings will be generated for motorists (automobiles and trucks) 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.



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 estimate for travel time savings is simply the product of hours of delay, vehicle occupancy, and respective value of time.

### Assumptions

The assumptions used in the estimation of reduced vehicle idling time benefits are summarized in the table below.

**Table 21: Assumptions used in the Estimation of Reduced Vehicle Idling Time**

Variable Name	Unit	Value	Source
Auto Occupancy	persons/vehicle	1.67	US DOT, BCA Guidance March 2022; 2017 National Household Travel Survey.
Truck Occupancy	persons/vehicle	1.00	Assumption for commercial trucks.
Avg. Bus Drivers per Bus	persons/vehicle	1.00	Assumption for bus operators.
Avg. Bus Passenger Occupancy	persons/vehicle	1.00	City of Spokane Valley
Value of Time for Automobile Driver and Passenger	2020\$/hour	\$17.80	US DOT, BCA Guidance March 2022; Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis (2016).
Value of Time for Bus Passenger	2020\$/hour	\$17.80	
Value of Time for Truck Driver	2020\$/hour	\$32.00	
Value of Time for Bus Driver	2020\$/hour	\$33.60	

## 7.2.2 Reduced Vehicle Operating Costs

### Methodology

In addition to travel time impacts, out-of-pocket cost savings were monetized based on the change in delay time and associated fuel and oil used while idling.

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.





## Assumptions

The assumptions used in the estimation of reduced vehicle operating costs are summarized in the tables below.

**Table 22: Assumptions used in the Estimation of Vehicle Operating Cost Savings**

Variable Name	Unit	Value	Source
Gasoline Burned at Idle - Autos	gallons/hour	0.44	US DOE: Alternative Fuels Data Center and Argonne National Laboratory, "Idle Reduction Savings Worksheet" (2018) - Average of gasoline passenger vehicles.
Diesel Fuel Burned at Idle - Trucks	gallons/hour	0.90	US DOE: Alternative Fuels Data Center and Argonne National Laboratory, "Idle Reduction Savings Worksheet" (2018) - Combination Trucks.
Motor Oil Consumption at Idle - Autos	quarts/hour	0.03	Based on US DOT: HERS-ST Highway Economic Requirements System (2002) oil consumption of 1.38qt/1000 miles and assuming that "One hour of idle time is equal to approximately 25 miles of driving" (Ford Motor Company, 2011)
Motor Oil Consumption at Idle - Trucks	quarts/hour	0.03	
Motor Oil Consumption at Idle - Buses	quarts/hour	0.03	
Cost of Motor Oil - Autos	\$/quart	\$10.70	Average Oil Price Sourced from HERS Model and Inflated to 2020\$ by Motor Oil CPI (BLS CUUR0000SS47021)
Cost of Motor Oil - Trucks	\$/quart	\$4.28	
Cost of Motor Oil - Buses	\$/quart	\$4.28	

**Table 23: Assumptions used in the Estimation of Vehicle Operating Cost Savings – Fuel Costs**

	Unit	Year	Gasoline	Diesel	Source
Fuel Costs	\$/gallon	2021	\$2.46	\$2.58	Based on forecast of transportation fuel costs less Federal and States taxes. Data obtained from US EPA's Annual Energy Outlook 2022 Release. Values deflated to 2020\$ from 2021\$.
		2022	\$2.34	\$2.46	
		2023	\$2.04	\$2.36	
		2024	\$2.03	\$2.47	
		2025	\$2.01	\$2.47	
		2026	\$2.04	\$2.47	
		2027	\$2.07	\$2.48	
		2028	\$2.11	\$2.51	
		2029	\$2.13	\$2.54	
		2030	\$2.20	\$2.53	
		2031	\$2.29	\$2.62	
		2032	\$2.32	\$2.64	
		2033	\$2.35	\$2.66	
		2034	\$2.37	\$2.67	
		2035	\$2.39	\$2.68	
		2036	\$2.41	\$2.71	
		2037	\$2.43	\$2.74	
		2038	\$2.47	\$2.76	
		2039	\$2.47	\$2.78	
		2040	\$2.50	\$2.81	
2041	\$2.52	\$2.83			
2042	\$2.53	\$2.83			
2043	\$2.56	\$2.87			
2044	\$2.59	\$2.91			
2045	\$2.60	\$2.93			



### 7.2.3 Improved Travel Time Reliability

On average, motorists are delayed 67 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.

### 7.2.4 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.

### 7.2.5 Benefit Estimates

The table below highlights the economic competitiveness benefits as a result of eliminating vehicle idling as a result of train traffic at the grade crossing. The estimated present value of discounted benefits over a 20-year period is \$10.7 million.

**Table 24: Estimates of Economic Competitiveness Benefits**

Values in 2020\$	Over the Study Period	
	Undiscounted	Discounted
Reduced Vehicle Idling Time	\$29,073,196	\$10,139,632
Reduced Vehicle Operating Costs	\$1,550,112	\$530,013
<b>Total</b>	<b>\$30,623,308</b>	<b>\$10,669,645</b>

## 7.3 Environmental Sustainability Outcomes

Environmental costs are increasingly considered an important component in the evaluation of transportation projects. The primary environmental impact of vehicle use is exhaust emissions, which 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 as well as the local environmental conditions into which the pollution is released.

The City’s Greenhouse Gas Emissions Reduction Policy<sup>18</sup> 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;

<sup>18</sup> <https://laserfiche.spokanevalley.org/WebLink/DocView.aspx?id=292645&dbid=0&repo=SpokaneValley>



- Promotes reduction of Particulate Matter (PM<sub>10</sub>) 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<sup>19</sup>

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, where the assumptions used to monetize the reduction in emissions are summarized in Table 25.

