SR 162 Center Turn Lane Planning and Pre-Design Study Final Report

September 2025

Washington State Department of Transportation

Olympic Region Multimodal Planning
7407 31st Avenue NE
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List of Acknowledgements

This study was a collaboration between the Washington State Department of Transportation (WSDOT) Olympic Region Multimodal Planning Office and partners, stakeholders, and local communities. Consulting tribes were invited to participate in this study. WSDOT would like to thank the following partners for their participation in the study:

Local Government
- City of Bonney Lake
- City of Orting
- City of Puyallup
- City of Sumner
- Pierce County Council
- Pierce County Emergency Management
- Pierce County Parks and Recreation
- Pierce County Planning and Public Works
- Pierce County Sheriff
- Pierce County Transportation Advisory Commission
- Orting Valley Fire Rescue

Transit Agencies
- Pierce Transit
- Sound Transit

School Districts
- Orting School District
- Sumner-Bonney Lake School District

Freight and Business Representatives
- Brookfield Properties
- City of Orting Chamber of Commerce
- Commencement Bay Corrugated
- King-Pierce Farm Bureau
- Pierce County Agricultural Advisory Commission
- Washington Rock Quarries

Community Based Organizations and Groups
- ForeverGreen Trails
- New Horizon Communities
- SR 162 Community Group
- Foothills Coalition
- Tacoma Urban League

List of Acronyms

AADT – Annual Average Daily Traffic
AASHTO - American Association of State Highway Transportation Officials
ACS - American Community Survey
ADA – Americans with Disabilities Act
AWSC – All Way Stop Control
BLTS – Bicycle Level of Traffic Stress
CMF – Crash Modification Factor
CPFD – Central Pierce Fire District
CTL – Center Turn Lane
EB - Eastbound
HSM – Highway Safety Manual
HV – Heavy Vehicle
LOS – Level of Service
LTS – Level of Traffic Stress
MOA – Memorandum of Agreement
MP – Milepost
NB - Northbound
NCHRP – National Cooperative Highway Research Program
OECR – Office of Equity and Civil Rights
OPD – Orting Police Department
PHF – Peak Hour Factor
PLTS – Pedestrian Level of Traffic Stress
PTBA - Pierce Transit Benefit Area
RAP – Rapid Action Plan
RCW – Revised Code of Washington
RDI – Route Directness Index
RIRO – Right in/right out
ROW – Right of Way
SAG – Study Advisory Group
SB - Southbound
SR – State Route
SSSC – Single Side Stop Control
STIP – Statewide Transportation Improvement Program
TIP – Transportation Improvement Program
TWLTL - Two-Way Left Turn Lanes
TWSC – Two Way Stop Control
WB - Westbound
WSDOT – Washington State Department of Transportation

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Executive Summary

Legislative Direction

The Washington State Legislature allocated, "$1,000,000 of the motor vehicle account – state appropriation is provided solely for planning and pre-design for expansion of state route number 162 from state route number 410 south to west city limits of Orting with an addition of a center turn lane to increase safety, relieve congestion, reduce collisions, and increase fire and law enforcement personnel response time to emergencies".

Study Engagement

This study used multiple means of engagement. Five meetings were held with the Study Advisory Group, one of which was in-person. Multiple meetings were held with local agencies and community groups. The study team provided information tables at two events in Orting in October 2024; and hosted an online open house, which received over 2,000 comments from the public.

Alternative Design Concepts

WSDOT considered six alternative design concepts to meet the legislative intent for the study, including:

1. Continuous Center Turn Lane and Signal Improvements with Full North Bridge Replacement
2. Continuous Center Turn Lane and Signal Improvements with New North Bike/Ped Bridge
3. Continuous Center Turn Lane and Roundabouts with New North Bike/Ped Bridge
4. Targeted Center Turn Lane and Roundabouts with New North Bike/Ped Bridge
5. Channelized Center Turn Lanes and Roundabouts with New North Bike/Ped Bridge
6. Channelized Center Turn Lanes and Roundabouts/Jug Handles with New North Bike/Ped Bridge

Recommendation

The following study recommendations include intersection control improvements, a continuous center turn lane in a portion of the corridor, access management, and new connections to an upgraded Foothills Trail. See Table 6 for more detailed information on these various improvements, which include:

- Intersection control modifications at multiple intersections in the form of right-in/right-out conversions, roundabouts, and signal timing adjustments.
- Added connections from SR 162 to the Foothills Trail.
- Upgrades to the existing Foothills Trail that align with transportation facility standards.
- Installation of a center turn lane on SR 162 from 100th Street to 149th Street with either a sidewalk or shared-use path along a portion of SR 162 for access to the Foothills Trail.
- Implementing access control using a raised median from 128th Street to 149th Street roundabout.
- Widening shoulders in spot locations where additional width is needed.

These recommendations are presented as “full build out” and “near-term” improvements. The near-term recommendations are a subset of the full build out package, delivered as smaller and less expensive, and therefore could be implemented in a shorter time frame compared to the full build out package. Additionally, the near-term recommendations would address those locations that are experiencing congestion and crashes.

The full build-out recommendation would cost approximately $109 million, while the near-term projects would cost approximately $25-37 million. Both estimates are in 2025 dollars and do not account for inflation. See Chapter 5: Recommendation and Chapter 6: Next Steps for further information on the proposed improvements.

Conclusion

The improvement recommendations can be delivered as individual projects of independent utility or as one continuous project. See Chapter 6. Next Steps for the near-term improvements list. Local jurisdictions can work with WSDOT to determine priorities for incorporating the recommendations into Pierce County Regional Council’s Regional Transportation Plan.

Chapter 1. Introduction

Study Origin

The State Route (SR) 162 Center Turn Lane (CTL) Planning and Pre-design Study is a planning level effort from Sumner to Orting (Figure 1), Milepost (MP) 0.00 to 8.11, ARM 0.00 to 5.73, to assess current and future conditions along the corridor and develop improvements to address those conditions. Improvements studied include provision of a continuous center lane, intersection upgrades, maintenance, operations, safety and the environment. The study process included gathering input from local officials and the public regarding traffic conditions they see affecting the corridor, reviewing existing regional and local comprehensive plans for planned population and employment growth, and funded transportation improvements.

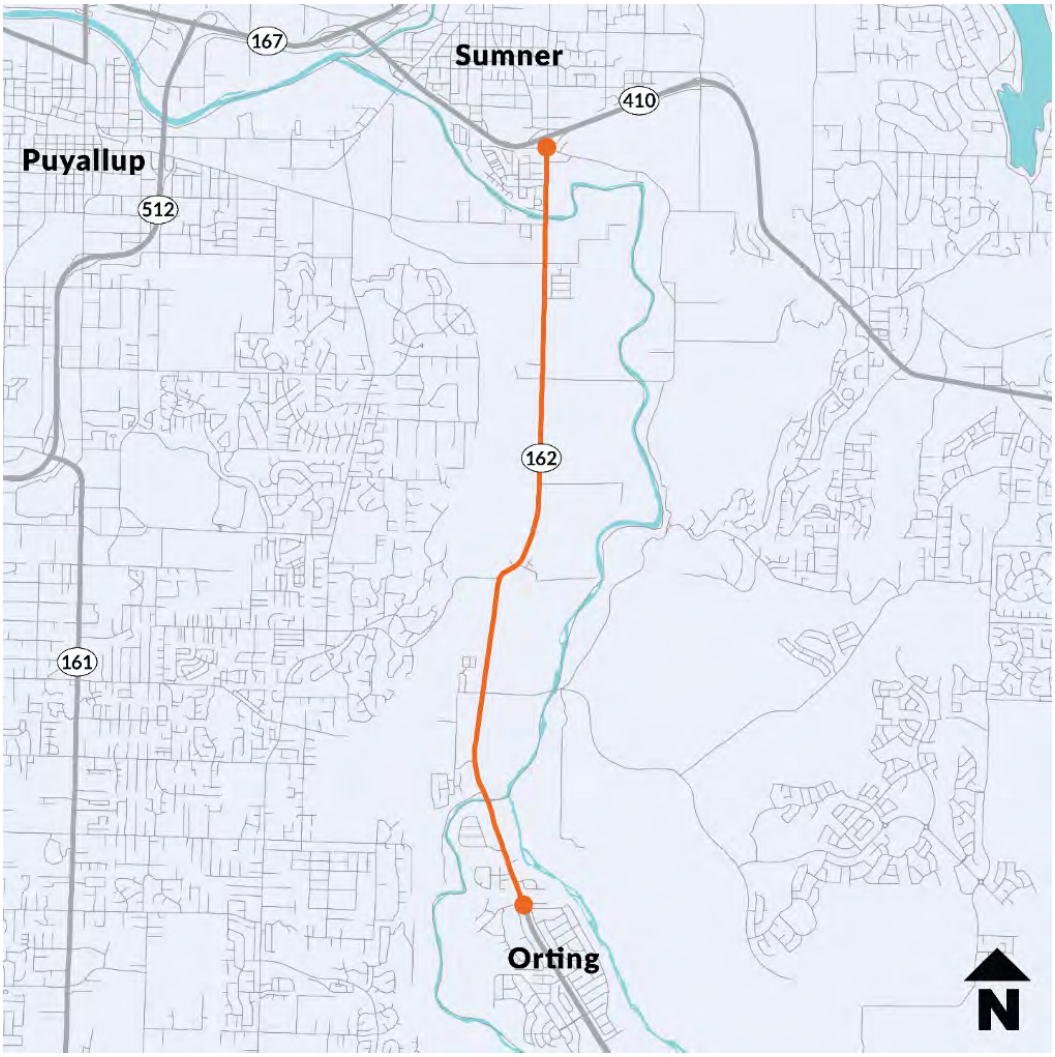

Figure 1. Vicinity Map

The Washington State Legislature assigned the amount of $1,000,000 from the motor vehicle account solely for SR 162 Center Turn Lane Planning and Pre-design Study. No design or construction funds were identified at the time of the study.

Study Purpose

SR 162 is an important north-south link through east Pierce County. It moves people and goods and connects the cities of Sumner and Orting, and the Orting Valley. Building upon the 2017 SR 162 Sumner to Orting Corridor Planning Study; and following Legislative direction this study will utilize new data and a fresh round of community engagement to develop recommendations that will help improve safety, access, mobility, and emergency response times. Recommendations published in the final study report will be used to pursue funding for design and construction.

Previous Planning Efforts

2017 SR 162 Sumner to Orting Corridor Planning Study

WSDOT conducted a study of the SR 162 Sumner to Orting corridor in 2017. The SR 162 Center Turn Lane Planning and Pre-design Study intends to be compatible with the 2017 study recommendations.
Recommendations from that study included Transportation Demand Management, intelligent transportation systems, addition of public transportation, park-and-ride lots, bicycle and pedestrian facilities, and intersection control and corridor improvements. The improvements could include roundabouts, channelization such as striping and turn lanes, and widening the existing roadway.

2018 SR 162/SR 410 Interchange Study

The 2018 study evaluated replacing the existing signalized intersections of SR 162 with the SR 410 ramps with roundabouts. The study noted a two-stage approach which would construct a single-lane roundabout in the initial stage with a latter project to both widen the roundabouts to two lanes in each direction on SR 162 and widen the bridge over SR 410 to accommodate four through lanes. The current project WSDOT has planned would be the first of these two stages. The SR 162 Center Turn Lane Study assumes roundabouts at the SR 162/SR 410 interchange.

Policy Guidance

The Pierce County Comprehensive Plan includes the following key policies which apply to the SR 162 corridor:

- TR-3.3 Prioritize transportation capacity and system improvements that consider all modes and the overall ability for the transportation system to move people and freight efficiently.
- TR-10.4 Consider access management to reduce the number of conflict points between pedestrians and vehicles, with the intention of improving pedestrian safety.
- TR-11.1 Implement Complete Streets to promote roadways that are safe and convenient for all users.

Target Zero

This study's emphasis on reducing the potential of fatal and serious injury crashes aligns with federal, state, and local policy direction.

- USDOT's National Road Safety Strategy begins with the statement: "Our priority … is to make our transportation system safe for all people".
- Washington State law prioritizes safety and preservation over all other transportation system policy goals (RCW 47.04.280).
- WSDOT's Strategic Plan points to the agency's mission to, "provide safe, reliable and cost-effective transportation options to improve communities and economic vitality for people and businesses."
- Safety is a core WSDOT value and the legislative direction to study the implementation of a center turn lane does not change this policy direction.[1]

Level of Service

The Revised Code of Washington (RCW) 47.06.140(2) requires WSDOT to set Level of Service (LOS) standards for state highways and ferry routes of statewide significance. WSDOT's threshold for acceptable LOS on SR 162 is LOS D. The study team analyzed traffic volumes and design solutions to meet this LOS standard.

Visit the online map for more about WSDOT's Level of Service standards.

Complete Streets

As of July 31, 2025, Complete Streets applies to all WSDOT projects with a cost exceeding $1,000,000. RCW 47.04.035 requires that WSDOT must "plan, design, and construct facilities providing context-sensitive solutions that contribute to network connectivity and safety ... as needed to integrate the state route into the local network". The goal of Complete Streets is for active transportation facilities to have a Level of Traffic Stress (LTS) of 2 or better. Level of Traffic Stress is a rating system that measures the perceived comfort, safety, and convenience for bicyclists and pedestrians in relation to vehicle traffic.

[1] *Per 23 U.S. Code 148 and 23 U.S. Code 407, safety data, reports, surveys, schedules, list complied or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such report, surveys, schedules, lists, or data.*

Chapter 2. Agency and Public Coordination

For more detailed information on the community engagement approach for this study, refer to Appendix E. Online Open House.

Study Engagement Goals and Outcomes

Engagement Goals

1. Identify community issues, concerns, and priorities that advance the development of the study and its recommendations by involving the public and key audiences throughout the study process.
2. Inform the public about the study, the study process, and its purpose and need.
3. Create meaningful engagement opportunities for organizations that serve overburdened communities and vulnerable populations who reside, work, or access services and commerce in the study area. Provide study information in their preferred format and tailored to their interests, creating a direct dialogue about their community's concerns.
4. Collect community input on proposed concepts through multiple methods.

Desired Engagement Outcomes

The following are the desired outcomes from the engagement effort:

- Residents and other key audiences in east Pierce County feel confident that the state government is working to improve mobility and safety performance in their communities.
- Residents and other key audiences in east Pierce County understand how their participation informed the study process and final recommendations.
- WSDOT has built and/or deepened relationships and trust with residents, community groups, and other key audiences in east Pierce County.

Community Profile

Based on 2020 census data, the approximate population within the demographic area is 74,363, with approximately 26,887 households. According to the Washington State Environmental Disparities map, the racial classification of the population of the demographic area is shown in Table 1:

Racial category	Percent
White	72.65%
Hispanic/Latino	9.39%
African American/Black	1.62%
Asian	4.04%
Multi-racial	8.43%
Identifies as another race	2.13%
American Indian/Alaska Native	1.22%
Native Hawaiian/Pacific Islander	0.51%

Table 1. Community Demographics by Race

The median household income within the demographic area is $118,111, which is higher than the Pierce County average of $91,486. According to the 2020 US Census, 4.14 percent of the population of the study area is below the federal poverty level. That level is about one-half the poverty level of the state, which is at 10 percent. The employment rate is approximately 95 percent, which is higher than the rest of Pierce County's employment rate (63 percent).

About 12 percent of individuals speak a language other than English in the home. According to the American Community Survey (ACS) 2021 data, using Public Use Microdata, the top languages spoken other than English include Spanish, Russian, Korean, Khmer, Samoan or Hawaiian, and Tagalog.

When five percent or more of a population speaks a language other than English, that flags requirements for translation and interpretation needs. Although no language meets this threshold the most spoken language other than English, Spanish, has a high enough prevalence (4.62 percent) to warrant translation. The study team translated outreach materials into Spanish to improve access to content. Organizations that serve Spanish speakers were also invited to participate in the SAG, community briefings, and interviews.

Agency Coordination

Study Advisory Group

The Study Advisory Group (SAG) consisted of community groups, local governments, and other private and public agency representatives within the study area. The group met a total of five times throughout the course of the study.

The SAG included representatives from the following agencies and communities:

- Brookfield Properties
- City of Bonney Lake
- City of Orting
- City of Puyallup
- City of Sumner

- Commencement Bay Corrugated
- ForeverGreen Trails
- Foothills Coalition
- Orting School District
- Orting Valley Fire and Rescue
- Pierce County Agricultural Advisory Commission
- Pierce County Emergency Management
- Pierce County Fire and Rescue
- Pierce County Parks
- Pierce County Sheriff's Office
- Pierce Transit
- Snowshoe Evergreen
- Sound Transit
- SR 162 Community Group
- Sumner-Bonney Lake School District
- Tacoma Urban League
- Washington Rock Quarries
- Washington State Patrol – District 1
- WSDOT Emergency Management

Meeting #1

On June 27, 2024, WSDOT, with support from consultants Fehr and Peers and S&A Communications, introduced the study to the SAG members. SAG members suggested additional groups to engage in the study and identified safety as the highest concern, specifically intersection safety, multimodal safety, emergency response times and evacuation. This meeting was held virtually.

Meeting #2

On September 24, 2024, WSDOT, with support from Fehr and Peers and S&A Communications, presented the existing corridor conditions. SAG members were concerned about whether the study's analysis would include future land use, pedestrian counts, and freight traffic patterns. Congestion, safety, emergency response, and emergency evacuation were priorities for the SAG members. This meeting was held virtually.

Meeting #3

On November 21, 2024, WSDOT, with support from Fehr and Peers and S&A Communications, presented six preliminary alternatives for the corridor. SAG members expressed concerns about whether some of the alternatives would sufficiently address congestion. The SAG members were interested in further analysis of Alternatives 1 and 2 and not proceeding with the other alternatives. This meeting was hybrid, with both in-person and video call participation.

Meeting #4

On April 30, 2025, WSDOT presented three refined alternatives for the corridor, based on feedback from the previous SAG meetings and the online open house. SAG members provided input on the refined alternatives. This meeting was held virtually.

Meeting #5

On June 25, 2025, WSDOT presented the draft final recommendation for the corridor, which incorporates the feedback and constraints discussed and analyzed over the course of the study. Additionally, the schedule for release of the draft report was reviewed. This meeting was held virtually. The study report was sent to the SAG for their review and comments.

Public Events

Two tabling events were held in October 2024. Representatives of the study team attended Red Hat Days on October 5 and the Orting Harvest Festival on October 12. The events included interaction with over 100 community members, respectively. Maps of the corridor and sticky notes for providing comments at specific locations were provided at both events.

Additionally, briefings were provided to the Pierce County Transportation Advisory Commission on September 26, 2024; and to the Orting City Council on October 9, 2024.

Figure 2. Engaging with the Community at Harvest Fest

Online Open House and Questionnaire

An online open house was conducted in November 2024 and received nearly 7,000 unique visitors. The feedback questionnaire received approximately 2,246 responses. Those responses indicated that the top challenges were:

- Congestion (85%)
- Multimodal safety (27%)
- Lack of transit (19%)
- Lack of active transportation (9%)

The issues that mattered most to the respondents were:

- Congestion (94%)
- Emergency evacuation (31%)
- Safety (28%)
- Emergency response times (18%)
- Crashes (9%)

Respondents expressed a desire for improvements at the following locations:

- Entirety of SR 162 (34%)
- SR 410 and Sumner (25%)
- Military Road East intersection (11%)
- Foothills Trail (10%)
- 128th Street intersection (9%)
- Driveways/intersections (9%)
- Farm entrances (7%)
- 149th Street intersection (6%)
- Pioneer Way E intersection (5%)

Respondents supported the following improvement ideas:

- More through lanes (59%)
- Improved turns (31%)
- Traffic signal efficiency (9%)
- New/alternative routes (6%)
- Transit (4%)
- Concurrency (4%)
- Active transportation (3%)

Over 250 respondents mentioned roundabouts in at least one of their written responses and 187 (73%) of these respondents were supportive of installing roundabouts in the SR 162 corridor.

Information Distribution

The study used a variety of information distribution methods and techniques for outreach, including WSDOT social media, website updates, emails to organizations, advisory committee notices, coordination with school districts, and media release. WSDOT used hardcopy flyers in Spanish and English, advertised the online open house at more than 20 community gathering spaces throughout the study area. Refer to Appendix E. Online Open House for more information on the online open house and questionnaire, and how that information was distributed.

Chapter 3. Corridor Context

Land Use

The land use of the study area includes a mix of farmland, rural residential, and urban residential. Future land use plans involve the urban growth areas of Sumner and Orting. The middle of the study area between Sumner and Orting is planned for largely rural future land use, including rural residential and agricultural resource land. Near the corridor there are plans for an employment-based planned community (Tehaleh).

Highway Classification

SR 162 is classified as an Urban Minor Arterial and has an annual average daily traffic (AADT) of 17,000 to 22,000 vehicles per day.

Access management is the systematic regulation of the location, spacing, design, and operation of driveway, city street, and county road connections to state highways. The study corridor has the following access management classifications:

- Full Control – SR 410 to SR 410 Eastbound off ramp (MP 0.00 to MP 0.10)
- Class 3 – SR 410 Eastbound off ramp - Pioneer Way E (MP 0.10 to 3.21)
- Class 2 – Pioneer Way E to 144th St (MP 3.21 to 7.17)
- Class 3 – South of 144th St (MP 7-17 to MP 8.11)

Class 2 (Pioneer Way E to 144th St) prioritizes mobility over access and is characterized by low-to-high travel speeds, medium-to-high volumes, typically large minimum distances between access points.

Class 3 (North of Pioneer Way E; South of 144th Street) is characterized by moderate travel speeds, moderate traffic volumes, and reasonable balance between access and mobility needs.

Existing Roadway Conditions

SR 162 between Sumner and Orting is a two-lane roadway with occasional left turn lanes at intersections and serves as the primary connecting roadway between the two cities. Most of the corridor has a posted speed limit of 50 miles per hour. The posted speed reduces to 35 miles per hour approaching Sumner to the north (MP 0–3.23) and Orting to the south (MP 8.11–8.6). Advisory speed limit changes are posted at approaches to major intersections along the corridor. There are 8 signalized intersections, 21 side-street-stop-controlled intersections, and 67 driveways along the study corridor.

The corridor has 85 private properties with driveways directly connected to the roadway, 1,024 private properties which access a side road or development which has primary or sole access to and from SR 162, and 173 private properties with access to a side road in which SR 162 is one of two or more connecting roadways.

Utilities

Puget Sound Energy transmission lines run parallel to and beside SR 162 from the SR 410 interchange southward to Military Road East. Impacts to the roadway prism to provide a center turn lane plus active transportation facilities may require relocation of portions of the transmission lines.

Emergency Response

The study team held interviews with local emergency response agencies including the Orting Police Department (OPD) and the Central Pierce Fire District (CPFD). Topics reviewed included traffic conditions they encounter during emergency responses and what improvements along the corridor could help improve emergency response times. While there is limited data regarding emergency response times, the OPD and CPFD stated that some of the major signals have pre-emption, which gives the green light to the direction of travel of the emergency vehicles. Pre-emption is not used by Washington State Patrol, but it is used by most of the local agencies in the corridor.

An average of 1.5-2.3 pre-emptions occur per day at each signal, which is typical for this type of corridor. Most pre-emption calls are northbound on SR 162. Interviews with emergency responders in the area revealed preference for wider shoulders for vehicles to pull over during emergencies, signals with pre-emption, center turn lanes, and roundabouts that are designed to accommodate their vehicles. The most challenging intersections on SR 162 for emergency responders are at 149th Street and Military Road East. National research indicates that roundabouts have no impact or a slight improvement on emergency response times, as they keep traffic flowing.

Emergency Evacuation

The City of Orting's Emergency Preparedness Plan and City of Puyallup's Emergency Management Plan direct residents to walk up and out of the area in a lahar event and to "keep the roads open and clear for emergency vehicles." Developing active transportation infrastructure will support the evacuation of low areas to high areas.

Local Plans

WSDOT's capital investment planning is built from locally adopted plans. The following Regulatory Code of Washington (RCW) citations direct WSDOT to follow this procedure. Those RCWs include:

- Local Plans, Public Transportation Plans, and WSDOT's Investment Plan consistency - RCW 47.05.030
- City Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) consistency - RCW 35.77.010
- County TIPs and STIP consistency - RCW 36.81.121
- Six Year Transit Development Plans - RCW 35.58.2795

As noted in the Transportation Element (Table 12-Y) of the 2025 Pierce County Comprehensive Plan, the preliminary engineering phase for the Military Road E widening will also include an analysis of the potential extension of 128th Street E to SR 162. This connection would impact volumes on SR 162. Pierce County policies focus on access management and transportation for all modes of travel. These policies prioritize system efficiency over expanding the system capacity, because of the major impacts expansion would have on property owners from right of way (ROW) acquisition.

The Alderton-McMillin Community Plan notes that "sidewalks are not consistent with the rural character of the community and should be discouraged," but acknowledges the benefits of paths adjacent to roadways for nonmotorized transportation. These policies apply only to county and private roads and not to state routes, such as SR 162.

The study area falls within the limits of the Alderton-McMillin Community Plan. Goal T-4 follows as it is applicable to this corridor:

- Retain existing County and private roads in their rural state. (AM T-4)
- Paved shoulders are generally preferred to sidewalks along rural roadways. (AM T-4.1)
- Sidewalks are not consistent with the rural character of the community and should be discouraged. (AM T-4.1.1)
- Consider the use of paths adjacent to roadways for nonmotorized purposes. (AM T-4.2)

Multimodal

Active Transportation Facilities

The Foothills Trail is a regionally significant separated shared-use trail system, providing 22 miles of a 12-foot-wide shared-use commuter and recreational route between the City of Puyallup and City of Buckley. The trail roughly parallels SR 162 from Military Road East south to Orting. The Foothills Trail is recognized as a destination for many users and events on weekends when there is a significant rise in use. There are two trailhead facilities in the vicinity of the highway corridor: the East Puyallup trailhead is located one mile east of the highway on 80th Street E and the McMillin Trailhead lot is adjacent to the highway at the Puyallup River Bridge at MP 6.91.

Transit

There is currently no transit service within the study area, which lies outside the Pierce Transit benefit area. Pierce Transit's draft Destination 2045 Long Range Plan would not add service to SR 162. Providing transit service along the study corridor would require both additional revenue sources to increase this level of service and expansion of the Pierce Transit service area by a vote of people living in the expansion area.

Data Collection

Current Annual Average Daily Traffic Volumes (AADT) on the SR 162 study corridor are at 22,000 vehicles. By 2044 the AADT is projected to be 26,000 vehicles. Traffic volumes and forecasts for this study were informed by Pierce County's travel demand model, PierceCast, which used the 2044 Pierce County Comprehensive Plan (Plan), effective February 1, 2025. The traffic

projections reflect the expected traffic volumes under the future conditions of the Plan's Preferred Alternative and do not include this study's recommendations. They also reflect the Plan's assumption that Pierce County will increase east/west capacity between SR 162 and SR 161 - either through widening Military Road East or extending 128th Street, now known as the Orting Valley East/West Corridor.

The Pierce County planning model was used to forecast future traffic operations. Model volumes were provided for 2018 and 2044. Those volumes were then post-processed to forecast volumes at each study intersection. The models assumed the Tehaleh connection to 128th Street and completion of the SR 167 extension. The models are based on three-lane results (one travel lane in each direction and a center turn lane).

The Plan includes capital projects identified by Pierce County to meet the demands of growth over the next six years (2024-2029) and over the next 20 years (denoted as costs additional to the six-year period, from 2030-2044). The projects listed below are relevant to the SR 162 corridor.

- 128th Street E (SR 162 to BR #7195-A) Public/private partnership to widen and connect to a new arterial roadway from SR-162 to BR #7195-A $40,000,000. See page 12-100 of the comprehensive plan.
- BR #7195-A / 128th Street E (At Puyallup River/McCutcheon Rd E): Public/private partnership to widen and connect to a new arterial roadway from the Puyallup River / McCutcheon Rd E. $40,000,000. See page 12-103 of the comprehensive plan.
- ORTING VALLEY EASTWEST CORRIDOR (122nd St E/Shaw Rd E to SR-162): Widen and reconstruct roadway to provide additional lane(s) Alternative alignments will be evaluated from Shaw Rd E to SR-162 $100,000,000. See page 12-105 of the comprehensive plan.
- PUGET SOUND GATEWAY PROGRAM (I-5 to SR 161): County portion of WSDOT project to build SR 167 from I-5 to SR 161, add lanes, an interchange at SR-161 and I-5, and ramps at Valley Avenue E, with trail and toll facilities from I-5 to SR 161; $2,000,000,000. See page 12-105 of the comprehensive plan.
- Table 12-Y List of Preferred Alternative (2044) Roadway Projects: C-5 2 Military Road E: Widen to 5 Lanes from 122nd Ave E to SR 162. $115,500,000. The preliminary engineering phase for the Military Road E widening will include an analysis of the potential extension of 128th Street E to SR 162, which is part of the Orting Valley East-West Corridor (122nd St E/Shaw Rd E to SR-162). See page 12-111 of the comprehensive plan.

On May 30, 2024, WSDOT collected turning movement counts at 13 intersections during the AM and PM peak periods, from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively. The data collected at the off-set intersections at SR 162 and 74th St E and SR 162 and 74th St Ct was considered one intersection.

The one-hour interval within the peak period with the highest vehicle counts was designated as the AM and PM peak hour for each intersection listed below.

- SR 162 and SR 410 WB Ramp (Signal)
- SR 162 and SR 410 EB Ramp (Signal)
- SR 162 and 74th St E Single Side Stop Control (SSSC)
- SR 162 and 74th St Ct (SSSC)
- SR 162 and 143rd Ave E/Rivergrove Drive E (Signal)

- SR 162 and 80th St E (SSSC)
- SR 162 and Pioneer Way E /Bowman Hilton Rd (Signal)
- SR 162 and 96th St E (Signal)
- SR 162 and Military Rd E (Signal)
- SR 162 and 128th St E (Signal)
- SR 162 and 136th St Ct E (Connecting to 142nd Ave E) (Signal)
- SR 162 and 144th St E (SSSC)
- SR 162 and 149th St Ct E (SSSC)
- SR 162 and Williams Blvd (Signal)

Safety Analysis

The most recent crash data, 2019 through 2023, was used and analyzed for this study. During this five-year period, there were a total of 400 reported crashes along the study corridor. Rear-end crashes were the most common crash type with 262 crashes (52 crashes/year) representing 65% of the total crashes. None of these rear-end crashes resulted in a fatality or suspected serious injury. During commute hours, the corridor experiences congestion with standing queues or slow-rolling traffic between the signalized intersections.

This condition can lead to stop-and-go traffic and associated rear-end crashes. Angle crashes, including the crash types “entering at angle” and “opposite direction – 1 left turn, 1 straight,” are the second most common crash type on the corridor, representing 50 crashes and 12.5% of total crashes. The study corridor has 8 signalized intersections, 21 side-street-stop-controlled intersections, and 67 driveways, each of which is a potential location where turning conflicts may result in angle crashes.

No fatal crashes were reported in the 5-year period. Four suspected serious injury crashes were reported: two run-off-the-road crashes, one sideswipe crash, and a crash involving a bicyclist.

Crashes with Active Transportation Users

Three crashes in the five-year period involved people walking and rolling, commonly referred to as active transportation users. Two crashes involving these users occurred at the intersection of State Route 162 and Williams Boulevard. The first crash occurred between 1:00PM and 2:00PM in November 2020, when a driver in a passenger car made a left turn and hit a minor walking, sustaining a possible injury. The second crash occurred between 10:00PM and 11:00PM in August 2023, when a driver in a passenger car headed straight on SR 162 hit a minor riding a bicycle, sustaining a suspected serious injury. A third crash involving a person walking occurred at the intersection of State Route 162 and 96th Street East. The crash occurred between 8:00AM and 9:00AM in August 2022, when a driver in a pickup truck made a left turn and hit the pedestrian who sustained a possible injury. See Appendix B. Safety Analysis Report for more detailed information.

Center Turn Lane

The study’s direction to consider a center turn lane involved evaluating several key factors including existing access, emergency response, and reducing crash potential.

The existing and future land uses of SR 162 between Sumner and Orting are considered in a rural context. Center turn lanes may be used where justified on a Managed Access Class 3 facility (North of Pioneer Way E; South of 144th Street) where main line traffic volumes are below 25,000 AADT (WSDOT Design Manual, 2025). The installation of a continuous center turn lane, is typically associated with an urban context with a decreased focus on mobility. Access management as described in section 3.2 does not recommend a continuous center turn lane in Managed Access Class 2, which exists between Pioneer Way E and 144th Street.

A process known as "The Predictive Method" was used to evaluate reductions in crash potential and corridor safety. The Predictive Method is a core component of the American Association of State Highway Transportation Officials (AASHTO) Highway Safety Manual, (HSM 2010). This manual is used for estimating the safety performance of existing and planned scenarios. Safety is generally expressed as the average crash frequency (crashes per year). The Predictive Method considers vehicle and pedestrian volumes, and roadway and roadside characteristics.

The analysis identified two findings: [2]

- The corridor experiences fewer crashes than similar facilities.
- Implementation of a continuous center turn lane would not measurably improve safety performance in the corridor.

The options evaluated are shown in the Table 2.

[2] An additional center turn lane, traffic control changes, and access management options were evaluated in the study. The Federal Highway Administration Crash Modification Factor (CMF) Clearinghouse provides summaries of available crash modification factors that quantify the anticipated effects of a particular infrastructure change on safety performance. A crash modification factor is used to calculate the anticipated number of crashes after the proposed change using the formula: (crashes before) * CMF = (crashes after)

Measure/Change	Crash Modification Factor (CMF)	CMF Applies To
Create directional median openings to allow left-turns and U-turns	0.49 (CMF ID: 1516)	All crash types, all crash severities
Install right in right out (RIRO) operations at stop-controlled intersections	0.55 (CMF ID: 9821)	All crash types and all severities
Convert stop-controlled intersections into single-lane roundabout	0.28 (CMF ID: 206)	All crash types and all severities
	0.12 (CMF ID: 210	Serious injury, minor injury, and possible injury crashes; all types
Convert signalized intersections into single or multilane roundabout	0.65 (CMF ID: 209)	All crash types and all severities
	0.26 (CMF ID: 212)	Serious injury, minor injury, and possible injury

Table 2. Roadway Design Crash Modification Factors

"Create direction median openings to allow left turns" was presented in the alternatives as channelized center turn lanes. With a CMF of 0.49 for all crash types, and all severities, the channelized center turn lane can be used at key intersections to reduce the potential of crashes on the corridor.

Chapter 4. Alternatives Development and Evaluation

Six alternatives were developed for initial evaluation based on corridor context, study goals, and input from the SAG. Those alternatives were:

a) Continuous Center Turn Lane and Signal Improvements with Full North Bridge Replacement
b) Continuous Center Turn Lane and Signal Improvements with New North Bike/Pedestrian (Ped) Bridge
c) Continuous Center Turn Lane and Roundabouts with New North Bike/Ped Bridge
d) Targeted Center Turn Lane and Roundabouts with New North Bike/Ped Bridge
e) Channelized Center Turn Lanes and Roundabouts with New North Bike/Ped Bridge
f) Channelized Center Turn Lanes and Roundabouts/Jug Handles with New North Bike/Ped Bridge

For the purposes of this study, the following distinctions have been made between the various options for a center turn lane.

A *continuous center turn lane*, sometimes known as a 'two-way left turn lane' provides a dedicated lane for the majority of the corridor allowing vehicles traveling in either direction to make left turns at virtually any access point with limited restrictions. Under normal operations, vehicles cannot use this lane for passing or through travel, although the lane may be used for such purposes by emergency vehicles. This concept has dedicated turn lanes at all signalized intersections.

A *channelized center turn lane* directs left-turning vehicles to specific intersections and driveways through the use of raised channelization, conversion of minor driveways to right in/out operation, and inclusion of turnaround points (such as roundabouts) to minimize out of direction travel. No vehicle can use this lane for passing or through travel due to the presence of raised channelization.

A *targeted center turn lane* combines elements of the other two concepts with access control approaching major intersections and driveways, combined with more permissive left-turns on/off the corridor between these major accesses. Under normal operations, vehicles cannot use this lane for passing or through travel, and usage by emergency vehicles may be limited if raised channelization is present.

Qualitative Alternatives Evaluation (Level 1)

The preliminary alternatives were evaluated against these qualitative metrics based on legislative direction:

- Improved Safety – Preliminary alternatives that included countermeasures for the specific type of crashes, were likely to reduce vehicle travel speeds in non-peak hours, or were likely to remove conflict points, were given higher scores.
- Improved Mobility – Preliminary alternatives more likely to improve vehicle operations, reduce travel time, or allow improved access along the study corridor were given higher scores.

- Improved Emergency Response – Preliminary alternatives that provide emergency signal priority or afford emergency vehicles additional passing opportunities were given higher scores.
- Feasibility – Preliminary alternatives that can easily be phased in multiple projects and are likely to avoid significant ROW and utility impacts were given higher scores.

Table 3 presents the results of the Level 1 evaluation of each alternative based on the four metrics outlined above. The performance of the alternatives within each metric is indicated by a pie chart; the more filled in the circle, the better the alternative performed for that metric.

