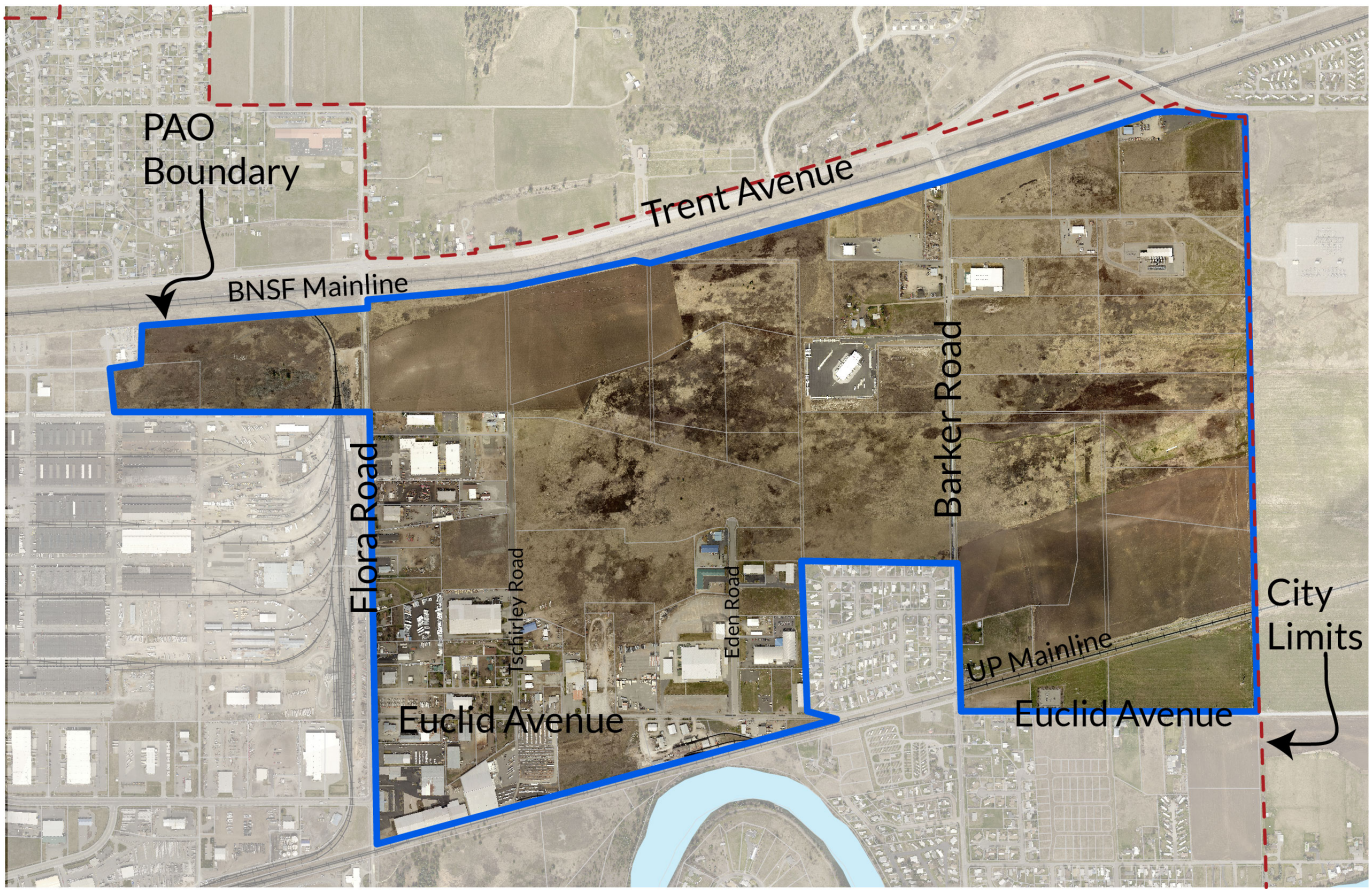
Northeast Industrial Area
Planned Action Ordinance
SEPA Analysis



FACT SHEET

NAME OF PROPOSAL

The City of Spokane Valley Northeast Industrial Area Planned Action Ordinance.

PROPOSED ACTION

The City of Spokane Valley plans to adopt a Planned Action Ordinance (PAO) to support and streamline environmental permitting in the City's Northeast Industrial Area. The PAO designation would apply to industrial development within the envelope analyzed in this SEIS.

PROPONENT

City of Spokane Valley

LOCATION

The proposal is located in the City of Spokane Valley's northeast quadrant bounded by Flora Road on the west, Trent Avenue on the north, the Union Pacific line on the south, and the city limits on the east. The approximate center of the project area can be further located at 47°41'32.2"N 117°09'48.2"W.

PREVIOUS ACTION TAKEN

The City of Spokane Valley completed an Environmental Impact Statement (EIS) on the 2017- 2037 Comprehensive Plan. This 2017 Planned Action Supplemental EIS incorporates by reference and supplements the analysis contained in the 2017 – 2037 Comprehensive Plan EIS.

DATE OF IMPLEMENTATION

2017–2040 –Market driven phased development

LEAD AGENCY

City of Spokane Valley
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REQUIRED APPROVALS AND/OR PERMITS

Planned Action Ordinance adoption by Spokane Valley City Council.

AUTHORS AND PRINCIPAL CONTRIBUTORS TO THIS EIS

This City of Spokane Valley Comprehensive Plan/Final Environmental Impact Statement has been prepared under the direction of the City of Spokane Valley, as SEPA Lead Agency.

DATE OF DRAFT SEIS ISSUANCE

November 23, 2018

DATE OF COMMENTS DUE

January 22, 2019

AVAILABILITY OF THE SEIS

Notice of Availability and copies of the Comprehensive Plan/FEIS and supporting development regulations have been distributed to agencies, organizations, and individuals noted on the Distribution List (Section 3.3 of this document).

The complete 2017-2037 Comprehensive Plan, FEIS, and supporting regulations are available for download at the project website: www.spokanevalley.org/CP.

The complete NIA-SEIS and associated draft development code are available at: www.spokanevalley.org/PlannedAction

Copies of these documents are also available for public review at the following location:

Spokane Valley City Hall
10210 East Sprague Avenue
Spokane Valley, WA 99206

Section 1: Concise Summary of Alternatives

Appendix A: *Existing Transportation Conditions Report for Spokane Valley Northeast Industrial Area PAO*

Appendix B: *Spokane Valley Northeast Industrial Area PAO Traffic Analysis for Phase 1, Phase 2, and Phase 3*

Appendix C: *Infrastructure Plan for the Spokane Valley Northeast Industrial Area PAO*

Appendix D: *General Sewer Summary Packet for Planned Action Ordinance Applications*

SECTION 1.0: SUMMARY

1.1 Introduction

This section summarizes the information contained in the Planned Action Supplemental Environmental Impact Statement (SEIS) for the City's Northeast Industrial Area (NIA-SEIS). It contains a summary of impacts, mitigation measures, and significant unavoidable adverse impacts. The summary is intentionally brief; the reader should consult individual sections of the SEIS for detailed information concerning the affected environment, impacts, and mitigation measures.

1.2 Proposed Action and Location

Proposed Action

An adoption of an ordinance designating a portion of the City of Spokane Valley's Northeast Industrial Area as a Planned Action for the purposes of the *State Environmental Policy Act* (SEPA) compliance. The Planned Action designation would apply to proposed industrial development within the envelope analyzed in this SEIS. The Planned Action designation would apply to development that occurs through the end of 2040.

Location

The proposal is located in the City of Spokane Valley's northeast quadrant bounded by Flora Road on the west, Trent Avenue on the north, the Union Pacific line on the south, and the city limits on the east, and includes the south ¾ of Section 6, the west ½ of Section 5, and a north portion of Township 25 North, Range 45 East, Willamette Meridian. The approximate center of the project area can be further located at 47°41'32.2"N 117°09'48.2"W (see Figure 1).

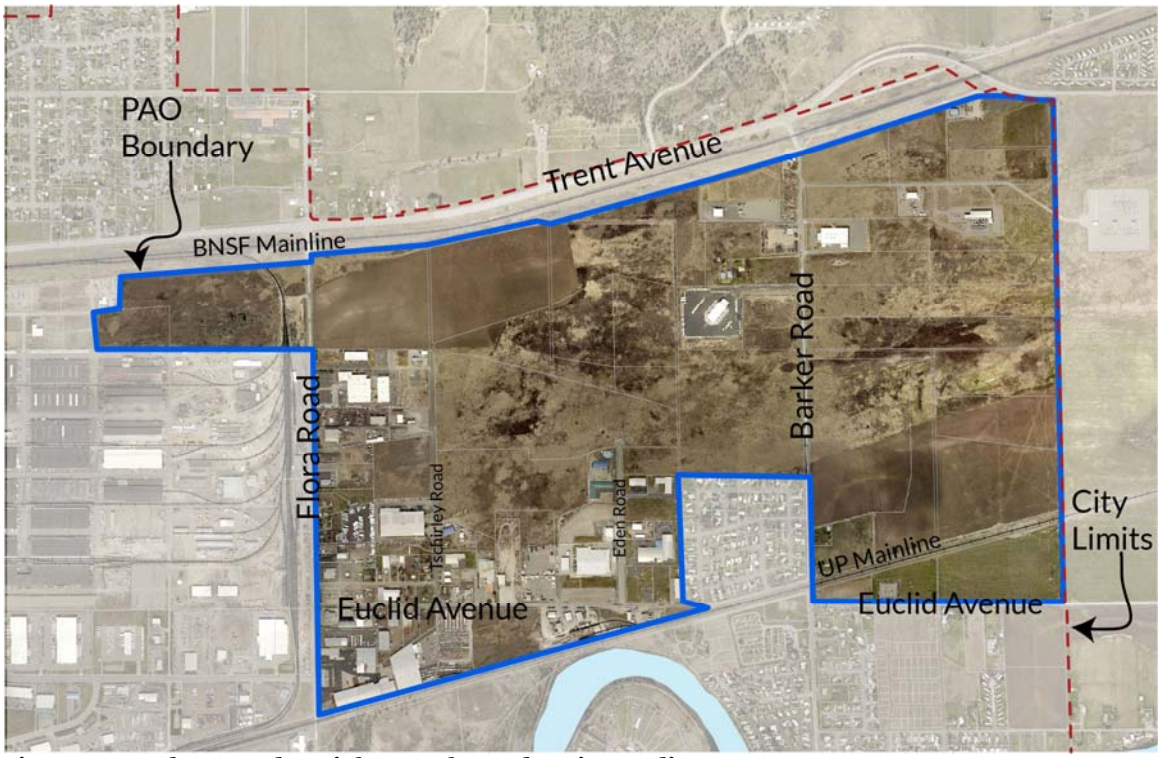


Figure 1: Northeast Industrial Area Planned Action Ordinance Area

1.3 Discussion of Alternatives and Phasing

The SEIS dos not evaluate discrete alternatives since it proposes to use the adopted alternative in the 2017-2037 Comprehensive Plan and FEIS as the ceiling for build-out. Instead, this SEIS provides additional project level detail for a defined geographic area for elements not adequately addressed in the original document (Transportation – systems, traffic, circulation; Water – runoff/absorption, supply; Air – quality, odor). In other words, the Northeast Industrial Area – Supplemental Environmental Impact Analysis (NIA-SEIS) is an implementation to the adopted FEIS instead of offering an alternative to it.

1.4 Summary of Potential Impacts and Mitigation Measures

Table 1-1 provides a summary of the environmental impacts for each element of the environment evaluated in Section 3 of the SEIS. For a complete discussion of the elements of the environment considered in this SEIS, please refer to Section 3.

Table 1: Summary of Potential Impacts and Mitigation Measures

Environmental Element	Impacts	Mitigation
Air Quality	Increased industrial development is likely to increase impacts to air quality including ambient air quality, point source impacts, and increased motorized transportation emissions.	– Use existing regulations for ambient air quality and transportation related emissions. – Provide notice to agency(ies) responsible for point source pollution permits
Surface Water and Water Runoff	Increased development on vacant land will increase impervious surface from rooftops, parking area and access drives.	– Stormwater facilities will comply with the Spokane Regional Stormwater Manual and use Best Management Practice (BMP) techniques to address stormwater
Historic and Cultural Resources	Increased development will increase land disturbance activities. The area has been previously disturbed by homesteading, residential subdivisions, roadway construction, utilities, railroad lines, and major industrial development.	– Require an inadvertent disturbance plan that includes procedures for the discovery of cultural materials and human skeletal material
Utility Provision	Increased development will require water, sewer, telecommunication, natural gas, and power.	– Various improvements already identified in respective improvement programs (water & sewer). – Ensure adequate notice for potential projects during land use or building permit action.
Transportation	Increased demand on various local and arterial streets.	– Various transportation improvements, including grade separation of Barker, widening of Barker, and Barker I-90 interchange

1.5 Issues to be Resolved

Adoption of the Planned Action Ordinance supports development and expansion of the Northeast Industrial Area (NIA) with industrial development consistent with the City of Spokane Valley Comprehensive Plan 2017-2037. The key environmental issue facing decision makers is the impact of additional traffic on the area roadways and the mitigating measures to address such impacts.

1.6 Significant Unavoidable Adverse Impacts

Transportation

The development of the NIA would generate additional traffic volumes on the area's transportation network. Increases in congestion at intersections and along corridors will result in significant, unavoidable, adverse impacts on the transportation system. However, the improvements proposed will increase capacity and mitigate undesired impacts, reducing the impacts on the system to the adopted level of service.

SECTION 2.0: DESCRIPTION OF PROPOSAL

2.1 Introduction

The 2017-2037 Comprehensive Plan and FEIS covered the analysis for the industrial designation in the proposed area through the year 2037. This SEIS adds additional information to support the adoption of a Planned Action for industrial development in the area. The proposal assumes an approximate total of 4,000 employees within the project area; 3,200 more over existing conditions. The employees generally translates to approximately 4 to 6 million square feet of building area.

2.2 Planned Action Process

Planned Action Overview

WAC 197-11-164 defines a Planned Action. The City proposes to designate the Northeast Industrial Area as a Planned Action, pursuant to SEPA and implementing rules. As shown in Figure 1, the project area is generally bounded Flora Road on the west, Trent Avenue on the north, the City limits on the east, and the Union Pacific mainline and Euclid Avenue on the south. Spokane Valley will follow applicable procedures, described generally below, to review proposed projects within the project area through the land use review process associated with each project to determine their impacts and impose any appropriate development conditions.

Planned Action EIS

The significant environmental impacts of projects designated as Planned Actions must be identified and adequately analyzed in an EIS (WAC 197-11-164). The City anticipates supplementing the 2017-2037 Comprehensive Plan and FEIS with additional project level detail for elements not adequately addressed in the original document for the Planned Action. This supplement includes transportation analysis, water, runoff/absorption, supply; and air quality and odor.

Planned Action Ordinance

According to WAC 197-11-168, the ordinance designating the Planned Action shall:

- Describe the type(s) of project action being designated as a Planned Action;
- Describe how the Planned Action meets the criteria in WAC 197-11-164 (including specific reference to the EIS that addresses any significant environmental impacts of the planned action);
- Include a finding that the environmental impacts of the Planned Action have been identified and adequately addressed in the EIS, subject to project review under WAC 197-11-172; and
- Identify any specific mitigation measures other than applicable development regulations that must be applied to a project for it to qualify as the Planned Action.

Following the completion of this SEIS process, Spokane Valley will adopt the Planned Action designation by ordinance in 2017.

2.3 Environmental Review

2017-2037 Comprehensive Plan and FEIS

The City of Spokane Valley completed the 2017-2037 Comprehensive Plan and Environmental Impact Statement in December of 2016. The elements of the environment that were considered in the EIS included economic welfare, land use, transportation, housing, and natural environment. This Planned Action Supplemental EIS incorporates by reference and

supplements the analysis contained in the 2017-2037 Comprehensive Plan and Environmental Impact Statement.

2.4 Proposed Action

The proposal is to adopt a Planned Action for the City of Spokane Valley's Northeast Industrial Area. The area that would be the subject to the Planned Action is seen in Figure 1. The proposal assumes the build-out proposed in the Comprehensive Plan EIS, roughly an additional 4–6 million square feet of industrial development and 4,000 employees (3,200 over existing conditions) over the 20 year plan horizon. These growth levels are consistent with the adopted comprehensive plan and represent the analysis ceiling for the Planned Action. Since the Planned Action assumes the same level and type of growth analyzed in the comprehensive plan, this analysis does not contain distinct alternatives.

2.5 Benefits and Disadvantages of Delaying the Proposed Action

The Proposed Action includes adoption of a Planned Action Ordinance for future development in the Northeast Industrial Area. There is no benefit to delaying the implementation of the Proposed Action. The expected and planned for growth in the area is allowed under existing policy and regulation, and the Planned Action allows for a comprehensive analysis of impacts of the planned for growth and a more efficient permit process.

2.6 Major Issues to be Resolved

Adoption of a Planned Action Ordinance would support development and re-development of the area to an industrial character consistent with the comprehensive plan. The key environmental issue facing decision-makers is the impact of additional traffic on area roadways and mitigating measures to address such impacts.

SETION 3.0: AFFECTED ENVIRONMENT, IMPACTS, AND MITIGATION

3.1 Air Quality

Affected Environment

Ambient Air Quality

The Clean Air Act (CAA), as amended in 1990, governs air quality in the United States. Its counterpart in Washington State is the Washington Clean Air Act of 1991. These laws set standards for the concentration of pollutants that can be in the air. At the federal level, the Environmental Protection Agency (EPA) administers the CAA. The Washington Clean Air Act is administered by Ecology at the state level and by local clean air agencies at the regional levels. Spokane Regional Clean Air Agency (Spokane Clean Air) enforces federal, state and local regulations to reduce air pollution for areas within Spokane County.

The U.S. EPA sets National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: Carbon Monoxide, Lead, Nitrogen Dioxide, Ozone, Particle Pollution, and Sulfur Dioxide. The purpose of these standards is to prevent air pollution from reaching levels that harm public health and welfare. The CAA requires states to develop plans for protecting and maintaining air quality in all areas of the state. It also requires states to develop specific plans for bringing nonattainment areas back into attainment. The plans are called State Implementation Plans (SIPs).

In the past, the Spokane region has been in nonattainment for carbon monoxide (CO) and Particulate Matter (PM10) and as such Spokane Clean Air in conjunction with the Washington State Department of Ecology have developed a SIPs for both PM10 and CO. The SIP for PM10 explains how the area will continue to meet the federal standard for PM10 through 2025. The SIP for CO demonstrates that the area will be in compliance with the NAAQS (40 CFR part 50) through 2025.

Ground-level ozone poses health risks to humans, animals, and plant life. Primarily a concern during the hot summer months, ozone is formed as a result of photo-chemical reactions between nitrogen oxides and volatile organic compounds in the presence of sunlight and heat. Both nitrogen oxides and volatile organic compounds can be emitted directly from industrial, mobile, and consumer sources.

Transportation Air Quality

Regionally significant transportation projects (regardless of the source of funding) proposed for construction within nonattainment areas or maintenance areas are subject to the Transportation Conformity regulations specified under federal regulations (EPA 40 CFR Parts 51 and 93) and state regulations (Chapters 173–420 of WAC). The Spokane Regional Transportation Council (SRTC) classifies a project as regionally significant as, in part, projects that serve roads federally classified as a principal arterial, highway or freeway and alters the number of through-lanes for motor vehicles for a length greater than a half mile, or impacts a freeway or freeway interchange (other than maintenance projects federally classified as a principal include constructing or widening new roadways and widening signalized intersections; the SRTC Policy Board can also determine a project as regionally significant.

SRTC's Metropolitan Transportation Plan, Horizon 2040, demonstrates that future carbon monoxide (CO) emissions from the 2010, 2030, and 2040 future project conditions are all well below the CO Motor Vehicle Emissions Budget (MVEB) of 558,000 lbs/day as required by the approved CO Maintenance Plan. In December of 2016, SRTC certified that the

transportation related provisions in the City's adopted Comprehensive Plan are generally consistent with the Revised Code of Washington, including the Growth Management Act, and SRTC's RTP Horizon 2040. The plan included the 2017-2022 TIP roadway projects with the Northeast Industrial Area.

- Barker and Trent Burlington Northern Santa Fe Railroad Grade Separation,
- Barker Road street widening 3 lane urban arterial from Spokane River to Euclid Avenue,
- Interstate 90 and Barker Interchange improvements

Point Source Air Quality

While the single largest contributor to most criteria pollutant emissions is derived from on-road vehicles, secondary sources of emissions are derived from commercial and industrial land uses. Additional point pollution sources include space heating equipment (e.g., gas and diesel) and wood-burning appliance emissions. Spokane Clean Air issues three types of permits:

- **Notice of Intent (NOI)** – Required for a portable source installed at a specific site temporarily, not to exceed 12 consecutive months. NOC required the first time a portable source is installed and operated
- **Notice of Construction (NOC)** - construction, installation, replacement or modification of air contaminant sources, emissions units or air pollution control equipment; required to register the permit annually
- **Air Operating Permit (AOP)** - Issued to major sources of air pollution and other sources identified by EPA; required to register the permit annually

Spokane Clean Air maintains a list of classes of stationary sources that require a permit, which are identified in *Regulation I, Article IV Exhibit R*[1] of the Spokane Regional Clean Air Agency. Below is a partial list of the types of operations regulated based on air emissions:

- Asphalt Plant
- Boiler
- Coffee Roaster
- Crematory
- Emergency Generator Sets
- Lithographic Printing
- Resin/Gelcoat Operations
- Baghouse
- Chrome Plating
- Concrete Batch Plant
- Crushing Operations
- Furnaces/Ovens
- Paint Booth
- Solvent Cleaning, Stripping

Impacts

Ambient Air Quality

Increased industrial and commercial development within the Northeast Industrial Area are likely to have minimal in impacts to NAAQS criteria pollutants (Carbon Monoxide, Lead, Nitrogen Dioxide, Ozone, Particle Pollution, and Sulfur Dioxide). The SIP for PM10 explains how the area will continue to meet the federal standard for PM10 through 2025. The SIP for CO demonstrates that the area will be in compliance with the NAAQS for CO through 2025 and meets EPA requirements for a Limited Maintenance Plan (LMP).

[1] www.spokanecleanair.org/documents/regulation_docs/ARTICLE-IV.pdf

Transportation Air Quality

The single largest contributor to most criteria pollutant emissions is derived from on-road vehicles. The SRTC Metropolitan Transportation Plan for Spokane County concludes that the on-road mobile source CO emissions estimates will remain below the CO Motor Vehicle Emissions Budget of 558,000 lbs./day as required by the approved CO Maintenance Plan. The emissions decreased by 53% from 2010 to 2020 and decreased significantly between 2020, 2030, and 2040. The decrease in emissions are attributed to technological advances in vehicles since VMT is projected to increase over the planning horizon 2010 to 2040. The increases in VMT should be mitigated by vehicle technology allowing the modeled emissions to stay below the MVEB. The City's adopted Comprehensive Plan was certified by SRTC and found generally consistent with the Revised Code of Washington, including the Growth Management Act, and SRTC's RTP Horizon 2040.

Point Source Air Quality

As of May 2017 the Northeast Industrial Area has 9 registered commercial and industrial facilities that require a NOC permit and portion of the Kaiser Aluminum Washington facility registered for an Air Operating Permit. The 9 registered facilities area:

- Wagstaff, Inc.
- Eastside Electric
- Eclipse Screen Printing
- UTEC Metals / Gillingham Best
- Spur Industries
- US Wax & Polymer
- Greenacres Gypsum & Lime Company
- MOCO Engineering
- Avista Utilities

The adopted Comprehensive Plan and this analysis anticipates a range of industrial type development of 2.9-3.9 million square feet. The exact type of industrial development is unknown. Increased industrial development is likely to increase point source air pollution, and all new point source pollution will be required to comply with Spokane Clean Air permit requirements.

Mitigations

Ambient Air Quality

The SIP for PM10 and CO explains the area will be in compliance with the NAAQS. No mitigations beyond those already required from existing regulations are required.

Transportation – Air Quality

Transportation project conformity may be required for certain projects. In order to facilitate a streamlined process, projects that could trigger project conformity shall be forwarded to SRTC. This process will be conducted through the evaluation of projects in determining whether they are consistent with the thresholds analyzed in the PAO.

Point Source Air Quality

Spokane Regional Clean Air Agency (Spokane Clean Air) enforces federal, state and local regulations to reduce air pollution for areas within Spokane County. Spokane Clean Air receives notice of potential commercial and industrial facilities that trigger their permit process either through the building permit notice or SEPA notice. In order to facilitate a streamlined process, projects that could trigger a Spokane Clean Air permit shall be forwarded to Spokane Clean Air. This process will be conducted through the evaluation of projects in determining whether they are consistent with the thresholds analyzed in the PAO.

3.2: Surface Water and Water Runoff

Affected Environment

The majority of the City is underlain by an extensive, sole-source aquifer that provides high quality drinking water and provides some return flows to the Spokane River. The entire Northeast Industrial Area lies within the Aquifer Sensitive Area (ASA). A single developed parcel (55075.0231) south of Euclid and Eden sits within the shoreline jurisdiction but outside the shoreline buffer area which is limited by the Union Pacific railroad. Development on parcel 55075.0231 will be subject to the adopted Shoreline Master Program. No other parcels are within the shoreline jurisdiction or any other surface water.

The City of Spokane Valley does not have a centralized storm collection or treatment system and generally requires that all stormwater be managed on-site. The soils within the Northeast Industrial Area are generally well draining and have good to high infiltration rates. The table and figure below display the hydrologic soil groups that occur within the Northeast Industrial Area. Development projects within the Northeast Industrial Area are expected to have stormwater management facilities that discharge runoff below the ground surface through Best Management Practice (BMP) techniques such as bioswales and dry wells. The stormwater management facilities will comply with the City of Spokane Valley regulations and the Spokane Regional Stormwater Manual.

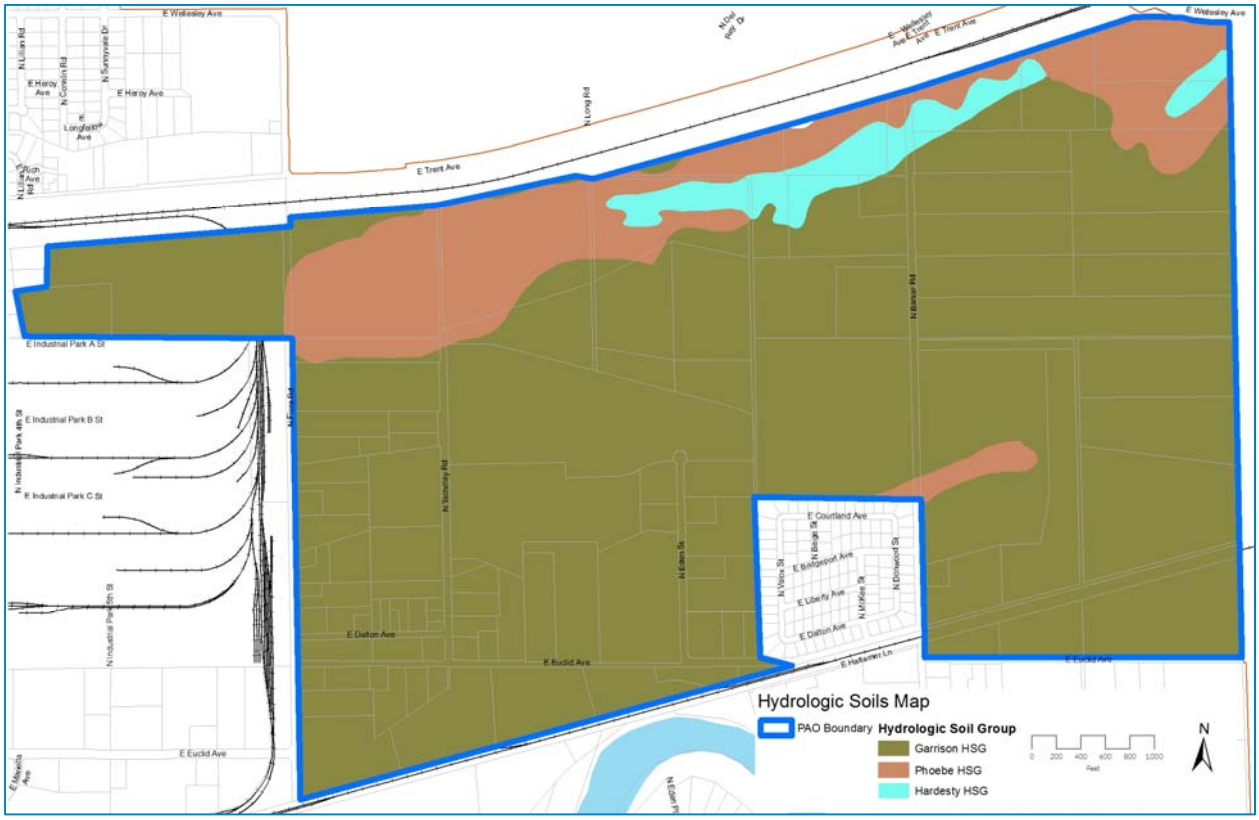


Figure 2: Hydrologic Soil Group Map

Table 2: Infiltration Rate and Percent Soils in Northeast Industrial Area

Hydrologic Soil Type	Infiltration Rate	Acres	Percent
Garrison	Good	685	83%
Phoebe	High	113	14%
Hardesty	Very slow	26	3%
Total		**824**	

Impacts

The Northeast Industrial Area is expected to grow in industrial development. The development will generally occur on vacant land increasing impervious surfaces within the study area from rooftops, parking areas, and access drives. Stormwater will infiltrate the ground and likely enter the groundwater from onsite stormwater management facilities.

Stormwater facilities will comply with the Spokane Regional Stormwater Manual and use Best Management Practice (BMP) techniques to address stormwater. Stormwater from parking lots, access drives, and roads will use oil-water separators and bioswales for treatment prior to infiltration. Non-pollution generating surfaces like rooftops will use infiltration galleries or dry wells. The BMPs must be capable of treating flows up to the 10 year 24-hour storm event.

Mitigations

No mitigations beyond those required by exiting City regulations are proposed.

3.3 Historic and cultural preservation

Affected Environment

Historic and cultural resources are protected by a variety of state and federal laws. Federal law applies to all projects that involve federal money, permits and/or licenses, and state law applies to local projects. State law includes the Governor's Executive Order 05-05 (EO 05-05), statutes regarding the protection of cultural resources (WAC 197-11, RCW 27.44, and RCW 27.53), and SEPA.

Both RCW 27.44 and RCW 27.53.060 require permits from the Washington State Department of Archaeology and Historic Preservation (DAHP) before excavating, removing, or altering Native American human remains or archaeological resources in Washington. Failure to obtain a permit is punishable by civil fines and other penalties including criminal prosecution.

According to the publically available information from DAHP's online database, the Washington Information System for Architectural and Archaeological Records Data (WISAARD), for cultural resource survey reports, archaeological site records, and cemetery records there are no registered or eligible properties within the project area. The databased did identify 27 properties derived from County Assessor building records imported by DAHP into WISAARD in 2011. These assessor derived properties were part of a project to facilitate community and public involvement in stewardship, increasing data accuracy, and providing a versatile planning tool to Certified Local Governments (CLGs) and does not necessarily identify a designated historic property.

Impacts

The Northeast Industrial Area is primarily vacant and is likely to see increased development over time. The area has been previously disturbed by homesteading, residential subdivisions, roadway construction, utilities, railroad lines, and major industrial development, including a recent gravel mining operation on the north termination of Eden Road. The DAHP predictive model indicates that the Northeast Industrial Area is primarily is situated in a High to Very High Risk probability area, likely because of the proximity to the Spokane River. However, the modifications to the landscape within the Northeast Industrial Area there is likely low to moderate probability of intact cultural resources within the area.

Mitigations

Land disturbing and construction activities shall submit an inadvertent disturbance plan in their scope of work. The inadvertent disturbance plan shall include procedures for the discovery of cultural materials and human skeletal material.

- Inadvertent Discovery of Cultural Materials

  In the event that archaeological deposits are inadvertently discovered during construction in any portion of the AI, ground-disturbing activities should be halted immediately in an area large enough to maintain integrity of the deposits and DAHP should be notified directly. DAHP would then contact the Spokane Tribe of Indians, depending on the nature of the find.

- Procedures for the Discovery of Human Skeletal Material

  Any human remains that are discovered during project-related construction, maintenance, or operation activities will be treated with dignity and respect. In the event that human remains are discovered during construction the following procedures are to be followed to ensure compliance with RCW 68.60: Abandoned and Historic Cemeteries and Historic Graves, and RCW 27.44: Indian Graves and Records.

  If ground disturbing activities encounter human skeletal remains during the course of construction, then all activity must cease that may cause further disturbance to those remains and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains must be reported to the county coroner and local law enforcement in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

  The county coroner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the county coroner determines the remains are non-forensic, then they will report that finding to DAHP, who will then take jurisdiction over those remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or non-Indian and report that finding to any appropriate cemeteries and the affected tribes. DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

3.4 Utility Provision and Supply

Affected Environment

Water

Water service within the Northeast Industrial Area is provided by Consolidated Irrigation District (CID). The Bureau of Reclamation owns the physical system but CID operates and maintains the system. CID is divided into two independent systems defined by the Spokane River; the North System includes the West Farms, Otis Orchard, East Farms, Granite, and Chinook pressure zones. The Northeast Industrial Area is within the North System in the West Farms pressure zone. The West Farms pressure zone is within well field 5 and has three wells and one reservoir.

CID's retail service area extends beyond the Northeast Industrial Area and the City of Spokane Valley city limits. CID has coordinated with the City of Spokane Valley, Spokane County, and the City of Liberty Lake in order to ensure that the CID water system plan is consistent with locally adopted plans. The City of Spokane Valley found the water system plan to be consistent with the adopted comprehensive plan and development regulations. CID anticipates that undeveloped areas within Spokane Valley will change from agricultural areas to urban or suburban areas.

It is expected that CID will provide service to all new connections within the retail service area when the District's conditions for water service and District Bylaws are met, generally the conditions include:

1. The municipal water supplier has sufficient capacity to serve water in a safe and reliable manner.
2. The service request is consistent with adopted local plans and development regulations.
3. The municipal water supplier has sufficient water rights to provide service.
4. The municipal water supplier can provide service in a timely and reasonable manner.

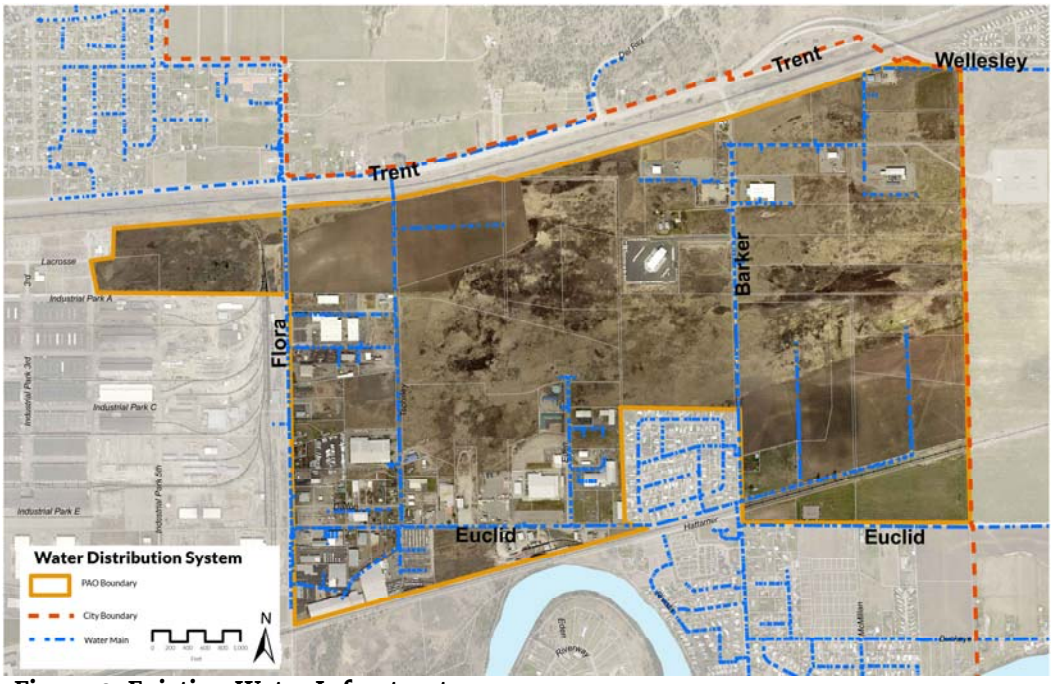


Figure 3: Existing Water Infrastructure

Sewer

The County provides wastewater collection, conveyance, treatment, and disposal for areas within the City of Spokane Valley, based on an inter-local agreement established in 2009. In areas where sewer is not currently installed, developer extensions may be required. The adopted level of service standard within the City of Spokane Valley is that public sewer is required for new development consistent with its sewer concurrency requirements.

Most of the Northeast Industrial Area is presently unserved by sewer. In 2017, a mainline sewer was installed in Euclid Avenue along the southern border of the planned action boundary and serves as a start to bringing sewer service to the area. Spokane County designs the collection and transport systems for peak flow conditions so that overflows, backups, and discharges from the system do not occur under normal operating situations. Generally, the collection and transport system will use gravity flow where possible. In areas where use of gravity flow is not possible, pump stations, force mains, and low-pressure sewer mains are used to pump the sewage to a location where gravity flow can be used. Specific design criteria shall conform to the requirements of the Washington State Department of Ecology and Spokane County Environmental Services.

The Northeast Industrial Area Planned Action Area is located in the North Valley Interceptor sewer basin and served by Drainage Basins 7 and 8. Drainage Area 7 is bounded by BNSF on the north, the city limits on the east, Euclid Avenue on the south, and Barker Road on the west. Generally, sewer flows generated in this basin can drain south by gravity in the proposed Barker Road sewer main to the Euclid Avenue sewer main. Easements may be needed for the proposed development to construct sewer and connect to Barker Road. The southern triangular portion of Drainage Area 7 will tie into Barker Road via Euclid Avenue south of the UPRR tracks.

Drainage Area 8 is bounded by BNSF to the north, Barker Road on the east, Euclid Avenue on the south, and Flora Road on the west. Tschirley Road and Eden Lane are existing north/south roads that are also in this basin. Sewer flows generated within this drainage area will drain south based on the existing topography. When future gravity sewer mains are constructed in Tschirley Road, Flora Road, or the future east-west Flora/Barker connectors within the basin, these sewer flows would be conveyed south to the North Valley Interceptor through the Euclid Avenue sewer main and Flora Pit sewer extension.

Drainage Basin 8 includes the residential platted property at the northwest corner of Barker Road and Euclid Avenue. The residential area is not part of the Northeast Industrial Area. This residential plat would be served by the proposed Barker Road sewer line draining south or the Euclid Avenue Sewer Main draining west.

Drainage Basin 8 also includes a pump station owned by Wagstaff Industries, LLC. The private pump station flows west across Flora Road to the Spokane Business and Industrial Park (SBIP) private sewer system, then south in a force main to an existing manhole and 10" sewer line.

The whole Northeast Industrial Area drains southwest through the new Flora Pit sewer extension line paralleling the Spokane River and connecting to the existing North Valley Interceptor, which drains to the Spokane County Regional Water Reclamation Facility (SCRWRF). The SCRWRF provides treatment to most of Spokane Valley's wastewater. SCRWRF is located at the old Stockyards site east of Freya and south of Trent. The SCRWRF currently has a rated capacity of 8 mgd, but is expandable up to approximately 24 mgd on an average daily basis. Spokane County also has an agreement with the City of Spokane for an additional 10 mgd of treatment capacity at the Riverside Park Water Reclamation Facility

(RPWRF). The combination of these two treatment facilities has been estimated to handle 20 years of future growth in Spokane Valley.

Power, Natural Gas, Telecommunications

Avista Utilities provides power to the Northeast Industrial Area. Avista is statutorily obligated to provide reliable electricity service to its customers at rates, terms, and conditions that are fair, just, reasonable, and sufficient. To determine how to best meet the future electric needs of its customers, Avista produces an Electric Integrated Resource Plan (IRP). The IRP looks ahead 20 years to identify resource strategies and portfolios that will cost-effectively meet customers' long-term needs.

Avista Utilities provides power to the Northeast Industrial Area. To determine how to best meet the future natural gas energy needs of its customers, Avista produces a Natural Gas IRP. The IRP looks ahead 20 years to identify resource strategies and portfolios that will cost effectively meet customers' long-term needs.

Internet service is available through multiple providers. CentruryLink and Comcast are the primary cable television and Internet providers. CenturyLink provides Internet service via telephone lines and Comcast provides Internet service via cable. However, numerous cable providers serve the area, and generally, include Internet access service options

Impacts

Water

The Northeast Industrial Area will see increased industrial development; however, this development is consistent with the adopted comprehensive plan. Consolidated Irrigation District's water system plan indicates that the North System which includes West Farms as an adequate supply to meet 20-year max day demand and peak hour demand needs. CID plans no improvements to North System supply facilities at this time. The water system plan also includes an alternate design concept analysis that shows the North System has adequate physical storage to meet current and projected 20-year needs. At this time CID plans no storage improvements for the North System.