**Table 25: Assumptions used in the Estimation of Environmental Benefits – Emission Values**

Social Cost of Emissions (2020\$/metric ton)						Source/Comment
Year	CO <sub>2</sub>	NO <sub>x</sub>	PM	SO <sub>2</sub>	VOC	
2021	\$52.00	\$15,600	\$748,600	\$41,500	\$0	Technical Support Document: Estimating the Benefit per Ton of Reducing PM2.5 Precursors from 17 Sectors (February 2018)” <a href="https://www.epa.gov/sites/default/files/2018-02/documents/sourceapportionmentbpttsd_2018.pdf">https://www.epa.gov/sites/default/files/2018-02/documents/sourceapportionmentbpttsd_2018.pdf</a>  NOX, SOX, and PM2.5 values are inflated from 2015 to 2020 dollars using the GDP deflator.  Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 (February 2021) <a href="https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf">https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf</a>  Values are kept constant after 2050.
2022	\$53.00	\$15,800	\$761,600	\$42,300	\$0	
2023	\$54.00	\$16,000	\$774,700	\$43,100	\$0	
2024	\$55.00	\$16,200	\$788,100	\$44,000	\$0	
2025	\$56.00	\$16,500	\$801,700	\$44,900	\$0	
2026	\$57.00	\$16,800	\$814,500	\$45,700	\$0	
2027	\$58.00	\$17,100	\$827,400	\$46,500	\$0	
2028	\$60.00	\$17,400	\$840,600	\$47,300	\$0	
2029	\$61.00	\$17,700	\$854,000	\$48,200	\$0	
2030	\$62.00	\$18,100	\$867,600	\$49,100	\$0	
2031	\$63.00	\$18,100	\$867,600	\$49,100	\$0	
2032	\$64.00	\$18,100	\$867,600	\$49,100	\$0	
2033	\$65.00	\$18,100	\$867,600	\$49,100	\$0	
2034	\$66.00	\$18,100	\$867,600	\$49,100	\$0	
2035	\$67.00	\$18,100	\$867,600	\$49,100	\$0	
2036	\$69.00	\$18,100	\$867,600	\$49,100	\$0	
2037	\$70.00	\$18,100	\$867,600	\$49,100	\$0	
2038	\$71.00	\$18,100	\$867,600	\$49,100	\$0	
2039	\$72.00	\$18,100	\$867,600	\$49,100	\$0	
2040	\$73.00	\$18,100	\$867,600	\$49,100	\$0	
2041	\$74.00	\$18,100	\$867,600	\$49,100	\$0	
2042	\$75.00	\$18,100	\$867,600	\$49,100	\$0	
2043	\$77.00	\$18,100	\$867,600	\$49,100	\$0	
2044	\$78.00	\$18,100	\$867,600	\$49,100	\$0	
2045	\$79.00	\$18,100	\$867,600	\$49,100	\$0	

### 7.3.1 Reduce Air Emissions

#### 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<sub>2</sub>, NO<sub>x</sub>, VOC, PM, and SO<sub>2</sub> 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.

<sup>19</sup> <https://wsdot.wa.gov/publications/manuals/fulltext/M41-10/20218.5x5.5.pdf>



## Assumptions

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

**Table 26: Assumptions used in the Estimation Environmental Sustainability Benefits – Autos**

Emissions per Gallon of Fuel Burned - Passenger Vehicles (grams/veh-hour)						Source/Comment
Year	NO <sub>x</sub>	VOC	PM	SO <sub>2</sub>	CO <sub>2</sub>	
2021	0.980	0.549	0.018	0.0310	4,668	Based on MOVES average annual emission factors for passenger vehicles in Spokane County in Washington. Assuming idling vehicles have emissions similar to vehicles traveling 2.5 mph. Moves model run in March 2022.
2022	0.890	0.501	0.017	0.0304	4,574	
2023	0.799	0.454	0.017	0.0298	4,480	
2024	0.709	0.406	0.016	0.0291	4,386	
2025	0.618	0.359	0.015	0.0285	4,292	
2026	0.527	0.312	0.015	0.0279	4,199	
2027	0.437	0.264	0.014	0.0273	4,105	
2028	0.346	0.217	0.014	0.0266	4,011	
2029	0.256	0.170	0.013	0.0260	3,917	
2030	0.165	0.122	0.013	0.0254	3,823	
2031	0.151	0.117	0.012	0.0252	3,787	
2032	0.137	0.112	0.012	0.0249	3,751	
2033	0.124	0.106	0.012	0.0247	3,715	
2034	0.110	0.101	0.012	0.0244	3,678	
2035	0.096	0.095	0.011	0.0242	3,642	
2036	0.082	0.090	0.011	0.0240	3,606	
2037	0.068	0.084	0.011	0.0237	3,569	
2038	0.054	0.079	0.011	0.0235	3,533	
2039	0.041	0.074	0.011	0.0232	3,497	
2040	0.027	0.068	0.010	0.0230	3,461	
2041	0.025	0.067	0.010	0.0229	3,452	
2042	0.024	0.067	0.010	0.0229	3,444	
2043	0.023	0.066	0.010	0.0228	3,435	
2044	0.021	0.065	0.010	0.0228	3,426	
2045	0.020	0.064	0.010	0.0227	3,418	

**Table 27: Assumptions used in the Estimation Environmental Sustainability Benefits – Trucks**

Emissions per Gallon of Fuel Burned - Trucks (grams/veh-hour)						Source/Comment
Year	NO <sub>x</sub>	VOC	PM	SO <sub>2</sub>	CO <sub>2</sub>	
2021	70.056	3.769	1.327	0.0457	13,583	Based on MOVES average annual emission factors for trucks in Spokane County in Washington. Assuming idling vehicles have emissions similar to vehicles traveling 2.5 mph. Moves model run in March 2022.
2022	68.614	3.524	1.220	0.0449	13,349	
2023	67.172	3.279	1.114	0.0441	13,115	
2024	65.731	3.034	1.007	0.0433	12,882	
2025	64.289	2.789	0.901	0.0424	12,648	
2026	62.847	2.544	0.794	0.0416	12,414	
2027	61.406	2.299	0.688	0.0408	12,180	
2028	59.964	2.054	0.581	0.0400	11,946	
2029	58.523	1.809	0.475	0.0392	11,713	
2030	57.081	1.564	0.368	0.0383	11,479	
2031	56.825	1.521	0.352	0.0381	11,395	
2032	56.569	1.477	0.336	0.0378	11,312	
2033	56.313	1.434	0.320	0.0375	11,228	
2034	56.058	1.391	0.303	0.0372	11,145	
2035	55.802	1.348	0.287	0.0369	11,061	
2036	55.546	1.304	0.271	0.0366	10,978	
2037	55.290	1.261	0.255	0.0363	10,894	
2038	55.034	1.218	0.239	0.0361	10,810	
2039	54.778	1.174	0.222	0.0358	10,727	
2040	54.523	1.131	0.206	0.0355	10,643	
2041	54.479	1.126	0.204	0.0354	10,630	
2042	54.436	1.121	0.202	0.0354	10,616	