Alternative ID	Description	Improve Safety	Improve Mobility	Improve Emergency Response	Feasibility
1	Continuous Center Turn Lane and Signal Improvements with Full North Bridge Replacement	◔	◑	◕	◔
2	Continuous Center Turn Lane and Signal Improvements with New North Bike/Ped Bridge	◔	◔	◑	◑
3	Continuous Center Turn Lane and Roundabouts with New North Bike/Ped Bridge	◑	◑	◕	◑
4	Targeted Center Turn Lane and Roundabouts with New North Bike/Ped Bridge	◑	◑	◑	◑
5	Channelized Center Turn Lanes and Roundabouts with New North Bike/Ped Bridge	◕	◑	◔	◑
6	Channelized Center Turn Lanes and Roundabouts/Jug Handles with New North Bike/Ped Bridge	◕	◕	◔	◑

Table 3. Qualitative Evaluation of Alternatives (Level 1)

Based on the Level 1 evaluation, input from the SAG, and analysis by the study team, three alternatives were developed to proceed into a more detailed evaluation. Those alternatives were:

- Alternative A: includes a continuous center turn lane, complete replacement of the Puyallup River Bridge north of 80th Street, and signal improvements. No changes with intersection control type (signalized/stop control).
- Alternative B: includes a targeted center turn lane, construction of a multiuse path bridge across the Puyallup River north of 80th Street, converts three intersections to roundabouts, and converts 80th Street to RIRO.
- Alternative C: includes a channelized center turn lane, construction of a multi-use path bridge across the Puyallup River north of 80th Street, converts five intersections to

roundabouts, restricts left turns at 74th Street and 74th Street Court, and converts 80th Street to RIRO only.

Alternative A was developed to specifically provide a continuous center turn lane the length of the study corridor to meet the legislative intent. Alternatives B and C were developed based on a more limited scope of providing an intermittent center turn lane that is more compatible with roundabouts at major intersections. Each of the alternatives included open drainage, with ditches between SR 162 and the active transportation facilities to convey runoff to drainage ponds.

An additional alternative was developed to minimize ROW impacts. This narrow cross section alternative included curb, gutter, and storm sewer rather than ditches and a continuous sidewalk on one side of the roadway.

Detailed Alternatives Evaluation (Level 2)

The Level 2 evaluation of the four refined alternatives was based on factors consistent with the legislative direction and considered trade-offs using data and information to guide toward a final recommendation.

Both Level 1 and Level 2 alternatives included roundabouts, which are designed to accommodate vehicles of all sizes, including emergency vehicles, buses, and truck and trailer combinations. The circular shape is designed to control the direction of traffic and reduce speeds to 15 to 20 mph. It also reduces the likelihood of T-bone (right angle) or head-on collisions, reducing the crash potential when compared to stop sign and signal-controlled locations.[3]

The existing SR 162 bridge over the Puyallup River north of 80th Street does not provide adequate active transportation facilities or the capability of widening to accommodate such facilities. Therefore, all alternatives included a new bridge across the Puyallup River. Alternatives with a continuous center lane included complete replacement of the bridge with a new structure which would include both a center turn lane and active transportation facilities. The other alternatives included only construction of an active transportation bridge; the existing bridge would remain to carry vehicular traffic.

One of the metrics noted for Level 2 analysis was congestion delay which is measured as LOS. Table 5 displays the intersections analyzed for LOS along the study corridor. This analysis was performed in both the AM and PM peak hours for existing conditions and a future no-build scenario (2044 traffic volume) for the three Level 2 alternatives.

[3] https://wsdot.wa.gov/travel/traffic-safety-methods/roundabouts

Study Intersection	Existing (2024)		No Build (2044)		Future Year (2044)	
	AM	PM	AM	PM	AM	PM
74th St	E	F	F	F	F	C
74th St Ct	D	F	E	F	C	C
Rivergrove Dr	A	F	B	F	B	D
80th St	C	F	C	F	B	B
Pioneer Way E	C	F	D	F	C	C
88th St	N/A	N/A	N/A	N/A	N/A	N/A
96th St	N/A	N/A	C	N/A	B	C
136th St	A	F	A	F	A	A
144th St	D	F	D	F	A	A
149th St Ct	D	F	D	F	A	A
Williams Blvd	B	F	C	F	N/A	B

Table 4. Level of Service for Intersection Improvement Recommendations

Analysis showed that each intersection could provide an improved LOS in the design year through improvements to existing traffic control signals or construction of roundabouts at intersections.

Table 5. Detailed Alternatives Evaluation Summary presents the results from the detailed evaluation of the refined alternatives. A blue arrow indicates the alternative performs higher than the existing condition. An orange arrow indicates lower performance, and a grey arrow indicates no change.

Evaluation Factors	Alt. A	Alt. B	Alt. C	Narrow Cross Section
Crash Severity	↔	↑	↑	↔
Crash Likelihood	↔	↑	↑	↔
Crash Exposure	↓	↑	↑	↓
Congestion Delay	↔	↑	↑	↔
Active Transportation Across SR 162	↑	↑	↑	↑
Emergency Response	↑	↑	↑	↑
Utility Impacts	↓	↓	↓	↓
Construction Cost	↓	↓	↓	↓
Local Plans Compatibility	↑	↑	↑	↑
Access to/from SR 162	↑	↑	↑	↑

Table 5. Detailed Alternatives Evaluation Summary

Level 2 evaluation results show that roundabouts provide better LOS than signalized or unsignalized operations, and selective use of RIRO can improve LOS in conjunction with roundabouts. Alternatives B and C performed better than Alternative A or the narrow cross section alternative. Alternatives B and C had equal or better performance rankings for all ten metrics than Alternative A or the narrow cross section alternative.

Key considerations from the Level 2 analysis include:

- 74th Street: A left turn restriction onto SR 162 will be needed in the design year if a roundabout is not provided. Vehicles seeking to go south on SR 162 will be able to make a U-turn using the roundabouts at the SR 410 interchange.
- 74th Street Court: The best level of service is gained by converting the intersection to right in/right out (RIRO) operation. Vehicles use local streets to access the Rivergrove Drive E intersection, which will provide full turning movements in either the signalized or roundabout configuration.
- 80th Street: A center turn lane at this intersection may require full replacement of the adjacent Puyallup River Bridge. In the design year, either the center turn lane must be provided or the intersection converted to RIRO operation to meet LOS requirements. Since Alternatives B and C do not replace the bridge, they both include a RIRO operation at 80th Street.
- Pioneer Way E: The LOS analysis for the Pioneer Way E roundabout for Alternatives B and C assumes diversion of left turning vehicles from 80th Street to Pioneer Way E. For both signalization and a roundabout, the existing eastbound right turn lane on Pioneer Way E remains.
- 96th Street: Providing LOS E in the PM peak hour for a signalized condition requires adding a northbound right turn lane on SR 162. Further improvement to LOS D with signalization requires widening both SR 162 and 96th Street to provide a double left turn on southbound SR 162 and a second departing lane on eastbound 96th Steet. A roundabout at 96th will need a southbound left turn lane to meet LOS requirements.

Chapter 5. Study Recommendation

The study recommendation reflects corridor context as outlined in chapter 3, local plans, community input, crash data, and traffic analysis. The recommendation focuses on solutions that help relieve congestion, reduce crash potential, and improve emergency response times.

The study recommendation is broken down into three segments along SR 162:

1. Northern Corridor Segment: SR 410 to Pioneer Way East
2. Middle Corridor Segment: Pioneer Way East to Military Road East
3. Sothern Corridor Segment: Military Road East to Williams Boulevard

Each segment includes recommendations that fall into several categories, described generally here and more specifically for each segment, later in this chapter.

Intersection Control Modifications

Roundabouts

Roundabouts are recommended along the corridor where a reduction in congestion and crash potential are needed. The roundabouts and other intersection control modifications improve congestion at the key intersections shown in Table 6.

Intersection	Existing control	Recommendation
410 N Interchange	Signal	Future project – no further action
410 S Interchange	Signal	Future project – no further action
74th St E	Unsignalized	Westbound right-in/right-out
74th St Ct	Unsignalized	Eastbound right-in/right-out
Rivergrove Drive E	Signal	Signal Timing Adjustments
80th St	Unsignalized	Eastbound right-in/right-out
Pioneer Way E	Signal	Single Lane Roundabout w/EB right
88th St	Unsignalized	Westbound right-in/right-out
96th St	Signal	Single Lane Roundabout w/SB left
Military Rd	Signal	Funded roundabout project – no further action
128th St	Signal	Funded roundabout project – no further action
136th St	Signal	Single Lane Roundabout
144th St	Unsignalized	Single Lane Roundabout
149th St Ct	Unsignalized	Single Lane Roundabout
Williams Blvd	Signal	Signal Timing Adjustments

Table 6. Major Intersection Improvement Recommendations

According to the National Cooperative Highway Research Program (NCHRP) Guide for Roundabouts, mixing roundabouts and signals along a corridor requires additional evaluation of the unique intersection control to verify the design, safety performance, and traffic operations of the entire corridor. This may include addressing the presence of a single, adjacent signal or a broader corridor that includes multiple signals that could affect the roundabout. Although this mixing only occurs at two locations in the study area, further evaluation will be completed during the design phase to optimize the signalized intersections.

Right-In/Right-Out

A RIRO operation is recommended at intersections to reduce crash potential involving left-turning vehicles. Both proposed RIRO locations have an alternative intersection for making left turns.

Signal Timing Adjustment

Revisions to signal timing are proposed at several intersections. These revisions would involve lengthening both the signal cycle length and the SR 162 arterial green time and shortening the side street green time, particularly during the PM peak hour. This would improve operations by providing a greater percentage of the green time for the primary movement, which in the PM peak hour is southbound through traffic on SR 162.

Center Turn Lane

A center turn lane was evaluated in the form of a two-way left turn lane and channelized center turn lane. While a continuous center turn lane was not recommended for the full corridor, both two-way left turn lanes and channelized turn lanes have been utilized in different segments of the corridor fitting with the unique development and existing access points along SR 162.

Puyallup River Crossing

A replacement of the Puyallup River Bridge was originally proposed to provide a continuous center turn lane along the entire study corridor. Ultimately, no bridge investments are proposed. Factors leading to this recommendation include:

a) A center turn lane does not measurably improve safety performance.
b) No turning movements exist along the bridge that would benefit from a center turn lane.
c) The bridge is in fair condition and does not need replacement.

Shoulder Widths

Shoulder width was a roadway component that received focus during the study development process. The specific width for any recommendation will need to be addressed in a project design phase. The WSDOT Design Manual provides guidance on shoulder widths and are typically 4–8 feet wide for this type of corridor. The shoulder width will depend on the intended use and does not have to be consistent through the entire corridor.

The typical sections shown in Figure 6 shows 6 feet of width for widening associated with a center turn lane and 8 feet of total shoulder width (inside shoulder plus outside shoulder) for widening in areas with a proposed raised median for access management.

Access Management

Access management helps maintain the carrying capacity of highways and improve safety performance along a corridor. The installation of a raised median at two-way stop-control side streets and driveways uses a physical barrier to restrict left turns onto SR 162, thereby reducing crash potential and maintaining corridor capacity. Pairing this recommendation with closely spaced roundabouts to provide opportunities for U-turns, helps reduce out-of-direction travel. Physical barriers can be designed as mountable to allow emergency service vehicles to navigate, if necessary.

Stormwater Management

Stormwater management refers to how rainfall is directed off the roadway to adequate drainage and treatment facilities. This treatment can occur either at a roadside bioswale or by using curb and gutter to convey through a piped system. WSDOT generally prefers to treat stormwater using a bioswale which may require purchase of ROW rather than curb and gutter, due to associated long-term maintenance requirements.

Complete Streets

Coordination with the SAG highlighted the local community's desire to utilize the Foothills Trail as a transportation facility, in part, to meet the Complete Streets requirement. While the Foothills Trail corresponds with the design features of a shared use path, some upgrades are needed. The full extent of these upgrades would be determined as part of individual projects. The Washington State Department of Transportation's Design Manual, Section 110.04(6) states, "If a project is subject to Complete Streets, based on the established screening process, the Complete Streets need must be met within the state highway ROW unless one of the two conditions outlined in this section is met:

- The original state highway transportation scope, as approved by the Legislature, addresses Complete Streets outside the existing ROW.
- An existing or funded local agency pedestrian or bicycle facility meeting Level of Traffic Stress (LTS) 2 or better, exists in a nearby corridor."

These two conditions provide the opportunity to integrate an upgraded Foothills Trail as a recommendation from this study. An upgraded Foothills Trail with improved access points was characterized as a feasible approach for meeting the SR 162 Complete Streets need south of Pioneer Way E.

The Foothills Trail would need some physical upgrades due to changes in design standards over time. Some examples include trail lighting, detectable warning surfaces and other American Disability Act (ADA) requirements, signage, and access. Access to the Foothills Trail will need to be provided approximately every half-mile from SR 162. This study does not identify the exact locations of these access points which will likely require the purchase of private property rights.

"Contractual upgrades" describes the legal logistics for the State to use the Foothills Trail as a transportation facility. These upgrades could include maintenance agreements from the current owner, Pierce County Parks. Other contractual upgrades include any property rights needed for access or other physical upgrades.

Northern Corridor Segment: SR 410 to Pioneer Way East

Intersections Right-in Right-out

This study recommends the following intersections for improvements using a RIRO modification.

- 74th Street Court: The best level of service is gained by converting the intersection to RIRO operation. Vehicles use local streets to access the Rivergrove Drive East intersection, which will provide full turning movements as a signalized intersection.
- 74th Street: A left turn restriction onto SR 162. Vehicles seeking to go south on SR 162 will be able to make a U-turn using the roundabouts at the SR 410 interchange which are scheduled to be constructed in 2026. Implementing a RIRO at 74th is tied to constructing roundabouts at the SR 410 ramp terminals to prevent significant out-of-direction travel.
- 80th Street: Converting the intersection to a RIRO operation is a safety improvement to the intersection. On-going development along 80th street could require mitigation to this intersection and this recommendation is non-restrictive to any future developer mitigation. Implementing a RIRO at 80th is tied to improvements at Pioneer Way E to prevent significant out of direction travel. See Chapter 6: Next Steps for more implementation considerations.

Roundabouts

A single lane roundabout with an eastbound right turn lane is recommended at the Pioneer Way E intersection. This roundabout configuration helps with the significant number of eastbound right turns from eastbound Pioneer Way E onto southbound SR 162 as shown in Figure 3.

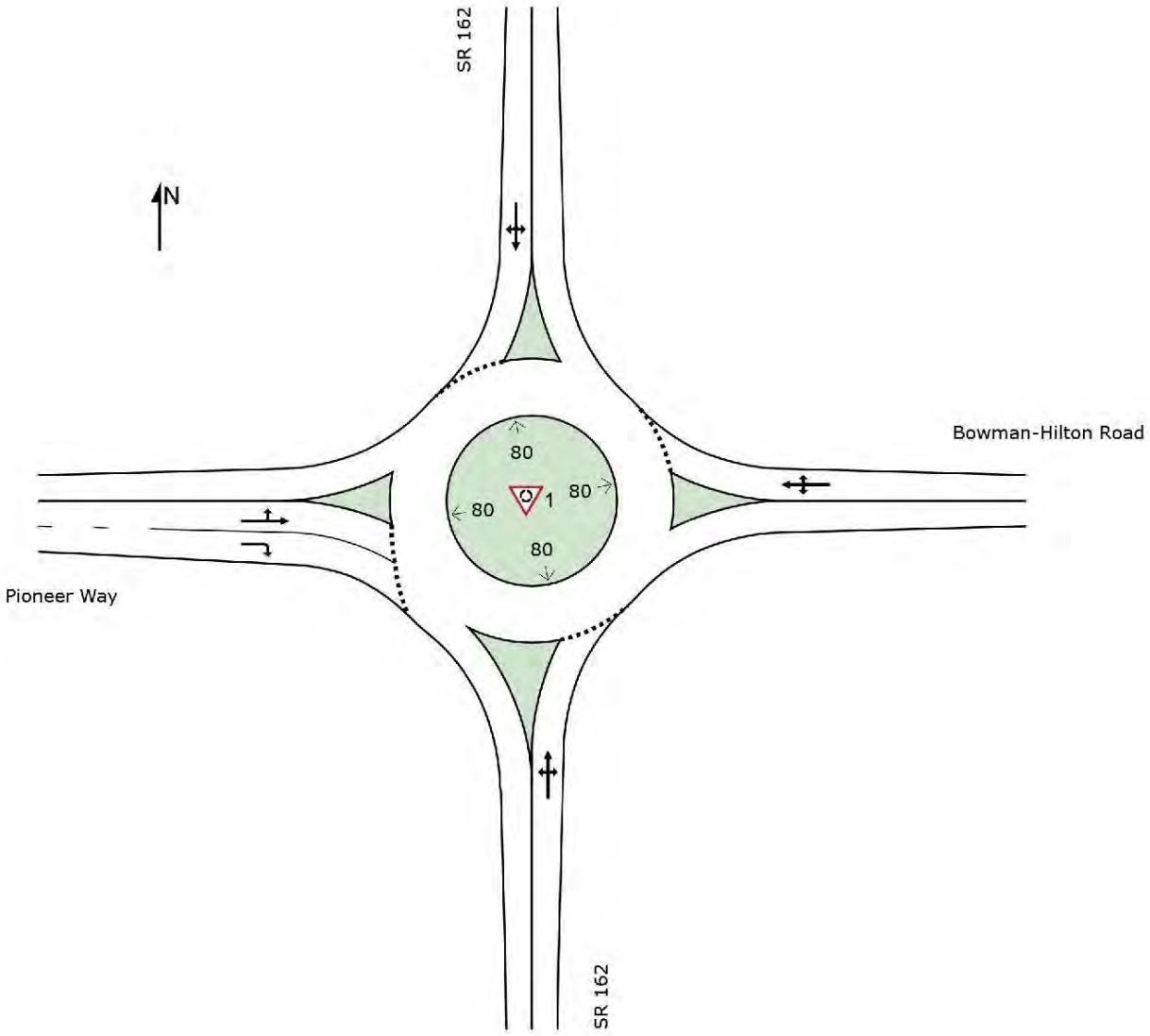

Figure 3. Pioneer Way E Roundabout Configuration

Center Turn Lane

The SR 162 corridor has an existing center turn lane that begins at the SR 410 eastbound off ramp and ends at the Rivergrove Drive E intersection. The existing center turn lane in this segment will remain but may be modified at 74th Street and 74th Street Court because of the recommended improvements. Paired with the proposed improvements at several access points along SR 162 (between Rivergrove Drive E and Pioneer Way E) and this study's focus on reducing crash potential, a center turn lane is not proposed for this segment of SR 162. See the Center Turn Lane section of Chapter 3. Corridor Context for additional context on the center turn lane evaluation.

Complete Streets

This study does not recommend improvements in the segment between SR 410 and Pioneer Way E. Complete Streets requirements will be screened for future projects in this area to comply with

providing multimodal facilities and to address active transportation gaps. Complete Streets will need to be addressed at the spot improvements of the recommended intersection improvements listed above. A Foothills Trail connection is proposed along Pioneer Way E to provide access to the Foothills Trial, serving as the Complete Streets facility south of Pioneer Way E.

If applicable, an individual intersection improvement project will develop Complete Streets solutions consistent with design guidance. Complete Streets screenings will be used during project inception to determine applicability based on the cost and location of the intersection improvement.

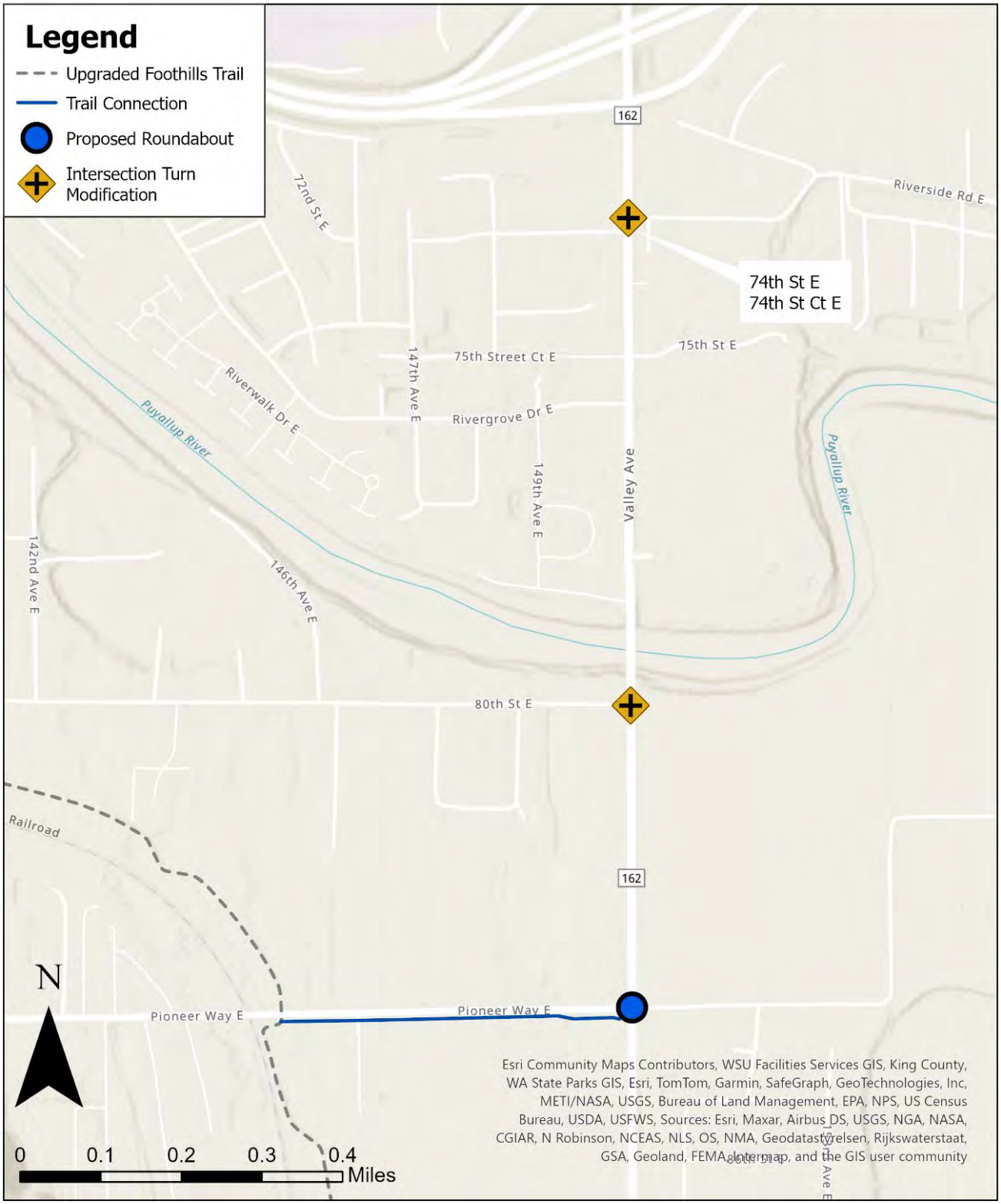

Figure 4. Northern Corridor Segment: State Route 410 to Pioneer Way E Recommendation

Middle Corridor Segment: Pioneer Way East to Military Road East

An existing continuous center turn lane extending south of Pioneer Way E to 88th Street would be converted to a channelized center turn lane. Additionally, 87th Street would be converted to a right in/right out intersection. The residents of Summer View have access to Pioneer Way E intersection via Bowman Hilton Road.

Roundabouts

A single lane roundabout with a southbound left turn lane would be installed at the 96th Street intersection. This roundabout configuration helps with the significant number of southbound left turns from SR 162 onto eastbound 96th Street. Left-turning vehicles can be separated from the other traffic for the southbound direction, which increases the efficiency of the roundabout. It targets where a single lane roundabout would begin to see delay and congestion and provides a solution targeting the predominant travel paths for the intersection.

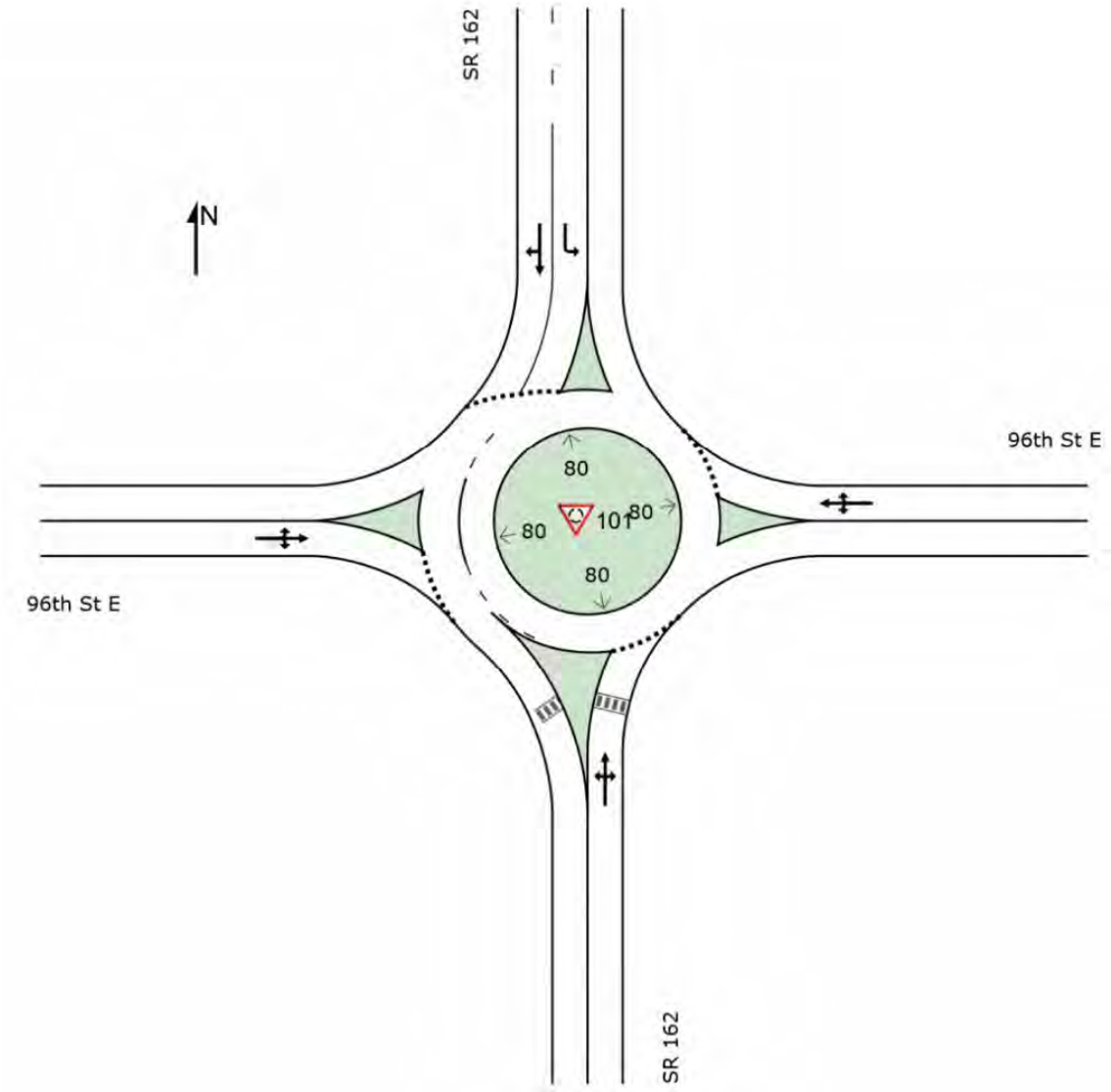

Figure 5. Single-Lane Roundabout with a Southbound Left Turn Lane

The Military Road East intersection is subject to developer mitigation negotiations and therefore is not included within the recommended improvements. Improvements to Military Road East are also included in the Pierce County Transportation Improvement Plan (Military RD E/122 St E – Shaw Rd E to SR-162).

Center Turn Lane

A continuous center turn lane is recommended from 100th Street to Military Road East. As previously mentioned, a center turn lane does not match the road classification for this rural area but due to the unique mixture of pocket residential developments and businesses, a center turn lane could improve congestion by removing left turning vehicles from the through lane. While a restrictive median was considered, due to the spacing between legal U-turns, it would require extended out of direction travel for existing access points. Figure 6 shows the widths associated with the center turn lane widening. There are sidewalk/shared use paths associated within this segment of road between Pioneer Way E and Military Road East that are not shown on the typical, see Appendix D. Complete Streets for locations of active transportation facilities.

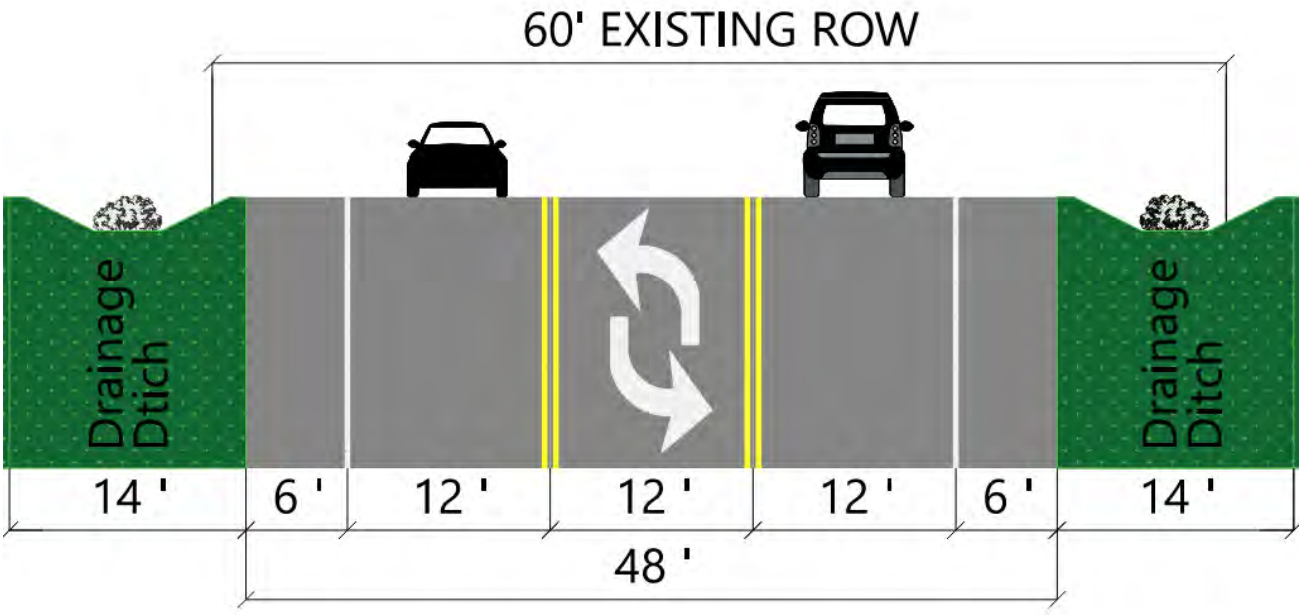

Figure 6. Center Turn Lane Typical Section

Complete Streets

Community input guided the study's recommendation to utilize the existing Foothills Trail as a transportation facility. The Foothills Trail between Pioneer Way E and Military Road East is located approximately 1,000 feet parallel with SR 162. New Foothills Trail access connections are needed approximately every half mile. Connections between crosswalks and the trail will require ROW and access permits for any connection crossing the short line railroad alongside the trail.

In addition to trail connections, sidewalk and/or a shared use path are proposed in spot locations along SR 162 to provide clustered residential developments (along the east side of SR 162) access

to the Foothills Trail. For consistency with the Alderton-McMillin Community Plan, these sidewalks and shared use paths should be asphalt.

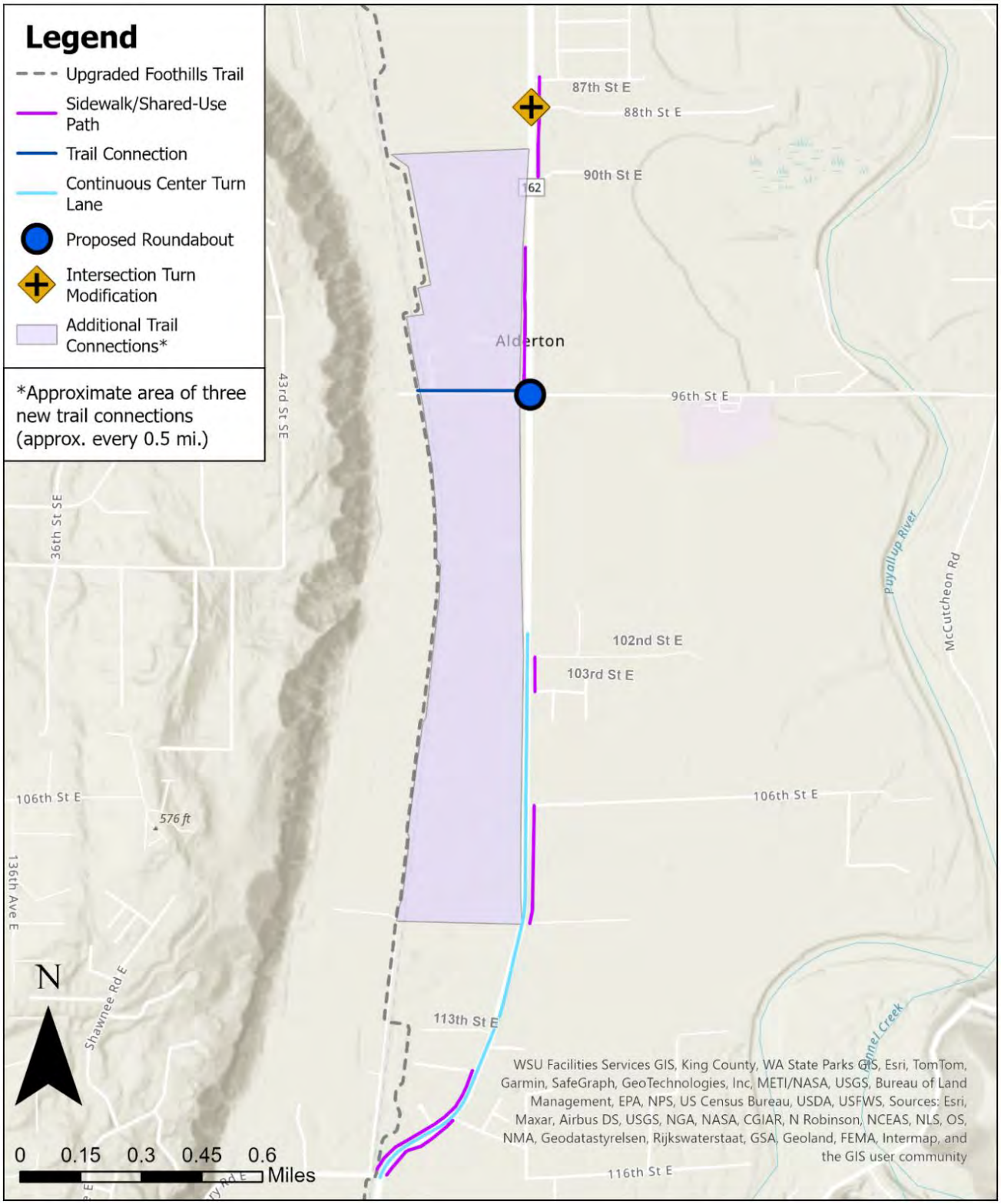

Figure 7. Middle Corridor Segment: Pioneer Way E to Military Road East Recommendation

Southern Corridor Segment: South of Military Road East

The Military Road E to 128th Street segment on SR 162, including the intersections of Military Road East and 128th Street are subject to developer mitigation and Pierce County plans. This study evaluated short-term improvements to the Military Road E intersection, but it has been determined that signal optimization has already been incorporated by modifying traffic signal timing. The long-term recommendation is dependent on planned capacity increases between SR 162 and SR 161 as specified in the Pierce County's Plan.

This study recommends that any intersection improvements be consistent with the needs generated by future local development and in alignment with the planned capacity increase between SR 162 and SR 161.

Additionally, a Memorandum of Agreement (MOA) between WSDOT and Brookfield (referred to as Nash in the agreement) states that the developer will provide a maximum of $30.99 million (2018 dollars) to pay for the design, ROW acquisition, and construction of improvements on SR 162 to mitigate the impacts of the Tehaleh Phase 2 development. A guaranteed commitment of $21.72 Million is to be used for a roundabout at SR 162 and 128th Street, and design and ROW acquisition for 4 lanes on SR 162 between 128th Street and Military Road East and a roundabout at Military Road East. A separate account of $9.27 million (2018 dollars) will fund WSDOT highway improvements that will be determined by WSDOT. These funds include inflationary increases using 3%/year and increase every January 1 starting January 1, 2020, until paid. The $9.27 Million portion of the mitigation will be adjusted as shown in section 5 of the MOA based on actual trips generated by the development. The construction for the 128th Street to Military Road East portion of the project will be after January 1, 2027.

Roundabouts

The following intersections along SR 162 are recommended to be converted to a single lane roundabout:

- SR 162 and 136th Street
- SR 162 and 144th Street
- SR 162 and 149th Street

Access Management

Access management is proposed on SR 162 between the intersections of 128th Street and 149th Street in the form of a raised median. A raised median will reduce crash potential along this portion of the corridor by removing the option for left turns. The proposed raised median, paired with the roundabout improvements at 128th St., 136th St., 144th St., and 149th St intersections gives opportunities for U-turns for residents and businesses along this segment. See Figure 8 for a typical cross section that includes the proposed sidewalk. Raised medians can be designed as mountable which allows emergency service vehicles to navigate, if necessary.