The water system plan does identify deficiencies within the Northeast Industrial Area related to the distributions system not meeting the fire flow and pressure criteria in the vicinity of Flora Rd and Tschirley Road.

Sewer

The planning and design for wastewater treatment and effluent disposal facilities is based on the 20-year projections of population growth and current water quality criteria as established by the Washington State Department of Ecology. In the case of Northeast Industrial Area, forecasts are based on the City of Spokane Valley's Comprehensive Plan. While the County's Comprehensive Wastewater Management Plan was last updated in 2014 and the City's Comprehensive Plan was adopted in 2016 both plans forecast industrial land uses within the Northeast Industrial Area. For this analysis it's assumed that the increased development in the Northeast Industrial Area is anticipated by County's 2014 Comprehensive Wastewater Management Plan (CWMP) and planned for in the October 2015 Flora-Euclid Sewer Basin Pre-design Report.

According to CWMP, the County's current treatment capacity at the SCRWRF and RPWRF are sufficient to accommodate projected 20-year flows. However, additional treatment capacity will likely be needed to support long-term buildout needs of the County's service area. When flows reach 85% of the design and/or contractual capacities for three consecutive months,

facility planning will begin (if it will have not already been started) to determine the optimal method to address treatment facility needs for future flow increases.

Ongoing maintenance of conveyance and distribution lines will be necessary. No conflicts with proposed plans, policies, or regulations are expected. No improvements to add capacity are necessary and only the new collection line along Barker Road is planned. Additionally, the existing dry-line in Eden Lane, installed in 1990, was connected to the Euclid Avenue main in 2017.

Typically Spokane County Environmental Services, the agency administering the CWMP, receives notice of development projects via State Environmental Policy Act (SEPA) noticing. If the Northeast Planned Action Ordinance is adopted the standard SEPA noticing would not occur. Spokane County Environmental Services uses its comments to provide sewer design and construction requirements, including details related to easements, dedications, and sewer connections.

Power, Natural Gas, Telecommunications

According to Avista's Electrical Integrated Resource Plan (IRP), over the next 20 years, Avista anticipates adding almost 90,000 retail customers with a 0.6 percent annual growth in electric demand. The IRP includes plans and strategies to meet future demand. The IRP is updated every two years and looks 20 years into the future. Natural gas also has an IRP that includes plans and strategies to meet future demand.

New industrial development will place increased demand on electrical and possibly natural gas needs within the Northeast Industrial Area. Avista reviewed and commented on the City's adopted comprehensive plan that anticipated industrial uses in the area. While the review was done at a very high level, the Planned Action Ordinance does not change the anticipated land use. Industrial users that would place a significant demand on electrical and/or natural gas may require additional consultation with Avista to ensure appropriate level of service.

Mitigations

Water

The Consolidated Irrigation District water system plan identifies three improvements to the distribution system that impact development within the Northeast Industrial Area. These improvements are aimed at addressing the low pressure and fire flow impacts identified above. The water system plan includes improvements for both 20-year and 50-year horizons because water mains typically have a longer lifespan than 20-years and the CID aims to prevent installation of a main that might require replacement prior to reaching its full service life due to capacity limitations. The three improvements within the West Farms pressure zone that impact the Northeast Industrial Area are seen in the table below.

Table 3: West Farms 20 and 50 year Distribution Improvements

Type of Deficiency	Location	20-year Improvement	50-year Improvement
Low Pressure	Vicinity of Flora Rd and Tschirley Rd North of Euclid Ave and South of Trent Ave	None	Improvements (a) and (b)
Fire Flow	Vicinity of Flora Rd and Tschirley Rd North of Euclid Ave and South of Trent Ave	(a) Replace Campbell Rd from Euclid Ave to Wellesley Ave with 16"	20-year improvements and

	(b) Construct 12" loop parallel to south side of Trent Ave from Barker Rd to Tschirley Rd	(c) Replace north side of Trent Ave from Tschirley Rd to Flora Rd with 10"

Sewer

Spokane County develops a 6-year Capital Improvement Program (CIP) summary as a part of its sewer planning. In the Northeast Industrial Area the City of Spokane Valley and Spokane County have an agreement to coordinate the installation of sewer improvements with transportation system improvements. Barker Road is slated to be widened to a 3-lane urban cross section in a phased project beginning in 2020 and the installation of a sewer line ranging from 8-10 inches is planned at that time.

In addition to the proposed Barker Road project, Spokane County has completed a number of sewer projects scoped in the 2014 CWMP to facilitate industrial development within the Northeast Industrial Area, these include:

- SM-6.1: Euclid Avenue Gravity Sewer Main (Flora to Barker). Constructed in 2017, this project includes a new 15-inch sewer main. Flows will be collected at the intersection of Barker Road and Euclid Avenue and in Flora Road on the east side of the Spokane Business Industrial Park, south of Euclid Avenue. All flows will drain in Euclid Avenue to the Flora Pit Sewer Extension (see Project SM-6.2). This project is designed to deliver sewer flows generated between Barker Road, Flora Road, Euclid Avenue, and the BNSF Railroad. The purpose of this project is to provide future sewer service to a potentially developable commercial area in the northeast portion of the City of Spokane Valley.
- SM-6.2: Flora Pit Sewer Extension. Constructed in 2016-2017, this project includes a new 18-inch sewer main that collects sanitary sewer flows between Barker Road and Flora Road in Euclid Avenue (see Project SM-6.1). Flows will drain southwest through this new sewer line paralleling the Spokane River and connect to the existing North Valley Interceptor Extension at the Flora Pit Road and Sullivan Road intersection. The purpose of this project is to collect flows draining to Euclid Avenue and provide future sewer service to a potentially developable commercial area in the northeast portion of the City of Spokane Valley.

While improvements in capacity are not necessary at this time, the 2014 CWMP does mention monitoring treatment capacity at SCRWRF to assist in predicting when design for upgrades will be required.

- WWTP-20.1: Longer-term Expansions/Upgrades to SCRWRF. This project is a placeholder for longer-term expansions/upgrades to the SCRWRF, such as treatment process construction that may be necessary to increase its capacity and/or treatment capabilities. Appropriate expansions will be done in phases, maybe before, but probably beyond the next 20 years.

All projects that desire to participate in the PAO shall connect to public sewer consistent with adopted County regulations and policies. In order to facilitate a streamlined process, notice shall be provided to Spokane County Environmental Services as part of the process used to evaluate a project's consistency with the thresholds analyzed in the PAO of the project. As

part of the PAO request, applicants shall complete Spokane County's general sewer packet, including a signed sewer planning requirements form[2].

Telecommunications, Natural Gas, Power

In order to address the potential loss of SEPA comment period, as part of a potential project's review for consistency with this analysis notice shall be provided to Avista Utilities and Comcast Communications of the project.

3.5 Transportation

Affected Environment

For a full detail of the existing conditions related to transportation please see *Appendix A: Existing Transportation Conditions Report for Spokane Valley Northeast Industrial Area PAO[3].*

Streets

The street network within the study area is fairly coarse compared to other parts of the City, as much of the land is undeveloped and there are few local streets. There are three existing collector and arterial streets within the study area each spaced about a mile apart. All streets within the study area have two lanes, there are no signalized intersections and only a few streets segments contain curb and gutter.

Major (collector and arterial) Streets

- **Barker Road** – Barker is the primary north-south street through the study area. It is the only street in the study area that crosses the Spokane River, thus providing direct access to I-90 and Appleway Boulevard to the south. It also connects with Trent Avenue to the north. As a result this street has the highest existing traffic volumes in the study area averaging about 5,500 vehicles per day. Barker is designated as a minor arterial within the study area. The posted speed is 45 mph in the study area and 35 mph south of Euclid.
- **Flora Road** – Flora Road is parallel to Barker Road and located one mile to the west of Barker. This street provides connections between Trent Avenue and Euclid Avenue, but does not connect across the Spokane River. It becomes a private road south of Euclid.
- **Euclid Avenue** – This is the only continuous east-west street through the study area providing connections between Liberty Lake to the east and Sullivan Road to the west. However, the street dog-legs where it intersects Barker Road (crossing the UP railroad tracks) and Flora Road in the study area.

Local Streets

Excluding the small residential development on the northwest corner of Barker Road and Euclid Avenue (which is not part of the study area), the study area contains just three publicly accessible local streets (Dalton Avenue, Tschirley Road and Eden Street) combining for just over 1 mile in total length. Eden Street is one of the only streets in the study area with a curb and gutter.

Major Regional Roadways Nearby

[2] Appendix D includes the Spokane County General Sewer Summary Packet

[3] Appendix A was developed prior to naming the area Centennial Business Park, the Northeast Industrial Area and Centennial Business Park are synonymous.

There are several major regional roadways that, while outside the study area, provide access to the state and national highway system. Connections to these roadways will be critical to employee and freight access as part of future land development.

- **Trent Avenue (SR 290)** – Trent is a major east-west connection and freight artery through the Spokane region. It is a five lane principal arterial road just north of the study area with a 50 mph posted speed. There are side street stop controlled intersections where both Flora Road and Barker Road intersect Trent. The intersection at Barker and Trent is currently in design for a round-about and the improvements are fully funded.
- **Interstate-90** – I-90 is the major east-west interstate highway across the state of Washington and is one of the principal interstates spanning the country from coast to coast. This highway is an important artery for freight and interstate travel in the region. An interchange to I-90 is located 1.5 miles south of the study area with an interchange at Barker Road.
- **Appleway Boulevard** – Appleway/Sprague is the major east-west corridor through the heart of Spokane Valley. Barker Road intersects Appleway Boulevard about 2 miles south of the study area.
- **Sullivan Road** – Sullivan Road is a major north-south arterial located just to the west of the study area. Euclid Avenue intersects Sullivan about 1 mile west of the study area. Sullivan Road also provides access to Trent Avenue and I-90.

Traffic Operations

The Spokane Valley Comprehensive Plan adopts the following Level of Service Standards (LOS):

- LOS D for major arterial corridors:
  - Argonne/Mullan between the town of Millwood and Appleway Boulevard
  - Pines Road between Trent Avenue and 8th Avenue
  - Evergreen Road between Indiana Avenue and 8th Avenue
  - Sullivan Road between Wellesley Avenue and 8th Avenue
  - Sprague Avenue/Appleway Boulevard between Fancher Road and Sullivan Road
- LOS D for signalized intersections not on major arterial corridors
- LOS E for unsignalized intersections (LOS F is acceptable if the peak hour traffic signal warrant is not met)

As part of this analysis the City conducted a LOS for 18 intersections critical to the development of the Northeast Industrial Area. As shown in the table below, under the existing conditions, most intersections included in this study currently meet LOS criteria in both the AM and PM peak periods. Intersections that do not meet the LOS criteria are shown in **bold text**.

Table 4: Existing LOS for NIA Critical Intersections

Intersection	Type	AM Peak		PM Peak		Approach Reported (AM/PM)
		Delay (secs)	LOS	Delay (secs)	LOS	
Barker Rd/Trent Ave	Side-Street Stop	**59**	**F***	41	E	NB
Barker Rd/Euclid Ave (north)	Side-Street Stop	10	A	11	B	EB
Barker Rd/Euclid Ave (south)	Side-Street Stop	12	B	17	C	WB
Barker Rd/Buckeye Ave	Side-Street Stop	13	B	10	B	WB
Barker Rd/Riverway Ave	Side-Street Stop	16	C	20	C	WB
Barker Rd/Indiana Ave (north)	Side-Street Stop	11	B	12	B	EB

Barker Rd/Indiana Ave (south)	Side-Street Stop	14	B	15	B	WB
Barker Rd/Mission Ave	Signal	13	B	17	B	
Barker Rd/Boone Ave	Side-Street Stop	22	C	18	C	EB/WB
Barker Rd/Westbound I-90 Ramps	Signal	**68**	**E**	43	D	
Barker Rd/Eastbound I-90 Ramps	Signal	44	D	**113**	**F**	
Flora Rd/Trent Ave	Side-Street Stop	**129**	**F**	**124**	**F**	SB/NB
Flora Rd/Euclid Ave (north)	Side-Street Stop	11	B	11	B	WB
Flora Rd/Euclid Ave (south)	Side-Street Stop	10	A	10	A	EB
Sullivan Rd/Trent (north)	Signal	16	B	12	B	
Sullivan Rd/Trent (south)	Signal	13	B	21	C	
Sullivan Rd/Euclid Ave	Signal	51	D	60	E**	
Del Rey Dr/Trent Ave	Side-Street Stop	23	C	18	C	SB

Source: Fehr & Peers

* Does not meet City LOS standard because intersection operates at LOS F and traffic volumes satisfy the peak hour signal warrant

**LOS E is acceptable here because Sullivan is a major arterial corridor that meets LOS standard corridor-wide

Transit Network

Spokane Transit Authority (STA) provides public transit service within Spokane Valley, no fixed-route transit service is provided in the study area. The closest bus stop is about a mile south of the study area at the Barker Road/Mission Avenue intersections. This stop is served by route 98 which operates at 30 minute frequencies during weekdays between Liberty Lake and the Valley Transit Center. Route 96 also stops just over a mile west of the study area at the Sullivan Road/Euclid Avenue intersection. This route also operates at 30 minute frequencies weekdays and connects North Sullivan Road with the Mirabeau mixed-use commercial area, Pines Road and the Valley Transit Center. As the study area densifies, STA may provide transit service in the future and all arterial roadways will be designed to accommodate transit vehicles.

Bicycle Network

There are no existing bicycle facilities within the study area. However, some bicycle facilities exist just south of the study area. These include a bicycle lane on Barker Road just south of the study area (that extends for about 2/3 of a mile) between the Spokane River Bridge and Boone Avenue and the Centennial Trail multiuse path on the south side of the Spokane River also just south of the study area. This Centennial Trail spans about 7 miles across the City of Spokane Valley and beyond connecting the Pasadena Park area with Liberty Lake.

Bicycle lanes are planned to be constructed along Barker Road between the Spokane River and Trent Avenue and between Boone Avenue and Appleway Boulevard by year 2021 as part of the City's Barker Road Improvement Project. As part of the City of Spokane Valley's Bike and Pedestrian Master Program, bicycle lanes are also proposed on Flora Road and a multi-use trail is proposed parallel to Trent Avenue just north of the study area. No funding or timeline has been identified for these projects.

Pedestrian Network

The majority of the streets within the study area do not have sidewalks, curbs or gutter. There are two exceptions, a 0.3 mile stretch of Eden Avenue north of Euclid Avenue and a short segment (about 360 feet) along the west side of Barker Road. The Eden Avenue sidewalk is a 5 foot sidewalk and curb on both sides of the street. The sidewalk on the east side is detached from the curb, while on the west side it is attached except for the northern section. The Barker Road is a detached sidewalk and curb that was constructed as part of a recent development. There are no signalized pedestrian crossings in the study area and no painted crosswalks.

Truck Routes & Volumes

There is a high percentage of truck traffic on the major streets in the study area compared to other parts of Spokane Valley. Truck traffic on the three major streets in the study area (Barker Road, Flora Road and Euclid Avenue) accounts for about 12-17% of the average daily vehicle traffic, and 3-13% of the peak hour traffic. The three major streets are classified as T-3 based on the annual freight tonnage they carry (between 300,000 and 4 million tons of freight per year). The major corridors around the study, Trent Avenue, I- 90, Sullivan Avenue and a section of Barker Road just south of I-90 support even higher volumes of freight and are classified as T-1 or T-2, carrying more than 4 million tons of freight per year.

Several businesses operating in the industrial area support existing larger industrial businesses and generate internal trips related to business interaction. For example, there are Kaiser Aluminum suppliers that shuttle materials back and forth within the existing Industrial Park and within the study area.

Rail Operations

The Northeast Industrial Area is also flanked by two mainline railroads. The Burlington Northern Santa Fe (BNSF) mainline parallels the northern edge of the study area and the Union Pacific (UP) mainline parallels the southern boundary of the study. The BNSF route is one of the company's main transcontinental lines between west coast ports and the interior of the country and hosts Amtrak's twice daily Empire Builder between Chicago and Seattle/Portland. Both rail companies also have rail spurs to industrial land uses west of the study area. While no rail spurs currently exist in the study area, preservation of access to both rail lines will be important to future industrial development within the study area.

Federal Railroad Administration (FRA) data indicates that the BNSF line hosts about 54 trains per day, mostly long-haul freight trains passing quickly through the area, and the UP line hosts about 9 trains a day, including a combination of short-haul freight, long-haul freight, and short trains performing switching operations. The table below describes some basic operating characteristics, including a list of crashes since 1975.

Table 5: Operating characteristics of at-grade rail crossings

Railroad	Street Crossing	Avg Trains per day	Typical Frequency	Gates Down avg/max mins	Typical Speed	Crashes 1975-2016
BNSF	Barker	54	10-90 mins	3:00 / 4:30	1-79 mph	1991 – fatality
	Flora	54	10-90 mins	No data	1-79 mph	1975 – no injury 1990 – no injury
UP	Barker	9	1-4 hours	2:00 / 4:00	24-49 mph	1989 – fatality
	Flora	9	1-4 hours	No data	24-49 mph	None

Source: Fehr & Peers; Federal Railroad Administration

At-Grade Rail Crossings

There are four at grade railroad crossing within the Northeast Industrial Area: BNSF at Flora; BNSF at Barker; UP at Flora; and UP at Barker. Traffic queueing impacts related to railroad crossings were analyzed as part of this analysis for the crossings on Barker Road. Flora Road crossings were not analyzed because the grade separation project on Barker and BNSF would close the BNSF crossing at Flora. Additionally, the UP traffic is about 5 times less BNSF traffic.

The queuing analysis was done using Synchro, a traffic analysis software, and are based on observed gate down times and traffic volumes during both the AM and PM peak hour. Trucks

are assumed to be the equivalent of three passenger vehicles and each passenger vehicle is assumed to be 25 feet in length. The table below shows the queuing lengths at both the average gate down time and the longest gate down time at peak travel times. The longest gate down time at peak travel times is likely to occur only a few times a year but can occur more frequently on the BNSF crossings.

Table 6: Vehicle Queue Lengths at Barker Road Railroad Crossings

Frequency	Trains per day	Gate Down Time	Vehicle Queue Length (feet) AM Peak NB	AM Peak SB	PM Peak NB	PM Peak SB
BNSF Crossing						
Average (50th percentile)	54	3 minutes	150	250	275	275
Worst Case (95th percentile)	54	4.5 minutes	275	425	475	475
UP Crossing						
Average (50th percentile)	9	2 minutes	300	250	225	500
Worst Case (95th percentile)	9	4 minutes	700	250	525	1,050

Source Fehr & Peers

In the southbound direction at the Barker Road crossing there is only about 100 feet between the railroad crossing stop bar and the Trent Avenue intersection, which is enough space for about 4 cars (or 1 truck and 1 car). This means the queue typically extends about 175 feet along Trent Avenue (and can be as long as 375 feet during the worst case scenario). Vehicles queued on Trent would be in either the westbound left turn pocket, which is about 200 feet long or the eastbound right-turn lane, which is about 300 feet long. Currently these lanes are long enough to store vehicles queued on Trent during the worst case scenario without spilling into the thru lanes.

When gates are down at the UP crossing during the PM peak hour, queues typically build up to about 500 feet southbound and 225 feet northbound (with the queue typically spilling onto both directions of Euclid Avenue). During the worst case scenario queues can be 1,075 feet in the southbound direction during the PM peak and 700 feet in the northbound direction during the AM peak.

Lastly, because there are no grade-separated rail crossings in the study area, there are times that the gates are down on both the UP and BNSF line at the same time. This could delay access into or out of the site for emergency vehicles by as much as 4 minutes. The nearest alternative route would be via Sullivan Road (2 miles west of Barker Road), which is grade-separated from both railroads, and Euclid Avenue.

Programmed Transportation Projects

Several streets within the study area and surrounding intersections are programmed for improvement as part of the Spokane Valley Six-Year Transportation Improvement Program (TIP) and/or as a part of the Spokane Regional Transportation Council (SRTC) financially constrained project list in the Horizon 2040 Plan. Programmed projects that will impact transportation in the study area are listed in the table below. These projects, because they have been programmed prior to the Northeast Industrial Area PAO, are assumed to occur regardless of the action and do not appear as a mitigation.

Table 7: Existing Transportation Projects Impacting Study Area

Project	Description	Program (Project #)	Year	Agency Responsible	In Study Area?
Sullivan/Euclid - Concrete Intersection	Reconstruct intersection in concrete pavement (slight change in lane configuration)	6-year TIP	2018	City of Spokane Valley	No
Barker Road – Euclid to Garland	Reconstruct to 3-lane urban section	6-year TIP	2021	City of Spokane Valley	Yes
Barker Road – Garland to Trent	Reconstruct to 3-lane urban section	6-year TIP	2023	City of Spokane Valley	Yes
Barker Road Improvement Project – Appleway to I-90	Widen and improve to 5-lane urban section; roundabout @ Broadway; realign east leg of Broadway	6-year TIP	2024	City of Spokane Valley	No
Barker Road Improvement Project – Spokane River to Euclid	Reconstruct and widen to 3-lane urban section	6-year TIP	2023	City of Spokane Valley	No
Barker Road/BNSF Grade Separation	Construct grade separation at Barker/BNSF RR/Trent	6-year TIP	2022	City of Spokane Valley	Yes
I-90/Barker Road Interchange	Construct general purpose lanes and replace Barker Rd I/C	*Horizon 2040 Plan*	2020	WSDOT	No
Sullivan Road Bridge over Trent	Construct new bridge over Trent and BNSF railroad tracks	*Horizon 2040 Plan*	2031-2040	City of Spokane Valley, BNSF	No

Impacts

The Northeast Industrial Area is likely to see increased development resulting in impacts to the transportation network not only within the area's boundary but to intersections and roadways beyond the project boundary. Improvements to the transportation network represent one of the largest investments related to increased development and one that is easily linked to the pace and intensity of development. In order to provide a predictable and flexible impact analysis, the transportation impacts have been separated into three phases, described below. Each phase includes a technical memorandum and is included as *Appendix B: Spokane Valley Analysis for Phase 1, Phase 2, and Phase 3*[4].

- **Phase 1 – 2017-2019.** Consists of two adjacent industrial developments proposed on approximately 80 acres of currently undeveloped land on the northeast corner of Barker Road and Euclid Avenue in Spokane Valley. The two projects are estimated to have a combined total of 375 employees when they open.
- **Phase 2 – 2020-2032**. Consists of the widening of Barker Road to five lanes south of Mission Avenue to I-90. This project is the only large scale mitigation project needed in Phase 3 that was not tied to another project with a pre-defined timeline.
- **Phase 3 – 2032-2040.** Consists of all the remaining projects needed to accommodate approximately 3,200[5] additional employees in the Northeast Industrial Area. The level of intensity expected is consistent with the adopted 2017 Comprehensive Plan.

[4] Appendix B was developed prior to naming the area Centennial Business Park, the Northeast Industrial Area and Centennial Business Park are synonymous.

[5] Employment forecast is based on the 2017 Comprehensive Plan. An updated version of the SRTC model assumes less growth for the area; however, an updated analysis completed after initial review the DSEIS indicated the impacts are similar, so the Comprehensive Plan numbers are being used for consistency. Please see Appendix -

Phase 1 Impacts

New vehicle trips associated with the two projects in Phase 1 were estimated for the morning and afternoon peak hour on a typical weekday using the ITE Trip Generation Manual, 9th Edition. Trip rates were calculated based on the number of employees. The land use of both sites was assumed to be General Light Industrial (ITE Code 110) as this land use type best matched the anticipated trip rates and directional distribution by time of day for the two proposed developments. Note that Manufacturing (ITE Code 140) was also considered, however, the General Light Industrial use resulted in slightly more conservative (higher) trip generation rates, so that land use category was used.

The table below shows the estimated vehicle trips that will be generated from Phase 1. Phase 1 is anticipated to generate a total of 1,198 new trips per weekday, including 131 in the morning peak hour and 160 during the afternoon peak hour. The number of trucks is 13% and is based on 2017 traffic counts.

Table 8: Phase 1 Vehicle Trip Generation

Trip Generator	Land Use	Employees	AM Peak Hour		PM Peak Hour		Weekday Total
			In	Out	In	Out	
Project #1	Light Industrial	150	56	10	13	50	473
Project #2, 1st Shift	Light Industrial	125	46	9	11	42	399
Project #2, 2nd Shift	Light Industrial	100	0	0	37	7	326
	Total	**375**	**112**	**19**	**61**	**99**	**1,198**

Trip Distribution

The distribution of trips in Phase 1 was estimated using existing peak hour traffic volumes and turn movements along Barker Road. Traffic data were collected in either June, 2016 or February, 2017. The estimated distribution of trips from Phase 1 is shown in the list and figure below:

- Trent Avenue, west of Barker Road: 28%
- Trent Avenue, east of Barker Road: 18%
- Euclid Avenue, west of Barker Road: 2%
- Euclid Avenue, east of Barker Road: 8%
- Mission Avenue, west of Barker Road: 8%
- Mission Avenue, east of Barker Road: 2%
- I-90, west of Barker Road: 19%
- I-90, east of Barker Road: 5%
- Barker Road, south of I-90: 10%

Figure 4: Phase 1 Trip Distribution

Level of Service Results

Traffic operations, including vehicle delay and level of service (LOS) at each intersection under Phase 1 were analyzed using Synchro (a transportation planning software). The results of the LOS analysis, including a comparison of existing (2017) and future (2019) conditions under Phase 1, for each of the six major intersections on Barker Road are shown below.

Table 9: Phase 1 Intersection Level of Service Results

Intersection along Barker	Control[1]	Existing (2017)				Phase 1 (2019)				Approach
		AM Peak		PM Peak		AM Peak		PM Peak		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
Trent Ave	SSSC	**59**	**F[2]**	41	E	**139**	**F[2]**	**90**	**F[2]**	NB
Site Access Rd	SSSC	n/a	n/a	n/a	n/a	11	B	12	B	SBL/WB
Euclid Ave (north)	SSSC	10	B	11	B	11	B	13	B	EB
Euclid Ave (south)	SSSC	12	B	15	C	14	B	20	C	WB
Mission Ave	Signal	13	B	17	B	14	B	15	B	
I-90 westbound	Signal	**68**	**E**	43	D	**92**	**F**	46	D	
I-90 eastbound[3]	Signal	44	D	**113**	**F**	50	D	**122**	**F**	

1. SSSC = Side Street Stop Control
2. Does not meet City LOS standard because intersection operates at LOS F and traffic volumes satisfy the peak hour signal warrant per MUTCD guidelines
3. Based on HCM 2000 methodology

Results show that under Phase 1 there would be minimal change in vehicle delay from today at the Barker Road/Euclid Avenue (north and south) and the Barker Road/Mission Avenue intersections. Those intersections would continue to achieve LOS B or C, well within the acceptable LOS threshold established by the Spokane Valley Comprehensive Plan. The intersections with the most significant traffic impacts under Phase 1 include:

- Barker Road/Trent Avenue
- Barker Road/I-90 Westbound
- Barker Road/I-90 Eastbound

At Grade Railroad Crossings

The impacts of queuing vehicles at the two at-grade railroad crossings along Barker Road were analyzed using Synchro under Phase 1 conditions. The table below shows the queuing lengths for the average gate down time and the longest gate down time at peak travel times.

Table 10: Vehicle queue length on Barker Road at-grade rail crossings when gates are down

Railroad Crossing	Condition	Trains per Day	Gate Down Time[1]	Vehicle Queue Length (feet)			
				AM Peak		PM Peak	
				NB	SB	NB	SB
BNSF	Average (50th percentile)	54	3 minutes	175	300	375	325
	Worst Case (95th percentile)	54	4.5 minutes	325	525	650	525
UP	Average (50th percentile)	9	2 minutes	400	275	300	650
	Worst Case (95th percentile)	9	4 minutes	950	275	650	1,350

[1] Duration and frequency of gate down times was recorded at both the BNSF and UP rail crossings along Barker Road between 7AM and 6PM Tuesday, February 14, 2017

The queues at the UP crossing will likely back up onto Euclid Avenue in both directions, but beyond being a little longer than observed today, are not anticipated to have any additional traffic impacts. However, because there is only about 100 feet of space along Barker Road between the BNSF railroad crossing stop bar and Trent Avenue the Barker Road/BNSF rail crossing a more detailed analysis was performed to see if there would be any impacts to traffic on Trent Avenue.

In most cases during the peak period, vehicles will end up queued along Trent Avenue, either in the eastbound right-turn pocket (about 300 feet of storage space) or the westbound left-turn pocket (about 225 feet of storage space). During the AM peak, the percentage of vehicles turning left or right off of Trent Avenue onto southbound Barker Road is split close to 50/50 (eastbound/westbound). During the PM peak the split is 75/25 (eastbound/westbound). These ratios were applied to the estimated queue length during the average and worst case scenarios.

Table 11: Vehicle queues on Trent Avenue at Barker and BNSF Railroad Crossing

Condition	Vehicle Queue Length (feet)					
	Total Queue Need	Barker Road	Trent Ave			
			Turn Lanes		Unused Storage	
			EBL	WBL	EBL	WBL
Existing Vehicle Storage Space		100	300	200	n/a	n/a
Average (50th percentile) AM	300	100	100	100	200	125
Average (50th percentile) PM	325	100	175	50	125	175
Worst Case (95th percentile) AM	525	100	225	200	75	25
Worst Case (95th percentile) PM	525	100	325	100	**-25**	125

The table above demonstrates that during the average scenario there would be sufficient storage space in both the westbound left-turn pocket and eastbound right-turn pocket along Trent Avenue during the peak hours. In the worst case scenario there would be sufficient capacity in both the westbound left-turn pocket and eastbound right-turn pocket along Trent Avenue during the AM peak hours. During PM peak the westbound left-turn pocket has sufficient capacity but the eastbound right-turn pocket exceeds capacity by 25 feet (about 1 car) during the PM peak. It is estimated (based on the frequency of 4.5 minute gate down times) that this scenario would occur about 9-10 times per year.

Phase 2 Impacts

Phase 2 was developed after Phase 3. Where Phase 3 identifies the impacts out to 2040, the City desired to identify an intermediate level of development between Phase 1 (in year 2019) and Phase 3 (in year 2040). Of the recommended projects to mitigate traffic impacts associated with Phase 3 development (see section below), the largest and most expensive would be widening Barker Road to five lanes from Mission Avenue to I-90. Unlike some of the other recommended projects, the timeline for widening Barker Road to five lanes is not tied to other projects, but would be based on the pace of nearby development and associated growth in traffic

Traffic forecasts show that Barker Road between Mission Avenue and I-90 will likely need to be widened to five lanes at some point between the year 2025 and 2032. This forecast assumes steady growth in background traffic on this corridor over the next 20 years at a rate of about 1.33% per year. The variability in timing in this analysis is based on how rapidly the Northeast Industrial Area is developed. If no new industrial development in the Northeast Industrial Area occurs over the next 14 years, background traffic growth alone on Barker Road – caused by other nearby and regional developments – would likely trigger the need to widen Barker Road south of Mission Avenue by year 2032. Alternatively, if there were to be rapid buildout of the Northeast Industrial Area over the next 5-10 years, the earliest year that widening would likely be needed is in 2025.

Using the City's adopted LOS, the approximate year in which traffic growth along Barker Road south of Mission Avenue would trigger the need for the City of Spokane Valley to widen the section of Barker Road between Mission Avenue and I-90 to five lanes is shown in the table below for three different development scenarios in the Northeast Industrial Area.

Table 12: Forecast year Barker Road would exceed LOS south of Mission Avenue

Phase 2 Development Scenario	Year LOS D threshold would be exceeded
With no new development in the Northeast Industrial Area	2032
With 75% of the 2015-2040 forecast growth in the Northeast Industrial Area	2026
With 100% of the 2015-2040 forecast growth in the Northeast Industrial Area	2025

Phase 3 Impacts

Traffic volumes under Phase 3 were estimated using the same regional travel demand model that was used for the recent update (2017) to the Spokane Valley Comprehensive Plan. Prior to running the model, input was gathered from the project's technical advisory committee (TAC) to identify future land use and transportation network changes that were not already incorporated in the model. The TAC is comprised of representatives from Spokane Valley, Spokane County, Liberty Lake, the Spokane Regional Transportation Council (SRTC), Washington State Department of Transportation (WSDOT), developers, utility providers, and the railroads.

After consulting with the TAC, a few changes were made to the regional travel demand model in the vicinity of the Northeast Industrial Area before running the model:

- The 2015 and 2040 land use, including the number of dwelling units and employees, in the seven TAZs within Liberty Lake (442, 445, 446, 447, 448, 449 & 450) were updated based on information provided in the *Liberty Lake Network Analysis Transportation Stud*y (February, 2017).
- Indiana Avenue was connected between Barker Road and Harvard Road in the 2040 model
- A new east-west connector road between Flora Road and Barker Road was added between Euclid Avenue and Trent Avenue to reflect a developer funded planned connection for the area
- Reconfiguration of the Barker Road/Trent Avenue intersection, including a scenario both with and without Flora Road open across the BNSF Railroad south of Trent Avenue

After the TAC's initial review, it was identified that the 2015 and 2040 travel demand models used for the Spokane Valley Comprehensive Plan (and Northeast Industrial Area PAO) differ from the land use assumptions in the most recent version of the SRTC 2015 and 2040 regional travel demand model (updated in December of 2017). In early 2018, an analysis was conducted to identify if any different infrastructure needs would have been identified for the Spokane Valley Northeast Industrial Area PAO using the recently updated SRTC land use forecasts and travel model compared to the land use forecasts assumed in the DSEIS. The analysis of infrastructure based on the new forecasts show that there would be no change in infrastructure recommendations identified previously.[6]

2040 Street Network Assumptions

The 2040 Synchro network (used to analyze level of service at each intersection) assume the following changes to the street network from what they are today. These were also reflected in the Spokane Regional Transportation Council (SRTC) 2040 travel demand model. These assumptions based on projects that were programmed in the Spokane Valley Six-Year Transportation Improvement Program (TIP) or the SRTC financially constrained project list from the Horizon 2040 Plan when this study started:

- Northbound and southbound left turn lanes were added at all intersections along Barker Road to reflect the planned upgrade of Barker Road to a 3-lane urban section
- The Barker Road/I-90 interchange was reconfigured to a standard diamond interchange with two-lane roundabouts plus slip ramps for right-turn movements at both ramps (as reflected in I-90/Barker Rd the Interchange Justification Report)
- Five lanes were added along Barker Road between I-90 and Appleway Boulevard
- The existing partial interchange at I-90/Appleway Boulevard was replaced with a new, full interchange at I-90/Henry Road[7]
- New northbound and southbound left turn lanes were added on Sullivan Road at the Trent Avenue ramps

Trip Generation

[6] Spokane Valley Northeast Industrial Area Planned Action Ordinance – Spokane Regional Transportation Council Model Update; April 4, 2018

[7] This configuration is consistent with the existing SRTC plan and was assumed when this study was initiated. However, since this study was initiated WSDOT completed their modeling for a new Henry Road interchange and found it did not show purpose and need. Potential strategies to address future traffic if the Henry Road/I-90 interchange is not built by 2040 are addressed in the mitigations section.

Based on land use assumptions from the 2017 Spokane Valley Comprehensive Plan, the Northeast Industrial Area will grow by about 3,200 employees between 2015 and 2040. The 2040 travel demand model forecasts the Northeast Industrial Area to generate about 1,500 PM new peak hour trips, with about 1,340 of those generated by land uses east of Flora Road. The table below shows employment growth and PM peak hour trip generation from new employees within the Northeast Industrial Area boundary. The travel demand model assumes an average PM peak hour trip generation rate of about 0.46 trips per employee, with 37% of trips inbound and 63% of trips outbound during the PM peak. This trip rate is similar to ITE's trip rate for General Light Industrial uses (ITE Code 110).

Table 13: Trip Generation within NIA

Section of NIA	2015-2040 Employment Growth	In[1]	Out[1]	**Total[1]**
West of Flora	340	60	100	**160**
Between Flora and Barker	1,460	250	430	**680**
East of Barker	1,420	245	415	**660**
Total	**3,220**	**555**	**945**	**1,500**

1: PM Peak hour trips

Trip Distribution

There is no public access across the railroad spur west of Flora Road. Therefore the portion of the Northeast Industrial Area west of Flora Road will load primarily onto Sullivan Road and Euclid Avenue, while the area east of Flora Road will primarily load onto Flora Road, Barker Road and Euclid Avenue. The distribution of trips from land uses within the Northeast Industrial Area is described in the table below and mapped in the figures below.

Table 14: Trip Distribution within the NIA

Direction	Via primary road/street	West of Flora[1]	East of Flora[1]
Northwest	– Flora Road (north)	0%	8%
	– Trent Avenue (west)	24%	20%
	– Sullivan Road (north)	22%	3%
Southwest	– Mission or I-90 (west of Barker)	N/A	11%
	– Mission/Indiana or I-90 (west of Sullivan)	11%	N/A
	– Sullivan Road (south of Marietta)	33%	14%
	– Sullivan Road (south of I-90)	22%	N/A
East	– Wellesley Avenue (east)	2%	11%
	– Trent Avenue (eastbound)	3%	2%
	– Euclid Avenue (eastbound)	6%	10%
South	– Mission/Indiana Avenue (eastbound) or I-90 (east of Barker)	5%	4%
	– Barker Road (south)	2%	7%
Local	– Nearby local streets	3%	13%

1: Percent trips by trip end location
Source: Fehr and Peers

Figure 5: 2040 Trip Distribution West of Flora

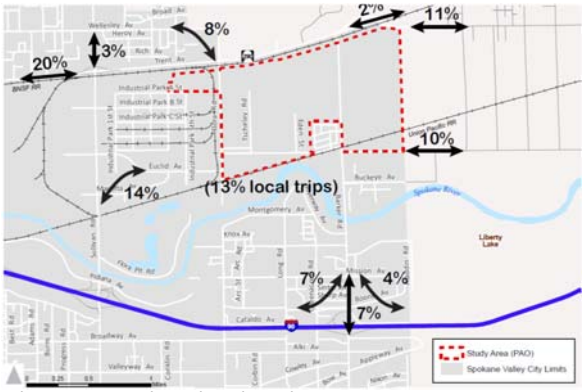


Figure 6: Trip Distribution East of Flora

Local Capture Rate

The 2040 local capture rate of 13% was derived from the SRTC approved travel model. The local capture rate accounts for all trips that begin or end within the PAO boundary and within the area roughly bound by Sullivan Road, Trent Avenue, the east City limits, and Mission Avenue. The other 87% of trip that begin or end within the PAO boundary pass through all the other road segments identified in Table 14: Trip Distribution above. Several businesses operating in the industrial area support each other and shuttle materials back and forth. It is likely that these types of supportive industries will continue to co-locate in the Northeast Industrial Area. All these local trips were considered as part of the mitigation measures identified in this analysis. Overall, the total trips that growth in the PAO area will add to the roadway system were reviewed and the results from the SRTC model were post-processed to ensure future growth in traffic that is consistent with recent trends and that all future traffic volumes are notably higher than current conditions.

Level of Service Standard Results

Traffic operations, including intersection vehicle delay and level of service (LOS) at each intersection under both existing conditions (2017) and Phase 3 conditions (2040) were analyzed using Synchro (a transportation planning software). The table below shows the results of that analysis.

The results show that by 2040 under Phase 3 of development in the Northeast Industrial Area the majority of intersections studied would operate at an acceptable LOS. These results assume all projects included in the Spokane Valley Six-Year TIP and the SRTC financially constrained project list from the Horizon 2040 Plan are operational by 2040. However, two intersections are forecast to fail the City's LOS standards by 2040, a significant transportation impact: Barker Road/Boone Avenue and Flora Road/Trent Avenue. Additional transportation impacts were also identified along Barker Road south of Mission Avenue and at the Barker Road/UP Railroad at-grade crossing, both discussed below.

