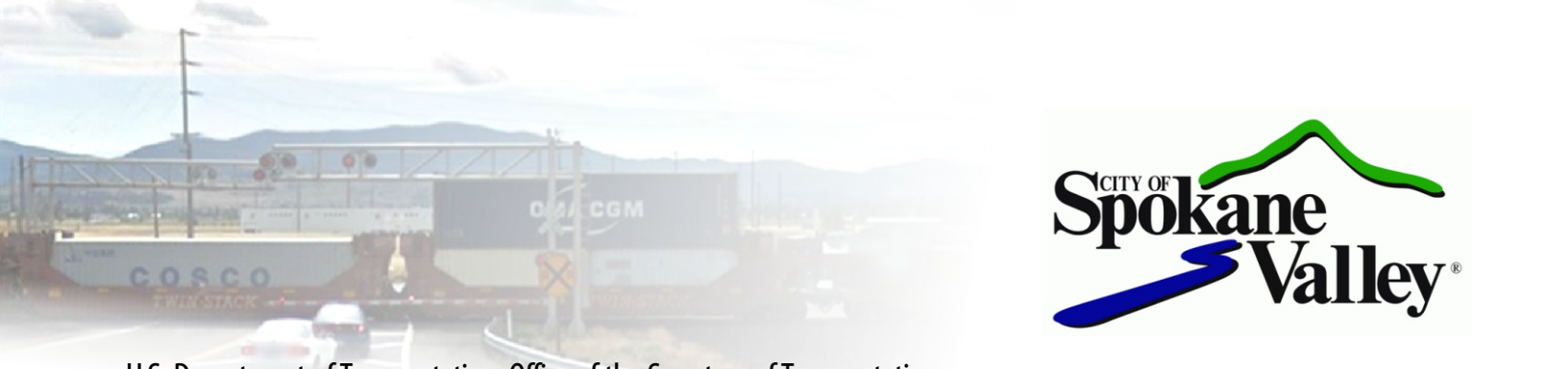

U.S. Department of Transportation, Office of the Secretary of Transportation

Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE) FY 2017 Grant Application

Bridging the Valley:
Barker Road BNSF Grade Separation Project

Project Name.	**Bridging the Valley: Barker Road BNSF Grade Separation Project**
Was a FASTLANE application for this project submitted previously?	Yes.
• If yes, what was the name of the project in the previous application?	Bridging the Valley: Barker Road and Pines Road (SR 27) BNSF Grade Separation Project
Previously Incurred Project Cost	$394,385.
Future Eligible Project Cost	$36,035,000.
Total Project Cost	$36,429,385.
FASTLANE Request	$21,621,000.
Total Federal Funding (including FASTLANE)	$22,341,000.
Are matching funds restricted to a specific project component? If so, which one?	Yes. FMSIB funds are for construction.
Is the project or a portion of the project currently located on National Highway Freight Network	No.
Is the project or a portion of the project located on the National Highway System	Yes.
• Does the project add capacity to the Interstate system?	No.
• Is the project in a national scenic area?	No.
Do the project components include a railway-highway grade crossing or grade separation project?	Yes.
• If so, please include the grade crossing ID.	066244T
Do the project components include an intermodal or freight rail project, or freight project within the boundaries of a public or private freight rail, water (including ports), or intermodal facility?	No.
If answered yes to either of the two component questions above, how much of requested FASTLANE funds will be spent on each of these project components?	$21,621,000 for railway-highway grade separation.
State(s) in which project is located.	Washington.
Small or large project	Small.
Urbanized Area (UA) in which project is located, if applicable.	Majority of project is rural. Part of project falls within Spokane, WA UA.
Population of Urbanized Area.	387,487 (2010 Census)
Is the project currently programmed in the:	
• TIP.	Yes.
• STIP.	Yes.
• MPO Long Range Transportation Plan.	Yes.
• State Long Range Transportation Plan.	No. (It defers to State Freight Plan)
• State Freight Plan?	Yes.

FASTLANE Grant Re-Application: Summary of Changes since April 2016

The enclosed FY17 application is very similar to Spokane Valley's FASTLANE FY16 application previously submitted in April 2016. Key differences between the applications are highlighted yellow throughout the document and are summarized here.

Since FASTLANE FY16:

- ***Split two major grade separation projects into two FASTLANE FY17 applications.***
- ***A STIP amendment for design was approved.***
- ***Design is about to start for the Barker Road BNSF project using City and federal funds.***
- ***City has increased committed funding.***

Scope

- The previous application included two railway-highway grade separation projects: one on Barker Road and one on Pines Road. The current application includes only the Barker Road BNSF grade separation project. A separate FASTLANE FY17 application is being submitted for the Pines Road BNSF grade separation project.
- The combined project in the FASTLANE FY16 application was categorized as a large rural project. This application is for a small rural project.

Design Advancement and Schedule Updates

- The City of Spokane Valley is committed to delivering this project. They coordinated a STIP amendment in 2016 to start design and it was approved. Using their own funds ($600,000) and a previous federal earmark ($720,000), the City has procured services to proceed with the engineering phase of this project. Contract execution is expected this month.
- In an effort to keep the project moving forward, the City has also allocated funds to advance the design phase. $1,200,000 remains available in committed City funding that can be used as match money to help obtain other funding sources.
- The overall project schedule shifted six months without FASTLANE FY16 funds. However, construction completion is anticipated by June 2020, which is before the FASTLANE funding obligation deadline.

Funding

- Some funding sources specific to the Barker Road BNSF grade separation project have changed:
  - The City increased committed funds by $379,265 to a total of $1,800,000 (five percent of the project) in order to begin the final design phase of the project.
  - The FASTLANE request was increased from $15,814,845 to $21,621,000. The request is 60 percent of the project cost.
  - Potential TIGER FY16 funds have been removed. Instead, the City will be pursuing future funding opportunities such as future TIGER, TIB, etc.

Table of Contents

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1 Project Description

This section describes the proposed project, the challenges the project aims to address, key project objectives and proposed solutions, and key benefits.

1.1 Project Description

The City of Spokane Valley requests $21,621,000 from the FY 2017 FASTLANE Grant Program to complete funding for the Barker Road/BNSF Grade Separation Project. The Barker Road/BNSF Grade Separation Project replaces an at-grade crossing with an overpass of BNSF's railroad tracks and Trent Avenue (SR 290); incorporates interchange ramps to provide access between Barker Road and SR 290; connects Barker Road to a large residential area to the north; and closes the at-grade crossing of Flora Road at the BNSF Railway.

The project is classified as a small rural project. The total project size of $36,429,385 includes $394,385 previously incurred costs and $36,035,000 future eligible costs. The project is in the small category because the project size is less than Washington State's $100 million FY 2017 apportionment for projects located in one state. The project is also classified as rural based on the description in Section 2 (Project Location).

The construction of this project has both national and regional significance. At the national level, this project improves the safety of freight trains, passenger trains, and freight trucks by eliminating road/rail conflicts. It also improves the mobility of freight trucks. The BNSF railway carries freight and passenger trains between western ports and Midwest intermodal facilities. The elimination of two at-grade crossings will eliminate train/vehicle crash risks through Spokane Valley. The elimination of delays at the rail crossings will improve the mobility of freight trucks traveling from Canada to Interstate 90 just south of the project. Additional benefits at the regional level include unlocking the economic potential to develop prime vacant land zoned for industrial, mixed-use, and commercial uses; re-connecting communities and recreation areas; supporting active pedestrian and bicycle lifestyles, and improving the quality of life through

Figure 1. Project Location Related to National BNSF Intermodal Freight Movement

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

Expected system users that will benefit from this project include:

- Travelers (automobile drivers/passengers, pedestrians, bicyclists)
- Trucking companies and the companies that use their services for freight transport
- BNSF Railway and companies that use the railway for freight transport
- Amtrak and their passengers
- Property owners near the project (businesses, residents, vacant land owners)

1.2 Challenges Project Aims to Address

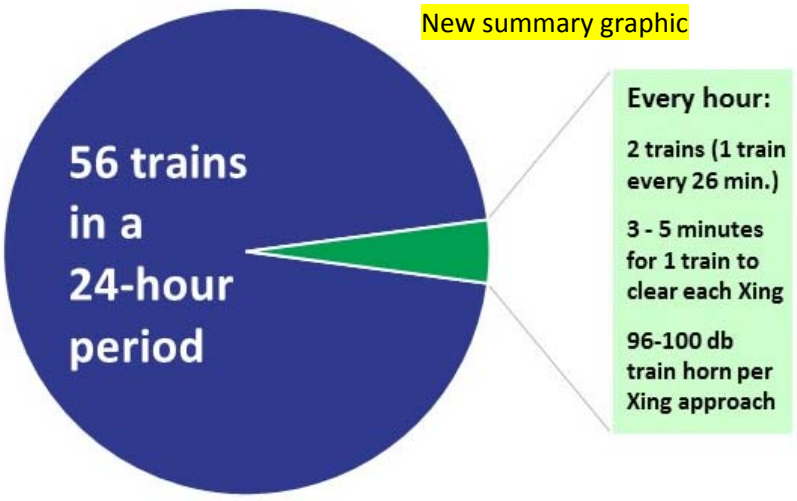
This project aims to address safety, mobility, economic, and community challenges associated with the two existing at-grade crossings as described in this section.

1.2.1 Safety Risk at and Near the Crossings

All at-grade crossings have the potential for fatalities, serious injuries, and hazardous material spills (e.g. Bakken oil), particularly when there are high volumes of rail traffic and roadway traffic, such as at the Barker Road/BNSF rail line crossing.

1.2.2 Long Delays at and Near Crossings

On average, people and freight are delayed 56 times per day at each roadway-railway crossing. With trains nearly one and a half miles in length, crossings are closed for approximately three to five minutes for each train to pass. Queuing vehicles on the crossing approaches compounds the delay once the train has passed. Additional delay is incurred at the nearby intersection at SR 290.



Challenges Posed by Frequent Train Crossings

1.2.3 Inefficient Emergency Services Access

Key emergency services (fire, police, hospital) are located south of the railway. The long and frequent delays at the rail crossings may cause delays for providing emergency services to the north.

1.2.4 Economic Development Standstill

Close to 500 acres of prime industrially-zoned parcels and 75 acres of residentially-zoned parcels are undeveloped because property owners and developers cannot afford to mitigate the LOS 'F' operating conditions at the Barker Road/Trent Avenue (SR 290) 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.

1.2.5 Inefficient Intermodal Activities

Frequent long delays at the crossings hinder long-haul and short-haul freight trucks from reaching destinations in a timely manner. Trent Avenue (SR 290) and Barker Road are preferred long-haul freight routes for accessing Interstate 90 to the south due to heavy congestion on Highway 95 through Coeur d'Alene, Idaho. Short-haul freight trucks also travel through the crossing to reach the many industrial land uses served by spur rail lines near the project site.

1.2.6 Lack of Community Connectivity

The BNSF Railway bisects the northern parts of Spokane Valley from the main city south of the railway. On Barker Road, the BNSF railway provides a barrier between neighborhoods, industrial jobs, and recreation areas. Developers north of the Barker Road/BNSF crossing are seeking to expand the more than 300-acre Highland Estates neighborhood and develop 100 additional acres within the Vista Grande Subdivision. The crossing does not provide sidewalks or bicycle facilities, making the route unappealing to pedestrians and bicyclists.

1.2.7 Noise Pollution from Train Whistles

Spokane Valley residents have long complained about the noise pollution of the train whistles. Federal law requires locomotives to sound their horns at 96 to 100 decibels as they approach at-grade crossings and continue blowing the horn until the train clears the crossing. Not only do the horns disturb the peacefulness of the surrounding area, medical studies have linked loud noises, such as train whistles, to stress-related health problems, such as stroke and heart disease[1].

1.3 Key Project Objectives and Proposed Solutions

This section provides a summary of the key project objectives, proposed solutions, and a summary of the before and after conditions.

This project is part of the broader Bridging the Valley effort where the main goal is separating vehicle traffic from train traffic in the 42-mile corridor between Spokane, Washington, and Athol, Idaho. Bridging the Valley includes project objectives to:

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

- Improve public safety by reducing rail/vehicle collisions
- Improve emergency services access to residents and businesses along the corridor
- Eliminate waiting times and improve traffic flow for all travel modes at rail crossings
- Reduce noise levels, particularly related to train whistles at crossings
- Enhance economic opportunities for a rail corridor served by a key regional railroad

Proposed solutions for the Barker Road/BNSF Railway project include:

- Grade-separation so that Barker Road passes over the BNSF Railway
- Add sidewalks and bicycle lanes to the Barker Road overpass
- Turn the Barker Road/Trent Avenue (SR 290) intersection into an interchange
- Close the Flora Road/BNSF at-grade crossing
- Realign Wellesley Road and close the Wellesley Road bridge over the BNSF tracks

Table 1 provides a summary of the before and after project impacts.

Table 1. Before and After Conditions at BNSF Railway Crossings

Conditions	Before (2016)	After (2022)
At-grade crossings	2	0
Train volumes (freight/passenger)*	54 / 2	70 / 2
Daily volumes at crossing (vehicles)	5,500	5,950
Crash risk (fatalities/year)	0.047	0
Annual automobile idling delay (hours)**	15,164	0
Annual truck idling delay (hours)	522	0
Fuel consumption (gallons/year)***	30,777	0
Level of service at SR 290	F	A
Acres of undeveloped land	575	0
Daily train whistles	112	0

* Current track capacity is 76 trains. Freight train volumes are increasing approximately three to four percent per year. In the future when BNSF adds a second mainline track, approximately 125 trains per day are anticipated by 2035. (Sources: Federal Rail Administration (http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/query/invdetl.aspx) and *Washington State Rail Plan* 2013, Technical Note 4a, Figures 4.1 and 4.2)

** Vehicle delay also accounts for the delay to emergency services and school buses.

*** Fuel consumption is correlated to emissions, which includes numerous measures of particulate matter such as CO. The fuel consumption includes idling delay at the crossing. At the Barker Road/BNSF project location, it also includes the fuel consumption for vehicles that currently travel out of direction to access the residential area directly north of the Barker Road/Trent Avenue (SR 290) intersection. The project will eliminate out of direction travel.

The key benefits for the Barker Road BNSF grade separation project remain unchanged. The numbers reflect this project only instead of the combined Barker and Pines projects numbers.

1.4 Key Benefits

This FASTLANE project will generate key long-term benefits that leverage federal investment by improving the mobility and safety of people and freight in the Inland Pacific Hub, while also providing economic opportunities and enhancing the environment and surrounding communities. This project will result in the following outcomes:

Cost-Effectiveness

- Overall project **benefit-cost ratio** is 1.4 (discounted at 7%) and 3.1 (discounted at 3%).