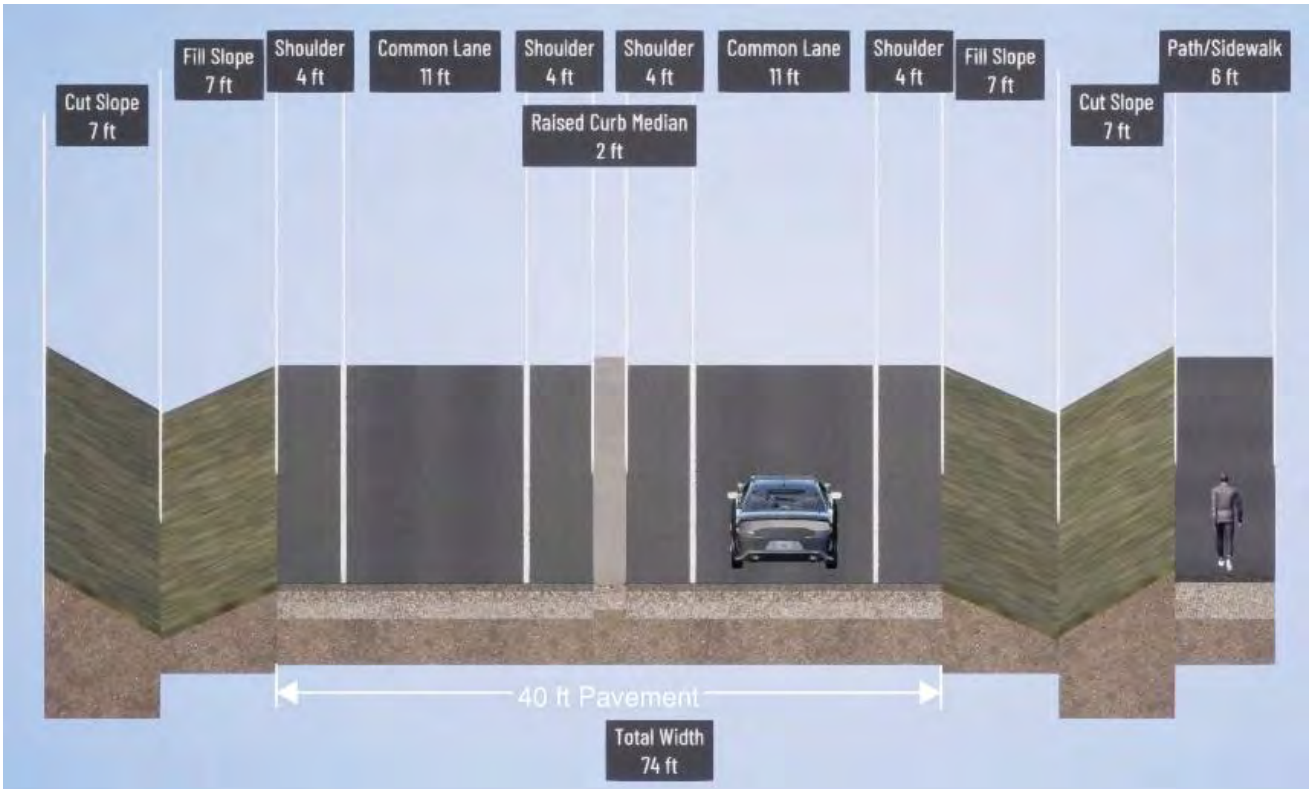

Figure 8. Typical Cross Section for Access Management (Raised Median)

Shoulder Widths

A shoulder width of 8 feet (in total) is recommended for the portion of the corridor where access management is proposed, shown in Figure 8. The 8 feet is allocated as 4 feet of inside shoulder and 4 feet of outside shoulder in both directions. The inside and outside shoulder widths will be revisited during the design phase and may be reallocated based on location-specific needs within the corridor.

Complete Streets

The Foothills Trail on the west side of SR 162 would serve as the active transportation facility within this segment. In addition, sidewalk segments would be constructed on the east side of the corridor in areas with multiple residences in close proximity, serving as a collector for active transportation users. Each section of the sidewalk would include a crosswalk across SR 162 and a connection between that crosswalk and the Foothills Trail for users to cross the roadway and access the trail. No ROW would be needed for these connections. Access permits would be needed for any crossings at the short line railroad that operates between Military Road E and 133rd Street. For consistency with the Alderton-McMillin Community Plan, these sidewalks and shared use paths should be asphalt (See Figure 9).

Figure 9. Example of Separated Paved Path/Sidewalk in Rural Context

Figure 10 shows the layout of proposed improvements within this section of SR 162 and provides a cross section of the typical layout of SR 162 between 128th Street and Williams Boulevard. Not shown in the figure is a shared use path which will be constructed on the south side of 128th Street E as part of the 128th roundabout project. That path will cross SR 162 and connect to the Foothills Trail.

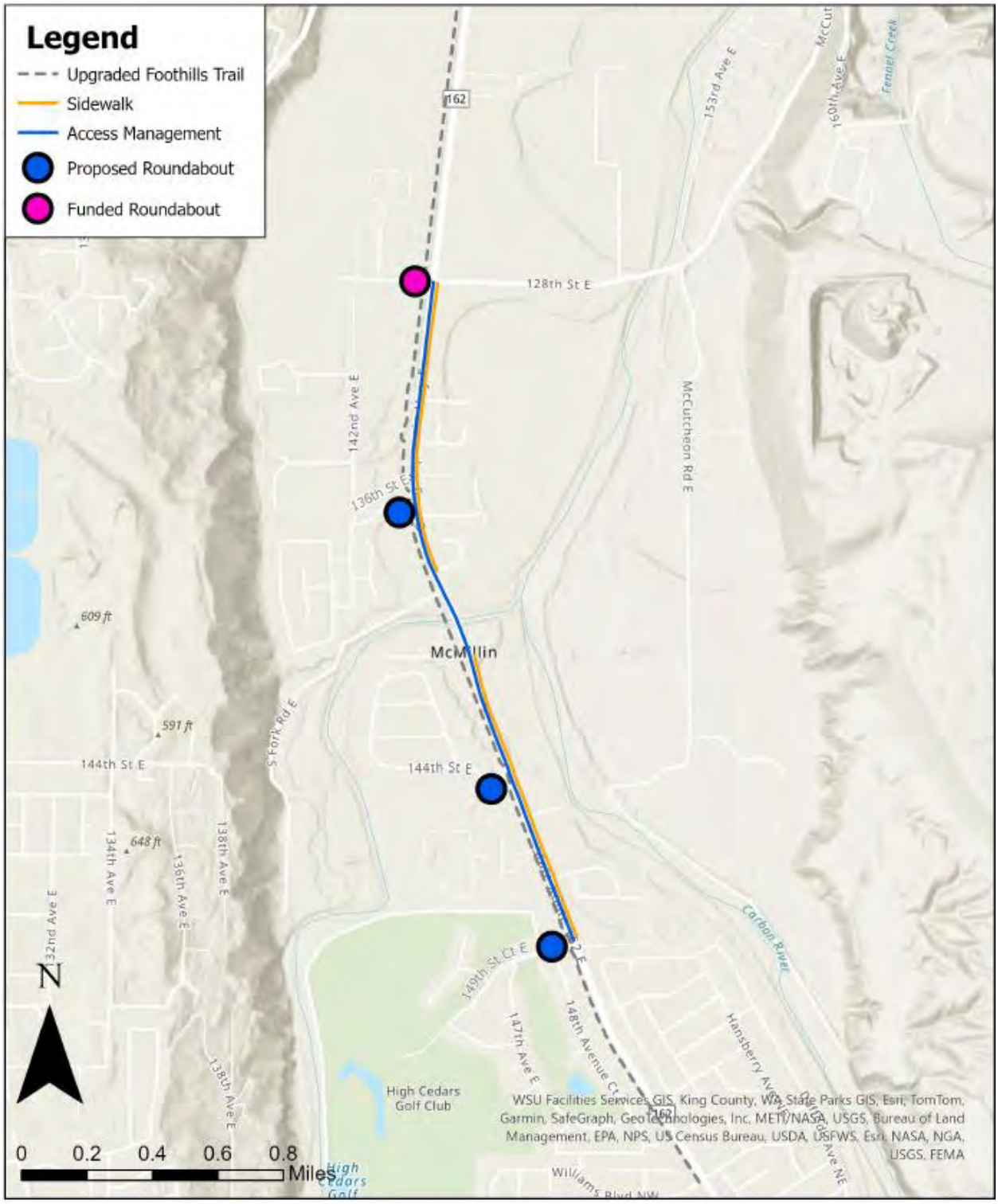

Figure 10. Southern Corridor Segment: South of Military Road East Recommendation

Cost Estimate

A summary of the recommendations at each major intersection along SR 162 is presented in Table 6.

Cost Estimate – Full Build Out

Table 7 lists the elements of the cost estimate for the full build out of the study recommendation. The estimate is a planning level estimate in 2025 dollars and does not account for inflation.

Cost Category	Cost (millions)
Roadway	$9.4
Intersections	$16.1
Stormwater and ESC	$10.7
Complete Streets	$6.4
Traffic Control	$4.5
Right of Way	$9.2
Utilities	$1.6
Project Administration	$49.5
Total Preliminary Cost Estimate	**$109.3**

Table 7. Full Build Cost Estimate

The 'Direct Construction Subtotal' includes the individual cost categories including roadway, intersections, and other work associated with those upgrades. The 'Project Administration Subtotal' includes preliminary engineering, construction engineering, design allocation, mobilization, and sales tax.

Chapter 6. Next Steps

Implementation Considerations

The evaluation of the alternatives and cost estimates developed for this study assume the improvements would be constructed as a single project. However, it is more likely that funding would be available for smaller, less expensive improvements rather than the full amount needed to implement all the recommendations as a single project.

The following points outline an approach for identifying smaller future projects:

- The RIRO restrictions at 74th Street Court could be implemented if improvements are made simultaneously at Rivergrove Drive to accommodate diverted left-turning traffic.
- The RIRO restrictions at 74th Street cannot occur until the conversion of the SR 410 ramp terminals to roundabouts.
- A conversion to RIRO operation at 80th Street cannot occur until the conversion of the Pioneer Way E intersection to a roundabout. The Pioneer Way E roundabout should be designed to accommodate vehicles from 80th Street which would be making U-turns at Pioneer Way E to go northbound on SR 162.
- The roundabouts at either 96th Street or Pioneer Way E could be packaged as separate projects.
- Consider addressing one of the proposed roundabouts at either 144th Street or 149th Street, as a near-term project and addressing the other intersection later.
- Signal upgrades could be implemented as near-term projects.

WSDOT will incorporate appropriate Complete Streets elements as part of any near-term improvement that it undertakes to SR 162. Those elements might include the connections, signage, and ADA upgrades for adjacent sections for the Foothills Trail that will serve as the long-term LTS 2 concept. The proposed roundabouts and other near-term improvements will include appropriate Complete Streets elements to be defined at a later time during each project's Pre-design project phase.

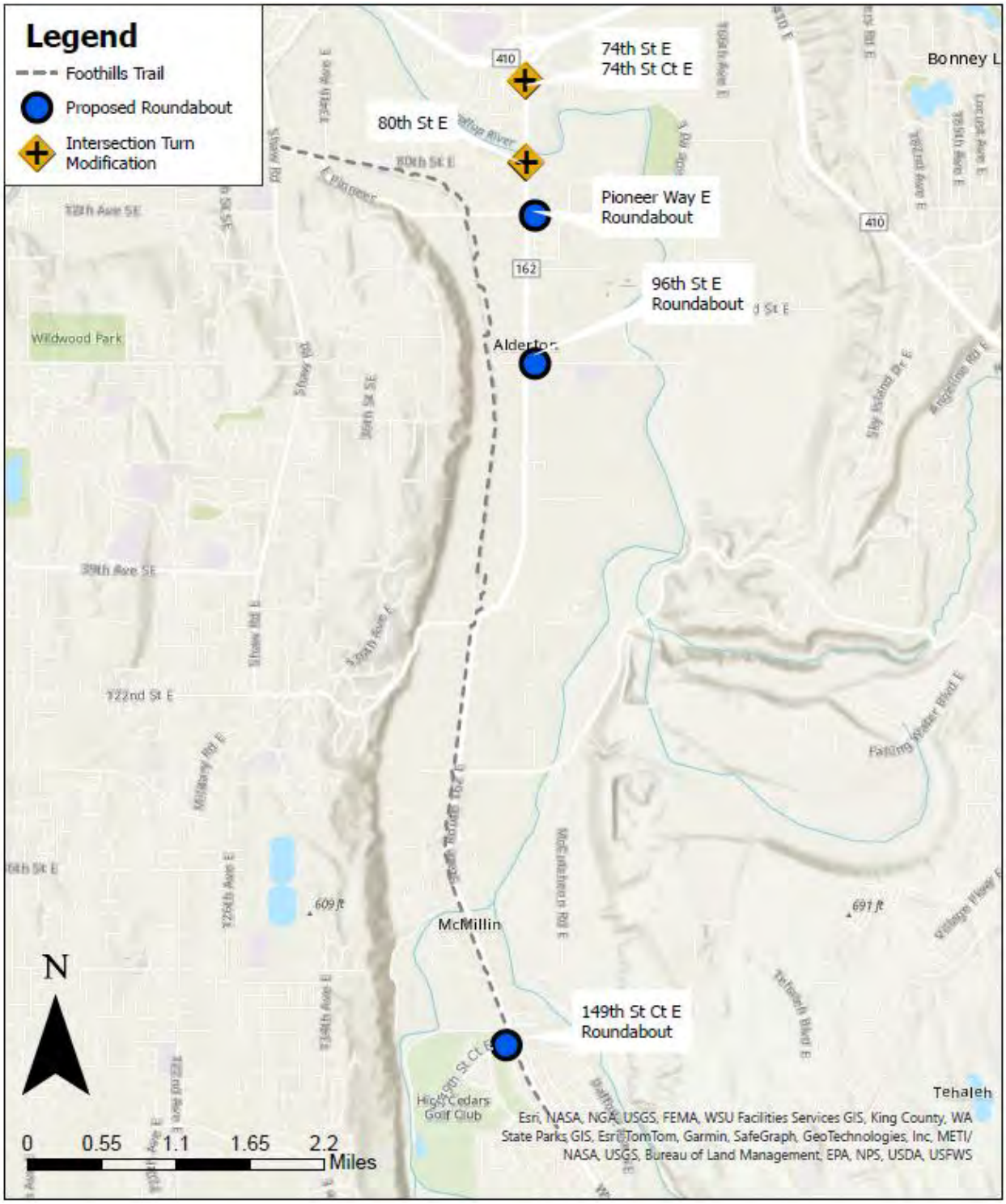

Figure 11. Near-Term Project Recommendations

Cost Estimate – Near-Term

The near-term cost estimate shows the stand-alone project cost for each intersection. The project cost includes both construction and administrative costs. At this conceptual phase, the near-term

cost estimate is given in a range to account for unknown items, risks, and contingencies. These estimates are in 2025 dollars and do not account for inflation.

Improvement	Cost Range
74th Intersection Modification	$380K - $600K
80th Intersection Modification	$360 - $540K
Pioneer Way E Roundabout	$8.8 million - $13.1 million
96th St Roundabout	$8.8 million - $13.2 million
149th St Ct Roundabout	$6.8 million - $10.2 million
Total Near-Term Cost	**$25.1 million - $37.6 million**

Table 8. Near-Term Projects Cost Estimate

Future Considerations

The following considerations should be made for future projects along the study corridor:

- Coordination will be needed between WSDOT and Pierce County Parks regarding maintenance of the Foothills Trail.
- Agreements may be needed between WSDOT, Pierce County Planning and Public Works, and Pierce County Parks regarding roadway projects which could impact the Foothills Trail.
- Use of crosswalk enhancements for visibility as discussed in the Pierce County Adopted Vision Zero Action Plan and in the Washington State Strategic Highway Safety Plan 2024 (Target Zero).
- Signage such as wayfinding, restricted parking on shoulders, and warning of slow-moving vehicles between Military Road East and 128th Street.
- The proposed Knutson Farms industrial park currently includes mitigation at the 80th Street intersection. If the development proceeds, the developer will need to provide a feasible mitigation design at 80th Street East or propose substitute mitigation.

Conclusion

The final study recommendation and associated near-term projects represent a realistic plan to address the legislative direction for this study. However, funding must still be secured to design and implement the roughly $109 million in transportation improvements recommended by this study. In addition to the capital costs of each improvement, agencies will need to identify ongoing funding for operations, maintenance, and preservation of additional infrastructure, and potentially transit service.[4]

[4] Per the state's transportation system policy goals (RCW 47.04.280), any new infrastructure must be maintained in a State of Good Repair. WSDOT estimates that maintenance costs of new infrastructure on the state highway system is about 0.5% of the total capital cost per biennial budget, or 0.25% per year. Cities, counties, and transit agencies also must maintain new infrastructure so that it has long-term value, but the costs of maintenance for these non-WSDOT facilities varies.

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Appendix A. Existing Conditions Report

Report

Date: June 2, 2025

Subject: Existing Conditions Report

Introduction and Study Area

This memorandum summarizes the existing conditions on the SR 162 corridor between Sumner and Orting which were compiled as part of the SR 162 Center Turn Lane Study. It includes the study background and purpose, summaries of previous and ongoing transportation studies and infrastructure projects in this area, demographics, crash history, and current travel patterns.

Project Purpose

State Route 162 is an important north-south link through east Pierce County. It moves people and goods and connects the cities of Sumner and Orting, and the Orting Valley. Building upon the 2017 SR 162 Sumner to Orting Corridor Planning Study; and following legislative direction this study will utilize new data and a fresh round of community engagement to develop recommendations that will help improve safety, access, mobility, and emergency response times. Recommendations published in the final study report will be used to pursue funding for design and construction.

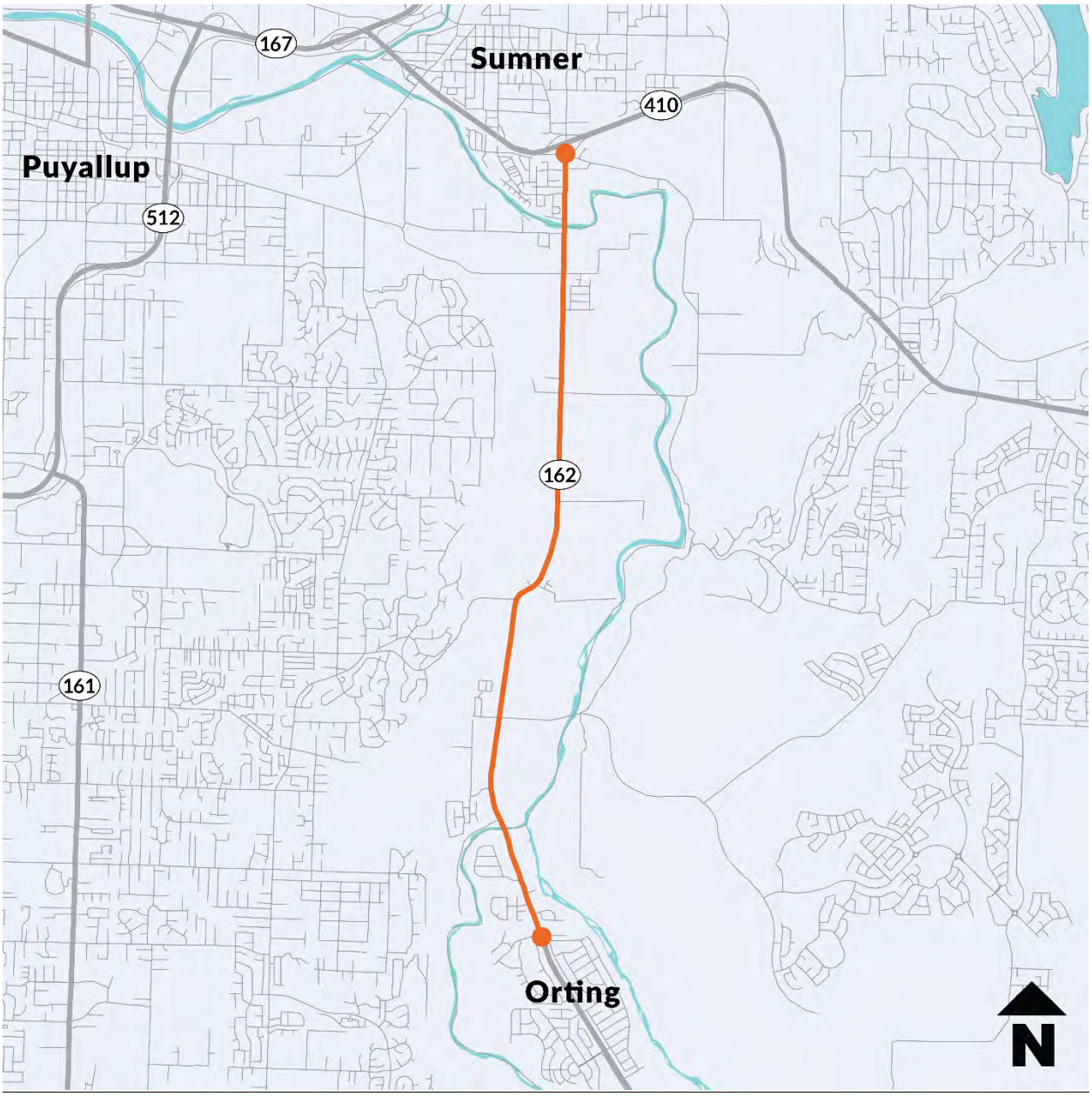


Figure 1. Main Study Area

Previous Planning Efforts

2017 – SR 162 Sumner to Orting Corridor Planning Study

WSDOT conducted a study of the SR 162 Sumner to Orting corridor in 2017. Recommendations from that study included Transportation Demand Management, intelligent transportation systems, addition of public transportation services, park-and-ride lots, bicycle and pedestrian facilities, and intersection control and corridor improvements. The improvements could include roundabouts, channelization such as striping and turn lanes, and widening the existing roadway.
The 2025 SR 162 Center Turn Lane Study is compatible with the 2017 study and builds upon the recommendations of that previous study.

2018 – SR 162/SR 410 Interchange Study

The 2018 study evaluated replacing the existing signalized intersections of SR 162 with the SR 410 ramps with roundabouts. The study noted a two-stage approach which would construct a single-lane roundabout in the initial stage with a latter project to both widen the roundabouts to two lanes in each direction on SR 162 and widen the bridge over SR 410 to accommodate four through lanes. The current project WSDOT has planned would be the first of these two stages.

The SR 162 Center Turn Lane Study assumes roundabouts at the SR 162/SR 410 interchange.

Demographic Overview

Based on 2020 census data, the approximate population within the demographic area is 74,363, with approximately 26,887 households. According to the Washington State Environmental Disparities map, the racial classification of the population of the demographic area is as follows:

Racial category	Percent
White/Caucasian	72.65%
Hispanic/Latino	9.39%
African American/Black	1.62%
Asian	4.04%
Multi-racial	8.43%
Identifies as another race	2.13%
American Indian/Alaska Native	1.22%
Native Hawaiian/Pacific Islander	0.51%

Table 1. Study Area Demographics (Delete)

Income. The median household income within the demographic area is $118,111, which is higher than the Pierce County average of $91,486. According to the 2020 US Census, 4.14 percent of the population of the study area is below the federal poverty level. That level is about one-half the poverty level of the state, which is at 10 percent.

Education. About 20.33 percent of residents aged 25 or older hold a bachelor's or graduate degree.

Employment: The employment rate is approximately 94.82 percent, which is higher than the rest of Pierce County's employment rate (63 percent).

Languages. About 12 percent of individuals speak a language other than English in the home. According to the American Community Survey 2021 data, using Public Use Microdata, the top languages spoken other than English include Spanish, Russian, Korean, Khmer, Samoan or Hawaiian, and Tagalog.

When five percent or more of a population speaks a language other than English, that flags requirements for translation and interpretation needs. Although no language met this threshold, the most spoken language other than English, Spanish, had a high enough prevalence (4.62 percent) to warrant translation. The study team translated study materials into Spanish to improve access to content.

According to the US Bureau of Labor Statistics, the two largest industries within the demographic area are educational services, health care and social assistance (7,810 full time employees) and retail trade (4,534 full time employees).

Based on data from the Washington State Health Disparities Map, most of the population in the study area relies upon driving alone to work, and there is minimal use of public transportation for commuting.

Students. Demographic analysis also examined enrollment reports from the school districts of Sumner-Bonney Lake and Orting, which both contain schools within the demographic area. There are approximately 13,276 students enrolled across the two school districts.

According to the Sumner School District, Spanish is the second most common language in the district, spoken by 4.8 percent of their students. Ukrainian is the third most common (0.91 percent) and Russian is the fourth (0.75 percent).

According to the Washington Office of Superintendent of Public Instruction, the following percentages of the student population were eligible for free or reduced school lunches in the 2018-2019 school year:

District	Percent of student population eligible
Sumner-Bonney Lake School District	27%
Orting School District	25.8%

Table 2. Student Population Eligible for Free or Reduced Lunch

Traffic Safety

Crash history from 2019 to 2023 was evaluated as part of the SR 162 CLT Study. Detailed results of this evaluation are included in the Safety Analysis. There were no fatalities during this five-year period. Data involving all serious injury and fatal crashes is displayed in Table 3.

Crash Severity Level	2019	2020	2021	2022	2023	Total
Property Damage Only Crashes	57	50	65	48	51	271
Possible Injury	23	24	13	18	21	99
Suspected Minor Injury	4	1	7	6	8	26
Suspected Serious Injury	0	0	1	0	3	4
Total	**84**	**75**	**86**	**72**	**83**	**400**

Table 3. All Serious Injury and Fatal Crashes[5]

Corridor Characteristics

SR 162 between Sumner and Orting is a two-lane arterial roadway. Two short sections of roadway currently have a center turn lane, from the SR 410 interchange to Rivergrove Drive E Drive and from Pioneer Way E to 88th Street. Multiple intersections have left turn lanes, including 96th Street, Military Road, 128th Street, 136th Street, and 146th Street.

The corridor is a mix of farms, large-lot residential housing, small-lot residential housing, and several residential parks for recreation vehicles and mobile homes. A light industrial area is located just west of the corridor and uses 136th Street as its primary access.

An evaluation was done of the residences in the vicinity of the corridor. It was determined that:

- 85 residences have driveways with direct access onto SR 162.
- 1024 residences have semi-direct access; their driveways are onto local roadways whose only direct access is via SR 162. These include residences in three mobile home parks.
- 173 residences have indirect access; their driveways are onto local roadways which connect to SR 162 but also have an alternate means of access which would not involve SR 162.

The Meeker Southern Railroad operates a spur line in the Orting Valley. The line runs parallel to and immediately adjacent to SR 162 between Military Road and 133rd Street Court. Service is light, as Commencement Bay Corrugated is the only customer south of Military Road.

The Foothills Trail is an active transportation facility which runs from Puyallup to Carbonado. In the study area, the trail is parallel to and immediately adjacent to SR 162 from Military Road southward to Orting. North of Military Road, the path turns slightly to the northwest while SR 162 shifts eastward between Military Road and 109th Street, then continues north to Sumner. Thus, between Military Road and Pioneer Way E, the distance between the trail and SR 162 increases. The trail is managed by Pierce County Parks and Recreation.

[5]*Information is from WSDOT crash data, 2019-2023.*
Under 23 U.S. Code 148 and 23 U.S. Code 407, safety data, reports, surveys, schedules, list complied or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such report, surveys, schedules, lists, or data

There are currently no active transportation facilities within the corridor itself.

There are school bus stops along SR 162 that are not specifically designated as such; and locations of these bus stops can change at the start of each school year.

SR 162 is designated as a T-2 freight route.

There are two crossings of the Puyallup River. The north crossing is approximately 30 feet wide and was constructed in 1973. The sidewalks on the north crossing are approximately 3 feet wide. The south crossing is approximately 40 feet wide and was constructed in 2015. It has no active pedestrian facilities, but is in close proximity to the Foothills Trail.

Most of the corridor is posted at 50 mph. The speed limit falls to 35 mph approaching Sumner at the north end of the corridor and approaching Orting at the south end.

Existing Transit Network

Pierce Transit

There is currently no Pierce Transit service in the study corridor. The corridor does not lie within the Pierce Transit service area.

Pierce Transit's long-range plan, Destination 2045, includes two scenarios for additional future service. Neither of these scenarios includes service on SR 162. The long-range plan notes that any expansion of the service area would require a vote by residents of those communities to rejoin the Pierce Transit Benefit Area (PTBA) through sales taxation.

Sound Transit

There is currently no Sound Transit service in the study corridor.

Sound Transit 3, the most recent set of projects for long-range improvements within the Sound Transit service area, includes a concept for Sounder rail extension from Puyallup to Orting. The concept is noted as a future investment study. The existing rail line from Puyallup to the McMillin area would be utilized for this service, with a southern terminus in the vicinity of 128th Street. Upgrades would be needed to the current rail line, owned by Meeker Southern Railroad), before passenger service can occur. There is currently no known funding or schedule for implementation.

Additional Considerations

Safety Concerns

The SR 162 corridor was evaluated using predictive modeling. It was determined that the current crash rate is comparable to what would be expected for a two-lane arterial roadway.

Future Transit Services

New transit service could help improve access currently limited by lack of transit. Such service could include shelters at transit stops.

Appendix B. Safety Analysis Report

Introduction

This report is a part of the SR 162 Center Turn Lane Planning and Pre-design Study. The study is in response to the following legislative direction:

"Planning and pre-design for expansion of State Route Number 162 from State Route Number 410 south to north city limits of Orting with an addition of a center turn lane to **reduce crashes**, relieve congestion, and improve fire and law enforcement personnel response time to emergencies."

This study's emphasis on reducing the potential of fatal and serious injury crashes aligns with federal, state, and local policy direction.

USDOT's National Road Safety Strategy begins with the statement: "Our priority … is to make our transportation system safe for all people".

Washington State law prioritizes safety and preservation over all other transportation system policy goals (RCW 47.04.280).

WSDOT's Strategic Plan points to the agency's mission to, "provide safe, reliable and cost-effective transportation options to improve communities and economic vitality for people and businesses."

Safety is a core WSDOT value and the legislative direction to study the implementation of a center turn lane does not change this policy direction. The recommendations of this study prioritize improving safety.

More information about the 2024 Target Zero Plan can be found at https://targetzero.com/
State Route 162 is an important north-south link through eastern Pierce County. It moves people and goods and connects the cities of Sumner and Orting. The study corridor is approximately five-and-a-half-mile section of SR 162 extending from the SR 410 interchange to the north and Williams Boulevard to the south. Travelers who use State Route 162 often experience delays during peak commute hours, 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, and continued development in this part of Pierce County. There are no schools or public transportation within the study corridor. The nearest school is approximately a half mile south of the study area, at approximately milepost 8.6. Additional information regarding traffic volumes can be found in Appendix C. Traffic Operations Summary of the SR 162 Center Turn Lane study report.

Safety is an important component of the SR 162 Center Turn Lane Planning and Pre-design Study. The five-year crash history of the study corridor was evaluated.
This safety analysis documents the crash history in two segments given the different roadway and land-use context. The northern segment is from the SR 410 interchange to the northern Puyallup River crossing (Milepost (MP) 0.53, just south of 78th Street Court East) and the southern segment is from the northern Puyallup River Crossing to William Boulevard North (MP 8.11). This safety analysis documents the crash history through the corridor. The northern segment is characterized by a rural to urban transition with a posted speed limit of 35 mph and existing center turn lane on some sections while the southern is characterized with rural land use, 50 mph posted speed and very few turn lanes outside of signal-controlled intersections.

All data tables in this report use 2019–2023 traffic count data from WSDOT's Engineering Datamart.

Corridor Context

The study corridor is approximately five-and-a-half-mile section of SR 162 extending from the SR 410 interchange, MP 0.0 to the north and Williams Boulevard (MP 8.11) to the south (from 74th (MP 0.17, ARM 0.17) to Williams (MP 8.11, ARM 5.73)). The corridor is in the Alderton-McMillin census-designated place. The west side of study corridor borders the City of Sumner from the SR 410 Interchange to the Puyallup River crossing (just south of 78th Street Court East) and the east side of the corridor borders the City of Orting from 150th Street East to Williams Boulevard.

SR 162 is a two-lane Urban Minor Arterial with limited segments of a two-way-center-turn-lanes or dedicated left-turn lanes. The center turn lanes or two-way left turn lanes (TWLTL) currently exist MP 0.11 – 0.31 and 0.92 – 1.14. The corridor has an AADT which ranges from 17,000 to 23,000 vehicles/day.

Figure 1. State Route 162 – Urban Minor Arterial

Most of the corridor has a posted speed limit of 50 miles per hour. The posted speed reduces to 35 miles per hour approaching Sumner to the north (MP 0-3.23) and Orting to the south (MP 8.11-8.6). Advisory speed limit changes are posted at approaches to major intersections along the corridor.

There are 8 signalized intersections, 21 side-street-stop-controlled intersections, and 67 driveways along the study corridor.

There are no existing linear dedicated pedestrian or bicycle facilities within the study corridor right-of-way. The Foothills Trail is an existing shared-use path that runs parallel to SR 162 on the west side of the corridor. It is adjacent to SR 162 south of Military Road. North of Military Road the Foothills Trail diverges from SR 162 to the west. Pedestrian and Bicycle counts for the corridor

included very low bicycle counts and low pedestrians counts. There are a significant number of crossings associated with the Foothills Trail. The PM counts between 4 PM and 6PM had approximately 22 pedestrian crossings at the intersection south of Military where the trail is adjacent to SR 162. The AM pedestrian counts for the same area were in the 4-5 range for the count period between 7 AM and 9AM.

Heavy vehicle (HV) percentages are higher on the northern part of the corridor and reduces approaching the City of Orting. Based on the counts collected, the typical HV percentage in the AM is 5-8% and 1-2% in the PM peak periods.

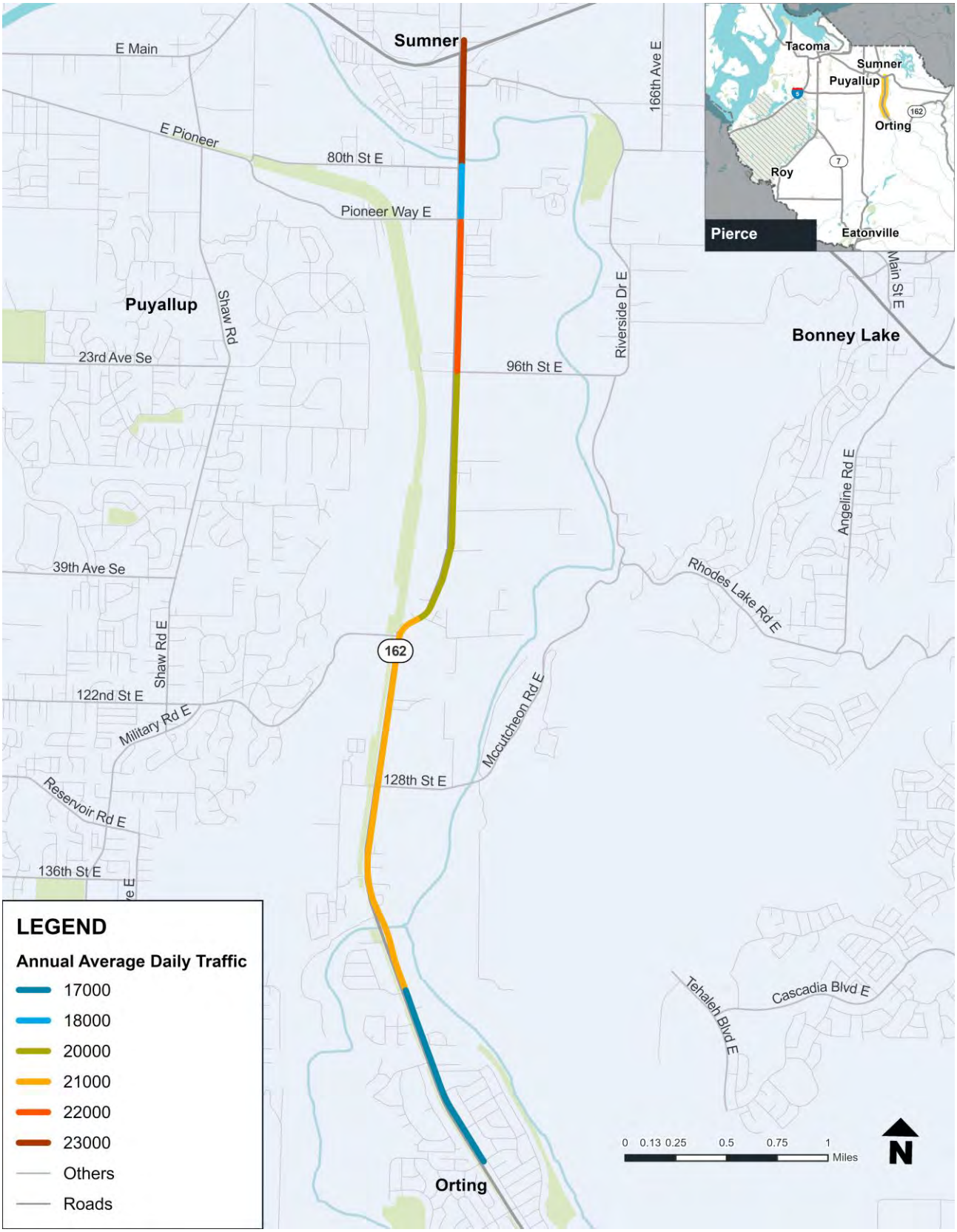


Figure 2. State Route 162 Study Corridor Annual Average Daily Traffic

Northern Section

The northern section is from MP 0.0 at the SR 410 interchange to southern boundary of the City of Sumner at the northern Puyallup River crossing (MP 0.53) (just south of 78th Street Court East). This section has one lane in each direction with four to eight-foot shoulders. There is a center turn lane between the interchange and Rivergrove Drive E (MP 0.11-0.31). The speed limit of this section is 35 miles per hour. The land use along the northern segment is primarily residential.