Table 15: Intersection LOS Results for Phase 3 (year 2040)

Intersection	Control[1]	AM Peak		PM Peak		Approach
		Delay	LOS	Delay	LOS	
1a. Barker Rd/ Wellesley Ave[2]	Signal or Roundabout	28	C	25	C	
1b. Wellesley Ave/ Trent Ave[2]	Signal or Roundabout	26	C	25	C	
2. Barker Rd/ Euclid Ave (north)	SSSC	12	B	16	C	EB
3. Barker Rd/ Euclid Ave (south)	SSSC	14	B	19	C	WB

4. Barker Road/ Buckeye Ave	SSSC	14	B	17	C	WB
5. Barker Road/ Riverway Ave	SSSC	26	D	40	E	WB
6. Barker Rd/ Indiana Ave (north)	SSSC	13	B	17	C	EB
7. Barker Rd/ Indiana Ave (south)	SSSC	23	C	26	D	WB
8. Barker Rd/ Mission Ave	Signal	20	C	25	C	
9. Barker Rd/ Boone Ave	SSSC	139	F[4]	**>300**	**F[5]**	WB
10. Barker Rd/ I-90 Westbound Ramps	Roundabout	30	C	13	B	
11. Barker Rd/ I-90 Eastbound Ramps	Roundabout	12	B	25	C	
12a. Flora Rd/ Trent Ave (if Flora Rd/BNSF rail crossing is open[2])	SSSC	**>300**	**F[5]**	**>300**	**F[5]**	SB/NB
12b. Flora Rd/Trent Ave (if Flora Rd/BNSF rail crossing is closed[3])	SSSC	**174**	**F[5]**	**>300**	**F[5]**	SB
13. Flora Rd/ Euclid Ave (north)	SSSC	15	B	15	B	WB
14. Flora Rd/ Euclid Ave (south)	SSSC	11	B	12	B	EB
15. Sullivan Rd/ Trent Westbound Ramps	Signal	39	D	53	D	
16. Sullivan Rd/ Trent Eastbound Ramps	Signal	12	B	38	D	
17. Sullivan Rd/ Euclid Ave	Signal	52	D	51	D	
18. Del Rey Dr/ Trent Ave	SSSC	35	E	29	D	SB

1. SSSC = Side Street Stop Control.
2. This scenario assumes Barker Road will be diverted ½ mile east to a new intersection with Wellesley Road just south of the BNSF Railroad
3. This scenario assumes Barker Road will intersect Trent Avenue via a new grade separated BNSF Railroad crossing
4. Does not satisfy peak hour signal warrant using MUTCD guidelines, thus would technically still meet the City's LOS standard.
5. Does not meet City LOS standards. Intersection operates at LOS F and traffic volumes satisfy the peak hour signal warrant per MUTCD guidelines.

While the forecast trip distribution in 2040 was pulled from the SRTC model, the city also conducted a sensitivity analysis to review a 50/50 split of trips between trips heading north and trips heading south on Barker, similar to trip distribution seen on Sullivan. The analysis showed that Barker Road would still operate within WSDOT and City of Spokane Valley standards in 2040 with the recommended mitigations in place.

The intersection of Barker and Mission was used to conduct the sensitivity analysis since it was found to have the worst delay in the 2040 analysis. The analysis increased northbound through movements by 30 vehicles and southbound through movements by 105 vehicles during the PM peak over the original 2040 forecasts; about a 10% increase in traffic generated from the study area going to and coming from the south. The analysis showed that with the increase volume the intersection would continue to operate at LOS C during the PM peak hour and average delay at the intersection would increase from 25 to 31 seconds.

<u>Barker Road/Boone Avenue Intersection</u>

By 2040 the Barker Road/Boone Avenue intersection is forecast to operate at LOS F (as measured by the westbound approach) during both the AM and PM peak – and traffic volumes peak would be high enough on Barker Road and Boone Avenue during the PM peak

to meet the peak hour signal warrant using MUTCD[8] criteria. The 2040 travel demand model used for this analysis assumes that Cataldo Avenue - which is a local road that provides access to several industrial sites just east of Barker Road and north of I-90 - would be rerouted (as part of the Barker Road/I-90 interchange reconstruction planned by WSDOT) north to intersect Boone Avenue just east of Barker Road instead of intersecting Barker Road at the I-90 westbound ramps as it does today. This would effectively shift all of the traffic currently (and in the future) along Cataldo Avenue to instead use the Barker Road/Boone Avenue intersection. This would be sufficient by 2040 to cause the Barker Road/Boone Avenue intersection to fail the City's LOS threshold.

Barker Road (I-90 to Euclid Avenue)

The 2016 Spokane Valley Comprehensive Plan recommended widening Barker Road to five lanes from I-90 to Euclid Avenue by 2040. That recommendation was re-examined as part of this study. Average daily traffic (ADT) and the peak hour one-way volumes on Barker Road were forecast for 2040 between I-90 and Euclid Avenue based on the updates to the travel demand model described previously. Results are shown in the table below.

Table 16. Traffic volumes on Barker Road

Barker Road Segment	Existing (2017)		2040	
	ADT	Peak Hour Volume (highest approach)	ADT	Peak Hour Volume (highest approach)
Boone Avenue – Mission Avenue	13,400	640	18,400	780
Mission Avenue – Euclid Avenue	10,200	510	16,000	715

The industry standard threshold for the amount of vehicles one thru-lane of traffic can accommodate before significant delays occur ranges from about 600-900 vehicles per hour. The variation depends on driveway/intersection frequency, access control, travel speed, intersection control, concentration of traffic during the peak hour and other factors. The results of the updated analysis, above, demonstrate that volumes would be high enough on Barker Road between I-90 and Mission Avenue (combined with the presence of signalized intersections and frequent driveways/intersections) to have a significant transportation impact. Traffic volumes on Barker Road north of Mission are forecast to be a lower and, while being on the cusp of warranting mitigation, are not forecast to have a significant transportation impact.

Flora Road/ Trent Avenue

By year 2040, without any improvements, delay would increase substantially during both the AM and PM peak and thus continue to fail the City's LOS standards. Since this is a side-street stop controlled intersection, LOS is measured based on the approach with the highest delay. Under an alternative where the Flora Road/BNSF Railroad crossing remains open, the highest delay during the AM peak would be from the southbound approach, where traffic originates primarily from residential development north of Trent Avenue (outside the study area). In the PM peak, the highest delay would occur from the northbound approach, where traffic originates from the industrial sites south of Trent Avenue. Despite the added delay,

[8] *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, https://mutcd.fhwa.dot.gov

the SRTC travel model predicts the deviation in Barker Road would cause a substantial number of drivers to opt for Flora Road instead of Barker Road to access Trent Avenue.

Under and alternative where the Flora Road/BNSF Railroad crossing is closed, delay from the southbound approach would still be well above LOS F during both the AM and PM peak hours. Under both alternatives, peak hour traffic volumes would be high enough on Flora Road and Trent Avenue to meet the peak hour signal warrant using MUTCD[9] criteria.

Impacts at the At-Grade Rail Crossings

The impacts of queuing vehicles from the Union Pacific (UP) railroad at-grade crossing at Barker Road were analyzed using Synchro in year 2040. The UP Railroad crosses Barker Road between the Euclid Avenue westbound and Euclid Avenue eastbound intersections. No grade-separation projects are currently planned at this crossing, thus is it assumed there will still be an at-grade rail crossing at this location in year 2040. Based on data provided by the Federal Railroad Administration (FRA), the UP line hosts about 9 trains per day on average. No information is provided on whether or not UP anticipates the number of trains a day to change in the future. Thus, the same number of trains on average per day today was also assumed to also occur in 2040. If the frequency of trains were to increase in the future this would not impact the queue length (unless the average length of trains or speed of trains changed), but instead, would affect the frequency of queueing. The table below shows the estimated vehicle queue lengths in 2040 at the Barker Road/UP railroad at-grade crossing.

Table 17. 2040 vehicle queue length, Barker Road/UP at-grade rail crossing when gates are down

Condition	Trains per Day	Gate Down Time	Vehicle Queue Length (feet)			
			AM Peak		PM Peak	
			NB	SB	NB	SB
Average (50th percentile)	9	2 minutes	600	375	400	975
Worst Case Thru Trains (95th percentile)	9	4 minutes	1,275	800	875	2,025
Worst Case Trains Accessing Future Spur[1] (95th percentile)	unknown	6 minutes	1,875	1,200	1,275	3,000

1. This scenario is what could occur if a train were to be backing into or out of the new rail spur planned by developers east of Barker Road during a particularly high surge in peak hour traffic.

The queues at the UP crossing are forecast to be about 50-100% longer than they are today. The longest queues are anticipated to occur in the northbound direction in the AM peak and southbound direction during the PM peak.

Vehicle queueing will occur both on Barker Road and Euclid Avenue. Based on the forecast approach volume from each of those streets, close to 80 percent of the queue during the AM peak heading northbound would be on Barker Road, with the remaining on Euclid Avenue south of the tracks (heading westbound to turn onto Barker Road). Therefore it is anticipated that the average vehicle queue during the AM peak on Barker Road heading northbound would be about 475 feet, but about 3-4 times per year could be as long as 975 feet. Assuming trains backing onto the planned rail spur east of Barker Road were to block the intersection for 6 minutes, the queue on (northbound) Barker Road during the AM peak in this scenario could be as long as 1,450 feet.

[9] *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, https://mutcd.fhwa.dot.gov

About 10 percent of the vehicles heading north on Barker Road would be making a right turn onto Euclid before the railroad tracks and about 40 percent of vehicles heading west on Euclid Avenue would be making a left turn onto Barker Road and not crossing the railroad tracks. Thus, about 20 percent of the traffic south of the rail crossing in the AM peak would not actually be heading across the tracks, but most of these vehicles would get stuck in the queue. These vehicles would not only lengthen the queues in AM peak by an additional 20 percent, but this occurrence would add to driver frustration and increase the likelihood of drivers performing risky maneuvers to get around the queues. While the northbound queues would be shorter during the PM peak, the percentage of vehicles likely to get caught in the queue not intending to cross the tracks (heading northbound right or westbound left at Barker Road/Euclid Avenue [south]) would be even higher during the PM peak, representing about 35 percent of traffic. Therefore, the long northbound queue is determined to be a significant transportation impact.

During the PM peak the longest queues will occur north of the tracks from vehicles heading southbound on Barker Road (or eastbound on Euclid Avenue). During this time about 50 percent of the queue will be on Barker Road and about 50 percent will be on Euclid Avenue. Therefore it is anticipated that the average vehicle queue during the PM peak would be about 500 feet on both Barker Road heading southbound and Euclid Avenue heading eastbound, but about 3-4 times per year could be as long as 1,000 feet on both streets. Assuming trains backing onto the planned rail spur east of Barker Road were to block the intersection for 6 minutes, the queue on (southbound) Barker Road and (eastbound) Euclid Avenue during the PM peak in this scenario could be as long as 1,500 feet on each street. Fewer than 25 vehicles per hour are forecast to be heading either southbound right or eastbound left at this intersection, thus about 95 percent of the vehicles in the queue would be waiting to cross the tracks.

As part of the Phase 1 development, a new rail spur is planned off the Union Pacific mainline just north and east of the Barker Road/Euclid Avenue (north) intersection to provide rail access to the planned industrial development. In the future (as part of Phase 3 of development), land owners are considering extending that rail spur west across Barker Road at-grade to provide access to developable land between Barker Road and Flora Road. Given that train movements on the spur are planned to be infrequent and short, no significant impacts to traffic operations on Barker Road are anticipated as long as the mitigation criteria are met.

Harvard Road/Wellesley Avenue and Harvard Road/Euclid Avenue

These intersections are about 1.5 miles east of the Northeast Industrial Area, and Spokane County has identified that by 2040 both intersections will need improvements to meet their LOS standards. At the time this document was prepared, no improvements for the two intersections have been identified. To determine the impact of development within the Northeast Industrial Area a select zone analysis was performed for both intersections using the SRTC 2040 regional travel demand model updated in December, 2017. The model was updated using the roadway network adjustments discussed above in the Phase 3 assumptions. The results show that by 2040 about 12% of traffic passing through the Harvard Road/Wellesley Avenue intersection and about 12% of traffic passing through the Harvard Road/Euclid Avenue intersection would be generated by the Northeast Industrial Area. Ensuring these intersection continue to function at adopted LOS will require cooperation and coordination with Spokane County.

Trent Avenue/ Del Ray

The analysis assumed the forecast land use that is currently in the SRTC model for the area north of Trent Avenue, which assumes the large TAZ in this area would grow by about 800 dwelling units between 2015 and 2040. At the time when traffic analysis for the PAO was completed, the Highland Estates project, accessed from the intersection, has approximately 11 lots left to plat and 40-50 lots that are currently platted but vacant, and an approved 120 unit apartment building. As part of the Barker/BNSF Grade Separation project the City is studying how many additional trips to/from the north would lead to LOS issues at the reconfigured Barker/Trent intersection.

Mitigations

The table below identifies the mitigation measures needed to support the 2040 development of the Northeast Industrial Area. Several of the projects needed are either already programmed as part of the Spokane Valley 6-year TIP, will be implemented by other agencies (such as WSDOT), or will be built by developers as the area gets developed (these projects are indicated below). The traffic analysis completed for the NIA-SEIS demonstrated that several other mitigation projects will be needed by 2040 to meet LOS standards and are not yet programmed that are identified by "Identified Mitigation Measures".

Table 18: Needed and Existing Projects to Meet LOS

Project	Description	Timeframe
Identified Mitigation Measures		
Cataldo Avenue realignment	Reroute Cataldo Avenue to intersect Boone Avenue instead of Barker Road; add a cul-de-sac to Cataldo Avenue at existing intersection with Barker Road	2018-2023
Interim signal at Barker Road/Boone Avenue	Add an interim signal	2018-2023
Barker Road – Mission Avenue to I-90	Reconstruct to a 5-lane urban section	2025-2032
Flora Road/Trent Avenue	Add a signal with left turn lanes on Flora Road or convert to a roundabout	2021
Barker Road/Euclid Avenue (south)	Add northbound right-turn lane and westbound left-turn lane and sign/strip "do not block intersection"	By 2040
Barker Road/Boone Avenue	Add a permanent signal with northbound left and right turn pockets or a roundabout accommodating two lanes of traffic on Barker Road[1]	By 2040
Existing Programed Improvements		
Barker Road Improvement Project – Appleway to I-90	Widen and improve to 5-lane urban section; roundabout @ Broadway; realign east leg of Broadway	2021
Barker Road Improvement Project – Spokane River to Euclid	Reconstruct and widen to 3-lane urban section	2021
Barker Road/BNSF Grade Separation	Construct grade separation at Barker/BNSF RR/Trent	2021
I-90/Barker Road Interchange[10]	Construct general purpose lanes and replace Barker Rd I/C	2020

[10] Funding for the Barker Road Roundabout at the north ramp terminal has been secured. Design work will commence in the fall of 2018, the construction schedule has yet to be identified. The Barker Road south roundabout will be constructed in 2019.

Project	Description	Timeframe
Sullivan Road Bridge over Trent	Construct new bridge over Trent and BNSF railroad tracks (to accommodate an additional mainline track)	2031-2040

1. A roundabout is provided as the highest cost option

At-Grade Rail Crossings

In order to mitigate the impacts of vehicle queues from Barker Road/ UP Crossings the following mitigation strategies are recommended:

- To mitigate the potential for blocked streets and high-traveled driveways, it is recommended to strategically sign and paint "Do Not Block Intersection/Driveway" at locations where vehicles are likely to get blocked. We also recommend restricting (or discouraging) the construction of new driveways to medium or large scale developments on Barker Road or Euclid Avenue within 1,000 feet of the UP at-grade crossing.
- To limit the number of vehicles that may get caught in the queue, but are not trying to get across the tracks and may try a risky maneuver to get around traffic, it is recommended to add a 500-foot long northbound right turn lane and 300-foot eastbound left turn lane at the Barker Road/Euclid Avenue (south) intersection.
- The rail spur across Barker Road should be located sufficiently far from the existing Barker Road/UP at-grade crossing and from the Barker Road/Trent Avenue intersection so as not to risk vehicle queues from those locations backing into the rail spur or interfering with the planned Barker Road/BNSF grade separation project. It is recommended that the planned rail spur be located at least 1,500 feet from the Barker Road/UP at-grade crossing and at least 2,000 feet from the Barker Road/Trent Avenue intersection. This leaves about 1,300 feet of area along Barker Road in which the spur crossing could be located.
- In order to address delay from train movement along the planned rail spur across Barker Road, it is recommended that as a condition of construction of the new rail spur, the City coordinate with owners of the rail spur along with the UP Railroad to agree to limit movement of trains across Barker Road along the rail spur to non-peak hours. Or to at least limit the time the gates are down during the peak hours to be less than two-minutes.

The extension of the new rail spur would add a new rail crossing across Barker Road, which is designated as an arterial street by the City of Spokane Valley. This will require the owner of the rail spur to file a petition (RCW 81.53.030 and WAC 480-62-150(1)(a)) with the State Utilities and Transportation Commission (UTC). It would also require an on-site safety assessment with UTC staff, Union Pacific Railroad, and the City of Spokane Valley at a minimum as well as a feasibility study as decided by the UTC Commissioners to demonstrate why a grade separation would be impractical at this location.

Non-project Mitigations

In order to mitigate the impacts of traffic from the Northeast Industrial Area at the intersection Harvard & Wellesley and Harvard & Euclid, the it is recommended that the City of Spokane Valley and Spokane County develop a memorandum of understanding (MOU) that clearly identifies the planned projects at the two intersections to improve traffic operations and the estimated costs of those projects. The MOU would also identify the estimated cost per PM peak hour trip generated by the Northeast Industrial Area by multiplying the total estimated project cost (agreed on and documented in the MOU) by the percentages identified

above (12%) and dividing by the forecast number of PM peak hour trips that would be generated by the Northeast Industrial Area east of Flora Road (1,340).

Consideration within the MOU may also consider broader locations and traffic impacts where development in Spokane Valley impacts Spokane County infrastructure, and vice-versa, other impacts and mitigation costs could also be included in the MOU. Once the MOU is signed by all parties, a future developer will develop a trip letter and calculate the fee owed to add necessary capacity at the Spokane County intersections.

Transportation Infrastructure Financing Strategy

In order to offset the costs of future infrastructure projects needed to mitigate the traffic impacts identified, Spokane Valley has developed an infrastructure plan to identify a fair-share cost estimate for needed improvements and is included for reference as Appendix C. The table below shows the fair-share financial contribution that traffic the Northeast Industrial Area is expected to contribute to each of the intersections or streets where needed projects were identified.

Table 19: Northeast Industrial Area Fair-share Cost of Improvements

Project Location	Associated Development Phase	Portion of future traffic from Northeast Industrial Area[1]	Estimated Total Project Cost (2017 dollars)	Northeast Industrial Area Fair-Share Cost
Interim signal at Barker Rd/Boone Ave	Phase 1 only	4.0%[2]	$ 198,000	$ 7,920
Cataldo Avenue realignment	Phases 1 & 3	10.3%	$ 1,377,000	$ 142,003
Barker Road – Mission Avenue to I-90	Phase 2	11.3%	$ 2,818,000	$ 317,300
Flora Road/Trent Avenue	Phase 3	21.4%	$ 2,163,000	$ 463,686
Barker Road/Euclid Avenue (south)	Phase 3	29.5%	$ 244,000	$ 71,933
Barker Road/Boone Avenue (Phase 3)	Phase 3	10.3%	$ 2,214,000	$ 228,319
Barker Road – Euclid to Trent	Planned (2021)	33.6%	$ 4,184,000	$ 1,404,691
Barker Road – Spokane River to Euclid	Planned (2022)	22.1%	$ 3,302,000	$ 728,628
Sullivan Bridge over Trent	Planned (by 2040)	see below[3]		
		Total Northeast Industrial Area Fair-Share Cost		**$ 3,364,480**

1. Rounded to the nearest tenth percentage
2. Since this project will only apply to Phase 1, the proportion of traffic in Phase 1 was used here
3. Since only a portion of this project is to be funded by Spokane Valley and development in the Northeast Industrial Area primarily west of Flora Road will have the most significant traffic impacts at this location, the fair-share cost of this project was calculated separately

The table below shows how the fair-share costs were factored into a final PM peak hour trip cost for Phase 1 and Phase 2 & 3 development. If developers agree to participate in the Northeast Industrial Area Planned Action Ordinance they will meet their SEPA obligations to mitigate traffic congestion impacts through a mitigation contribution of up to $156 per PM peak hour trip for development associated with Phase 1 and $2,831 per PM peak hour trip for all future developments after Phase 1. After making this mitigation payment developers will not have to conduct another traffic study, outside of a site access and circulation study, which may be required by Spokane Valley to ensure safe access for all modes into and within the development site. The City may opt to shoulder the cost of the Phase 1 development impact fee.

Table 20: Cost per PM peak hour trip by development phase

Projects by Phase	Fair-Share Cost	Forecast PM Peak Trips	Phase 1 Cost per PM peak hour trip	Phase 3 Cost per PM peak hour trip
Projects that benefit Phase 1 only	$ 7,920	160	$ 50	N/A
Projects that benefit Phase 2 & 3 only	$3,214,558	1,180	N/A	$ 2,725
Projects that benefit Phase 1, 2 and 3	$142,003	1,340	$ 106	$ 106
Total	**$ 3,364,482**	**1,340**	**$ 156**	**$ 2,831**

If developers opt not to participate in the PAO, they will be responsible for conducting their own traffic impact analysis following the guidelines set forth by Spokane Valley. They will also be responsible for funding any found during that process that will be needed to meet concurrency standards.

Utility impacts from future development and costs associated with that were not factored into the mitigation fee. Developers will still be required to follow the Spokane Valley approval process for utilities and will pay for those costs separately.

Spokane Valley will use other financing strategies to pay for the remaining costs of the projects identified above that will not be covered by developers. One potential strategy includes applying a broader-based impact fee program in collaboration with surrounding jurisdictions to collect fair-share fees from residential developments in Spokane Valley, Liberty Lake and unincorporated Spokane Valley. Other financing strategies Spokane Valley might consider include implementing a local improvement district or transportation benefit district, applying for grants, leveraging Federal Aid Road designation and leveraging other State and regional resources.

SECTION 4.0: NOTICES

4.1 Determination of Significance and Scoping

City of Spokane Valley
Notice of Determination of Significance (DS) and
Request for Comments on Scope of
Supplemental Environmental Impact Statement (SEIS)

PROJECT NAME: Northeast Industrial Area Planned Action Ordinance
DESCRIPTION OF PROPOSAL: The City of Spokane Valley plans to adopt a Planned Action Ordinance (PAO) to support and streamline environmental permitting in the City's northeast industrial area. The northeast industrial area was identified as a community priority in the 2017-2037 Comprehensive Plan and Final Environmental Impact Statement (FEIS). The PAO will implement the community priority by identifying mitigation measures including a phased infrastructure plan for transportation and utilities.
The proposal applies to approximately 840 acres (277 acres developed and 563 acres undeveloped). The types of projects anticipated are new and expanded heavy and light industrial uses as described below. The PAO will identify the impacts and necessary mitigations for foreseeable industrial developments. The amount of new industrial development is unknown at this time but will be described in the SEIS.

- **Industrial, heavy use**: Establishments that assemble, manufacture, package, or process raw or semi-finished materials to produce goods. Heavy industrial uses can have the potential to be dangerous or to have significant impacts to surrounding properties with noise, odor, nuisance, or vibration.
- **Industrial, light use:** Establishments that assemble, manufacture, package, or process semi-finished materials to produce goods. All processing, fabricating, assembly, or disassembly of items takes place within an enclosed building. Light industry uses tend to be consumer oriented as the products are for end users and typically not to be used in an intermediate step by another industry.

The lead agency has preliminarily identified the following elements for analysis in the Supplemental Environmental Impact Statement (SEIS): ***Transportation – systems, traffic, circulation; Water – runoff/absorption, supply; Air – quality, odor.*** Land Use, Housing, Economic Welfare, and Natural Environment were analyzed in the 2017-2037 Comprehensive Plan and Final Environmental Impact Statement (FEIS) and will be referenced as relevant and necessary.
APPLICANT: City of Spokane Valley
LOCATION OF PROPOSAL: The proposal is located in the City of Spokane Valley's northeast quadrant bounded by Flora Road on the west, Trent Avenue on the north, the Union Pacific line on the south, and the city limits on the east. The approximate center of the project area can be further located at 47°41'32.2"N 117°09'48.2"W.
DETERMINATION: EIS Required.
The City of Spokane Valley, as the lead agency, has determined this proposal is likely to have a significant adverse impact on the environment. An EIS is required under RCW 43.21C.030 (2)(c) and will be prepared. The City anticipates supplementing the 2017-2037 Comprehensive Plan and FEIS with additional project level detail for elements not adequately addressed in the original document. The Comprehensive Plan and FEIS was adopted on December 13, 2016.
SCOPING AND COMMENTING: Agencies, affected tribes, and members of the public are invited to comment on the scope of the SEIS. You may comment on alternatives, mitigation measures, probable significant adverse impacts, and licenses or other approvals that may be required. Comments on the scope of the EIS must be received **on or before 5:00 pm April 3, 2017.** Send comments to Chaz Bates at City of Spokane Valley, 11707 E Sprague Avenue, Suite 106, Spokane Valley, WA 99216 or via email to cbates@spokanvalley.org
AVAILABILITY OF COMPREHENSIVE PLAN AND FEIS: The City of Spokane Valley 2017-2037 Comprehensive Plan and FEIS can be read online at www.spokanevalley.org/cp. A hard copy is available for viewing between 8:00 am and 5:00 pm at Spokane Valley City Hall located at 11707 East Sprague, Suite 106.
STAFF CONTACT: Chaz Bates, AICP, Economic Development Specialist, PH: (509) 720-5315 or email cbates@spokanevalley.org.
RESPONSIBLE OFFICIAL: Mike Basinger, AICP, Senior Planner, PH: (509) 720-5331 or email mbasinger@spokanevalley.org.
DATE ISSUED: March 3, 2017
APPEAL: An appeal of this determination must be submitted to the Community Development Department within fourteen (14) calendar days after the date issued. This appeal must be written and make specific factual objections to the City's threshold determination. Appeals shall be conducted in conformance with Chapter 17.90 (Appeals) of the Spokane Valley Municipal Code and the required fees pursuant to the City's adopted Fee Schedule shall be paid at time of appeal submittal.

_____
Carrie Koudelka, CMC
Spokane Valley Deputy City Clerk
PUBLISH: 03-03-2017

4.2 Draft EIS and Document Availablity

NOTICE OF ISSUANCE AND AVAILABILITY
ADOPTING AN EXISTING DOCUMENT
OF THE CITY OF SPOKANE VALLEY FOR A
PLANNED ACTION ORDINANCE AND
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Notice is hereby given that the City of Spokane Valley has prepared an amendment to Title 21 of the Spokane Valley Municipal Code (SVMC) creating a new chapter 21.60 SVMC Centennial Business Park Planned Action. To support the proposed amendment the City prepared a SEIS for the northeast industrial area. The City of Spokane Valley is the Lead Agency for the SEIS. The analysis was undertaken to meet the direction of the State Environmental Policy Act (SEPA).

PROPONENT: City of Spokane Valley

LOCATION OF PROPOSAL: The proposal is located in the City of Spokane Valley's northeast quadrant bounded by Flora Road on the west, Trent Avenue on the north, the Union Pacific line on the south, and the city limits on the east. The approximate center of the project area can be further located at 47°41'32.2"N 117°09'48.2"W.

LEAD AGENCY: City of Spokane Valley

DOCUMENT BEING ADOPTED and ADOPTION DATE
City of Spokane Valley has adopted the 2017-2037 Comprehensive Plan and Final Environmental Impact Statement. Adopted on December 13, 2016.

AGENCY THAT PREPARED DOCUMENT BEING ADOPTED
City of Spokane Valley

DESCRIPTION OF DOCUMENT BEING ADOPTED
The Comprehensive Plan and FEIS are an integrated document as such the entire document and analysis is being adopted for the proposal; however, the analysis as it relates to the location of the proposal and the goals and policies related to industrial lands are especially relevant. Additionally, Appendix A: SEPA analysis is also relevant.

DRAFT CONTENTS: The City prepared a SEIS for the northeast industrial area. The NIA-SEIS evaluates the growth and land use for the 20-year planning horizon established in the Comprehensive Plan and FEIS. The SEIS reviews potential impacts to air quality, historic and cultural resources, water, and transportation. The SEIS also identifies mitigation measures to address identified impacts.

DSEIS DATE OF ISSUANCE: November 23, 2018

REVIEW PERIOD: Following the issuance of the NIA-SEIS and related Planned Action Ordinance, a 60-day comment period commences. The public and other reviewers are invited to comment on the draft document. You may submit written comments on the document no later than **5:00 p.m. January 22, 2019**. All written comments must be received by that date and time.

Written comments via mail or email must be submitted to:

Community and Economic Development Department
10210 East Sprague Ave.
Spokane Valley, WA 99206
Email: cbates@spokanevalley.org

Please note that comments received in response to the draft document, including names and addresses of those who comment, will be considered part of the public record on this proposed action and will be available for public inspection.

PUBLIC HEARING:
December 13, 2018 - 6:00 p.m. (Planning Commission)

DOCUMENT AVAILABILITY:
The complete 2017-2037 Comprehensive Plan and FEIS are available for download at:
www.spokanevalley.org/CP.

The complete NIA-SEIS and associated draft development code are available at:
www.spokanevalley.org/PlannedAction

Copies of these documents are also available for public review during regular business hours at the following location:

Spokane Valley City Hall
10210 East Sprague Avenue Suite 106
Spokane Valley, WA 99206

Copies are also available for purchase upon advanced notice for the cost of printing from the City of Spokane Valley at 10210 East Sprague Ave., Spokane Valley, WA 99206.

If you have special accommodation needs, please contact the City of Spokane Valley at (509)-720-5000.

CITY CONTACT: Chaz Bates, AICP, Economic Development Specialist

SEPA RESPONSIBLE OFFICIAL: Mike Basinger, AICP, Economic Development Manager

DATE: November 23, 2018

_____
Carrie Koudelka, CMC
Spokane Valley Deputy City Clerk
PUBLISH: November 23, 2018

4.3 Public Hearing

SPOKANE VALLEY PLANNING COMMISSION

Public Hearing for Code Text Amendment

December 13, 2018, 6:00 p.m.

The Spokane Valley Planning Commission will hold a public hearing December 13, 2018 at City Hall Council Chambers, 10210 East Sprague Avenue, Spokane Valley, WA 99206 at 6:00 p.m., to receive public testimony on the following proposal:

FILE NUMBER: CTA-2018-0004
DESCRIPTION OF PROPOSAL: The City has prepared a text amendment to Title 21 of the Spokane Valley Municipal Code (SVMC). The proposed amendment will create a new chapter 21.60 SVMC Centennial Business Park Planned Action.

PROPONENT: City of Spokane Valley, 10210 E Sprague Avenue, Spokane Valley, WA 99206
HEARING PROCEDURES AND APPEALS: The Spokane Valley Planning Commission will conduct the hearing pursuant to Planning Commission rules of procedure. Interested persons may testify at the public hearing and may submit written comments and documents before or at the hearing. The Planning Commission may limit the time given to speakers. The Planning Commission will forward a recommendation on the proposed amendment to the Spokane Valley City Council. Appeals shall be pursuant to SVMC 17.90 Appeals.

ENVIRONMENTAL DETERMINATION: Spokane Valley, acting as the Lead Agency, issued a Determination of Significance (DS) on March 3, 2017 pursuant to WAC 197-11-360. Comments on the scope of the EIS were accepted until April 3, 2017. The City has prepared a supplement to the 2017-2037 Comprehensive Plan and FEIS that was adopted on December 13, 2016. Comments on the draft Supplemental Environmental Impact Statement and code text amendment are being accepted until January 22, 2019.

STAFF REPORT AND INSPECTION OF FILE: A staff report will be available for inspection seven (7) calendar days prior to the hearing, at Spokane Valley City Hall, 10210 East Sprague Avenue, Spokane Valley, WA between 8:00 am and 5:00 pm, Monday-Friday, excluding holidays. Please send written comments to Chaz Bates, Economic Development Specialist; 10210 East Sprague Avenue, Spokane Valley, WA 99206; (509) 720-5337; Fax (509) 921-1008; or send email to cbates@spokanevalley.org.

NOTICE: Individuals planning to attend the meeting who require special assistance to accommodate physical, hearing, or other impairments, please contact the City Clerk at (509) 720-5000 as soon as possible so that arrangements may be made.

Carrie Koudelka, CMC

Spokane Valley Deputy City Clerk

PUBLISH: 11-23 & 11-30, 2018

4.4 Final EIS and Document Availablity

[To be inserted after adoption]

4.4 Distribution List

City of Spokane Valley

City Officials
- Mayor and City Council
- Planning Commission

City Manager
City Clerk
City Attorney
Community and Economic Development Director
Human Resources Director
Finance Director
Parks & Recreation Director
Police Chief
Public Works Director

Other Agencies

Local

City of Liberty Lake
City of Spokane
City of Millwood

County

Spokane County Fire District No. 1
Spokane County Fire District No. 8
Spokane County Building and Planning
Spokane County Division of Utilities
Spokane County Water District No. 3

State

Department of Archeology & Historic Preservation
Department of Resource and Conservation
Department of Commerce
Department of Ecology & SEPA Register
Department of Fish & Wildlife
Department of Natural Resources
Department of Transportation
Department of Health

Tribal

Spokane Tribe of Indians

Federal

Federal Aviation Administration (FAA) – Seattle District
Federal Emergency Management Agency (FEMA), Region X
National Marine Fisheries Service - NOAA
U.S. Army Corps of Engineers – Seattle District
U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)
U.S. Environmental Protection Agency, Region X
U.S. Department of Homeland Security, Region X

Utilities

CenturyLink
Avista Utilities
Comcast
Consolidated Irrigation District No. 19

Media

Spokane Valley Herald
Spokesman Review

Schools

Central Valley School District No. 356
East Valley School District No. 361
West Valley School District No. 363

Other

Spokane County Joint Aquifer Board
Spokane Regional Health District
Spokane Regional Transportation Council
Spokane Transit Authority
Spokane County Library District
Spokane Regional Clean Air Agency
Holiday Trailer Court
Kaiser Aluminum
Pinecroft Mobile Home Park
Spokane Business & Industrial Park

SECTION 5.0 RESPONSE TO COMMENTS

5.1 Comments and Responses on the Scope

A comment letter from Spokane Valley Fire Department was received on scope it contained two comments:

- Coordination with Consolidated Irrigation District No. 19 regarding water availability is recommended.
- All specific Fire Department requirements shall be conditioned on future commercial permits

These comments are noted and do not require an adjustment to the scope of the Supplemental Environmental Impact Analysis.

5.2 Comments and Responses on the draft SEIS

The 60-day comment period closed on January 24, 2019. No written comments were received on the SEIS. One public comment was made at the public hearing held December 13, 2018 at the Planning Commission. This comment and response is noted below.

#	Name	Comment	Response
1	John Patrouch	Would like to see the light trespass and ground water protections added	Lighting was not considered in the scope of the environmental analysis. The city has exiting standards related to light trespass. Comment noted. Surface water and water runoff were addressed in the environmental analysis and it was determined existing regulations provide sufficient mitigation for the proposed impacts. See Section 3.2 of the supplemental Environmental Impact Analysis. Comment noted.

APPENDIX A:

EXISTING TRANSPORTATION CONDITIONS REPORT FOR SPOKANE VALLEY NORTHEAST INDUSTRIAL AREA PAO

Existing Transportation Conditions Report

Spokane Valley Northeast Industrial Area PAO

Prepared for:
City of Spokane Valley

Updated June 2016

SE17-0508

FEHR PEERS

Contents

Study Area

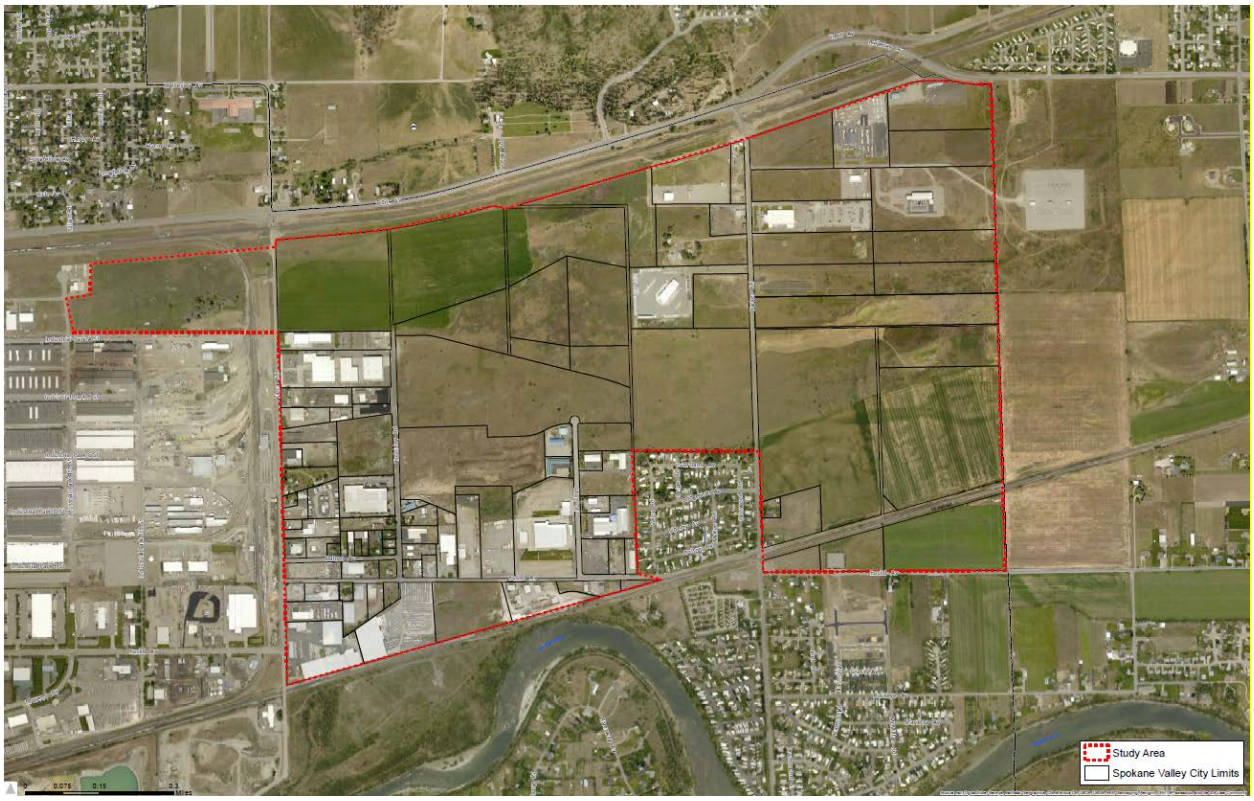
The study area for the Northeast Industrial Area Planned Action Ordinance (PAO) is mapped in **Figure 1**. The study area is approximately 1.23 square miles of largely undeveloped land located in the northeast corner of the City of Spokane Valley. The area is generally bound by Flora Road on the west (with the exception of a small area to the north where the western boundary extends across Flora Road to 4th Street), the Burlington Northern Santa Fe Railroad on the north, the Spokane Valley city limits on the east and Euclid Avenue and the Union Pacific Railroad to the south. The study area excludes an existing residential development on the northwest corner of Barker Road and Euclid Avenue.

Figure 1. Northeast Industrial Area PAO Location

Land Use Context

The study area consists of 277 acres of developed land and 563 acres of undeveloped land. The majority of developed land is located in the southwest portion of the study area flanking Flora Road and Euclid Avenue and is primarily used for industrial and warehouse related uses (see **Figure 2**). Based on 2015 transportation analysis zone (TAZ) data, there are currently about 700-800 employees in the study area. Under the City's future land use map, within the recently adopted 2016 Comprehensive Plan, all of the land within the study area is designated industrial.