Emissions per Gallon of Fuel Burned - Trucks (grams/veh-hour)						
Year	NO <sub>x</sub>	VOC	PM	SO <sub>2</sub>	CO <sub>2</sub>	Source/Comment
2043	54.393	1.116	0.200	0.0354	10,603	
2044	54.350	1.111	0.198	0.0353	10,590	
2045	54.307	1.106	0.195	0.0353	10,576	

### 7.3.2 Promote 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.

### 7.3.3 Benefit Estimates

The table below shows the benefit estimates of reducing vehicle delay times. The estimated present value of discounted benefits over a 20-year period is almost \$270,000.

**Table 28: Estimates of Environmental Sustainability Benefits**

Values in 2020\$	Over the Study Period	
	Undiscounted	Discounted
Reduced Air Emissions - GHG	\$317,030	\$194,955
Reduced Air Emissions - CAC	\$195,979	\$71,496
<b>Total</b>	<b>\$513,009</b>	<b>\$266,451</b>

## 7.4 State of Good Repair Outcomes

### 7.4.1 Change in O&M Costs

#### Methodology

As the Project looks to change numerous components, it is expected that this change would impact the annual operations and maintenance costs of those various features. This impact is then monetized for the duration of the benefits period.

#### Assumptions

The assumptions used in the estimation of the change in O&M costs are summarized in the table below.

**Table 29: Assumptions used in the Estimation of State of the Change in O&M Costs**

Variable Name	Unit	Value	Source
Avoided O&M Costs	2020\$/year	\$11,000	City of Spokane Valley

City funds have sufficient capacity to cover operations and maintenance since there is a Capital Reserve available as a contingency. City has also delivered similar projects: 2021-2022 TIGER-funded Barker Road/BNSF Grade Separation Project and the 2015 reconstruction of the Sullivan Road West Bridge at the Spokane River.



## 7.4.2 Residual Value of Capital Assets

### 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.

Additionally, for any right-of-way land acquisition as part of the project, the residual value of that component is expected to equal the initial value of the land.

### Assumptions

The assumptions used in the estimation of the residual value of capital assets are summarized in the table below.

**Table 30: Assumptions used in the Estimation of the Residual Value of Capital Assets**

Variable Name	Unit	Value	Source
Useful Life of Bridges	years	50	Per Transportation for America which indicates bridges have an "expected lifespan of 50 years". <a href="http://t4america.org/maps-tools/bridges/overview/">http://t4america.org/maps-tools/bridges/overview/</a>
Right of Way Acquisition	2020\$	\$5,110,253	Cost data provided by the City of Spokane Valley.

## 7.4.3 Benefit Estimates

The table below shows the estimated State of Good Repair benefits generated by the Project. The estimated present value of discounted benefits over a 20-year period is \$1.4 million.

**Table 31: Estimates of State of Good Repair Benefits**

Values in 2020\$	Over the Study Period	
	Undiscounted	Discounted
Change in O&M	\$220,000	\$83,087
Residual Value	\$6,965,577	\$1,283,402
<b>Total</b>	<b>\$7,185,577</b>	<b>\$1,366,489</b>

## 7.5 Quality of Life Outcomes

### 7.5.1 Improved Mobility and Community Connectivity

The project will increase mobility and expand community connectivity with its non-motorized facilities that allow people to move freely through the project limits while maximizing opportunity for the community can live, work, and play without barriers. The project is located in a Historically Disadvantaged Community and will directly improve Census Tract 117.02 which has many of Spokane Valley's highest rates for vulnerable populations. 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.

All of the project improvements reduce barriers to disadvantaged populations and improve access and mobility for these users by increasing transportation options including supporting the existing paratransit services for the 124 customers living near the project, 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 Avista Utilities has donated property to the project to accommodate the new trailhead to the Centennial Trail and Spokane River. 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.

### 7.5.2 Improved Emergency Vehicle Access

Key emergency services (fire, police, medical) 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.

### 7.5.3 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. The required pattern is two long, one short and one long horn, repeated as necessary until the train clears the crossing. With today's conservative average of 67 trains crossing Pines Rd., horns are a source of significant public concern in Spokane Valley. 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.



## 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. The preferred innovative delivery option is for the City to reimburse BNSF to self-perform the bridge design and construction with its own unionized labor force. If this occurs, the project will realize great time and cost savings. This allows for a streamlined review and approval process and a BNSF-approved method of construction not available to general contractors otherwise using the design-bid-build process.

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. Other ITS technologies, such as work zone queue management and speed management systems, will be evaluated for use during construction.

## 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 2045, and in the previous Bridging the Valley plan and other workshops, stakeholder outreach, and funding initiatives to further this effort. Table 32 summarizes the key partners associated with the Pines Road/BNSF grade-separation project and other related projects.