There are two signalized intersections in the northern section:

- State Route 410 eastbound ramp terminal intersection (MP 0.07, 0.08)
- Rivergrove Drive E (MP 0.33)

Southern Section

The southern section is from the northern Puyallup River Crossing to William Boulevard. This section has one lane in each direction with four to eight-foot shoulders. There is a center turn lane between Pioneer Way E and 88th Street East (MP 3.30-3.52). The land use along the southern section between Orting and Sumner is a mixture of low density commercial and agricultural with some residential development along the corridor. The speed limit is 50 miles per hour and reduces to 35 miles per hour at Williams Boulevard and entering the City of Orting (MP 8.11).

There are six signalized intersections in the southern section:

- Pioneer Way E/Bowman Hilton Road (milepost 3.21)
- 96th Street East (milepost 3.95)
- Military Road East (milepost 5.35)
- 128th Street East (milepost 6.11)
- 136th Street East (milepost 6.56)
- Williams Boulevard (milepost 8.11)

Historical Safety Performance

Overall

A five-year crash history was retrieved from WSDOT's statewide crash database for the years 2019 through 2023, There was a total of 400 reported crashes, which includes 129 crashes involving injuries ranging from possible injury to suspected serious injury. There were four suspected serious injury crashes and no fatal injury crashes reported in the five-year period. Table 1 shows the number of crashes by year and crash severity level.

Crash Severity Level	2019	2020	2021	2022	2023	Total
Suspected Serious Injury	0	0	1	0	3	4
Suspected Minor Injury	4	1	7	6	8	26
Possible Injury	23	24	13	18	21	99
Property Damage Only Crashes	57	50	65	48	51	271
Total	**84**	**75**	**86**	**72**	**83**	**400**

Table 1. All crashes on State Route 162 by year and crash severity level

Most crashes on the corridor occurred at the approaches to signalized intersections or minor, stop-controlled intersections. Figure 3 shows the relative density of crashes along the corridor and the locations of all fatal and serious injury crashes.

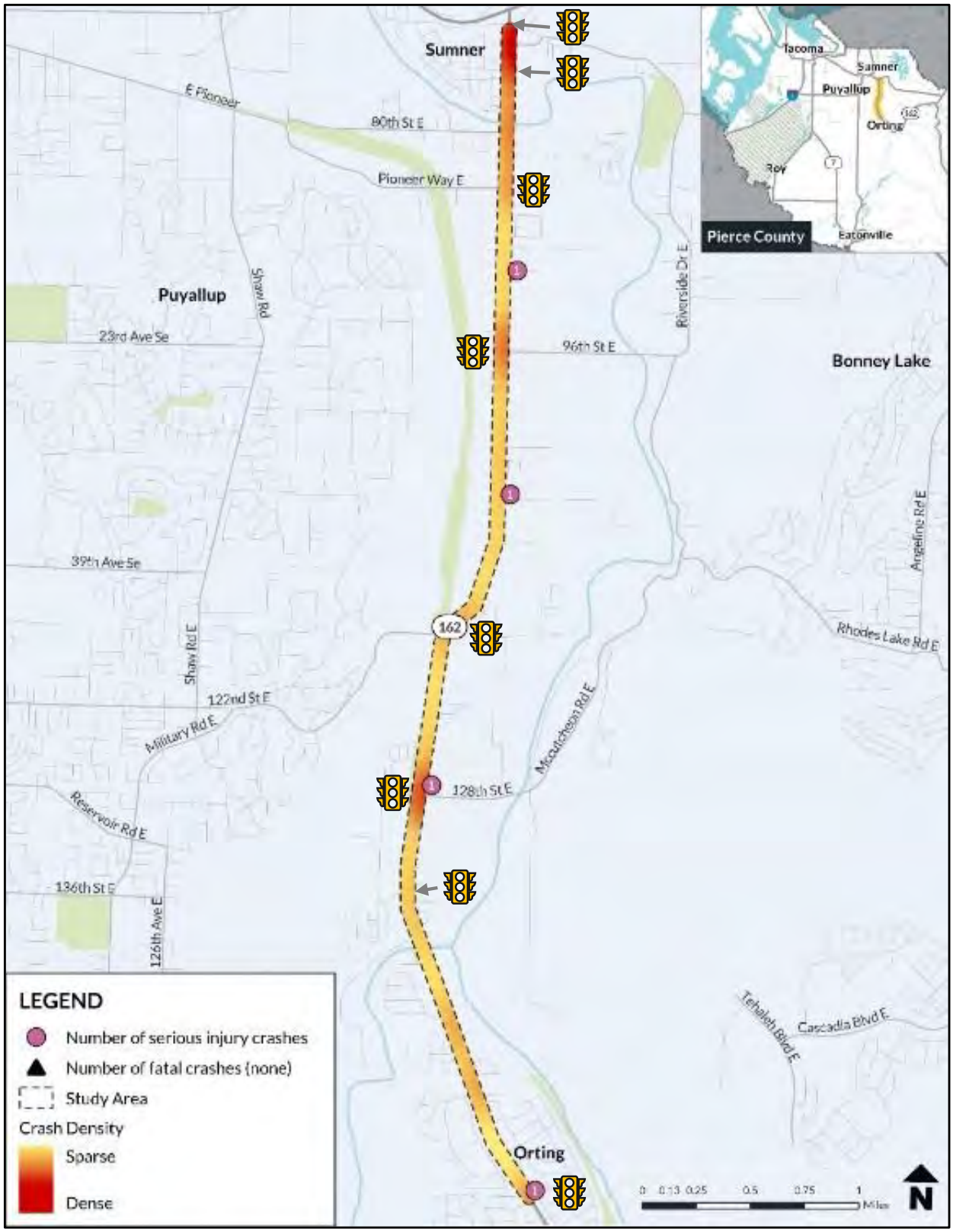


Figure 3. Heatmap of Crashes on State Route 162 from 2019 through 2023

Crash Types

No fatal crashes were reported in the 5-year time period. Four suspected serious injury crashes were reported: two run-off-the-road crashes, one sideswipe crash, and a crash involving a bicyclist.

Rear-end crashes were the most common crash type on the corridor, representing 262 crashes and 45% of total crashes from 2019 to 2023. Over the 5-year period, these rear end crashes resulted in 27 suspected minor injury crashes and 97 possible injury crashes. None of these rear-end crashes resulted in a fatal and suspected serious injury. During commute hours, the corridor experiences congestion with standing queues or slow-rolling traffic between the signalized intersections. This condition can lead to stop-and-go traffic and associated rear-end crashes.

Angle crashes, including the crash types “entering at angle” and “opposite direction – 1 left turn, 1 straight,” are the second highest occurring crash type on the corridor, representing 50 crashes and 13% of total crashes. Angle crashes resulted in the second highest number of total injuries (21) per crash type. None of these crashes resulted in a fatal and suspected serious injury. The study corridor has 8 signalized intersections, 21 side-street-stop-controlled intersections, and 67 driveways, each of which is a potential location where turning conflicts may result in angle crashes.

Crash Type	Fatal Crashes	Suspected Serious Injury Crashes	Suspected Minor Injury Crashes	Possible Injury Crashes	PDO Crashes	Total Crashes
Rear-end	0	0	15	66	181	**262**
Entering at angle	0	0	3	14	24	**41**
Run off the Road	0	2	3	3	24	**32**
Sideswipe	0	1	1	6	15	**23**
Opp Dir - 1 turning left 1 turning right	0	0	0	0	1	**1**
Opp Dir - 1 turning left 1 going straight	0	0	0	4	5	**9**
Opp Dir Head-On	0	0	1	2	1	**4**
Same Dir - Other	0	0	1	1	8	**10**
Opp Dir All Others	0	0	1	0	1	**2**
Wildlife	0	0	0	0	7	**7**
From same direction - all others	0	0	0	0	3	**3**
Vehicle overturned	0	0	1	0	1	**2**
All Other Multi vehicle	0	0	0	0	1	**1**
VEH Pedestrian	0	0	1	1	0	**2**
VEH Bicyclist	0	1	0	0	0	**1**
Total	0	**4**	**27**	**97**	**272**	**400**

Table 2. Crash Types by Crash Severity

Crash Contributing Circumstances

Table 3 summarizes the crash contributing circumstances reported for vehicle 1 in crashes over the five-year period. Following too closely was the most common contributing circumstance at 23% of the reported crashes. Exceeding a reasonable safe speed was the second most common at 15%. A crash can have multiple contributing circumstances.

Contributing Circumstance Reported for Vehicle 1	Number of crashes
Apparently Asleep or Fatigued	14
Apparently Ill	5
Did Not Grant R/W to Non Motorist	4
Did Not Grant RW to Vehicle	31
Disregard Traffic Sign and Signals	9
Distracted by Adjusting Vehicle Controls	1
Distracted by Other Occupant	3
Distractions Outside Vehicle	9
Exceeding Reas. Safe Speed	63
Exceeding Stated Speed Limit	2
Follow Too Closely	98
Improper Backing	2
Improper Passing	5
Improper Turn/Merge	11
Improper U-Turn	1
Inattention	34
Lost in Thought / Day Dreaming	2
Non Motorist on Wrong Side of Road	1
None	18
Operating Defective Equipment	10
Operating Handheld Cell Phone	9
Operating Hands-Free Cell Phone	1
Operating Recklessly or Aggressively	4
Other Contributing Circ Not Listed	13
Other Distractions	12
Other Driver Distractions Inside Vehicle	1

Contributing Circumstance Reported for Vehicle 1	Number of crashes
Over Center Line	1
Overcorrecting / Oversteering	2
Physically Impaired	1
Under Influence of Alcohol	20
Under Influence of Drugs	5
Unknown Distraction	29
Grand Total	**421**

Table 3. Crash Contributing Circumstances

Crashes with Vulnerable Users

Three crashes in the five-year period involved people walking and rolling, commonly referred to as vulnerable users. Two crashes involving these users occurred at the intersection of State Route 162 and Williams Boulevard. The first crash occurred at between 1 and 2 PM in November 2020, when a driver in a passenger car made a left turn and hit a 13-year-old walking, sustaining a possible injury. The second crash occurred between 10 and 11 PM in August 2023, when a driver in a passenger car headed straight on SR 162 and hit a 14-year-old minor riding a bicycle, sustaining a suspected serious injury. A third crash involving a person walking occurred at the intersection of State Route 162 and 96th Street East. The crash occurred between 8 and 9AM in August 2022, when a driver in a pickup truck made a left turn and hit the pedestrian who sustained a possible injury.

Northern Segment Section (Milepost 0 to 0.56)

This section examines the crash history at the intersections and segments northern segment from 2019 through 2023.section. There were 29 crashes at or related to two signalized intersections, 11 crashes at or related to two unsignalized intersections, and 47 segment related crashes.

Signalized Intersection: SR 410 On/Off Ramp (Milepost 0.07 to 0.08)

The intersection is the terminal of the eastbound SR 410 on and off-ramps. This is a 4-leg intersection, one leg is on off ramp with a left turn lane, the north leg has a left turn pocket, one leg is an on ramp, the south leg has two through lanes and a TWLTL. The speed is 35 MPH.
A total of thirteen crashes were reported at or related to this intersection over the four years, including four. Four rear-end crashes resulted in three possible injury crashes and one suspected minor injury crash.

WSDOT proposes roundabouts on each end of the State Route 162/Valley Avenue overpass in Sumner. Additional information can be found at the project webpage: SR 162 SR 410 interchange construct roundabouts.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	1	3	7	**11**
Entering at angle	0	0	0	0	1	**1**
Opposite Direction - 1 turning left 1 turning right	0	0	0	0	1	**1**
Total	0	**0**	**1**	**3**	**9**	**13**

Table 4. State Route 410 on/off ramp intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	2	1	**3**
Distraction	0	0	1	0	2	**3**
Inattention	0	0	0	0	1	**1**
Drug Impaired	0	0	0	0	1	**1**
Wet Pavement	0	0	0	0	1	**1**
Dark	**0**	0	0	1	4	**5**
Total	**0**	**0**	**1**	**3**	**10**	**14**

Table 5. State Route 410 on/off ramp intersection crashes by contributing circumstances and crash severity

Unsignalized Intersection: 74 St E/74 St Ct E (Milepost 0.17 to 0.19)

This is two offset T intersections that are side road stop controlled. Mainline is 2 through lanes and 1 TWLTL, speed is 35 MPH.

There was a total of ten crashes at or related to this intersection. Five rear-end crashes that resulted in two possible injury crashes and one suspected minor injury crash.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	1	2	2	**5**
Entering at angle	0	0	0	1	1	**2**
Sideswipe	0	0	0	0	1	**1**
Same Dir - Other	0	0	0	0	1	**1**
Vehicle overturned	0	0	1	0	0	**1**
Total	**0**	**0**	**2**	**3**	**5**	**10**

Table 6. 74th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	1	1	0	**2**
Distraction	0	0	0	0	0	**0**
Inattention	0	0	1	2	3	**6**
Alcohol Involved	0	0	0	0	0	**0**
Drug Impaired	0	0	0	0	0	**0**
Wet Pavement	0	0	1	1	0	**2**
Snow/Ice	0	0	0	0	0	**0**
Dark	0	0	1	0	0	**1**
Fog/Smoke	0	0	0	0	0	**0**
Total	0	**0**	**4**	**4**	**3**	**11**

Table 7. 74th St E intersection crashes by contributing circumstances and crash severity

Unsignalized Intersection: 75 St Ct E (Milepost 0.29)

This is a T intersection with STOP control on the minor approach. The mainline has two through lanes and one two-way left turn lanes, with a posted speed of 35 MPH.

There was one crash at or related to this intersection: a rear-end property damage only crash (no injuries). The Police Traffic Collision Report did not report any contributing circumstances to the crash.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	0	1	**1**
Total	0	**0**	**0**	**0**	**1**	**1**

Table 8. 75th St Ct E intersection crashes by type and crash severity

Signalized Intersection: Rivergrove Dr E (Milepost 0.33)

The Rivergrove Drive E intersection is a three-leg intersection providing access to a residential neighborhood. Mainline and side road both have left turn lanes, speed limit is 35 MPH.
There was a total of sixteen crashes at or related to this intersection. There were thirteen rear-end crashes and three entering-at-an-angle crashes with two resulting in possible injury.

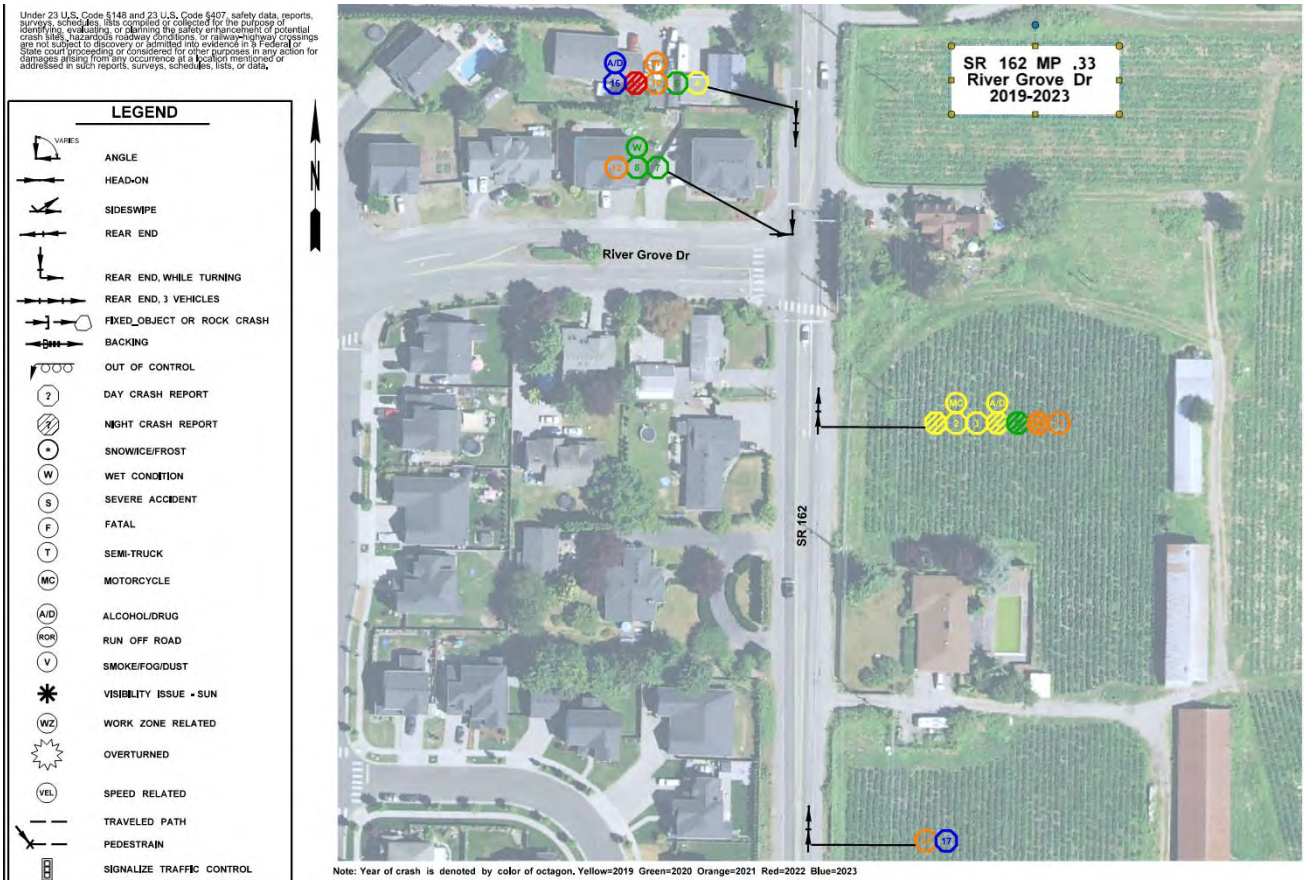


Figure 4. State Route 162 Milepost 0.33 Rivergrove Dr E Crash Diagram

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	1	12	**13**
Entering at angle	0	0	0	1	2	**3**
Total	0	**0**	**0**	**2**	**14**	**16**

Table 9. Rivergrove Dr E intersection crashes by type and crash

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	2	**2**
Alcohol Involved	0	0	0	0	1	**1**
Drug Impaired	0	0	0	0	1	**1**
Wet Pavement	0	0	0	0	2	**2**
Dark	0	0	0	0	4	**4**
Total	0	**0**	**0**	**0**	**10**	**10**

Table 10. Rivergrove Dr E intersection by contributing circumstances and crash severity

Segment-Related Crashes Within the North Section (Milepost 0.00 to 0.53)

There were 47 total segment-related crashes within the northern segment and none resulted in fatal or suspected serious injuries.

The most common crash type was rear-end crashes (41 crashes) and 32 of the 41 rear-end crashes involved drivers heading north toward the SR 410 interchange. Table 11 summarizes the crash types for all the crashes reported between signalized intersections in the northern segment.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	4	12	25	**41**
Run off the Road	0	0	0	0	3	**3**
Sideswipe	0	0	0	0	2	**2**
Opposite Direction - one turning left and 1 going straight	0	0	0	1	0	**1**
Total	**0**	**0**	**4**	**13**	**30**	**47**

Table 11. Segment Crashes with Northern Section (Milepost 0.00 to 0.53)

Contributing Circumstance	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	1	8	12	**21**
Distraction	0	0	1	0	5	**6**
Inattention	0	0	0	4	4	**8**
Alcohol Involved	0	0	1	0	1	**2**
Drug Impaired	0	0	0	0	0	**0**
Wet Pavement	0	0	0	3	7	**10**
Snow/Ice	0	0	0	0	0	**0**
Dark	0	0	1	1	4	**6**
Fog/Smoke	0	0	0	0	0	**0**
Total	**0**	**0**	**4**	**16**	**33**	**53**

Table 12. Segment Crash Contributing Circumstances within Northern Section (Milepost 0.00 to 0.53)

Southern Section (Milepost 0.56 – 8.16)

This section examines the crash history at the intersections and segments of the southern section. There were 109 reported crashes at or related to the six signalized intersections and 15 unsignalized intersections. There are 11 unsignalized intersections that had no crashes. There were 207 segment-related crashes.

Unsignalized Intersection: 80th St E (Milepost 0.58)

This is a T intersection that is side road stop controlled. No turn lanes, 35 MPH.
There was a total of ten crashes at or related to this intersection. One rear-end crash, eight entering at angel, and one fixed object that resulted in four possible injury crashes.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	0	1	**1**
Entering at angle	0	0	0	4	4	**8**
Fixed Object	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**4**	**6**	**10**

Table 13. 80th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Alcohol Involved	0	0	0	1	0	**1**
Wet Pavement	0	0	0	0	1	**1**
Dark	0	0	0	2	1	**3**
Total	**0**	**0**	**0**	**3**	**2**	**5**

Table 14. 80th St E intersection crashes by contributing circumstances and crash severity

Signalized Intersection: Pioneer Way E/Bowman Hilton Road E (Milepost 3.21)

The intersection with Pioneer Way E Each and Bowman Hilton Road East is a four-leg intersection. The east leg of Bowman Hilton Road East serves agricultural and low-density residential land use. The western leg of Pioneer Way E East is a county arterial roadway that connects users to the City of Puyallup. The mainline has left turn pockets on both legs. The speed limit is 35 MPH on Pioneer Way E East and 25 mph on Bowman Hilton Road East. The mainline speed is 50 mph.

Fourteen crashes were reported at or related to the intersection over the five years with four resulting in possible injury. This included seven rear-end crashes, three entering-at-angle crashes, and two sideswipe crashes.

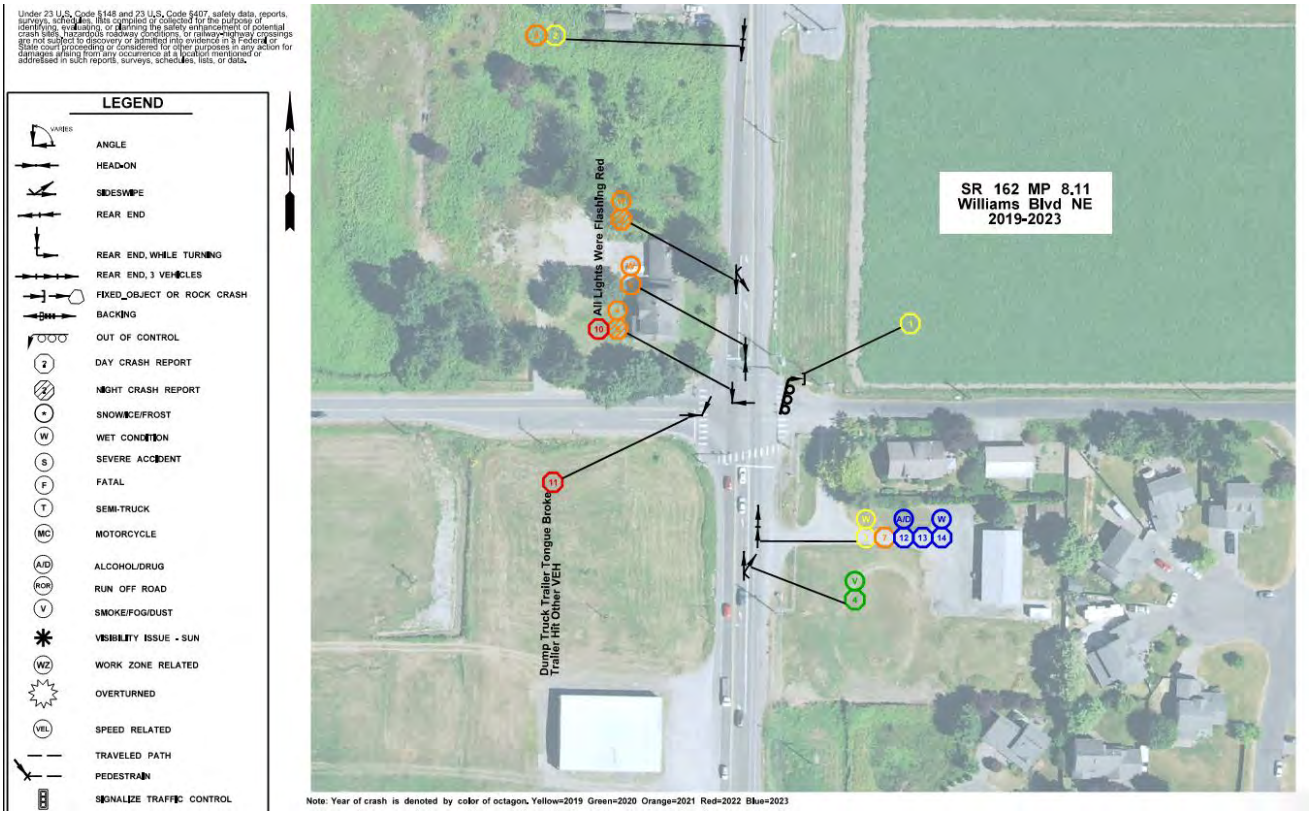


Figure 5. Crash Diagram Pioneer Way E Intersection

Signalized Intersection: 96th St E (Milepost 3.95)

The four-leg intersection of 96th Street East serves agricultural and low-density residential land use to the east and west.

There was a total of six crashes at or related to the intersection with one resulting in possible injury over the five years. There were two rear-end crashes and one entering-at-angle crash over the five years.

One crash involving a vulnerable user occurred at this intersection within five years when a driver of a pickup truck made a left turn and hit a pedestrian. The pedestrian sustained a possible injury.

Stop Controlled Intersections (Milepost 3.44 to 3.86)

Intersections 87th St Ct E (MP 3.44), 88th St E (MP 3.49), 90th St E (MP 3.61), and 94th St Ct (MP 3.86) are unsignalized T intersections that had no reported crashes over the five years. The mainline posted speed limit is 50 MPH.

Signalized Intersection 96th ST E (milepost 3.95)

The four-leg intersection of 96th Street East serves agricultural and low-density residential land use to the east and west. The mainline has left turn lanes, the posted speed limit is 50 MPH.

There was a total of ten crashes at or related to this intersection over the five years. This included six rear-end crashes, one entering at angel, one same direction 1 turning right/ 1 going straight, one fixed object, and one vehicle-pedestrian crash.

The crash involving a vulnerable user occurred at this intersection when the driver of a pickup truck made a left turn and hit a pedestrian. The pedestrian sustained a possible injury.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	1	5	**6**
Entering at angle	0	0	0	0	1	**1**
From Same Dir - one turning right and one going straight	0	0	0	0	1	**1**
Pedestrian	0	0	0	1	0	**1**
Fixed Object	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**2**	**8**	**10**

Table 15. 96th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	2	**2**
Inattention	0	0	0	0	1	**1**
Alcohol Involved	0	0	0	0	1	**1**
Wet Pavement	0	0	0	0	4	**4**
Dark	0	0	0	0	4	**5**
Total	**0**	**0**	**0**	**0**	**12**	**13**

Table 16. 96th St E intersection crashes by contributing circumstances and crash severity

Unsignalized Intersection: 102nd St E (Milepost 4.4)

Intersection 102nd St E (MP 4.4) is an unsignalized T intersection that had no reported crashes.

Unsignalized Intersection: 103rd St E (Milepost 4.45)

There was a total of two crashes at or related to this intersection. Two rear-end crashes that resulted in one possible injury crash.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	1	1	**2**
Total	**0**	**0**	**0**	**1**	**1**	**2**

Table 17. 103rd St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	1	**1**
Distraction	0	0	0	1	1	**2**
Dark	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**1**	**3**	**4**

Table 18. 103rd St E intersection crashes by contributing circumstances and crash severity

Unsignalized Intersection: 106th St E (Milepost 4.65)

This is a T intersection that has STOP control on the minor approach.

Two crashes were reported at or related to this intersection in the five years: two rear-end possible injury crashes.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	1	1	**2**
Total	**0**	**0**	**0**	**1**	**1**	**2**

Table 19. 106th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Distraction	0	0	0	1	0	**1**
Wet Pavement	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**1**	**1**	**2**

Table 20. 106th St E intersection crashes by contributing circumstances and crash severity

Intersection: 109th St E (Milepost 4.85)

Intersection 109th St E (MP 4.85) is an unsignalized T intersection with no reported crashes over the five-year period.

Unsignalized Intersection: 115th St E (Milepost 5.18)

This is a T intersection with STOP control on the minor approach. Only one crash was reported at or related to this intersection in the five years: it was an at angle property damage only crash.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Entering at angle	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**0**	**1**	**1**

Table 21. 115th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Dark	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**0**	**1**	**1**

Table 22. 115th St E intersection crashes by contributing circumstances and crash severity

Intersection: 115th Ct E (Milepost 5.24)

Intersection 115th Ct E (MP 5.24) is an unsignalized T intersection with no reported crashes over the five-year period.

Signalized Intersection: Military Road East (Milepost 5.35 to 5.36)

The three-leg intersection of Military Road East connects users with the South Hill area.

There was a total of five property damage-only crashes at or related to the intersection over the five-year period. These included three rear-end crashes and two entering-at-angle crashes.

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	2	**2**
Distraction	0	0	0	0	1	**1**
Wet Pavement	0	0	0	0	1	**1**
Dark	0	0	0	0	2	**2**
Fog/Smoke	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**0**	**7**	**7**

Table 23. Military Rd E intersection crashes by contributing circumstances and crash severity

Intersections: 121st St E (Milepost 5.67) and 122nd St E (Milepost 5.72)

Intersections 121st St E (MP 5.67) and 122 St E (MP 5.72) are an unsignalized T intersections with no reported crashes over the five-year period.

Signalized Intersection: 128th St East (Milepost 6.11)

The four-leg intersection of 128th Street East serves low-density residential and agricultural land use, connecting users with the City of Bonney Lake to the east. There was a total of twenty-one crashes at or related to the intersection over the five year period: six resulted in possible injuries and the remaining 15 were property damage only crashes.

Future plans for this intersection include conversion into a roundabout and the anticipated completion date is the first quarter of 2027.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	5	8	**13**
Entering at angle	0	0	0	1	3	**4**
Sideswipe	0	0	0	0	2	**2**
From Dir - 1 RT 1 STR	0	0	0	0	2	**2**
Total	**0**	**0**	**0**	**6**	**15**	**21**

Table 24. 128th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	5	**5**
Distraction	0	0	0	2	3	**5**
Inattention	0	0	0	0	1	**1**
Alcohol Involved	0	0	0	1	0	**1**
Wet Pavement	0	0	0	1	8	**9**
Dark	0	0	0	1	5	**6**
Fog/Smoke	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**5**	**23**	**28**

Table 25. 128th St E intersection crashes by contributing circumstances and crash severity

Signalized Intersection 136th Street East (Milepost 6.56)

The three-leg intersection of 136th Street East serves commercial businesses and a residential neighborhood. There was five rear-end crashes in the five-year period: two entering at angle, one sideswipe, two opposite direction with one turning left and one going straight, one same direction with one turning right and one going straight, and one same direction with one turning right and one going straight resulting. Four of the five crashes were possible injury crashes and one was property damage only.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	2	3	**5**
Entering at angle	0	0	0	1	1	**2**
Sideswipe	0	0	0	0	1	**1**
Opp Dir - 1 LT 1 STR	0	0	0	1	1	**2**
Same Dir - 1 RT 1 STR	0	0	0	0	1	**1**
Same Dir - 1 LT 1 ST	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**4**	**8**	**12**

Table 26. 136th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	2	**2**
Wet Pavement	0	0	0	0	3	**3**
Dark	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**0**	**6**	**6**

Table 27. 136th St E intersection crashes by contributing circumstances and crash severity

Unsignalized Intersection 135th St Ct E (Milepost 6.6)

This is a T intersection with STOP control on the minor approach. Only one crash was reported at this intersection in the five-year period. It was an at angle possible injury crash. The reporting officer recorded speeding as a contributing circumstance in the crash.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	1	0	**1**
Total	**0**	**0**	**0**	**1**	**0**	**1**

Table 28. 135th St Ct E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	1	0	**1**
Total	**0**	**0**	**0**	**1**	**0**	**1**

Table 29: 135th St Ct E intersection crashes by contributing circumstances and crash severity

Intersection: 140th St E (Milepost 6.9)

Intersection 140th ST E (MP 6.9) is an unsignalized T intersection that had no reported crashes.

Unsignalized Intersection: 144th St E (Milepost 7.17)

This is a T intersection with STOP control on the minor approach. Eleven crashes were reported at or related to the intersection: eight of these were rear-end crashes, two at angle crashes, and one sideswipe crash. Two of these crashes were possible injury crashes and the rest were property damage only.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	1	7	**8**
Entering at angle	0	0	0	1	1	**2**
Sideswipe	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**2**	**9**	**11**

Table 30. 144th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	4	**4**
Inattention	0	0	0	0	3	**3**
Wet Pavement	0	0	0	2	2	**4**
Dark	0	0	0	2	2	**4**
Total	**0**	**0**	**0**	**4**	**11**	**15**

Table 31. 144th St E intersection crashes by contributing circumstances and crash severity

Unsignalized Intersection: 145th St E (Milepost 7.27)

This is a T intersection with STOP control on the minor approach.
Only one crash, a property-damage only sideswipe crash was reported at or related to this intersection over the five-year period.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Sideswipe	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**0**	**1**	**1**

Table 32. 145th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**0**	**1**	**1**

Table 33. 145th St E intersection crashes by contributing circumstances and crash severity

Unsignalized Intersection: 146th St E (Milepost 7.33)

This is a T intersection with STOP control on the minor approach. One at angle possible injury crash was reported in the five year period. It occurred during dark lighting conditions.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Entering at angle	0	0	0	1	0	**1**
Total	**0**	**0**	**0**	**1**	**0**	**1**

Table 34. 146th St E intersection crashes by type and crash severity

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Dark	0	0	0	1	0	**1**
Total	**0**	**0**	**0**	**1**	**0**	**1**

Table 35. 146th St E intersection crashes by contributing circumstances and crash severity

Intersection: 147th St Ct E (Milepost 7.4)

Intersection 147th St Ct E (MP 7.4) is an unsignalized T intersection that had no reported crashes in the five-year period.

Unsignalized Intersection: 149th St Ct E (Milepost 7.54)

This is a T intersection that is side road stop controlled. The three-leg intersection serves as the northern access to a residential neighborhood and as access to a golf course.

There was a total of eight crashes at or related to this intersection in the five-year period. This included two rear-end crashes, five entering at angle crashes and one opposite direction one turning left one going straight crash. Two of the at-angle crashes were possible injury crashes.
There were five at angle crashes reported at the unsignalized intersection of 149th Street Court East. Four of the five crashes involved a vehicle turning left from 149th Street Court East onto State Route 162. One crash involved a vehicle making a left turn from State Route 162 onto 149th Street Court East. Two of the five crashes resulted in possible injuries.

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	0	0	2	**2**
Entering at angle	0	0	0	2	3	**5**
Opposite Direction one turning left and one going straight	0	0	0	0	1	**1**
Total	**0**	**0**	**0**	**2**	**6**	**8**

Table 36. 149th St Ct E intersection crashes by type and injury

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	1	**1**
Distraction	0	0	0	0	1	**1**
Inattention	0	0	0	0	1	**1**
Alcohol Involved	0	0	0	1	0	**1**
Wet Pavement	0	0	0	0	2	**2**
Dark	0	0	0	0	2	**2**
Total	**0**	**0**	**0**	**1**	**7**	**8**

Table 37. 149th St Ct E intersection crashes by contributing circumstances and injury

Signalized Intersection: Williams Boulevard North (Milepost 8.11)

The four-leg intersection of Williams Boulevard Northwest/Northeast serves residential neighborhoods, which can generate pedestrian and bicycle demand to cross State Route 162 and to access the Foothills Trail. Eighteen crashes were reported at the intersection: one was a suspected serious injury crash and two crashes were possible injury crashes.

Two crashes involving vulnerable users occurred at this intersection, both involving minors (aged 13 and 14). The first occurred when a driver in a passenger car made a left turn and hit a minor walking, sustaining a possible injury and the second occurred when a driver in a passenger car heading straight hit a minor riding a bicycle, sustaining a suspected serious injury. There are residential neighborhoods on both sides of SR 162 at Williams Boulevard. The nearest school is approximately a half mile to the south on SR 162.