Figure 2. Study area aerial view



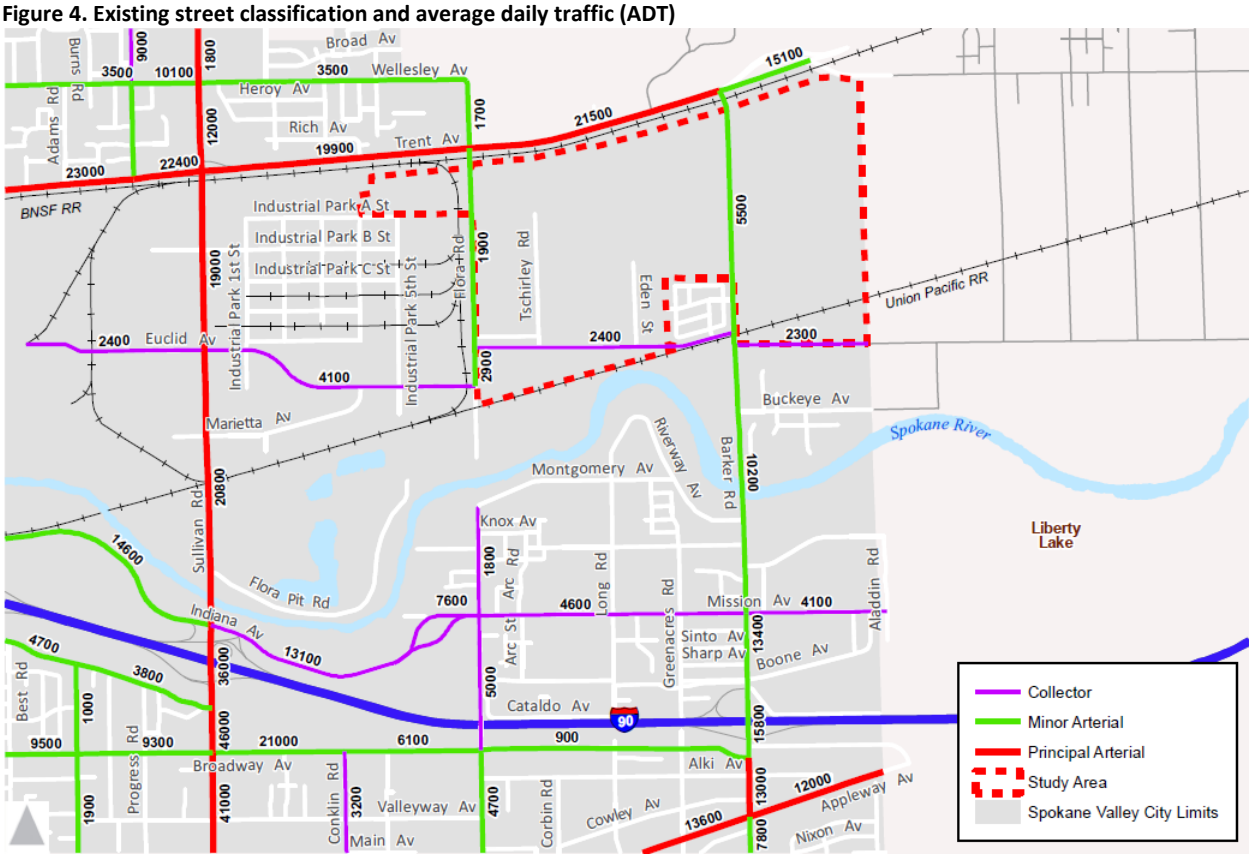
Street Network

The street network within the study area is fairly coarse compared to other parts of the City, as much of the land is undeveloped and there are few local streets. There are three existing collector and arterial streets within the study area each spaced about a mile apart (see **Figure 3** and **Figure 4**). All streets within the study area have two lanes, there are no signalized intersections and only a few streets segments contain curb and gutter. Euclid Avenue on the south edge of the study area provides the only east-west connection across the study area.

Figure 3. Arterial & Collector Streets in the Study Area

Street	Dir.	Class	# of Lanes	Posted Speed	ADT (% trucks)	Miles in study area	% curb & gutter	Major intersecting streets nearby
Barker Road	N-S	Minor Arterial	2	45 mph	5,500 (12%)	0.9	3%	Trent Avenue, I-90, Appleway Avenue
Flora Road	N-S	Minor Arterial	2	35 mph	1,900 (16%)	0.9	0%	Trent Avenue
Euclid Avenue	E-W	Collector	2	35 mph	2,800 (17%)	1.5	0%	Barker Road, Flora Road, Sullivan Road

Figure 4. Existing street classification and average daily traffic (ADT)



Major Streets

- **Barker Road** – Barker is the primary north-south street through the study area. It is the only street in the study area that crosses the Spokane River, thus providing direct access to I-90 and Appleway Avenue to the south. It also connects with Trent Avenue to the north. As a result this street has the highest existing traffic volumes in the study area averaging about 5,500 vehicles per day. Barker is designated as a minor arterial within the study area. The posted speed is 45 mph in the study area and 35 mph south of Euclid.
- **Flora Road** – Flora Road is parallel to Barker Road and located one mile to the west of Barker. This street provides connections between Trent Avenue and Euclid Avenue, but does not connect across the Spokane River. It becomes a private pit road south of Euclid.
- **Euclid Avenue** – This is the only continuous east-west street through the study area providing connections between Liberty Lake to the east and Sullivan Road to the west. However, the street dog-legs where it intersects Barker Road (crossing the UP railroad tracks) and Flora Road in the study area.

Local Streets

Excluding the small residential development on the northwest corner of Barker Road and Euclid Avenue (which is not part of the study area), the study area contains just three publicly accessible local streets (Dalton Avenue, Tschirley Road and Eden Street) combining for just over 1 mile in total length. Eden Street is one of the only streets in the study area with a curb and gutter.

Major Regional Roadways Nearby

There are several major regional roadways that, while outside the study area, provide access to the state and national highway system. Connections to these roadways will be critical to employee and freight access as part of future land development.

- **Trent Avenue (SR 290)** – Trent is a major east-west connection and freight artery through the Spokane region. It is a five lane principal arterial road just north of the study area with a 50 mph posted speed. There are side street stop controlled intersections where both Flora Road and Barker Road intersect Trent.
- **I-90** – I-90 is the major east-west interstate highway across the state of Washington and is one of the principal interstates spanning the country from coast to coast. This highway is an important artery for freight and interstate travel in the region. An interchange to I-90 is located 1.5 miles south of the study area along Barker Road.
- **Appleway Avenue** – Appleway/Sprague is the major east-west corridor through the heart of Spokane Valley. Barker Road intersects Appleway Avenue about 2 miles south of the study area.
- **Sullivan Road** – Sullivan Road is a major north-south arterial located just to the west of the study area. Euclid Avenue intersects Sullivan about 1 mile west of the study area.

Traffic Operations

The City of Spokane Valley uses level of service (LOS) to describe and evaluate traffic operations along major arterial corridors and intersections within the City. Levels range from LOS A to LOS F, which encompass a range of congestion types from uninterrupted traffic (LOS A) to highly-congested conditions (LOS F). The description and intersection delay thresholds of each LOS category are described in **Figure 5.** These are based on the Highway Capacity Manual, which is the methodology used by Spokane Valley.

Figure 5. Level of service description and delay thresholds at intersections

Level of Service	Description	Signalized Intersection Delay (seconds)	Unsignalized Intersection Delay (seconds)
A	Free-flowing conditions.	0-10	0-10
B	Stable operating conditions.	10-20	10-15
C	Stable operating conditions, but individual motorists are affected by the interaction with other motorists.	20-35	15-25
D	High density of motorists, but stable flow.	35-55	25-35
E	Near-capacity operations, with speeds reduced to a low but uniform speed	55-80	35-50
F	Over-capacity conditions with long delays.	> 80	>50

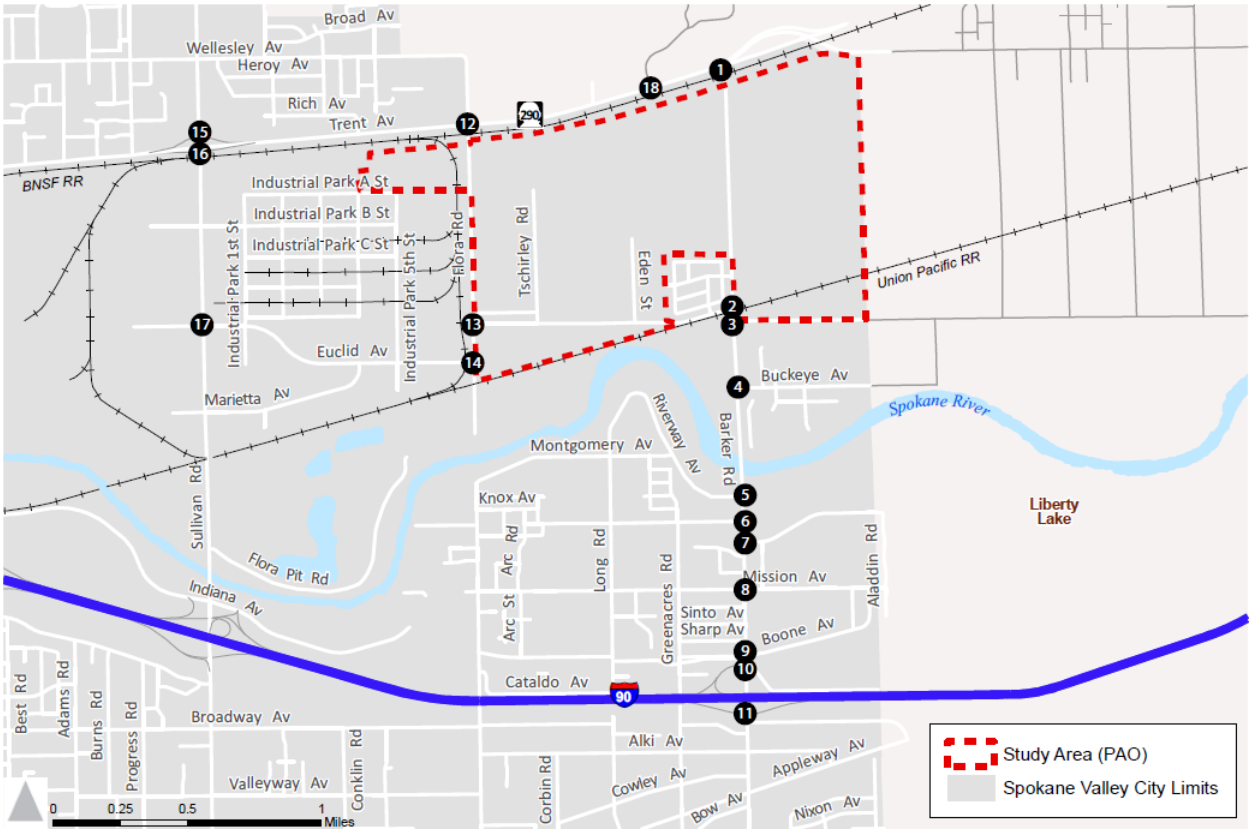
Source: *Highway Capacity Manual 2010*, Transportation Research Board

The LOS standards used by Spokane Valley are defined in the Comprehensive Plan as follows:

- LOS D for major arterial corridors:
  - Argonne/Mullan between the town of Millwood and Appleway Boulevard
  - Pines Road between Trent Avenue and 8th Avenue
  - Evergreen Road between Indiana Avenue and 8th Avenue
  - Sullivan Road between Wellesley Avenue and 8th Avenue
  - Sprague Avenue/Appleway Boulevard between Fancher Road and Sullivan Road
- LOS D for signalized intersections not on major arterial corridors

- LOS E for unsignalized intersections (LOS F is acceptable if the peak hour traffic signal warrant is not met)

Figure 6. Intersections included in LOS analysis



A total of 18 intersections in and around the study area (shown in **Figure 6)** were identified by Spokane Valley staff as important to describing existing traffic operations and to use as a baseline for forecasting potential traffic impacts from future land use changes within the study area. Traffic counts were collected at all 18 intersections during both the AM and PM peak hour on a weekday (either in June, 2016 or February, 2017). Synchro (a transportation planning software) was used to analyze traffic operations, including LOS, at each intersection based on traffic volumes, turn movements, and average percent truck traffic during the peak hour on each road segment. The results of the existing conditions LOS analysis, including delay in seconds, for each intersection are shown in **Figure 7**.

Figure 7. Existing LOS at selected intersection in and around the study area

Intersection	Type	AM Peak		PM Peak		Approach reported (AM/PM)
		Delay (secs)	LOS	Delay (secs)	LOS	
1 - Barker Rd/Trent Ave	Side-Street Stop	**59**	**F***	41	E	NB
2 - Barker Rd/Euclid Ave (north)	Side-Street Stop	10	A	11	B	EB
3 - Barker Rd/Euclid Ave (south)	Side-Street Stop	12	B	17	C	WB
4 - Barker Rd/Buckeye Ave	Side-Street Stop	13	B	10	B	WB
5 - Barker Rd/Riverway Ave	Side-Street Stop	16	C	20	C	WB
6 - Barker Rd/Indiana Ave (north)	Side-Street Stop	11	B	12	B	EB
7 - Barker Rd/Indiana Ave (south)	Side-Street Stop	14	B	15	B	WB

Intersection	Type	AM Peak		PM Peak		Approach reported (AM/PM)
		Delay (secs)	LOS	Delay (secs)	LOS	
8 - Barker Rd/Mission Ave	Signal	13	B	17	B	
9 - Barker Rd/Boone Ave	Side-Street Stop	22	C	18	C	EB/WB
10 - Barker Rd/Westbound I-90 Ramps	Signal	**68**	**E**	43	D	
11 - Barker Rd/Eastbound I-90 Ramps	Signal	44	D	**113**	**F**	
12 - Flora Rd/Trent Ave	Side-Street Stop	**129**	**F**	**124**	**F**	SB/NB
13 - Flora Rd/Euclid Ave (north)	Side-Street Stop	11	B	11	B	WB
14 - Flora Rd/Euclid Ave (south)	Side-Street Stop	10	A	10	A	EB
15 - Sullivan Rd/Trent (north)	Signal	16	B	12	B	
16 - Sullivan Rd/Trent (south)	Signal	13	B	21	C	
17 - Sullivan Rd/Euclid Ave	Signal	51	D	60	E**	
18 - Del Rey Dr/Trent Ave	Side-Street Stop	23	C	18	C	SB

Source: Fehr & Peers

* Does not meet City LOS standard because intersection operates at LOS F and traffic volumes satisfy the peak hour signal warrant

**LOS E is acceptable here because Sullivan is a major arterial corridor that meets LOS standard corridor-wide

As shown in **Figure 7**, under the existing conditions, most intersections included in this study currently meet the City of Spokane Valley's LOS criteria in both the AM and PM peak periods. However, the following intersections do not currently meet the City's LOS standards resulting in noticeable delays for some drivers during the peak hour:

- Barker Rd/Trent Ave AM Peak (northbound approach)
- Barker Rd/ I-90 WB Ramps AM Peak
- Barker Rd/I-90 EB Ramps PM Peak
- Flora Rd/Trent Ave AM Peak (southbound approach) and PM Peak (northbound approach)

Barker Road/Trent Avenue

The Barker Road/Trent Avenue intersection does not meet the LOS standards identified in the City of Spokane Valley Comprehensive Plan. This is because this intersection operates at LOS F (as measured by the delay to vehicles in the northbound approach) during the AM peak - and peak hour traffic volumes are sufficient to meet the peak hour signal warrant using MUTCD[1] criteria. The City is planning to grade-separate Barker Road with the BNSF railroad (just south of Trent Avenue) as part of the 6-year TIP, which would change the configuration of this intersection in the future (see *Programmed Transportation Project* section below), however the final design for the grade separation still needs to be identified.

Barker Road/I-90 Intersection

Improvements are planned as part of the City's 6-year Transportation Improvement Program along Barker Road at the I-90 interchange (see Programmed Transportation Projects section below). In addition, WSDOT recently finalized an Intersection Justification Report (IJR) to reconstruct the Barker Road/I-90 intersection to include a roundabout at each on-ramp and a new bridge over I-90. These and other planned improvements will improve LOS at the Barker Rd/I-90 intersections and will be factored into future year traffic analyses.

[1] *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, https://mutcd.fhwa.dot.gov

Flora Road/Trent Avenue

Analysis shows that the Flora Rd/Trent Ave intersection currently operates at LOS F during both the AM and PM peak. Since this is a side-street stop controlled intersection, LOS is measured based on the approach with the highest delay. The highest delay during the AM peak is from the southbound approach, where traffic originates primarily from a residential development north of Trent Avenue (outside the study area). In the PM peak, the highest delay occurs on the northbound approach, where traffic originates from the industrial sites south of Trent Avenue. In addition to operating at LOS F, an analysis of peak hour traffic volumes indicate that this intersection meets the peak hour signal warrant. As a result of operating at LOS F and meeting the peak hour signal warrant, this intersection does not currently meet the City's LOS standards. Future analysis will consider either signalizing this intersection to meet LOS standards or potentially closing the Flora Road at-grade railroad crossing over the BNSF tracks (just south of Trent) and diverting traffic to Barker Road as part of a new grade-separated crossing planned at that location.

Sullivan Road/Euclid Avenue

The Sullivan Rd/Euclid Ave intersection operates at LOS E during the PM peak. However, because Sullivan Road is a major arterial the LOS is measured corridor-wide. According to the City's Comprehensive Plan, Sullivan Road currently meets the LOS D standard when assessed corridor-wide and thus LOS E is considered acceptable at the Euclid intersection based on the City's standards. This intersection is also slated for reconstruction in 2017 as part of the City's 6-Year TIP, which will include minor improvements to the lane configuration.

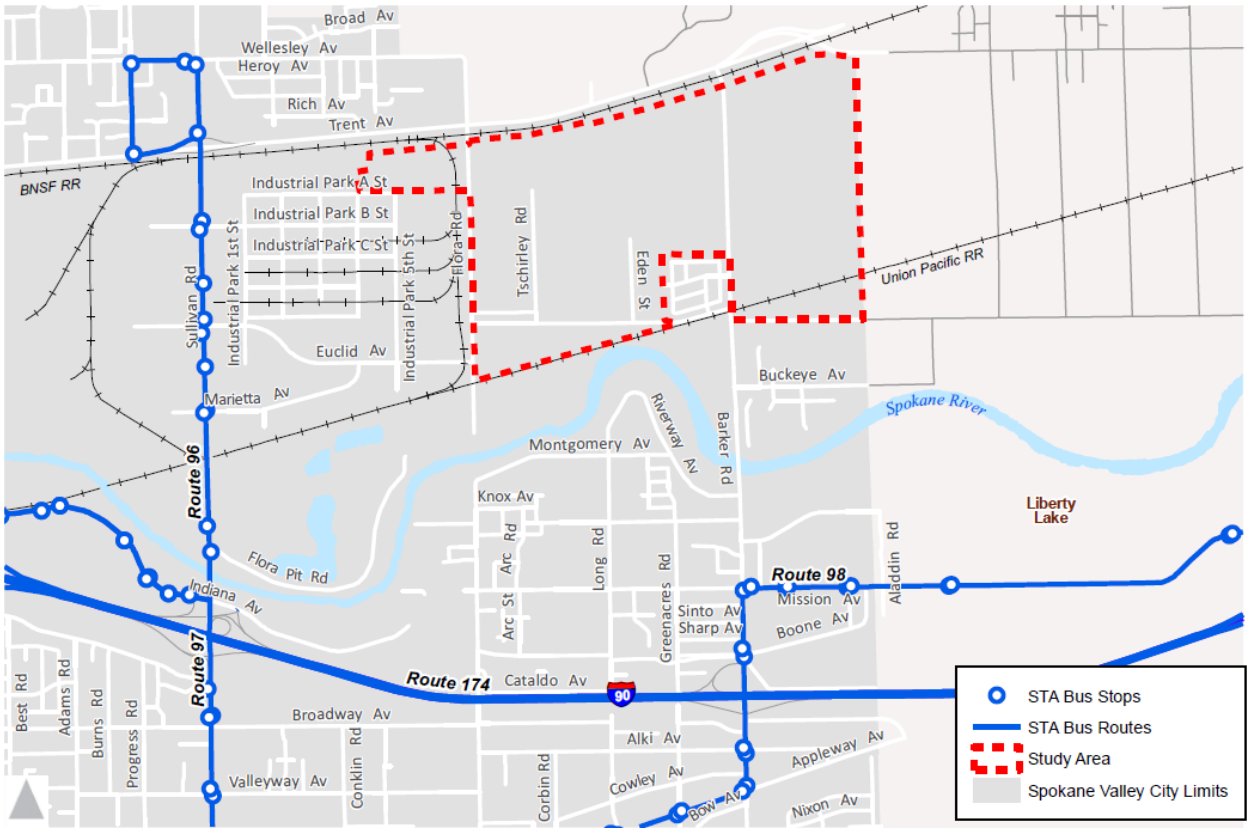
WSDOT LOS Standards

Trent Avenue is a State Highway (SR 290) maintained and operated by Washington State Department of Transportation (WSDOT). Trent Avenue is not defined as a Highway of Statewide Significance (HSS) by WSDOT and therefore has a LOS standard that is established by SRTC and WSDOT, which is set at LOS D. The Barker Road/Trent Avenue and Flora Road/Trent Avenue intersections currently operate at LOS F during the peak hour and the peak hour signal warrant is met at both these intersections. Ultimately, Spokane Valley is considering modifications at both intersections, which could include closing the Flora Road section south of Trent Avenue (which could also include channelization changes to improve the operations of the north leg) and a grade separation of the BNSF railroad at Barker road (which could include a new traffic signal, roundabout, or interchange at Barker/Trent).

Transit Network

Spokane Transit Authority (STA) provides public transit service within Spokane Valley. However, no fixed-route transit service is provided in the study area. The closest bus stop is about a mile south of the study area at the Barker Road/Mission Avenue intersections. This stop is served by route 98 which operates at 30 minute frequencies during weekdays between Liberty Lake and the Valley Transit Center. Route 96 also stops just over a mile west of the study area at the Sullivan Road/Euclid Avenue intersection. This route also operates at 30 minute frequencies weekdays and connects North Sullivan Road with the Mirabeau mixed-use commercial area, Pines Road and the Valley Transit Center. As the study area densifies, STA may provide transit service in the future and all arterial roadways will be designed to accommodate transit vehicles.

Figure 8. Existing transit network

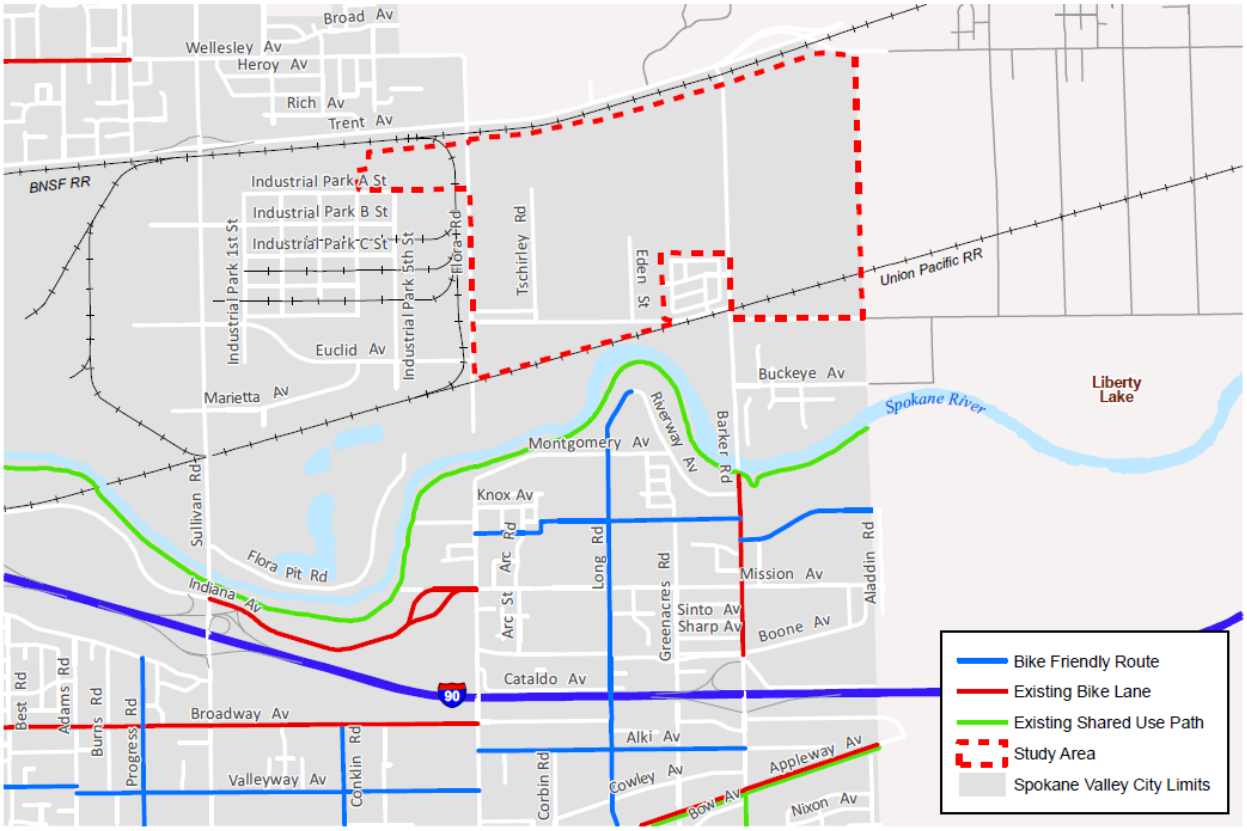


Bicycle Network

There are no existing bicycle facilities within the study area. However, some bicycle facilities exist just south of the study area. These include a bicycle lane on Barker Road just south of the study area (that extends for about 2/3 of a mile) between the Spokane River Bridge and Boone Avenue and the Centennial Trail multiuse path on the south side of the Spokane River also just south of the study area. This Centennial Trail spans about 7 miles across the City of Spokane Valley and beyond connecting the Pasadena Park area with Liberty Lake. Nearby bicycle facilities are mapped in **Figure 9.**

Bicycle lanes are planned to be constructed along Barker Road between the Spokane River and Trent Avenue and between Boone Avenue and Appleway Avenue by year 2021 as part of the City's Barker Road Improvement Project (see the Programmed Transportation Projects section below). As part of the City of Spokane Valley's Bike and Pedestrian Master Program, bicycle lanes are also proposed on Flora Road and a multi-use trail is proposed parallel to Trent Avenue just north of the study area. No funding or timeline has been identified for these projects.

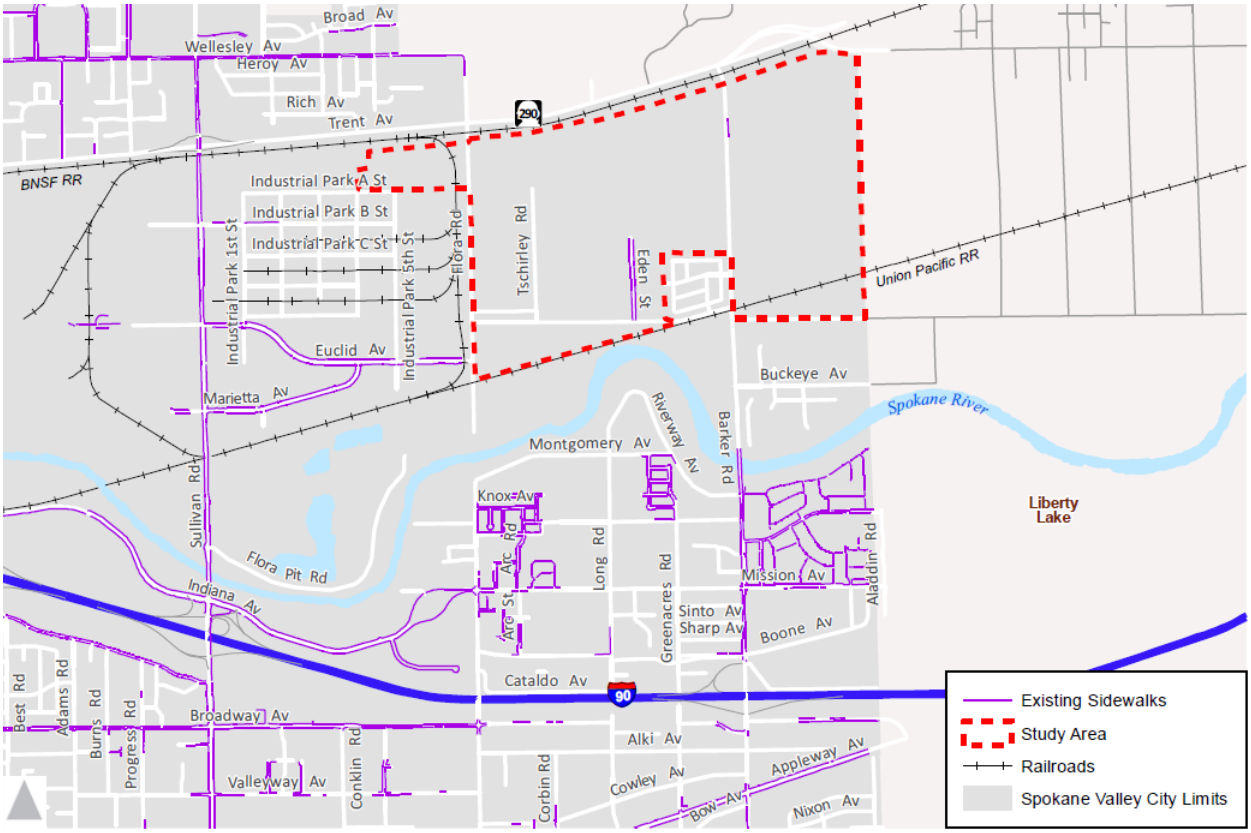
Figure 9. Existing bicycle network



Pedestrian Network

The majority of the streets within the study area do not have sidewalks, curbs or gutter. The two exceptions are shown in **Figure 10**. These include a 0.3 mile stretch of Eden Avenue north of Euclid Avenue that has a 5 foot sidewalk and curb on both sides of the street. The sidewalk on the east side of is detached from the curb, while on the west side it is attached except for the northern section. There is also a short segment (about 360 feet) along the west side of Barker Road with a detached sidewalk and curb that was constructed as part of a recent development. There are no signalized pedestrian crossings in the study area and no painted crosswalks.

Figure 10. Existing sidewalk network



Barker Road and Euclid Avenue both have pedestrian facilities just outside the study area. There are sidewalks on both sides of Barker Road just south of the study area (beginning at the bridge over Spokane River) and on both sides of Euclid Avenue just west of the study area. Sidewalks are planned to be constructed along Barker Road from the Spokane River to Trent by year 2021 as part of the City's Barker Road Improvement Project (see the Programmed Transportation Projects section below).

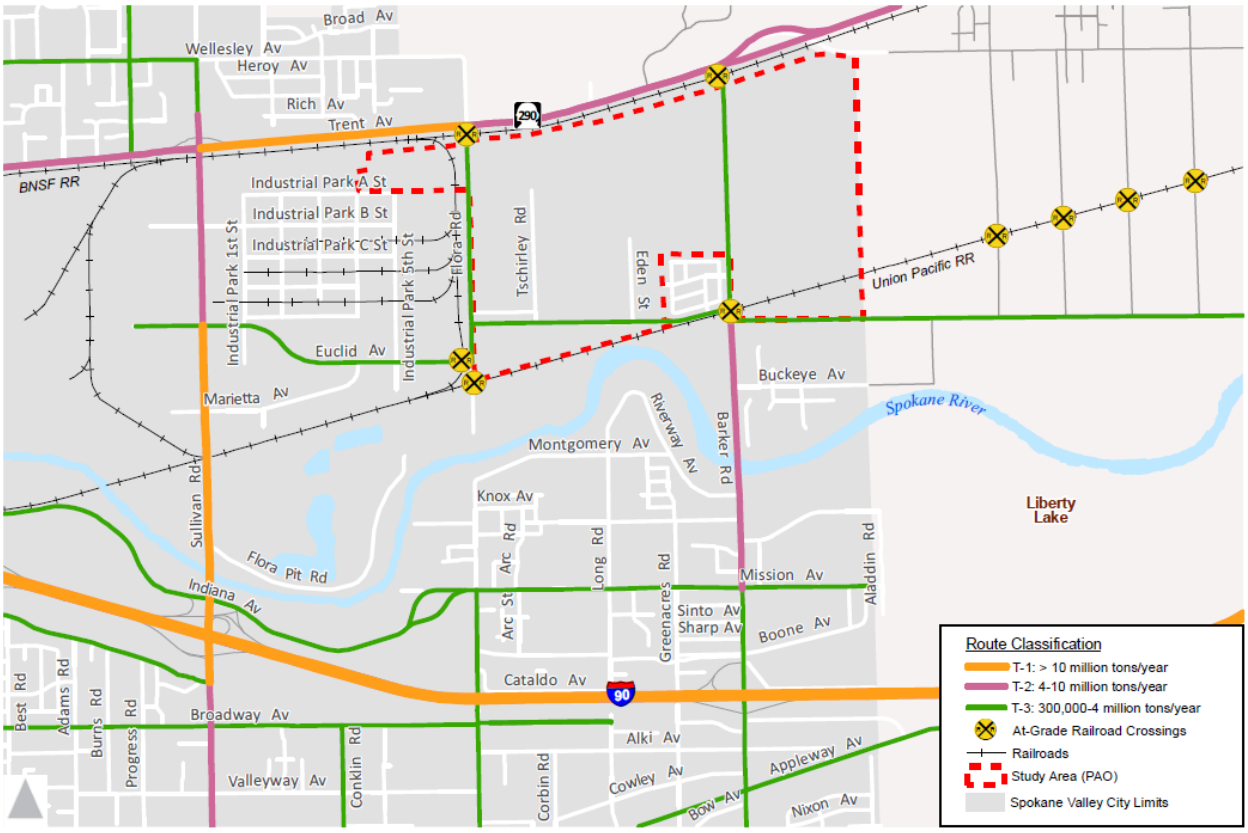
Freight & Rail Access

The developed land within the study area and the land just west of the study area are mostly industrial in nature. In addition, future land use of the entire study area is designated as industrial as part of the City' Comprehensive Plan and zoning code. Thus, truck and rail access are critical to the day-to-day needs of existing businesses and will be important for future developments.

Truck Routes & Volumes

There is a high percentage of truck traffic on the major streets in the study area compared to other parts of Spokane Valley. **Figure 3** shows that truck traffic on the three major streets in the study area (Barker Road, Flora Road and Euclid Avenue) account for about 12-17% of the average daily vehicle traffic, and 3-13% of the peak hour traffic. **Figure 11** shows that these streets are classified as T-3 based on the annual freight tonnage they carry (between 300,000 and 4 million tons of freight per year). Several major corridors around the study area support even higher volumes of freight, including Trent Avenue, I-90, Sullivan Avenue and a section of Barker Road just south of I-90. These roadways are classified as T-1 or T-2, carrying more than 4 million tons of freight per year.

Figure 11. Truck route classification and at-grade railroad crossing locations



Rail Operations

In addition to the major truck routes in the area, the study area is also flanked by two mainline railroads. The Burlington Northern Santa Fe (BNSF) mainline parallels the northern edge of the study area and the Union Pacific (UP) mainline parallels the southern boundary of the study. The BNSF route is one of the company's main transcontinental lines between west coast ports and the interior of the country and hosts Amtrak's twice daily Empire Builder between Chicago and Seattle/Portland. Both rail companies also have rail spurs to industrial land uses west of the study area. While no rail spurs currently exist in the study area, preservation of access to both rail lines will be important to future industrial development within the study area.

There are four at-grade crossings of the mainline railroads within the study area illustrated in **Figure 11**, one for each rail line on both Barker Road and Flora Road. **Figure 12** illustrates some basic operating characteristics for each of these at-grade crossings. Federal Railroad Administration (FRA) data indicates that the BNSF line hosts about 54 trains per day, mostly long-haul freight trains passing quickly through the area, and the UP line hosts about 9 trains a day, including a combination of short-haul freight, long-haul freight, and short trains performing switching operations.

Historic crash data indicates that the grade crossings on Barker and Flora Road for both rail lines have operated safely over the last 25 years. **Figure 12** shows that despite the high train volumes, it has been over 25 years since a crash occurred at any of the four at-grade rail crossings in the study area.

Figure 12. Operating characteristics of at-grade rail crossings in the study area

Railroad	Street Crossing	Average Trains per Day	Typical Train Frequency	Gates Down Average/Max (minutes)	Typical Train Speed	List of Crashes (1975-2016)
BNSF	Barker Road	54	10-90 mins	3:00/4:30	1 - 79 mph	• 1991 - Fatality
	Flora Road	54	10-90 mins	No data	1 - 79 mph	• 1975 – no injury • 1990 - no injury
UP	Barker Road	9	1-4 hours	2:00/4:00	24 - 49 mph	• 1989 - Fatality
	Flora Road	9	1-4 hours	No data	24 - 49 mph	None

Source: Fehr & Peers; Federal Railroad Administration

Traffic Impacts of At-Grade Rail Crossings

Based on data collected on February 14, 2017 the gates at the Barker Road/BNSF crossing were down for an average of about 3 minutes per train crossing, but ranged anywhere from 30 seconds to 4.5 minutes. At the Barker Road/UP crossing, gates were down an average of about 2 minutes per train crossing and ranged from 30 seconds to 4 minutes.

Figure 13 shows the estimated vehicle queue length in feet on Barker Road during both the AM and PM peak hour when the gates are down at both the BNSF and UP crossing. Trucks are assumed to be the equivalent of three passenger vehicles and each passenger vehicle is assumed to be 25 feet in length. Queues were calculated using Synchro and are based on observed gate down times and traffic volumes. The estimates include both the average, which is the 50th percentile queue length during an average gate down time and the worst case, which is the 95th percentile queue length during the peak hour during the longest gate down time observed. The latter likely only occurs a handful of times per year, although is about five times more likely to occur on the BNSF line than the UP line because trains are five times more frequent on the BNSF line.

Figure 13. Vehicle queue lengths at the Barker Road at-grade rail crossings when gates are down during the peak hour

Frequency	Trains per day	Gate Down Time	Vehicle Queue Length (feet) AM Peak		PM Peak	
			NB	SB	NB	SB
BNSF Crossing						
Average (50th percentile)	54	3 minutes	150	250	275	275
Worst Case (95th percentile)	54	4.5 minutes	275	425	475	475
UP Crossing						
Average (50th percentile)	9	2 minutes	300	250	225	500
Worst Case (95th percentile)	9	4 minutes	700	250	525	1,050

Source: Fehr & Peers

Figure 13 shows that queues are typically longer during the PM peak (when traffic volumes are greater) and are longer at the UP crossing than the BNSF crossing, although much less frequent (because trains are much less frequent at the UP crossing than the BNSF crossing). During the PM peak hour, the vehicle queue is typically about 275 feet long on either side the BNSF crossing along Barker Road (about 11 vehicles queued in each direction). During the worst case scenario, queues can be as long as 475 feet on either side of the BNSF crossing (about 19 northbound and 19 southbound vehicles). It should be noted that in the southbound direction there is only about 100 feet between the railroad crossing stop bar and the Trent Avenue intersection, which is enough space for about 4 cars (or 1 truck and 1 car). This means

the queue typically extends about 175 feet along Trent Avenue (and can be as long as 375 feet during the worst case scenario). Vehicles queued on Trent would be in either the westbound left turn pocket, which is about 200 feet long or the eastbound right-turn lane, which is about 300 feet long. Currently these lanes are long enough to store vehicles queued on Trent during the worst case scenario without spilling into the thru lanes.

When gates are down at the UP crossing during the PM peak hour, queues typically build up to about 500 feet southbound and 225 feet northbound (with the queue typically spilling onto both directions of Euclid Avenue). During the worst case scenario queues can be 1,075 feet in the southbound direction during the PM peak and 700 feet in the northbound direction during the AM peak.

Lastly, because there are no grade-separated rail crossings in the study area, there are times that the gates are down on both the UP and BNSF line at the same time. This could delay access into or out of the site for emergency vehicles by as much as 4 minutes. The nearest alternative route would be via Sullivan Road (2 miles west of Barker Road), which is grade-separated from both railroads, and Euclid Avenue.

Programed Transportation Projects

Several streets within the study area and surrounding intersections are programmed for improvement as part of the Spokane Valley Department of Public Works' Six-Year Transportation Improvement Program (TIP) and/or as a part of the Spokane Regional Transportation Council (SRTC) financially constrained project list in the *Horizon 2040 Plan*. Programmed projects within the study area that will impact intersections analyzed as part of this project are listed in **Figure 14**.

Figure 14. Programmed transportation projects located in the study area or at key intersections nearby

Project	Description	Program (Project #)	Year	Agency Responsible	In Study Area?
Euclid Avenue Reconstruction – Flora to Barker	Replace roadway and widen shoulders as part of new sanitary-sewer installation	2017 CIP	2017	Spokane Valley & Spokane County	Yes
Sullivan/Euclid - Concrete Intersection	Reconstruct intersection in concrete pavement (slight change in lane configuration)	6-year TIP (#16)	2017	City of Spokane Valley	No
Barker Road – Euclid to Trent	Reconstruct to 3-lane urban section	6-year TIP (#36)	2021	City of Spokane Valley	Yes
Barker Road Improvement Project – Appleway to I-90	Widen and improve to 5-lane urban section; roundabout @ Broadway; realign east leg of Broadway	6-year TIP (#37)	2021	City of Spokane Valley	No
Barker Road Improvement Project – Spokane River to Euclid	Reconstruct and widen to 3-lane urban section	6-year TIP (#41)	2021	City of Spokane Valley	No
Barker Road/BNSF Grade Separation	Construct grade separation at Barker/BNSF RR/Trent	6-year TIP (#42)	2021	City of Spokane Valley	Yes
I-90/Barker Road Interchange	Construct general purpose lanes and replace Barker Rd I/C	*Horizon 2040 Plan* (#12)	2020	WSDOT	No

Project	Description	Program (Project #)	Year	Agency Responsible	In Study Area?
Sullivan Road Bridge over Trent	Construct new bridge over Trent and BNSF railroad tracks	*Horizon 2040 Plan* (#29)	2031-2040	City of Spokane Valley	No

Key Findings

The following list provides a summary of key findings from the existing transportation conditions analysis of the Northeast Industrial Area Planned Action Ordinance. It will be important to consider these findings when planning the future transportation network within and around the study area.