Economic Outcomes

- Decrease transportation costs and improve long-term efficiency, reliability, and costs in the movement of workers and goods
- Significantly reduce the cost of transporting export cargoes from Canada
- Enhance the access and reliability to close to 500 acres of prime, buildable industrial-zoned land and 75 acres of residential-zoned land
- Generate approximately $2 billion in state economic output, including **9,800 new jobs** (3,300 of those in Spokane Valley) and new general fund taxes ($12.3 million for City and **$50.8 million for State**)

Mobility Outcomes

- **Dramatically reduce delay** to vehicles, bicycles, and pedestrians and improve traffic circulation
- Greatly enhance accessibility of pedestrians and bicyclists by eliminating infrastructure gaps and reducing delay

Safety Outcomes

- **Eliminates the growing risk of conflict** between roadway users and trains by separating uses
- Adds ADA-accessible pedestrian and bicycle features to increase safety
- Addresses existing safety concerns at roadway intersections

Community and Environmental Outcomes

- Improves community connectedness between neighborhoods, industrial jobs, and nearby recreational areas
- **Eliminates train horn noise** due to safety requirements for trains crossing roadways at grade, which also improves the health and well-being of surrounding residents and businesses
- **Reduces fuel consumption and tailpipe emissions** for vehicles idling in delayed traffic

Partnership and Innovation

- Helps fulfill the vision of the MPO's "Bridging the Valley" and "Horizon 2040 Metropolitan Transportation Plan" to separate vehicle traffic from train traffic in the 42-mile corridor between Spokane, Washington and Athol, Idaho

Cost Share

- Helps a city with limited resources to reconnect communities that are bisected by a private railroad line

2 Project Location

Figure 2 shows the proposed project location and surrounding area. Key features shown include:

- **Project:** highway-rail crossing improvements on the BNSF rail line: grade separation at Barker Road and crossing closure at Flora Road
- **Freight Rail Routes:** BNSF and UPRR lines
- **Freight Roadway Routes:** designated freight routes and ton haulage per year
- **Traffic Data:** BNSF train volumes (56 per day) and average daily traffic on project roadways (up to 21,500 vehicles per day)
- **Intersection Level of Service:** sub-standard service level at the Trent Avenue (SR 290)/Barker Rd intersection
- **Land Use:** key industrial areas, parks and recreation areas, schools, and vacant land zoned for industrial, mixed-use, or commercial uses (more detail is shown in Figure 3)
- **Urbanized Area (UA) Boundary from 2010 Census:** the majority of the project is located just outside the UA, satisfying the rural requirements of the FASTLANE grant

3 Project Parties

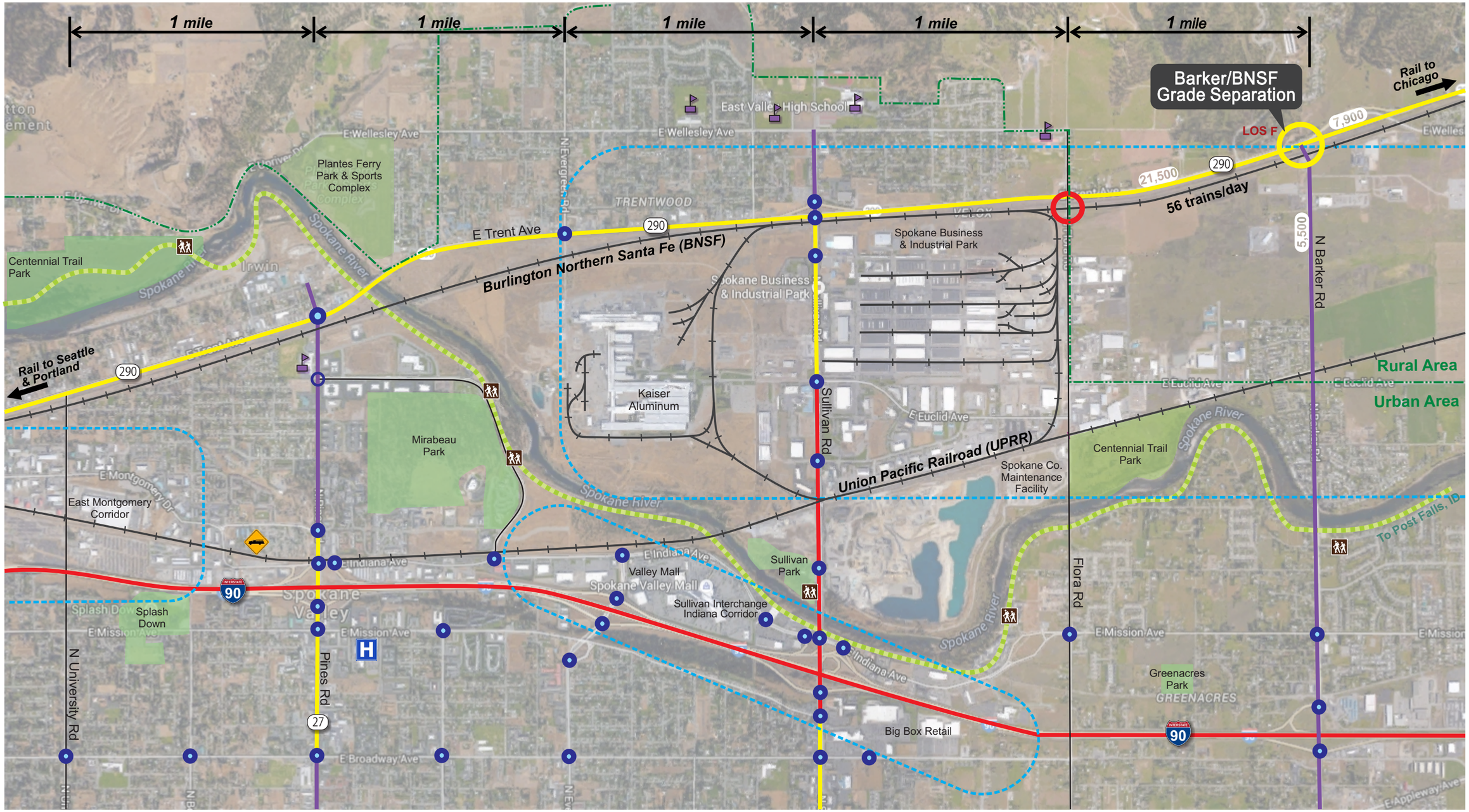
The City of Spokane Valley is the applicant for this project and will manage any grant funding awarded and all design and construction activities associated with the project. The City will work closely with the Washington State Department of Transportation (WSDOT) and BNSF Railway to deliver the project. Appendix A includes letters of support from all three partners.

The **City of Spokane Valley** is located near the eastern border of Washington and is the ninth largest city in Washington with a population of 93,340[2].

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 Trent Avenue (SR 290).

BNSF Railway operates the east-west Class I railway at the heart of this project. This railway connects Seattle and Portland in the west to Chicago and Minneapolis-St. Paul in the east with many service points in between. This railway also connects customers with the global marketplace. The Spokane region is a convergence of several rail lines on the northern tier of BNSF's network.

[2] Washington State Office of Financial Management. http://www.ofm.wa.gov/pop/april1/default.asp. April 1, 2015.



LEGEND

- Traffic Signal
- Planned Traffic Signal
- Highway-Rail Grade Crossing Separation
- Highway-Rail Grade Crossing Closure
- Rail Lines
- Selected Employment Activity Centers
- Recreational Trail
- Urbanized Area Boundary (2010 Census)
- Hospital
- Fire Station
- School
- Trailhead
- Land Use: Parks & Rec

LOS - Level of Service

(7,900) - Average Daily Vehicles

Project Roadway Freight & Goods Designations:

- T-1 - > 10 Million Tons/Year
- T-2 - 4 to 10 Million Tons/Year
- T-3 - 300,000 to 4 Million Tons/Year

City of Spokane Valley

Figure 2

Project Location

No Scale

The project partners will coordinate closely and support project delivery:

Project Activity:	Spokane Valley	WSDOT	BNSF Railway
Manage Funding Allocations	✓		
Procurement	✓		
Project Reviews/Approvals	✓	✓	✓
Public Involvement	✓	✓	

4 Sources and Uses of all Project Funding

We are requesting $21,621,000 in FASTLANE grant funds, which is 60 percent of the total $36,035,000 project future eligible cost. These funds will be used for project design, right-of-way acquisition, construction, and project oversight. This section provides discussion on the future eligible cost, committed and expected funding, federal funding overview, project budget, FASTLANE funding allocation, and the City's financial condition and grant management capabilities.

4.1 Future Eligible Cost

The future eligible project cost for this project is $36,035,000. Previously incurred project costs include $394,385 for planning (done in 2004), preliminary engineering (done in 2004), which included 30 percent design plans and cost estimates, and environmental documentation (NEPA approval in 2006). The future eligible costs will be used for the following activities:

- Pre-construction activities:
  - Preliminary and final engineering (this includes an update of the 30% plans and cost estimates to bring the plans to current standards, add bicycle facilities, and account for current costs)
  - Acquisition of real property
- Construction

4.2 Committed and Expected Funding

Committed funding sources have been secured for $9,407,000, or 27.0 percent, of the $36,035,000 total future eligible project costs. This includes 2.0 percent federal funds and 25.0 percent non-federal funds. The committed funds include a federal earmark and non-federal funds from the Washington Freight Mobility Strategic Investment Board (FMSIB) and the City of Spokane Valley. The City is pursuing the 60.0 percent of the expected funding from federal funding opportunities (this FASTLANE grant) and 13.0 percent of the funding from other sources. The City has the opportunity to receive additional matching funds through the Washington State Transportation Improvement

Board (TIB) each year. The City fully intends on pursuing grant funds for these projects in 2017-2018. In addition to the TIB funding source, the City continues to petition the Washington State Legislature for additional legislative discretionary funds. The City Council fully supports this project and may also consider additional city funding sources or alternate funding mechanisms, such as selling bonds. Table 2 provides a detailed breakdown of the committed and expected funding for both federal and non-federal sources.

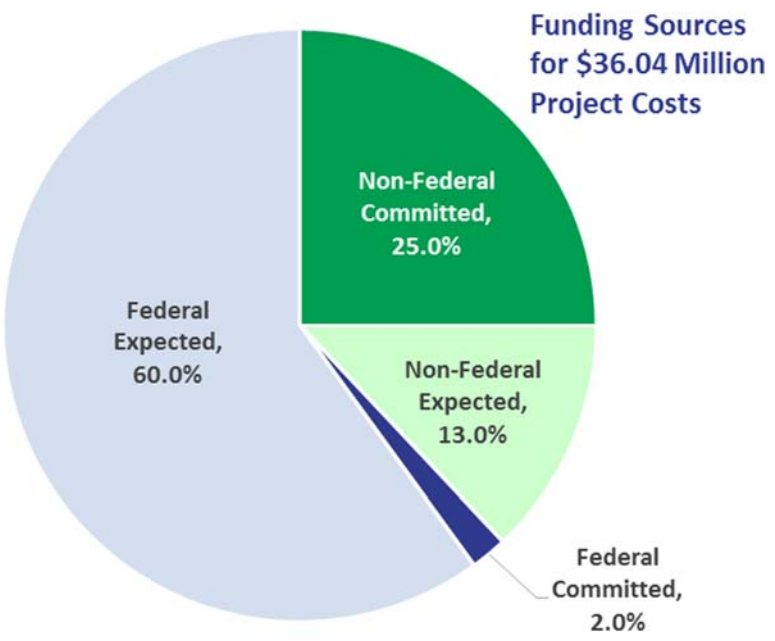


Table 2. Committed and Expected Funding

	Funding Source	Total ($)	Total (%)
Federal Funding			
Committed	2009 Federal Earmark	$720,000	2.0%
Expected	FASTLANE	$21,621,000	60.0%
	Subtotal:	**$22,341,000**	**62%**
Non-Federal Funding			
Committed	Washington State FMSIB*	$7,207,000	20.0%
	City of Spokane Valley	$1,800,000	5.0%
Expected	BNSF**	$432,420	1.2%
	Other (e.g., TIB)	$4,254,580	11.8%
	Subtotal:	**$13,694,000**	**38%**
	Total:	**$36,035,000**	**100%**

* FMSIB has committed to funding 20% of the total Barker Road/BNSF construction costs up to $10 million.
** Per 23CFR 646.210, BNSF will determine their funding commitment once the 30% design plans and cost estimates (done in 2004) have been brought up to current standards. Their letter of support demonstrates their willingness to contribute to the funding of this project.

The total project cost remains the same. The FASTLANE FY16 application included a $15,814,845 FASTLANE request, $10,440,000 TIGER request, $1,420,735 of committed City funds, and no other expected non-federal funds.

4.3 Federal Funding Overview

The federal funding includes both committed and expected sources for a total of 62 percent of the project costs. A small portion of secured federal funds was allocated as part of the 2005 - 2009 SAFETEA-LU High Priority Projects Program. The FHWA allocated $720,000 for the development of highway-rail crossings in Spokane County, Washington and Kootenai County, Idaho. These federal funds make up 2.0 percent of the total project costs. This FASTLANE grant request is $21,621,000 for 60 percent of the funding needed for this grade separation project.

4.4 Project Budget

With a few exceptions, the City generally plans to apply each funding source proportionately throughout each phase of the project based on the funding source's percentage of the total project costs. The 2009 federal earmark is nearing its obligation date; therefore, it will be applied to the engineering phase, which will begin as soon as contracts are executed later this month. The City has allocated $600,000 of their funding towards the engineering that will begin soon. The FMSIB funds were specifically allocated towards the construction of the project, so 100 percent of those funds will be used for the construction phase.

Table 3. Project Budget

Project Phase	FASTLANE	Other Federal	Non-Federal	Total Cost
Right-of-Way Acquisition	$1,452,000 (60.0%)	$0 (0.0%)	$968,000 (40.0%)	$2,420,000
Engineering	$1,155,000 (46.7%)	$720,000 (29.1%)	$600,000 (24.2%)	$2,475,000
Construction	$19,014,000 (61.6%)	$0 (0.0%)	$12,126,000 (38.9%)	$31,140,000
TOTAL:	**$21,621,000**	**$720,000**	**$13,694,000**	**$36,035,000**

4.5 FASTLANE Funding Allocation

If awarded $21,621,000 in FASTLANE funding, the City will allocate the funding to the engineering, right-of-way acquisition, and construction of the project elements. All of the funding will be spent on railway-highway grade separation.

4.6 City's Financial Condition and Grant Management

The financial condition of the City of Spokane Valley is reported in their comprehensive annual budget and monthly financial reports[3]. The City employs staff with experience in grant management.