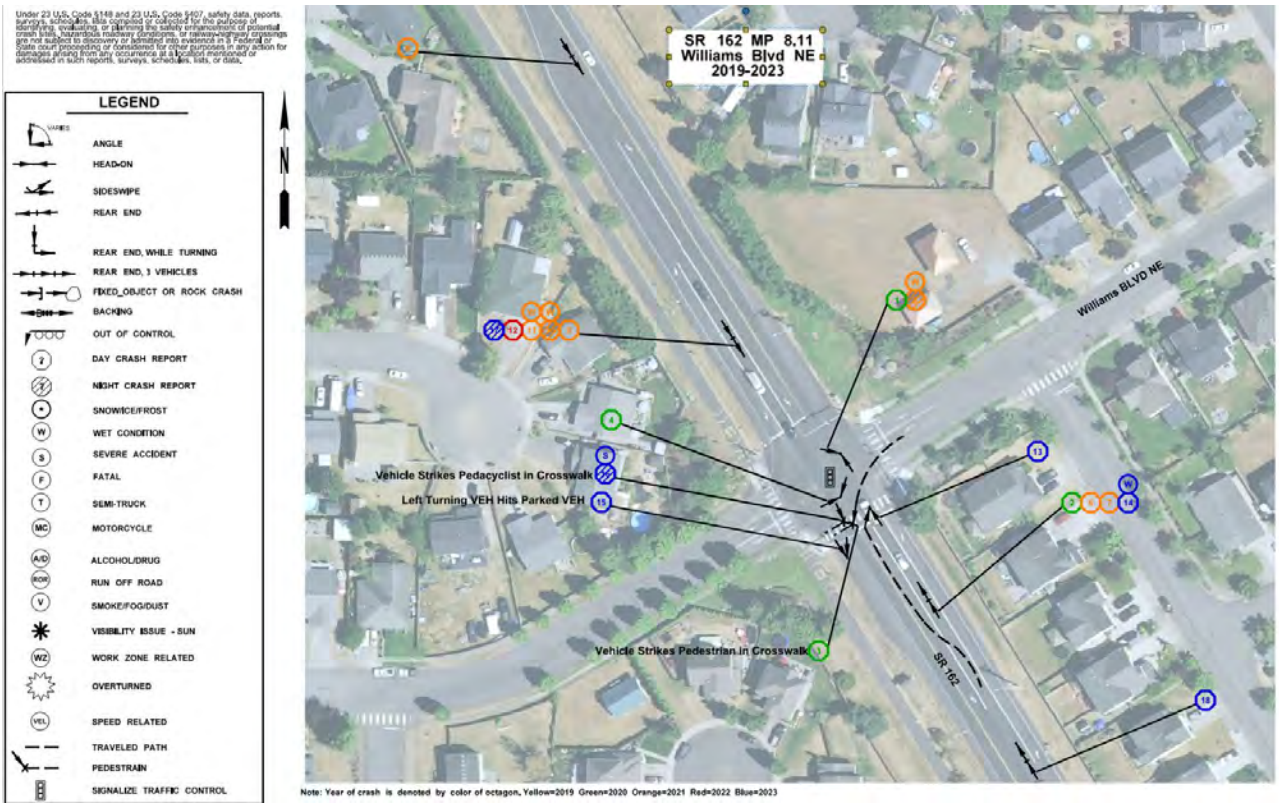


Figure 6. State Route 162 Milepost 8.11 Williams Boulevard Crash Diagram

Crash Type	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Rear-end	0	0	1	0	10	**11**
Opp Dir - 1 LT 1 STR	0	0	0	0	3	**3**
Sam Dir - 1 RT 1 ST	0	0	0	0	1	**1**
1 Parked - 1 Moving	0	0	0	1	0	**1**
Veh - Bicyclist	0	1	0		0	**1**
Veh - Pedestrian	0	0	0	1	0	**1**
Total	**0**	**1**	**1**	**2**	**14**	**18**

Table 38. Williams Blvd Northwest/Northeast intersection crashes by type and injury

Contributing Circumstances	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	0	0	1	**1**
Distraction	0	0	1	1	4	**6**
Drug Impaired	0	0	0	0	1	**1**
Wet Pavement	0	0	1	0	3	**4**
Dark	0	1	0	0	3	**4**
Total	**0**	**1**	**2**	**1**	**12**	**16**

Table 39. Williams Blvd Northwest/Northeast intersection crashes by contributing circumstances and injury

Crashes Between Signalized Intersections (milepost 0.53 to 8.16)

During the five years, 207 crashes were reported on the southern section of the corridor. This included three suspected serious injury crashes. 133 of these crashes were rear-end and these crashes occurred across the corridor in both directions with larger concentrations on the approaches to intersections. At angle crashes were the second most common: 13 crashes over the five-year period.

Three fatal and suspected serious injury crashes occurred in the south section. Two of the serious injury crashes involved motorcyclists: one crash with a vehicle and one crash with a fixed object (guardrail). Both motorcyclists were wearing helmets and aged 50 and 59 years old respectively. The third serious injury crash was a sideswipe crash when one of the drivers overcorrected.

Table 40 summarizes the contributing factors to segment crashes on the southern section (MP 0.53 to 8.16). The highest contributing factors were Dark and wet pavement followed by speed and distraction.

Contributing Circumstance	Fatal Crashes	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	PDO	Total
Speeding	0	0	6	10	18	**34**
Distraction	0	0	2	7	14	**23**
Inattention	0	0	1	6	9	**16**
Alcohol Involved	0	0	1	3	9	**13**
Drug Impaired	0	0	0	1	2	**3**
Wet Pavement	0	0	3	14	36	**53**
Snow/Ice	0	0	0	0	1	**1**
Dark	0	1	5	13	43	**62**
Fog/Smoke	0	0	0	2	4	**6**
Total	**0**	**1**	**18**	**56**	**136**	**211**

Table 40. Segment Crash contributing Circumstances within Southern Section (Milepost 0.53 to 8.16)

Countermeasures

Crash Modification Factor (CMF)

A CMF is a multiplicative factor that indicates the average proportion of crashes that would be expected after implementing a countermeasure. CMFs with a value less than 1.0 indicate an expected average decrease in crashes. CMFs greater than 1.0 indicate an expected average increase in crashes.[6] WSDOT has a "Short List" of approved CMFs for countermeasures.

[6] https://cmfclearinghouse.fhwa.dot.gov/

Measure/ change	Crash Modification Factor	CMF Applies To
Create directional median openings to allow left-turns and U-turns	0.49 (CMF ID: 1516)	All crash types, all crash severities
Signalize a two-way stop-controlled intersection (and don't add left turn lanes)	0.83 (CMF ID: 1459)	All crash types, all crash severities
	0.33 (CMF ID: 320)	Angle crashes, fatal and all injury crashes (so excluding property damage only crashes)
Signalize a two-way stop-controlled intersection and add left turn lanes	0.541 (CMF ID: 7966)	All crashes and all severities
Install right in right out operations at stop-controlled intersections	0.55 (CMF ID: 9821)	All crash types and all severities
Convert stop-controlled intersection into single-lane roundabout	0.28 (CMF ID: 206)	All crash types and all severities
	0.12 (CMF ID: 210)	Serious injury, minor injury, and possible injury crashes; all types
Convert signalized intersection into single or multilane roundabout	0.65 (CMF ID: 209)	All crash types and all severities
	0.26 (CMF ID: 212)	Serious injury, minor injury, and possible injury crashes; all types

Table 41: Selected Washinton State Department of Transportation Short List Crash Modification Factors

Based on the crashes observed, countermeasures should focus on rear end and intersection related crashes. The highest occurring crash type on the corridor is rear-end crashes at 45% of the crashes, followed by angle crashes at 13%. The 4 crash types resulting in serious injuries did not have similarities. 2 of the 4 involved motorcyclist and were not related to an intersection. One motorcyclist had an unknown distract and hit a guardrail. One motorcyclist sideswiped a motor vehicle. One of the 4 serious injuries was a bicyclist that did not grant the right of way to a vehicle at Williams Blvd intersection. One of the 4 serious injuries involved two motor vehicles traveling in the opposite direction. One driver ran of the road to the right, hit a utility box and overcorrected sending them over the centerline and the other motor vehicle.

Three crashes involving vulnerable users, two of which involved minors (aged 13 and 14), occurred at intersections on the study corridor. People walking and rolling are more likely to suffer severe injuries in crashes. Countermeasures such as protected crossings (signalized intersection or enhanced crosswalks including pedestrian hybrid signals) may reduce potential for crashes with people walking and rolling.

Roundabouts are designed to manage the speed and impact angles of crashes at these intersections. This reduces the likelihood of crashes because slower vehicle movements allow more time for drivers to react, and, should an impact occur, it is at a lower speed and at small impact angles, resulting in a lower injury severity.[7]

Predictive Analysis

The American Association of State Highway and Transportation Officials (AASHTO) Highway Safety Manual Predictive Safety Analysis estimates the expected number of crashes at a given roadway segment or intersection based on exposure, roadway characteristics, and other variables. This represents a more reliable measure of the crash history for the site or corridor. A predictive analysis was performed on the segments along the corridor and there were two major findings: a) the study corridor is currently experiencing fewer segment crashes than similar facilities, and b) the addition of a continuous center turn lane throughout will not measurably change the existing safety performance of the corridor. Based on the predictive analysis safety performance, it is not recommended adding two way left turn lanes across the entire corridor.

Study Recommendations

The study evaluated the corridor context, congestion, safety performance, and considered input from the advisory committee. The study recommendations for intersections are summarized in Table 42 and the study recommendations for the segments are summarized in Table 43: 95th Percentile Queuing Results During Existing Conditions PM Peak Hour. More detailed information on each recommendation can be found in the study report.

[7] https://wsdot.wa.gov/travel/traffic-safety-methods/roundabouts

Intersection	Existing control	Recommendation
410 N Interchange	Signal	Future project – no further action
410 S Interchange	Signal	Future project – no further action
74th St E	Unsignalized	Westbound Right-in/right-out
74th St Ct	Unsignalized	Eastbound Right-in/right-out
Rivergrove Dr	Signal	Signal Timing Adjustments
80th St	Unsignalized	Eastbound Right-in/right-out
Pioneer Way E	Signal	Single Lane Roundabout w/EB right
88th St	Unsignalized	Westbound Right-in/right-out
96th St	Signal	Single Lane Roundabout w/SB left
Military Rd	Signal	Funded roundabout project – no further action
128th St	Signal	Funded roundabout project – no further action
136th St	Signal	Single Lane Roundabout
144th St	Unsignalized	Single Lane Roundabout
149th St	Unsignalized	Single Lane Roundabout
Williams Blvd	Signal	Signal Timing Adjustments

Table 42. Full Build Recommendation – Intersections

Segment	Existing control	Recommendation
102nd St E to Military Road	Two lane undivided	Center Turn Lane (two way center turn lane)
128th St E to 149th St Ct E	Two lane undivided	Access Management (raised median)

Table 43. Full Build Recommendation – Segments

Appendix C. Traffic Operations Summary

Date: July 11, 2025
Subject: Traffic Operations Summary

Introduction

This memorandum documents existing traffic operations for the SR 162 Center Turn Lane Planning and Pre-Design Study. The study corridor is a 5.5-mile-long section of SR 162 from the SR 410 interchange in the north to Williams Boulevard in the south. Travelers who use SR 162 often experience delays during peak commute hours, and continued development in this part of Pierce County will likely increase traffic volumes along the study corridor.
The study team identified the most relevant intersections within the corridor and appropriate time of day for a comprehensive understanding of traffic flow in the study area. Based on this consultation, 13 intersections, both signalized and unsignalized, were identified for AM and PM peak hour analysis. During the operational analysis, the intersection where SR 162 meets 74th St E/74th St Ct was analyzed as two separate intersections due to the alignment gap between 74th St E and 74th St Ct. The study intersections and intersection type are listed below. Signalized intersections are identified as (Signal), and side-street stop-controlled intersections are identified as single side stop control (SSSC).

SR 162 Study Intersections

1. SR 162 and SR 410 WB Ramp (Signal)
2. SR 162 and SR 410 EB Ramp (Signal)

3a. SR 162 and 74th St E (SSSC)
3b. SR 162 and 74th St Ct (SSSC)

4. SR 162 and 143rd Ave E/Rivergrove Dr E (Signal)
5. SR 162 and 80th St E (SSSC)
6. SR 162 and Pioneer Way E E/Bowman Hilton Rd (Signal)
7. SR 162 and 96th St E (Signal)
8. SR 162 and Military Rd E (Signal)
9. SR 162 and 128th St E (Signal)
10. SR 162 and 136th St Ct E (Connecting to 142nd Ave E) (Signal)
11. SR 162 and 144th St E (SSSC)
12. SR 162 and 149th St Ct E (SSSC)
13. SR 162 and Williams Blvd (Signal)

Data Collection

To accurately understand current traffic conditions at the identified intersections, turning moving count data was collected for vehicles, heavy vehicles (HV), pedestrians, and bicyclists. Data collection took place while school was still in session, to better reflect typical traffic conditions during peak commute hours. StreetLight data and annual average daily traffic data was used to verify traffic volumes collected in the field.

Turning Movement Counts

On May 30, 2024, IDAX Data Company collected turning movement counts at 13 intersections during the AM and PM peak periods, from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively. The data collected at the off-set intersections at SR 162 and 74th St E and SR 162 and 74th St Ct was considered one intersection. The one-hour interval within the peak period with the highest vehicle counts was designated as the AM and PM peak hour for each intersection. In addition to vehicle counts collected during the identified peak hour for each intersection, IDAX also calculated the peak hour factor (PHF), HV percentage, and bicycle and pedestrian volumes.

Methodology

The study team used SimTraffic 11 to analyze traffic operations at all study intersections during the AM and PM peak hours. SimTraffic was selected due to its ability to provide microsimulation modeling traffic at the individual vehicle level, offering a more detailed and realistic assessment of vehicle behavior. SimTraffic captures the complex interactions between vehicles, including lane changes, merging, and signal timing effects, which contribute to queuing. This allows for a better understanding of vehicle queuing conditions along the corridor.

Delay, Level of Service, and 95th Percentile Queuing

The study team utilized SimTraffic to analyze delay, level of service (LOS), and 95th percentile queuing. SimTraffic calculates total delays by accounting for all elements associated with traffic control devices. This includes not only the time vehicles are stopped at an intersection but also delays caused by deceleration in advance of the intersection, time spent moving up in the queue, acceleration after clearing the intersection, and additional factors such as lane changes, geometric alignment, and delays caused by turning vehicles blocking through lanes.

SimTraffic is a simulation tool where each run produces different results to account for real-life traffic randomization. While incorporating randomness is beneficial, it can also result in outliers that differ significantly from other runs. To address this, the study team conducted 15 SimTraffic runs. By analyzing the correlation between total delay per vehicle and hourly exit rate, the study team identified and excluded five significantly different runs. The remaining 10 runs were used for the final analysis.

For signalized and all-way stop-controlled (AWSC) intersections, SimTraffic reports the average delay experienced across all movements, weighted by traffic volume. For two-way stop-controlled (TWSC) or SSSC intersections, SimTraffic reports the delay from the worst-performing movement. To gain a comprehensive understanding of each intersection, the average delay from 10 runs was used to calculate the final LOS and delay.

Level of service is a qualitative measure describing the operational efficiency of an intersection, primarily in terms of delay. For signalized and AWSC intersections, LOS is based on the average delay across all approaches; for TWSC and SSSC intersections, LOS is determined by the movement with the highest delay. LOS is rated on a scale from A to F, with A representing minimal delays and F indicating severe congestion. Table 1 provides a description of each LOS grade and the corresponding delay ranges.

Level of Service	Description	Signalized Intersection Delay (seconds)	Unsignalized Intersection Delay (seconds)
A	Free-flowing Conditions	≤ 10	0-10
B	Stable Flow (slight delays)	>10-20	>10-15
C	Stable Flow (acceptable delays)	>20-35	>15-25
D	Approaching Unstable Flow (tolerable delay)	>35-55	>25-35
E	Unstable Flow (intolerable delay)	>55-80	>35-50
F	Forced, Unpredictable Flow (Excessive delay)	> 80	> 50

Table 1. Level of Service Descriptions[8]

In addition to delay and LOS, SimTraffic was used to analyze 95th percentile queue lengths at each intersection. This metric reflects queue lengths that are not exceeded 95% of the time during peak periods. On corridors nearly at capacity during peak demand times, queuing affects overall intersection performance, particularly in locations where excessive queues may block upstream intersections or spill over into adjacent lanes. SimTraffic captures queuing by factoring in vehicle interactions, traffic signal timing, and lane blockages. By assessing queuing, the study team identified problem areas where excessive queues may cause additional delays or safety concerns.
Each intersection has a LOS standard set based on the jurisdiction it belongs to. Since the entire study area is under WSDOT jurisdiction, each intersection must comply with WSDOT's LOS standards. WSDOT's existing policies set the LOS standard at D across the study area.[9]

Operation Analysis Methods and Assumptions

The study team employed SimTraffic for this analysis, requiring a detailed Synchro file. The analysis began by constructing the Synchro network in Synchro 11, using signal timing sheets obtained from WSDOT, which were integrated into the model. The WSDOT Synchro and SimTraffic protocol, along with insights from field visits, guided the other inputs in an attempt to accurately simulate existing study corridor operations. Detailed input descriptions follow:

- SimTraffic relies on continuous volume data across all intersections to ensure accurate vehicle counts. For both AM and PM peak hours, traffic volumes were balanced from collected turning movement counts.
- Pedestrian and cyclist volumes were determined using IDAX counts, with a default assumption of five pedestrians per hour when counts were below that threshold.
- For peak-hour analysis, SimTraffic requires a single PHF for the entire network. These values were derived from a combination of traffic counts and engineering judgment. The weighted

[8]Source: Fehr and Peers descriptions, based on *Highway Capacity Manual, 6th Edition.*

[9] WSDOT Level of Service Standard
https://www.arcgis.com/home/item.html?id=3f840aeeb1ba481c905270ca103cd1db

average PHF was calculated across all intersections, resulting in a PHF of 0.93 for AM and 0.96 for PM. However, field observations and drone footage prompted a manual adjustment of the PM PHF to 0.90 to better reflect existing conditions.

- Along with PHF, SimTraffic requires a single HV percentage for the entire network. HV percentage was calculated by dividing the total number of HV by the overall vehicle count. The AM HV percentage was calculated to be 6%, and the PM percentage was calculated to be 1%. Due to this low PM HV percentage, it was adjusted to 2% to better represent actual traffic composition.
- The link speed was maintained at the posted speed limit, and WSDOT protocol was followed to account for observed field speeds.
- Saturation flow rates, reflecting the headway between queued vehicles, were set at 1,500 vehicles per hour for both AM and PM, based on roadway conditions (at-grade roadway with direct driveway access) and discussion with Orting staff to reflect the large queues observed on the roadway.
- Vehicle Parmeter for car1 was set to 18 feet and car2 was set to 16 feet; other inputs were kept at default.
- Vehicle Occurrence for car1, car2, Truck SU, and SemiTrk2 were adjusted to 0.5 and all other types were set as 0.
- A growth factor was applied for sensitivity testing, ensuring sufficient vehicle volumes during pre-peak conditions. Field observations indicated a traffic queue prior to the PM peak, especially in the southbound direction, prompting the use of a growth factor during the 30-minute seeding period before the peak hour. Increased southbound traffic, observed in contrast to IDAX counts, resulted in a growth factor increase to 130 for all southbound movements except for Wiliams Boulevard where southbound movements were increased to 150 due to especially long queuing observed during field visits. Specific movements, such as westbound left, were also adjusted to 130 for all intersections except at 128th Ave E where an especially long queue was seen before peak hour and was adjusted to 140. The eastbound right movement for all intersections was also adjusted up to 130 except intersections where queues accurately reflected conditions (eastbound SR 410 off-ramp, Pioneer Way E, Military Rd E and 128th St E).
- Saturation flow rates have direct coordination with headway. Headway remained unaltered from its default setting to avoid conflicts with the manually adjusted saturation rate.
- Additionally, turning speed for the eastbound right movement at the SR 410 EB ramp was adjusted to 15 mph from the default 9 mph for both AM and PM based on field observations.
- Yellow deceleration represents the likelihood of drivers to run red lights. Higher yellow deceleration value represents drivers that are less likely to run red lights. This value was set between 7.0 and 12.0 to account for variability in red-light compliance observed during the field visit.
- Courtesy deceleration, indicating how much space drivers allow others to change lanes, ranged from 3.0 to 10.0.

- Yellow reaction time represents the amount of time it takes for a driver to respond to a signal changing to yellow. This value was set between 1.2 and 1.7 seconds with 1.2 for driver type 1 through 5.
- Green light reaction time describes the amount of time it takes a driver to respond to a signal changing green and ranged from 0.2 to 0.5 seconds. Driver type 1 through 5 was set to 0.5.
- Gap acceptance factors, representing how much space vehicles allow at unsignalized intersections, were set between 0.85 and 1.0, influenced by field observations of conservative gap choices. Driver type 1 to 5 was set to a gap acceptance factor of 1.00.
- Mandatory distance management and position distance adjustment reflects lane change behavior. Both values were set between 80% and 125% with an increment of 5% per each driver.
- Seeding periods were utilized to capture these different adjustments within the network: before the recording of the network, a 15-minute seeding period was applied before the AM (7:00 AM to 8:00 AM) and 30-minute seeding period was applied to PM (4:00 PM to 5:00 PM) peak hours. Seeding interval reflected the amount of queue within the corridor prior to the peak hour. This was especially important for the PM peak hour, which had high queues prior to the peak hour reflected by growth factor adjustments.

Existing Conditions Operation Results

AM Peak Hour

The results of the AM traffic operations analysis for existing conditions are presented in Table 2**.** Table 3 illustrates the queuing data for this period, with queuing results rounded up to the nearest five feet. LOS results are also visualized in Figure 1. Study Intersection Level of Service – North Study Corridor and Figure 2. The analysis and field observations show significant northbound traffic issues during the morning peak period, especially approaching the SR 410 interchange ramps and at intersections south of 128th St E.

Intersections SR 162 and 74th St E and 74th St Ct experience significant delays. This is due to side street vehicles being unable to enter the main corridor because of northbound queues. At the SR 162/74th St Ct intersection, a westbound queue of 1,450 feet was observed due to excessive northbound queuing at the SR 410 EB ramp intersection, causing delays for westbound traffic on the day data was collected.

Study intersections between 128th St E and 149th St Ct E all exhibit LOS F during the AM peak hour, primarily due to northbound traffic queues restricting movement. At the SR 162/136th St Ct E intersection, the northbound queue extends to 2,335 feet, creating significant congestion. In many instances, northbound traffic struggles to clear within the allotted signal time, resulting in high queues throughout these intersections. This queue persists up to 149th St Ct E, severely affecting delays at all signals in the study area south of 128th St E.

ID	Intersection Name	Control	LOS Standard	Delay Sec/Veh	LOS	Movement
1	SR 162/SR 410 WB Ramp	Signal	D	20	B	-
2	SR 162/SB 410 EB Ramp	Signal	D	42	D	-
3a	SR 162/74th St E	SSSC	D	150+	F	WBRT
3b	SR 162/74th St Ct	SSSC	D	150+	F	EBLT
4	SR 162/143rd Ave E/Rivergrove Dr E	Signal	D	7	A	-
5	SR 162/80th St E	SSSC	D	14	B	EBLT
6	SR 162/Pioneer Way E/ Bowman Hilton Rd	Signal	D	18	B	-
7	SR 162/96th St E	Signal	D	36	D	-
8	SR 162/Military Rd E	Signal	D	23	C	-
9	SR 162/128th St E	Signal	D	88	F	-
10	SR 162/136th St Ct E	Signal	D	133	F	-
11	SR 162/144th St E	SSSC	D	137	F	EBLT
12	SR 162/149th St Ct E	SSSC	D	116	F	NBTH
13	SR 162/Williams Blvd	Signal	D	15	B	-

Table 2. Level of Service Results During Existing Conditions AM Peak Hour[10]

[10] Source: Fehr and Peers, 2024.

UID	Intersection Name	Control	EB (ft)	WB (ft)	NB (ft)	SB (ft)
1	SR 162/SR 410 WB Ramp	Signal	-	180	400	265
2	SR 162/SB 410 EB Ramp	Signal	140	-	505	160
3a	SR 162/74th St E	SSSC	-	1,450	80	55
3b	SR 162/74th St Ct	SSSC	170	-	380	5
4	SR 162/143rd Ave E/Rivergrove Dr E	Signal	100	-	175	145
5	SR 162/80th St E	SSSC	60	-	55	5
6	SR 162/Pioneer Way E/Bowman Hilton Rd	Signal	120	85	290	250
7	SR 162/96th St E	Signal	20	165	755	170
8	SR 162/Military Rd E	Signal	190	-	195	280
9	SR 162/128th St E	Signal	50	125	1,265	110
10	SR 162/136th St Ct E	Signal	85	-	2,335	110
11	SR 162/144th St E	SSSC	110	-	1,025	5
12	SR 162/149th St Ct E	SSSC	65	-	900	5
13	SR 162/Williams Blvd	Signal	110	115	275	180

Table 3. 95th Percentile Queuing Results During Existing Conditions AM Peak Hour[9]

PM Peak Hour

The results of the PM traffic operations analysis for existing conditions are presented in Table 4.Error! Reference source not found. Table 5 illustrates queuing data for this period, with queuing results rounded up to the nearest five feet. LOS results are also visualized in Figure 1 and Figure 2. This analysis and field observation show significant southbound traffic issues during the PM peak period.

At intersections SR 162 and SR 410 WB ramp and SR 162 and SR 410 EB ramp, noticeable southbound queues were observed. The SR 162 and SR 410 EB ramp intersection exhibits notably high queue lengths in the eastbound direction as well, driven by traffic attempting to transition from SR 410 eastbound to SR 162.

The intersection of SR 162/74th St E shows long westbound queue on the eastern leg of the intersection, with an estimated 95th percentile westbound queue of 1,315 feet.

The intersection of SR 162/Military Rd has an estimated 95th percentile southbound queue of 8,135 feet. During peak PM hours, it's not uncommon for the queue to extend all the way to 96th St E. South of this location, impacting intersections north of Military Road including study intersection SR 162/128th St E, which has a LOS F during the PM peak hour.

The analyzed westbound queue at SR 162/128th St E resulted in shorter queues than observed during field visits and is lower than expected for this location. This may result from an unusually low volume of westbound traffic on the day data was collected.

ID	Intersection Name	Control	LOS Standard	Delay Sec/Veh	LOS	Movement
1	SR 162/SR 410 WB Ramp	Signal	D	88	F	-
2	SR 162/SB 410 EB Ramp	Signal	D	75	E	-
3a	SR 162/74th St E	SSSC	D	150+	F	WBLT
3b	SR 162/74th St Ct	SSSC	D	145	F	EBLT
4	SR 162/143rd Ave E/Rivergrove Dr E	Signal	D	25	C	-
5	SR 162/80th St E	SSSC	D	31	D	EBLT
6	SR 162/Pioneer Way E/Bowman Hilton Rd	Signal	D	35	D	-
7	SR 162/96th St E	Signal	D	92	F	-
8	SR 162/Military Rd E	Signal	D	150+	F	-
9	SR 162/128th St E	Signal	D	150+	F	-
10	SR 162/136th St Ct E	Signal	D	51	D	-
11	SR 162/144th St E	SSSC	D	51	F	EBLT
12	SR 162/149th St Ct E	SSSC	D	108	F	EBLT
13	SR 162/Williams Blvd	Signal	D	23	C	-

Table 4. Level of Service Results During Existing Conditions PM Peak Hour[11]

ID	Intersection Name	Control	EB (ft)	WB (ft)	NB (ft)	SB (ft)

[11] Source: Fehr and Peers, 2024.

1	SR 162/SR 410 WB Ramp	Signal	-	155	245	1,620
2	SR 162/SB 410 EB Ramp	Signal	1,490	-	515	605
3a	SR 162/74th St E	SSSC	-	1,315	50	235
3b	SR 162/74th St Ct	SSSC	55	-	230	25
4	SR 162/143rd Ave E/Rivergrove Dr E	Signal	75	-	135	630
5	SR 162/80th St E	SSSC	85	-	105	5
6	SR 162/Pioneer Way E/ Bowman Hilton Rd	Signal	415	120	225	530
7	SR 162/96th St E	Signal	50	150	305	1,705
8	SR 162/Military Rd E	Signal	2,330	-	420	8,135
9	SR 162/128th St E	Signal	40	270	1,275	2,035
10	SR 162/136th St Ct E	Signal	100	-	930	435
11	SR 162/144th St E	SSSC	70	-	95	0
12	SR 162/149th St Ct E	SSSC	160	-	190	5
13	SR 162/Williams Blvd	Signal	85	90	205	395

Table 5. 95th Percentile Queuing Results During Existing Conditions PM Peak Hour

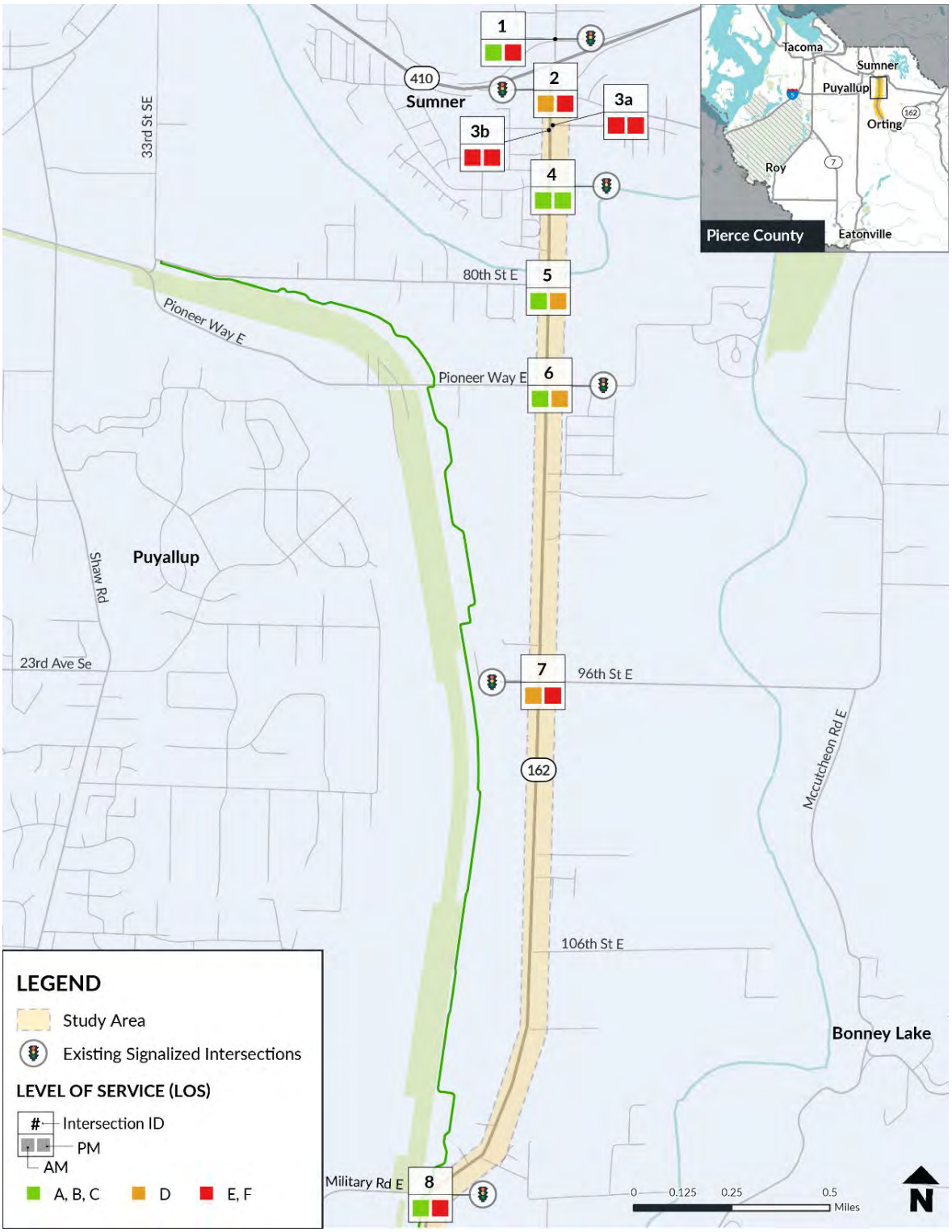


Figure 1. Study Intersection Level of Service – North Study Corridor[12]

[12] Source: Fehr and Peers, 2024.

Figure 2. Study Intersection Level of Service – North Study Corridor[13]

[13] Source: Fehr and Peers, 2024.

Existing Conditions Operations Summary

AM Traffic Conditions:

- Northbound traffic congestion is significant during the morning peak, especially approaching the SR 410 interchange and intersections between 128th St E and 149th St Ct E.
- 74th St E and 74th St Ct demonstrate significant side street delays, as vehicles struggle to enter the main corridor due to northbound queues.
- SR 162/136th St Ct E intersection shows estimated northbound queues extending 2,335 feet, creating heavy congestion and preventing traffic from clearing in the allotted signal time.

PM Traffic Conditions:

- Southbound traffic congestion is significant during the evening peak, especially at intersections SR 162 and SR 410 WB and EB ramps and intersections south of SR 162/Military Rd E.
- SR 162 and SR 410 eastbound ramp intersection exhibits high queue lengths for eastbound traffic transitioning from SR 410 to SR 162.
- SR 162/74th St E intersection shows heavy westbound queuing.
- SR 162/Military Rd E intersection experiences critical congestion, with the 95th percentile southbound queue reaching 8,135 feet, sometimes extending to 96th St E.
- 128th St westbound queue is shorter than expected, possibly due to low traffic volume on the day of data collection. Longer queues were observed during field visits.
- Williams Boulevard southbound queue is shorter than expected, with current data and analysis resulting in LOS C. This intersection may perform worse than the results indicate.

Future Year Forecasting Method

Pierce County's traffic volumes model was used for both the existing traffic operations analysis described in this memo and future year (2044) analysis to evaluate potential improvements. The model was also used to develop turning volumes for both the existing (2024) and future (2044) years. Growth rates in population and traffic volumes between 2024 and 2044 previously incorporated into the model were also applied to the volumes for this study. No adjustments were made to the model for this study.

The data in Table 6 was extracted from the model at two random locations along the SR 162 study corridor, between SR 410 and Williams Boulevard:

Segment	AADT (2018-2019 daily traffic counts)	segPOST (2044 Processed Volumes)	segVOL (2044 model volumes)	baseSeg_VOL (2018 base year model volumes)
SR 410 to Puyallup River	10667	12963	13062	10766
149th Street Court E to Williams Blvd	10500	11339	11529	10690

Table 6. PierceCast Data Excerpt

AADT = 2018/2019 daily traffic counts
segVOL = 2044 model volumes
segPOST = 2044 post processed volumes
base_segVOL = 2018 base year model volumes

The Table 6 data provided is for one direction on SR 162, so the total AADT is assumed to be approximately twice the value provided. This results in an existing model AADT of approximately 21,000. Multiple tube counts were taken for the study and showed SR 162 had AADT volumes at the count locations of 22,100 to 22,500, indicating that the model data was reasonably close to actual conditions.

Compared to the tube counts, the Table 6 2044 projection shows an increase in AADT in the north portion of the corridor from 22,500 to 26,124 (Table 6, 2044, SR 410 to Puyallup River). This represents a 16 percent increase in traffic. For comparison, the Pierce County Comprehensive Plan shows population growth in Orting from 9041 (2020) to 9590 (2044), around 6% growth. Bonney Lake increases from 22,487 to 26,078, around 16%. Therefore, the percentage increase in traffic volumes within the model is comparable to the anticipated population growth in the area in the comprehensive plan.

It should be noted that capacity analysis performed for the study at major intersections determined that SR 162 is close to capacity northbound in the morning and southbound in the evening. Therefore, the existing corridor has a limited ability to accommodate additional traffic volumes.

Appendix D. Complete Streets

SR 162 Center Turn Lane Planning and Pre-Design Study: Complete Streets Analysis

Prepared by:

WSDOT

In association with:

Fehr and Peers

Introduction

This report is part of the SR 162 Center Turn Lane Planning and Pre-Design Study in response to the following legislative direction:

> Planning and pre-design for expansion of State Route Number 162 from State Route Number 410 south to north city limits of Orting with an addition of a center turn lane to **improve traffic safety, relieve congestion, reduce collisions, and improve fire and law enforcement personnel response time** to emergencies.

The study corridor is a 5.5-mile-long section of SR 162 extending from the SR 410 interchange in the north to Williams Boulevard in the south. The corridor lies in the Alderton-McMillin census-designated place. The west side of study corridor borders the City of Sumner from the SR 410 interchange to Puyallup River crossing (just south of 78th Street Court East) and the east side of the study corridor borders the City of Orting from 150th Street East to Williams Boulevard, as shown in Figure 1.