**Table 32: Partners in Project Development**

<b>State and Local Agencies</b>	
<ul style="list-style-type: none"> <li>Washington State Dept. of Transportation</li> <li>WA Freight Mobility Strategic Investment Board</li> <li>State and Federal Legislators</li> </ul>	<ul style="list-style-type: none"> <li>Idaho Transportation Department</li> <li>Washington Utility and Transportation Commission</li> </ul>
<b>Regional Agencies</b>	
<ul style="list-style-type: none"> <li>Spokane Regional Transportation Council</li> <li>Spokane Regional Traffic Management Center</li> <li>Spokane Transit Authority</li> </ul>	<ul style="list-style-type: none"> <li>Kootenai Metropolitan Planning Organization</li> <li>Avista Utilities</li> </ul>
<b>Railroads</b>	
<ul style="list-style-type: none"> <li>BNSF Railway Company</li> </ul>	<ul style="list-style-type: none"> <li>Union Pacific Railroad</li> </ul>
<b>Local Agencies and Districts</b>	
<ul style="list-style-type: none"> <li>Counties: Spokane, Kootenai</li> <li>Cities &amp; Towns: Athol, Rathdrum, Spokane, Spokane Valley, Millwood</li> </ul>	<ul style="list-style-type: none"> <li>Police/Fires/Emergency Responders</li> <li>Area School Districts</li> <li>Freight/Industry Representatives</li> </ul>
<b>Chambers of Commerce</b>	
<ul style="list-style-type: none"> <li>Spokane Valley</li> </ul>	<ul style="list-style-type: none"> <li>Greater Spokane Incorporated</li> </ul>

The City has an excellent working relationship with WSDOT and collaborate on roughly 10 to 20 projects per year, including traffic impact studies, permits for private developments on state routes, capital improvement projects, the regional ITS network, and shared traffic signals.

The City coordinates with BNSF regarding all road-rail crossings in the city. The city and BNSF are actively working to construct the Barker Rd./BNSF GSP in 2021 and 2022. Together, the City and BNSF are evaluating the potential for BNSF to self-perform the project's bridge design and construction for the two railroad bridges and the piers and piles for a future third rail bridge.

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.

## 8 Summary of Findings and Benefit-Cost Outcomes

The tables below summarize the BCA findings. Annual costs and benefits are computed over the lifecycle of the project (29 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 33: Benefit Estimates by Merit Criteria Outcome for the Full Build Alternative, 2020 Dollars**

Merit Criteria	Benefit Category	Undiscounted	Discounted
Safety	Improved Safety from Grade Separation	\$49.8 M	\$18.7 M
	Improved Safety from Intersection Improvements	\$13.1 M	\$4.7 M
	Improve Pedestrian Accessibility	Not Monetized	Not Monetized
Economic Competitiveness	Reduced Vehicle Idling Time	\$29.1 M	\$10.1 M
	Reduced Vehicle Operating Costs	\$1.6 M	\$0.5 M
	Improved Travel Time Reliability	Not Monetized	Not Monetized
	Improved Access to Economic Development Potential	Not Monetized	Not Monetized
Environmental Sustainability	Reduced Air Emissions - GHG	\$0.3 M	\$0.2 M
	Reduced Air Emissions - CAC	\$0.2 M	\$0.1 M
	Promoting Electrification	Not Monetized	Not Monetized
State of Good Repair	Change in O&M	\$0.2 M	\$0.1 M
	Residual Value of Capital Assets	\$7.0 M	\$1.3 M
Quality of Life	Improved Connectivity	Not Monetized	Not Monetized
	Reduced Noise Pollution	Not Monetized	Not Monetized
	Improved Emergency Vehicle Access	Not Monetized	Not Monetized
Partnership	Innovative Bridge Construction	Not Monetized	Not Monetized
<b>Total</b>		<b>\$101.3 M</b>	<b>\$35.8 M</b>

**Table 34: Overall Results of the Benefit Cost Analysis, 2020 Dollars**

Evaluation Metrics	Undiscounted	Discounted
Total Benefits	\$101.3 M	\$35.8 M
Total Costs	\$31.9 M	\$25.8 M
Net Present Value (NPV)	\$69.4 M	\$10.0 M
Return on Investment (ROI)	217%	39%
Benefit-Cost Ratio (BCR)	3.2	1.4
Payback Period (years)	7.1	11.5
Internal Rate of Return (IRR)	10.1 %	

Considering all monetized benefits and costs, the estimated internal rate of return of the project is 10.1 percent. With a 3 percent real discount rate on CO<sub>2</sub>-related impacts and a 7 percent real discount rate on all other impacts, the \$25.8 million investment would result in \$35.8 million in total benefits for a Net Present Value of \$10.0 million and a Benefit/Cost ratio of approximately 1.4.

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 \$14.3 million and a benefit cost ratio of 1.9, while the roundabout is expected to result in a benefit cost ratio of 0.5. 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 35: Grade Separation Benefits**

Impact Categories	NPV Over 20 Years of Operations	
	Undiscounted	Discounted
<b>Benefits</b>		
Improved Safety from Grade Separation	\$49.8 M	\$18.7 M
Reduced Vehicle Idling Time	\$29.1 M	\$10.1 M
Reduced Air Emissions - GHG	\$0.3 M	\$0.2 M
Reduced Air Emissions - CAC	\$0.2 M	\$0.1 M
Reduced Vehicle Operating Costs	\$1.6 M	\$0.5 M
Change in O&M	\$0.2 M	\$0.1 M
Residual Value	\$4.4 M	\$0.8 M
<b>PV Benefits</b>	<b>\$85.6 M</b>	<b>\$30.6 M</b>
<b>Costs</b>		
Capital Cost	\$20.3 M	\$16.3 M
<b>PV Costs</b>	<b>\$20.3 M</b>	<b>\$16.3 M</b>
<b>NPV</b>	<b>\$65.2 M</b>	<b>\$14.3 M</b>
<b>BCR</b>	<b>4.2</b>	<b>1.9</b>

**Table 36: Roundabout Benefits**

Impact Categories	NPV Over 20 Years of Operations	
	Undiscounted	Discounted
<b>Benefits</b>		
Improved Safety from Intersection Improvements	\$13.1 M	\$4.7 M
Residual Value	\$2.6 M	\$0.5 M
<b>PV Benefits</b>	<b>\$15.7 M</b>	<b>\$5.2 M</b>
<b>Costs</b>		
Capital Cost	\$11.6 M	\$9.5 M
<b>PV Costs</b>	<b>\$11.6 M</b>	<b>\$9.5 M</b>
<b>NPV</b>	<b>\$4.1 M</b>	<b>(\$4.3 M)</b>
<b>BCR</b>	<b>1.4</b>	<b>0.5</b>