[3] Spokane Valley Budget & Financial Reports:
http://www.spokanevalley.org/content/6836/6902/7156/default.aspx

Spokane Valley Key Financial Features	
Capital Funding:	REET
Operations Funding:	Gas and Telephone Tax
Contingency Plan:	Capital Reserve Fund, General Fund
Grant Oversight:	Approximately $5 - $8 million per year; audited annually
Financial Condition:	Annual Budget

The City successfully manages approximately five to eight million dollars in grants (federal and non-federal) on an annual basis and documents this in the annual budget. The primary source of the City capital funding for transportation projects comes from the City's Real Estate Excise Tax (REET) Revenue and 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 2013 and 2014, **reported no Significant Deficiencies or Material Weaknesses**.

The City is currently managing the $15 million Sullivan Road W Bridge Replacement Project, which combines four funding sources: one federal, two state, and a local city match. The City hired a consultant using a RFQ process. The design was completed, the right-of-way was obtained, the project was bid, and construction began in the summer of 2014. The project is administered and inspected by the City. Construction was substantially completed in late 2016.

5 Merit and Other Selection Criteria

This section provides a summary of how the project meets the merit selection criteria and other review selection criteria.

5.1 Merit Selection Criteria

This section describes how the project meets the merit selection criteria for outcomes related to the economy, mobility, safety, community, and the environment.

5.1.1 Economic Outcomes

The smooth flow of trade, so vital to U.S. economic competitiveness, is facilitated by addressing key deficiencies across the system. The Barker Road grade separation of the BNSF mainline provide an opportunity to target a local deficiency that effectively ripples benefit through the rest of the transportation system. The BNSF mainline that travels through the City of 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. **Almost 94 percent of Washington's east-west**

bulk cargo rail traffic travels through this corridor.[4] The BNSF rail line also serves interstate passenger rail service via Amtrak's Empire Builder route between Seattle and Chicago. Currently, the BNSF line carries an average of 54 freight and two passenger trains daily, and usage on the line is estimated to grow 143 percent by 2035.[5] Upon completion of the project and the Pines Road BNSF grade separation project, an 8.8-mile section of rail corridor between Vista Road and Harvard Road will be unencumbered by at-grade crossings.

Almost 94 percent of Washington's east-west bulk cargo rail traffic travels BNSF's northern tier corridor through Spokane Valley.

The Barker Road grade separation also has a significant benefit to trade facilitated by trucking. Barker Road serves as a primary arterial roadway directly connecting a State Highway (SR 290) at the project site with Interstate 90 to the south. Barker Road is a preferred freight route to I-90 from north Idaho and Canada to avoid the congestion on U.S. Highway 95 through Coeur d'Alene, Idaho. The project promotes improved interstate freight movement from Canada and Idaho through Spokane County/Kootenai County by eliminating vehicle-train conflicts as envisioned in the 2004 Bridging the Valley Plan.

The project improves regional economic vitality by significantly improving reliability and accessibility to the City's largest undeveloped industrial area, home to close to 500 acres of prime industrially-zoned and 75 acres of residential-zoned parcels shown in Figure 3. With the City expected to accommodate an additional 20,000 residents and 18,000 employees, the Barker/SR 290/BNSF/I-90 area is a targeted locale for growth. This project contributes significantly to supporting and managing this economic growth by building transportation infrastructure necessary to attract, retain, and expand businesses.

Economic analysis estimates that this project will be a **significant generator of jobs and revenues**:

	Barker Rd/BNSF
State economic output:	$2 billion
New jobs in state (local share):	9,800 (3,300)
New City general fund taxes:	$12.3 million
New State general fund taxes:	$50.8 million

(See Appendix C for detailed fiscal and economic analysis)

[4] Washington Department of Transportation (WSDOT). Washington State Rail Plan. Technical Note 3a: Freight Rail Demand, Commodity Flows and Volumes. Dec. 2013.
[5] Ibid.

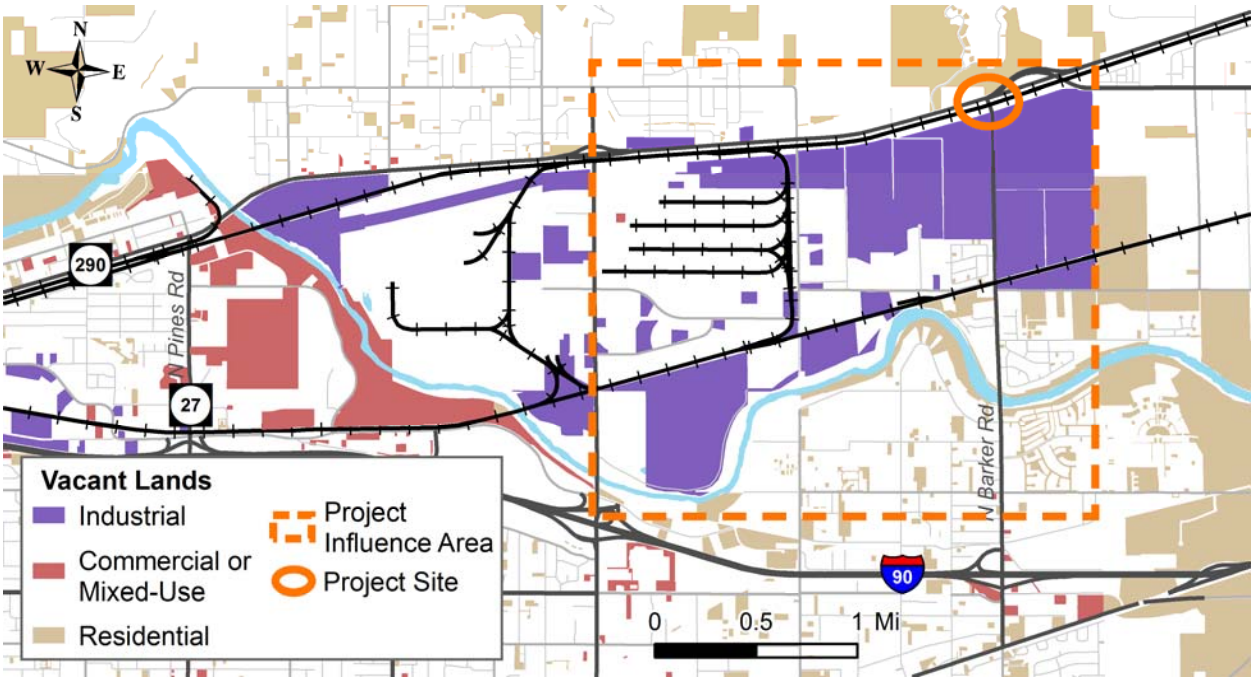


Figure 3. Vacant Parcels in Spokane Valley

5.1.2 Mobility Outcomes

The project improves Barker Road/Trent Avenue (SR 290) from LOS 'F' to 'A'.

The 21st-century transportation system enhances the mobility needs of all users. The project design results in improved mobility for vehicles, bicycles, and pedestrians. As previously noted, the community of Spokane Valley is growing and experiencing the transportation impacts associated with growth. The existing intersection at Barker Road and Trent Avenue (SR 290) currently operates at a Level of Service (LOS) 'F' and is forecasted to reach 50,050 vehicle hours of delay per year by 2030 without this project. Add to the mix an average of 56 trains per day, up to 7,700 feet in length (nearly 1.5 miles in length), and the impact on traffic flow at these at-grade crossings is significant. **The project improvements for Trent Avenue (SR 290) at Barker Road transforms the LOS 'F' intersection to LOS 'A'.** This greatly benefits travel time reliability for all modes, but significantly for emergency response vehicles where delay can have tragic outcomes; for school buses where delay means tardiness; and for commercial vehicles where the delay has negative economic impact.

The positive outcome for freight and passenger rail travel by removing two at-grade crossings of the BNSF line is the continued implementation of the Bridging the Valley Plan that envisions a freight and passenger rail corridor unencumbered by at-grade crossings. The project will also accommodate the planned additional mainline tracks for the rail corridor.

The ability to safely walk or bike on Trent Avenue (SR 290) between the residential communities, schools, commercial centers, and employment areas is hampered by gaps in the pedestrian and

bicycle networks on Barker Road. The project significantly enhances mobility for pedestrian and bicyclists by constructing Americans with Disabilities Act (ADA)-compliant sidewalks and bicycle lanes that connect the land uses to the north and south of the project area.

5.1.3 Safety Outcomes

Rail traffic is expected to increase to 125 trains per day (approximately 5 trains per hour) and will negatively impact Spokane Valley without the construction of this project.

The BNSF rail line and Trent Avenue (SR 290) are high volume train and vehicle corridors respectively. This creates the potential for significant safety hazards for vehicle, pedestrian, and bicyclist cross-traffic. The project eliminates two at-grade roadway-railway crossings. With an average 56 trains per day using the BNSF line currently **and the expectation that rail traffic will increase to 125 daily freight trains – that is five trains every hour** – the reduction in exposure to conflicts between modes is enormous. This is of particular concern to the community because the BNSF rail corridor is the route for commodity travel from the North American interior through Spokane Valley on its way to west coast terminals. To illustrate the magnitude of shipments, the **Washington State Department of Ecology estimates that 2.87 billion gallons per year of Bakken oil travels through Spokane Valley**[6]. This project eliminates the risk of fatalities, serious injuries, and road-related commodity spills that can happen at any roadway-railway at-grade crossing. This project eliminates two at-grade crossings, including one that is on a well-traveled arterial route.

In addition to the positive outcomes of the roadway-railway at-grade closures, the project offers additional safety benefits by improving the configuration of the Barker Road intersection with Trent Avenue (SR 290). Barker Road northbound traffic has difficulty accessing SR 290 due to its high speeds and traffic volumes. Northbound Barker Road traffic faces additional challenges when making a left turn onto SR 290 due to a relatively poor sightline, and the need for drivers to watch for traffic heading east and two different traffic flows heading west (Wellesley Avenue and SR290/Trent Avenue). Traffic on SR 290 has a limited westerly field of vision, preventing drivers from seeing appropriate gaps in oncoming traffic. The result is a highway intersection upgrade that addresses and resolves speed and sight distance issues.

The safety of pedestrians and bicyclists will be enhanced with the addition of ADA-accessible sidewalks and bicycle lanes on the Barker Road overpass.

[6] Maps of Oil Movement across Washington: http://www.ecy.wa.gov/programs/spills/OilMovement/Maps.html

5.1.4 Community and Environmental Outcomes

The Barker Road BNSF Grade Separation project will substantially contribute to the improved livability for residents in the region by enhancing community connectivity while reducing the negative effects of train horn noise and decreasing transportation delays. The BNSF rail corridor bisects the community. The area north of SR 290 is largely residential interspersed with three schools and the Plantes Ferry Park and Sports Complex. South of the BNSF corridor and SR 290 lies the majority of the City's commercial, employment, and residential uses. This project will help knit together the northern and southern sectors of the community by eliminating barriers that impede mobility. The project delivers additional north-south grade separated connections that allow travelers to avoid the long waits for passing trains.

This project enhances access to the Centennial Trail and nearby river recreation activities, which makes the area an attractive place to live, work, and play.

The project will complete key gaps in the City's pedestrian and bicycle networks that provide transportation and recreational options. Sidewalks and bicycle lanes are proposed for Barker Road. SRTC's Horizon 2040 Plan shows the planned pedestrian and bicycle networks. This project enhances the unique characteristics of Spokane Valley. Barker Road is a gateway for access to the 37.5-mile paved, mixed-use Centennial Trail that runs along the Spokane River between Spokane, Washington and Coeur d'Alene, Idaho. Barker Road has an existing trailhead for the Centennial Trail 1.5 miles south of the project site with direct access to the Spokane River. During springtime, the Spokane River offers some of the most attractive river rafting and kayaking opportunities in the Inland Northwest. Many river users access the Spokane River at Barker Road because it is the midway point between unrestricted river use (i.e. no dams or diversions) between the crossing at the Idaho-Washington border and Plantes Ferry Park, providing access to over 12 miles of recreational river usage. Plantes Ferry Park and Sports Complex, located north of SR 290, is a 95-acre regional sports complex with sporting fields, trails, picnic areas, and playgrounds. This project significantly improves connections to these community amenities.

This project will eliminate train horns that cause noise pollution approximately 5.6 hours per day at each crossing.

In addition to the community benefits, the grade separation of the BNSF rail line also generates environmental benefits in reduced noise and air pollution. Without safety measures, federal law requires locomotives to sound their horns at 96 to 110 decibels as they approach at-grade crossings. The horns must continue blowing until the train clears the intersection. For Spokane Valley residents this represents a seemingly continuous sounding of horns along the BNSF corridor from Barker Road to Pines Road. With a grade separation at Barker Road and the closure of the Flora Road at-grade crossing, the required sounding of the horn is eliminated in a 3.7-mile stretch (Vista Road to Evergreen Road), resulting in a significant reduction in noise pollution.

Air quality and fuel efficiency also receive a boost from this project. Vehicles will no longer sit idling as 56 trains per day cross a key north-south route. With trains nearly one and a half miles in length, crossings are closed for approximately three to five minutes for each train to pass and then vehicles are further delayed as the traffic clears. In that time, idling vehicles are consuming fuel and emitting harmful air pollutants. Spokane Valley and the rest of the region are identified by the U.S. Environmental Protection Agency (EPA) as maintenance areas for Particulate Matter (PM_{10}) and Carbon Monoxide (CO). With the grade separation, the fuel use from idling drops from an estimated 30,777 gallons per year to 0 (in Year 2022), providing a significant annual reduction in CO, particulate matter, and greenhouse gas as compared with the current configuration.[7]

5.2 Other Review Selection Criteria

This section shows how the project meets the other review selection criteria being considered by the U.S. DOT: partnership and innovation, as well as cost share.

5.2.1 Partnership and Innovation

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 Bridging the Valley Transportation Study completed in 2004 and subsequent workshops, stakeholder outreach, and funding initiatives to further this effort.

Bridging the Valley Partners

State and Local Agencies

- Idaho Transportation Department
- Washington State Department of Transportation
- Washington Freight Mobility Strategic Investment Board
- Washington Utility and Transportation Commission
- State and Federal Legislators

Regional Agencies

- Spokane Regional Transportation Council
- Spokane Transit Authority
- Kootenai Metropolitan Planning Organization

Railroads

- BNSF Railway
- Union Pacific Railroad

Local Agencies and Districts

- Kootenai County
- Spokane County
- City of Athol
- Town of Millwood
- City of Rathdrum
- City of Spokane
- City of Spokane Valley
- Area Fire Districts/Emergency Response Systems
- Area School Districts

Chambers of Commerce

- Spokane Valley
- Spokane Regional

The significance of this project can be shown through the partnership Spokane Valley has with the Washington State Freight Mobility and Strategic Investment Board (FMSIB). The FMSIB recognizes the need to improve the efficient movement of freight through the Spokane Region and has committed to funding 20% of construction costs for the Barker Road BNSF grade separation project up to a total of $10 million. **This project also enjoys the benefit of a partnership with the BNSF Railroad, who plans to contribute several hundreds of thousands of dollars (per CFR 646.210) in additional matching funds.**

[7] Spokane Valley FASTLANE Appendix B: Benefit Cost Analysis Summary

The City of Spokane Valley has a great working relationship with WSDOT, and we collaborate on roughly 10 to 20 projects per year. WSDOT maintains and operates 26 miles of state roadways within Spokane Valley. The City and WSDOT are both members of the Spokane Regional Transportation Management Center (SRTMC) and work together to provide active regional transportation systems management and operations (e.g. incident management, traveler information). WSDOT and the City have delivered several intelligent transportation system (ITS) projects together, and WSDOT operates and maintains City traffic signals and ITS infrastructure on the state highways within the City through a long-standing Interlocal Agreement. The City and WSDOT collaboratively review traffic impact studies and permits for properties on Trent Avenue (SR 290). Other recent joint projects include planning efforts for three interchange justification reports (IJRs), paving projects, and bridge projects. The City worked closely with WSDOT on the recent development of the consultant engineering scope of services for the Barker Road BNSF grade separation project that should be executed soon.