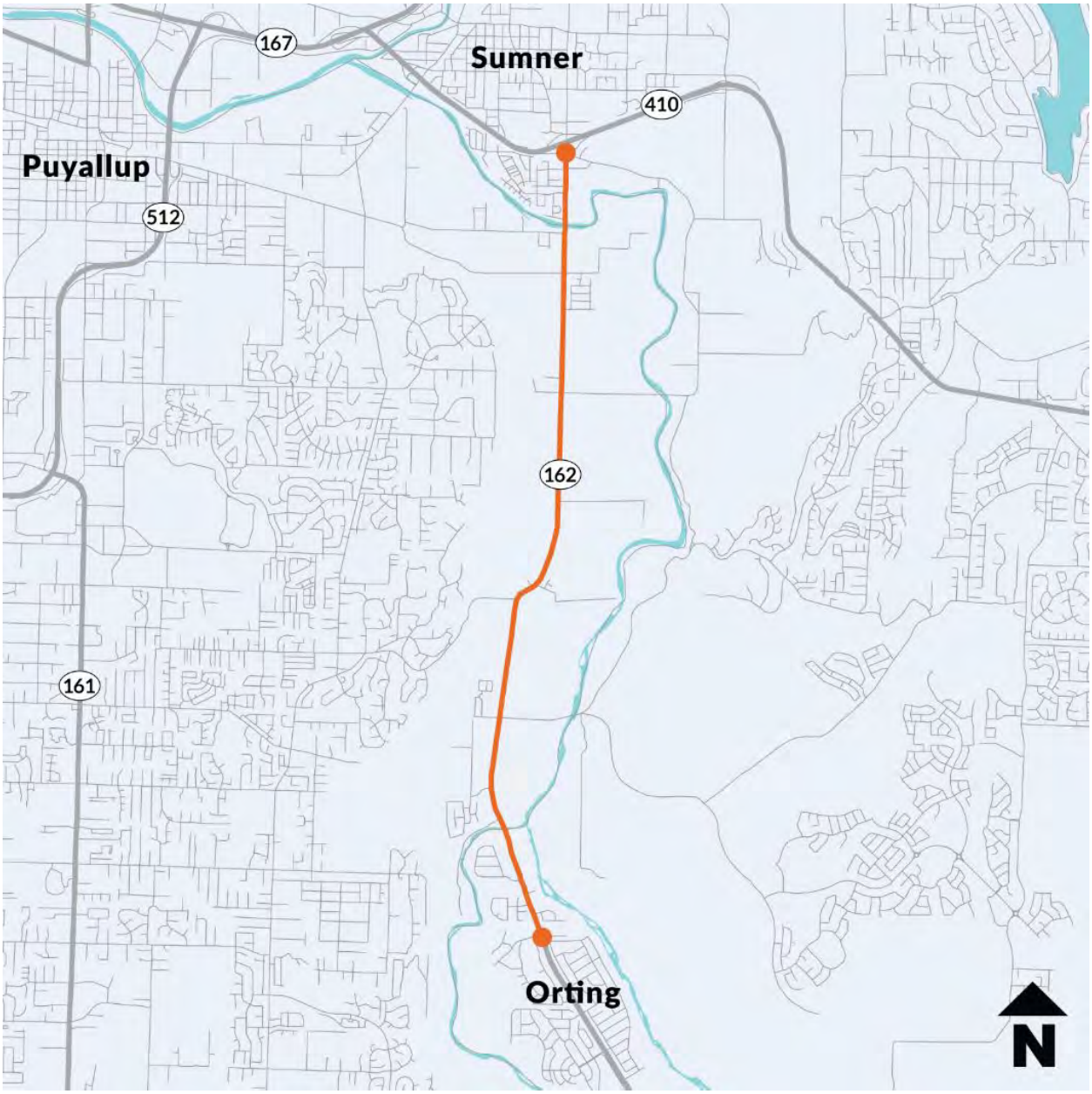


Figure 1. State Route 162 Center Turn Lane Planning and Pre-Design Study Corridor

Complete Streets provide comfortable access for all people using all transportation modes: driving, walking, biking, using mobility aids, riding transit, and more. Complete Streets projects reflect local context and are responsive to community needs. Planning and designing Complete Streets focuses on pedestrian level of traffic stress (PLTS) and bicycle level of traffic stress (BLTS), connectivity, route directness, and a Safe System Approach.

The Washington State Legislature adopted a Complete Streets requirement for WSDOT capital projects in RCW 47.04.035 starting in 2022. This directive states, "in order to improve the safety, mobility and accessibility of state highways, it is the intent of the Legislature that the department must incorporate the principles of complete streets with facilities that provide street access with all users in mind, including pedestrians, bicyclists and public transportation users" and "integrate the state route into the local network" for "state transportation projects starting design on or after July 1, 2022 and that are $500,000 or more."

The SR 162 Center Turn Lane Planning and Pre-Design Study project was screened by WSDOT's Complete Streets Team which determined that Complete Streets applies and therefore "the project will be designed and developed as a Complete Street or deferred in alignment with established processes."[14] The primary reasons noted in the screening process were the project's location within a census-designated place (Alderton-McMillin), that active transportation gaps were identified within the project extents, and the existence of vulnerable and overburdened populations.

This report identifies Complete Streets design metrics, reviews the existing conditions, defines the approach for evaluating and selecting Complete Streets elements, and proposes a Complete Streets strategy for the corridor.

Complete Streets Metrics

The WSDOT Design Manual, Division 11 – Practical Design, 1100.03(1) Design Process – Complete Streets, Goals and Objectives states Complete Streets designs should accomplish the following:

- Address the unique Complete Streets concerns of overburdened communities.
- Address active transportation network gaps that have been identified through a WSDOT or local plan and/or through community engagement.
- Provide bicycle and pedestrian facilities that offer the required LTS (2 or better) and route directness index (2 or better).
- Provide a separation from vehicular traffic that involves a vertical element when it is determined that a posted speed must be maintained at greater than 30 mph.
- Provide adequate access to transit, including specific improvements for bicycles and pedestrians in high-capacity transit areas.

The WSDOT Design Manual Division 11 – Practical Design, 1101.04(2) Needs Identification, Baseline Performance Metrics, Complete Streets lists five categories of metrics:

- Bicycle and pedestrian movement measured by LTS and route directness.
- Concerns of overburdened communities.

[14] WSDOT Design Manual 1100.03(3) Complete Streets, Project Screening

- Active transportation network gaps.
- Access to transit.
- Comfortable roadside environment (street trees).

The WSDOT Design Manual, Division 15 – Pedestrian and Bicycle Facilities defines the design performance metric for Complete Streets projects using Level of Traffic Stress (LTS). Level of Traffic Stress is a metric used during planning and design to provide an indication of the relative stress experienced by bicycle riders and pedestrians. Level of Traffic Stress is a numeric rating from 1 to 4, where a lower number indicates lower BLTS or PLTS. Route directness refers to the amount of out of direction travel pedestrians and bicyclists must engage in to travel between destinations. It is measured by route directness index (RDI), the ratio of the actual distance traveled to the direct distance between two points (WSDOT Design Manual 1101.04(2)(a)).

The WSDOT Design Manual, Division 15 – Pedestrian and Bicycle Facilities, 1510.02(5) Pedestrian Facilities, Policy, Design Performance Metrics – Level of Traffic Stress states the LTS performance metric is used to evaluate Complete Streets projects. Complete Streets projects target a level of traffic stress of 2 or better (i.e., LTS 1 or LTS 2).

The WSDOT Design Manual, Division 15 – Pedestrian and Bicycle Facilities, 1520.03(3) Roadway Bicycle Facilities, Design Performance Metric – Level of Traffic Stress states the LTS performance metric is used to evaluate Complete Streets projects. Complete Streets projects require a level of traffic stress of 2 or better (i.e., LTS 1 or LTS 2).

The WSDOT Design Manual, Division 13 – Intersections and Interchanges, 1310.03(1) Intersections – Designing for Active Transportation, Design Process states that interpretation of LTS 2 at intersections is still in development but the Complete Streets requirement for intersections will be met using Exhibit 1310-31 Pedestrian and Bicycle Intersection Treatments.

Target Metrics

The success of the strategy was measured by how well it met the following Complete Streets metrics:

- For pedestrians, a PLTS of 2 or better.
- For cyclists, a BLTS of 2 or better.
- For directness, and RDI equal to or less than 2.

Pedestrian Facilities

For corridors with a posted speed greater than 35 MPH, the pedestrian facilities that meet the PLTS 2 are

- sidewalk separated by physical separation, and
- a separated shared-use path.

For corridors with a posted speed equal to or less than 35 MPH, the pedestrian facilities that meet the PLTS 2 standard are

- 8-foot sidewalk with no buffer,

- sidewalk separated by physical separation, and,
- separated shared-use path.

Currently, no change in the posted speeds for SR 162 is assumed as part of this project.

Bicycle Facilities

For corridors with a posted speed greater than 35 MPH, the bicycle facilities that meet the LTS 2 standard are

- separated bike lane, and
- separated shared-use path.

Crossings

Route directness targets a desired segment length of approximately 0.5-mile between protected pedestrian crossings (signalized intersection or enhanced crosswalks including pedestrian hybrid signals). Providing protected crossings at 0.5-mile intervals along the corridor would require no more than 0.5-mile of out-of-direction travel between any two points along the corridor. Given land use context and vulnerable populations, access measurements are focused on specific land use such as residential developments, the Foothills Trail, and agricultural employers. The RDI targets between specific land uses is less than or equal to 2.

Existing Conditions and Gap Analysis

Vehicle Infrastructure

SR 162 is a two-lane Urban Minor Arterial with limited segments of two-way center turn lanes or dedicated left-turn lanes. The corridor has AADT ranging from 17,000 to 23,000 vehicles (see Figure 2). The right-of-way width varies throughout the corridor: it is generally 60 feet but narrows to 50 feet from 96th St E to 109th St E (0.7 miles). Most of the corridor has a posted speed limit of 50 mph. The posted speed reduces to 35 mph approaching Sumner to the north and Orting to the south. Advisory speed limit changes are posted at approaches to major intersections along the corridor (see Figure 3).

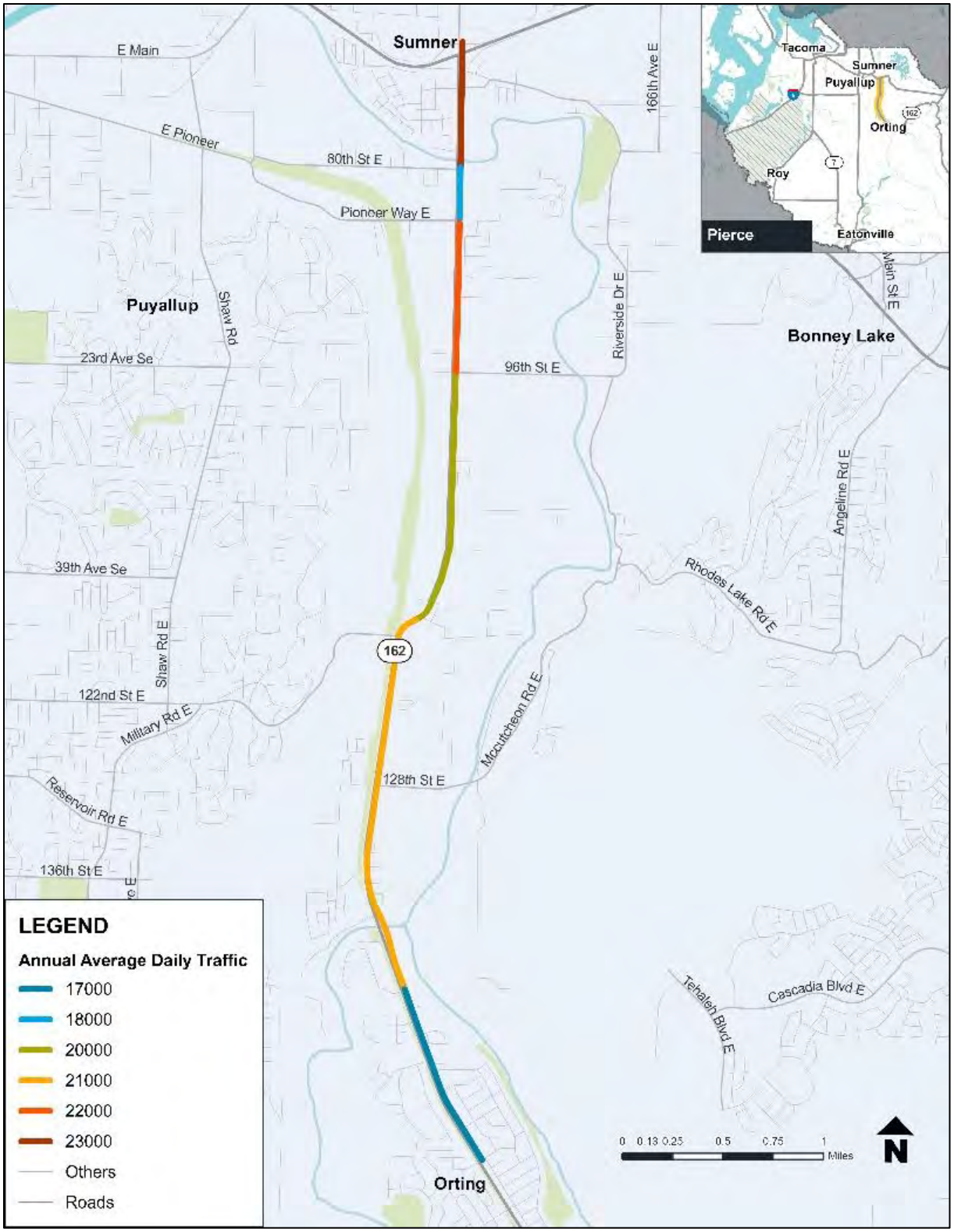


Figure 2. State Route 162 Study Corridor AADT

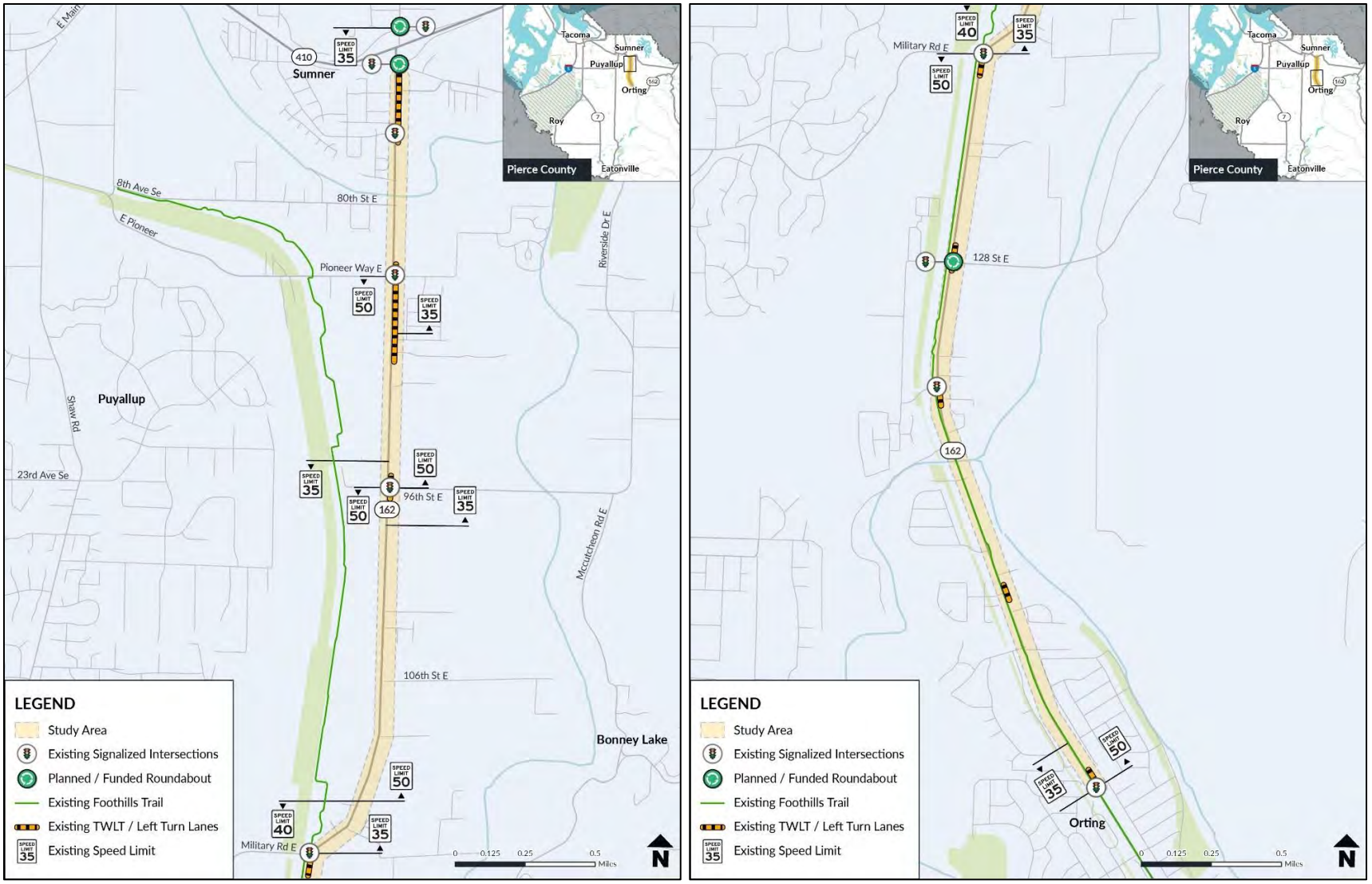


Figure 3. State Route 162 Existing Features and Planned Projects Map

Active Transportation Infrastructure

There are no existing linear dedicated pedestrian or bicycle facilities within the study corridor right-of-way. People walking and biking currently use the shoulder or grass along the east and west sides of the corridor. Figure 4 shows photos of typical roadside conditions.

Figure 4. Photos of Typical State Route 162 Roadside Conditions

Foothills Trail is an existing shared-use path that runs parallel to SR 162 on the west side of the corridor. It is adjacent to SR 162 south of Military Road. North of Military Road the Foothills Trail diverges from SR 162 to the west. Two trailheads are located near the study corridor. The Eastern Puyallup Trailhead is located on 80th St E about 0.75 miles west of SR 162. The McMillin Trailhead is located on 140th St E, less than 200 feet west of SR 162. Figure 5 shows photos of the Foothills Trail. The alignment and trailhead locations of the Foothills Trail are shown in Figure 6.

Source: https://www.piercecountywa.gov/1384/Foothills-Trail

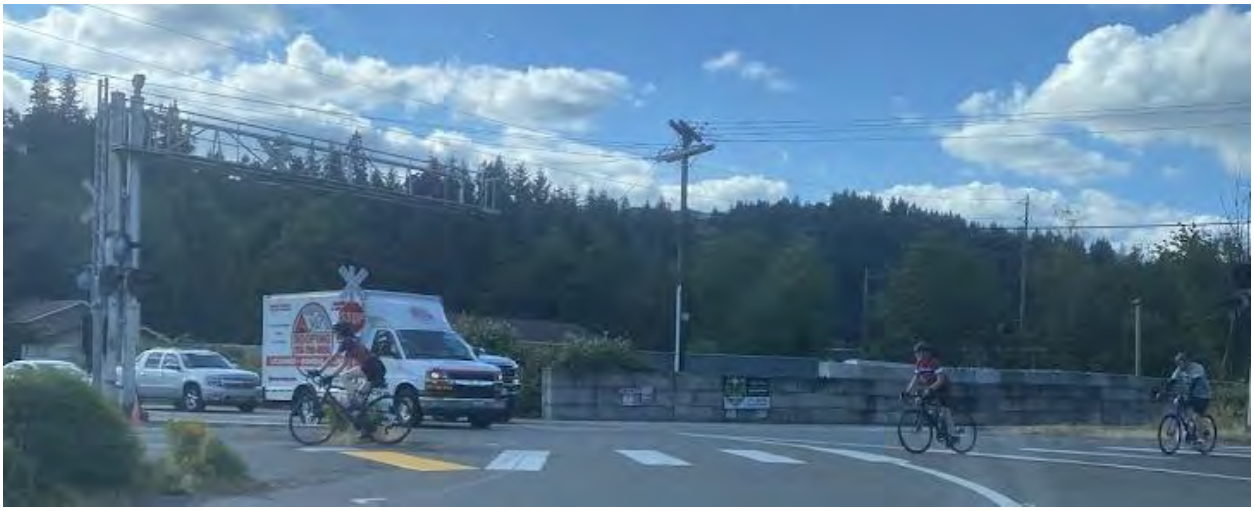


Figure 5. Photos of the Foothills Trail

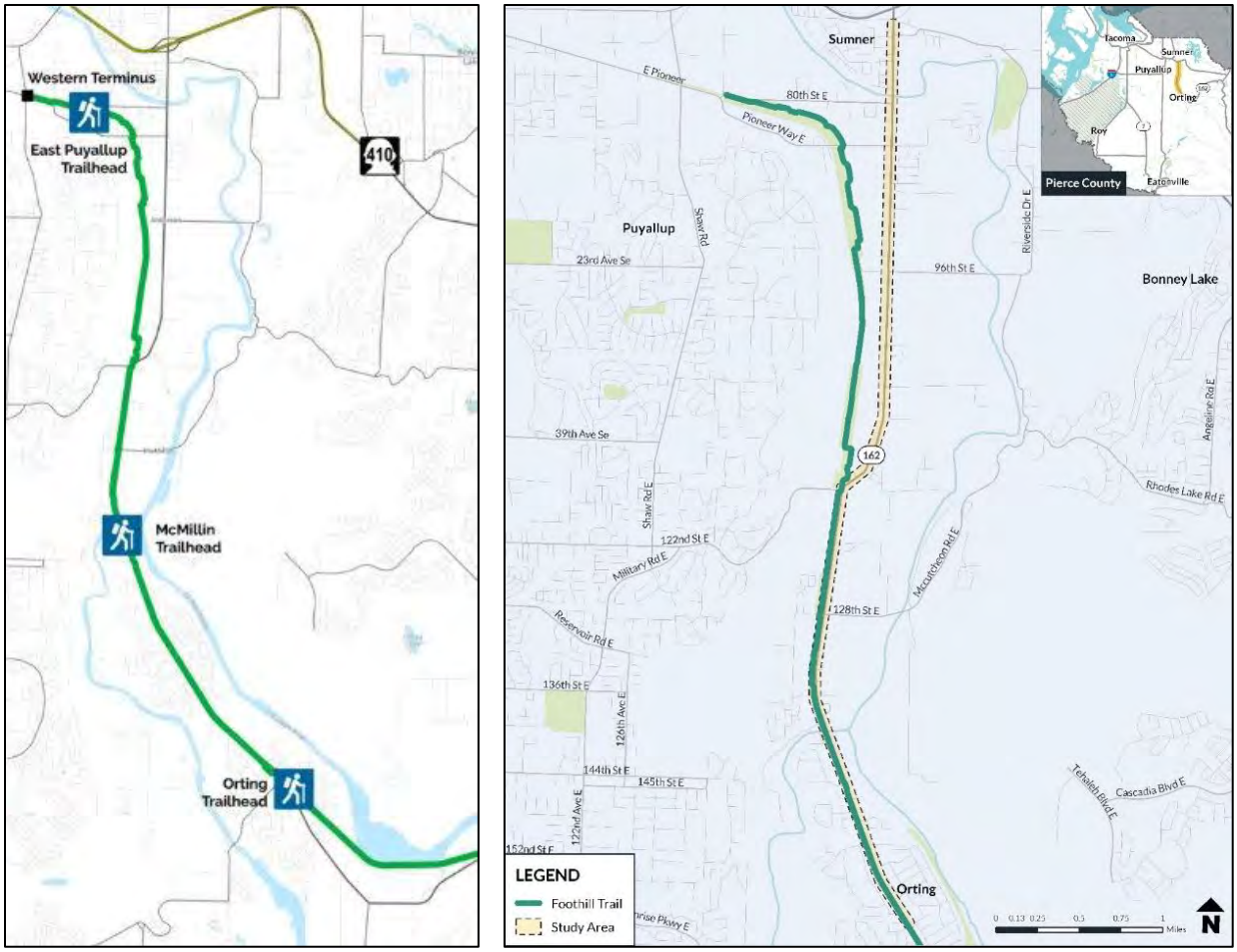


Figure 6. Foothills Trail Trailhead Locations and Alignment

Source: https://www.piercecountywa.gov/1393/Trailheads (left), Fehr and Peers (right)

Bridges

There are two Puyallup River crossings on the study corridor. The northern crossing location is just south of 78th Street Court E. The bridge at the northern river crossing location is approximately 30 feet wide and was constructed in 1973. The cross section of this northern bridge consists of an approximately 3-foot concrete curbed sidewalk and two 11-foot travel lanes.
The southern crossing location is just south of South Fork Road. The bridge at the southern crossing location is approximately 40 feet wide and was constructed in 2015. The cross section of this southern bridge consists of two 11-foot travel lanes. The Foothills Trail crosses the Puyallup river at this location on a parallel bridge west of SR 162. The width of the Foothills Trail narrows to approximately nine feet across the bridge. Figure 7 shows photos of the north and south bridges.

North Bridge

Source: Google Earth, 2024.

South Bridge

Source: Google Earth, 2024.

Foothills Trail Bridge

Source: WSDOT, 2025

Figure 7. State Route 162 Bridge Photos

Signalized Intersections

There are eight existing signalized intersections providing protected crossings of SR 162 and breaking the study corridor into seven segments. The segments between intersections range from 0.2 miles to 1.6 miles in length with four out of seven existing segments greater than 0.5 miles in length. Distances between crossing locations greater than 0.5 miles increase the route directness index, requiring higher amounts of out of direction travel for people walking or biking to reach their destination.

The existing signalized crossing locations are listed below (from north to south).

- SR 410 EB ramp
- 143rd Avenue/Rivergrove Drive East
- Pioneer Way East/Bowman Hilton Road
- 96th Street East
- Military Road East
- 128th Street East
- 136th Street East
- Williams Boulevard

All intersections, signalized or stop-controlled, are legal crossings for pedestrians and bicyclists whether or not they are marked with a crosswalk.[15] There are 21 side-street stop-controlled intersections and 67 driveways along the study corridor. None of the side-street-stop-controlled intersection include marked crosswalks crossing SR 162. The existing crossing locations, crossing distances, and driveway counts are shown in Figure 8.

[15] Washington State RCW 46.61.240

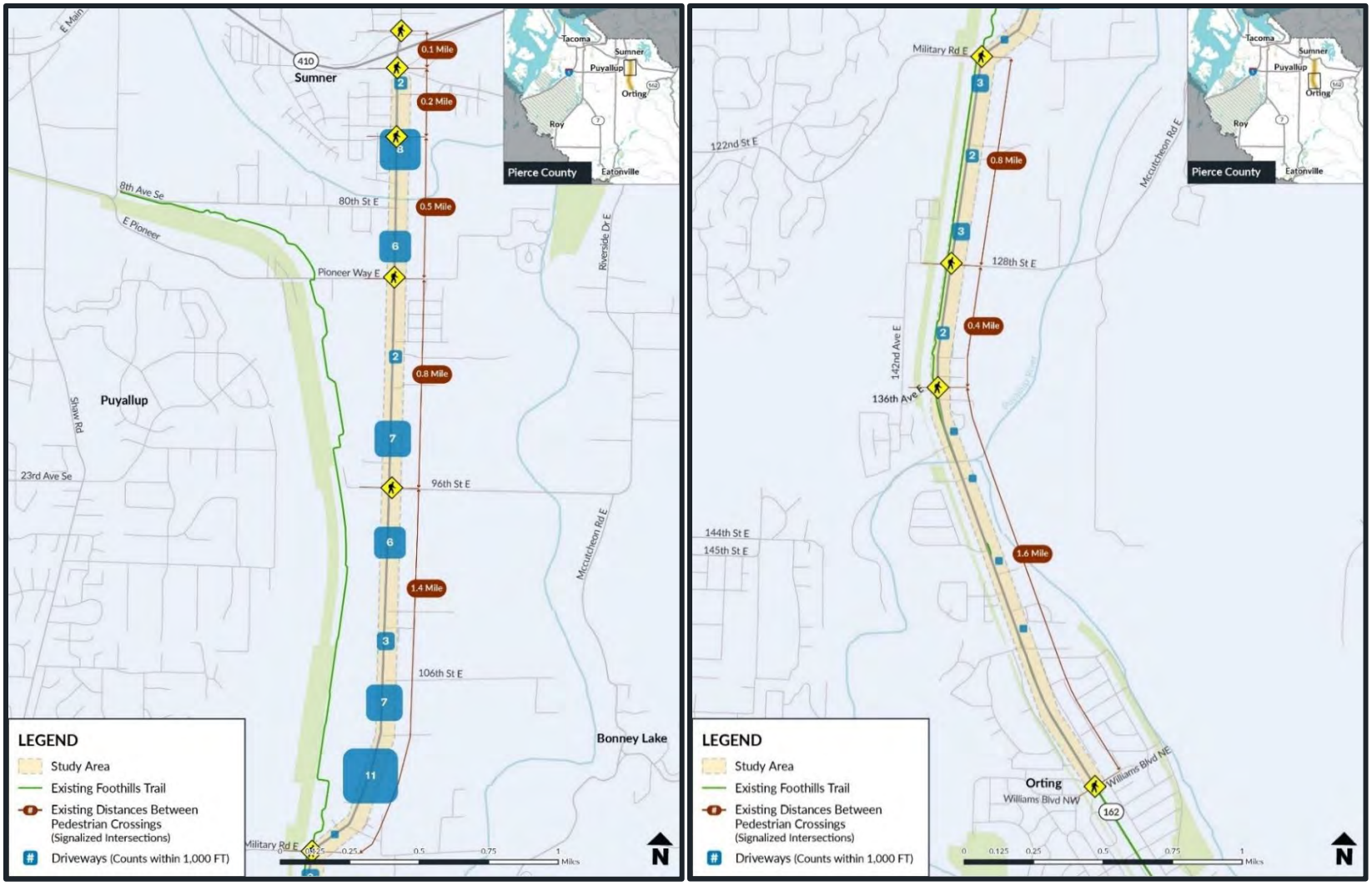


Figure 8. Existing State Route 162 Active Transportation Crossing Locations

Transit Service

The SR 162 corridor has minimal access to public transit options. Pierce Transit and Sound Transit are the two main providers for transit in the region. Pierce Transit provides bus, paratransit, and on-demand service to Pierce County. There are no existing fixed route transit services on the study corridor. SR 162 is not within the current service area but is adjacent to the eastern edge of the service area and was within the pre-2012 service area. The nearest area with bus, paratransit, and on-demand services is the City of Puyallup. Pierce Transit Runner offers on-demand microtransit within Pierce County. The Peirce Transit Runner and Runner Buffer Zones do not include the study corridor. While Sound Transit planned to establish commuter rail service near SR 162 from McMillin to Puyallup, the project has not received any recent updates. Pierce Transit is in process of updating their long-range plan "Destination 2024" and has developed four scenarios for growth and expansion of fixed services. Scenarios A-C do not include fixed service on SR 162. Scenario D, which has the highest annual service hours—translating to the highest level of annual cost and capital investment—would include a fixed route on SR 162. This would require a ballot measure and additional funding sources. School bus stops serving area schools are located along the study corridor, specific bus stop locations can change from year to year. These stops are typically located in lane or on wider highway shoulders. Improved active transportation infrastructure on SR 162 would make it easier for people to access school bus stops and public transit, should it become available in the future.

Evacuation and Emergency Response

The study corridor is within the Lahar Evacuation Zone. The current instructions during volcanic events that could result in lahars is as follows:

- Plan to WALK OUT – Automobile accidents create huge bottlenecks. You will be able to get out faster if you walk.[16]
- Move on foot when possible. Do not drive. Keep roads open and clear for emergency vehicles.
- The vehicles already on the roads when the lahar sirens sound should travel northbound on SR 162 and turn right onto 128th St E or left onto Military Rd.[17]

Improved active transportation infrastructure on SR 162 could make it easier for people to evacuate by foot as instructed.

The legislative directive for the project includes guidance to improve emergency response times along the corridor. Existing queues and congestion along the corridor combined with lack of alternative routes or shoulders is a concern for emergency responders.

WSDOT provides guidance on evaluating the LTS of pedestrian facilities, shared-use paths, and bicycle facilities in the WSDOT Design Manual Chapters 1510, 1515, and 1520. LTS is determined by assessing roadway characteristics including traffic volume, posted speed limit, number of travel lanes, and quality of pedestrian or bicycle facility. The quality of facility is based on type and width of the facility, separation from vehicle travel lanes, and vehicle travel speeds adjacent to the facility.

[16] Emergency Preparedness, City of Orting
[17] East Pierce County Lahar Rapid Action Plan (RAP), City of Puyallup Emergency Management.

Pedestrian Level of Traffic Stress (PLTS)

The study corridor has paved shoulders but no dedicated pedestrian facility within the right -of -way. The WSDOT PLTS for a road with no dedicated pedestrian facility and shoulder, as shown in Figure 9, is LTS 4. A map of the existing PLTS along the study corridor is shown in Figure 10.

Exhibit 1510-1 Pedestrian Level of Traffic Stress (PLTS) **no dedicated pedestrian facility,** with shoulder

No dedicated pedestrian facility, with shoulder								
Lane configuration	AADT (total)	Target Speed						
		≤20	25	30	35	40	45	50+
1 thru lane per direction (or 1 lane one-way street)	0 - 750	1	2	3	4	4	4	4
	751 - 1500	1	2	3	4	4	4	4
	1501 - 3000	2	2	3	4	4	4	4
	> 3000	2	3	3	4	4	4	4
2 thru lanes per direction	0 – 6000	3	3	3	4	4	4	4
	> 6000	3	3	4	4	4	4	4
3+ thru lanes per direction	Any ADT	4	4	4	4	4	4	4

Source: WSDOT Design Manual M 22-01.23, September 2024, Analyzed by Fehr and Peers.

Figure 9. State Route 162 Pedestrian Level of Traffic Stress Analysis

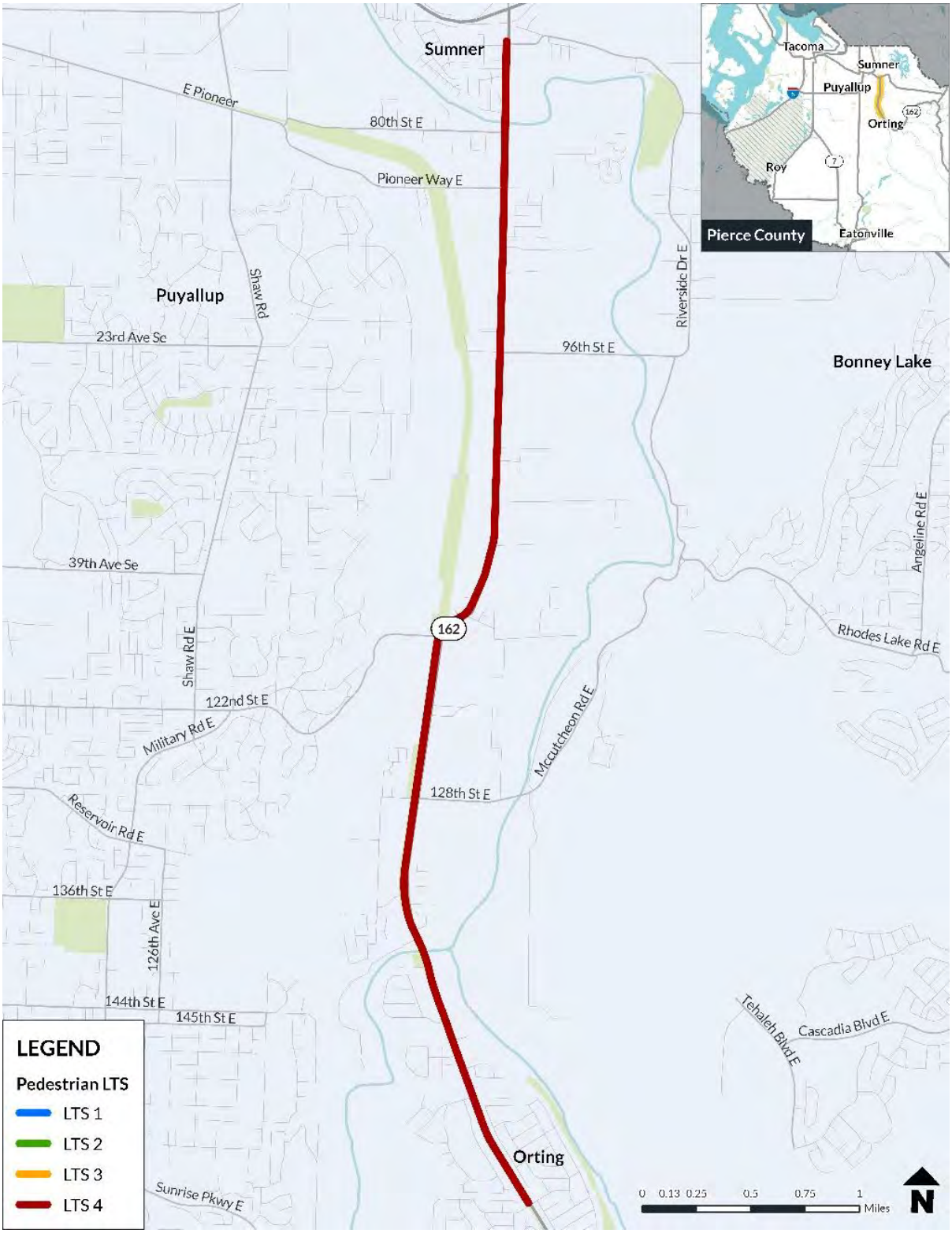


Figure 10. State Route 162 Pedestrian Level of Traffic Stress Map

Bicycle Level of Traffic Stress (BLTS)

The study corridor has paved shoulders but no dedicated bicycle facility within the right-of-way. The WSDOT BLTS for a road with no dedicated bicycle facility, as shown in Figure 11, is LTS 4. A map of the existing BLTS along the study corridor is shown in Figure 12.

Exhibit 1520-5 Bicycle Level of Traffic Stress in mixed traffic (no bicycle facility)

BLTS in mixed traffic (no bicycle facility)								
Lanes	AADT	Target Speed						
		≤20	25	30	35	40	45	50+
1 thru lane per direction (or 1 lane one-way street)	0 - 750	1	2	3	4	4	4	4
	751 - 1500	1	2	3	4	4	4	4
	1501 - 3000	2	2	3	4	4	4	4
	> 3000	2	3	3	4	4	4	4
2 thru lanes per direction	0 - 6000	3	3	3	4	4	4	4
	> 6000	3	3	4	4	4	4	4
3+ thru lanes per direction	Any ADT	4	4	4	4	4	4	4

Figure 11. State Route 162 Bicycle Level of Traffic Stress Analysis

Source: WSDOT Design Manual M 22-01.23, September 2024, Analyzed by Fehr and Peers.