## 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 3 percent discount rate for CO<sub>2</sub>-related impacts and a 7 percent discount rate for all other impacts, 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 37: Quantitative Assessment of Sensitivity, Summary (Discounted)**

Original NPV (Discounted)	Original BCR	Parameters	Change in Parameters	New NPV (Discounted)	Change in NPV	New BCR
<b>\$10.0 M</b>	<b>1.4</b>	Change in Capital Costs	Increase capital costs by 25%	\$4.1 M	-59.3%	1.1
			Decrease capital costs by 25%	\$16.0 M	+59.3%	1.8
		Freight Train Growth Rates	Low Growth Scenario	\$6.6 M	-34.6%	1.3
			High Growth Scenario	\$12.2 M	+21.8%	1.5
			No Growth Scenario	\$7.1 M	-28.8%	1.3
		AADT Growth Rate	+ 2% Growth	\$14.5 M	+44.9%	1.6
			- 2% Growth	\$6.6 M	-34.0%	1.3

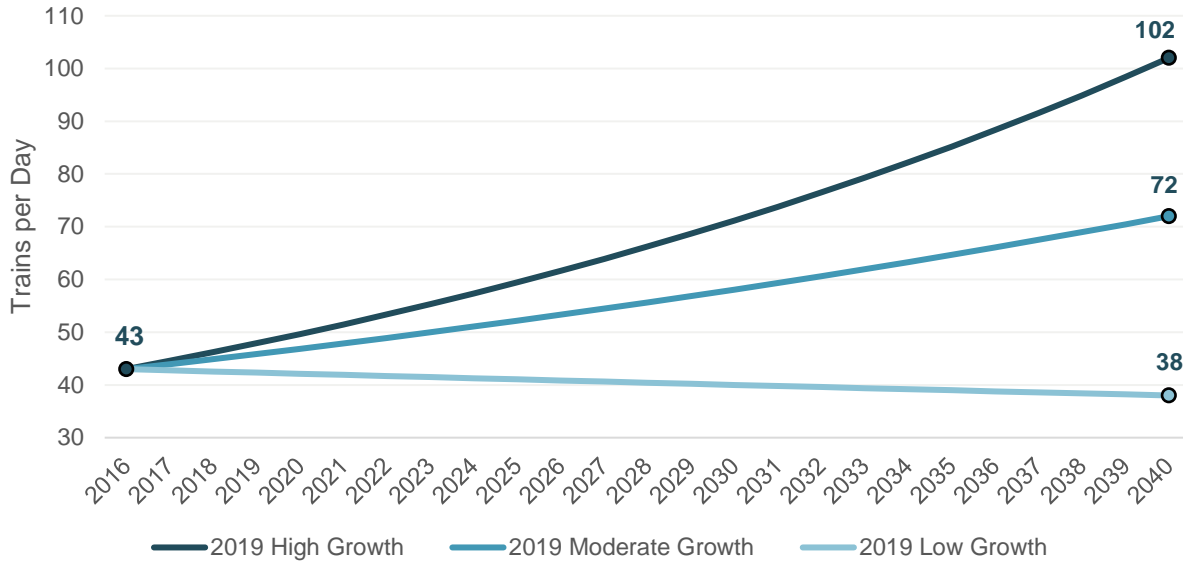
As shown in Figure 2 below, the 2019 State Rail Plan for Washington State considers various growth scenarios for freight train. For the basis of the analysis, the moderate growth scenario was selected as it is assumed the freight trains are expected to grow, unlike the low growth scenario, and the growth rate was more conservative than the high growth scenario. If the growth rates were selected from the low growth scenario, the NPV drops by 34.6 percent resulting in an NPV of \$6.6 million and a BCR of 1.3. Meanwhile, considering a higher growth rate to align with the high growth scenario, the NPV increases by 21.8 percent and a BCR of 1.5. Finally, in addition to the growth scenarios based on the 2019 State Rail Plan, another scenario which considers no growth was also considered. Under this scenario, it translates into a 28.8 percent decline in the NPV and results in a BCR of 1.3.

In addition to freight train growth, AADT growth variations were considered as well. Specifically, a 2 percent increase in the AADT growth results in a 44.9 percent increase in the NPV, while a 2 percent decrease in the AADT results in a 34.0 percent decrease in the NPV. Finally, a change in the capital costs was considered to assess how sensitive the results are to changes in the capital costs. A 25 percent change in the capital cost would translate into a 59.3 percent change in the NPV, which is the largest impact amongst the sensitivity scenarios assessed and result in a BCR ranging from 1.1 to 1.8.



The sensitivity analysis indicates that the Pines Road Grade Separation project is robust across the changes, with the benefit cost ratio exceeding the 1.0 threshold in each of the cases examined, resulting in beneficial impacts to stakeholders and society.

**Figure 2: Freight Train Forecast Comparison**



Sources: 2019 Washington State Rail System Plan

# Appendix D

## Secured Funding Letters

Morgan Bishop  
 Common Street Consulting, LLC  
 PO Box 10391  
 Spokane, WA 99209

Parcel No: 45033-9090, 45033-9091 & 45033-9126  
 Owner: Avista Corporation  
 Federal Aid No: N/A  
 Project: Pines/BNSF Grade Sep. Proj.  
 R/W Plan Title: N/A  
 Map Sheet: N/A  
 Map Approval Date: N/A  
 Date of Last Map Revision: N/A

CERTIFICATE OF APPRAISER

I certify that, to the best of my knowledge and belief:

- ◆ The statements of fact contained in this appraisal are true and correct;
- ◆ The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conclusions, and are my personal, impartial, unbiased professional analyses, opinions, and conclusions;
- ◆ I have no present or prospective interest in the property that is the subject of this appraisal, and I have no personal interest or bias with respect to the parties involved;
- ◆ My compensation is not contingent upon the reporting of a predetermined value or direction that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event;
- ◆ My analyses, opinions, and conclusions were developed, and this appraisal has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice and the Uniform Appraisal Standards for Federal Land Acquisitions;
- ◆ I have made a personal inspection of the property that is the subject of this report. I have made a personal exterior inspection of the comparable sales contained in the report addenda;
- ◆ I have afforded the owner or a designated representative of the property that is the subject of this appraisal the opportunity to accompany me on the inspection of the property;
- ◆ No one provided significant professional assistance to the persons signing this report;
- ◆ I have disregarded any increase in Fair Market Value caused by the proposed public improvement or its likelihood prior to the date of valuation. I have disregarded any decrease in Fair Market Value caused by the proposed public improvement or its likelihood prior to the date of valuation, except physical deterioration within the reasonable control of the owner;
- ◆ This appraisal has been made in conformity with the appropriate State and Federal laws and requirements, and complies with the contract between the agency and the appraiser;
- ◆ The use of this report is subject to the requirements of the Appraisal Institute regarding review by its duly authorized representatives.
- ◆ I, John W. Arney, MAI, have performed services, as an appraiser or in another capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment;
- ◆ As of the date of this report, John W. Arney, MAI, has completed the requirements under the continuing education program of the Appraisal Institute.

The property has been appraised for its fair market value as though owned in fee simple, or as encumbered only by the existing easements. The opinion of value expressed below is the result of, and is subject to the data and conditions described in detail in this report of 41 pages.

I made an initial personal inspection of the property that is the subject of this report on October 12, 2021. The **Date of Value** for the property that is the subject of this appraisal is October 12, 2021.

Per the FAIR MARKET VALUE definition herein, the value conclusions for the property that is the subject of this appraisal are on a cash basis and are:

FAIR MARKET VALUE BEFORE ACQUISITION	\$790,500
FAIR MARKET VALUE AFTER ACQUISITION	\$0
DIFFERENCE	\$790,500

Date of Assignment or Contract: September 28, 2021 Name:

John W. Arney, MAI

Date Signed: October 27, 2021 Signature:

Washington State Certified General Real Estate Certification Number:

1100473

After recording return document to:

**City of Spokane Valley**  
**Attn: Engineering Services**  
**10210 E. Sprague Ave.**  
**Spokane Valley, WA 99206**

**Document Title: Warranty Deed**  
**Reference Number of Related Document:**  
**Grantor: Avista Corporation**  
**Grantee: City of Spokane Valley**  
**Legal Description: Ptn. Govt Lots 7 & 8 03-25-44**  
**Additional Legal Description is on Pages 4-7 of Document.**  
**Assessor's Tax Parcel Numbers: 45033.9090, 45033.9091, 45033.9126**

**WARRANTY DEED**

**CIP 0223 PINES ROAD/BNSF RAILROAD GRADE SEPARATION PROJECT**

The Grantor, **Avista Corporation, a Washington public utility corporation**, for and in consideration of a **donation**, and other valuable consideration, hereby conveys and warrants to the **City of Spokane Valley, a Washington municipal corporation**, Grantee, the following described real property situated in Spokane County, in the State of Washington:

For legal description and additional conditions  
See Exhibit A attached hereto and made a part hereof.

**WARRANTY DEED**

The grant or release herein of property rights is made voluntarily and with full knowledge of Grantor's entitlement to receive just compensation therefore. Grantor hereby waives the City's requirement, if any, of obtaining an appraisal for the acquired/released property rights.

It is understood and agreed that delivery of this deed is hereby tendered and that the terms and obligations hereof shall not become binding upon the **City of Spokane Valley** unless and until accepted and approved hereon in writing for the **City of Spokane Valley**, by its authorized agent.

Date: 12-16-2021, \_\_\_\_\_

AVISTA CORPORATION

BY: *Ann Howard*

ITS: *SR.DM., ENV. AFFAIRS/RENESTATE*

Accepted and Approved

**CITY OF SPOKANE VALLEY**

By: *City of Spokane Valley*

Title: *City Engineer Gloria May*

Date: *4/13/22*



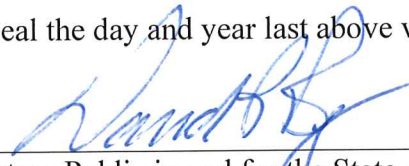
WARRANTY DEED

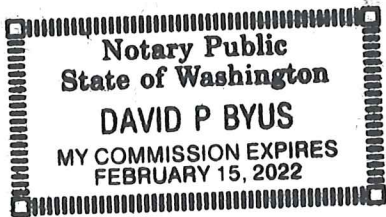
STATE OF WASHINGTON )  
 : ss  
County of Spokane )

On this 16<sup>th</sup> day of December, 2021, before me personally appeared BRUCE HOWARD to me known to be the Senior Director Environmental Affairs & Real Estate of Avista Corporation and acknowledged said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that he is authorized to execute said instrument.

GIVEN under my hand and official seal the day and year last above written.

(SEAL)

  
\_\_\_\_\_  
Notary Public in and for the State of  
Washington, residing at MtD, WA  
My commission expires 2-15-22



**WARRANTY DEED**

AVISTA Utilities Land Donation

EXHIBIT A

PARCEL A:

THAT PORTION OF GOVERNMENT LOTS 7 AND 8 IN THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 25 NORTH, RANGE 44 EAST OF THE WILLAMETTE MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE WESTERLY BANK OF THE SPOKANE RIVER WITH THE INTERSECTION OF A LINE DRAWN CONCENTRIC AND PARALLEL WITH AND DISTANT 200.0 FEET SOUTHERLY OF, AS MEASURED RADIALLY AND AT RIGHT ANGLES TO THE HEREINAFTER DESCRIBED ORIGINAL MAIN TRACK CENTERLINE OF THE BURLINGTON NORTHERN RAILROAD COMPANY (FORMERLY NORTHERN PACIFIC RAILWAY COMPANY);

THENCE SOUTHWESTERLY ALONG SAID CONCENTRIC AND PARALLEL LINE TO THE POINT OF INTERSECTION WITH A LINE DRAWN PARALLEL WITH AND DISTANT 50.0 FEET NORTHERLY OF, AS MEASURED AT RIGHT ANGLES TO, BURLINGTON NORTHERN RAILROAD COMPANY'S (FORMERLY NORTHERN PACIFIC RAILWAY COMPANY'S) MAIN TRACK CENTERLINE AS NOW LOCATED AND CONSTRUCTED;