The City coordinates with BNSF Railway regarding the roadway crossings (at-grade and grade-separated) throughout the city. The two entities have worked together to complete several crossing diagnostic reviews in the past few years and coordinate all regularly scheduled and unplanned maintenance activities. In recent years, the City and BNSF have worked together to add an expansion joint to the Fancher Road overpass, enhance safety at the Vista Road at-grade crossing, and add barrier curb at the Park Road at-grade crossing. The City worked with BNSF while developing the consultant engineering scope of services for the Barker Road BNSF grade separation project to account for BNSF requirements.

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

5.2.2 Cost Share

The 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 inconceivable. 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. Grade separation projects are commonly completed as public-private partnerships. This is true for the Barker Road grade separation. BNSF is contributing funding to the project in partnership with the City of Spokane Valley and Washington State. The

project also benefits from previous federal funding allocated for this project. The City of Spokane Valley is sufficiently positioned to financially deliver this project with the assistance of the FASTLANE funding.

6 Small Project Requirements

The proposed project, while categorized as a small project, meets the large project criteria for FASTLANE funding due to its ability to provide regional and state benefits (parenthesis indicate report section where each is discussed):

- ✓ Project generates national or regional economic, mobility, or safety benefits (5.1)
- ✓ Is cost-effective (7)
- ✓ Contributes to one or more goals described in 23 U.S.C. 150 (1.3)
- ✓ Based on the results of preliminary engineering (8.1)
- ✓ Has one or more stable and dependable funding or financing sources to construct, maintain, and operate and contingency amounts to cover unanticipated costs (4.2)
- ✓ Cannot be easily and efficiently completed without other federal funding or financial assistance (5.2.2)
- ✓ Reasonably expected to begin construction no later than 18 months after the date of obligation (8)

7 Cost-Effectiveness Analysis

This $36,035,000 capital project (in year of expenditure dollars) discounted at three percent has a net present value of $74.4 million and a **benefit-cost ratio of 3.1**. Discounted at seven percent, the project has a net present value of $12.0 million and a benefit-cost ratio of 1.4 as shown in Table 4. The cost-effectiveness of the project is largely due to the reduction of vehicle hours of delay but is also attributed to eliminating the safety risks of at-grade crossings, reductions in emissions, and reduced operating costs over the life cycle of the project.

The factors (and their sources) used for the benefit-cost calculations are provided in Appendix B. The Excel spreadsheet included with this grant application shows results using discount rates of both three and seven percent as noted in U.S. DOT's *BCA Resource Guide*.

Table 4. Benefit/Cost Analysis Summary

	Present Value of Capital Costs	Benefits Total	Net Present Value	Benefit/Cost Ratio
Discounted at 3%	($34,707,273)	$109,086,327	$74,379,053	3.1
Discounted at 7%	($28,063,105)	$40,102,238	$12,039,133	1.4

8 Project Readiness

With the help of FASTLANE funding, the Barker Road/BNSF Grade Separation Project is expected to begin construction well before the grant deadline and be fully constructed by September 2020. 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. The City is moving ahead with the final design of the Barker Road/BNSF grade separation project and expects to have a design contract executed this month (December 2016). Federal and city funds will be used to complete the design in 2017.

8.1 Technical Feasibility

The technical feasibility of the proposed improvements has been thoroughly established through previous planning and preliminary engineering efforts. This section describes the statement of work, design criteria and basis of design, basis of cost estimate and contingency levels, and scope/schedule/budget risk mitigation measures.

8.1.1 Statement of Work

This project will construct a grade-separated overcrossing of Barker Road at the BNSF Railway and also closes the at-grade crossing of the BNSF Railway at Flora Road. Figure 4 illustrates and lists the key design features of the project. Table 5 provides the detailed project scope of work pertaining to how the design and construction will be achieved for the project.

8.1.2 Design Criteria and Basis of Design

The oversight of the project design and construction will be a joint effort by the City of Spokane Valley, WSDOT, and BNSF Railway. Project roles for each stakeholder are described in Section 3. Design criteria was identified in the Bridging the Valley preliminary engineering effort and includes national standards as well as City, WSDOT, and BNSF standards. The process will follow WSDOT's project development and delivery procedures and standards supplemented with City procedures and standards as applicable to the project. Procedures and design criteria from the *BNSF-UPRR Guidelines for Railroad Grade Separation Projects* will also guide the project. The City, WSDOT, and BNSF collaborated on the design criteria and basis of design in 2016 during development of an engineering services contract, which is expected to be executed later this month (December 2016).

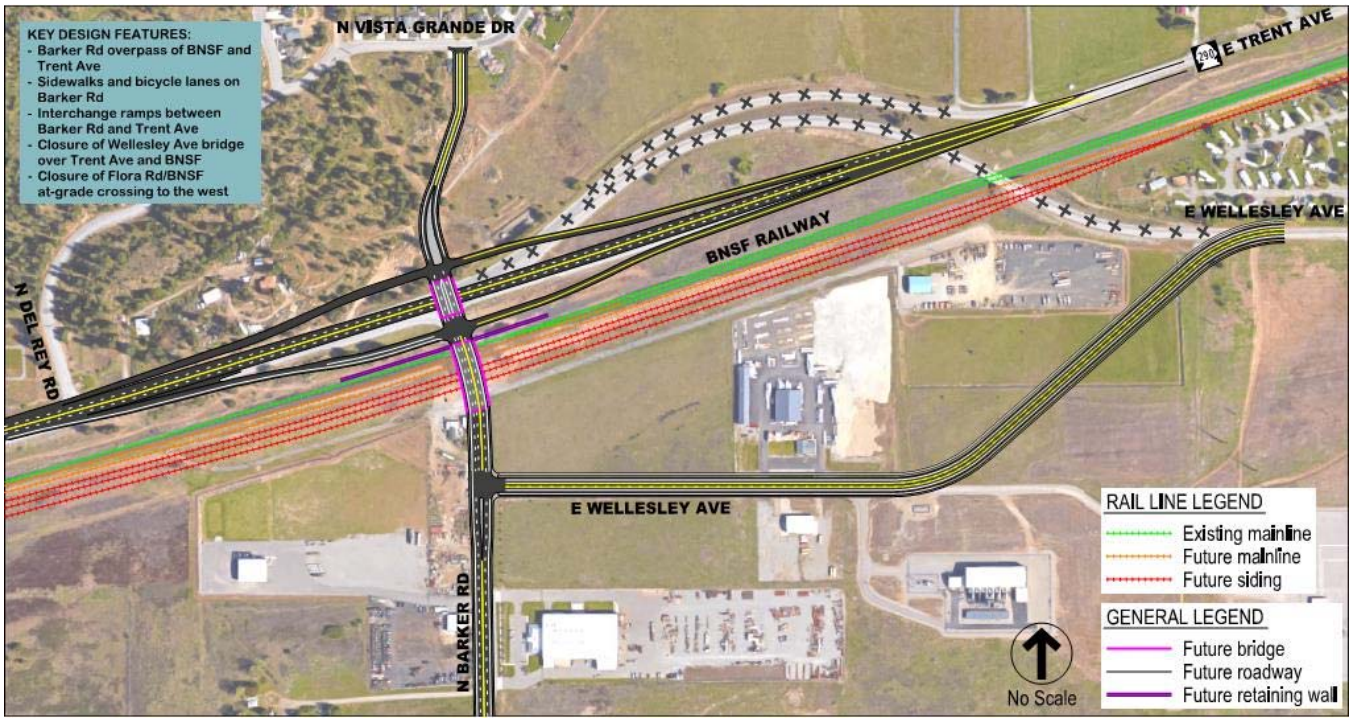


Figure 4. Barker Road/BNSF Grade Separation Conceptual Layout

Table 5. Project Scope of Work

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

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

8.1.3 Basis of Cost Estimate and Contingency Levels

Cost estimates have been completed for the 30 percent design effort completed in 2004. The Barker Road/BNSF Grade Separation cost estimate was updated in 2014 as part of a previous funding request. The estimate included inflation through the end of the construction period and a 30 percent contingency for construction costs. A detailed cost estimate is included in Appendix B.

8.1.4 Scope, Schedule, and Budget Risk Mitigation Measures

The scope, schedule, and budget risks for this project are low because the engineering is already 30 percent complete and the project details have been vetted through numerous planning and design efforts. Both the City of Spokane Valley and WSDOT have proven design standards and project delivery procedures in place.

8.2 Project Schedule

The project schedule shown in Figure 5 includes the major project milestones for right-of-way acquisition, engineering, and construction and demonstrates that the project easily meets the funding obligation and construction deadlines required by the FASTLANE grant program. Environmental approval was obtained through NEPA in 2006 as part of the Bridging the Valley environmental documentation process. Project-specific NEPA documentation will be developed as part of the engineering effort and approval is anticipated by October 2017. The schedule takes into account procurement and review timelines. With FASTLANE funding, the full project will be constructed by June 2020.

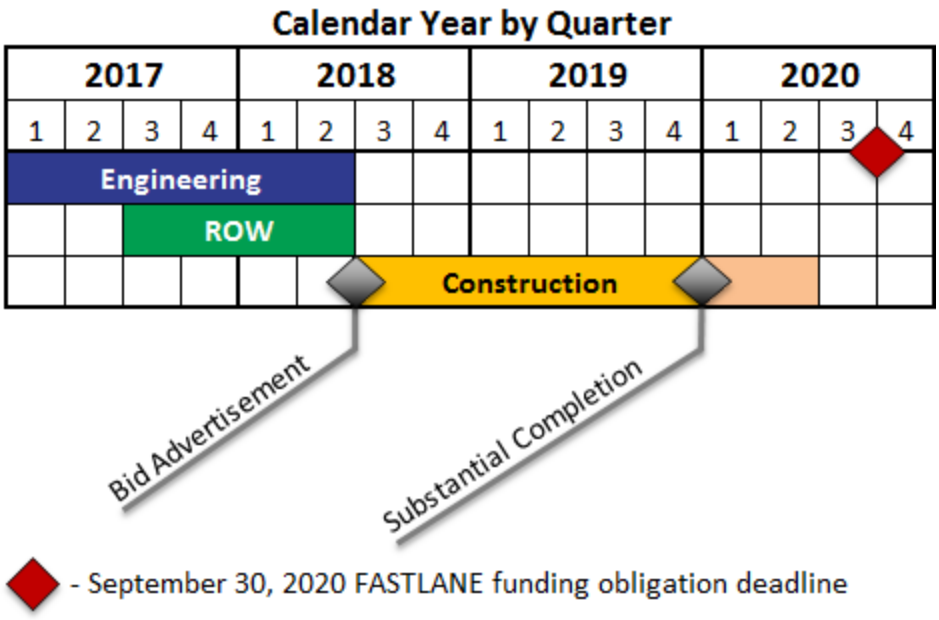


Figure 5. Project Schedule

The FASTLANE FY16 application schedule went through December 2019 and the FASTLANE FY16 funding obligation deadline was September 30, 2019.

8.3 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.

8.3.1 Environmental Permits and Reviews

The project has completed the environmental process as follows:

Environmental Process	Completed Efforts
National Environmental Protection Agency (NEPA) and State EPA (SEPA) Status	The project has **already received NEPA Class II Categorical Exclusion and SEPA Categorical Exemption** per WAC 197-11-800 on August 22, 2006. The approval documentation is posted on the City's website[8]. Project-specific NEPA documentation will be developed as part of the engineering effort and approval is anticipated by October 2017.
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 5.2.1 participated in reviews. This included reviews by the City of Spokane Valley, WSDOT, and BNSF.
Environmental Studies and other Documents	Full environmental documentation in hard copy is on file at the Spokane Regional Transportation Council (SRTC). Copies are available upon request. The project was found to have no effect for most environmental components. Where there are small environmental impacts, mitigation measures have been identified and include procedures for hazmat disposal, erosion control, and stormwater treatment facilities.
DOT Discussions on NEPA Compliance	The project team coordinated with WSDOT to obtain SEPA approval concurrently with the NEPA approval.
Public Engagement	Extensive public engagement has been an on-going effort as part of the Bridging the Valley planning and engineering efforts. A Strategic Advisory Committee (SAC) was formed to oversee public engagement. Efforts included public open houses, alternatives workshops, site visits with neighborhoods at each crossing in Washington and Idaho, mailings, and outreach. Public support has been overwhelmingly positive. Public engagement will continue through the right-of-way, engineering, and construction of this project.

[8] http://www.spokanevalley.org/filestorage/6836/6914/BTV-Local_Agency_Env_Classification_Summary.pdf

8.3.2 State and Local Approvals

The Barker Road/ BNSF Grade Separation project is included in the STIP, Horizon 2040 Metropolitan Transportation Plan, and the Spokane Valley TIP. A STIP amendment was obtained earlier this year to proceed with the full engineering phase of the project. Additional right-of-way, engineering, and construction approvals will be obtained from the City, WSDOT, and BNSF at key milestones throughout the project.