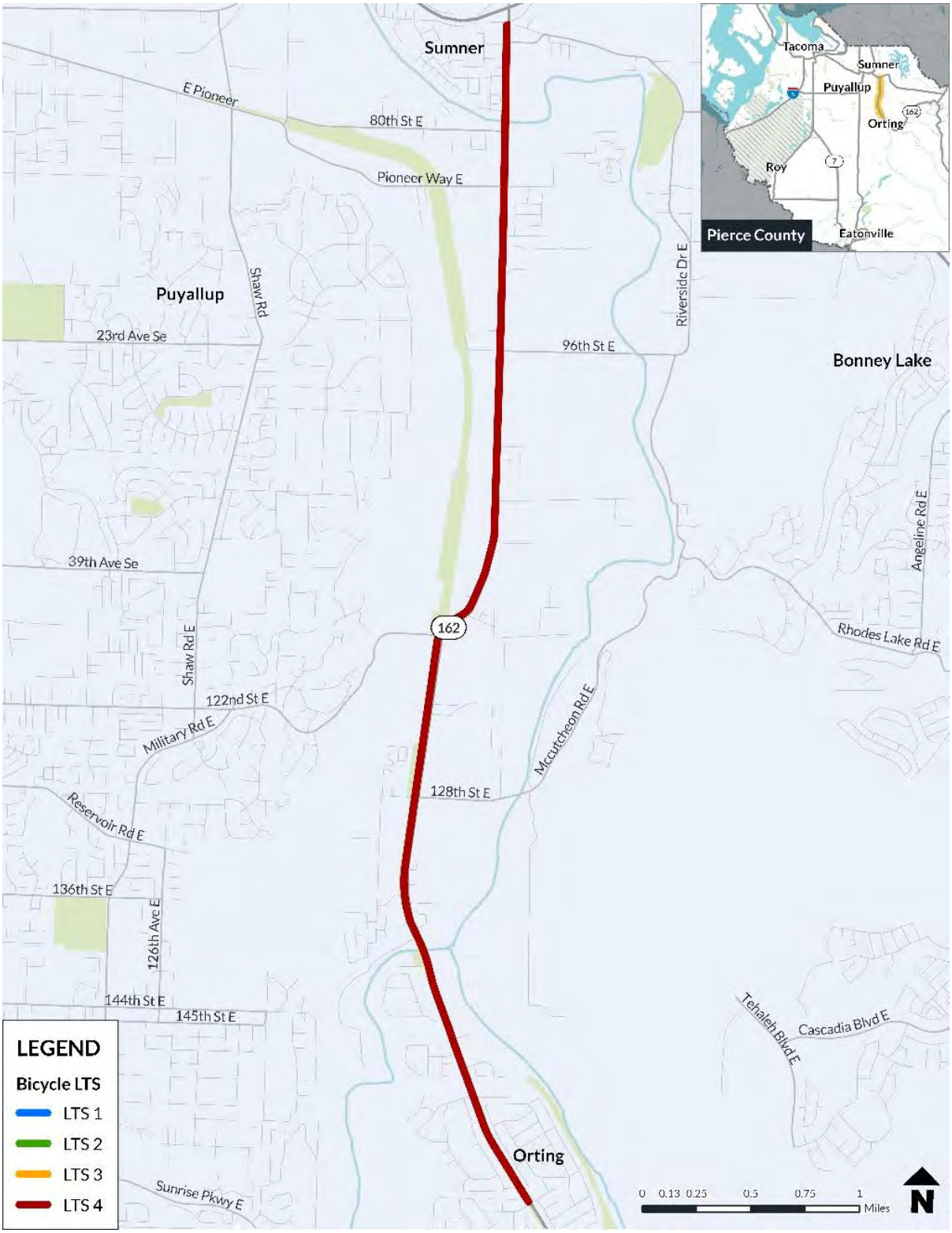


Figure 12. State Route 162 Bicycle Level of Traffic Stress Map

Foothills Trail Level of Traffic Stress

The WSDOT Design Manual Division 15 – Pedestrian and Bicycle Facilities, 1515.03 Shared-Use Paths, Complete Streets Level of Traffic Stress (LTS) (New 2024) states, "A shared-use path that meets the requirements of this chapter by definition meets the requirements of an LTS 2 or better facility for both bicyclists and pedestrians." The Foothills Trail was evaluated at select locations to determine if it meets the requirements. Based on preliminary evaluation, the Foothills Trail generally meets the Complete Streets requirements and has a PLTS and BLTS of 2 or better.

The anticipated user types on the Foothills Trail are pedestrians (mainly recreational hikers and walkers) and cyclists of all ages and abilities. A design speed of 15 MPH was assumed. The Foothills Trail generally maintains a 12-foot width along the corridor, except at the southern bridge crossing. The trail's curve radii are appropriate for the design speed, with tighter curves at approaches to street and railroad crossings which serve to slow users. Clearances, shoulders, and cross slopes appear to meet design requirements.

The Foothills trail is operated and maintained by the Pierce County Parks and Recreation Department and is therefore considered a park facility and not a transportation facility. Signing at trailheads indicates trail use is restricted to daylight hours ("dawn to dusk").
Additional enhancements such as widening the trail in locations with higher volumes, marking and signage, adding rest areas, and pedestrian illumination to allow use outside of daylight hours to better serve transportation needs may be considered to further improve the Foothills Trail.

Existing Active Transportation Usage and Access

Counts of people walking and biking were collected on May 30, 2024, at 13 study intersections during the AM and PM peak periods (7:00 to 9:00 AM and 4:00 to 6:00 PM respectively). People walking or biking were observed at all thirteen study intersection locations during either the AM or PM peak period. A higher volume of pedestrians was observed at study intersections where the Foothills Trail crossings are included as part of the intersection. These intersections include:

- Military Road E,
- 136th Street E,
- 144th Street E,
- 149th Street Court E, and
- Williams Boulevard.

The Foothills Trail crosses west of the intersection at 128th Street E; therefore, people crossing at this location were not included in the intersection traffic count data collected. The highest peak period pedestrian volumes occurred at the intersection of SR 162 and Military Road, with 49 pedestrians observed in the PM peak period.

Access to Foothills Trail

The Foothills Trail within the study area provides an LTS 2 facility adjacent to the corridor for the segments south of Military Road E. For those segments, the trail is separated from SR 162 by a railway

with 80 feet of low growth vegetation. North of Military Road E, the alignment of SR 162 shifts east, with the trail gently curving west to eventually match the alignment of Pioneer Way E. For this segment, the distance between the study corridor and the Foothills Trail ranges between 800 feet (just north of Military Road E) and 1,500 feet (at Pioneer Way E). There is a public right-of-way connection to the Foothills Trail at N 96th Street E.

According to the *WSDOT Project Delivery Memo, #22-03 – Complete Streets Implementation*, "[A] gap is defined as either a physical barrier, or a highway segment that provides for a pedestrian or bicycle Level of Traffic Stress (LTS) 3 or 4 and/or a Route Directness Index greater than 2." Therefore, the existing Foothills Trail access for pedestrians and bicyclists was evaluated on a parcel basis along the study corridor. Parcels with direct access to the Foothills Trail or parcels fronting roadways connecting to the trail with a PLTS 2 or better were defined as having access. There are currently 1,595 parcels with access to an LTS 2 facility, shown in Figure 13.

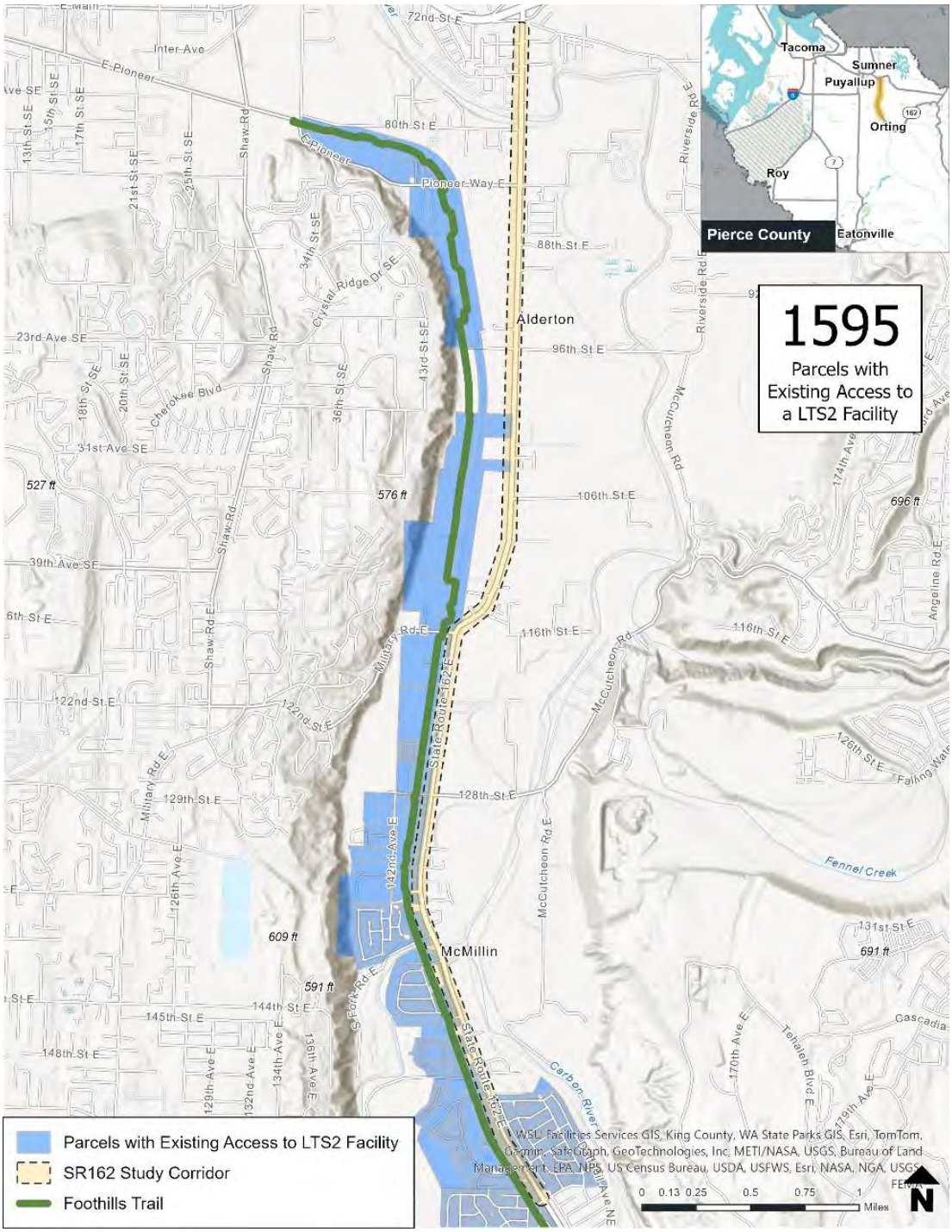


Figure 13. Parcels along the Study Corridor with Existing Access to a Level of Traffic Stress 2 Facility

Safety[18]

A five-year crash history (2019-2023) from WSDOT's statewide crash database was collected and analyzed for the study corridor. There was a total of 400 crashes on the study corridor reported in that time frame, three of which involved vulnerable road users (defined as people walking, rolling or biking).

Two crashes involving vulnerable users occurred at the intersection of State Route 162 and Williams Boulevard North. The first crash occurred at 1:45 PM in November 2020, when a 19-year-old driving a passenger car made a left turn striking a 13-year-old minor waking, sustaining a possible injury. The second crash occurred at 10:28 PM in August 2023, when a 31-year-old who was driving a passenger car struck a 14-year-old who was riding a bicycle and sustained a suspected serious injury.

A third crash involving a vulnerable user occurred at the intersection of State Route 162 and 96th Street East. The crash occurred at 8:17 AM in August 2022, when a 45-year-old driving a pick-up truck made a left turn, striking a 50-year-old pedestrian, sustaining a possible injury.

Approach

The Complete Streets strategy goals for the study corridor are the following:

1. Provide safe and comfortable access for people walking, biking, or rolling between neighborhoods and businesses fronting SR 162.
2. Enable active transportation as a safe and low stress mode choice.
3. Support the potential for future transit services by providing low stress active connections to potential future stops and stations.
4. Meet WSDOT requirements for Complete Streets.

The *WSDOT Design Manual Division 11 – Practical Design, 1104.03(1) Alternatives Analysis, Alternative Solution Formulation, Complete Streets Alternatives* lists the following strategies for incorporating Complete Streets:

- Reallocation of existing space to include pedestrian and bicyclist modes.
- Adding measures to implement a safe system approach such as reducing vehicle speeds.
- Expanding the cross section to accommodate active transportation modes, and measures to reduce vehicle speeds.
- Increase separation to achieve the target level of traffic stress.
- Increase quantity and quality of crossings to contribute to network connectivity.

[18] Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Strategy Evaluation

Strategies were evaluated for three segments of SR 162: Segment 1 is north of Pioneer Way E. Segment 2 is the segment south of Pioneer Way E to Military Road E. Segment 3 is south of Military Road E. For Segment 1, Foothills Trial diverges away from the study corridor and cannot be utilized as a transportation facility. Segment 2, Foothills Trail is separated from the study corridor by 800 to 1,500 feet, with a public access connection at 96th Ave E. For Segment 3, the Foothills Trail is parallel to the study corridor separated by 80 feet of vegetation and a rail line for a portion and approximately 40 feet of vegetation south of the rail line termination at 136th Street E.

PLTS and BLTS Evaluation

Segment 1: North of Pioneer Way E

The following strategies were evaluated to meet the Complete Streets metrics:

- Strategy 1: Separated shared-use path along the east of SR 162 (no facilities on the west side)
- Strategy 2: Separated shared-use path along the west of SR 162 (no additional facilities on the east side)
- Strategy 3: Separated shared-use path along one side of SR 162 and a separated sidewalk facility on the opposite side

Segment 2: Pioneer Way E to Military Road E

The following strategies were evaluated to meet the Complete Streets metrics:

- Strategy 1: Separated shared-use path along the east of SR 162 (no facilities on the west side)
- Strategy 2: Separated shared-use path along the west of SR 162 (no additional facilities on the east side)
- Strategy 3: Separated shared-use path along one side of SR 162 and a separated sidewalk facility on the opposite side
- Strategy 4: Utilize the Foothills Trail as a shared-use path by additional access points and provide a network of connections along SR 162 to cluster developments. This supplemental strategy was developed based on the SR 162 Center Turn Lane Study Advisory Group feedback.

Segment 3: South of Military Road E

The following strategies were evaluated to meet the Complete Streets metrics:

- Strategy 1: Utilizing Foothills Trail as a shared-use path on the west side of SR 162.
- Strategy 2: Utilizing Foothills Trail as a shared-use path on the west side and add a sidewalk on the east side of SR 162.

Table 1 provides the PLTS and BLTS of the proposed strategies.

Segment	Strategy	PLTS (Eastside)	PLTS (Westside)	BLTS	Meets Targets
1 (North of Pioneer Way E)	1	2	4	2	No
	2	4	2	2	No
	3	2	2	2	Yes
2 (Pioneer Way E to Military Rd E)	1	2	4	2	No
	2	4	2	2	No
	3	2	2	2	Yes
	4	2	2	2	Yes
3 (South of Military Rd E)	1	2	4	2	No
	2	2	2	2	Yes

Table 1. Pedestrian Level of Traffic Stress and Bicycle Level of Traffic Stress Analysis for Complete Streets Strategies

For Segment 1, Strategy 3 meets PLTS and BLTS targets. For Segment 2, Strategy 3 and 4 meets PLTS and BLTS targets. For Segment 3, Strategy 2 meets PLTS and BLTS targets. A corridor that fulfills the Complete Streets goals must meet or exceed the scoring thresholds for both pedestrians AND cyclists.

Route Directness Evaluation

Route directness for the study corridor was evaluated to determine potential enhanced crossing locations with a of ½mile spacing between enhanced crossing locations. Crossing locations were prioritized based on specific land use context that is likely to generate pedestrian activities, such as: residential housing developments; observed Foothills Trails access locations (such as informal footpaths from the roadway); and large agricultural employers.

Potential crossing locations at or near the following intersections are proposed to meet metrics for route directness:

- 88th Street E
- 106th Street E
- 121st Street E / 122nd Street E
- Just south of the southern bridge crossing
- 144th Street E
- 149th Street Court E

The proposed addition of the above enhanced crossing locations would result in a maximum distance of 0.7 miles between protected pedestrian crossings, and an average distance of 0.4 miles between protected crossings.

At a minimum, enhanced crossings should be designed to include:

- Protected movements for active transportation such as pedestrian half signals or crossings at full signals.
- High visibility crosswalk markings.
- Appropriate pedestrian crossings pavement markings and warning signs on approach to the crossing location.
- Crosswalk illumination per WSDOT design standards.

Recommended Strategies

The draft Complete Streets strategy for this study is described below to achieve the level of traffic stress goal of LTS 2 for both pedestrians and bicyclists and context-appropriate route directness.

North of Pioneer Way E

Due to the evaluation of the center turn lane north of Pioneer Way E. See the full report regarding the exclusion of any segment widening or roadway segment modification between SR 410 and Pioneer Way E. The recommended improvement includes intersection modifications at 74th St E, 80th St E, and Pioneer Way E. Depending on the complete streets screening, those individual locations would be required to incorporate complete streets at those project locations

Pioneer Way E to Military Road

The recommended strategy for segment 2 is strategy 4 listed above. This strategy was developed in coordination with WSDOT active transportation subject matter experts to determine the feasibility of utilizing the Foothills Trail as a transportation facility.

Utilize existing parallel Foothills Trail as separated mixed-use path on the west side of the corridor was deemed feasible for the segment from Pioneer Way E to Military Road. The east side of the corridor will have portions of pedestrian and bike facilities connecting urban clusters of residents and business to access points.

Utilization of the Foothills trail is better aligned with the rural nature of this segment and with the understanding that feasibility is subject to on-going design elements and agreements between the state and Peirce County Parks and Recreation. Due to the lack of county road connections between SR 162 and the Foothills trail, it is necessary to provide LTS 2 access points approximately every 0.5 miles. Figure 15 shows the area in which the lack of access points to the Foothills trails would need improvement. It should be noted that any new connections built between SR 162 and the trail will require the purchase of right of way from adjoining property owners. Additionally, access permits would be needed for any connection which has to cross the short line railroad alongside the trail.

Additional enhancements such as widening the trail in locations with higher volumes, installing wayfinding signing and striping, adding rest areas, and pedestrian illumination to allow use outside of

daylight hours may be considered to further improve the Foothills Trail. Improvements to the existing trail will require the permission and coordination with Pierce County Parks and Recreation.

South of 128th Road

The Military Road to 128th Street improvements on SR 162 are subject to developer mitigation and county plans at the Military Road and 128th Street intersections. The SR 162 study roadway improvements and complete streets elements will defer to those separate development plans.
The recommended strategy for segment 3 is strategy 2 listed above. This strategy will utilize the existing parallel Foothills Trail as a separated mixed-use path on the west side of the corridor. The east side of the corridor will have sections of sidewalk added along the east side to the proposed crossing locations.
Utilization of the Foothills trail in the segment south of Military Road has the same level of enhancement and coordination to make the Foothills trail a transportation facility.

Enhanced Pedestrian and Bicycle Crossings

The strategy aims to construct controlled protected crossings at appropriate intervals based on land use and context targeting an approximate ½-mile spacing between protected crossings. Potential crossing locations at or near the following intersections are proposed to meet metrics for route directness:

- 88th Street E
- 106th Street E
- 121st Street E / 122nd Street E
- Just south of the southern bridge crossing
- 144th Street E
- 149th Street Court E

At a minimum, enhanced crossings should be designed to include protected movements for active transportation such as pedestrian half signals or crossings at full signals, high visibility crosswalk markings, appropriate pedestrian crossings pavement markings and warning signs on approaches to the crossing location, crosswalk illumination per WSDOT design standards.

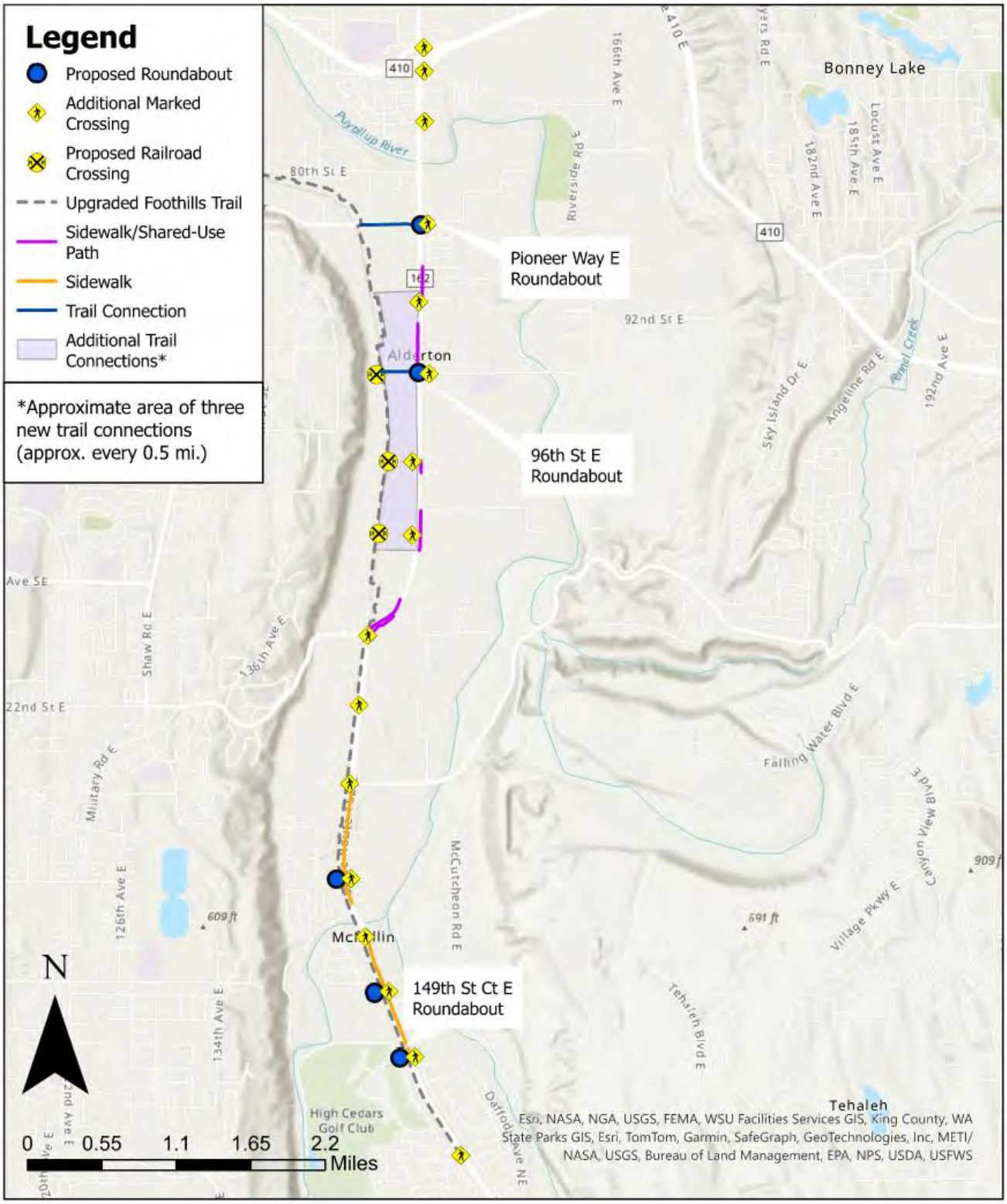


Figure 14. Proposed Complete Streets Strategy Map

Appendix E. Online Open House Report

Executive Summary

Project overview

The Washington State Department of Transportation (WSDOT) is conducting a study of State Route (SR) 162 from SR 410 in Sumner to Williams Boulevard in Orting. This study is looking at existing conditions in the corridor and developing recommendations to improve mobility, safety, and emergency response times.

SR 162 is an important north-south link that moves people and goods, connects the cities of Sumner and Orting, and extends through the Orting Valley. The study area encompasses a 5.5-mile section of SR 162, where travelers often experience delays during peak commute hours. Continued development in this part of Pierce County will likely increase traffic volumes along the study corridor.

Study community engagement

WSDOT hosted an online open house and community questionnaire as part of the study. This online open house provided community members with general study information, easy-to-digest graphics, and key messaging about the study. It also included an embedded community questionnaire to collect feedback on issues and community experience traveling in the study area. The online open house and questionnaire were translated into Spanish and compliant with Section 508.

Between Oct. 21 and Nov. 12, 2024, 6,939 individuals visited the online open house, and 2,246 people completed the questionnaire.

Key takeaways

The questionnaire included multiple-choice questions and open-ended or write-in questions. The community responses revealed several key challenges, improvement suggestions, and priorities. Key takeaways include:

- *Challenges:* Participants noted experiencing the most challenges related to congestion, safety for all modes of transportation, and lack of public transit options.
- *Suggestions*: Responses mentioned the most improvements related to congestion, safety, and business access. Participants want more road lanes, better public transit, and evacuation routes.
- *Locations:* We heard from participants who primarily reside in Orting, Bonney Lake, Puyallup, and Buckley. When asked if there are specific locations or places where they would like improvements, *Intersections 1*, *2*, *6*, *8*, *9*, *12*, *the Foothills Trail*, *and various farm entrances along the corridor garnered the most suggested improvements.* Participants also provided a list of improvement locations that were not indicated in the existing conditions of the study area, some of which are managed by WSDOT but unrelated to this study.
- *Priorities:* There is consensus that the most important improvements address multiple challenges simultaneously.

Engagement completed

The study team developed an online open house hosted on the Engage.wsdot.wa.gov platform as a main vehicle for engagement and collecting feedback. To review the full online open house, see Online Open House Content.

The online open house was designed to inform the public about the study and collect community input. When visiting the online open house, participants could:

- Learn about why WSDOT is conducting the study.
- Review study area maps.
- Review data about existing transportation conditions.

WSDOT embedded a community questionnaire into the online open house to collect feedback on issues experienced while traveling and community priorities for the study area. The questionnaire format included multiple choice questions and options for writing in answers, consisting of nine questions and six optional demographic questions. To review the full questionnaire, see Questionnaire.

The online open house and community questionnaire were available on the Engage.wsdot.wa.gov platform between Oct. 21 and Nov. 12, 2024. WSDOT provided the online open house and questionnaire in Spanish and English.

Goals

The following goals guided the study's online open house engagement:

- Promote awareness about the study, process, purpose, and need.
- Collect community input to identify issues, concerns, and priorities that will inform the development of the study and its strategies.

Promotions

WSDOT is committed to conducting an inclusive planning process that aims to break down barriers to involvement for all community members. The study team shared information about the online open house and questionnaire with audiences and communities through several channels.

Outreach method	Promotion details
Flyer	A flyer was posted in 11 community locations in Orting, Sumner, and Puyallup on October 22.
Schools	Printed flyer and emails were shared with School District staff to disseminate on October 22.
Social media	• October 21 Facebook post: 332 reactions, 298 comments, 259 shares • October 23 Twitter post: 6,700 impressions, four replies, six reposts, three favorites • November 7 Instagram story/Facebook slide story: Instagram views: 12K videos, 108 clicks (Facebook data not available)
Emails to community-based organizations	An email with an attached flyer was sent to 62 non-profits, HOAs, religious institutions, and other local organizations on October 21.

Table 1. Outreach Methods

Materials

WSDOT

OCTOBER 2024

SR 162 Center Turn Lane Planning and Pre-Design Study

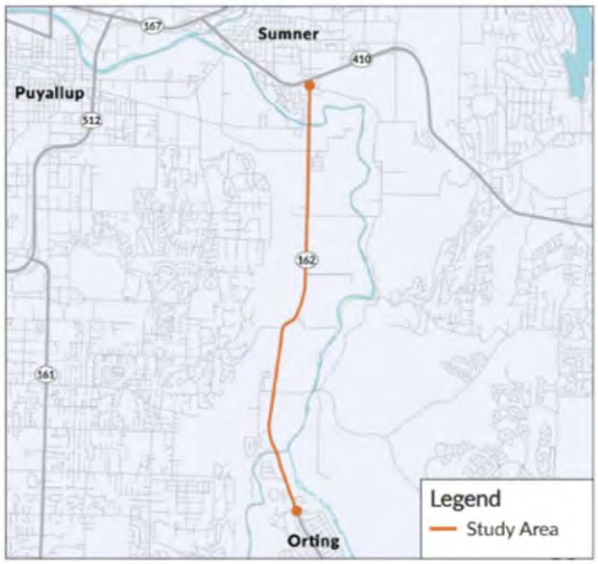
The Washington State Department of Transportation is leading a study of the State Route 162 corridor between Orting and SR 410 in Sumner.

WE WANT TO HEAR FROM YOU!

Visit **engage.wsdot.wa.gov** and choose **SR 162 Center Turn Lane Planning and Pre-Design Study**

View the online open house and share your feedback Oct. 21 - Nov. 12, 2024.

Photo: WSDOT



FOR MORE INFORMATION

Contact: SR162CTLstudy@wsdot.wa.gov

wsdot.wa.gov/construction-planning/search-studies/sr-162-center-turn-lane-planning-and-pre-design-study

AMERICANS WITH DISABILITIES ACT (ADA) INFORMATION: This material can be made available in an alternate format by emailing the Office of Equity and Civil Rights at wsdotada@wsdot.wa.gov or by calling toll free, 855-362-4ADA (4232). Persons who are deaf or hard of hearing may make a request by calling the Washington State Relay at 711.

TITLE VI NOTICE TO PUBLIC: It is the Washington State Department of Transportation's (WSDOT) policy to assure that no person shall, on the grounds of race, color, or national origin as provided by Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his/her Title VI protection has been violated, may file a complaint with WSDOT's Office of Equity and Civil Rights (OECR). For additional information regarding Title VI complaint procedures and/or information regarding our non-discrimination obligations, please contact OECR's Title VI Coordinator at (360) 705-7090.

Figure 1. Online open house flyer in English

WSDOT

OCTUBRE DE 2024

Estudio previo al diseño y planificación del carril de giro central de la SR 162

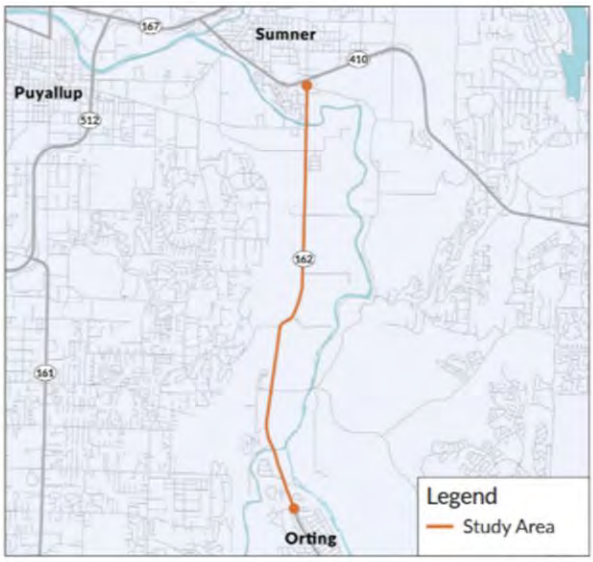
El Washington State Department of Transportation está liderando un estudio del corredor de la carretera estatal SR 162 entre Orting y la SR 410 en Sumner.

¡QUEREMOS CONOCER SU OPINIÓN!

Visite **engage.wsdot.wa.gov** y seleccione **Estudio previo al diseño y planificación del carril de giro central de la SR 162**

Vea la muestra en línea y comparta sus comentarios entre el 28 de octubre y el 12 de noviembre de 2024

Foto: WSDOT



PARA OBTENER MÁS INFORMACIÓN

Contacto: SR162CTLstudy@wsdot.wa.gov

wsdot.wa.gov/construction-planning/search-studies/sr-162-center-turn-lane-planning-and-pre-design-study

INFORMACIÓN SOBRE LA LEY PARA ESTADOUNIDENSES CON DISCAPACIDADES (AMERICANS WITH DISABILITIES ACT, ADA): Este material puede estar disponible en un formato alternativo si envía un correo electrónico a la Oficina de Equidad y Derechos Civiles a wsdotada@wsdot.wa.gov o llama al número gratuito, 855-362-4ADA (4232). Las personas sordas o con dificultades auditivas pueden hacer una solicitud llamando al 711 del Servicio de Retransmisión de Washington.

AVISO AL PÚBLICO DEL TÍTULO VI: es política del Washington State Department of Transportation (WSDOT), según lo dispuesto en el título VI de la Ley de Derechos Civiles de 1964, garantizar que ninguna persona sea excluida de participar en cualquiera de sus programas y actividades financiados con fondos federales, se le nieguen los beneficios de los mismos o sea discriminada de cualquier otra forma por motivos de raza, color u origen nacional. Cualquier persona que crea que se han vulnerado sus derechos bajo el título VI puede presentar una queja ante la Oficina de Equidad y Derechos Civiles (Office of Equity and Civil Rights, OECR) del WSDOT. Para obtener información adicional sobre los procedimientos de queja del título VI o sobre nuestras obligaciones de no discriminación, comuníquese con el coordinador del título VI de la OECR al (360) 705-7090.

Figure 2. Online open house flyer in Spanish

Engagement results

Below are the results of the online open house and community questionnaire.
For a question-by-question breakdown of participant responses to these questions, see Question-by-question breakdown of questionnaire results on page 30. This questionnaire is not considered a scientific or statistically significant poll.

Participation

Between Oct. 21 and Nov. 12, 2024, 6,939 individuals visited the online open house, and 2,246 people completed the questionnaire. Questionnaire responses were submitted in English and Spanish.

Audiences

Title VI of the Civil Rights Act of 1964 requires the Washington State Department of Transportation to be sure that everyone in the affected project areas has a chance to be heard and to respond to transportation programs and activities that may affect their community.
To help with that, we asked participants to voluntarily provide us with information about race, ethnicity, gender, and/or other demographics. Responses to these questions were not required.

Zip Code

- The top three zip codes we heard from in the questionnaire were 98360 (40%), 98391 (19%), and 98374 (9%). These zip codes belong to Orting, Bonney Lake, and Puyallup.
- Fifteen percent (15%) of participants chose "Other." Of this, the top three specified were 98372 (79 responses), 98321 (43 responses), and 98373 (22 responses). These zip codes belong to Puyallup and Buckley.

Gender

- Most participants identify as female (53%), with thirty-eight percent (38%) identifying as male and less than one percent (1%) identifying as non-binary.
- Eight percent (8%) of participants chose not to disclose their gender.

Disability

- Most participants do not identify as having a disability (82%), while eight percent (8%) identify as having a disability.
- Ten percent (10%) of participants chose not to disclose whether they had a disability.

Ethnicity

- Most participants do not identify as Hispanic or Latino (95%), while five percent (5%) identify as Hispanic or Latino.

- 105 responses marked "Hispanic or Latino." 3.87% is the percent of the sample that marked only "Other" for Race AND selected "Hispanic or Latino" for ethnicity.

Race[19]

- Most participants identify as only Caucasian (84%).
- About five percent (4.6%) identify as two or more races.
- Around two percent (1.7%) of participants identify as American Indian/Alaska Native.
- Around two percent (1.5%) of participants identify as Asian.
- Around two percent (2.3%) of participants noted their racial identity as "Other."
- Less than one percent (0.8%) of participants identify as Black or African American.
- Less than one percent (0.4%) of participants identify as Native Hawaiian/Pacific Islander.

Language (spoken at home)

- The top three languages spoken at home by questionnaire participants include English (90%), Spanish (3%), and Tagalog (1%).
- Four percent (4%) of participants chose not to disclose their language spoken at home.

Age

- Most participants (26%) are between the ages of 35 and 44, followed by the ages of 25 to 34 (19%) and 45 to 54 (18%).
- About ten percent (10%) of participants chose not to disclose their age or left the question blank.

[19] Percentages of racial groups above exclude responses that were left blank or marked "Prefer not to disclose." About seventeen percent (17%) of participants chose not to disclose their racial identity.

The study team mapped out a demographic area based on 2020 Census data and the Washington State Environmental Disparities map to account for those living closest to the corridor. This demographic area is represented by the state legislative districts 25, 31, and 2.

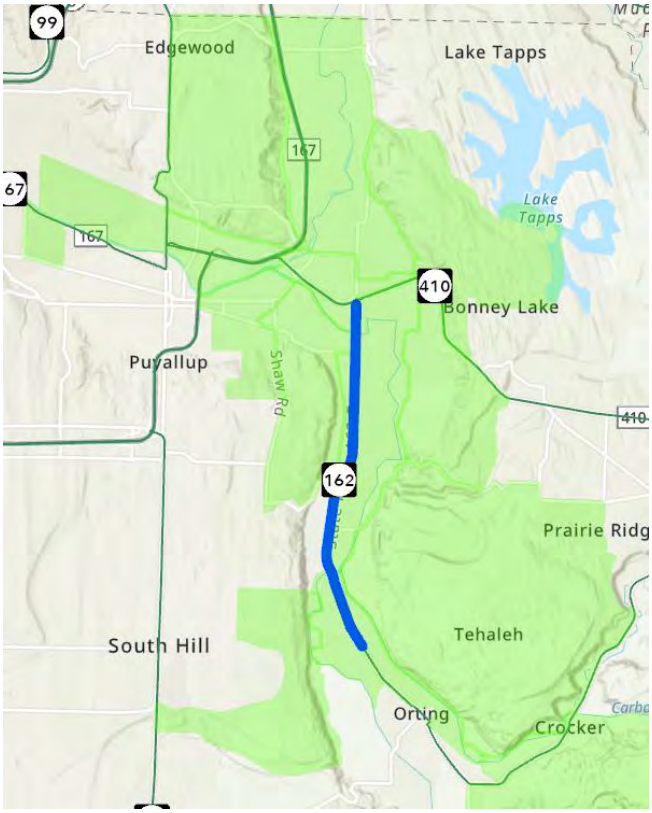


Figure 3. Map of census tracts in demographic area

Methodology

The survey results were analyzed using a mix of quantitative and qualitative methods. Qualitative comment data (see Questionnaire) was first coded in Microsoft Excel, using both inductive and deductive coding to identify comments containing key words. Groups of coded comments were then imported into an online whiteboarding tool to affinity map (a method for sorting and grouping information) each group and distill the key themes or insights for each code/key word.