- **Street connectivity is limited (especially east-west connections), but there is opportunity for improvement.** The street network within the study area is fairly coarse and there is only one continuous east-west connection (Euclid Avenue). This level of connectivity is sufficient today given the lack of existing development and low traffic volumes, but additional connections will be provided as new development occurs within the study area. The three major streets within the study area (Euclid Avenue, Flora Road and Barker Road) provide a solid foundation for future connectivity. All three streets are part of the City's existing arterial/collector network and are aligned with the City's existing north-south/east-west grid structure. They are each spaced about a mile apart and provide key connections to other roads outside the study area. Given that most of the land within the study area is undeveloped, there is ample opportunity to plan a connected street network as the area is built-out.
- **Existing traffic volumes are relatively low, while truck volumes are relatively high.** Because much of the land is undeveloped, all of the streets within the study area carry relatively low traffic volumes today. Barker Road has the highest traffic volumes with just over 5,000 vehicles per day. Because of the industrial nature of the area, truck activity represents about 12%-17% of daily traffic in the study area, and less during the peak hour.
- **Most area intersections currently meet the City's LOS standards for traffic congestion.** An analysis of 18 intersections in and around the study area during the morning and afternoon peak periods found that traffic in all but four locations currently meets the City's level of service (LOS) standards for traffic congestion. Three of these intersections are planned for improvement in the next several years, either by WSDOT or as part of the City's 6-year TIP. These include the Barker Road/I-90 eastbound and westbound ramps and at Barker Road/Trent Avenue. The other intersection failing the City's LOS standard is at Flora Road/Trent Avenue. Future analysis will consider either a signal at this intersection or potentially closing the southern approach across the BNSF tracks in conjunction with the planned intersection improvement at Barker Road/Trent Avenue.
- **There is minimal existing multimodal infrastructure.** Non-auto transportation infrastructure (pedestrian, bike, and transit facilities) are nearly non-existent within the study area. However, several planned projects will improve walking and bicycle access to and within the study area. Barker Road is slated to be widened to a three-lane urban section through the study area by 2021. This project will add continuous bike lanes and sidewalks, which will connect to the pedestrian and bicycle network to the south. Bike lanes are also planned along Flora Road, and a new multiuse trail is planned parallel to Trent as part of the City's Pedestrian and Bicycle Master Program, although no timeline or funding has been identified for these projects.

- **Good access to freight routes.** The location of study area provides good access to regional and interstate truck routes and the national rail network. Both the BNSF and UP railroads have mainline tracks running through the study area, with potential for new spurs. Several regional roads and highways important to freight and employee access are within 1.5 miles or less of the study area, including Trent Avenue, I-90, Appleway Avenue, and Sullivan Road. Connections are provided from the study area to these regional corridors primarily by Barker Road, but also Flora Road and Euclid Avenue.
- **Vehicle queues on Barker Road at the at-grade rail crossings.** Analysis shows the average vehicle queue on Barker Road when the gates are down at the BNSF rail crossing is 275 feet (on either side of the crossing), but can be as much as 475 feet when the gates are down longer than usual during a spike in peak hour traffic. Queues sometimes extend north onto Trent Avenue, but analysis show that even during the worst case scenario would be contained to the right- and left-turn lanes (and not the through lanes). While queues are typically longer at the UP crossing, they occur about five times as frequently at the BNSF crossing which hosts about 54 trains per day. At the UP crossing during the worst case scenario (long gate down times during a spike in peak hour traffic) analysis shows that queues can be as long as 1,075 feet in the southbound direction and 700 feet in the northbound direction.
- **Barker Road provides a critical connection to the study area.** Barker Road has the highest existing traffic volumes in the study area, is the only street through the study area that crosses the Spokane River (connecting Trent Avenue with I-90 and Appleway Avenue) and provides access to most of the undeveloped land in the study area. As such, this will be an important corridor for future development. Several capital improvement projects are also planned along Barker Road over the next five years that will greatly enhance multimodal access to land within the study area. These projects include:
    - Converting Barker to a three-lane urban section (with bike lanes, sidewalks and curb and gutter) from the Spokane River to Trent Avenue
    - Reconstructing the Barker Road interchange with I-90
    - Improving the Barker Road/Trent Avenue intersection to create a grade-separation with the heavily trafficked BNSF mainline and to better connect Barker Road and Trent Avenue

APPENDIX B:

SPOKANE VALLEY NORTHEAST INDUSTRIAL AREA PAO TRAFFIC ANALYSIS FOR PHASE 1, PHASE 2, AND PHASE 3

FEHR PEERS

MEMORANDUM

Date: December 21, 2017

To: Chaz Bates, City of Spokane Valley

From: Chris Breiland, PE
Patrick Picard, AICP

Subject: Spokane Valley Northeast Industrial Area PAO – Phase 1 Traffic Analysis

SE17-0508

INTRODUCTION

This memo presents traffic operations findings associated with the first phase (Phase 1) of land use growth in the Spokane Valley Northeast Industrial Area. Phase 1 consists of two adjacent industrial developments proposed on approximately 80 acres of currently undeveloped land on the northeast corner of Barker Road and Euclid Avenue in Spokane Valley. The two projects are estimated to have a combined total of 375 employees when they open. For purposes of this analysis, opening day for these projects is assumed to be in 2019.

The focus of this analysis is on traffic impacts at the major intersections on Barker Road between I-90 and Trent Avenue as well as traffic impacts the two at-grade rail-crossings along this stretch of Barker Road, which includes the mainlines of the Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) railroads. Intersections analyzed as part of Phase 1 include:

- Barker Rd/Trent Ave
- Barker Rd/Euclid Ave (west)
- Barker Rd/Euclid Ave (east)
- Barker Rd/Mission Ave
- Barker Rd/I-90 Westbound Ramps
- Barker Rd/I-90 Eastbound Ramps

PHASE 1 LAND USE DESCRIPTION

Information about each project included in Phase 1 relevant to trip generation and distribution is summarized below. This information came from site plans and other information submitted by the developers. The projects are identified for reference as Project #1 and Project #2.

Project # 1

- 40 acre site
    - Manufacturing facility (150,000 square feet)
    - Storage Space (115,000 square feet)
- 150 employees
- New rail spur off Union Pacific mainline

Project # 2

- 40 acre site
    - Manufacturing facility (350,950 square feet)
    - Warehouse (45,840 square feet)
    - Research & development institute (41,470 square feet)
    - Storage (60,100 square feet)
- 225 employees (split shift)
    - Shift 1: 125 employees (6 AM – 4:30 PM)
    - Shift 2: 100 employees (4:30 PM – 3 AM)
- New rail spur off Union Pacific mainline
- 30 large trucks entering/exiting facility per day

METHODOLOGY

Trip Generation

New vehicle trips associated with the two projects in Phase 1 were estimated for the morning and afternoon peak hour on a typical weekday using the *ITE Trip Generation Manual, 9th Edition*. Trip rates were calculated based on the number of employees. The land use of both sites was assumed to be General Light Industrial (ITE Code 110) as this land use type best matched the anticipated trip rates and directional distribution by time of day for the two proposed developments. Note that Manufacturing (ITE Code 140) was also considered, however, the General Light Industrial use resulted in slightly more conservative (higher) trip generation rates and more accurate directional distribution given information provided by the developer about shift changes, so that land use category was used.

Project #1 is assumed to have a traditional 8 AM – 5 PM schedule for most employees and thus no adjustments were made to the ITE trip generation rates. However, based on information from the project applicant, Project #2 will have a split shift, with the first shift consisting of 125 employees from 6 AM – 4:30

PM and the second shift consisting of 100 employees from 4:30 PM – 3 AM. For Project #2, peak hour trips during the morning were estimated using the number of employees scheduled for the first shift (125) and the ITE trip rate (0.44) and directional distribution (83% in, 17% out) for light industrial during the AM peak. It should be noted that this will result in a conservative estimate of morning trips during the peak hour as most of these trips will actually occur prior to 6 AM.[1] To account for the shift change during the PM peak, two different trip rates were used, one for each shift:

- For shift 1 (125 employees), the PM peak hour trip rate (0.42) and distribution (21% in, 79% out) for light industrial was used
- For shift 2 (100 employees), the AM peak hour trip rate (0.44) and distribution (83% in, 17% out) for light industrial was used

Figure 1 illustrates the estimated vehicle trips that will be generated from Phase 1 using the methodology described above. Phase 1 is anticipated to generate a total of 1,198 new trips per weekday, including 131 in the morning peak hour and 160 during the afternoon peak hour.

Figure 1: Vehicle Trip Generation

Trip Generator	Land Use	Employees	AM Peak Hour		PM Peak Hour		Weekday Total
			In	Out	In	Out	
Project #1	Light Industrial	150	56	10	13	50	473
Project #2, 1st Shift	Light Industrial	125	46	9	11	42	399
Project #2, 2nd Shift	Light Industrial	100	0	0	37	7	326
	Total	**375**	**112**	**19**	**61**	**99**	**1,198**

Truck Trips

Truck trips from both project sites are not expected have a significant impact on the percentage of trucks on the adjacent streets. Truck trips from Project #1 are assumed to be the same as or less than what is currently on adjacent roadways. Project #2 is anticipated to generate about 30 truck trips per day, or about 4% of total new trips generated by the project. This is well below the most recent counts (from 2011) of 13% of daily traffic from trucks on Barker Road. However, this is close to the current peak hour truck percentages of traffic on Barker Road, which is 6% in the morning and 3% in the afternoon (based on 2017 counts). Therefore, in order to err on the side of being conservative, the percentage of truck traffic on adjacent streets is assumed to be the same in the Phase 1 analysis as existing conditions.

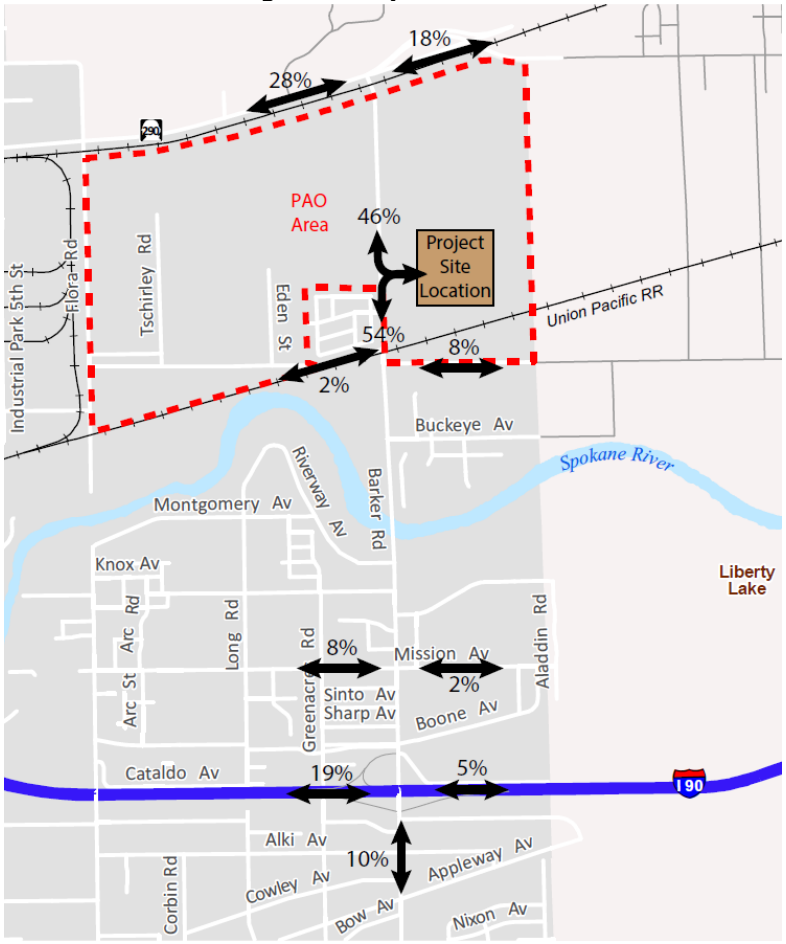
[1] This assumption would also account for a situation where Project #2 operates at a standard shift, ensuring that there will not be any unexpected traffic operations issues even if the plant is at reduced capacity with a single shift.

Trip Distribution

The distribution of trips from the two projects in Phase 1 was estimated using existing peak hour traffic volumes and turn movements along Barker Road. Traffic data were collected in either June, 2016 or February, 2017. The estimated distribution of trips from Phase 1 development is shown in **Figure 2** and described here:

- Trent Avenue, west of Barker Road: 28%
- Trent Avenue, east of Barker Road: 18%
- Euclid Avenue, west of Barker Road: 2%
- Euclid Avenue, east of Barker Road: 8%
- Mission Avenue, west of Barker Road: 8%
- Mission Avenue, east of Barker Road: 2%
- I-90, west of Barker Road: 19%
- I-90, east of Barker Road: 5%
- Barker Road, south of I-90: 10%

Figure 2: Trip Distribution



Background Traffic Growth

The Spokane Valley Comprehensive Plan forecasts a growth rate in traffic along Barker Road between Trent Avenue and Euclid Avenue of about 3.7% per year through 2040. This growth rate is reasonably consistent with recent observed traffic growth along Barker Road between Trent Avenue and I-90. Therefore, a growth rate of background traffic on adjacent streets of 3.7% per year was applied as part of the Phase 1 traffic analysis.

RESULTS

Level of Service Standards

The City of Spokane Valley uses level of service (LOS) to describe and evaluate traffic operations along major arterial corridors and intersections within the City. Levels range from LOS A to LOS F, which encompass a range of congestion types from uninterrupted traffic (LOS A) to highly-congested conditions (LOS F). The description and intersection delay thresholds of each LOS category are described in **Figure 3.** These are based on the Highway Capacity Manual, which is the methodology used by Spokane Valley. The LOS for signalized intersections is measured by the average delay per vehicle entering the intersection from all approaches, while the LOS for unsignalized intersections is measured by the average delay per vehicle on the approach with the highest average delay.

Figure 3 Level of service description and delay thresholds at intersections

Level of Service	Description	Signalized Intersection Delay (seconds)	Unsignalized Intersection Delay (seconds)
A	Free-flowing conditions.	0-10	0-10
B	Stable operating conditions.	10-20	10-15
C	Stable operating conditions, but individual motorists are affected by the interaction with other motorists.	20-35	15-25
D	High density of motorists, but stable flow.	35-55	25-35
E	Near-capacity operations, with speeds reduced to a low but uniform speed	55-80	35-50
F	Over-capacity conditions with long delays.	> 80	>50

Source: Highway Capacity Manual 2010, Transportation Research Board

The LOS standards used by Spokane Valley are defined in the Comprehensive Plan as follows:

- LOS D for major arterial corridors:
  - Argonne/Mullan between the town of Millwood and Appleway Boulevard
  - Pines Road between Trent Avenue and 8th Avenue
  - Evergreen Road between Indiana Avenue and 8th Avenue
  - Sullivan Road between Wellesley Avenue and 8th Avenue
  - Sprague Avenue/Appleway Boulevard between Fancher Road and Sullivan Road
- LOS D for signalized intersections not on major arterial corridors
- LOS E for unsignalized intersections (LOS F is acceptable if the peak hour traffic signal warrant is not met)

Level of Service Results

Traffic operations, including vehicle delay and level of service (LOS) at each intersection under Phase 1 were analyzed using Synchro (a transportation planning software). The results of the LOS analysis**,** including a comparison of existing (2017) and future (2019) conditions under Phase 1, for each of the six major intersections on Barker Road are shown in **Figure 4.**

Figure 4: Phase 1 Intersection LOS Results

Intersection along Barker Road	Control[1]	Existing (2017)				Phase 1 (2019)				Approach
		AM Peak		PM Peak		AM PEAK		PM PEAK		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
Trent Ave	SSSC	**59**	**F[2]**	41	E	**139**	**F[2]**	**90**	**F[2]**	NB
Site Access Rd	SSSC	n/a	n/a	n/a	n/a	11	B	12	B	SBL/WB
Euclid Ave (north)	SSSC	10	B	11	B	11	B	13	B	EB
Euclid Ave (south)	SSSC	12	B	15	C	14	B	20	C	WB
Mission Ave	Signal	13	B	17	B	14	B	15	B	
I-90 westbound	Signal	**68**	**E**	43	D	**92**	**F**	46	D	
I-90 eastbound[3]	Signal	44	D	**113**	**F**	50	D	**122**	**F**	

1. SSSC = Side Street Stop Control

2. Does not meet City LOS standard because intersection operates at LOS F and traffic volumes satisfy the peak hour signal warrant per MUTCD guidelines

3. Based on HCM 2000 methodology

Results show that under Phase 1 there would be minimal change in vehicle delay from today at the Barker Road/Euclid Avenue (north and south) and the Barker Road/Mission Avenue intersections. Those

intersections would continue to achieve LOS B or C under Phase 1, well within the acceptable LOS threshold established by the Spokane Valley Comprehensive Plan. The intersections with the most significant traffic impacts under Phase 1 include:

- Barker Road/Trent Avenue
- Barker Road/I-90 Westbound
- Barker Road/I-90 Eastbound

Barker Road/Trent Avenue Intersection

Under existing conditions, the Barker Road/Trent Avenue intersection does not meet the LOS threshold as established by the City of Spokane Valley Comprehensive Plan. This is because this intersection operates at LOS F today (as measured by the northbound approach) during the AM peak - and peak hour traffic volumes are high enough on Trent Avenue and Barker Road to meet the peak hour signal warrant using MUTCD[2] criteria. Under Phase 1, the average delay in the northbound direction on Barker Road at Trent Avenue would remain LOS F during the AM peak and increase from LOS E to F during the PM peak. Because peak hour traffic volumes at this intersection would continue to be high enough to meet the peak hour signal warrant (using MUTCD criteria), this intersection would not meet the City's LOS thresholds under Phase 1.

Barker Road/I-90 Intersections

Average vehicle delay would increase slightly at the Barker Road/I-90 intersections under Phase 1 conditions as compared to existing conditions. However, this increase would not be enough to change the LOS from what is observed today with the exception of the Barker Road/I-90 westbound intersection in the AM peak, which would change from LOS E today to LOS F under Phase 1. During the PM peak it would continue to operate at LOS D. The Barker Road/I-90 eastbound intersection would continue to operate at LOS D during the AM peak and LOS F during the PM peak.

Barker Road/Site Access Road

Two analyses were also performed for the intersection of the new access road to the site and Barker Road to determine:

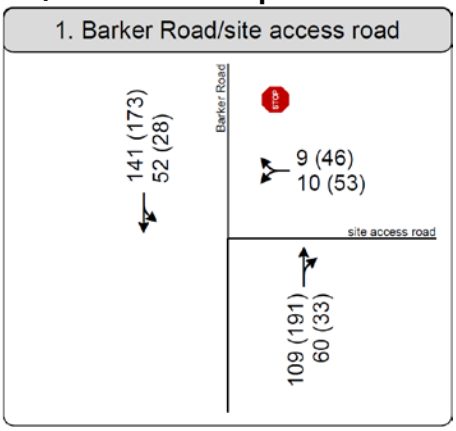
1. How many westbound lanes would be needed at the Barker Road intersections, and
2. Whether a southbound left turn lane would be warranted on Barker Road into the new development

Figure 5 shows the turn movements and volumes forecast at the new Barker Road/site access road intersection. An LOS intersection analysis in Synchro shows that the average delay for outbound vehicles

[2] *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, https://mutcd.fhwa.dot.gov

waiting to turn onto Barker Road (assuming one westbound lane) would be 8 seconds in the AM peak and 12 seconds in the PM. These volumes suggest one outbound lane on the access road would be sufficient to handle forecast traffic.

Figure 5: Barker Road/site access road peak hour turn volumes – AM (PM)



To determine whether a left turn lane is needed on Barker Road at this intersection, a left-turn lane warrant for a two-way stop controlled intersection was used based on the methodology presented in the Transportation Research Board *NCHRP Report 475*[3] and the *AASHTO Green Book*[4]. Calibration constants were adjusted to more conservative amounts than is assumed in the *AASHTO Green Book* based on more recent research published by Fitzpatrick and Wolff in 2003[5]. Critical headway was increased by another 0.5 seconds beyond this to account for the higher than average volumes of heavy trucks. These adjustments resulted in the following calibration constants that were used for the left-turn lane warrant:

- Average time for making left turn: 4.3 seconds
- Critical headway: 6.0 seconds
- Average time for left-turn vehicle to clear the advancing lane: 3.2 seconds

The results of the left-turn analysis are shown in **Figure 6** and **Figure 7**. Based on the above methodology a left-turn lane would not be warranted under Phase 1 conditions. It should be noted that during the AM peak (and assuming the more conservative calibration values identified above) traffic volumes in Phase 1 would be just below the threshold for a left-turn warrant.

[3] Bonneson, J. and M. Fontaine, *Engineering Study Guide for Evaluating Intersection Improvements*, NCHRP Report No. 457, Transportation Research Board, Washington, DC, 2001.
[4] American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets* (2011)
[5] Fitzpatrick, K. and T. Wolff, *Left-Turn Lane Installation Guidelines*, Proceedings of the 2nd Urban Street Symposium, Transportation Research Board, Anaheim, CA (2003)

Figure 6: AM peak left-turn lane warrant on Barker Road at future site access road intersection

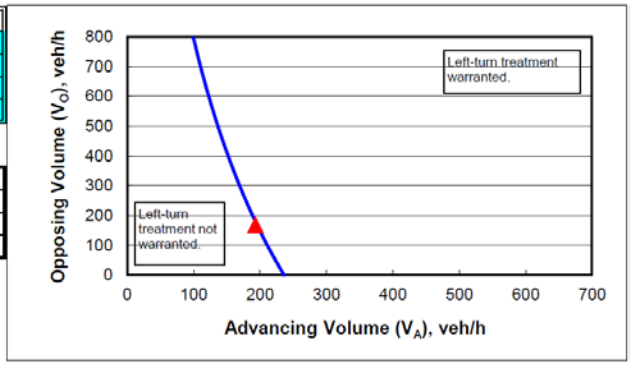
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	27%
Advancing volume (V_A), veh/h:	193
Opposing volume (V_O), veh/h:	169

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	195
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

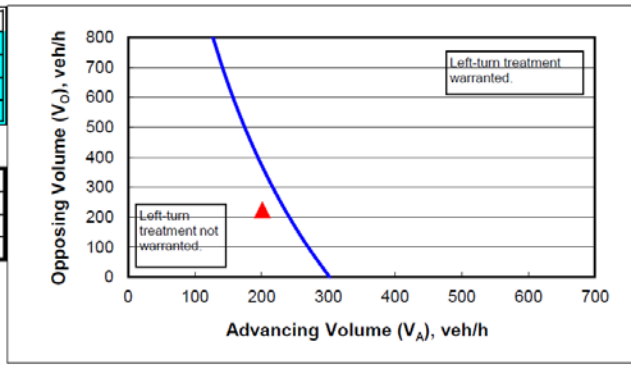
Variable	Value
Average time for making left-turn, s:	4.3
Critical headway, s:	6.0
Average time for left-turn vehicle to clear the advancing lane, s:	3.2

Figure 7: PM peak left-turn lane warrant on Barker Road at future site access road intersection

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	14%
Advancing volume (V_A), veh/h:	201
Opposing volume (V_O), veh/h:	224

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	235
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	4.3
Critical headway, s:	6.0
Average time for left-turn vehicle to clear the advancing lane, s:	3.2

Traffic Impacts at the At-Grade Rail Crossings

The impacts of queuing vehicles at the two at-grade railroad crossings along Barker Road were analyzed using Synchro under Phase 1 conditions. The two rail crossings include the Burlington Northern Santa Fe (BNSF) Railroad, which crosses Barker Road just south of Trent Avenue, and the Union Pacific (UP) Railroad, which crosses Barker Road between the Euclid Avenue westbound and Euclid Avenue eastbound intersections. Based on data provided by the Federal Railroad Administration (FRA), the BNSF line hosts about 54 trains per day and the UP line hosts about 9 trains per day on average.

The queuing analysis looked at the queue length and associated traffic impacts under two scenarios in which the gates are down during both the AM and PM peak:

- **Average queue length** – This was measured by the 50th percentile queue length during an average

gate down time and represents the typical queue that would occur when a train crosses Barker Road during the peak commuting period.

- **Worst case scenario queue length** – This was measured by the 95th percentile queue length during the longest observed gate down time[6] and represents a queue during the worst case scenario: a particularly high surge in peak hour traffic combined with a long gate down time. Note: based on the observed frequency of long gate down times on each line the worst case scenario is likely to occur 3-4 times per year along the UP line and 9-10 times per year along the BNSF line.

The results of the queuing analysis are shown in **Figure 8**, including the estimated vehicle queue length in feet along Barker Road during the AM and PM peak when the gates are down. The queues at the UP crossing will likely back up onto Euclid Avenue in both directions, but beyond being a little longer than observed today, are not anticipated to have any additional traffic impacts. However, because of the proximity of Trent Avenue to the Barker Road/BNSF rail crossing a more detailed analysis was performed to see if there would be any impacts to traffic on Trent Avenue.

Figure 8: Vehicle queue length on Barker Road at-grade rail crossings when gates are down

Railroad Crossing	Condition	Trains per Day	Gate Down Time	Vehicle Queue Length (feet)			
				AM Peak		PM Peak	
				NB	SB	NB	SB
BNSF	Average (50th percentile)	54	3 minutes	175	300	375	325
	Worst Case (95th percentile)	54	4.5 minutes	325	525	650	525
UP	Average (50th percentile)	9	2 minutes	400	275	300	650
	Worst Case (95th percentile)	9	4 minutes	950	275	650	1,350

There is only about 100 feet of space along Barker Road between the BNSF railroad crossing stop bar and Trent Avenue. Therefore, in most cases during the peak period, vehicles will end up queued along Trent Avenue, either in the eastbound right turn pocket, which has about 300 feet of storage space before the taper begins, or the westbound left-turn pocket, which has about 225 feet of storage space. Under Phase 1, during the AM peak, the percentage of vehicles turning left or right off of Trent Avenue onto southbound Barker Road is split close to 50/50 between the eastbound and westbound directions. During

[6] Duration and frequency of gate down times was recorded at both the BNSF and UP rail crossings along Barker Road between 7AM and 6PM Tuesday, February 14, 2017

the PM peak, about 75% of vehicles heading south on Barker Road across the BNSF tracks would have turned right from the eastbound direction of Trent Avenue, and the other 25% would have turned left off Trent Avenue. These ratios were applied to the estimated queue length during the average and worst case scenarios.

Figure 9 demonstrates that during the average scenario (represented by the 50th percentile queue length, during an average length of gate down time), there would be sufficient storage space in both the westbound left- and eastbound right-turn pockets along Trent Avenue during the peak hours to prevent vehicles from queuing onto the through lanes. However, in the worst case scenario queues may spill slightly onto the eastbound through lanes. In the AM peak, the westbound left turn pocket would be just long enough during the worst case scenario to store the queue waiting to turn left onto Barker (about 200 feet). During the PM peak, the queue of vehicles waiting to turn right from Trent Avenue to Barker Road in the worst case scenario would be 325 feet. Since the eastbound right turn pocket has 300 feet of storage before the lane begins to taper, the queue would be about 25 feet longer than the length of the eastbound right turn pocket. It is estimated (based on the frequency of 4.5 minute gate down times) that this scenario would occur about 9-10 times per year.

Figure 9: Vehicle queues on Trent Avenue at Barker Road from the BNSF railroad crossing

Condition	Vehicle Queue Length (feet)					
	Total	Barker Road	Trent Ave			
			Turn Lanes		Unused Storage	
			EBR	WBL	EB	WB
Existing Vehicle Storage Space	600	100	300	225	n/a	n/a
Average (50th percentile) AM	300	100	100	100	200	125
Average (50th percentile) PM	325	100	175	50	125	175
Worst Case (95th percentile) AM	525	100	225	200	75	25
Worst Case (95th percentile) PM	525	100	325	100	**-25**	125

MITIGATION

Recommended mitigations at the three intersections that would fail the City's LOS standards under Phase 1 are described below. Recommendations for the BNSF and UP at-grade rail crossings on Barker Road are also discussed.

Barker Road/Trent Avenue Intersection

Results show that this intersection would fail the City's LOS standards under Phase 1 as it currently does today. The City of Spokane Valley is planning to grade-separate Barker Road with the BNSF railroad (just south of Trent Avenue) as part of the 6-year TIP, which would change the configuration of this intersection in the future. It is anticipated that any grade separation project would result in adequate LOS at this intersection as the grade separation would also reconstruct the intersection with Trent and Barker. The City recently hired a consulting engineering team to design the grade separation project beginning in the summer of 2017 and this is a top priority project for the city to complete, however no timeline has been set for construction.

Given the technical and financial commitment by Spokane Valley to reconstruct the Trent/Barker intersection, the City is confident that the intersection LOS issue identified here will be mitigated in the near-future. However, given that funding for construction still needs to be secured and the various agencies required to approve the project, Spokane Valley has decided to use a two-tiered mitigation approach. In the near-term, it will be assumed that the grade separation project will move forward in a timely matter. However, if for any reason sufficient progress is not being made on the grade-separation project within the next three years, the City will instead consider installing an interim traffic signal. Under WSDOT design criteria an Intersection Control Analysis (ICA) and approvals from WSDOT will be required for any interim improvement.

A span wire signal with video vehicle detection would be a low cost, interim option to address the LOS issue at this location. Based on analysis performed in Synchro (and assuming an actuated, uncoordinated signal with a 110 second cycle length and protected left turn on Trent Avenue) the conversion of this intersection from a two-way stop controlled intersection to a signalized intersection would improve the LOS in Phase 1 from F to B. However, given that this intersection is within 200 feet of an at-grade railroad crossing, a signal at this intersection would also need to be interconnected with the railroad crossing on Barker Road 100 feet south of Trent Avenue. This would require the City to file a petition with the State Utilities and Transportation Commission (UTC). This petition includes an on-site safety assessment with the UTC, WSDOT, and BNSF prior to filing the petition. Interconnection of the traffic signal and the railroad crossing arms would result in some additional costs. An interim signal at this location should also include advance warning signs to alert drivers of the signal from the eastbound and westbound approach to Barker Road. Drivers may not be expecting a signal at this location given both the curvature in the road near Wellesley Avenue (which reduces sight distance) and rural character around the intersection.

Barker Road/I-90 Intersections (eastbound & westbound)

The Barker Road/I-90 intersections currently operate at LOS F for part of the day. Without any improvements these intersections would continue to operate at LOS F under Phase 1. However, two

separate improvement projects are planned at this intersection that will improve LOS to an acceptable level under Phase 1. WSDOT is planning to reconstruct this intersection in the next several years. The recently completed Interchange Justification Report (IJR) includes a traditional diamond interchange design with two-lane roundabouts at both eastbound and westbound ramps at Barker Road. The City is also planning to widen Barker Road between I-90 and Appleway Avenue, from 3 to 5 lanes, as part of the 6-year TIP. The combination of these two projects already in the pipeline will sufficiently address LOS at the Barker Road/I-90 intersections under Phase 1 and no additional mitigations are recommended.

Note: Following conclusion of this traffic analysis the original assumption that the Barker Road/I-90 interchange would be reconstructed by 2020 changed. The more recent assumption is that full reconstruction of the interchange (as described above) would occur by 2040. The only project currently funded for the Barker Road/I-90 interchange is construction of a single lane roundabout at the Barker Road/I-90 Eastbound Ramp. Given this change in funding it is recommended that the City of Spokane Valley work with WSDOT to find funding for the earlier proposed interchange reconstruction project (see the 2014 approved IJR). The proposed interchange includes a two-lane roundabout at both the westbound and eastbound ramps that would address existing and future LOS issues through 2040.

Barker Road/BNSF Railroad At-Grade Crossing

An analysis of vehicle queue length at the BNSF rail crossing on Barker Road shows that, except in the worst case scenario, the turn pockets on Trent Avenue are of sufficient length to store vehicles waiting to turn onto Barker when the gates are down. During the worst case scenario (the 95th percentile queue length during the PM peak, during a particularly long gate down time) the queue of vehicles in the eastbound right-turn pocket may spill 25 feet beyond the storage lane. This situation is likely to occur only about 9-10 times per year and even then there would still be about 100 feet of partial right-turn lane (where the lane tapers) and vehicles can largely pull out of the through lane. Because this scenario would only occur during the PM peak hour when drivers are more accustomed to vehicle queues, and only about 9-10 times per year, no mitigations are recommended at the BNSF crossing as part of Phase 1.

Barker Road/UP Railroad At-Grade Crossing

An analysis of vehicle queue length at the UP rail crossing on Barker Road shows that vehicle queues will be about 10-35% longer under Phase 1 than they are today. However, no additional traffic impacts (e.g. additional blocked driveways) beyond slightly longer queues on Barker Road and Euclid Avenue are anticipated and thus no mitigations are recommended around the UP railroad at-grade crossing as part of Phase 1.

CONCLUSIONS

The results of the traffic impact analysis in the Northeast Industrial Area of Spokane Valley demonstrated that the following three intersections would fail the City's LOS standards under Phase 1 of development:

- Barker Road/Trent Avenue
- Barker Road/I-90 Eastbound Ramps
- Barker Road/I-90 Westbound Ramps

Results also indicated that there is a possibility that about 9-10 times a year during the PM peak the vehicle queue at the BNSF crossing may get just long enough to partially block the eastbound lane of Trent Avenue.

The following mitigations are recommended to address these impacts:

- **Barker Road/I-90** - WSDOT and the City of Spokane Valley are already planning to make improvements to the Barker Road/I-90 intersections that would improve the LOS at those intersections to acceptable levels within the next several years. Thus no additional mitigations are recommended.

- **Barker Road/Trent Avenue** - The City is also planning to improve the Barker Road/Trent Avenue intersection as part of the Barker Road/BNSF Railroad grade separation project included in the 6-year TIP, which will bring this intersection to an acceptable LOS and would qualify as adequate mitigation. However, given the increased delay resulting from the Phase 1 development, the City will reevaluate this intersection three years after there is development at the Phase 1 site. If at that time sufficient progress is not being made on the grade-separation project, the City will consider a relatively low-cost interim improvement. Adding a wire span signal with video detection would improve LOS to an acceptable level and negate any concern for additional industrial development in the near future. Because the intersection is within 200 feet of an at-grade railroad crossing it would require signal coordination with the crossing gates, filing a petition to the State UTC, and an on-site safety assessment with the UTC, WSDOT, and BNSF prior to filing the petition.

- **Vehicle Queues from Barker Road Railroad Crossings** - Analysis demonstrated that vehicle queues on Barker Road at the BNSF and UP railroad at-grade crossings would increase in length by about 10-35% in Phase 1 from what they are today. The most significant impact identified (beyond the delay already experienced by drivers today waiting to cross the railroad tracks when the gates are down) would be that there is a possibility that about 9-10 times a year during the PM peak the queue at the BNSF crossing may get just long enough to partially block the eastbound

lane of Trent Avenue. Given the infrequent likelihood of this occurrence, that it would only occur in the PM peak in an urban area when commuters would be expecting queues and that the City is planning to grade-separate this crossing as part of the 6-year TIP, no additional mitigations are recommended for the rail crossings as part of Phase 1.

FEHR PEERS

MEMORANDUM

Date: June 14, 2017

To: Chaz Bates, City of Spokane Valley

From: Chris Breiland, PE
Patrick Picard, AICP

Subject: Spokane Valley Northeast Industrial Area PAO – DRAFT Phase 2 Traffic Analysis

SE17-0508

INTRODUCTION

This memo presents traffic analysis findings as part of Phase 2 of development in the Spokane Valley Northeast Industrial Area. The intent of defining a Phase 2 of development in the Northeast Industrial Area is to determine an intermediate level of development between Phase 1 (in year 2019) and Phase 3 (in year 2040) that may trigger the need for a large infrastructure project prior to 2040. Phase 2 of development would thus provide guidance to the City as to when major projects will likely be needed based on growth in the Northeast Industrial Area and growth in background traffic.

METHODOLOGY

This section describes the methodology used to estimate when Phase 2 of development will likely occur and trigger the need for a major infrastructure project.

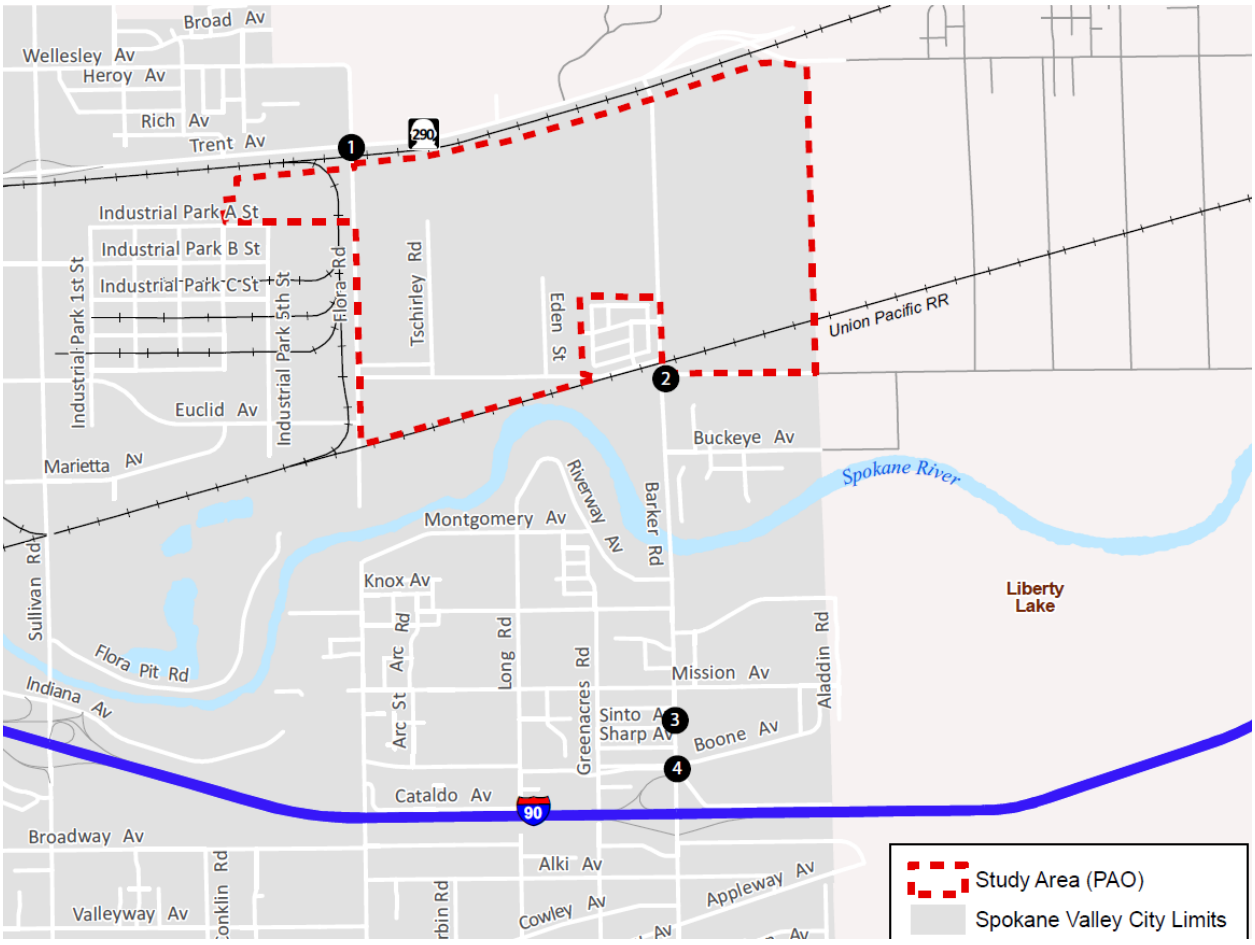
Key Infrastructure Projects Needed By 2040

Several key infrastructure projects were recommended for implementation by 2040 as part of the traffic analysis for Phase 3 development in the Northeast Industrial Area (see **Figure 1**). These are in addition to projects already planned as part of City's 6-year Transportation Improvement Program (TIP) and the Spokane Regional Transportation Council (SRTC) *Horizon 2040 Plan* (fiscally constrained version). The

following list also assumes that a new east-west local street connecter between Barker Road and Flora Road (north of Euclid Avenue) will be implemented prior to 2040 as the area is developed.

1. **Flora Road/Trent Avenue** – Signalize the intersection and add northbound and southbound left turn lanes on Flora Road or convert intersection to a roundabout.
2. **Barker Rd/UP Railroad at-grade crossing** – Add a northbound right turn lane on Barker Road and a westbound left turn lane on Euclid Avenue at the Barker Road/Euclid Ave (south) intersection. Also sign and paint "do not block" at key driveways and intersections on Barker Road approaching the UP Railroad crossing.
3. **Barker Road (from Mission Avenue to I-90)** – Widen to five lanes
4. **Barker Road/Boone Avenue** – As part of the Barker Road/I-90 interchange reconstruction project planned by WSDOT, Spokane Valley will either need reroute Cataldo Avenue from Barker Road to Boone Avenue and add a signal/roundabout to the Barker Road/Boone Avenue intersection or convert the Barker Road/Cataldo Avenue intersection to right-in/right-out and accommodate U-turns or build a roundabout at the Barker Road/Boone Avenue intersection.