THENCE NORTHWESTERLY A DISTANCE OF 200.0 FEET TO THE INTERSECTION WITH THE SAID ORIGINAL MAIN TRACK CENTERLINE;

THENCE NORTHEASTERLY ALONG SAID CENTERLINE TO THE POINT OF INTERSECTION WITH THE WESTERLY BANK OF THE SPOKANE RIVER;

THENCE SOUTHEASTERLY ALONG SAID WESTERLY BANK TO THE POINT OF BEGINNING;

EXCEPTING THEREFROM ANY PORTION LYING WITHIN THAT PARCEL OF LAND CONVEYED TO WASHINGTON STATE PARKS AND RECREATION COMMISSION, BY QUIT CLAIM DEED DATED DECEMBER 26, 1989, RECORDED FEBRUARY 28, 1990, UNDER SPOKANE COUNTY AUDITOR'S FILE NO. 9002280205;

ALSO EXCEPTING THEREFROM THAT PORTION OF SAID PREMISES CONVEYED TO BNSF RAILWAY COMPANY, A DELAWARE CORPORATION BY SPECIAL WARRANTY DEED RECORDED UNDER SPOKANE COUNTY AUDITOR'S FILE NO. 6753058;

SITUATE IN THE CITY OF SPOKANE VALLEY, COUNTY OF SPOKANE, STATE OF WASHINGTON.

**WARRANTY DEED**

RESERVING THEREFROM AN EASEMENT FOR THE BENEFIT OF AVISTA CORPORATION AT AVSITA CORPORATION'S SOLE EXPENSE TO CONSTRUCT, RECONSTRUCT, OPERATE, MAINTAIN, UPGRADE, REPAIR, MOVE, REMOVE, OR REPLACE ELECTRIC DISTRIBUTION OR TRANSMISSION, NATURAL GAS, FIBER AND COMMUNICATIONS LINES, TOGETHER WITH ALL RELATED APPURTENANCES, ON, OVER, UNDER, ALONG AND ACROSS SAID PROPERTY, INCLUDING THE RIGHT OF INGRESS, EGRESS AND ACCESS ON, OVER AND ACROSS SAID PROPERTY.

PARCEL B:

THAT PORTION OF GOVERNMENT LOTS 7 AND 8 IN THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 3, TOWNSHIP 25 NORTH, RANGE 44 EAST OF THE WILLAMETTE MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE INTERSECTION OF THE WESTERLY BANK OF THE SPOKANE RIVER AND A LINE DRAWN PARALLEL WITH AND DISTANT 50.0 FEET NORTHERLY OF, AS MEASURED AT RIGHT ANGLES TO, BURLINGTON NORTHERN RAILROAD COMPANY'S (FORMERLY NORTHERN PACIFIC RAILWAY COMPANY'S) MAIN TRACK CENTERLINE, AS NOW LOCATED AND CONSTRUCTED;

THENCE SOUTHWESTERLY ALONG SAID PARALLEL LINE TO THE POINT OF INTERSECTION WITH A LINE DRAWN CONCENTRIC WITH AND DISTANT 200.0 FEET SOUTHERLY OF, AS MEASURED RADIALY TO, SAID RAILROAD COMPANY'S HEREINAFTER DESCRIBED ORIGINAL MAIN TRACK CENTERLINE; THENCE NORTHEASTERLY ALONG SAID CONCENTRIC LINE TO THE POINT OF INTERSECTION WITH SAID WESTERLY BANK OF THE SPOKANE RIVER; THENCE SOUTHEASTERLY ALONG SAID WESTERLY BANK TO THE POINT OF BEGINNING;

EXCEPTING THEREFROM ANY PORTION LYING WITHIN THAT A PARCEL OF LAND CONVEYED TO WASHINGTON STATE PARKS AND RECREATION COMMISSION, BY QUIT CLAIM DEED DATED DECEMBER 26, 1989, RECORDED FEBRUARY 28, 1990, UNDER SPOKANE COUNTY AUDITOR'S FILE NO. 9002280205;

ALSO EXCEPTING THEREFROM THAT PORTION OF SAID PREMISES CONVEYED TO BNSF RAILWAY COMPANY, A DELAWARE CORPORATION BY SPECIAL WARRANTY DEED RECORDED UNDER SPOKANE COUNTY AUDITOR'S FILE NO. 6753058;

SITUATE IN THE CITY OF SPOKANE VALLEY, COUNTY OF SPOKANE, STATE OF WASHINGTON.

**WARRANTY DEED**

RESERVING THEREFROM AN EASEMENT FOR THE BENEFIT OF AVISTA CORPORATION AT AVSITA CORPORATION'S SOLE EXPENSE TO CONSTRUCT, RECONSTRUCT, OPERATE, MAINTAIN, UPGRADE, REPAIR, MOVE, REMOVE, OR REPLACE ELECTRIC DISTRIBUTION OR TRANSMISSION, NATURAL GAS, FIBER AND COMMUNICATIONS LINES, TOGETHER WITH ALL RELATED APPURTENANCES, ON, OVER, UNDER, ALONG AND ACROSS SAID PROPERTY, INCLUDING THE RIGHT OF INGRESS, EGRESS AND ACCESS ON, OVER AND ACROSS SAID PROPERTY

PARCEL C:

THAT PORTION OF THE NORTH HALF OF THE SOUTH HALF AND GOVERNMENT LOT 7 OF SECTION 3, TOWNSHIP 25 NORTH, RANGE 44 EAST OF THE WILLAMETTE MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE WESTERLY BANK OF THE SPOKANE RIVER WITH THE INTERSECTION OF A LINE DRAWN CONCENTRIC AND PARALLEL

WITH AND DISTANT 200.0 FEET SOUTHERLY OF, AS MEASURED RADIALLY AND AT RIGHT ANGLES TO THE HEREINAFTER DESCRIBED ORIGINAL MAIN TRACK CENTERLINE OF THE BURLINGTON NORTHERN RAILROAD COMPANY (FORMERLY NORTHERN PACIFIC RAILWAY COMPANY);