8.3.3 State and Local Planning

Significant planning and preliminary engineering for this project have been completed. These efforts show that the proposed project is not only feasible but has the support of all project partners, the community, the region, and beyond:

Planning or Design Effort	Project Elements
Bridging the Valley Planning Study	• *Grade Separation Analysis:* development, evaluation, refinement, and documentation of grade separation alternatives to support transportation needs and BNSF operations • *Traffic Analysis:* evaluation of traffic impacts associated with each alternative for 2001 and 2020 • *Economic Analysis:* benefit-cost analysis of all alternatives
Bridging the Valley 30% Preliminary Engineering	• Right-of-Way needs were determined for this project • Design reports (including criteria), 30% plans, cost estimate, and environmental documentation were performed for these projects
Inland Pacific Hub Transportation Investment and Project Priority Blueprint	• Lists the Bridging the Valley grade separation projects as priority rail improvement projects with significant project synergy economic benefits • Demonstrates support from local partners and identifies a midterm construction period of 2016-2021
Washington State Freight Mobility Plan 2014	• Identifies project for future implementation
Horizon 2040 Metropolitan Transportation Plan	• Identifies this project and other Bridging the Valley grade separation projects
Spokane Valley Comprehensive Plan (2014)	• Goal to support and encourage the continued viability of passenger and freight rail system in the region; Policy to support Bridging the Valley grade separation projects
City of Spokane Valley TIP	• Includes project funding for early pre-construction activities
Fiscal and Economic Analysis of Project	• Analysis of incremental development, tax revenue benefits, economic output, jobs, and wages showing the significant benefit of implementing this project (see Appendix C for full report)

8.4 Assessment of Project Risks and Mitigation Strategies

We have identified the following potential project risks and the associated mitigation measures:

Potential Risks	Mitigation Measures
Project Funding	The City has multiple options for meeting the project's remaining financing needs. The FMSIB funding for the Barker Road/BNSF Grade Separation is a match for 20% of the construction costs up to $10 million. Current estimates show only $7.2 million of this funding is needed, which leaves a surplus of $2.8 million if construction costs are higher than anticipated. The City plans to actively pursue other funding opportunities including TIB. The City Council will consider providing additional funding, including selling bonds. The project schedule also allows some leeway to obtain funding for the construction phase.
Environmental Issues	The project has already received NEPA approval for a categorical exclusion, and minor mitigation measures (e.g. erosion control, stormwater treatment) have been identified. This information will be used to complete project-specific NEPA documentation.
Utility Conflicts	Potential utility issues were identified during the 30% preliminary engineering, which means utility coordination can start early.
Right-of-Way Acquisition	On-going engagement with the public has built positive support for development potential. These efforts will be continued.

Appendix A.

Letters of Support

- Letters of support for this project are posted on the City's website:

  http://www.spokanevalley.org/content/6836/6914/9948.aspx

Appendix B.

Benefit-Cost Analysis (BCA) and Cost Estimate Summary

- Benefit-Cost Analysis (BCA)
- Cost Estimate Summary for Barker Road/BNSF Grade Separation Project

December 2016

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Table 1 General Inputs

Input #	Input Name	Units	Value
1	Real discount factor - scenario 1	%	7%
2	Real discount factor - scenario 2	%	3%
3	Base Year of Analysis	year	2015
4	Project Start Date	date	2018
5	Project End Date	date	2020
6	Benefits Start Date	date	2020
7	End Date of Analysis	date	2069
8	Number of days Freight Trains Running per year	days	365
9	Number of days Passenger Trains Running per year	days	365
10	Feet per Mile	feet	5,280
11	Grams per Short Ton	grams	907,185
12	Average Vehicle Speed Through Crossing	mph	45
13	Design Start Year	year	2017
14	Growth assumptions for train travel:	%	3.40%

Table 2 Summary of the benefits of the infrastructure improvements

		Barker
1	**Travel Time Savings**	$25.67
2	**Safety**	$12.03
3	**Operating Costs**	$1.45
4	**Environment and Emissions**	$0.95

Table 3 Anticipated funding sources and project costs

Funding Source	Barker Rd	% of Total Cost		
Fastlane Grant	$21,621,000	60.0%	**62.0%**	**Federal Funds**
2009 Federal Earmark	$720,000	2.0%		
City of Spokane Valley	$1,800,000	5.0%	**38.0%**	**Non-Federal Funds**
Washington State FMSIB *	$7,207,000	20.0%		
BNSF **	$432,420	1.2%		
Other (e.g., TIB) ***	$4,254,580	11.8%		
Total	**$36,035,000**	100.0%	100.0%	

*** FMSIB has committed to funding 20 percent of total Barker project costs, up to $10M.**

**** Per 23 CFR 646.10 (need more background on how this was calculated; used Barker # from 2015 TIGER application)**

***** Other expected funding sources may come from TIB.**

Table 4 Summary of Undiscounted Barker Benefits vs Costs per year

Year	Project Year	Barker undiscounted Cost	Barker Undiscounted Benefit	Barker Undiscounted Benefit-Cost	Barker Benefit /Cost Ratio
2017	1	-$2,860,000	$0	-$2,860,000	
2018	2	-$9,820,000	$0	-$9,820,000	
2019	3	-$15,570,000	$0	-$15,570,000	
2020	4	-$7,785,000	$2,205,616	-$5,579,384	
2021	5	-$9,000	$2,276,442	$2,267,442	
2022	6	-$9,201	$2,350,748	$2,341,547	
2023	7	-$9,406	$2,428,090	$2,418,684	
2024	8	-$9,616	$2,508,261	$2,498,645	
2025	9	-$9,831	$2,592,063	$2,582,232	
2026	10	-$10,050	$2,678,869	$2,668,819	
2027	11	-$10,274	$2,769,304	$2,759,030	
2028	12	-$10,503	$2,863,473	$2,852,969	
2029	13	-$10,738	$2,961,887	$2,951,149	
2030	14	-$10,977	$3,064,168	$3,053,190	
2031	15	-$11,222	$3,171,346	$3,160,124	
2032	16	-$11,473	$3,283,813	$3,272,340	
2033	17	-$11,729	$3,400,929	$3,389,200	
2034	18	-$11,990	$3,523,478	$3,511,488	
2035	19	-$12,258	$3,647,524	$3,635,266	
2036	20	-$12,531	$3,779,729	$3,767,198	
2037	21	-$12,811	$3,917,715	$3,904,904	
2038	22	-$13,097	$4,062,654	$4,049,557	
2039	23	-$13,389	$4,214,880	$4,201,491	
2040	24	-$13,688	$4,374,015	$4,360,327	
2041	25	-$13,993	$4,537,977	$4,523,984	
2042	26	-$14,305	$4,709,314	$4,695,008	
2043	27	-$14,625	$4,889,123	$4,874,499	
2044	28	-$14,951	$5,077,439	$5,062,488	
2045	29	-$15,284	$5,274,683	$5,259,399	
2046	30	-$15,626	$5,481,309	$5,465,683	
2047	31	-$15,974	$5,697,797	$5,681,823	

Year	Project Year	Barker undiscounted Cost	Barker Undiscounted Benefit	Barker Undiscounted Benefit-Cost	Barker Benefit /Cost Ratio
2048	32	-$16,331	$5,925,112	$5,908,781	
2049	33	-$16,695	$6,162,916	$6,146,221	
2050	34	-$17,067	$6,412,234	$6,395,166	
2051	35	-$17,448	$6,673,683	$6,656,235	
2052	36	-$17,838	$6,947,921	$6,930,084	
2053	37	-$18,236	$7,235,646	$7,217,410	
2054	38	-$18,642	$7,537,598	$7,518,955	
2055	39	-$19,058	$7,854,562	$7,835,504	
2056	40	-$19,484	$8,187,372	$8,167,888	
2057	41	-$19,918	$8,536,911	$8,516,993	
2058	42	-$20,363	$8,904,117	$8,883,755	
2059	43	-$20,817	$9,289,985	$9,269,168	
2060	44	-$21,282	$9,695,568	$9,674,286	
2061	45	-$21,757	$10,121,984	$10,100,228	
2062	46	-$22,242	$10,570,421	$10,548,179	
2063	47	-$22,738	$11,042,136	$11,019,397	
2064	48	-$23,246	$11,538,463	$11,515,218	
2065	49	-$23,764	$12,060,819	$12,037,054	
2066	50	-$24,294	$12,610,704	$12,586,409	
2067	51	-$24,837	$13,189,712	$13,164,876	
2068	52	-$25,391	$13,799,533	$13,774,143	
2069	53	-$25,957	$14,441,961	$14,416,004	
Sum		-$36,820,946	$310,482,003	$273,661,057	8.4

Table 5 Summary of 7% discounted Barker Benefits vs Costs per year

Year	Project Year	Barker 7% discounted Cost	Barker 7% Discounted Benefit	Barker Net 7% Discounted Benefit	Barker Benefit /Cost Ratio
2017	1	-$2,498,035	$0	-$2,498,035	
2018	2	-$8,016,045	$0	-$8,016,045	
2019	3	-$11,878,278	$0	-$11,878,278	
2020	4	-$5,550,597	$1,574,008	-$3,976,589	
2021	5	-$5,997	$1,518,570	$1,512,573	
2022	6	-$5,730	$1,465,885	$1,460,155	
2023	7	-$5,474	$1,415,449	$1,409,975	
2024	8	-$5,230	$1,366,885	$1,361,654	
2025	9	-$4,997	$1,320,508	$1,315,510	
2026	10	-$4,775	$1,275,821	$1,271,047	
2027	11	-$4,562	$1,232,989	$1,228,427	
2028	12	-$4,359	$1,191,898	$1,187,539	
2029	13	-$4,164	$1,152,531	$1,148,367	
2030	14	-$3,979	$1,114,724	$1,110,745	
2031	15	-$3,801	$1,078,717	$1,074,916	
2032	16	-$3,632	$1,044,313	$1,040,681	
2033	17	-$3,470	$1,011,223	$1,007,753	
2034	18	-$3,315	$979,551	$976,236	
2035	19	-$3,168	$948,138	$944,970	
2036	20	-$3,026	$918,670	$915,644	
2037	21	-$2,892	$890,364	$887,473	
2038	22	-$2,763	$863,357	$860,594	
2039	23	-$2,640	$837,671	$835,031	
2040	24	-$2,522	$812,902	$810,380	
2041	25	-$2,410	$788,684	$786,275	
2042	26	-$2,302	$765,302	$763,000	
2043	27	-$2,200	$743,037	$740,838	
2044	28	-$2,102	$721,674	$719,573	
2045	29	-$2,008	$701,170	$699,162	
2046	30	-$1,918	$681,482	$679,564	

Year	Project Year	Barker 7% discounted Cost	Barker 7% Discounted Benefit	Barker Net 7% Discounted Benefit	Barker Benefit /Cost Ratio
2047	31	-$1,833	$662,575	$660,742	
2048	32	-$1,751	$644,582	$642,831	
2049	33	-$1,673	$627,132	$625,459	
2050	34	-$1,599	$610,366	$608,768	
2051	35	-$1,527	$594,254	$592,727	
2052	36	-$1,459	$578,770	$577,310	
2053	37	-$1,394	$563,886	$562,492	
2054	38	-$1,332	$549,578	$548,246	
2055	39	-$1,273	$535,824	$534,551	
2056	40	-$1,216	$522,600	$521,384	
2057	41	-$1,162	$509,886	$508,724	
2058	42	-$1,110	$497,660	$496,550	
2059	43	-$1,061	$485,905	$484,845	
2060	44	-$1,013	$474,601	$473,588	
2061	45	-$968	$463,731	$462,763	
2062	46	-$925	$453,278	$452,353	
2063	47	-$884	$443,226	$442,342	
2064	48	-$844	$433,559	$432,715	
2065	49	-$807	$424,264	$423,457	
2066	50	-$771	$415,325	$414,554	
2067	51	-$736	$406,729	$405,993	
2068	52	-$704	$398,464	$397,761	
2069	53	-$672	$390,518	$389,845	
Sum		-$28,063,105	$40,102,238	$12,039,133	1.4

Table 6 Summary of 3% discounted Barker Benefits vs Costs per year

Year	Project Year	Barker 3% Discounted Cost	Barker 3% Discounted Benefit	Barker Net 3% Discounted Benefit	Barker Benifit/Cost Ratio
2017	1	-$2,695,824	$0	-$2,695,824	
2018	2	-$9,256,292	$0	-$9,256,292	
2019	3	-$14,676,218	$0	-$14,676,218	
2020	4	-$7,338,109	$1,902,584	-$5,435,525	
2021	5	-$8,483	$1,885,547	$1,877,064	
2022	6	-$8,673	$1,887,446	$1,878,773	
2023	7	-$8,866	$1,889,989	$1,881,123	
2024	8	-$9,064	$1,892,856	$1,883,792	
2025	9	-$9,266	$1,896,540	$1,887,274	
2026	10	-$9,473	$1,900,457	$1,890,984	
2027	11	-$9,684	$1,904,990	$1,895,306	
2028	12	-$9,900	$1,910,093	$1,900,193	
2029	13	-$10,121	$1,915,956	$1,905,835	
2030	14	-$10,347	$1,922,273	$1,911,925	
2031	15	-$10,578	$1,929,411	$1,918,833	
2032	16	-$10,814	$1,937,445	$1,926,631	
2033	17	-$11,055	$1,946,005	$1,934,950	
2034	18	-$11,302	$1,955,343	$1,944,041	
2035	19	-$11,554	$1,963,211	$1,951,657	
2036	20	-$11,812	$1,973,121	$1,961,309	
2037	21	-$12,076	$1,983,651	$1,971,575	
2038	22	-$12,345	$1,995,146	$1,982,801	
2039	23	-$12,620	$2,007,702	$1,995,082	
2040	24	-$12,902	$2,020,961	$2,008,059	
2041	25	-$13,190	$2,034,852	$2,021,662	
2042	26	-$13,484	$2,049,447	$2,035,963	
2043	27	-$13,785	$2,065,072	$2,051,287	
2044	28	-$14,093	$2,081,558	$2,067,465	
2045	29	-$14,407	$2,098,907	$2,084,500	
2046	30	-$14,729	$2,117,126	$2,102,398	
2047	31	-$15,057	$2,136,224	$2,121,167	
2048	32	-$15,393	$2,156,383	$2,140,990	

Year	Project Year	Barker 3% Discounted Cost	Barker 3% Discounted Benefit	Barker Net 3% Discounted Benefit	Barker Benifit/Cost Ratio
2049	33	-$15,737	$2,177,279	$2,161,543	
2050	34	-$16,088	$2,199,102	$2,183,014	
2051	35	-$16,447	$2,221,871	$2,205,424	
2052	36	-$16,814	$2,245,607	$2,228,794	
2053	37	-$17,189	$2,270,334	$2,253,146	
2054	38	-$17,572	$2,296,078	$2,278,505	
2055	39	-$17,964	$2,322,863	$2,304,899	
2056	40	-$18,365	$2,350,720	$2,332,355	
2057	41	-$18,775	$2,379,677	$2,360,902	
2058	42	-$19,194	$2,409,766	$2,390,572	
2059	43	-$19,622	$2,441,020	$2,421,398	
2060	44	-$20,060	$2,473,472	$2,453,412	
2061	45	-$20,508	$2,507,159	$2,486,652	
2062	46	-$20,965	$2,542,118	$2,521,153	
2063	47	-$21,433	$2,578,387	$2,556,954	
2064	48	-$21,911	$2,616,006	$2,594,095	
2065	49	-$22,400	$2,655,017	$2,632,617	
2066	50	-$22,900	$2,695,462	$2,672,562	
2067	51	-$23,411	$2,737,388	$2,713,977	
2068	52	-$23,933	$2,780,839	$2,756,906	
2069	53	-$24,467	$2,825,864	$2,801,396	
Sum		-$34,707,273	$109,086,327	$74,379,053	3.1