Figure 1: Key transportation projects needed by 2040 (from the Phase 3 analysis)



Of the recommended projects to mitigate traffic impacts associated with Phase 3 development, the largest and most expensive would be widening Barker Road to five lanes from Mission Avenue to I-90. Unlike some of the other recommended projects, the timeline for widening Barker Road to five lanes is not tied to other projects, but would be based on the pace of nearby development and associated growth in traffic. Therefore, it is recommended that Phase 2 be defined as when development in the Northeast Industrial Area (combined with growth in background traffic on Barker Road) is sufficient to trigger the need to widen Barker Road from three lanes to five lanes between Mission Avenue and I-90. The approximate timeline for when the other projects should be implemented is listed below:

- **Flora Road/Trent Avenue** – This project should be implemented concurrently with the Barker Road/BNSF Railroad grade separation project which is planned in the next six years. Note: the need for a signal/roundabout at Flora Road/Trent Avenue is contingent on the Flora Road/BNSF Railroad at-grade crossing remaining open. If this grade-crossing is closed in the future as part of the Barker Road/BNSF Railroad grade separation project, the need for a signal will need to be reexamined.
- **Barker Road/Euclid Avenue (south)** – This project is relatively small in scale and could be implemented any time prior to 2040 buildout. The City is planning to widen the section of Barker Road south of Euclid to a three-lane urban section (with curb, gutter, sidewalk and a bike lane) by 2021. This could be a logical time to implement this project. Alternatively the City could monitor queue lengths on Barker Road and Euclid Avenue from the UP Railroad crossing as part of the City's periodic traffic monitoring program and use that to inform a decision on when to implement this project.
- **Barker Road/Boone Avenue** – This project is directly associated with the Barker Road/I-90 interchange project and should be implemented concurrently with that project.

Phase 2 Development Scenarios

The need to widen Barker Road south of Mission Avenue will be triggered based on a combination of the growth in background traffic in the corridor (regardless of development in the Northeast Industrial Area) and the pace/intensity of development in the Northeast Industrial Area. Given the uncertainty of when development in the Northeast Industrial Area would occur between now and 2040 and the desire from the City to know the amount of development that would trigger the need to widen Barker Road south of Mission Avenue, the following three development scenarios were analyzed to provide a rough gauge for when this project may be needed:

- If there were no new development in the Northeast Industrial Area
- If 75% of the 2015-2040 forecast development occurred in the Northeast Industrial Area
- If 100% of the 2015-2040 forecast development occurred in the Northeast Industrial Area

The following four factors were used forecast future growth in traffic along Barker Road given each of the

three scenarios described above:

- **Existing (2015) ADT** – The existing ADT on Barker Road south of Mission Avenue was observed to be 13,400 in 2015.
- **Background Traffic Growth** –Background traffic growth on Barker Road is defined as the growth in traffic not associated with development in the Northeast Industrial Area, which is estimated to be about 1.33% per year between 2015 and 2040. This was estimated by running the 2040 SRTC travel demand model assuming no growth in employees in transportation analysis zones (TAZ's) 318 and 600 (which are the TAZ's where most of the forecast development in the Northeast Industrial Area that will generate trips on Barker road is expected to occur).
- **Traffic Growth from Development in the Northeast Industrial Area** – To estimate traffic growth on Barker Road between Mission Avenue and Boone Avenue from development in the Northeast Industrial Area we compared the 2040 model run assuming no growth in employees in TAZ's 318 and 600 (as described above) with the 2040 model run under Phase 3 of development. Using a select link analysis for the segment of Barker Road south of Mission Avenue, we found that there would be about 1,300 fewer daily trips from TAZ 318 and TAZ 600 on that segment of Barker in the 2040 model with no employment growth in those two TAZ's as compared to the 2040 model under Phase 3 of development.

Level of Service Thresholds

The City of Spokane Valley uses level of service (LOS) to describe and evaluate traffic operations along major arterial corridors and intersections within the City. Levels range from LOS A to LOS F, which encompass a range of congestion types from uninterrupted traffic (LOS A) to highly-congested conditions (LOS F). These are based on the Highway Capacity Manual, which is the methodology used by Spokane Valley. The Comprehensive Plan defines LOS D as the acceptable standard on most arterial streets.

Using the Highway Capacity Manual, the LOS D threshold for a three lane street on this segment of Barker Road was estimated to be about 16,500 ADT. This is based on a k-factor (the percent of daily traffic in the PM peak) of 0.9, and a d-factor (the percent of peak hour traffic in one direction) of 0.55 and posted speed of 35mph. The k-factor and d-factor were estimated based on observed traffic data. It should be noted that this is a rough estimate of when LOS D conditions would occur for forecasting purposes only. Traffic operations will to some extent depend on other factors, including growth in traffic volumes on Mission Avenue. Traffic conditions on Barker Road should be monitored to determine if and when conditions drop below LOS D.[1]

[1] Spokane Valley generally uses intersection LOS to evaluate traffic operations, however, for this section between Mission Avenue and I-90, a roadway segment analysis is appropriate to consider. The LOS results for the segment and the key intersections at Mission Avenue and I-90 Westbound Ramps are generally consistent with the segment LOS threshold defined above.

RESULTS

Phase 2 Development Thresholds

The approximate year in which traffic growth along Barker Road south of Mission Avenue would trigger the need for the City of Spokane Valley to widen the section between Mission Avenue and I-90 to five lanes is shown in **Figure 2** for each of the three different development scenarios in the Northeast Industrial Area (as described in the Methodology section).

Figure 2: Forecast year Barker Road would exceed LOS D thresholds south of Mission Avenue

Phase 2 Development Scenario	Year LOS D threshold would be exceeded
With no new development in the Northeast Industrial Area	2032
With 75% of the 2015-2040 forecast growth in the Northeast Industrial Area	2026
With 100% of the 2015-2040 forecast growth in the Northeast Industrial Area	2025

Traffic forecasts show that Barker Road between Mission Avenue and I-90 will likely need to be widened to five lanes at some point between the year 2025 and 2032. This forecast assumes steady growth in background traffic on this corridor over the next 20 years at a rate of about 1.33% per year. The variability in timing in this analysis is based on how rapidly the Northeast Industrial Area is developed. If no new industrial development in the Northeast Industrial Area occurred over the next 15 years, background traffic growth alone on Barker Road – caused by other nearby and regional developments – would likely trigger the need to widen Barker Road south of Mission Avenue by year 2032. Alternatively, if there were to be rapid buildout of the Northeast Industrial Area over the next 5-10 years, the earliest year that widening would likely be needed is in 2025.

CONCLUSIONS/RECCOMENDATIONS

The intent of defining a Phase 2 of development in the Northeast Industrial Area is to determine an intermediate level of development between Phase 1 (in year 2019) and Phase 3 (in year 2040) that may trigger the need for a large infrastructure project prior to 2040. Phase 2 of development would thus provide guidance to the City as to when major projects will likely be needed based on growth in the Northeast Industrial Area and growth in background traffic. Given that the widening of Barker Road to five

lanes between Mission Avenue and I-90 was the only large scale mitigation project identified in the Phase 3 traffic analysis that was not tied to another project with a pre-defined timeline, the timing of this project was used to define Phase 2 of development.

Traffic analysis was performed for the section of Barker Road south of Mission Avenue using the following factors:

- Existing traffic volumes,
- Assuming a future average annual background traffic growth rate of 1.33%; and
- Applying a LOS D threshold based on the HCM guidelines.

Results of this analysis showed that depending on the pace of development in the Northeast Industrial Area Barker Road would likely need to be widened to five lanes between Mission Avenue and I-90 sometime between 2025 and 2032. If development in the Northeast Industrial Area occurs at a rapid pace over the next 5-10 years Spokane Valley should plan to widen Barker Road closer to 2025. If development occurs more slowly over the next 5-10 years, this project may not be needed until 2030 or later. Given this project is not likely to be needed for 10-15 years we recommend that Spokane Valley collect fees as development occurs in the Northeast Industrial Area and update the forecast in about 5 years for when this project may be needed.

FEHR PEERS

MEMORANDUM

Date: December 21, 2017

To: Chaz Bates, City of Spokane Valley

From: Chris Breiland, PE
Patrick Picard, AICP

Subject: Spokane Valley Northeast Industrial Area PAO – Phase 3 Traffic Analysis

SE17-0508

INTRODUCTION

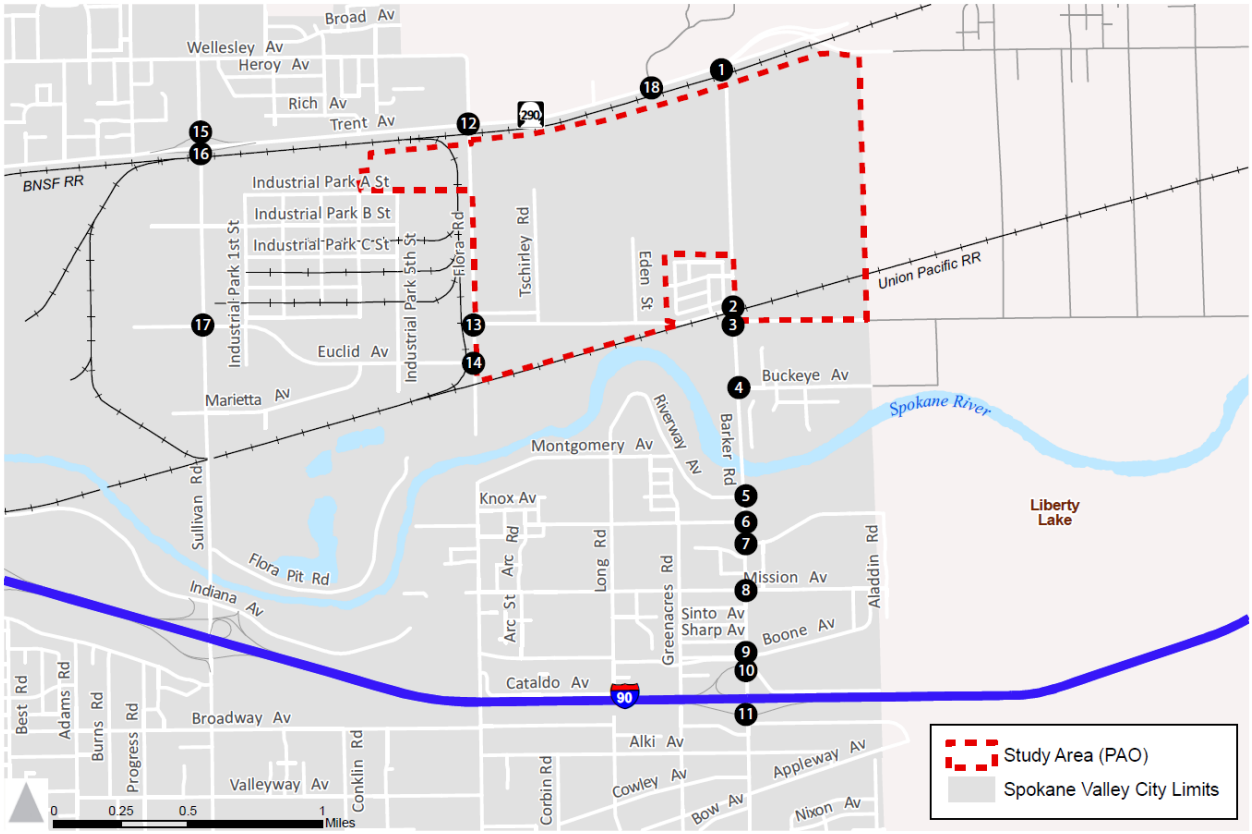
This memo presents traffic operations findings associated with land use growth under Phase 3 of development in the Spokane Valley Northeast Industrial Area which would occur in year 2040. A total of 18 intersections in the area were analyzed as well as traffic volumes on Barker Road and traffic impacts at the Union Pacific (UP) railroad at Barker Road at-grade railroad crossing.

Intersections analyzed as part of Phase 3 include the following, which area also mapped in **Figure 1**:

1. Barker Rd/Trent Ave
2. Barker Rd/Euclid Ave (north)
3. Barker Rd/Euclid Ave (south)
4. Barker Rd/Buckeye Ave
5. Barker Rd/Riverway Ave
6. Barker Rd/Indiana Ave (north)
7. Barker Rd/Indiana Ave (south)
8. Barker Rd/Mission Ave
9. Barker Rd/Boone Ave
10. Barker Rd/I-90 Westbound Ramps
11. Barker Rd/I-90 Eastbound Ramps
12. Del Rey Dr/Trent Ave

13. Flora Rd/Trent Ave
14. Flora Rd/Euclid Ave (north)
15. Flora Rd/Euclid Ave (south)
16. Sullivan Rd/Trent Ave (north)
17. Sullivan Rd/Trent Ave (south)
18. Sullivan Rd/Euclid Ave

Figure 1: Intersections Included in Phase 3 Traffic Analysis



METHODOLOGY

This section describes the methodology used to estimate the growth in vehicle trips in the study area as a result of the new employment.

Updating the Regional Travel Demand Model

Traffic volumes under Phase 3 were estimated using the same regional travel demand model that was used for the recent update to the Spokane Valley Comprehensive Plan. Prior to running the model, input was gathered from the project's technical advisory committee (TAC) to identify future land use and

transportation network changes that were not already incorporated in the model. The TAC is comprised of representatives from Spokane Valley, Spokane County, Liberty Lake, the Spokane Regional Transportation Council (SRTC), Washington State Department of Transportation (WSDOT), developers, utility providers, and the railroads.

After consulting with the TAC, a few changes were made to the regional travel demand model in the vicinity of the Northeast Industrial Area before running the model:

- The 2015 and 2040 land use, including the number of dwelling units and employees, in the seven TAZs within Liberty Lake (442, 445, 446, 447, 448, 449 & 450) were updated based on information provided in the *Liberty Lake Network Analysis Transportation Study* (February, 2017).
- Indiana Avenue was connected between Barker Road and Harvard Road in the 2040 model
- A new east-west connector road between Flora Road and Barker Road was added between Euclid Avenue and Trent Avenue to reflect a planned connection for the area.
- Reconfiguration of the Barker Road/Trent Avenue intersection, including a scenario both with and without Flora Road open across the BNSF Railroad south of Trent Avenue

Barker Road/Trent Avenue Reconfiguration

Several alternatives are being studied as part of a separate Baker Road/Trent Avenue intersection reconfiguration. Given that the final alternative is not known at this time, we assumed two scenarios when conducting the 2040 traffic analysis for the Flora Road/Trent Avenue intersection, one in which the Flora Road/BNSF Railroad at-grade crossing would remain open and one in which it would close. Both are being studied as alternatives as part the Barker Road/Trent Avenue reconfiguration. For all other intersections we assumed the scenario that would result in the most conservative (highest) traffic volume that would pass through the intersection (which happens with Flora Road remains open across the BNSF tracks). It should be noted that at most intersections, there was little variability in forecast traffic volumes between the alternatives being studied for Trent Avenue/Barker Road.

Applying the Difference Method

Instead of using the traffic forecasts directly from the 2040 travel demand, 2040 volumes were estimated using an industry standard approach known as the difference method. Under the difference method, the difference in traffic volumes between the 2015 and 2040 models were added to observed counts at each of the study area intersections to arrive at a 2040 forecast traffic. This method reduces model error by relying as much as possible on observed data rather than model output data.

Estimating AM Peak Volumes

The regional travel demand model forecasts daily traffic and PM peak traffic, but not AM peak. To estimate

traffic growth in the AM peak, 80% of PM peak traffic was used, which is consistent with research published in National Cooperative Highway Research Program Report 365[1] and in observed peak hour traffic count data in Spokane Valley. Additionally, the growth in traffic during the AM peak was assumed to be the inverse of growth in traffic in the PM peak (for example, 80% of PM peak volumes for southbound right turn movements were applied to eastbound left movements to get the AM peak traffic forecast).

2040 Street Network Assumptions

The 2040 Synchro network (used to analyze level of service at each intersection) assume the following changes to the street network from what they are today. These were also reflected in the Spokane Regional Transportation Council (SRTC) 2040 travel demand model. These assumptions based on projects that were programmed in the Spokane Valley Six-Year Transportation Improvement Program (TIP) or the SRTC financially constrained project list from the *Horizon 2040 Plan* when this study started:

- Northbound and southbound left turn lanes were added at all intersections along Barker Road to reflect the planned upgrade of Barker Road to a 3-lane urban section
- The Barker Road/I-90 interchange was reconfigured to a standard diamond interchange with two-lane roundabouts plus slip ramps for right-turn movements at both ramps (as reflected in I-90/Barker Rd the Interchange Justification Report)
- Five lanes were added along Barker Road between I-90 and Appleway Avenue
- The existing partial interchange at I-90/Appleway Avenue was replaced with a new, full interchange at I-90/Henry Road[2]
- New northbound and southbound left turn lanes were added on Sullivan Road at the Trent Avenue ramps

Trip Generation

The Phase 3 traffic analysis was conducted based on land use assumptions from the 2016 Update to the Spokane Valley Comprehensive Plan. The Comprehensive Plan assumes the Northeast Industrial Area will grow by about 3,200 employees between 2015 and 2040. Based on the 2040 travel demand model, employment growth in the Northeast Industrial Area is forecast to generate about 1,500 PM new peak hour trips, with about 1,340 of those generated by land uses east of Flora Road. **Figure 2** shows employment growth and PM peak hour trip generation from new employees by location within the Northeast Industrial Area boundary. The travel demand model assumes an average PM peak hour trip generation rate of about

[1] Martin, W., N. McGuckin. *Travel Estimating Techniques for Urban Planning*. NCHRP Report 365. National Academy Press, Washington, D.C., 1998.

[2] Note: This configuration is consistent with the existing SRTC plan and was assumed when this study was initiated. However, since this study was initiated WSDOT completed their modeling for a new Henry Road interchange and found it did not show purpose and need. Potential strategies to address future traffic if the Henry Road/I-90 interchange is not built by 2040 are addressed in the mitigations section.

0.46 trips per employee, with 37% of trips inbound and 63% of trips outbound during the PM peak. This trip rate is similar to ITE's trip rate for General Light Industrial uses (ITE Code 110).

Figure 2: 2015-2040 employment growth and trip generation within the Northeast Industrial Area

Section of the Northeast Industrial Area	2015-2040 Employment Growth	PM Peak Hour Trips		
		In	Out	Total
West of Flora Road	340	60	100	160
Between Flora Road and Barker Road	1,460	250	430	680
East of Barker Road	1,420	245	415	660
Total	**3,220**	**555**	**945**	**1,500**

Trip Distribution

There is no public access across the railroad spur west of Flora Road. Therefore the portion of the Northeast Industrial Area west of Flora Road will have a very different trip distribution than the rest of the Northeast Industrial Area. The area west of Flora Road will load primarily load onto Sullivan Road and Euclid Avenue, while the area east of Flora Road will primarily load onto Flora Road, Barker Road and Euclid Avenue. The distribution of trips from land uses within the Northeast Industrial Area is described in **Figure 3** and mapped in **Figure 4** for trips from land uses east of Flora Road, and **Figure 5** for trips from land uses west of Flora Road.

Figure 3: 2040 trip distribution from Northeast Industrial Area

Direction	Via primary road/street	% Trips by trip end location	
		East of Flora Rd	West of Flora Rd
Northwest	Flora Road (north)	8%	0%
	Trent Avenue (west)	20%	24%
	Sullivan Road (north)	3%	22%
Southwest	Mission Avenue or I-90 (west of Barker)	11%	N/A
	Mission/Indiana Ave or I-90 (w/o Sullivan)	N/A	11%
	Sullivan Road (south of Marietta Ave)	14%	33%
	Sullivan Road (south of I-90)	N/A	22%

East	Wellesley Avenue (east)	11%	2%
	Trent Avenue (east)	2%	3%
	Euclid Avenue (east)	10%	6%
South	Mission/Indiana Ave or I-90 (e/o Barker)	4%	5%
	Barker Road (south)	7%	2%
Local	Nearby local streets	13%	3%

Figure 4: 2040 trip distribution from Northeast Industrial Area east of Flora Road

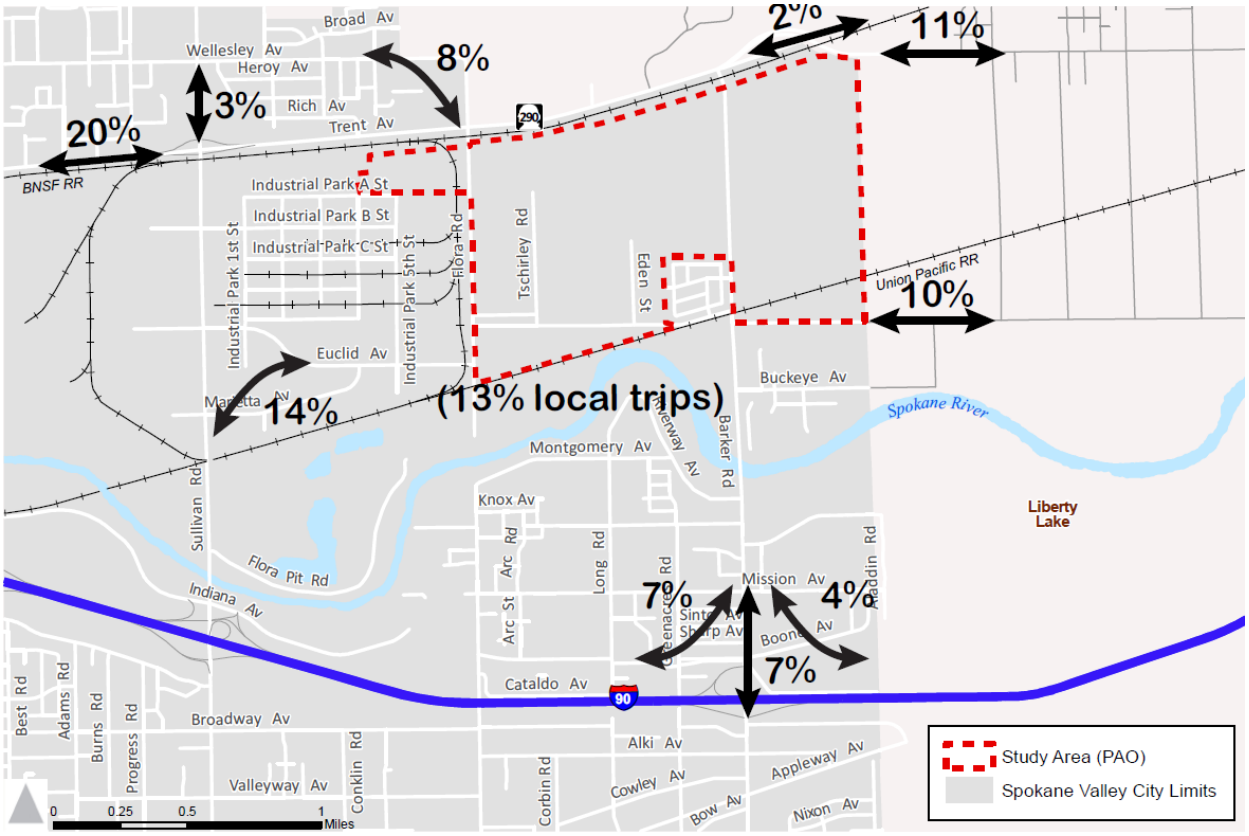
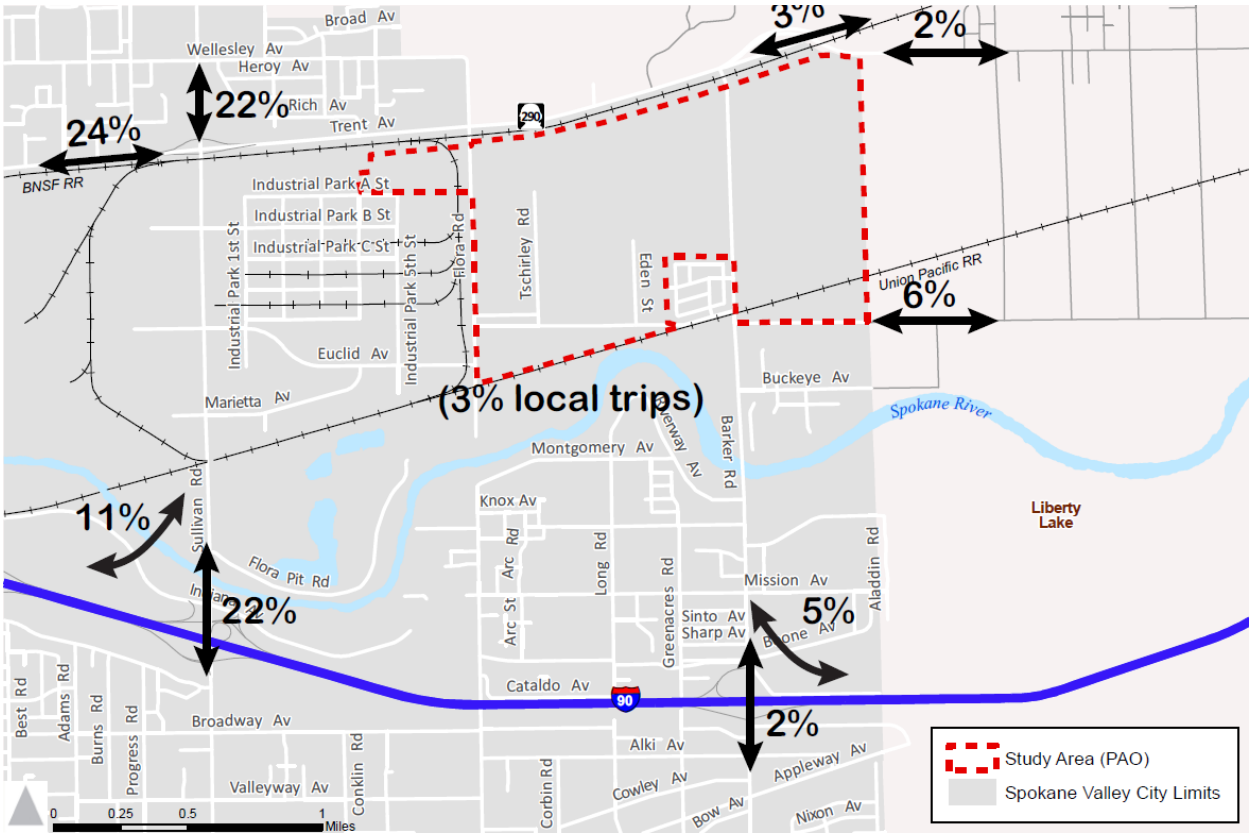


Figure 5: 2040 trip distribution from Northeast Industrial Area west of Flora Road



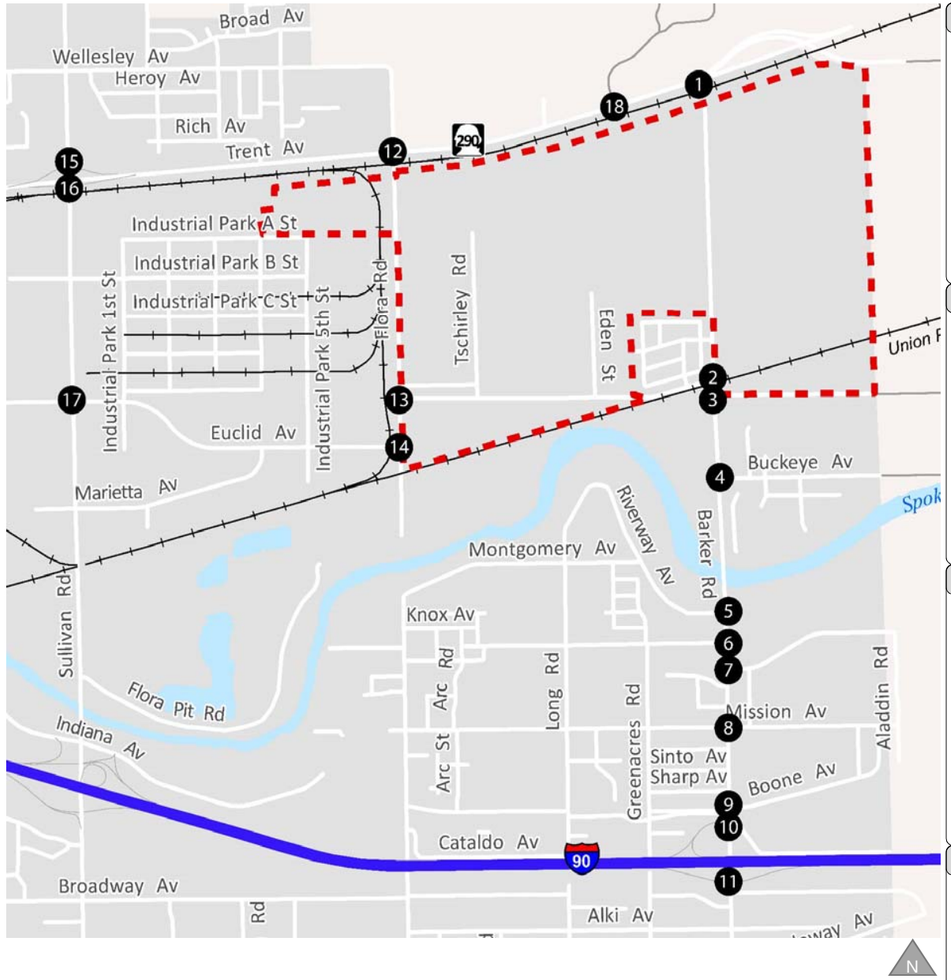
Truck Trips

The percent of trips made by heavy trucks in 2040 was assumed to be the same as observed counts in 2017.

RESULTS

Intersection Traffic volumes

The existing (2017) and forecast (2040) lane configurations and AM/PM peak hour turn movements for each of the intersections included in this study are shown in **Figure 6** and **Figure 7**.



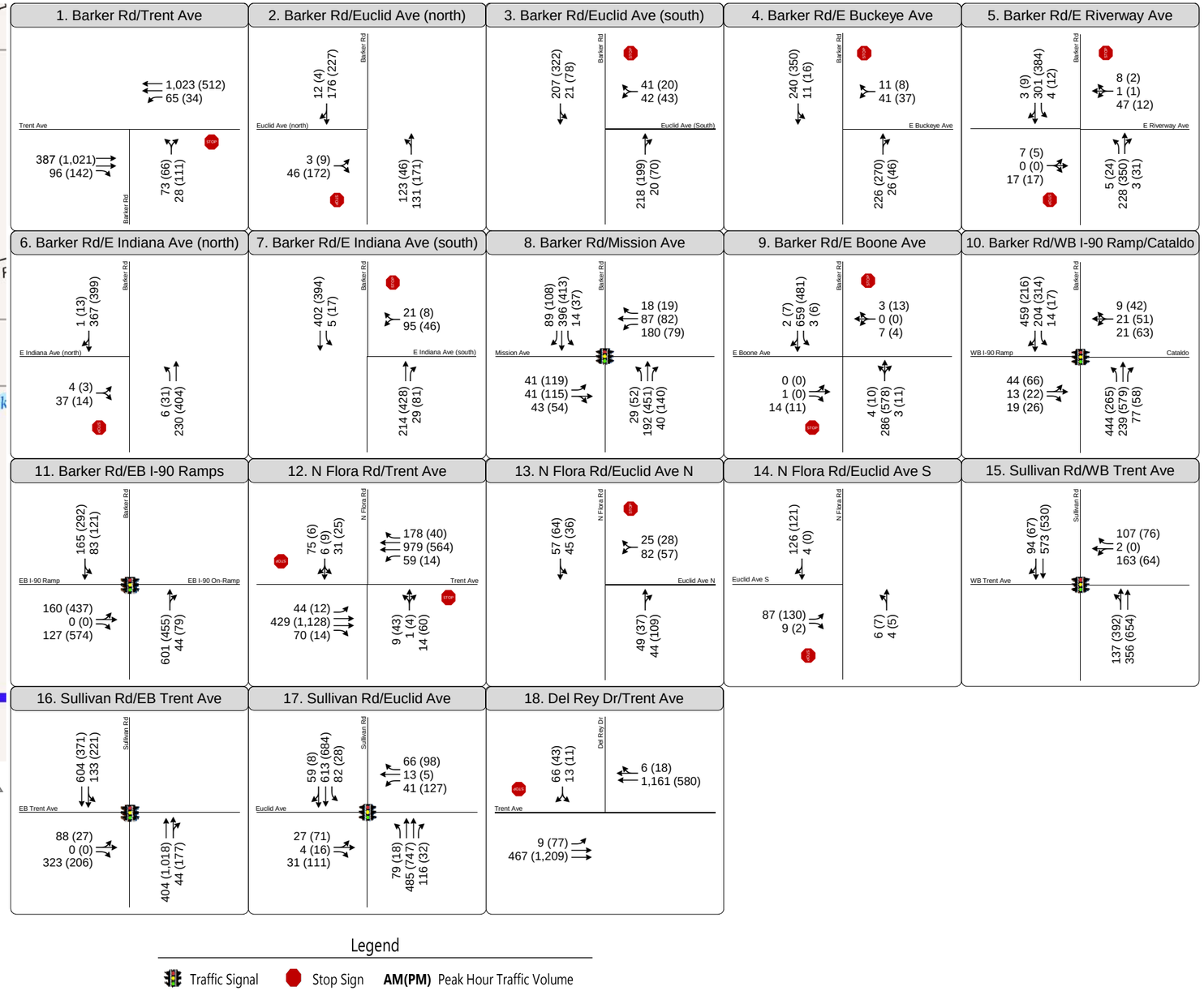
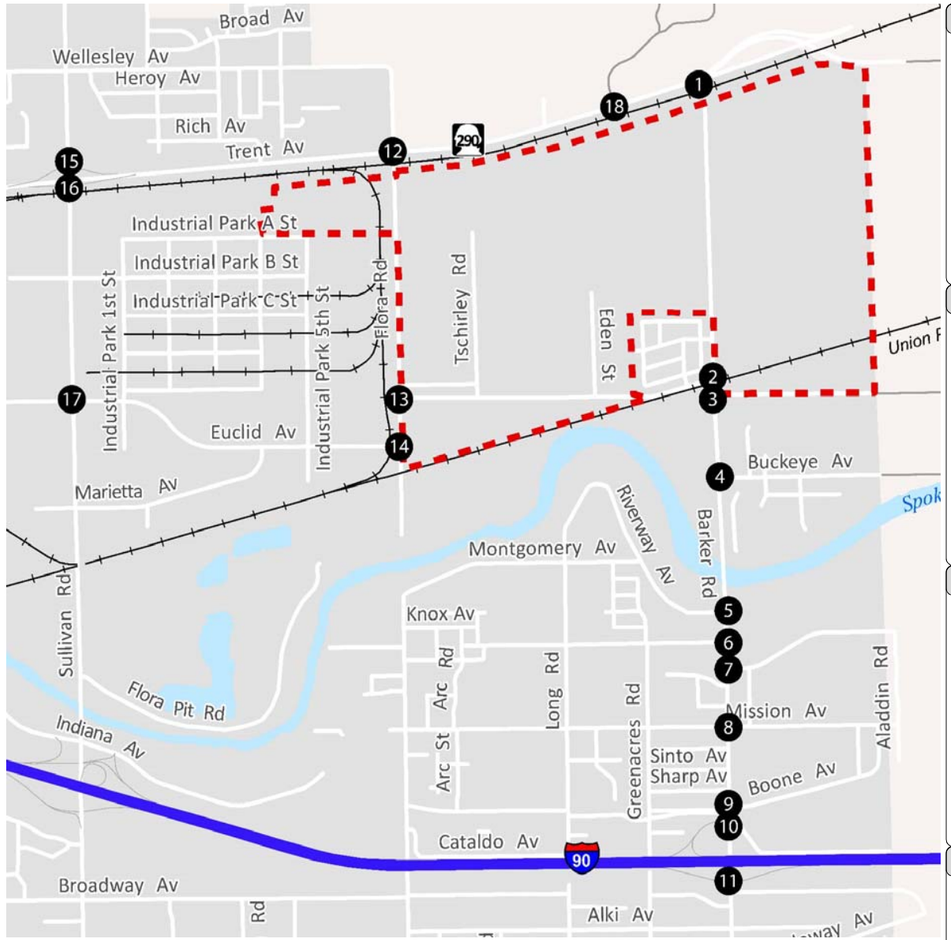


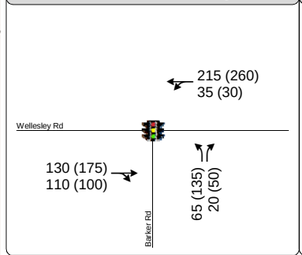
Figure 6
Peak Hour Traffic Volumes and Lane Configurations
Existing (2017) Conditions



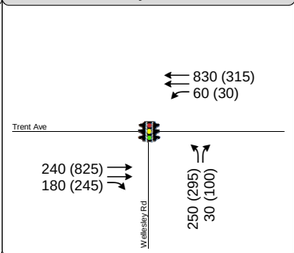
Legend

Traffic Signal Stop Sign **AM(PM)** Peak Hour Traffic Volume

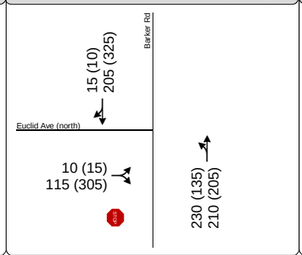
1a. Barker Rd/Wellesley Rd



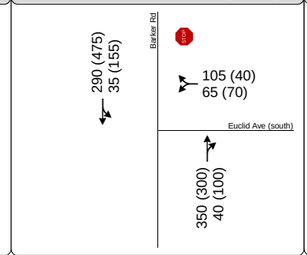
1b. Wellesley Rd/Trent Ave



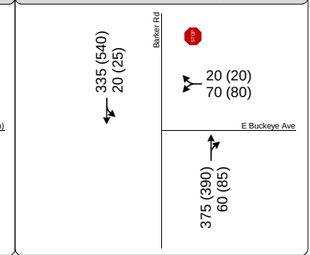
2. Barker Rd/Euclid Ave (north)



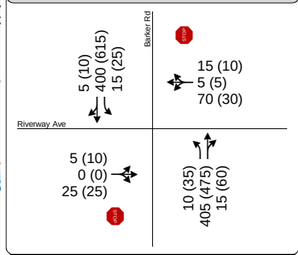
3. Barker Rd/Euclid Ave (south)



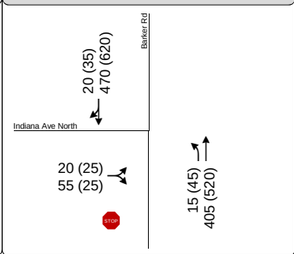
4. Barker Rd/E Buckeye Ave



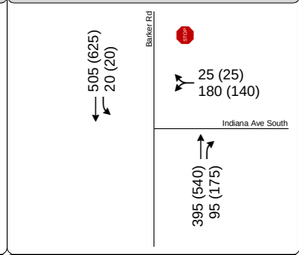
5. Barker Rd/Riverway Ave



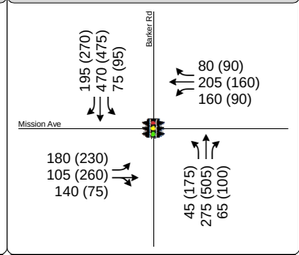
6. Barker Rd/Indiana Ave North



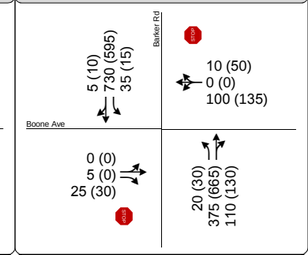
7. Barker Rd/Indiana Ave South



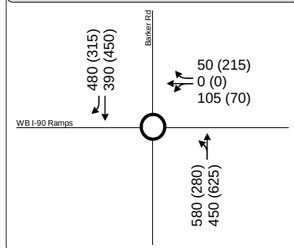
8. Barker Rd/Mission Ave



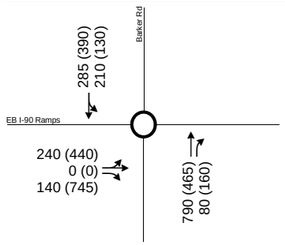
9. Barker Rd/Boone Ave



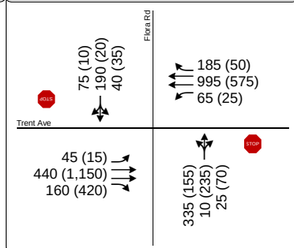
10. Barker Rd/WB I-90 Ramps



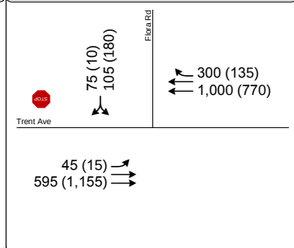
11. Barker Rd/EB I-90 Ramps



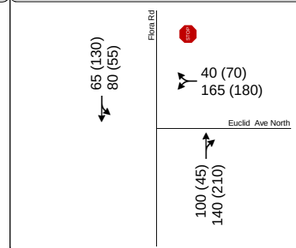
12a. Flora Rd/Trent Ave (RR x-ing open)



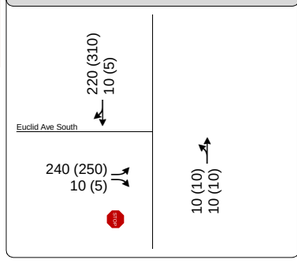
12b. Flora/Trent (RR x-ing closed)



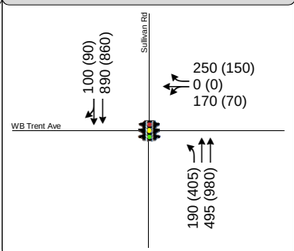
13. Flora Rd/Euclid Ave North



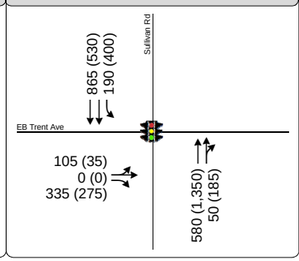
14. /Euclid Ave South



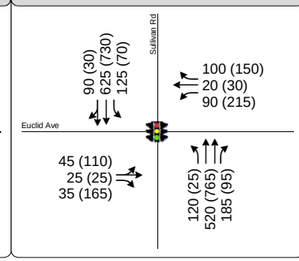
15. Sullivan Rd/WB Trent Ave



16. Sullivan Rd/EB Trent Ave



17. Sullivan Rd/Euclid Ave



18. Del Rey Dr/Trent Ave

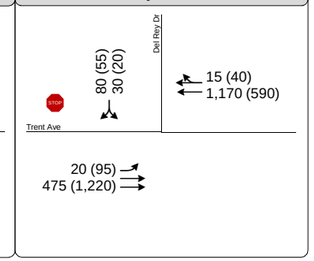


Figure 7
Peak Hour Traffic Volumes and Lane Configurations
Future (2040) Conditions

Level of Service Standards

The City of Spokane Valley uses level of service (LOS) to describe and evaluate traffic operations along major arterial corridors and intersections within the City. Levels range from LOS A to LOS F, which encompass a range of congestion types from uninterrupted traffic (LOS A) to highly-congested conditions (LOS F). The description and intersection delay thresholds of each LOS category are described in **Figure 8.** These are based on the Highway Capacity Manual, which is the methodology used by Spokane Valley. The LOS for signalized intersections is measured by the average delay per vehicle entering the intersection from all approaches, while the LOS for unsignalized intersections is measured by the average delay per vehicle on the approach with the highest average delay.