THENCE SOUTHWESTERLY ALONG SAID CONCENTRIC AND PARALLEL LINE TO THE POINT OF INTERSECTION WITH A LINE DRAWN PARALLEL WITH AND DISTANT 50.0 FEET NORTHERLY OF, AS MEASURED AT RIGHT ANGLES TO, BURLINGTON NORTHERN RAILROAD COMPANY'S (FORMERLY NORTHERN PACIFIC RAILWAY COMPANY'S) MAIN TRACK CENTERLINE AS NOW LOCATED AND CONSTRUCTED;

THENCE NORTHWESTERLY AT RIGHT ANGLES TO SAID ORIGINAL MAIN TRACK CENTERLINE A DISTANCE OF 200 FEET TO A POINT ON THE ORIGINAL MAIN TRACK CENTERLINE, BEING THE TRUE POINT OF BEGINNING;

THENCE CONTINUING NORTHWESTERLY AT RIGHT ANGLES TO THE ORIGINAL MAIN TRACK TO A POINT ON THE SOUTH LINE OF STATE HIGHWAY 2 (SR 290);

THENCE NORTHEASTERLY ALONG THE SOUTH LINE OF STATE HIGHWAY NO. 2 TO ITS INTERSECTION WITH THE WESTERLY BANK OF THE SPOKANE RIVER;

THENCE SOUTHEASTERLY ALONG THE WESTERLY BANK OF THE SPOKANE RIVER TO THE ORIGINAL MAIN TRACK CENTERLINE;

THENCE SOUTHWESTERLY ALONG THE ORIGINAL MAIN TRACK CENTERLINE TO THE TRUEPOINT OF BEGINNING;

**WARRANTY DEED**

EXCEPTING THEREFROM ANY PORTION LYING WITHIN THAT PARCEL OF LAND CONVEYED TO WASHINGTON STATE PARKS AND RECREATION COMMISSION, BY QUIT CLAIM DEED DATED DECEMBER 26, 1989, RECORDED FEBRUARY 28, 1990, UNDER SPOKANE COUNTY AUDITOR'S FILE NO. 9002280205;

SITUATE IN THE CITY OF SPOKANE VALLEY, COUNTY OF SPOKANE, STATE OF WASHINGTON.

RESERVING THEREFROM AN EASEMENT FOR THE BENEFIT OF AVISTA CORPORATION AT AVSITA CORPORATION'S SOLE EXPENSE TO CONSTRUCT, RECONSTRUCT, OPERATE, MAINTAIN, UPGRADE, REPAIR, MOVE, REMOVE, OR REPLACE ELECTRIC DISTRIBUTION OR TRANSMISSION, NATURAL GAS, FIBER AND COMMUNICATIONS LINES, TOGETHER WITH ALL RELATED APPURTENANCES, ON, OVER, UNDER, ALONG AND ACROSS SAID PROPERTY, INCLUDING THE RIGHT OF INGRESS, EGRESS AND ACCESS ON, OVER AND ACROSS SAID PROPERTY.

Grantor's Initials

BT

December 20, 2018

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

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](mailto:sminshall@srtc.org).

Sincerely,



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

## 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:



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

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<sup>000 AS</sup>**  
**Program(s): Urban Surface Transportation Block Grant (STBG)**

Dear Mayor Wick;

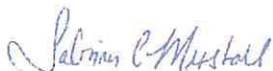
Congratulations! On February 13, 2020, the Spokane Regional Transportation Council (SRTC) Board of Directors selected City of Spokane Valley's Pine Grade Separation RW project for funding as part of the SRTC contingency funding process. This project previously received funding in the 2018 SRTC Call for 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<sup>000 AS</sup> 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](mailto:sminshall@srtc.org).

Sincerely,



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



## 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

**Partial Award:** No <sup>1,000 AS</sup>

**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:



Mayor Ben Wick  
City of Spokane Valley

MARK CALHOUN  
CITY MANAGER



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

2/23/2020  
Date

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](mailto:valarie.kniss@dot.gov)
- **FRA Grant Manager**
  - Leo Maldonado
  - 202-493-6369
  - [leonardo.maldonado@dot.gov](mailto: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](mailto:valarie.kniss@dot.gov)

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

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

# FMSIB Funding: 2000 Award, currently in deferred status.

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

**FMSIB Priority Ranking** D  
**Current Estimated Cost (09/15/04)**  
 Total Project Cost: \$ 11,719  
*Dollars (in thousands)*  
**FMSIB Share:** \$ 3,360

**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 Transportation Study which identifies this location as a high priority grade separation project.

**Partnerships:**

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

**Original Approved Amount**

<b>Freight Mobility</b>	<b>\$3,360</b>	<b>30%</b>
<i>Partnership</i>	\$7,840	70%
<b>TOTAL Project Cost</b>	<b>\$11,200</b>	<b>100%</b>

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

**Cash Flow Needs:**

<i>Dollars (in thousands)</i>	Prior	03 - 05	05 - 07	07 - 09	09 - 11	11 - 13	TOTAL
<b>P.E. Phase</b> Total			448	552			1,000
Freight Mobility							0
<b>R.W. Phase</b> Total			353	937			1,290
Freight Mobility							0
<b>CN. Phase</b> Total				7,259	2,170		9,429
Freight Mobility				1,680	1,680		3,360
<b>Freight Mobility TOTAL</b>							<b>\$3,360</b>
<i>Partnership TOTAL</i>							\$8,359
<b>TOTAL Project Cost</b>							<b>\$11,719</b>

\*\* 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

Dan O'Neal  
Chair

Karen Schmidt  
Executive Director

Board Members

Clifford Benson

Barbara Cothorn

Andrew Johnsen

David Kalberer

Don Lemmons

Sid Morrison

Carol Moser

Patricia Otley

Ross Kelley

Jim Toomey

Web Site

[www.fmsib.wa.gov](http://www.fmsib.wa.gov)

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 studied, 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,

A handwritten signature in cursive script that reads "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.

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**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 Schmidt  
Executive Director

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

10/18/2007