Table 7 Summary of Undiscounted Barker Benefits per year

Year	Travel Time Saving at Barker Road	Barker Safety Benefit	Barker Operating Cost	Barker Emissions	Barker Undiscounted Benefit
2020	1,267,768	806,283	$71,873	$59,693	2,205,616
2021	1,316,995	826,237	$74,925	$58,285	2,276,442
2022	1,368,581	846,686	$78,004	$57,476	2,350,748
2023	1,422,392	867,642	$81,122	$56,935	2,428,090
2024	1,478,671	889,118	$84,447	$56,025	2,508,261
2025	1,537,550	911,126	$88,012	$55,375	2,592,063
2026	1,599,165	933,681	$91,810	$54,213	2,678,869
2027	1,663,661	956,796	$95,765	$53,083	2,769,304
2028	1,731,192	980,483	$99,885	$51,912	2,863,473
2029	1,801,921	1,004,759	$104,269	$50,939	2,961,887
2030	1,876,019	1,029,637	$108,743	$49,769	3,064,168
2031	1,953,668	1,055,132	$113,732	$48,814	3,171,346
2032	2,035,061	1,081,259	$119,269	$48,223	3,283,813
2033	2,120,403	1,108,035	$124,955	$47,537	3,400,929
2034	2,209,908	1,135,475	$130,993	$47,102	3,523,478
2035	2,303,805	1,163,596	$137,201	$42,921	3,647,524
2036	2,402,337	1,192,415	$143,897	$41,080	3,779,729
2037	2,505,760	1,221,949	$150,894	$39,111	3,917,715
2038	2,614,347	1,252,216	$158,495	$37,596	4,062,654
2039	2,728,383	1,283,234	$166,449	$36,813	4,214,880
2040	2,848,176	1,315,022	$174,775	$36,043	4,374,015
2041	2,974,047	1,347,598	$180,758	$35,573	4,537,977
2042	3,106,341	1,380,983	$186,993	$34,997	4,709,314
2043	3,245,419	1,415,197	$193,489	$35,019	4,889,123
2044	3,391,666	1,450,259	$200,260	$35,253	5,077,439
2045	3,545,492	1,486,192	$207,320	$35,680	5,274,683
2046	3,707,328	1,523,017	$214,680	$36,284	5,481,309
2047	3,877,633	1,560,755	$222,357	$37,052	5,697,797
2048	4,056,894	1,599,430	$230,365	$38,422	5,925,112
2049	4,245,628	1,639,065	$238,720	$39,504	6,162,916
2050	4,444,380	1,679,684	$247,438	$40,731	6,412,234

Year	Travel Time Saving at Barker Road	Barker Safety Benefit	Barker Operating Cost	Barker Emissions	Barker Undiscounted Benefit
2051	4,653,732	1,721,311	$256,539	$42,101	6,673,683
2052	4,874,300	1,763,971	$266,039	$43,611	6,947,921
2053	5,106,737	1,807,690	$275,958	$45,261	7,235,646
2054	5,351,737	1,852,494	$286,317	$47,050	7,537,598
2055	5,610,035	1,898,410	$297,137	$48,980	7,854,562
2056	5,882,411	1,945,466	$308,441	$51,053	8,187,372
2057	6,169,695	1,993,691	$320,253	$53,273	8,536,911
2058	6,472,764	2,043,112	$332,596	$55,645	8,904,117
2059	6,792,554	2,093,760	$345,499	$58,173	9,289,985
2060	7,130,053	2,145,665	$358,987	$60,862	9,695,568
2061	7,486,314	2,198,859	$373,090	$63,721	10,121,984
2062	7,862,453	2,253,373	$387,839	$66,756	10,570,421
2063	8,259,655	2,309,241	$403,265	$69,975	11,042,136
2064	8,679,178	2,366,495	$419,402	$73,388	11,538,463
2065	9,122,358	2,425,171	$436,286	$77,004	12,060,819
2066	9,590,613	2,485,303	$453,953	$80,834	12,610,704
2067	10,085,451	2,546,929	$472,443	$84,889	13,189,712
2068	10,608,471	2,610,084	$491,797	$89,181	13,799,533
2069	11,161,371	2,674,808	$512,058	$93,724	14,441,961
Sum	218,280,471	78,078,794	$11,519,797	$2,602,941	310,482,003

Table 8 Summary of 7% discounted Barker Benefits per year

Year	Travel Time Saving at Barker Road	Barker Safety Benefit	Barker Operating Cost	Barker Emissions	Barker 7% discounted Benefit
2020	903,901	574,868	$51,244	$43,994	1,574,008
2021	877,569	550,556	$49,926	$40,519	1,518,570
2022	852,284	527,273	$48,577	$37,751	1,465,885
2023	827,845	504,975	$47,214	$35,415	1,415,449
2024	804,299	483,621	$45,933	$33,031	1,366,885
2025	781,612	463,171	$44,741	$30,984	1,320,508
2026	759,752	443,585	$43,618	$28,866	1,275,821
2027	738,685	424,829	$42,521	$26,954	1,232,989
2028	718,383	406,866	$41,449	$25,200	1,191,898
2029	698,816	389,663	$40,437	$23,615	1,152,531
2030	679,956	373,188	$39,414	$22,167	1,114,724
2031	661,775	357,410	$38,525	$21,008	1,078,717
2032	644,248	342,299	$37,758	$20,008	1,044,313
2033	627,351	327,828	$36,970	$19,076	1,011,223
2034	611,058	313,968	$36,221	$18,304	979,551
2035	595,347	300,695	$35,455	$16,640	948,138
2036	580,196	287,984	$34,753	$15,738	918,670
2037	565,583	275,810	$34,059	$14,912	890,364
2038	551,488	264,151	$33,434	$14,283	863,357
2039	537,892	252,985	$32,815	$13,979	837,671
2040	524,774	242,292	$32,202	$13,634	812,902
2041	512,118	232,050	$31,126	$13,391	788,684
2042	499,905	222,242	$30,093	$13,063	765,302
2043	488,118	212,849	$29,101	$12,969	743,037
2044	476,742	203,853	$28,149	$12,930	721,674
2045	465,761	195,237	$27,235	$12,937	701,170
2046	455,160	186,985	$26,357	$12,980	681,482
2047	444,924	179,083	$25,513	$13,055	662,575
2048	435,040	171,514	$24,703	$13,325	644,582
2049	425,494	164,266	$23,924	$13,448	627,132
2050	416,274	157,324	$23,176	$13,593	610,366
2051	407,367	150,676	$22,456	$13,756	594,254

Year	Travel Time Saving at Barker Road	Barker Safety Benefit	Barker Operating Cost	Barker Emissions	Barker 7% discounted Benefit
2052	398,761	144,308	$21,764	$13,936	578,770
2053	390,445	138,210	$21,099	$14,132	563,886
2054	382,408	132,370	$20,459	$14,341	549,578
2055	374,640	126,777	$19,843	$14,564	535,824
2056	367,131	121,420	$19,250	$14,800	522,600
2057	359,869	116,289	$18,680	$15,047	509,886
2058	352,848	111,376	$18,131	$15,306	497,660
2059	346,056	106,670	$17,602	$15,577	485,905
2060	339,487	102,163	$17,093	$15,859	474,601
2061	333,130	97,846	$16,602	$16,153	463,731
2062	326,979	93,712	$16,129	$16,457	453,278
2063	321,026	89,753	$15,674	$16,773	443,226
2064	315,263	85,961	$15,234	$17,101	433,559
2065	309,684	82,329	$14,811	$17,440	424,264
2066	304,280	78,851	$14,403	$17,791	415,325
2067	299,047	75,520	$14,009	$18,154	406,729
2068	293,976	72,329	$13,628	$18,530	398,464
2069	289,064	69,274	$13,262	$18,919	390,518
Sum	25,673,810	12,029,252	1,446,770	952,405	40,102,238

Table 9 Summary of 3% discounted Barker Benefits per year

Year	Travel Time Saving at Barker Road	Barker Safety Benefit	Barker Operating Cost	Barker Emissions	Barker 3% discounted Benefit
2020	1,093,588	695,507	$61,998	$51,492	1,902,584
2021	1,102,963	691,960	$41,812	$48,813	1,885,547
2022	1,112,782	688,433	$39,498	$46,734	1,887,446
2023	1,122,849	684,924	$37,271	$44,945	1,889,989
2024	1,133,278	681,435	$35,204	$42,939	1,892,856
2025	1,144,081	677,964	$33,291	$41,204	1,896,540
2026	1,155,270	674,511	$31,511	$39,164	1,900,457
2027	1,166,858	671,077	$29,823	$37,231	1,904,990
2028	1,178,858	667,661	$28,225	$35,350	1,910,093
2029	1,191,282	664,264	$26,734	$33,676	1,915,956
2030	1,204,145	660,885	$25,298	$31,945	1,922,273
2031	1,217,461	657,523	$24,007	$30,420	1,929,411
2032	1,231,246	654,180	$22,844	$29,176	1,937,445
2033	1,245,513	650,854	$21,716	$27,923	1,946,005
2034	1,260,279	647,546	$20,656	$26,862	1,955,343
2035	1,275,561	644,255	$19,631	$23,764	1,963,211
2036	1,291,375	640,982	$18,681	$22,083	1,973,121
2037	1,307,738	637,726	$17,775	$20,412	1,983,651
2038	1,324,668	634,488	$16,941	$19,049	1,995,146
2039	1,342,184	631,266	$16,143	$18,110	2,007,702
2040	1,360,305	628,062	$15,380	$17,214	2,020,961
2041	1,379,050	624,874	$14,433	$16,495	2,034,852
2042	1,398,441	621,704	$13,547	$15,755	2,049,447
2043	1,418,497	618,550	$12,719	$15,306	2,065,072
2044	1,439,241	615,412	$11,945	$14,959	2,081,558
2045	1,460,696	612,291	$11,220	$14,700	2,098,907
2046	1,482,883	609,187	$10,542	$14,513	2,117,126
2047	1,505,829	606,099	$9,908	$14,389	2,136,224
2048	1,529,556	603,027	$9,314	$14,486	2,156,383
2049	1,554,090	599,971	$8,757	$14,460	2,177,279
2050	1,579,459	596,932	$8,236	$14,475	2,199,102
2051	1,605,689	593,908	$7,748	$14,526	2,221,871

Year	Travel Time Saving at Barker Road	Barker Safety Benefit	Barker Operating Cost	Barker Emissions	Barker 3% discounted Benefit
2052	1,632,807	590,900	$7,291	$14,609	2,245,607
2053	1,660,845	587,908	$6,862	$14,720	2,270,334
2054	1,689,830	584,932	$6,460	$14,856	2,296,078
2055	1,719,795	581,971	$6,083	$15,015	2,322,863
2056	1,750,770	579,025	$5,729	$15,195	2,350,720
2057	1,782,790	576,095	$5,398	$15,394	2,379,677
2058	1,815,888	573,181	$5,086	$15,611	2,409,766
2059	1,850,100	570,281	$4,794	$15,845	2,441,020
2060	1,885,461	567,397	$4,520	$16,094	2,473,472
2061	1,922,010	564,527	$4,262	$16,360	2,507,159
2062	1,959,785	561,673	$4,020	$16,639	2,542,118
2063	1,998,827	558,833	$3,793	$16,934	2,578,387
2064	2,039,175	556,009	$3,579	$17,243	2,616,006
2065	2,080,874	553,199	$3,378	$17,565	2,655,017
2066	2,123,968	550,403	$3,190	$17,902	2,695,462
2067	2,168,501	547,622	$3,012	$18,252	2,737,388
2068	2,214,521	544,856	$2,845	$18,617	2,780,839
2069	2,262,077	542,104	$2,688	$18,995	2,825,864
Sum	76,373,739	30,778,373	785,801	1,148,414	109,086,327

Table 10 Barker Costs per Year

	Barker				
	Maintenance	P.E.+ R/W+ Construction	Total - Undiscounted	Total - Discounted 7%	Total - Discounted 3%
2017	$0	-$2,860,000	-$2,860,000	-$2,498,035	-$2,695,824
2018	$0	-$9,820,000	-$9,820,000	-$8,016,045	-$9,256,292
2019	$0	-$15,570,000	-$15,570,000	-$11,878,278	-$14,676,218
2020	$0	-$7,785,000	-$7,785,000	-$5,550,597	-$7,338,109
2021	-$9,000	$0	-$9,000	-$5,997	-$8,483
2022	-$9,201	$0	-$9,201	-$5,730	-$8,673
2023	-$9,406	$0	-$9,406	-$5,474	-$8,866
2024	-$9,616	$0	-$9,616	-$5,230	-$9,064
2025	-$9,831	$0	-$9,831	-$4,997	-$9,266
2026	-$10,050	$0	-$10,050	-$4,775	-$9,473
2027	-$10,274	$0	-$10,274	-$4,562	-$9,684
2028	-$10,503	$0	-$10,503	-$4,359	-$9,900
2029	-$10,738	$0	-$10,738	-$4,164	-$10,121
2030	-$10,977	$0	-$10,977	-$3,979	-$10,347
2031	-$11,222	$0	-$11,222	-$3,801	-$10,578
2032	-$11,473	$0	-$11,473	-$3,632	-$10,814
2033	-$11,729	$0	-$11,729	-$3,470	-$11,055
2034	-$11,990	$0	-$11,990	-$3,315	-$11,302
2035	-$12,258	$0	-$12,258	-$3,168	-$11,554
2036	-$12,531	$0	-$12,531	-$3,026	-$11,812
2037	-$12,811	$0	-$12,811	-$2,892	-$12,076
2038	-$13,097	$0	-$13,097	-$2,763	-$12,345
2039	-$13,389	$0	-$13,389	-$2,640	-$12,620
2040	-$13,688	$0	-$13,688	-$2,522	-$12,902
2041	-$13,993	$0	-$13,993	-$2,410	-$13,190
2042	-$14,305	$0	-$14,305	-$2,302	-$13,484
2043	-$14,625	$0	-$14,625	-$2,200	-$13,785
2044	-$14,951	$0	-$14,951	-$2,102	-$14,093
2045	-$15,284	$0	-$15,284	-$2,008	-$14,407
2046	-$15,626	$0	-$15,626	-$1,918	-$14,729
2047	-$15,974	$0	-$15,974	-$1,833	-$15,057
2048	-$16,331	$0	-$16,331	-$1,751	-$15,393