Figure 8: Level of service description and delay thresholds at intersections

Level of Service	Description	Signalized Intersection Delay (seconds)	Unsignalized Intersection Delay (seconds)
A	Free-flowing conditions.	0-10	0-10
B	Stable operating conditions.	10-20	10-15
C	Stable operating conditions, but individual motorists are affected by the interaction with other motorists.	20-35	15-25
D	High density of motorists, but stable flow.	35-55	25-35
E	Near-capacity operations, with speeds reduced to a low but uniform speed.	55-80	35-50
F	Over-capacity conditions with long delays.	> 80	>50

Source: Highway Capacity Manual 2010, Transportation Research Board

The LOS standards used by Spokane Valley are defined in the Comprehensive Plan as follows:

- LOS D for major arterial corridors:
  - Argonne/Mullan between the town of Millwood and Appleway Boulevard
  - Pines Road between Trent Avenue and 8th Avenue
  - Evergreen Road between Indiana Avenue and 8th Avenue
  - Sullivan Road between Wellesley Avenue and 8th Avenue
  - Sprague Avenue/Appleway Boulevard between Fancher Road and Sullivan Road
- LOS D for signalized intersections not on major arterial corridors
- LOS E for unsignalized intersections (LOS F is acceptable if the peak hour traffic signal warrant is not met)

WSDOT also uses LOS thresholds for State Highways. Within the study area intersections with Trent Avenue (SH 290) and I-90 would need to operate at LOS D or better to meet WSDOT LOS standards.

Level of Service Results

Traffic operations, including intersection vehicle delay and level of service (LOS) at each intersection under both existing conditions (2017) and Phase 3 conditions (2040) were analyzed using Synchro (a transportation planning software). The existing LOS results are shown in **Figure 9** and the results of the Phase 3 LOS analysis are shown in

Figure 10.

Results show that by 2040 under Phase 3 of development in the Northeast Industrial Area the majority of intersections studied in this memo would continue to operate at an acceptable LOS. These results assume all projects included in the Spokane Valley Six-Year TIP and the SRTC financially constrained project list from the *Horizon 2040 Plan* are operational by 2040. However, two intersections are forecast to fail the City's LOS standards by 2040, a significant transportation impact:

- Barker Road/Boone Avenue
- Flora Road/ Trent Avenue

Additional transportation impacts were also identified along Barker Road south of Mission Avenue and at the Barker Road/UP Railroad at-grade crossing, both discussed below.

Figure 9: Existing (Year 2017) Intersection LOS Results

Intersection	Control[1]	AM Peak		PM Peak		Approach
		Delay	LOS	Delay	LOS	
1. Barker Rd/ Trent Ave	SSSC	**59**	**F[2]**	41	E	NB
2. Barker Rd/ Euclid Ave (north)	SSSC	10	A	11	B	EB
3. Barker Rd/ Euclid Ave (south)	SSSC	12	B	17	C	WB
4. Barker Road/ Buckeye Ave	SSSC	13	B	10	B	WB
5. Barker Road/ Riverway Ave	SSSC	16	C	20	C	WB
6. Barker Rd/ Indiana Ave (north)	SSSC	11	B	12	B	EB
7. Barker Rd/ Indiana Ave (south)	SSSC	14	B	15	B	WB
8. Barker Rd/ Mission Ave	Signal	13	B	17	B	
9. Barker Rd/ Boone Ave	SSSC	22	C	18	C	EB/WB
10. Barker Rd/ I-90 Westbound Ramps	Signal	**68**	**E**	43	D	

11. Barker Rd/ I-90 Eastbound Ramps[3]	Signal	44	D	**113**	**F**	
12. Flora Rd/ Trent Ave	SSSC	**129**	**F[2]**	**124**	**F[2]**	SB/NB
13. Flora Rd/ Euclid Ave (north)	SSSC	11	B	11	B	WB
14. Flora Rd/ Euclid Ave (south)	SSSC	10	A	10	A	EB
15. Sullivan Rd/ Trent Westbound Ramps	Signal	16	B	12	B	
16. Sullivan Rd/ Trent Eastbound Ramps	Signal	13	B	21	C	
17. Sullivan Rd/ Euclid Ave	Signal	51	D	60	E[4]	
18. Del Rey Dr/ Trent Ave	SSSC	23	C	18	C	SB

1. SSSC = Side Street Stop Control.
2. Does not meet City LOS standards. Intersection operates at LOS F and volumes satisfy the peak hour signal warrant per MUTCD.
3. Based on HCM 2000 methodology.
4. LOS E is acceptable here because Sullivan is a major arterial corridor that meets LOS standard corridor-wide.

Figure 10: Phase 3 (Year 2040) Intersection LOS Results

Intersection	Control[1]	AM Peak		PM Peak		Approach
		Delay	LOS	Delay	LOS	
1a. Barker Rd/ Wellesley Ave[2]	Signal or Roundabout	28	C	25	C	
1b. Wellesley Ave/ Trent Ave[2]	Signal or Roundabout	26	C	25	C	
2. Barker Rd/ Euclid Ave (north)	SSSC	12	B	16	C	EB
3. Barker Rd/ Euclid Ave (south)	SSSC	14	B	19	C	WB
4. Barker Road/ Buckeye Ave	SSSC	14	B	17	C	WB
5. Barker Road/ Riverway Ave	SSSC	26	D	40	E	WB
6. Barker Rd/ Indiana Ave (north)	SSSC	13	B	17	C	EB
7. Barker Rd/ Indiana Ave (south)	SSSC	23	C	26	D	WB
8. Barker Rd/ Mission Ave	Signal	20	C	25	C	
9. Barker Rd/ Boone Ave	SSSC	139	F[4]	**>300**	**F[5]**	WB
10. Barker Rd/ I-90 Westbound Ramps	Roundabout	30	C	13	B	
11. Barker Rd/ I-90 Eastbound Ramps	Roundabout	12	B	25	C	

12a. Flora Rd/ Trent Ave (if Flora Rd/BNSF rail crossing is open[2])	SSSC	**>300**	**F[5]**	**>300**	**F[5]**	SB/NB
12b. Flora Rd/Trent Ave (if Flora Rd/BNSF rail crossing is closed[3])	SSSC	**174**	**F[5]**	**>300**	**F[5]**	SB
13. Flora Rd/ Euclid Ave (north)	SSSC	15	B	15	B	WB
14. Flora Rd/ Euclid Ave (south)	SSSC	11	B	12	B	EB
15. Sullivan Rd/ Trent Westbound Ramps	Signal	39	D	53	D	
16. Sullivan Rd/ Trent Eastbound Ramps	Signal	12	B	38	D	
17. Sullivan Rd/ Euclid Ave	Signal	52	D	51	D	
18. Del Rey Dr/ Trent Ave	SSSC	35	E	29	D	SB

1. SSSC = Side Street Stop Control.
2. This scenario assumes Barker Road will be diverted ½ mile east to a new intersection with Wellesley Road just south of the BNSF Railroad
3. This scenario assumes Barker Road will intersect Trent Avenue via a new grade separated BNSF Railroad crossing
4. Does not satisfy peak hour signal warrant using MUTCD guidelines, thus would technically still meet the City's LOS standard.
5. Does not meet City LOS standards. Intersection operates at LOS F and traffic volumes satisfy the peak hour signal warrant per MUTCD guidelines.

Barker Road/Boone Avenue Intersection

By 2040 the Barker Road/Boone Avenue intersection is forecast to operate at LOS F (as measured by the westbound approach) during both the AM and PM peak – and traffic volumes peak would be high enough on Barker Road and Boone Avenue during the PM peak to meet the peak hour signal warrant using MUTCD[3] criteria. The 2040 travel demand model used for this analysis assumes that Cataldo Avenue - which is a local road that provides access to several industrial sites just east of Barker Road and north of I-90 - would be rerouted (as part of the Barker Road/I-90 interchange reconstruction planned by WSDOT) north to intersect Boone Avenue just east of Barker Road instead of intersecting Barker Road at the I-90 westbound ramps as it does today. This would effectively shift all of the traffic currently (and in the future) along Cataldo Avenue to instead use the Barker Road/Boone Avenue intersection. This would be sufficient by 2040 to cause the Barker Road/Boone Avenue intersection to fail the City's LOS threshold.

It should be noted that traffic analysis completed as part of the I-90/Barker Road Interchange Justification Report (IJR) also assumes Cataldo Avenue would be rerouted to Boone Avenue east of Barker Road. As part of the Methods and Assumptions Memorandum for that project published prior to the IJR, WSDOT proposed three potential scenarios for the Barker Road/Boone Avenue intersection to accommodate traffic

[3] *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, https://mutcd.fhwa.dot.gov

on Cataldo Avenue, Barker Road and Boone Avenue. The three alternatives include:

- A five-way roundabout at Barker Road/Boone Avenue/Cataldo Avenue
- Converting Barker Road/Cataldo Avenue to a right-in/right-out intersection and Barker Road/Boone Avenue to a roundabout
- Rerouting Cataldo Avenue from Barker Road to Boone Avenue east of Barker Road and adding a signal to the Barker Road/Boone Avenue intersection

It is anticipated that any of these alternative configurations for Cataldo Avenue would meet the City's LOS standard.

Flora Road/Trent Avenue

Under existing conditions, the Flora Road/Trent Avenue intersection does not meet the City's LOS standards. Two future alternatives being considered by Spokane Valley were studied for this intersection:

1. Flora Road remains open across the BNSF railroad and Barker Road is diverted one half-mile east to a new intersection with Wellesley Avenue
2. Flora Road is closed across the BNSF railroad (effectively changing this from a four-leg to a three-leg intersection) and Barker Road intersects Trent Avenue via a new grade-separated crossing with the BNSF Railroad in approximately the same location as today's intersection

An added delay of 60 seconds was also added to the travel model to all northbound/southbound through and northbound/southbound left movements at Flora Road/Trent Avenue to account for the difficulty in making northbound and southbound left and through movements at this intersection. This change ensured that the travel model did not "overassign" traffic to an intersection that will likely have higher delays for northbound traffic.

By year 2040, without any improvements, delay would increase substantially under both alternatives (Flora open or closed across the BNSF tracks) during both the AM and PM peak and thus continue to fail the City's LOS standards. Since this is a side-street stop controlled intersection, LOS is measured based on the approach with the highest delay. Under the alternative where the Flora Road/BNSF Railroad crossing remains open, the highest delay during the AM peak would be from the southbound approach, where traffic originates primarily from residential development north of Trent Avenue (outside the study area). In the PM peak, the highest delay would occur from the northbound approach, where traffic originates from the industrial sites south of Trent Avenue. Despite the added delay, the SRTC travel model predicts the deviation in Barker Road would cause a substantial number of drivers to opt for Flora Road instead of Barker Road to access Trent Avenue.

Under the alternative where the Flora Road/BNSF Railroad crossing is closed, delay from the southbound approach would still be well above LOS F during both the AM and PM peak hours. Under both alternatives,

peak hour traffic volumes would be high enough on Flora Road and Trent Avenue to meet the peak hour signal warrant using MUTCD[4] criteria.

Barker Road (I-90 to Euclid Avenue)

The recently completed Spokane Valley Comprehensive Plan recommended widening Barker Road to five lanes from I-90 to Euclid Avenue by 2040. That recommendation was re-examined as part of this study. Average daily traffic (ADT) and the peak hour one-way volumes on Barker Road were forecast for 2040 on between I-90 and Euclid Avenue based on the updates to the travel demand model described in the methodology section of this Memo. Results are shown in **Figure 11**.

Figure 11: Traffic Volumes on Barker Road

Barker Road Segment	Existing (2017)		2040	
	ADT	Peak Hour Volume (highest approach)	ADT	Peak Hour Volume (highest approach)
Boone Avenue – Mission Avenue	13,400	640	18,400	780
Mission Avenue – Euclid Avenue	10,200	510	16,000	715

The industry standard threshold for the amount of vehicles one thru lane of traffic can accommodate before significant delays occur ranges from about 600-900 vehicles per hour. The variation depends on driveway/intersection frequency, access control, travel speed, intersection control, concentration of traffic during the peak hour and other factors. The results of this analysis demonstrate that volumes would be high enough on Barker Road between I-90 and Mission Avenue (combined with the presence of signalized intersections and frequent driveways/intersections) to have a significant transportation impact. Traffic volumes on Barker Road north of Mission are forecast to be a little lower and, while being on the cusp of warranting mitigation, are not forecast to have a significant transportation impact.

Traffic Impacts at the At-Grade Rail Crossings

The impacts of queuing vehicles from the Union Pacific (UP) railroad at-grade crossing at Barker Road were analyzed using Synchro in year 2040. The Union Pacific (UP) Railroad crosses Barker Road between the Euclid Avenue westbound and Euclid Avenue eastbound intersections. No grade-separation projects are currently planned at this crossing, thus is it assumed there will still be an at-grade rail crossing at this location in year 2040. Based on data provided by the Federal Railroad Administration (FRA), the UP line

[4] *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, https://mutcd.fhwa.dot.gov

hosts about 9 trains per day on average. No information is provided on whether or not UP anticipates the number of trains a day to change in the future. Thus, the same number of trains on average per day today was also assumed to also occur in 2040. If the frequency of trains were to increase in the future this would not impact the queue length (unless the average length of trains or speed of trains changed), but instead, would affect the frequency of queueing.

The railroad crossing analysis looked at the forecast queue length and associated traffic impacts under three scenarios in which the gates across Barker Road would be down during both the AM and PM peak:

- **Average queue length** – This was measured by the 50th percentile queue length during an average gate down time (2 minutes) and represents the typical queue that would occur when a train crosses Barker Road during the peak commuting period.
- **Worst case scenario queue length (through trains)** – This was measured by the 95th percentile queue length during the longest observed gate down time[5] and represents a queue during the worst case scenario: a particularly high surge in peak hour traffic combined with a long gate down time (4 minutes). Note: based on the observed frequency of long gate down times on each line the worst case scenario is likely to occur 3-4 times per year along the UP line.
- **Worst case scenario queue length (trains backing onto future rail spur)** – This was measured by the 95th percentile queue length during a hypothetical situation in which a train would be backing onto the new spur planned just east of Barker Road. This was measured by increasing the longest observed gate down time by 50% to 6 minutes. This would represent a queue during the worst case scenario for non-through train movements: if a train were to back onto the future spur planned just east of Barker Road during a particularly high surge in peak hour traffic.

Estimated existing vehicle queue lengths at the Barker Road/UP railroad at-grade crossing are shown in **Figure 12**. The results of the 2040 queuing analysis are shown in **Figure 13**, including the estimated vehicle queue length in feet along Barker Road during the AM and PM peak when the gates are down at the UP crossing given each scenario.

[5] Duration and frequency of gate down times was recorded at both the UP rail crossings along Barker Road between 7AM and 6PM Tuesday, February 14, 2017

Figure 12: Existing vehicle queue length, Barker Road/UP at-grade rail crossing when gates are down

Condition	Trains per Day	Gate Down Time	Vehicle Queue Length (feet)			
			AM Peak		PM Peak	
			NB	SB	NB	SB
Average (50th percentile)	9	2 minutes	300	250	225	500
Worst Case Thru Trains (95th percentile)	9	4 minutes	700	250	525	1,050

Figure 13: 2040 vehicle queue length, Barker Road/UP at-grade rail crossing when gates are down

Condition	Trains per Day	Gate Down Time	Vehicle Queue Length (feet)			
			AM Peak		PM Peak	
			NB	SB	NB	SB
Average (50th percentile)	9	2 minutes	600	375	400	975
Worst Case Thru Trains (95th percentile)	9	4 minutes	1,275	800	875	2,025
Worst Case Trains Accessing Future Spur[1] (95th percentile)	unknown	6 minutes	1,875	1,200	1,275	3,000

1. This scenario is what could occur if a train were to be backing into or out of the new rail spur planned by developers east of Barker Road during a particularly high surge in peak hour traffic.

In general, the queues at the UP crossing are forecast to be about 50-100% longer than they are today. The longest queues are anticipated to occur in the northbound direction in the AM peak and southbound direction during the PM peak.

Vehicle queueing will occur both on Barker Road and Euclid Avenue. Based on the forecast approach volume from each of those streets, close to 80 percent of the queue during the AM peak heading northbound would be on Barker Road, with the remaining on Euclid Avenue south of the tracks (heading westbound to turn onto Barker Road). Therefore it is anticipated that the average vehicle queue during the AM peak on Barker Road heading northbound would be about 475 feet, but about 3-4 times per year could be as long as 975 feet. Assuming trains backing onto the planned rail spur east of Barker Road were to block the intersection for 6 minutes, the queue on (northbound) Barker Road during the AM peak in this

scenario could be as long as 1,450 feet.

About 10 percent of the vehicles heading north on Barker Road would be making a right turn onto Euclid before the railroad tracks and about 40 percent of vehicles heading west on Euclid Avenue would be making a left turn onto Barker Road and not crossing the railroad tracks. Thus, about 20 percent of the traffic south of the rail crossing in the AM peak would not actually be heading across the tracks, but most of these vehicles would get stuck in the queue. These vehicles would not only lengthen the queues in AM peak by an additional 20 percent, but this occurrence would add to driver frustration and increase the likelihood of drivers performing risky maneuvers to get around the queues. While the northbound queues would be shorter during the PM peak, the percentage of vehicles likely to get caught in the queue not intending to cross the tracks (heading northbound right or westbound left at Barker Road/Euclid Avenue [south]) would be even higher during the PM peak, representing about 35 percent of traffic. Therefore, the long northbound queue is determined to be a significant transportation impact.

During the PM peak the longest queues will occur north of the tracks from vehicles heading southbound on Barker Road (or eastbound on Euclid Avenue). During this time about 50 percent of the queue will be on Barker Road and about 50 percent will be on Euclid Avenue. Therefore it is anticipated that the average vehicle queue during the PM peak would be about 500 feet on both Barker Road heading southbound and Euclid Avenue heading eastbound, but about 3-4 times per year could be as long as 1,000 feet on both streets. Assuming trains backing onto the planned rail spur east of Barker Road were to block the intersection for 6 minutes, the queue on (southbound) Barker Road and (eastbound) Euclid Avenue during the PM peak in this scenario could be as long as 1,500 feet on each street. Fewer than 25 vehicles per hour are forecast to be heading either southbound right or eastbound left at this intersection, thus about 95 percent of the vehicles in the queue would be waiting to cross the tracks.

MITIGATION

Recommended mitigations to address significant transportation impacts at the three intersections that would fail the City's LOS standards under Phase 3 as well as the section of Barker Road from I-90 to Mission Avenue are described below. Recommendations for the UP at-grade rail crossing on Barker Road are also discussed.

Barker Road/Boone Avenue Intersection

This analysis assumes Cataldo Avenue would be rerouted from Barker Road to Boone Avenue via a new north-south alignment somewhere east of Barker Road with the reconfiguration of the Barker Road/I-90 interchange, which is consistent with what was assumed in the I-90/Barker Road IJR published by WSDOT. Based on a review of parcel boundaries from Spokane County's SCOUT map, this may require right-of-way

from property owners, or the utilization of potential right-of-way on the border of Spokane Valley and Liberty Lake, along with a short extension of Boone Avenue to the east. This would also require construction of a cul-de-sac on the west end of Cataldo Avenue.

Assuming that Cataldo Avenue is rerouted from Barker Road to Boone Avenue as part of the Barker Road/I-90 interchange reconstruction, the Barker Road/Boone Avenue intersection would fail the City's LOS standards in 2040. To address this LOS impact, it is recommended that Spokane Valley add a signal or roundabout to this intersection. Analysis using Synchro shows that the addition of an actuated uncoordinated signal would improve the LOS at this intersection in 2040 from F to A during both the AM and PM peak. A roundabout would also operate acceptably.

If a signal is implemented, the intersection should be designed to include a separate northbound left turn pocket of at least 125 feet, along with a northbound through and through-right lane. The southbound approach should be similarly configured. Ideally the east and westbound Boone approaches would have separate left and through-right turn lanes. Also, it would be preferred if the offset between the east and west legs of Boone Avenue were realigned to be opposite of each other.

An alternative option would be to convert Cataldo to right-in/right-out access at its current intersection with Barker Road. Under this option, the Barker Road/Boone Ave intersection would operate at LOS D in the AM and LOS E in the PM in 2040 (based on the LOS of the westbound approach), which is acceptable for a side-street stop controlled intersection. However, a right-in/right-out configuration would require U-turn access at the Barker Road/Boone Avenue intersection. This could be accomplished through a roundabout or turnaround at the Barker Road/Boone Avenue intersection.

Flora Road/Trent Avenue Intersection

The Flora Rd/Trent Ave intersection currently operates at LOS F during both the AM and PM peak hour and delay is forecast to increase substantially by 2040 regardless of whether the southbound leg across the BNSF Railroad is closed in the future or not. To address this, it is recommended that a signal be installed at this intersection along with left turn pockets on Flora Road or a roundabout. Assuming an actuated, uncoordinated signal with a 110 second cycle length and protected left turn movements on Trent Avenue, traffic would operate at LOS C during the AM Peak and LOS B during the PM peak with the BNSF railroad crossing open (LOS A with the BNSF Railroad crossing closed) by 2040 if these mitigations were applied. A roundabout large enough to accommodate two-lanes of traffic in both directions of Trent Avenue would also operate acceptably. Given that Trent Avenue is a State Highway, under WSDOT design criteria an Intersection Control Analysis (ICA) would need to be conducted to evaluate alternatives before a signal can be installed.

Barker Road (I-90 to Euclid Avenue)

The recently completed Spokane Valley Comprehensive Plan recommends widening Barker Road to five lanes from I-90 to Euclid Avenue by 2040. Analysis as part of this study show that traffic volumes are forecast to be high enough (combined with the frequency of driveways/intersections and presence of signals or future roundabouts) to have a significant transportation impact on Barker Road between I-90 and Mission Avenue. Based on this, it is recommended to widen Barker Road between I-90 and Mission Avenue to five lanes by 2040.

Traffic volumes on Barker Road between Euclid Avenue and Mission Avenue are forecast to be close to, but not at the threshold to warrant widening. Therefore, it is recommended that Barker Road remain three lanes from Mission Avenue to Euclid Avenue by 2040. However, Spokane Valley should continue keep the widening plan in the Comprehensive Plan in order to require ROW from future developments. This will preserve the possibility for widening should forecasts change in the future or widening be deemed necessary shortly after 2040.

As part of this recommendation the City will continue to implement its Transportation System and Demand Management strategies identified in the 2016 Comprehensive Plan, see **Figure 14.** The Comprehensive Plan states that "it is the City's policy to consider strategies such as transportation demand management, access restrictions, design modifications, transit enhancements, and intelligent transportation systems prior to adding new lane capacity to the system, particularly for single-occupancy vehicles."

Figure 14: Spokane Valley Transportation System and Demand Management Strategies

Transportation System and Demand Management (Non-Capacity Projects)	Description
Intelligent Transportation Systems	Continue implementing Intelligent Transportation Systems (ITS), which include signal coordination, adaptive signal control, incident reporting, and other technologies. Coordinate with the Regional Transportation Management Center.
Commute Trip Reduction and Transportation Demand Management Programs	Implement the Spokane Valley Commute Trip Reduction Implementation Plan Update: 2015-2019. Work with employers to provide information, marketing materials, training, and support to reduce drive-alone commuting to workplaces in Spokane Valley.
Coordinate with Spokane Transit Authority	Continue to work with Spokane Transit Authority to implement transit service improvements, including High Capacity Transit on major corridors in Spokane Valley to provide other options to driving.

Encourage Infill and Higher Density Development	As identified in the Land Use Element, infill and higher density development is envisioned along many of the Valley's major arterial and transit routes. This development generates fewer auto trips than comparable lower density development that is not near transit and other commercial uses.
Pedestrian and Bicycle Infrastructure	Continue to implement the non-motorized transportation network identified in the Pedestrian and Bicycle Master Program to provide other options to driving in the community.

The City will work with employers in the Northeast Industrial Area to implement the Commute Trip Reduction and Transportation Management Programs. In the future bike lanes and sidewalks will be provided along the length of the Barker Road corridor (from Trent Avenue to I-90), all arterial roads will be designed to accommodate transit vehicles and as the area densifies the Spokane Transit Authority may provide transit service to the Northeast Industrial Area.

However, even with these measures in place, the substantial increase in employment within the Northeast Industrial Area will require roadway capacity expansion along Barker Road to accommodate access to the jobs and facilitate goods movement to and from the industrial sites.

Barker Road/UP Railroad At-Grade Crossing

An analysis of vehicle queue length at the UP rail crossing on Barker Road shows that vehicle queues will be about 50-100% longer in 2040 than they are today. Additionally, assuming there would be trains backing onto the planned rail spur with even longer gate down times than observed today, queue lengths could triple by 2040. In order address this later scenario, it is recommended that if owners want to take advantage of the EIS, as a condition of construction of the new rail spur the City coordinate with owners of the rail spur along with the UP Railroad agree to limit movement of trains onto and off of the rail spur to non-peak hours. This would largely avoid the likelihood of extremely long queues shown in **Figure 13**.

Results of the queueing analysis show that even though queue lengths from normal through train movement along the UP line would increase by 2040, the average queue during the peak hour on either Barker Road or Euclid Avenue would be 500 feet or less. During the worst case scenario, which would occur about 3-4 times per year (assuming no change to UP train frequency), the queue on Barker Road or Euclid Avenue would be less than ¼ mile. Beyond the occasional delay to drivers waiting to cross the tracks, two additional impacts would be anticipated from these longer queues:

- Increased frequency for queuing vehicles to block nearby local streets, particularly Bridgeport Avenue (which is about 680 feet north of Euclid Avenue) and some driveways; and
- Increased frequency of vehicles not intending to cross the tracks to get caught in the queue, which

would add to the length of the queue. For example, during the PM peak at the Barker Road/ Euclid Avenue (south) intersection, about 100 vehicles are forecast to make a northbound right from Barker Road to Euclid Avenue and about 70 vehicles are forecast to make a westbound left from Euclid Avenue to Barker Road. These vehicles would not cross the tracks, but could get caught in the queue. Less than 25 vehicles are forecast to make a similar movement, eastbound left or southbound right, at the Barker Road/Euclid Avenue (north) intersection.

The following strategies are recommended to mitigate these issues in the future:

- To mitigate the potential for blocked streets and high-traveled driveways, it is recommended to:
  - paint and sign "Do Not Block Intersection/Driveway" at locations where vehicles are likely to get blocked by the queue, including the southbound lane of Barker Road at Bridgeport Avenue and the northbound lane of Barker Road at Euclid Avenue (south);
  - not allow new driveways or access roads on Barker Road or Euclid Avenue within 500 feet of the UP Railroad crossing to developments that are anticipated to generate more than 20 vehicles per hour; and
  - discourage new driveways or access roads on Barker Road or Euclid Avenue within 1,000 feet of the UP Railroad crossing to developments that are anticipated to generate more than 20 vehicles per hour
- To reduce the number of vehicles caught in the queue that are not trying to get across the tracks and may try a risky maneuver to get around traffic, it is recommended to add a 500 foot long northbound right turn lane and 300-foot long eastbound left turn lane at the Barker Road/Euclid Avenue (south) intersection.

Henry Road/I-90 Interchange

It should be noted that the 2040 travel demand model used to forecast traffic presented in this Memo assumed that a new full interchange would be constructed at Henry Road/I-90 in place of the existing partial Appleway Avenue/I-90 interchange. This configuration is consistent with the existing SRTC Horizon 2040 Plan and was assumed when this study was initiated. However, since this study was initiated, WSDOT completed their modeling for a new Henry Road interchange and found it did not meet the purpose and need identified in the original project definition. Without the Henry Road interchange, there is the potential for new residential and commercial growth in Liberty Lake to result in additional traffic impacts on the Barker Road corridor between Mission Avenue and I-90. If the Henry Road/I-90 interchange is no longer assumed to be built by 2040, it is recommended that the City of Spokane Valley and Liberty Lake work together to jointly address future infrastructure needs given this new configuration. This could be accomplished through a long-range transportation analysis of the area to determine an appropriate range of transportation infrastructure improvements and a funding strategy to implement the improvements in a timely manner.

Planned Rail Spur Across Barker Road

As part of the Phase 1 development, a new rail spur is planned off the Union Pacific mainline just north and east of the Barker Road/Euclid Avenue (north) intersection to provide rail access to the planned industrial development. In the future (as part of Phase 3 of development), land owners are considering extending that rail spur west across Barker Road at-grade to provide access to developable land between Barker Road and Flora Road.

Given that train movements on the spur are planned to be infrequent and short, no significant impacts to traffic operations on Barker Road are anticipated as long as the following criteria are met:

- The rail spur across Barker Road should be located sufficiently far from the existing Barker Road/UP at-grade crossing and from the Barker Road/Trent Avenue intersection so as not to risk vehicle queues from those locations backing into the rail spur or interfering with the planned Barker Road/BNSF grade separation project. It is recommended that the planned rail spur be located at least 1,500 feet from the Barker Road/UP at-grade crossing and at least 2,000 feet from the Barker Road/Trent Avenue intersection. This leaves about 1,300 feet of area along Barker Road in which the spur crossing could be located.
- In order to address delay from train movement along the planned rail spur across Barker Road, it is recommended that as a condition of construction of the new rail spur, the City coordinate with owners of the rail spur along with the UP Railroad to agree to limit movement of trains across Barker Road along the rail spur to non-peak hours. Or to at least limit the time the gates are down during the peak hours to be less than two-minutes.

The extension of the new rail spur would add a new rail crossing across Barker Road, which is designated as an arterial street by the City of Spokane Valley. This will require the owner of the rail spur to file a petition (RCW 81.53.030 and WAC 480-62-150(1)(a)) with the State Utilities and Transportation Commission (UTC). It would also require an on-site safety assessment with UTC staff, Union Pacific Railroad, and the City of Spokane Valley at a minimum as well as a feasibility study as decided by the UTC Commissioners to demonstrate why a grade separation would be impractical at this location.

CONCLUSIONS

The results of the traffic impact analysis in the Northeast Industrial Area of Spokane Valley demonstrated that the following two intersections would fail the City's LOS standards under Phase 3 of development in year 2040:

- Barker Road/Boone Avenue
- Flora Road/ Trent Avenue

Results also show that by 2040 traffic volumes on Barker Road between I-90 and Mission Avenue would have a significant transportation impact on traffic operations. Lastly, results also indicate that the queue length at the Barker Road/UP Railroad at-grade crossing would increase by 50%-100% and could triple in length if back-up moves onto the planned rail spur east of Barker Road were to block Barker Road. This would increase the potential for blocked streets and driveways as well as the potential for traffic to get stuck in the queue that is not trying to get across the tracks and may make risky maneuvers.

The following mitigations are recommended to address these impacts:

- **Barker Road/Boone Avenue** – It is recommended that Spokane Valley either close the access to Cataldo Avenue from Barker Road or convert this intersection to right-in/right-out when the Barker Road/I-90 intersection is reconstructed given the proximity of this intersection with the planned roundabout and Boone Avenue. A closure would require rerouting traffic on Cataldo Avenue to Boone Avenue via a new north-south alignment somewhere east of Barker Road, which would require negotiation with private property owners for right-of-way. Under this option, traffic would increase substantially on Boone Avenue, which would cause the intersection to operate at a LOS that exceeds the City's threshold by 2040. To mitigate this, it is recommended that a signal or roundabout be added at this intersection. If a signal were implemented, it is recommended to also add a 125-foot northbound left turn lane and a right turn only lane at this intersection to prevent northbound vehicles from queuing into the Barker Road/I-90 Westbound Ramp roundabouts. A right-in/right-out configuration would require u-turn access at Barker Road/Boone Avenue, which could be accomplished through a roundabout or turnaround.

- **Flora Road/Trent Avenue** – This intersection does not currently meet the City's LOS standards and regardless of whether or not the southbound leg of the intersection is closed over the BNSF railroad tracks in the future delay will increase by 2040. It is recommended that a signal be installed at this intersection along with left turn pockets on Flora Road or the intersection be converted to a roundabout.

- **Barker Road (I-90 to Mission Avenue)** – Following with the recommendation from the 2016 Spokane Valley Comprehensive Plan, it is recommended to widen Barker Road between I-90 and Mission Avenue from three lanes to five lanes by 2040 in order to accommodate forecast traffic. The Comprehensive Plan also recommends widening Barker Road to five lanes from Mission Avenue to Euclid Avenue by 2040. However, analysis as part of this study shows traffic volumes on Barker Road north of Mission Avenue (while close to warranting five lanes) are forecast to be within the range that can be accommodated by a three lane road without causing significant delays. However, Spokane Valley should continue to keep the plan to widen Barker Road from Euclid

Avenue to Mission Avenue in the Comprehensive Plan in order to require right-of-way from future developments. This will preserve the possibility for widening should forecasts change in the future or widening be deemed necessary shortly after 2040.

- **Vehicle Queues from Barker Road/UP Railroad Crossings** – Three mitigation strategies are recommended to address the impacts from queuing vehicles at the Barker Road/UP Railroad crossing:
    - In order to address delay from back-up moves into and out of the planned rail spur east of Barker Road, it is recommended that as a condition of construction of the new rail spur the City coordinate with owners of the rail spur along with the UP Railroad agree to limit movement of trains onto and off of the rail spur to non-peak hours.
    - To mitigate the potential for blocked streets and high-traveled driveways, it is recommended to strategically sign and paint "Do Not Block Intersection/Driveway" at locations where vehicles are likely to get blocked. We also recommend restricting (or discouraging) the construction of new driveways to medium or large scale developments on Barker Road or Euclid Avenue within 1,000 feet of the UP at-grade crossing.
    - To limit the number of vehicles that may get caught in the queue, but are not trying to get across the tracks and may try a risky maneuver to get around traffic, it is recommended to add a 500-foot long northbound right turn lane and 300-foot eastbound left turn lane at the Barker Road/Euclid Avenue (south) intersection.

APPENDIX C:

INFRASTRUCTURE PLAN FOR SPOKANE VALLEY NORTHEAST INDUSTRIAL AREA PAO

Infrastructure Plan

Spokane Valley Northeast Industrial Area

Planned Action Ordinance

Prepared for:
City of Spokane Valley

Updated August 2018

SE17-0508

FEHR PEERS

Contents

Introduction

This document outlines a phased transportation infrastructure plan and implementation strategy to accommodate employment growth associated with development in the Northeast Industrial Area of Spokane Valley through year 2040. The boundaries of the Northeast Industrial Area are shown in Figure 1.

Figure 1. Northeast Industrial Area boundaries

Future transportation infrastructure needs were determined based on traffic analysis associated with forecast development in order to meet the City of Spokane Valley and Washington State Department of Transportation (WSDOT) level of service (LOS) standards. Based on the infrastructure needs, planning-level costs were estimated for each future project. This plan also includes a strategy to pay for those projects through a fair-share cost fee for future developments in the Northeast Industrial Area as well as through identification of additional potential financing options.

Phases of Development

Three future land use phases for the Northeast Industrial Area were identified as a way to incrementally organize when future infrastructure projects will likely be needed between now and 2040:

- **Phase 1 (2019)** – Two manufacturing sites near Barker and Euclid totaling about 375 employees.
- **Phase 2 (2025-2032)** – Partial development of the Northeast Industrial Area. This is defined as when development would likely trigger the need for a major infrastructure project prior to 2040.

- **Phase 3 (2040)** – 2040 Buildout of the Northeast Industrial Area as defined by the Community Prosperity Alternative of the Spokane Valley Comprehensive Plan

Traffic analysis was performed for each phase of development to identify traffic impacts and mitigation strategies. The detailed traffic analysis, including outcomes of each phase of development can be found in The Spokane Valley Industrial Area PAO - Phase 1, Phase 2 & Phase 3 Traffic Analysis Memorandums. A short summary of the intersections/roadway segments with traffic congestion issues are listed in Figure 2.

Figure 2. Locations forecast to have significant traffic impacts.

Intersection/Segment	Phase When LOS Degrades	LOS/Queueing
Barker Road/Trent Avenue	Phase 1	139 seconds / LOS F – AM peak hour 90 seconds/ LOS F – PM peak hour
Barker Road/I-90 westbound	Phase 1	92 seconds/ LOS F – AM peak hour
Barker Road/I-90 eastbound	Phase 1	122 seconds/ LOS F – PM peak hour
Barker Road (Mission Avenue to I-90)	Phase 2	LOS E
Barker Road/Boone Avenue	Phase 3	299 seconds/ LOS F – PM peak hour
Flora Road/Trent Avenue (BNSF grade crossing open)	Phase 3	>300 seconds/ LOS F – AM & PM peak hour
Flora Road/Trent Avenue (BNSF grade crossing closed)	Phase 3	290 seconds/ LOS F – AM peak hour 153 seconds/ LOS F – PM peak hour
Barker Road/Euclid Avenue (south)	Phase 3	600 ft. queue – 50th percentile, NB direction, AM peak hour 1,275 ft. queue – 95th percentile, NB direction, AM peak hour

Planned Infrastructure Projects

To determine which additional infrastructure projects are required to support additional development in the Northeast Industrial Area, our team first reviewed the lists of planned improvement projects to be implemented by 2040. These projects are a part of Spokane Valley Department of Public Works' Six-Year Transportation Improvement Program (TIP) and/or part of the Spokane Regional Transportation Council (SRTC) financially constrained project list in the *Horizon 2040 Plan* and are listed in Figure 3.

Figure 3. Planned transportation projects located in the study area or at key intersections nearby

Project	Description	Program (Project #)	Year	Agency Responsible	In Study Area?
Barker Road/BNSF Grade Separation	Construct grade separation at Barker/BNSF RR/Trent	2018-2023 TIP (#4)	2021	City of Spokane Valley	Yes
Barker Road – Euclid to Trent	Reconstruct to 3-lane urban section	2018-2023 TIP (#20)	2021	City of Spokane Valley	Yes
Barker Road Improvement Project – Appleway to I-90	Widen and improve to 5-lane urban section; roundabout @ Broadway; realign east leg of Broadway	2018-2023 TIP (#21)	2021	City of Spokane Valley	No
Barker Road Improvement Project – Spokane River to Euclid	Reconstruct and widen to 3-lane urban section	2018-2023 TIP (#25)	2022	City of Spokane Valley	No

Project	Description	Program (Project #)	Year	Agency Responsible	In Study Area?
I-90/Barker Road Interchange	Construct general purpose lanes and replace Barker Rd I/C	*Horizon 2040 Plan* (#12)	2020	WSDOT	No
Sullivan Road Bridge over Trent	Construct new bridge over Trent and BNSF railroad tracks (to accommodate an additional mainline track and add capacity)	*Horizon 2040 Plan* (#29)	2031-2040	City of Spokane Valley, BNSF	No

Of the projects listed in Figure 3 that are already planned, three were identified as projects to be included in the fair-share cost estimate for the Northeast Industrial Area Planned Action Ordinance:

- Barker Road – Euclid to Trent
- Barker Road Improvement Project – Spokane River to Euclid
- Sullivan Road Bridge over Trent

These projects were added to the impact fee for several reasons:

1. These projects will add capacity and benefit access to the Northeast Industrial Area,
2. Full funding for these projects has not been secured; and
3. The inclusion of these projects will help ensure they are in place to support development in the Northeast Industrial Area.