	Barker				
	Maintenance	P.E.+ R/W+ Construction	Total - Undiscounted	Total - Discounted 7%	Total - Discounted 3%
2049	-$16,695	$0	-$16,695	-$1,673	-$15,737
2050	-$17,067	$0	-$17,067	-$1,599	-$16,088
2051	-$17,448	$0	-$17,448	-$1,527	-$16,447
2052	-$17,838	$0	-$17,838	-$1,459	-$16,814
2053	-$18,236	$0	-$18,236	-$1,394	-$17,189
2054	-$18,642	$0	-$18,642	-$1,332	-$17,572
2055	-$19,058	$0	-$19,058	-$1,273	-$17,964
2056	-$19,484	$0	-$19,484	-$1,216	-$18,365
2057	-$19,918	$0	-$19,918	-$1,162	-$18,775
2058	-$20,363	$0	-$20,363	-$1,110	-$19,194
2059	-$20,817	$0	-$20,817	-$1,061	-$19,622
2060	-$21,282	$0	-$21,282	-$1,013	-$20,060
2061	-$21,757	$0	-$21,757	-$968	-$20,508
2062	-$22,242	$0	-$22,242	-$925	-$20,965
2063	-$22,738	$0	-$22,738	-$884	-$21,433
2064	-$23,246	$0	-$23,246	-$844	-$21,911
2065	-$23,764	$0	-$23,764	-$807	-$22,400
2066	-$24,294	$0	-$24,294	-$771	-$22,900
2067	-$24,837	$0	-$24,837	-$736	-$23,411
2068	-$25,391	$0	-$25,391	-$704	-$23,933
2069	-$25,957	$0	-$25,957	-$672	-$24,467

Table 11 Inputs and Assumptions for Barker Vehicle Delay

Input #	Input Name	Units	Value	Source/Comment
1	2016 - No. of Freight Trains Passing the Crossing/ day	trains/day	56	http://goo.gl/UlvLS0 http://goo.gl/1j9AKd http://goo.gl/j6CsrA http://goo.gl/SPthLH
2	2069 No. of Freight Trains Passing the Crossing/ day	trains/day	288	http://goo.gl/SPthLH
3	2016 No. of Passenger Trains Passing the Crossing/ day	trains/day	2	http://goo.gl/UlvLS0
4	Expected Passenger Annual Traffic Growth	%	2%	Estimate from DKS
5	Avg. Speed of Freight Train	mph	25	Speed Regulations in the BNSF Spokane area | http://goo.gl/2pXWk1
6	Avg. Speed of Passenger Train	mph	30	Speed Regulations in the BNSF Spokane area | http://goo.gl/2pXWk1
7	Avg. Freight Train Length	feet	6500	http://goo.gl/go220P http://goo.gl/mlLOIp
8	Avg. Passenger Train Length	feet	1000	
9	Barker/ Trent Intersection Annual Veh. Growth	%	1.40%	
10	N Del Rey Residential Area Annual Veh. Growth	%	5.50%	
11	Time of Lead/ Lag	minutes	0.6	
12	2016 Avg. Daily Traffic (ADT) at the Grade Crossing	vehicles	5500	http://goo.gl/UlvLS0 | then filter for Washington State, Spokane
13	2069 Avg. Daily Traffic (ADT) at the Grade Crossing	vehicles	8150	
14	Year of ADT	year	2016	
15	Automobile Driver and Passenger Value of Time	$/hour	12.5	https://goo.gl/VAR0hX
16	Bus Passenger Value of Time	$/hour	15	
17	Truck Driver Value of Time	$/hour	25.8	
18	Bus Driver Value of Time	$/hour	26.7	
19	Value of Time Annual Growth Rate	%	1.45%	
20	2016 Avg. Daily Traffic (ADT) to N Del Rey Residential Area	vehicles	1500	
21	Base Case Distance from Grade Crossing to N Del Rey Residential Area	miles	0.6	Google Earth Measurement | https://goo.gl/8cw97c
22	Alt Case Distance from Grade Crossing to N Del Rey Residential Area	miles	0.2	Google Earth Measurement | https://goo.gl/8cw97c
23	Base Case Avg. Veh. Speed	mph	12	Two one minute stops at Trent/Barker, and Trent/N DelRay Dr | https://goo.gl/8cw97c
24	Alt Case Avg. Veh. Speed	mph	30	Estimate from DKS
25	% of Automobiles of Total Traffic	%	87.00%	Estimate from DKS
26	% of Buses of Total Traffic	%	1.00%	Estimate from DKS
27	% of Trucks of Total Traffic	%	12.00%	Estimate from DKS
28	Avg. No. of Persons/ Automobile	persons	1.6	http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/CAFE_2012-2016_FRIA_04012010.pdf
29	Avg. No. of Passenger/ Bus	passengers	60	http://goo.gl/RwTDcH

Table 12 Barker Safety Inputs and Assumptions

Name of the Input	Units	Value	Input specific to grade crossing, from Database Input sheet		
Rail Grade Crossing Expected Accident Rate per Year - Base Case	accidents/year	0.1290	http://goo.gl/rIz9y3	http://goo.gl/gaelTM	http://goo.gl/a6BNaK
Rail Grade Crossing Expected Accident Rate per Year - Alt. Case	accidents/year	0			
Fatalities as Share of Total Accidents	%	31%	http://goo.gl/lE6oZU	Calculations below	Avg. of 1991-2014 (No of fatalities)/(total no of crossing accidents)
Injuries as Share of Total Accidents	%	69%	http://goo.gl/lE6oZU	Calculations below	Avg. of 1991-2014 (No of fatalities)/(total no of crossing accidents)
Road Intersection Expected Injuries per year - Base Case	injuries/year	1.25	Provided from the City of Spokane Valley		
Road Intersection Expected Fatalities per year - Base Case	fatalities/year	0.047304			
Road Intersection Expected PDO per year - Base Case	PDO/year	1.81332			
Road Intersection Expected Injuries per year - Alt Case	injuries/year	0.21024	Conversion of a two-way stop to a diamond interchange		
Road Intersection Expected Fatalities per year - Alt Case	fatalities/year	0.024528			
Road Intersection Expected PDO per year - Alt Case	PDO/year	0.36792			
Value of a Statistical Life	2014	$9,400,000	https://goo.gl/1LY0U3		
Average Cost per Accident Injury	2013	$166,778	US DOT, Based on MAIS Injury Severity Scale and KACBO-AIS Conversion if Injurty Unknown. Department of Transportation Analyses. 2013.		
Cost of a Property Damage Only (PDO) Accident	2013	$3,927	https://goo.gl/Mf9sZd		
Growth of the Cost of Accidents	%	1.07%	Adjusted for growth in real income (source: US DOT)		

Table 13 Barker Operating Costs Inputs and Assumptions

Fixed inputs:			
Description	**Value**	**Unit**	**Source**
Fuel consumption at idle (auto)	0.44	gal/hr	Argonne National Laboratory Idling Worksheet - Average of Gas Passenger Cars (http://www.anl.gov/sites/anl.gov/files/idling_worksheet.pdf)
Fuel consumption at idle (bus)	0.97	gal/hr	Argonne National Laboratory Idling Worksheet - Transit Bus (http://www.anl.gov/sites/anl.gov/files/idling_worksheet.pdf)
Fuel consumption at idle (truck)	1.1	gal/hr	Argonne National Laboratory Idling Worksheet - Delivery Truck with Load (http://www.anl.gov/sites/anl.gov/files/idling_worksheet.pdf)
Fuel economy (auto)	23.41	mi/gal	Dept of Energy AFDC Avg Fuel Economy of Major Vehicle Categories updated 2015 - Car (http://www.afdc.energy.gov/data/10310)
Fuel economy (bus)	6.64	mi/gal	Dept of Energy AFDC Avg Fuel Economy of Major Vehicle Categories updated 2015 - Delivery Truck (http://www.afdc.energy.gov/data/10310)
Fuel economy (truck)	6.30	mi/gal	Dept of Energy AFDC Avg Fuel Economy of Major Vehicle Categories updated 2015 - School Bus (http://www.afdc.energy.gov/data/10310)

Table 14 Barker Emissions Inputs and Assumptions

Fixed inputs:			
Description	**Value**	**Unit**	**Source**
Fuel consumption at idle (auto)	0.44	gal/hr	Argonne National Laboratory Idling Worksheet - Average of Gas Passenger Cars (http://www.anl.gov/sites/anl.gov/files/idling_worksheet.pdf)
Fuel consumption at idle (bus)	0.97	gal/hr	Argonne National Laboratory Idling Worksheet - Transit Bus (http://www.anl.gov/sites/anl.gov/files/idling_worksheet.pdf)
Fuel consumption at idle (truck)	1.10	gal/hr	Argonne National Laboratory Idling Worksheet - Delivery Truck with Load (http://www.anl.gov/sites/anl.gov/files/idling_worksheet.pdf)
Fuel economy (auto)	23.41	mi/gal	Dept of Energy AFDC Avg Fuel Economy of Major Vehicle Categories updated 2015 - Car (http://www.afdc.energy.gov/data/10310)
Fuel economy (bus)	6.64	mi/gal	Dept of Energy AFDC Avg Fuel Economy of Major Vehicle Categories updated 2015 - Delivery Truck (http://www.afdc.energy.gov/data/10310)
Fuel economy (truck)	6.30	mi/gal	Dept of Energy AFDC Avg Fuel Economy of Major Vehicle Categories updated 2015 - School Bus (http://www.afdc.energy.gov/data/10310)
Monetized value of VOCs	$1,844	2015$/short ton	Corporate Average Fuel Economy for MY2017-MY2025 Passenger Cars and Light Trucks (August 2012), page 922, Table VIII-16, "Economic Values Used for Benefits Computations (2010 dollars)" http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FRIA_2017-2025.pdf
Monetized value of NOx	$7,266	2015$/short ton	
Monetized value of PM	$332,405	2015$/short ton	
CO2 per gallon of fuel burned	8,887	gram/gal	US DOT. NHTSA. Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards. 75 FR 25324, May 7, 2010.
Grams per short ton	907,185	grams	

Table 15 Barker Road Cost Estimates

Bridging The Valley				
City of Spokane Valley				
Cost Estimate				
12/15/2016				
Alternative:		**General Description:**		
Consolidated Corridor		Barker Road 4-lane overcrossing of 6-track transload yard and over 4-lane SR 290.		
Project Name:	Bridge #	Extend Barker Rd (2 lanes only) north of SR 290 to Del Rey Drive		
Barker/Wellesley - BNSF		EB on/off ramps on MSE walls between RR and highway		
Location:	RR Milepost:	Barker approaches on fill. Some cut required north of SR290.		
Barker Rd/BNSF & SR290	58.93	Build new embankments using mat'l from existing Wellesley roadbed		
Project Type:		Build new Wellesley Ave south of and parallel to RR tracks		
Overcrossing / Interchange				
Project Information:	**Comments:**		**Cost (2016 Dollars)**	
Roadway	Proposed:	Existing:		$9,570,297
Crossing road	Barker			
Classification	Urban Principal Arterial			
No. of Through lanes	4	2		
No. of Turn lanes	0	0		
Intersecting road	SR 290 (Trent Ave.), Hwy Milepost 12.5			
Classification	Principal Arterial (P-6)			
Bicycle lanes	1 bicycle lane on each side of bridge	0		
No. of Through lanes	4	4		
No. of Turn lanes	4 ramps	1 right-turn (EB-SB)		
Railroad Tracks				$0
No. of Mainline	3	1		
No. of Siding	2	0		
No. of Yard	1	0		
Crossing Removal	1			
Bridge				$5,851,878
Hwy Bridge				
Configuration	3-span over transload yard, spill-thru abutment south, retaining abutment north			
Structure Type	precast concrete W58G girders. Include crash walls at Pier 3			
Hwy Bridge				

Configuration	Single-span, retaining abutments				
Structure Type	precast concrete WF74G girders				
Ancillary Facilities				$1,629,219	
Frontage roads	New	New Wellesley Ave, 2900-ft of 3-lane			
Retaining Walls	Yes	MSE walls for EB on/off ramps at Trent			
Pump station	No				
Traffic Signal	Yes				
Utilities	Yes	water, power, tel			
Temporary Facilities				$237,998	
Road detour	No				
Shoring	No				
Bridge structure	No				
Traffic Control	Yes				
	Construction Subtotal			$17,289,392	
	Contingency		30%	$5,186,818	
	Mobilization		10%	$2,247,621	
	Total Construction Cost				$24,723,831
	Design Engineering		10%	$2,472,383	
	Construction Engr and Insp		16.5%	$4,079,432	
	Total Project Development Cost				$6,551,815
	Sales Tax	% of Total Construction Cost	8.7%		$2,150,973
Other Direct Costs				$189,922	
Railroad Flagging	Yes	9 Months			
Shoofly Track	No				
Remove RR Crossing	Yes				
Temporary RR Signals	Yes				
Temporary RR Crossing	No				$189,922
Project Estimate- subtotal					$33,616,541
		Cost/Unit	SF		
Project ROW Costs		$4.00	604610		$2,418,440
Project Total Estimate					$36,034,981
Indirect Project Costs (Paid by others, not included in the estimate above)					$47,481

BARKER OVERCROSSING / INTERCHANGE

Work Item	L x W x D	Qty	Unit	Unit Cost	Cost

Demo Wellesley & WB Trent (Ramp B)	5500 + 6200	12,000	SY	$5.35	$64,259
Remv Exist Wellesley Embankments	As req'd for new embankmn	90,000	CY	$9.52	$856,793
Rock Excav WB On-Ramp		15,000	CY	$23.80	$356,997
Fill Barker North Approach	860 x 63 x 7ave	14,000	CY	$14.28	$199,918
Added 10' of additional width of new bridge	860 x 10 x 7 avg	2,230	CY	$20.00	$44,600
Fill Barker South Approach	1200 x 136 x 25 ave	151,000	CY	$14.28	$2,156,262
Added 10' of additional width of new bridge	1200 x 10 x 25	11,111	CY	$20.00	$222,220
Fill for New Wellesley		83,000	CY	$14.28	$1,185,230
Fill for EB ramps (use avail fill mat'l)	2x(1000x82x20 ave)	122,000	CY	$2.38	$290,358
Fill for WB Ramps		28,000	CY	$14.28	$399,837
New Barker Road (N of Trent)	634 x 2-lane ave	634	LF	$188.02	$119,204
New Bafker Road (S of Trent)	869 x 6-lane ave	869	LF	$415.31	$360,901
New Barker Road (S of Trent)	1050 x 4-lane ave	1,050	LF	$307.02	$322,368
New Wellesley (4-lane)	1305 x 4-lane ave	1,305	LF	$293.93	$383,575
New Wellesley (3-lane)	1595 x 3-lane ave	1,595	LF	$258.23	$411,873
New WB Trent	2560 x 1-lane	2,560	LF	$173.74	$444,771
New on/off ramps	3x2000' + 1150'	7,150	LF	$173.74	$1,242,231
WB on/off ramp (2-lane)	850 2-lane ave	850	LF	$224.91	$191,172
Connector Road (McMillan Rd)	500 x 2-lane Rural	500	LF	$188.02	$94,009
Guardrail (Barker + Ramps + Wellesley)	250+6000+650	6,900	LF	$23.80	$164,219
Driveways & cul-de-sacs		5	EA	$11,900.00	$59,500
Hwy Bridge over RR	269.3 x 78.63	21,175	SF	$139.60	$2,955,935
Added 10' of additional width of new bridge	269.3 X 10	2,693	SF	$200.00	$538,600
Hwy Bridge over Hwy	141 x 90.63	12,779	SF	$149.74	$1,913,504
Added 10' of additional width of new bridge	141 x 10	1,410	SF	$200.00	$282,000
Demo existing Wellesley bridges	2 ea	1	LS	$161,839.00	$161,839
MSE Wall (Barker SW)	280 x 16ave	4,500	SF	$41.65	$187,423
MSE Walls (EB On-Ramp)	340 x 5ave	1,700	SF	$41.65	$70,804
MSE Walls (EB Off-Ramp)	480 x 10ave	4,800	SF	$41.65	$199,918
Conc Barrier Rail (Barker + Wellesley)	2100 + 600	2,700	LF	$42.00	$113,400
Traffic Signal		3	INT	$300,000.00	$900,000
Lighting (Overhead)		3	INT	$29,749.67	$89,249
Relocate 8-inch water line		550	LF	$59.50	$32,725

Relocate tel-com lines		1,000	LF	$35.70	$35,700
Traffic Control		1	LS	$237,998.00	$237,998
Construction Subtotal					$17,289,392
Other Direct Costs					
Railroad Flagging	9 months x 21 days/mo	189	DAYS	$951.99	$179,926
Crossing Removal		1	LS	$4,760.00	$4,760
C&S Work		1	LS	$5,236.00	$5,236
ODC Subtotal					$189,922
Indirect Project Costs (Paid by Others)					
Relocate power poles	(Avista's cost $30k)	2	EA	$17,850.00	$35,700
Relocate gas line		550	LF	$21.42	$11,781
IPC Subtotal					$47,481

Assumptions:

This estimate was only reviewed with the City to provide our assistance in suggesting updates to the Engineers estimate. The previous estimate was only updated where highlighted.

This estimate does not account for a revision in the bridge standards or RR crossing width/height revisions.

1. Increased construction management costs from 15% to 16.5% to account for management costs that will be extended over 3 years.
2. Increased contingency costs up to 30% to account for a budget estimate based on a 30% design.
3. Increased cost for traffic signal ($300,000 + $100,000 for a temporary signal with multiple phases due to the lowering and reconfiguration of the signalized intersection.
4. Increased MSE wall to match Barker MSE at $41.65. Previously listed at $35 per SF
5. Contingency does not cover if bridge standards require additional height or width for the bridge crossings.
6. Increased the width of Barker Road to accommodate an additional 10' of structure width. This would likely be tapered down on each side but I left the estimate accommodating the additional width for the approaches (since they will be wall structures)

Items Missing (contingency):

1. Clearing and Grubbing
2. Removal of structure and obstructions
3. Erosion Water Pollution Control
4. Bridge transverse joint seal
5. Waterproofing membrane
6. Landscaping
7. Elements associated with roadway (assumed included in unit price for new road) Signing, striping, curb and gutter

Appendix C.

Fiscal and Economic Benefits of the Project

- Report for Fiscal and Economic Benefits of the Barker Road/BNSF Grade Separation Project

ECONorthwest
ECONOMICS • FINANCE • PLANNING

DATE: March 26, 2015
TO: Mike Basinger and Gloria Mantz, City of Spokane Valley
FROM: Morgan Shook and Austin Rempel, ECONorthwest
SUBJECT: FISCAL AND ECONOMIC BENEFITS OF THE BARKER ROAD PROJECT

Background and Purpose

The City of Spokane Valley (City) is currently contemplating investments in infrastructure to support industrial zoned lands within the City. The City is currently assembling a funding package that potentially includes federal, state, and local sources. As part of the planning, the City would like to better understand both the tax benefits and economic impact of the project to support decision-making. This memorandum summarizes preliminary results of analyses that estimate the ability of targeted infrastructure to support a higher a level of development intensities. Specifically, the analyses include estimates of:

- Potential incremental development estimates stemming from the infrastructure projects
- Potential tax revenue benefits accruing to the City of Spokane Valley and State of Washington from the incremental development.
- Potential direct and indirect economic effects (e.g. economic output, jobs, and wages) to Washington State.

Analytic Framework

The infrastructure projects provide benefits to development in the form of better access, travel-time savings, and operational savings. Utility improvements allow for development to host greater levels of economic uses. Those increased development benefits improve the economy through increases in regional productivity and the benefits of urbanization and agglomeration; enhanced employment accessibility; and, eventually, impacts on land rents and property values.

In this analysis, it is assumed that less intense development of the land is possible without the improvements and that septic and well-supported development will still allow productive use of the land but at lower land development intensities. However, transportation improvements and water/sewer service would allow full site development and greater land development intensities. Figure 1 illustrates how development under either of these scenarios would materialize.

Figure 1: Examples of Site Development Intensities

Lower Intensity Development

Higher Intensity Development

Description of the Proposed Project

The Barker Road Grade Separation Project replaces an at grade crossing with an overpass over BNSF's tracks and SR290, supplemented with other roadway access improvements. The Barker Road crossing is one of 57 high-priority crossings targeted for improvement since the mid-2000s as part of "Bridging the Valley," an important initiative for eastern Washington and north Idaho. BNSF's tracks currently carry approximately 55 scheduled trains a day, a figure that will increase substantially to serve a projected expansion in agricultural production, natural resources and other sectors. In 2014, the project cost was estimated at 29.2 million dollars. These costs are beyond the financial ability of Spokane Valley to bear on its own.

The existing intersection at Barker Road and SR290/Trent Ave has a Level of Service (LOS) of "F" due to high traffic volumes on SR290 and proximity to the at-grade crossing. This failing level of service rating prohibits 500 acres of nearby industrial-zoned land and 75 acres of residential-zoned land from being developed at planned intensities (shown in Figure 2). Without improvement, the crossing will experience continued increases in troublesome vehicle and rail conflicts, eroding the quality of life in nearby residential areas and hampering economic growth.

Figure 2: Project Context Map

Supporting Competitive Development Sites

The City is home to many industrial and manufacturing businesses. It has a keen interest in creating a well-positioned portfolio of industrial lands ready for development. Currently, the City has a limited supply of vacant industrial lands well served by transportation and sewer infrastructure. The City and state compete with land markets in Idaho and Oregon for industrial businesses. These improvements will allow the City and state to be more competitive to industrial businesses seeking locations. Specifically, there are over 500 acres of vacant industrial land that would be positively impacted by these projects (Figure 2).

Summary of Findings

The ability to attract businesses will positively affect economic growth in the area. The investment in infrastructure will allow for the land to support economic development at a much higher intensity. The economic and tax impacts of that higher level of development are estimated as follows stemming from the construction and occupation of industrial developments.

- $2 billion in total economic output in the state ($980 million in direct impacts)
- 9,800 new jobs supported in the state (3,300 direct job impacts)
- $12.3 million in new general fund taxes to the city (25 year present value at 4%)
- $50.8 million in new general fund taxes to Washington State (25 year present value at 4%)

Estimate of Higher Land Intensity Development

Currently, industrial land development has been developed at much lower intensity in the range of 0.05 FAR. FAR stands for floor area ratio and is a broad measure for how intense the land is developed. Higher intensity industrial land development typically is seen at the 0.20 FAR, where available transportation and other infrastructure allow for greater economically productive uses to take place.

In the case of the study area, development of the 500 acres of industrial land would translate into:

- Lower intensity 0.05 FAR: approximately 1,100,000 square feet of industrial development
- Higher intensity 0.20 FAR: approximately 4,300,000 square feet of industrial development

The increment of new industrial development that new infrastructure would be able to support would amount to 3,200,000 square feet of industrial development.

Fiscal Impacts

The action studied in this fiscal analysis is the development and operation of industrial businesses based on the increment of higher intensity development enabled by the infrastructure project. For the analysis, it is assumed that construction and occupation of the development would take place in 2015 in order to provide a range of magnitude estimate of the incremental effects. The analysis uses current City and state tax policy to estimate revenues to the jurisdictions.

The tax revenue benefits of the projects are as follows. Because little is known about the exact facilities and economic activities that might be housed on the site, average cost and productivity assumptions are used to account for typical construction types for industrial buildings.

Figure 3 summarizes the tax impacts. In summary, about $12.3 million in new general fund taxes to the City would be produced on the increment of new development. That same increment of higher intensity industrial development would generate about $50.9 million in new general fund taxes to Washington State.[1] While a full buildout of the area in a single year is not entirely likely, it does illustrate the potential opportunity cost of not supporting higher intensity industrial development in the area. However, full use of the area in small amount of time could be likely given that industrial users typically look for sites in the 20-100 acre range.

[1] Both analyses assume a 2015 buildout over tax benefits over a 25-year time frame and discounted back to 2015-dollar values at a discount rate of 4%.

Figure 3: Total Incremental Revenues Resulting From Development By Jurisdiction & Source (Figures in thousands)

Total Incremental Revenues Resulting From Development By J

Revenue Source	City	State
Property Taxes	$9,680	$15,580
Sales Tax on Construction	$2,550	$19,510
Ongoing Sales Tax	$120	$900
B&O on Construction	-	$4,500
Ongoing B&O Tax	-	$10,390
Total Incremental Revenues	**$12,350**	**$50,880**

Economic Impacts

The potential location of the industrial businesses in Spokane Valley in the study area will create economic impacts to both the City and broader region. The action studied in this analysis is the construction and operation of industrial facilities in this area in Spokane Valley. For the analysis, it is assumed that construction and occupation of the building would take place in 2015.

The economic impacts are separated into two types: one-time impacts from construction and annual recurring impacts resulting from on-going operation of the business at steady state. Economic impacts can be measured in several ways. Two most common measures of reporting impacts are:

- **Jobs** represent the number of people working full- or part-time jobs.
- **Output** represents the value of goods and services produced. This is the largest, most encompassing measure of economic activity and includes personal income.

ECONorthwest used the 2007 Washington State I/O model developed by the Office of Financial Management. The analysis uses Washington State level data to trace the ripple effects of direct expenditure that occurs within the economy. The model is used to track how an economic action, such as money spent at a jobs created by the industrial activity, will ripple through the local economy creating different levels of business revenue, jobs, and income in many different economic sectors.

One-Time Effects: Construction of Industrial Buildings

Assumed construction costs are based on comparable figures of other industrial buildings that might house the industrial businesses. These direct construction expenditures will go towards the construction industry. However, the project might also use architecture, planning, and engineering industries' services in the area – these impacts are not counted in this analysis.

Figure 4: Summary of Construction Impacts

	Incremental Intensity	
	Output (millions)	Jobs
Direct	$306	1,109
Indirect/Ind	$391	2,399
Total	$697	3,508

- **Job Impacts.** The incremental construction estimates of facilities would support about 1,109 direct jobs in the local construction industry over the entire project. It would also create an additional 2,399 jobs resulting from indirect and induced economic activity from the construction. The total job impact would be 3,508 jobs from construction.
- **Economic Output.** The $306 million construction investment would also create an additional $391 million in multiplier incremental economic activity from indirect and induced economic activity from the construction. The total impact would be about $697 million.

On-Going Impacts: Annual Operation of the Industrial Businesses

The following analysis uses assumptions on the number of jobs that might be supported in the area once buildings are occupied by businesses. The direct impacts estimates use industrial lands employment densities commonly found in industrial buildings to estimate the incremental employment growth that might be the result of higher land intensity development.

Figure 5: Summary of Business Operations Impacts

	Incremental Intensity	
	Output (millions)	Jobs
Direct	$673	2,268
Indirect/Ind	$685	4,036
Total	$1,358	6,305

- **Job Impacts.** In addition to the 2,268 direct jobs at the businesses, the business activity would create an additional 4,036 jobs resulting from indirect and induced economic activity. Total job impacts would be 6,305 jobs.
- **Economic Output.** Under the employment assumptions above, the business would generate $673 million in business income/output on a annual basis. The business would then create an additional $685 million in multiplier impacts from indirect and induced economic activity. A total impact of $1,358 million to the state economy.

Background and Methodology on Fiscal and Economic Impact Analysis

Fiscal Impacts

A public revenue model was used to allow for estimation of likely net tax revenue impacts resulting from new development in the study area .The analysis used a cash flow revenue model that will build up from the development assumptions, including phasing and timing of development, to estimate changes in affected tax bases, which in turn is used to estimate revenues for all affected jurisdictions. Current tax rates are applied to the incremental tax bases to estimate potential public revenues. Revenues are organized according to the legislative or policy limits on their use and whether they are one-time or ongoing revenues. The revenue model includes:

- Property Tax
- Sales Tax (both on construction and ongoing from business operations)

- B&O Taxes (both on construction and ongoing from business operations)

Economic Impacts

In general terms, economic impacts models work by tracing how spending associated with an industry circulates through an economy or study area. That is, changes in one sector or multiple sectors trigger changes in demand and supply throughout the economy. Initial changes in the demand spread through the economy, altering the quantities of inputs and outputs and associated jobs, income, and value-added. These *multiplier effects* continue until the initial change in final demand leaks out of the economy in the form of savings, taxes, and imports. Here, the final demand reflects the total amount of output created by the initial investment.

Input-output models enable the user to follow expenditures from a company as they ripple through the economy. These impacts are called the *multiplier* effects, and they measure the full scope of economic impacts. Economic impact analysis employs specific terminology to identify different types of economic impacts. *Direct* impacts are those associated with payroll and employment. They also include the direct output of activities in a specific geography, which is estimated using labor and non-labor operating expenses.

For this analysis, the 2007 Washington State Input-Output Model, developed by the Office of Financial Management is used to estimate economic impacts. It use state-level data to trace the ripple effects of an expenditure that occurs within the economy. The Washington State Input-Output model represents a 2007 estimate of the structure of the Washington economy (latest available model year). The model was a result of new data and industry information from a survey of businesses. The Washington I/O model has the advantage of being developed specifically to reflect Washington State's unique industry linkages (and being accepted by OFM).

The Washington Input-Output model estimates *indirect* impacts using purchases of goods and services from other businesses. These businesses, in turn, purchase a wide array of intermediate goods and services they need to operate. Because these purchases represent interactions among businesses, indirect effects are often referred to as "supply-chain" impacts. The resulting direct and indirect increases in employment and income enhance overall economic purchasing power, thereby *inducing* further consumption and investment-driven stimulus. These induced effects are often referred to as "consumption-driven" impacts.