The details for how the costs of these projects were included in the fair-share cost estimate is described later in this document.

New East-West Connector

In order to improve connectivity and access within the Northeast Industrial Area a new east-west local street is also assumed to be built prior to 2040 to connect Flora Road with Barker Road at a location north of Euclid Avenue and south of the BNSF railroad tracks. This street will be built by developers as the area is developed, and thus was not included in the list of infrastructure projects required to mitigate traffic impacts. This street will be a critical link to provide connectivity and access within the study area particularly if Flora Road is closed across the BNSF railroad. As such, it will be important for Spokane Valley to ensure that future developments in the area do not preclude a connection at this location and, depending on the size and location of the development, contribute toward the construction of this future connector.

Utility Projects

Future regional utility upgrades will be implemented by the utility companies as demand for the utilities increases with development and as is consistent with their standard practices. The cost of utility projects is not factored into the infrastructure costs presented in this document. Instead, individual developments will follow the standard approval process as required by Spokane Valley and utility providers and all utility costs will be borne by the developers when their developments come on line.

Infrastructure Projects by Phase

The following list provides a summary of the recommended transportation infrastructure projects to address traffic impacts associated with each phase of development in the Northeast Industrial Area.

Phase 1 Infrastructure Projects

The Phase 1 analysis identified traffic LOS issues at the Barker Road/Trent Avenue and Barker Road/I-90 intersections. Since city/regional improvement projects are already identified at these two locations and the implementing agencies do not require any additional developer funds from the Northeast Industrial Area to construct these projects, these improvements are not included in the infrastructure plan for the Northeast Industrial Area. However, it is important to point out that the improvements at Barker/Trent and Barker/I-90 are important for accessing the Phase 1 developments, so Spokane Valley should work to ensure the projects are developed on the timelines identified in the TIP and Horizon 2040 Plan.

- **Boone Avenue/Cataldo Avenue** – Currently, Caltaldo Avenue intersects with Barker Road at an intersection that also includes the westbound I-90 ramps. With the proposed reconstruction of the Barker Road/I-90 interchange, Cataldo Avenue would need to be reconfigured to accommodate the new design. While there are several options to realign Cataldo Avenue, for the purposes of this Infrastructure Plan, it is assumed that Cataldo Avenue would be terminated in a cul-de-sac just east of Barker Road and a new local access road would be constructed across private property to connect Cataldo Avenue and Boone Avenue. An interim signal will also be needed at the Barker Road/Boone Avenue intersection to accommodate traffic that will be rerouted from Cataldo until a more permanent solution is constructed when Barker Road is widened. This is assumed to be a simple span wire signal. It is unclear in the Barker Road/I-90 Interchange Justification Report, who would pay for this reconfiguration, so this project is included in the Infrastructure Plan.

Phase 2 Infrastructure Projects

- **Barker Road, Mission Avenue to I-90** – Based on the Phase 3 traffic analysis it is recommended that Barker Road be widened to five lanes between Mission Avenue and I-90. Given the size of this project, the timing for when this project will likely be needed was used as the trigger point to define Phase 2 of development. Depending on the pace of development in the Northeast Industrial Area, Barker Road would likely need to be widened to five lanes between Mission Avenue and I-90 sometime between 2025 and 2032 in order to accommodate forecast traffic. If no new industrial development in the Northeast Industrial Area occurred over the next 15 years, background traffic growth alone on Barker Road – caused by other nearby and regional developments – would likely trigger the need to widen Barker Road south of Mission Avenue by year 2032. Alternatively, if there were to be rapid buildout of the Northeast Industrial Area over the next 5-10 years, the earliest year that widening would likely be needed to meet the City's LOS standards is in 2025.

Phase 3 Infrastructure Projects

- **Flora Road/Trent Avenue** – It is recommended that Spokane Valley signalize the Flora Road/Trent Avenue intersection and add left turn lanes on Flora Road or convert this intersection to a roundabout to accommodate traffic growth. This project will be required by 2040 even if the southern leg of the intersection (across the BNSF tracks) is closed as part of the Barker Road/BNSF Railroad grade separation project.

- **Barker Road/Euclid Avenue (south)** – To address vehicle queuing from the Barker Road/UP Railroad at-grade crossing, it is recommended to add a northbound right turn lane on Barker Road and a westbound left turn lane on Euclid Avenue at the Barker Road/Euclid Ave (south) intersection. It is also recommended to sign and paint "do not block" at key driveways and intersections on Barker Road approaching the UP Railroad crossing.
- **Barker Road/Boone Avenue** – As traffic increases on Barker Road, the intersection with Boone Avenue will eventually need a traffic signal or roundabout. As noted earlier, this traffic signal/roundabout will also serve traffic that is rerouted from Cataldo Avenue that would now use this intersection to access Barker Road.

Estimating the Costs of Infrastructure Projects

The cost of each future infrastructure project recommended to mitigate traffic impacts in the Northeast Industrial Area was estimated based on the unit cost of common construction elements shown in Figure 4. Unit costs in Figure 4 were generally derived from the 2016 Mirabeau Subarea Traffic Study (in which a similar analysis was used) and adjusted for 2017 dollars based on the Caltrans construction cost index (which increased 19.6% from 2016 to 2017). In a few instances unit costs were based on recent WSDOT bid tabulations for roadway construction projects or adjusted based on the location of the projects within Spokane Valley.

Figure 4. Construction project unit costs

Element	Description	Unit Quantity	Unit Cost (2017 dollars)
Hard Costs			
Roadway Demolition	Demolition and removal of old roadway	Square Yard	$ 14
Curb Demolition	Demolition and removal of old curb/gutter	Linear Foot	$ 16
Sidewalk Demolition	Demolition and removal of old sidewalk	Square Yard	$ 19
Signal Demolition	Demolition and removal of old traffic signal equipment	Each mast arm	$ 6,000
Excavation	Excavation, grading, fill, earthwork	Cubic Yard	$ 36
Road Section	Construction of new roadway surface	Square Yard	$ 80
Curb	Construction of new curb/gutter	Linear Foot	$ 42
Sidewalk	Construction of new sidewalks	Square Yard	$ 80
Curb Ramp	Construction of new curb ramps	Each	$ 3,500
Traffic Signal	Construction of new traffic signal	Each Signal System	$ 480,000
Span Wire Signal	Construction of interim traffic signal	Each Signal System	$ 120,000
Roundabout (one lane)	Construction of new one-lane roundabout	Each	$ 650,000
Roundabout (two lanes)	Construction of new two-lane roundabout	Each	$ 1,000,000
Cul-de-sac	Construction of new cul-de-sac with a 50-foot radius	Each	$ 100,000
Additional Costs			
Right-of-way (partial)	Cost of acquiring right-of-way for part of a parcel	Square Foot	$ 5
Right-of-way (full)	Cost of acquiring right-of-way for the entire parcel	Spokane County Assessor's Value times 1.1 to reflect actual market value	
Drainage	Cost to provide proper stormwater drainage to the affected area	20% of "hard" costs above	
Mobilization	Cost to get a construction crew engaged	10% of "hard" costs above	
Engineering	Cost to design and permit the project	20% of "hard" costs above	
Traffic Control	Cost to manage traffic during construction	15% of "hard" costs above	

Element	Description	Unit Quantity	Unit Cost (2017 dollars)
Contingency	Cost contingency for potential for unexpected drainage/utility/earthwork conflicts; WSDOT coordination	30% of "hard" costs above	

In order to provide an incentive to the first wave of development in the Northeast Industrial Area, the City of Spokane Valley is shouldering all of the costs of the infrastructure required to facilitate Phase 1 development. Note that the Phase 1 infrastructure projects are major infrastructure improvements that also benefit Phase 2 and 3 development in the area. Thus, Figure 5 summarizes the estimated project cost (based on the unit costs from Figure 4) for each of the projects that would be needed as part of Phase 1, Phase 2 and Phase 3 of development in the Northeast Industrial Area, plus the projects already planned that will be included in the fair-share cost estimate as part of the PAO.

Figure 5. Recommended projects to mitigate traffic impacts associated with development in the Northeast Industrial Area

Project	Phase	Description	Cost Estimate (2017 dollars)
Cataldo Avenue realignment	3	Reroute Cataldo Avenue to intersect Boone Avenue instead of Barker Road; add a cul-de-sac to Cataldo Avenue at existing intersection with Barker Road	$ 1,377,000
Interim signal at Barker Road/Boone Avenue	1	Add an interim signal	$ 198,000
Barker Road – Mission Avenue to I-90	2	Reconstruct to a 5-lane urban section	$ 2,818,000
Flora Road/Trent Avenue	3	Add a signal with left turn lanes on Flora Road or convert to a roundabout	$ 2,163,000[1]
Barker Road/Euclid Avenue (south)	3	Add northbound right-turn lane and westbound left-turn lane and sign/strip "do not block intersection"	$ 244,000
Barker Road/Boone Avenue	3	Add a permanent signal with northbound left and right turn pockets or a roundabout accommodating two lanes of traffic on Barker Road	$ 2,214,000[1]
Barker Road – Euclid to Trent	Already Planned (2021)	Reconstruct to 3-lane urban section	$ 4,184,000
Barker Road – Spokane River to Euclid	Already Planned (2022)	Reconstruct to 3-lane urban section	$ 3,302,000
Sullivan Road Bridge over Trent	Already Planned (2031-2040)	Construct new bridge over Trent and BNSF railroad tracks (to accommodate an additional mainline track and add capacity)	see below[2]

1. To be conservative, the highest cost option (a roundabout) was used.
2. Since only a portion of this project is to be funded by Spokane Valley an estimate of the total cost is not available.

Northeast Industrial Area's Fair-Share Contribution

In order to offset the costs of future infrastructure projects that will be needed to mitigate the traffic impacts caused by development, Spokane Valley will collect fees from future developments in the Northeast Industrial Area based on a fair-share cost estimate. The fair-share financial contribution is

determined by how much traffic the Northeast Industrial Area is expected to contribute in 2040 to each of the intersections or streets where needed projects were identified.

The same regional travel demand model used to forecast 2040 traffic was used to estimate the percent of traffic generated by the Northeast Industrial Area through each project location. This was done by using a tool in the model called a "select zone analysis." The select zone analysis was set to identify the traffic generated by the Northeast Industrial Area development separate from any other traffic generated by development in the region.

It should be noted that since the portion of the Northeast Industrial Area west of Flora Road will have a different travel shed than the portion east of Flora Road, the fair-share contribution was estimated separately for each portion of the Northeast Industrial Area. Trips generated from development east of Flora Road will have the greatest impact on traffic along Flora Road and Barker Road, thus the select zone analysis was isolated to the land area east of Flora road for the projects in Figure 5. Trips generated by development west of Flora Road will have the greatest impacts on traffic along Sullivan Road. Thus, the fair-share financial contributions from land developed in that area were assumed to contribute toward increasing capacity on Sullivan Road at Trent Avenue.

Fair-Share Contribution for Areas East of Flora Road

The results of the select zone analysis from the portion of the Northeast Industrial Area east of Flora Road for each of the six respective projects identified is shown in Figure 6.

The results of this analysis show that the majority of traffic through the impacted locations is generated from land uses outside the Northeast Industrial Area. Furthermore, the farther a project location is from the Northeast Industrial Area, generally the smaller the portion of traffic generated by the Northeast Industrial Area will pass through that location.

Figure 6. Northeast Industrial Area's share of total improvement costs

Project Location	Associated Development Phase	Portion of future traffic from Northeast Industrial Area[1]	Estimated Total Project Cost (2017 dollars)	Northeast Industrial Area Fair-Share Cost
Interim signal at Barker Rd/Boone Ave	Phase 1 only	4.0%[2]	$ 198,000	$ 7,920
Cataldo Avenue realignment	Phases 1 & 3	10.3%	$ 1,377,000	$ 142,003
Barker Road – Mission Avenue to I-90	Phase 2	11.3%	$ 2,818,000	$ 317,300
Flora Road/Trent Avenue	Phase 3	21.4%	$ 2,163,000	$ 463,686
Barker Road/Euclid Avenue (south)	Phase 3	29.5%	$ 244,000	$ 71,933
Barker Road/Boone Avenue (Phase 3)	Phase 3	10.3%	$ 2,214,000	$ 228,319
Barker Road – Euclid to Trent	Planned (2021)	33.6%	$ 4,184,000	$ 1,404,691
Barker Road – Spokane River to Euclid	Planned (2022)	22.1%	$ 3,302,000	$ 728,628
Sullivan Bridge over Trent	Planned (by 2040)	see below[3]		
		Total Northeast Industrial Area Fair-Share Cost		**$ 3,364,480**

1. Rounded to the nearest tenth percentage

2. Since this project will only apply to Phase 1, the proportion of traffic in Phase 1 was used here

3. Since only a portion of this project is to be funded by Spokane Valley and development in the Northeast Industrial Area primarily west of Flora Road will have the most significant traffic impacts at this location, the fair-share cost of this project was calculated separately.

The portion of traffic from the Northeast Industrial Area that is forecast to pass through each project location was multiplied by the estimated cost of that project to arrive at the Northeast Industrial Area's fair-share cost per infrastructure project, shown in Figure 6.

Typically, costs to mitigate transportation infrastructure impacts are allocated based on PM peak hour traffic generation. Using PM peak hour trips is typical, since it is the PM peak hour that typically has the most-congested traffic and trips are a way to fairly distribute costs in a way that is proportionate to the total impact generated. In other words, larger developments that generate more trips pay proportionately more than smaller developments that generate fewer trips.

To develop a per-trip fee, it was first necessary to estimate PM peak hour traffic that will be generated by new development in the Northeast Industrial Area. Separate trip generation estimates are required for Phase 1 and Phase 2 & 3 since the reconfiguration of Cataldo Avenue will require an interim improvement that only benefits Phase 1, while the Cataldo realignment benefits all development in the Northeast Industrial Area. In addition, the other projects listed in **Figure 5** are not required for Phase 1 and therefore only benefit Phase 2 & 3 development. Using this logic, separate traffic impact mitigation fee components are calculated for:

- Projects that benefit Phase 1 only
- Projects that benefit Phase 2 & 3 only
- Projects that benefit Phase 1, 2 & 3

Projects that Benefit Phase 1 Development

Based on information from the City of Spokane Valley and trip generation rates from the Institute of Transportation Engineers (ITE), Phase 1 is expected to generate 160 PM peak hour trips. To calculate the Phase 1 fair-share costs, the Northeast Industrial Area fair-share cost of building the interim traffic signal at Barker Road/Boone Avenue is divided by PM peak hour trips in Phase 1 to get **a cost for projects that benefit Phase 1 only of $50 per PM peak hour trip.**

Projects that Benefit Phase 2 & 3 Development Only

Based on the land use forecasts in the Spokane Valley Comprehensive Plan it is estimated that about 2,886 new employees will work in the Northeast Industrial Area east of Flora Road by 2040. The travel demand model estimates a PM peak hour trip generation rate for employees in the Northeast Industrial Area of about 0.46. This trip rate is consistent with the trip rates for industrial land uses identified by ITE. When the average PM peak hour trip rate is applied to the growth in employees, it is estimated that about 1,340 new PM peak hour trips will be generated from employment growth in the Northeast Industrial Area east of Flora Road. Since growth associated with Phase 1 development is being excluded from this impact fee, the 160 PM peak hour trips estimated as part of Phase 1 development were subtracted from 1,340 to arrive at 1,180 PM peak hour trips. The Northeast Industrial Area's fair-share costs for projects that benefit Phase 2 & 3 development only (excludes the Cataldo Avenue realignment and the interim signal at Barker Road/Boone Avenue) were then divided by the growth in PM peak hour trips (between Phase 1 and the 2040 planning horizon) to get **a cost per PM peak hour trip for projects that benefit Phase 3 of development only of $2,725**:

$ 3,215,000 (Northeast Industrial Area's share of total project costs) / 1,180 (new PM peak hour trip generated east of Flora Road less the PM peak hour trips from Phase 1) = **$2,725 per PM peak hour trip**.

Projects that Benefit Phase 1, 2 and 3 Development

To estimate the cost per PM peak hour trip for the Cataldo Avenue realignment, which would benefit Phase 1, 2 and 3 development, the estimated fair-share cost of that project ($ 142,003) was divided by the new PM peak hour trips that will be generated from employment growth in the Northeast Industrial Area east of Flora Road by 2040 (1,340). This calculation results in **a cost of $106 per PM peak hour trip for projects that benefit both Phase 1, 2 & 3 of development**.

Cost per PM Peak Hour Trip by Development Phase

Figure 7 shows how these costs were factored into a final PM peak hour trip cost for Phase 1 and Phase 2 & 3 development. In order to get a cost per PM peak hour trip for Phase 1 of development the cost per PM peak hour trip for both the Cataldo Avenue realignment and the interim traffic signal at Barker Road/Boone Avenue was added to get $156 per PM peak hour trip. In order to get the cost per PM peak hour trip for Phase 2 & 3 of development the cost per PM peak hour trip for the Cataldo Avenue realignment was added to the cost per PM peak hour trip for all the projects that would benefit Phase 2 & 3 only. This results in a cost of $2,831 per PM peak hour trip for Phase 2 & 3 development. **Thus, the fee that would be assessed for developers that opt into the Northeast Industrial Area Planned Action Ordinance as part of Phase 1 development would be $156 per PM peak hour trip and the fee assessed to developments that occur after Phase 1 would be $2,831.** The City may opt to shoulder the cost of the Phase 1 development impact fee.

Figure 7. Cost per PM peak hour trip by development phase.

Projects by Phase	Fair-Share Cost	Forecast PM Peak Trips	Phase 1 Cost per PM peak hour trip	Phase 3 Cost per PM peak hour trip
Projects that benefit Phase 1 only	$ 7,920	160	$ 50	N/A
Projects that benefit Phase 2 & 3 only	$3,214,558	1,180	N/A	$ 2,725
Projects that benefit Phase 1, 2 and 3	$142,003	1,340	$ 106	$ 106
Total	**$ 3,364,482**	**1,340**	**$ 156**	**$ 2,831**

Fair-Share Contribution for Areas West of Flora Road

Euclid Avenue is the only public access road across the railroad spur west of Flora Road, and because it is considerably south of the PAO area, most of the traffic generated by future development in the portion of the Northeast Industrial Area west of Flora Road will load onto Sullivan Road via B Street. Thus the fair-share financial contributions from land developed in the western portion of the PAO area were assumed to instead contribute toward increasing capacity on Sullivan Road at Trent Avenue. The SRTC *Horizon 2040* plan identified a bridge replacement project at this location sometime between 2031 and 2040. Given that Spokane Valley will only pay a portion of the cost of the Sullivan Bridge replacement and that portion is unknown at this time, *the same cost per PM peak hour trip that was estimated east of Flora Road will be applied to development west of Flora Road*.

By applying the same fee to both development areas in the PAO area, development in one portion of the PAO area is not paying a disproportionately high fee, and the fees paid by development on the east and west side of Flora Road are directed toward the projects the developments have the greatest impacts on. This will create a simpler and more equitable fee structure for future developments across the entire Northeast Industrial Area.

Based on land use forecasts from the Spokane Valley Comprehensive Plan it is estimated that the portion of the Northeast Industrial Area west of Flora Road will grow by about 340 employees by 2040. This will generate an estimated 160 new PM peak hour trips. Assuming Spokane Valley collects $2,831 per new PM peak hour trip, fees collected from future development east of Flora Road as part of the Northeast Industrial Area fair-share financial contribution program will generate about $500,000 (in 2017 dollars). Based on the select zone analysis, forecast development in the area west of Flora Road would be responsible for about 9% of the total traffic growth through the Sullivan/Trent interchange.

Additional Financing Strategies

Funding generated by developers through the Northeast Industrial Area fair-share financial contribution program will only cover a portion of the cost of future infrastructure projects. Spokane Valley will need to use other financing strategies to pay for the remaining costs of those projects.

Additional financing strategies that Spokane Valley could consider include implementing a local improvement district or transportation benefit district, applying for grants, leveraging Federal Aid Road designation, and leveraging other State and regional resources.

Another option the City could explore is to apply a broader-based impact fee program in collaboration with surrounding jurisdictions. For example, a significant portion of future traffic along Barker Road at Mission Avenue and Boone Avenue will be generated by nearby development in Spokane Valley, Liberty Lake and unincorporated Spokane County. Spokane Valley could work with Liberty Lake and the County to conduct a joint regional sub-area transportation study for this area to determine an appropriate impact fee for future development projects that benefit mobility in all three jurisdictions.

Impact to Nearby Spokane County Intersections

Spokane County identified the intersections of Harvard Road/Wellesley Avenue and Harvard Road/Euclid Avenue as locations that will need improvements to meet their LOS standards by 2040. Both of these intersections are about 1.5 miles east of the Spokane Valley Northeast Industrial Area.

In order to determine the percent of traffic passing through these intersections during the PM peak generated from the Northeast Industrial Area, a select zone analysis (similar to what was performed as part of the fair-share analysis described previously) was performed for year 2040 for each approach of the two intersections. The analysis was performed using the SRTC 2040 regional travel demand model updated in December, 2017. It should be noted that several roadway network adjustments were made in the updated SRTC model to match what was assumed at part of the PAO analysis (such as the Barker Road/Trent Avenue intersection, closure of Flora Road at the BNSF rail crossing, the new east-west connector, the Indiana Avenue connection to Harvard Road, and the Henry Road overpass at I-90 without an interchange). These assumptions were verified with SRTC. The results show that by 2040 about 12% of traffic passing through the Harvard Road/Wellesley Avenue intersection and about 12% of traffic passing through the Harvard Road/Euclid Avenue intersection would be generated by the Northeast Industrial Area.

In order to mitigate the impacts of traffic from the Northeast Industrial Area at these two intersections it is recommended that the City of Spokane Valley and Spokane County develop a memorandum of understanding (MOU) that clearly identifies the planned projects at the two intersections to improve traffic operations and the estimated costs of those projects. At the time this document was prepared, no improvements for the two intersections have been identified. The MOU would also identify the estimated cost per PM peak hour trip generated by the Northeast Industrial area by multiplying the total

estimated project cost (agreed on and documented in the MOU) by the percentages identified above and dividing by the forecast number of PM peak hour trips that would be generated by the Northeast Industrial Area east of Flora Road in 2040, which equals 1,340. Given that there are other locations where development in Spokane Valley impacts Spokane County infrastructure, and vice-versa, other impacts and mitigation costs could also be included in the MOU. Once the MOU is signed by all parties, a future developer will develop a trip letter and calculate the fee owed to add necessary capacity at the Spokane County intersections.

Conclusions

This report provides a summary of the major infrastructure projects that will likely be needed to mitigate traffic impacts associated with development in the Northeast Industrial Area through 2040. The report also provides a financing strategy using a fair-share cost estimation and other strategies to pay for those projects.

Several major infrastructure projects are either already programmed (with outside funding coming from other sources) as part of the Spokane Valley 6-year TIP, will implemented by other agencies (such as WSDOT), or will be built by developers as the area gets developed. These projects were not factored into the fair-share cost calculations include, but are not limited to:

- The Barker Road/BNSF Railroad grade separation project
- Reconstruction of the Barker Road/I-90 interchange
- Adding an east-west local road to connect Barker Road with Flora Road between Euclid Avenue and the BNSF Railroad tracks

Traffic analysis (documented the Phase 1, 2 and 3 Traffic Analysis Memorandums) demonstrated that several mitigation projects will be needed by 2040 to meet LOS standards or are planned by the City but not funded. Funding and implementation of these projects will be the responsibility (at least partially) of Spokane Valley. These projects were factored into the Northeast Industrial Area's fair-share cost calculations and include:

- Realignment of Cataldo Avenue
- Barker Road/Boone Avenue intersection interim improvements
- Reconstructing Barker Road to a 5-lane urban section between Mission Avenue and I-90
- Flora Road/Trent Avenue intersection improvements
- Barker Road/Euclid Avenue (south) intersection improvements
- Barker Road/Boone Avenue intersection 2040 improvements
- Reconstructing Barker Road to a 3-lane urban section north of the Spokane River (Identified as two separate projects in the Spokane Valley 6-year TIP – and identified by the city to be partially funded by development in the Northeast Industrial Area)
- Sullivan Road/Trent Avenue capacity improvements (Identified by the SRTC Horizon 2040 plan – this project is included as it is not programmed by the City, but is to be partially funded by the City)

A fair-share cost calculation was developed to identify the Northeast Industrial Area's share of future traffic through each of the above projects and associated mitigation costs. A separate cost was estimated for Phase 1 of development versus Phase 2 & 3 of development to reflect the impacts to traffic from each of those phases. If developers agree to participate in the Northeast Industrial Area

Planned Action Ordinance they will meet their SEPA obligations to mitigate traffic congestion impacts through a mitigation contribution of up to $156 per PM peak hour trip for development associated with Phase 1 and $2,831 per PM peak hour trip for all future developments after Phase 1. After making this mitigation payment developers will not have to conduct another traffic study, outside of a site access and circulation study, which may be required by Spokane Valley to ensure safe access for all modes into and within the development site.

If developers opt not to participate in the PAO, they will be responsible for conducting their own traffic impact analysis following the guidelines set forth by Spokane Valley. They will also be responsible for funding any found during that process that will be needed to meet concurrency standards.

Utility impacts from future development and costs associated with that were not factored into the mitigation fee. Developers will still be required to follow the Spokane Valley approval process for utilities and will pay for those costs separately.

Spokane Valley will need to use other financing strategies to pay for the remaining costs of the projects identified above that will not be covered by developers. One potential strategy includes applying a broader-based impact fee program in collaboration with surrounding jurisdictions to collect fair-share fees from residential developments in Spokane Valley, Liberty Lake and unincorporated Spokane Valley. Other financing strategies Spokane Valley might consider include implementing a local improvement district or transportation benefit district, applying for grants, leveraging Federal Aid Road designation and leveraging other State and regional resources.

APPENDIX D:

GENERAL SEWER SUMMARY PACKET FOR PLANNED ACTION ORDINANCE APPLICATIONS

GENERAL SEWER SUMMARY PACKET
for Planned Action Ordinance Applications
ENVIRONMENTAL SERVICES DEPARTMENT

Kevin R. Cooke, P.E., Environmental Services Director

This packet presents Spokane County Environmental Services' process and requirements relative to the sewer system for development within the City of Spokane Valley's Northeast Industrial Area (NIA). The City of Spokane Valley's NIA is within Spokane County's sanitary sewer service area. Please read and understand this letter, so plan review and permitting can be completed in a timely manner.

Sewer Planning Requirements Form for Planned Action Ordinance Applications

The purpose of the attached Sewer Planning Requirements Form is to ensure that the developer, or their agent, and Spokane County Environmental Services (Environmental Services) have a preliminary conversation and project review regarding the specific sewer requirements prior to starting the sewer design for each project. This discussion will help clarify if any public sewer extension is required. Public sewer extensions can greatly impact both cost and timing for the completion of a project.

Project Sewer Plan Review & Acceptance for Construction

Construction plans for the sewage collection system need to be submitted and accepted by Environmental Services. These plans will determine the project's permitting requirements.

Generally, all developments that require public or private sanitary sewer service (8" pipe or larger) need to be submitted as a separate sewer submittal package with at least a cover sheet, plan and profiles, and a detail sheet for any specific project construction details and applicable Spokane County standard plans. The construction drawings need to be submitted on 24" X 36" plan sheets. For projects that will require public sewer installation, the developer's construction engineer shall submit a letter of intent to provide construction inspection and record drawing services prior to the Environmental Services' acceptance of the plans for construction.

For developments that require a private 6" sanitary sewer, a single sheet plan submittal may suffice. While profiles are not required, cleanout rims, pipe invert elevations, lengths, slopes and building finished floor elevations need to be clearly labeled. Additional details and applicable Spokane County standard plans may be required. The construction drawings need to be submitted on 24" X 36" plan sheets. Installation of all 4" and 6" sanitary sewer pipe and all building connections must be permitted and inspected by an Environmental Services sewer inspector.

The attached Commercial Water Usage Estimate Form shall be included with the first plan submittal to Environmental Services. The water usage estimate will be used to determine the sewer connection charges and the monthly sewer service fees. Not having this form completed early, prior to the permitting phase, can cause delays when building permits are ready for issuance.

Also to be included with the first submittal is the attached industrial pretreatment questionnaire, "Short Form Survey of Nonresidential Establishments". This form is used to determine whether any on-site pretreatment will be required prior to discharge in the County sewer system.

Project Specific Summary Letter

After plans are reviewed, a Project Specific Summary Letter will be provided if it is deemed necessary by Environmental Services. This letter will stipulate the project specific sewer requirements and must be signed and returned to Environmental Services.

Preconstruction Meeting, Project Inspection, Engineer's Statement, and Record Drawings

A Preconstruction meeting is mandatory for all projects within the NIA. Call your plan reviewer to schedule a time and place for the meeting.

Normally, a preconstruction meeting should have the contractor and engineer present. For projects with 8" (or greater) sanitary sewer, the developer, design engineer, construction management or Inspection Company and the contractor should all be in attendance.

During construction of the 8" (or greater) sanitary sewer, the sewer system must be inspected and tested in full accordance with the County's Project Construction Certification Procedures for Road, Drainage, And Sewer Projects dated January 2018. This includes continuous inspection during all times that pipe laying is underway for both mainline and side sewers. Television inspection of the system must be coordinated by your engineer with Environmental Services, prior to paving operations (pre-pave video inspection), and after completion of paving (post-pave video inspection). Upon completion of all construction and associated testing, your construction engineer must provide the required Engineer's Certification Statement, as well as acceptable record drawings for the sewer system. Sewer construction, inspections, record drawings and engineer's statements shall conform to the requirements set forth in the Spokane County Project Construction Certification Procedures for Road, Drainage and Sewer Projects dated January 2018.

Sewage Collection System Acceptance, Financial Security, and Warranty

Following Environmental Services' receipt of:

1) The Engineer's Certification Statement
2) Acceptable record drawings
3) Documentation of sewer construction costs (Public Sewer only)
4) Approved financial security instrument for the warranty period (Public Sewer only)

Environmental Services will accept the public portion of the sewer system (8-inch sewer mains or larger) for operation and maintenance. This acceptance will be subject to a one-year warranty period, and the financial security shall remain in place throughout the warranty period. The amount of the financial security for the warranty period will be based on representative 25% of the estimated construction cost of the system as calculated by Environmental Services. A calculation of the required sewer bond amount will be provided after the first plan submittal.

Sewer Connection Charges

Following submittal and review of Plans, a Sewer Connection Charge Agreement form must be completed by Environmental Services and signed by the Owner. Work directly with your plan reviewer on the Sewer Connection Charge Agreement. Developments located within the NIA will be subject to a Special Connection Charge (SCC), in addition to a General Facility Charge (GFC) as stipulated in the

County Sanitary Sewer Ordinance. The sewer connection charges, as outlined in Spokane County Code Article 8.03.1247, is calculated based on a dollar amount per Equivalent Residential Unit (ERU). An ERU is 800 cubic feet of non-irrigation water usage per month.

For budgeting purposes, the current SCC is $3,560.00 per Equivalent Residential Unit (ERU). The current GFC has been set at $4,630 per ERU. Therefore, total connection charges are currently $8,190 per ERU. These rates are subject to change, as determined by the Board of County Commissioners.

The County establishes the sewer connection charges for a property based upon the rates in effect at the time of sewer connection permit issuance. Sewer connection permits are valid for one year from the date of issuance. If the permit expires prior to the completion of the connection, a new permit is required, and sewer connection charges are then based upon the rates in effect at the time that the new permit is issued. Sewer connection charges may be paid in full at the time of sewer connection permit issuance, or as otherwise allowed under the Sanitary Sewer Ordinance.

Construction Cost Reimbursement for Public Sewer

For projects that install public sanitary sewer, only the SCC may be offset by the documented cost of sewer construction. Multiplying the SCC by the estimated ERU's of non-irrigation water usage provides the maximum potential dollar amount that may be credited toward the projects sewer connection charges. To receive the SCC credit, itemized documentation specific to the public sewer construction costs must be submitted to the County. Please be sure to track all public sewer related costs separate from other project costs.

Bill of Sale for Public Sewer

For the County's acceptance of the project as part of the public sewer system, itemized documentation will need to be submitted by the developer, or their engineer, for specific sewer construction costs.* Documentation should include detailed summary of the costs of the sewer installation, including copies of invoices for construction, design engineering, surveying, and inspection and testing services. These construction costs are used by Environmental Services to prepare a Bill of Sale, transferring ownership of the public sewer system elements to Spokane County. The Bill of Sale must be signed, dated, notarized and returned to our office for the transfer to be completed.

**For example, submitting a representative 1/3 of the overall project construction cost will not suffice as itemized documentation*.

Sewer Permit Application for Private Sewer

Following acceptance of Plans, a Sewer Permit Application form must be completed. Work directly with your plan reviewer on the Sewer Permit Application. No installation of 4" or 6" sewer or connections of any buildings to the sewer may occur prior to obtaining the required sewer connection permits from Spokane County.

Mailing and Contact Information

Spokane County Environmental Services
1026 W. Broadway Avenue, 4th Floor
Spokane, WA 99260
Phone: (509) 477-3604
Fax: (509) 477-4715

Colin Depner: (509) 477-7282, Plan Review & Permitting
cdepner@spokanecounty.org

Chris Knudson: (509) 477-7180, Plan Review & Permitting
cknudson@spokanecounty.org

Kristen Armstrong, PE: (509) 477-7412, Project Manager
kmarmstrong@spokanecounty.org

Eugene Repp, PE: (509) 477-7488, Planning and Design Manager
grepp@spokanecounty.org

Electronic Submittals

The Sewer Planning Requirements Form for Planned Action Ordinance Applications, Commercial Water Usage Estimate Form, Short Survey of Nonresidential Establishments form, and your project Plans can be submitted electronically. Hard copies of the forms are included and links to the forms provided below.

Electronic Submittal: ESPlanReview@spokanecounty.org

Attn: Colin Depner or Chris Knudson

*Subject line should read: “Project Name” within the Northeast Industrial Area PAO

Link to Additional Information: http://www.spokanecounty.org/SewerPlanningDesign

- Spokane County Standards for Road and Sewer Construction
  - Construction Certification Procedures *(Technical Reference C)*
  - Side Sewer Installation Handbook *(Technical Reference E)*
  - Sanitary Sewer Standards Manual (*Chapter 11)*
- Commercial Water Usage Estimate Form
- Sewer Planning Requirements Form for Planned Action Ordinance Applications
- Sewer Permit Application
- Short Form Survey of Nonresidential Establishments

SEWER PLANNING REQUIREMENTS FORM
for Planned Action Ordinance Applications
ENVIRONMENTAL SERVICES DEPARTMENT

Kevin R. Cooke, P.E., Environmental Services Director

Project Name:_____ Parcel #:_____

General Project Description:_____

The City of Spokane Valley's Northeast Industrial Area is within Spokane County's sewer service area.

PLEASE NOTE: Form must be finalized and signed by Spokane County Environmental Services

1. Is sewer currently available, with service connections provided as required, to serve the proposed development? (If yes, go to signature block; if no, go to 2a) Y ☐ N ☐

2a. Is the site within the Spokane County 6-Year Sewer Construction Capital Improvement Program? (If yes, go to 2b. If no, go to 3) Y ☐ N ☐

2b. Will the developer design, fund, construct & provide financial surety for the necessary systems to provide Dryline Sewer and/or Double Plumbing Dry Side Sewers as required? (If no, go to 3) Y ☐ N ☐

3. Will the developer design, fund, construct and provide financial surety for the necessary systems to extend sewer service to the site and provide service connections as required? Y ☐ N ☐

This sewer planning form is non-transferable to other projects and shall be valid as long as the referenced project remains active and is not modified.

Additional Sewer Requirements:

Signature of County Staff - Prepared By:_____ Date:_____

I certify I have read and will comply with the stipulations of this completed form and the County sewer requirements presented in the "General Sewer Summary Packet".

Signature of Owner/Owner's Agent/Developer:_____ Date:_____

1026 West Broadway Ave, 4th Floor, Spokane, WA 99260-0430
PHONE: (509) 477-3604 FAX: (509) 477-4715 TDD: (509) 477-7133

COMMERCIAL WATER USAGE ESTIMATE FORM

ENVIRONMENTAL SERVICES DEPARTMENT

Kevin R. Cooke, P.E., Environmental Services Director

DATE: _____

TO: Spokane County Environmental Services Department

FROM:_____(Please Print Name)

TITLE: _____

SUBJECT: Water Usage For: _____

Address: _____ Parcel No: _____

The estimated annual non-irrigation water usage for the subject property is_____cubic feet.

Notes:

1. Sewer connection charges will initially be based upon this estimate
2. The number of Equivalent Residential Units (ERUs) initially assigned to the propertywill be based upon an allowance of 800 cubic feet per month per ERU.
3. If the actual future non-irrigation water usage exceeds the estimate presented above, additional sewer connection charges will become due.
4. The monthly sewer service fees for the property will be determined based upon the sewer service fee rates in effect, which are subject to change over time.
5. The County will periodically review the water usage for the property to make appropriate billing adjustments.

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SHORT FORM SURVEY of NONRESIDENTIAL ESTABLISHMENTS

1. Company Name: _____ **2.** Telephone Number: (___) _____

3. Mailing Address: _____ **4.** Facility Address: _____

_____ (If different) _____

_____ _____

5. Does this Company have a facility located In Spokane County, Washington? ❑ Yes ❑ No

(If "NO", Get Authorized Signature Below, Stop Here, and Return Form In Envelope Provided)

6. Name of environmental contact person:_____Phone no. _____

(*Person empowered by authorized representative to represent the Company, or responsible for the proper completion of this survey form.)*

7. Primary type of business: _____

Narrative description of the type of operations conducted. Please identify all activities from which waste water is generated.

_____

SIC or NAICS Code(s) assigned if known: _____ _____ _____ _____

8. This facility uses water (gallons per day) from the following sources: *(check all that apply)*

❑Public Water _____ GPD ❑Private Well _____GPD ❑Reclaimed Water___ GPD ❑Surface Water___GPD

9. This estimated amount of water (in Gallons per Day) used for the following purposes is:

- ❑ Domestic uses *(restrooms, showers, kitchens, laundry rooms)*..... _____ GPD
- ❑ Boilers, cooling, or other unpolluted waste waters..... _____ GPD
- ❑ Non-Domestic activities *(describe the activities):*

_____ _____ GPD

_____ _____ GPD

_____ _____ GPD

10. Waste water from this facility goes to the following: *(check all that apply)*

❑ Sanitary Sewer ❑ Storm Sewer ❑ Ground (drain fields, wet well) ❑ Open Waters

❑ Waste Haulers ❑ Evaporation ❑ Other means of disposal - Please list:_____

11. Chemicals are used and/or stored on the premises: ❑In Drums ❑Only In Small Containers ❑No Chemicals

12. This facility (❑ does, ❑ does not) generate dangerous waste (WAC 173-303-090) (If Assigned, WAD#_____)

13. Materials, chemicals, products, equipment, or wastes (❑ are; ❑ are not) stored in uncovered areas.

14. This facility (❑does, ❑ does not) have a grease interceptor or an oil/water separator.

15. Vehicles and/or equipment (❑ are, ❑ are not) washed at this facility. If so, wash water goes to:_____

I have personally examined and am familiar with the information submitted in this document and attachments. Based on my inquiry of those individuals immediately responsible for obtaining the information reported herein, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and/or imprisonment.

_____ _____ _____

Printed name of Authorized Representative* Signature Date

_____ _____

Job Title* Telephone Number

*Surveys must be signed as follows: Corporations - By a principle executive officer of at least the level of Vice-President. Partnership - By a general partner. Sole Proprietorship - By the Proprietor. (Ref: CFR part 403.12(1))

Disclosure: Title 40 of the Code of Federal Regulations Part 403 Section 403.14 requires information provided in this questionnaire identifying the nature and frequency of discharge to be available to the public without restriction. Requests for confidential treatment of other information shall be governed by procedures specified in 40 CFR part 2 and applicable State Law. Should a discharge permit be required for your facility, the information in this questionnaire may be used to issue the permit.

Internal Use: Form sent on_____ Received on _____ LF Required ❑Yes ❑No

Fax: (509) 477-4715

Spokane County Environmental Services, 1026 West Broadway, Spokane, Washington, 99260-0430