Inductive coding involved skimming the full comments dataset to surface key words found in many of the survey responses (i.e. "roundabout") and tagging the responses containing those key words. Deductive coding involved searching the comments dataset for key words that were important to the project (i.e. "bicycles") and tagging the comments containing those words. Excel formulas were used for searching, tagging, and to ensure that word variations (i.e. "bikes," "bicycles," "cyclists," etc.) would be included in each tag group.

Equity analysis

Table 2 shows how responses to the questionnaire's optional demographic questions compared to the study area's demographics. It includes demographics which had statistically significant differences between the questionnaire's respondents and the study area's population. To compare it accurately to the American Community Survey (ACS) data for the demographic area, the following adjustments were made:

- All categories exclude responses that marked the question blank or "prefer not to disclose."
- Gender data exclude responses marked "nonbinary." The census data does not include this category.
- Age-related data exclude responses marked "Under 18," which were a disproportionately few; four respondents marked "Under 18," only 0.17% of the responses, whereas 25% of the total population in the study area is under 18.

The arrows next to each percentage indicate whether the most common demographic responses on the questionnaire overrepresent (↑) the demographics of the study area.

Demographic	Most Common Questionnaire Response	Questionnaire Percentage	Demographic Area ACS Response	Demographic Area ACS Percentage
Gender	Female	58%↑	Female	50%
Disability	Does not have a disability	91%↑	Has a disability	88.8%
Ethnicity	Not Hispanic or Latino	95%↑	Not Hispanic or Latino	91%
Race	Caucasian	88%↑	White	76%
Age (18+)	35-44	28% ↑	35-44	19%

Table 2. Demographics of Questionnaire Respondents

Overall, this indicates a questionnaire sample not completely representative of the study area. Demographics overrepresented in the questionnaire results include people who identify as female, who are white and not Hispanic or Latino, and who are between the ages of 35 and 44.

For this study, participants with social inequity indicators are defined as reporting at least one of the following:

- Living in parts of the study area with more environmental hazards,
- Having a disability,
- Identifying as a race other than only Caucasian,
- Identifying as Hispanic or Latino,
- Identifying as a gender other than Male or Female and/or
- Being over the age of 65 years old.

Current travel patterns

Most participants said they traveled through the corridor for shopping/errands (76.7%), recreational activities (71.6%), visiting friends and family (64.8%), and commuting to and from work (60.1%). Approximately four percent (4.2%) of participants chose 'Other,' and mostly took trips for medical appointments or were bus drivers along the study area.

Participants said they typically travel along the corridor multiple times per week (72%), with the remaining traveling along the corridor at least once a week (15%) or at least once a month (11%). Only two percent (2%) indicate they travel along the corridor never or rarely (less than once a month). Most participants said they get around the study area in a personal vehicle by themselves (96%), followed by carpooling using a vehicle (32%). Two percent (2%) of participants chose 'Other,' and other modes of transportation consisted mainly of work vehicles such as school buses, city buses, patrol cars, and fire trucks.

Travel challenges

The most noted challenges in participant responses were:

- *Congestion:* Eighty percent (80%) of participants noted this as their highest priority.
- *Safety for all modes:* Eight percent (8%) of participants noted this as their highest priority, with nineteen percent (19%) marking this as their second highest priority and an additional seventeen percent (17%) marking it as their third highest.
- *Lack of transit options:* Seven percent (7%) of participants noted this as their highest priority, with twelve percent (12%) marking it as their second highest priority and an additional ten percent (10%) marking it as their third and fourth highest priority, respectively.

The main themes mentioned in write-in responses were:

- *Lanes: Participants believe that the e*xisting two-lane road cannot handle current nor projected traffic volumes. They called for expansion to as little as four lanes (i.e., two in each direction, excluding a center turn lane) and as many as seven lanes (i.e., three in each direction, including a center turn lane).
- *Traffic signals and turn lanes***:** Participants mentioned a lack of proper traffic signals, synchronized lights, and dedicated turn lanes.
- *Lighting: Participants noted that there is insufficient* lighting in many areas of the corridor.
- *Emergency service and evacuation*: Participants expressed that congested roads along the corridor make it difficult for emergency responders, noting that there are limited westward or bypass options for emergencies. They also mentioned concern over inadequate planning for pedestrian-friendly and vehicle evacuation routes.
- *Environment and community:* Participants primarily view the study area as a rural and agrarian. They are frustrated with unchecked population growth and its environmental impacts. Some argue widening the road would harm the environment and encourage rapid population growth from the nearby urban areas.

Improvement suggestions and priorities

Participants were asked what improvements they would like to see in the study area. In their write-in responses, participants shared that they want more road lanes, better public transit, and evacuation routes. There is support for alternatives that combine several improvements to solve multiple challenges.

With over 1,500 comments, the common themes for suggested future improvements to SR 162 are: *Congestion and Traffic Flow.*

As a top concern for participants, proposals to alleviate traffic between Orting and Sumner included adding lanes, improving intersections, introducing measures such as reversible lanes and synchronized traffic lights, creating alternate routes, and reducing commuter traffic through strategic routing. Though some greatly oppose additional roundabouts, about 74% of respondents that mentioned roundabouts supported them as a solution for congestion and safety. ,.

- “Without congestion and gridlock, 162 could provide a good alternate route for getting on and off the Tehaleh plateau, especially during emergencies.”

- "Less congestion...a middle turn lane will help a little, and maybe the farms can get bigger lots. Especially the Xmas tree lots. People park on both shoulders, then run across the road."
- "Roundabouts to decrease traffic backup at intersections, both controlled and uncontrolled, and more lanes in both directions of travel with center turn lane at least from Sumner at 410 to the Orting High School/Pioneer Village/162 intersection."
- "Hoping the new pedestrian bridge that will go over 162 entering Orting will help with congestion leading up to rush hour traffic."

Safety and Accidents
Participants emphasized enforcing speed limits, improving intersection safety, and enhancing pedestrian infrastructure. Solutions include dedicated turn lanes, improved visibility, and emergency pull-offs.

- "Fix it so we can get out safely. We are tired of being thought of as the problem people just because we don't turn out fast enough. I'm honked at because I don't turn into my neighborhood at 50 miles an hour. While people live and park and walk out to the highway to access the bike path."
- "Enforcement of people doing the speed limit (people usually go too slow, causing the traffic), or a turn lane so people aren't stopping for multiple minutes while waiting for a gap when both directions are congested. A turn lane would also allow for safer travel when turning out of driveways and businesses."
- "Better visibility, more shoulder for emergencies. Turn lanes for things like Spooner Farm and the other recreational activities in the area. Often during the holiday season, the road is backed up to accommodate pumpkin patches and tree farms."

Public Transit
There is a call from participants for better bus and train services, including new routes, a park-and-ride program, improved access to transit hubs, and reduced car dependency.

- "I would like to see public transportation that connects directly with existing bus and light rail options with the expansion of bus service in Sumner/Bonney Lake/Buckley/Enumclaw to be completed within three years."
- "Any improvements that would help congestion and adding access to public transportation for members of my family that can't drive."

Road Expansion and Development
Participants would like to see the growing traffic demand from new developments addressed. Proposed solutions include widening SR 162, creating bypass routes, and proactively planning for future growth to accommodate increasing traffic volumes.

- "Wider roads, the volume of cars requires it, or nothing will help."
- "Make sure the travel can flow through the overpass to the freeway in Sumner."
- "Bypass road specifically for commercial vehicles only."

Improvement Locations

Participants were also asked if there are specific locations or places where they would like to see improvements across all modes of transportation (e.g., biking, walking, rolling, ridesharing, carpooling, or driving personal vehicles).
The following locations garnered the most improvement suggestions. Comments submitted for SR 162 as a whole were excluded. This was to isolate responses that only relate directly to the study area.
Intersection 1 and 2: SR 162/SR 410 Westbound (WB) and Eastbound (EB) Ramps

- "As you approach 410, cars try to turn left to go back towards Knutson Farms, WinCo, etc. This can result in backed-up traffic coming off or across 410 and slow down those proceeding to go across or onto 410. People often avoid that last section by turning downside streets."
- "Entering and exiting any residential community between 410 and Orting at an uncontrolled intersection is dangerous and frustrating due to congestion. A center turn lane will only help somewhat if southbound 162 is stopped for half the day."
- "The 410 on-ramps could use much more pedestrian and bike-friendly areas."

Intersection 8: SR 162/Military Rd E

- "The shoulder is very narrow, and the area is very dark between Military and 410 on the east side. I often pass people in the dark walking north and just barely off the white line."
- "The intersection of 162 and Military Road is not safe. With train tracks that separate the traffic trying to turn onto 162 and pedestrians and bikers trying cross is bad."
- "There is no place for pedestrians to walk up the hill on Military Road. There often are people walking their bikes up the windy road and people on foot. It is dangerous, to say the least. The frequent accidents on this road divert people into my neighborhood, where they speed and drive recklessly in the rain. Often, drivers try to beat the traffic going up and down the hill by speeding through the neighborhood. Speed bumps, at a minimum, should be installed along Military Road."

Foothills Trail

- "I would like a Foothills Trail crossing over Pioneer Way E and a pedestrian crossing at Orting High School/Safeway."
- "It's difficult to get to the Foothills Trail system from Calistoga in Orting and other areas that are a little ways off the system. It requires an unsafe ride on roads with drivers who are not used to sharing the road with bicycles. With the new communities being developed on Calistoga by the river. We need bicycle and pedestrian ways to get downtown and to the trails."
- "Force stops for trail 'traffic' with bar restrictions instead of stop signs. All streets going into 162 with stop signs on the Foothills Trail are not obeyed/generally ignored by most cyclists, skaters, and joggers."

Intersection 12: SR 162/149th St Ct E (near High Cedars Golf Course)

- "There is a lack of a left turn lane and traffic signal at the High Cedars Golf Course entrance road."

- "The golf course and 160+ homes need access in and out of the neighborhood. It's unbelievable there isn't a turn by lane or light."
- "High Cedars is horrible to get out of at high traffic times. The traffic stops, and you can't see the cars coming the other way to get out."

Intersection 9: SR 162/128th St E

- "I would like a longer/additional turn lane from 162 onto 128th E. The rock/dirt trucks that turn onto that street cause a lot of extra traffic."
- "We need a cross-base highway built and to extend 128th to Puyallup to relieve traffic heading north to Military Rd or 410, whose goal is heading to Lacey/Olympia."
- "It would be nice to be able to bike/walk/run from the south hill area down to the Orting/Sumner area. Currently, there is no road through at 128th."

Intersection 6: SR 162/Pioneer Way E/Bowman Hilton Rd

- "We need a dedicated turn lane to make a right on E Pioneer."
- "The stop sign at Pioneer needs to be a light or a roundabout."
- "Pioneer Way E has crosswalks but no safe sidewalks for anybody to walk or bike along 162. It would be nice if there were sidewalks along 162 and Pioneer Way E that connect to the Foothills Trail and/or other commercial areas towards Sumner."

Various farm entrances along the corridor (e.g., Spooner Farms)

- "Many vehicles park on the shoulder of SR 162 during peak farm seasons, sticking out into the roadway and creating a traffic hazard. The current two-lane highway and shoulder are not wide enough to accommodate this."
- "I would like more parking for tree farms and pumpkin farms and more traffic control around these areas."
- "We need sidewalks and turn lanes near Spooner and other farms to keep people off the roads."

Other improvement locations mentioned, related and unrelated to this study, included:

- *Alderton to McMillin*
- *McCutcheon Intersection*
- *Noble Firs Estates*
- Downtown Orting
- *Rhodes Lake to Puyallup*
- *Sumner to South Prairie*
- *Tahleah*
- *South Hill*
- SR 167

Online Open House Content

PAGE 1: Welcome

Welcome to our online open house!

The Washington State Department of Transportation is conducting a study of State Route (SR) 162 from SR 410 in Sumner to Williams Boulevard in Orting. The study will look at existing conditions in the corridor and develop recommendations to improve mobility, safety, and emergency response times.

This online open house will provide information about:

- Why we are doing this study,
- The existing conditions of the study corridor, and
- How you can share input.

Your input will help us develop recommendations to improve SR 162.

The online open house is available through **November 12, 2024**. Once you have reviewed the information, please visit the Feedback section of this open house. There you will find a series of questions and opportunities to share your input.

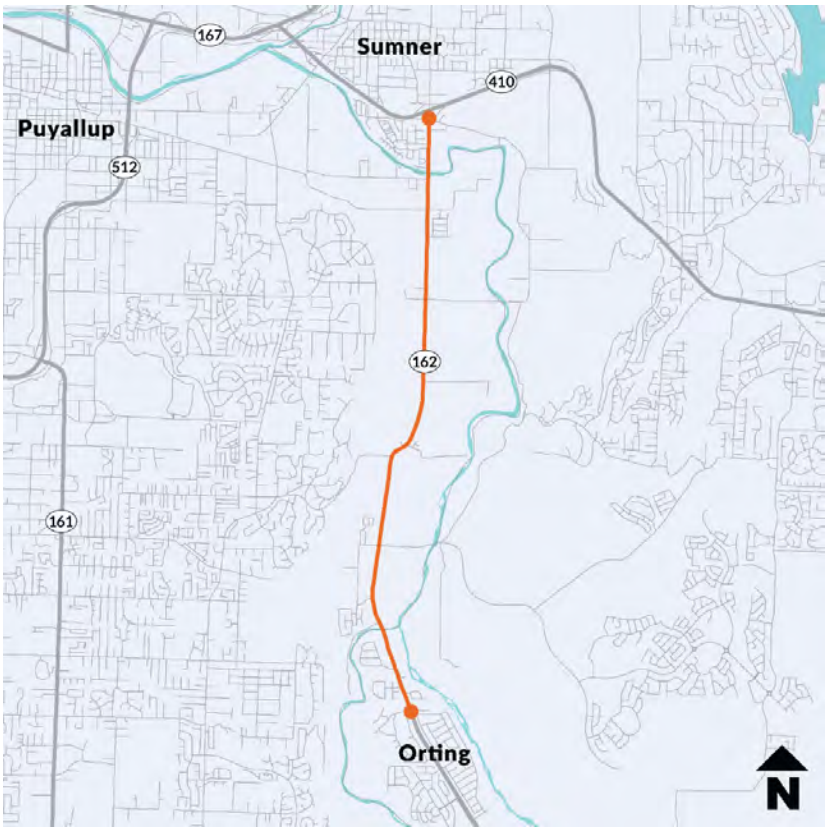


Figure 4. SR 162 Study Map

Title VI Notice to Public

Washington State Department of Transportation policy aims to ensure that no person shall, on the grounds of race, color, national origin, or sex as provided by the Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his or her Title VI protection has been violated may file a complaint with WSDOT's Office of Equity and Civil Rights (OECR). For additional information regarding Title VI complaint procedures and information regarding our nondiscrimination obligations, please contact the Title VI Coordinator within the Office of Equity and Civil Rights by calling 360-705-7090.

Americans with Disabilities Act (ADA) Information

WSDOT is committed to providing equitable access to its facilities, program, services, and activities for person with disabilities. The material contained in this document can be made available in an alternate format by emailing the WSDOT ADA Compliance Team at wsdotada@wsdot.wa.gov or by calling toll free 855-362-4ADA (4232). Persons who are deaf or hard of hearing may make a request by calling the Washington State Relay at 711.

PAGE 2: Study overview

Why are we conducting this study?

SR 162 is an important north-south link that moves people and goods, connects the cities of Sumner and Orting, and extends through the Orting Valley. The study area encompasses a 5.5-mile section of SR 162 where travelers often experience delays during peak commute hours. Continued development in this part of Pierce County will likely increase traffic volumes along the study corridor.

Figure 5. SR 162 corridor looking southeast, in Orting.

A Building upon the 2017 SR 162 Sumner to Orting Corridor Planning Study (https://wsdot.wa.gov/construction-planning/search-studies/sr-162-sumner-orting-corridor-planning-study); and following legislative direction, this study will utilize new data and a new round of community engagement to develop recommendations that will help improve safety, access, mobility, and emergency response times. Funding for design and construction have yet to be identified. Recommended improvement options from this study will be published and used to pursue project funding opportunities.

SR 162 Sumner to Orting Corridor Planning Study

As mentioned above, WSDOT completed a corridor planning study in 2017. The study outcomes included five short, mid- and long-term strategies for further development into potential solutions. They were:

1. Transportation Demand Management strategies aimed at travel behavior rather than expanding the transportation network to meet travel demand
2. Operations (Improvements)/Intelligent Transportation Systems/Incident Management including such elements as active Traffic Management, traffic signal timing/optimization and signal interconnect actions
3. Public Transportation Services including elements of transit and rail services
4. Park and Ride lots, bicycle and pedestrian facility improvements
5. Intersection control and corridor improvements

You can read the 2017 Corridor Study Report here. (http://chrome-extension/efaidnbmnnnibpcajpcglclefindmkaj/https:/wsdot.wa.gov/sites/default/files/2021-03/SR-162-study-corridor-congestion.pdf)

Funding

This study is funded through $1 million in state funding approved during the 2023 legislative session. No funding has been identified for design and construction of improvement recommendations made as part of this study.

Schedule

This study began in April 2024 and is scheduled for completion in June of 2025.

Spring to fall 2024	Study background, engage study advisory group, collect and analyze data.
Fall 2024 to winter 2025	Community outreach and two online open houses. Identify community issues, share initial analyses, and gather feedback on draft recommendations.
Spring 2025	Refine and finalize recommendations and complete engagement report that is shared with the community.

Table 3. Study Outreach Schedule

Figure 6. Example of two-way center turn lane. Photo credit FHWA.

What's Next

WSDOT will use community feedback collected in the questionnaire to inform draft recommendations. In 2025, WSDOT will share those draft recommendations with the community and stakeholders. Please email SR162CTLstudy@wsdot.wa.gov if you'd like to receive study updates.

Outcomes
Recommended improvement options from the SR 162 Center Turn Lane Planning and Pre-design Study will be published and used to pursue project funding opportunities.

PAGE 3: Existing Conditions

About the study area
The study area encompasses a 5.5-mile corridor of SR 162 from Williams Boulevard in Orting to SR 410 in Sumner. Municipalities within the study area include portions of Puyallup, Orting and Sumner. Travelers experience congestion and safety performance issues driving north- and southbound on SR 162. Travelers and emergency services who use SR 162 often experience delays during peak commute hours. Continued development in this part of Pierce County will likely increase traffic volumes and emergency response times along the study corridor.

SR 410 is just north of the study area. WSDOT conducted a separate study focused on the SR 162/410 interchange in 2017. (https://wsdot.wa.gov/construction-planning/search-projects/sr-162-sr-410-interchange-construct-roundabouts)

Figure 7. Aerial photo of SR 162 looking north.

Average Daily Traffic
Along the study corridor, the greatest weekday traffic volumes occur on SR 162 in Orting south of 128th Street East, and between 122nd Street East and Pioneer Way E. In these stretches of the corridor, the annual average daily traffic (AADT) is between 10,000 and 11,000 vehicles. AADT is the total volume of vehicle travel on a road for an entire year, divided by 365.

Figure 8. Annual Average Daily Traffic for SR 162 in the study area.

Transportation modes

People use multiple travel modes to move along the SR 162 study corridor:

Biking: People biking north and south along SR 162 can use the Foothills Trail, which provides a separate parallel shared use path for bikers to move safely through the corridor. There are limited connections for bikers who wish to use SR 162 instead of the Foothills Trail.

Walking and rolling: There is limited infrastructure for people walking or rolling, which creates safety concerns for people using these modes of travel. SR 162 does not have sidewalks, and though the roadway may have a wide shoulder, they are paired with high traffic volumes and speeds from motor vehicles. People walking or rolling north and south along SR 162 can use the Foothills Trail, which provides a separate parallel shared use path to move safely through the corridor.

Figure 9. Foothills Trail, photo credit City of Orting.

Taking transit: SR 162 is currently outside of the Pierce Transit service area so there are limited transit options.

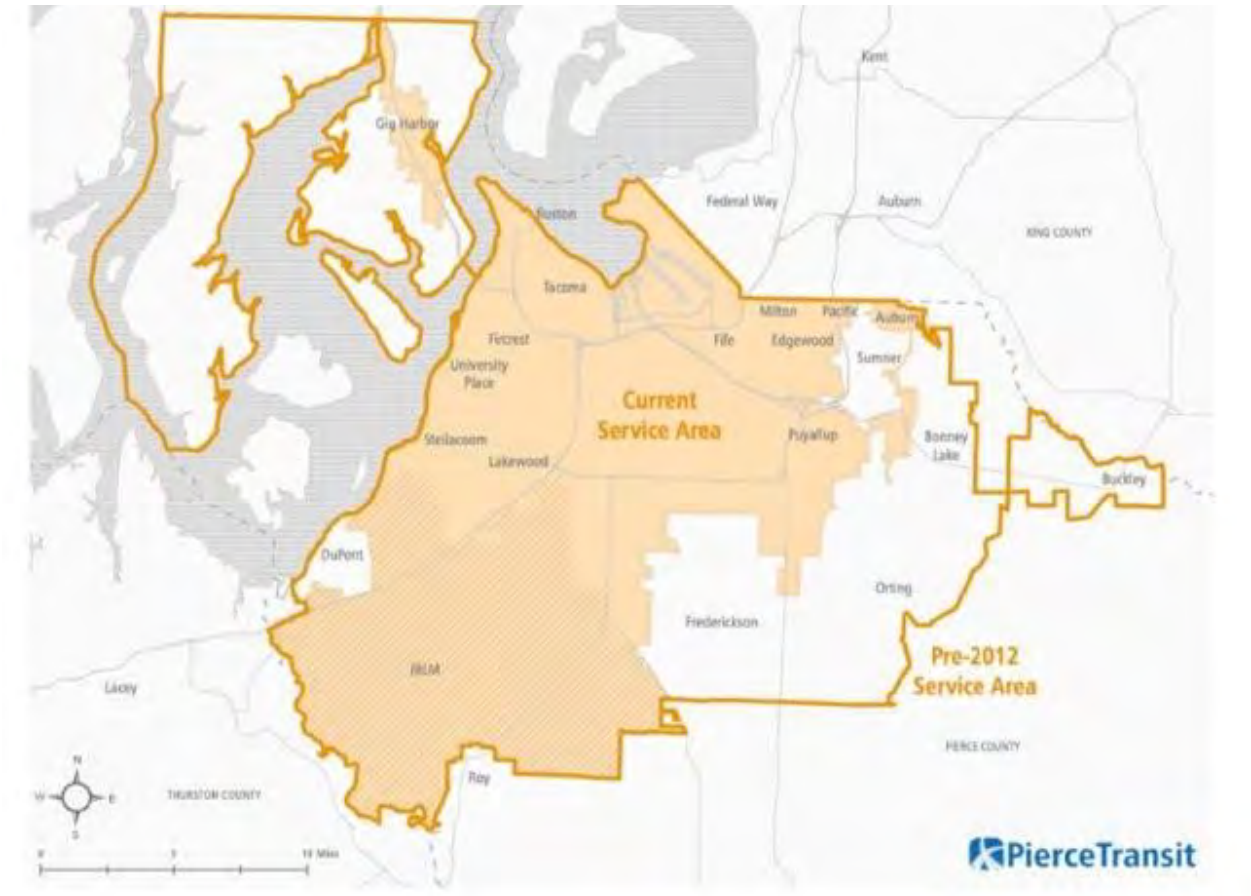


Figure 10. Pierce Transit's current service area.

Crashes on SR 162 in the study area

Safety is WSDOT's number one priority. This study will incorporate Target Zero practices to reduce traffic fatalities and serious injuries on Washington's roadways. Across the study area, there were 421 total vehicle crashes between 2018 and 2023, with 4 of them resulting in serious injury. There were 2 vehicle-to-pedestrian crashes and 1 vehicle-to-bicycle crash during that same period.

All Modes		
Severity	Crashes	Percentage
No Apparent Injury	283	67%
Other Injury	134	32%
Serious Injury	4	1%
Fatality	0	0%
Total	**421**	**100%**

Table 4. Study area crash data, 2018-2023

Emergency evacuation

Businesses and residents along the SR 162 corridor and in the Orting Valley can follow established Lahar evaluation walking routes in the event of a Mount Rainier eruption. This study's recommendations will be in support of existing Pierce County emergency preparedness and evacuation plans. To learn more, visit Pierce County's website. (https://www.piercecountywa.gov/3730/Mount-Rainier-Active-Volcano)

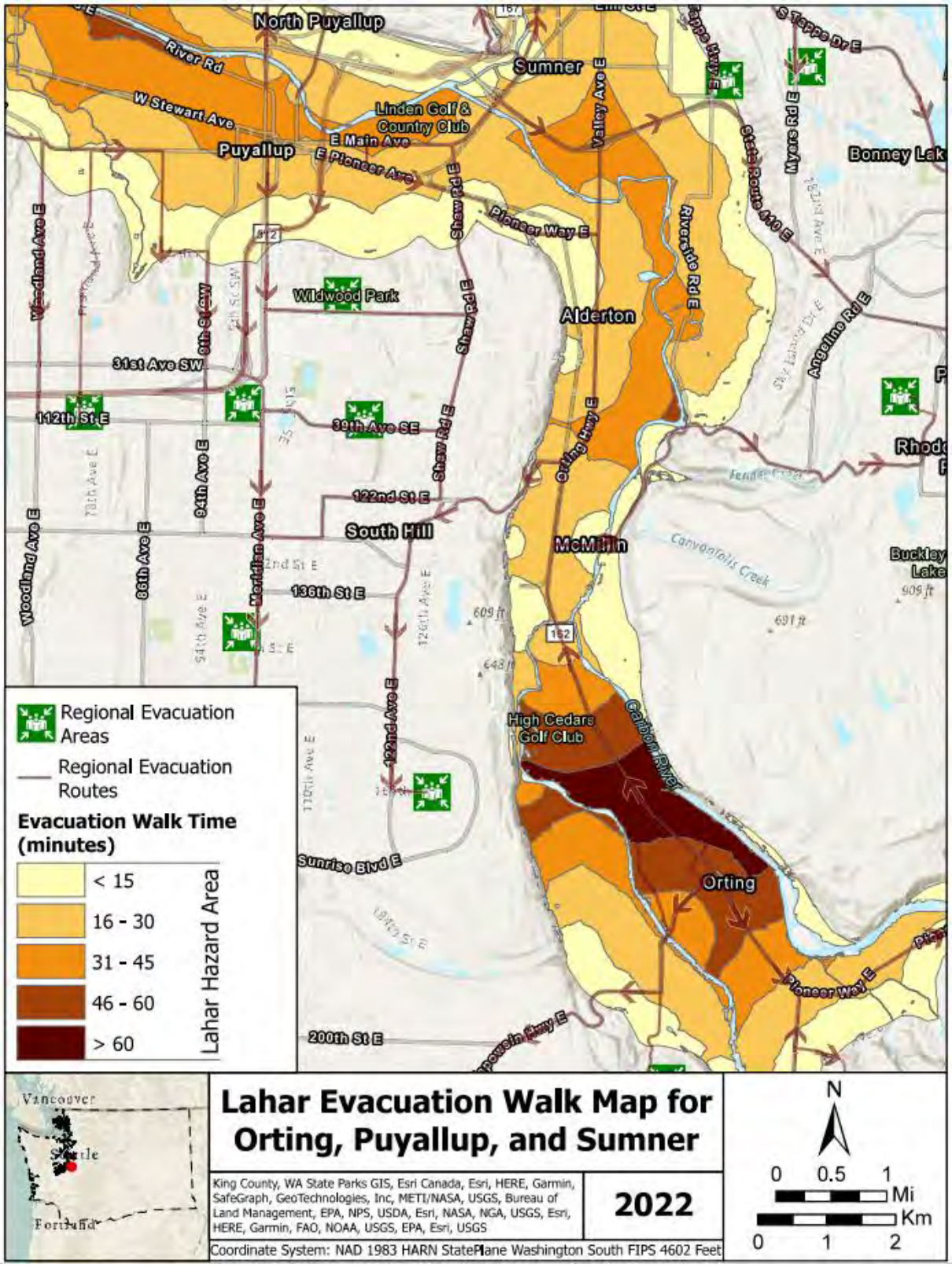


Figure 11. Lahar Evacuation Walk Map for Orting, Puyallup and Sumner.

Environment
The study will identify the impact of potential improvement strategies on river crossings, wetlands, flood hazard zones, fish passage barriers, and hazardous waste sites. Improvement strategies may be modified or removed from consideration depending on the level of impact they may have on these environmental factors.

Equity and health disparities
The study will consider the burdens and benefits of potential improvement strategies for areas where minority, low-income, or other disadvantaged communities might be affected. The improvement strategies will seek to better allocate resources towards areas that have historically received less funding and other resources.

Planned future improvements
There are a number of projects in the study area that improve travel for people driving, walking, rolling or biking:

- SR 162 / 128th St Roundabout Project (Complete April 2026)
- SR 162 / SR 410 Interchange Roundabouts (Complete Summer 2026) (https://wsdot.wa.gov/construction-planning/search-projects/sr-162-sr-410-interchange-construct-roundabouts)
- Foothills Trail Realignment
- Rivergrove Community Pedestrian Bridge (https://connects.sumnerwa.gov/ped-bridge)
- Orting Pedestrian Bridge (https://wsdot.wa.gov/LocalPrograms/Projects/Dashboard/ProjectDetail.aspx?ProjectId=11554&ProjectPhase=CN)

PAGE 4: Feedback

See Questionnaire.

Questionnaire

Feedback

We want to hear from you! Take the SR 162 Study Center Turn Lane Planning and Pre-design Study questionnaire. This questionnaire should take less than ten minutes to complete and will be available through November 12, 2024.
To learn about the study, visit our webpage. (https://wsdot.wa.gov/construction-planning/search-studies/sr-162-center-turn-lane-planning-and-pre-design-study) You can also submit questions and comments at SR162CTLstudy@wsdot.wa.gov.

Questionnaire

Please share your thoughts with us. All questions are optional.

1. What best describes you? Select all that apply:
   - I work at or attend school in the study area
   - I live in the study area
   - I travel through the study area
   - I have family in the study area
   - I do not work, live, or travel through the study area

2. What is your zip code?
   - 98391
   - 98374
   - 98390
   - 98371
   - 98338
   - Other (list)

3. What types of trips do you take in the study area? Select all that apply:
   - Commute to and from work
   - Commute to and from school
   - Travel for shopping/errands
   - Visit friends and family
   - Travel for recreational activities
   - Attend services or activities
   - Travel for deliveries and freight
   - Other (please explain):

4. How often do you travel around or through the study area? Select one:
   - Never
   - Rarely (less than once a month)
   - At least once a month
   - At least once a week
   - Multiple times per week

5. How do you get around the study area? Select all that apply:

- Walk or skateboard
- Bicycle
- Personal mobility device (scooter, wheelchair, etc.)
- Motorcycle
- Taxi or other private ride-sharing service (like Uber or Lyft)
- Vanpool/Paratransit/Microtransit
- Personal vehicle by yourself
- Carpool using vehicle with others
- Commercial vehicle
- Other (please explain):

6. What are the biggest challenges for you when you travel on or around SR 162 in the study area? Rank 1 being your least challenging and 6 being the biggest challenge.
   - Lack of separation between people driving and people walking and biking
   - Lack of transit options
   - Lack of infrastructure for people biking, walking, and rolling
   - Safety for all modes, including people walking, rolling, biking, taking transit or driving
   - Congestion
   - Other (please explain)

7. Are there specific locations or places you would like to see improvements for people traveling biking, walking, rolling, traveling in rideshare, carpool, or driving personal vehicles?

8. When thinking about how you travel through the study area, what improvements would you like to see in the future? Please describe it in one sentence.

9. Which of these categories matter most to you regarding the SR 162 study corridor? Choose two.
   a. Safety
   b. Congestion
   c. Crashes
   d. Emergency response times
   e. Active transportation network (walking, biking and rolling options)
   f. Maintenance and preservation
   g. Emergency evacuation
   h. Business access
   i. Other: (write in)

Optional Demographic Questions

Title VI of the Civil Rights Act of 1964 requires the Washington State Department of Transportation to be sure that everyone in the affected project areas has a chance to be heard and to respond to transportation programs and activities that may affect their community.

To help with that, we ask that you voluntarily provide us with information about your race, ethnicity, gender and/or other demographics. You are not required to disclose the information requested to participate in this questionnaire.

WSDOT will handle the information gathered as confidentially as possible. For further information regarding this process please contact the Title VI Coordinator by phone at 360-705-7090. Please respond to the following questions:

1) **Gender**
   - Male
   - Female
   - Non-binary
   - Prefer not to disclose
2) **Disability**
   - Yes
   - No
   - Prefer not to disclose
3) **Ethnicity**
   - Hispanic or Latino
   - Not Hispanic or Latino
4) **Race (check one or more)**
   - American Indian/Alaskan Native
   - Asian
   - Black or African American
   - Native Hawaiian/Pacific Islander
   - Caucasian
   - Other
   - Prefer not to disclose
5) **Language spoken at home (check one or more)**
   - English
   - Tagalog
   - Spanish
   - Korean
   - Russian
   - Chinese
   - German
   - Arabic
   - Vietnamese
   - Prefer not to disclose
   - Other
6) **Age**
   - Under 18
   - 18-24
   - 25-34
   - 35-44
   - 45-54
   - 55-64
   - 65-79
   - 80+

- Prefer not to disclose

Question-by-question breakdown of questionnaire results

Questionnaire

Question 1 | What best describes you? Select all that apply:

Answer	Percent
I travel through the study area	78%
I live in the study area	50%
I have family in the study area	23%
I work at or attend school in the study area	16%
I do not work, live, or travel through the study area	1%

Table 5. Online Open House Question 1 Responses

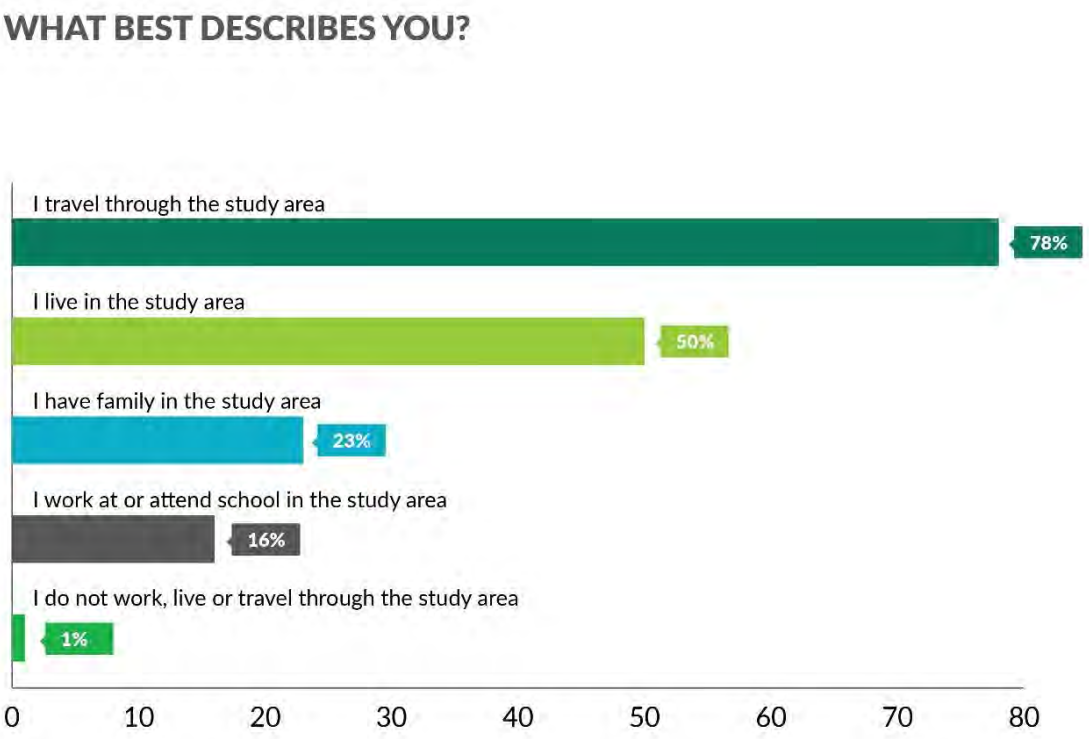


Figure 12. Online Open House Question 1 Response Graph

Question 2 | What is your zip code?

Answer	Percent
98360	40.21%
98391	18.60%
98374	9.44%
98338	8.81%
98390	6.40%
98371	1.34%
Other	15.21%

Table 6. Online Open House Question 2 Responses

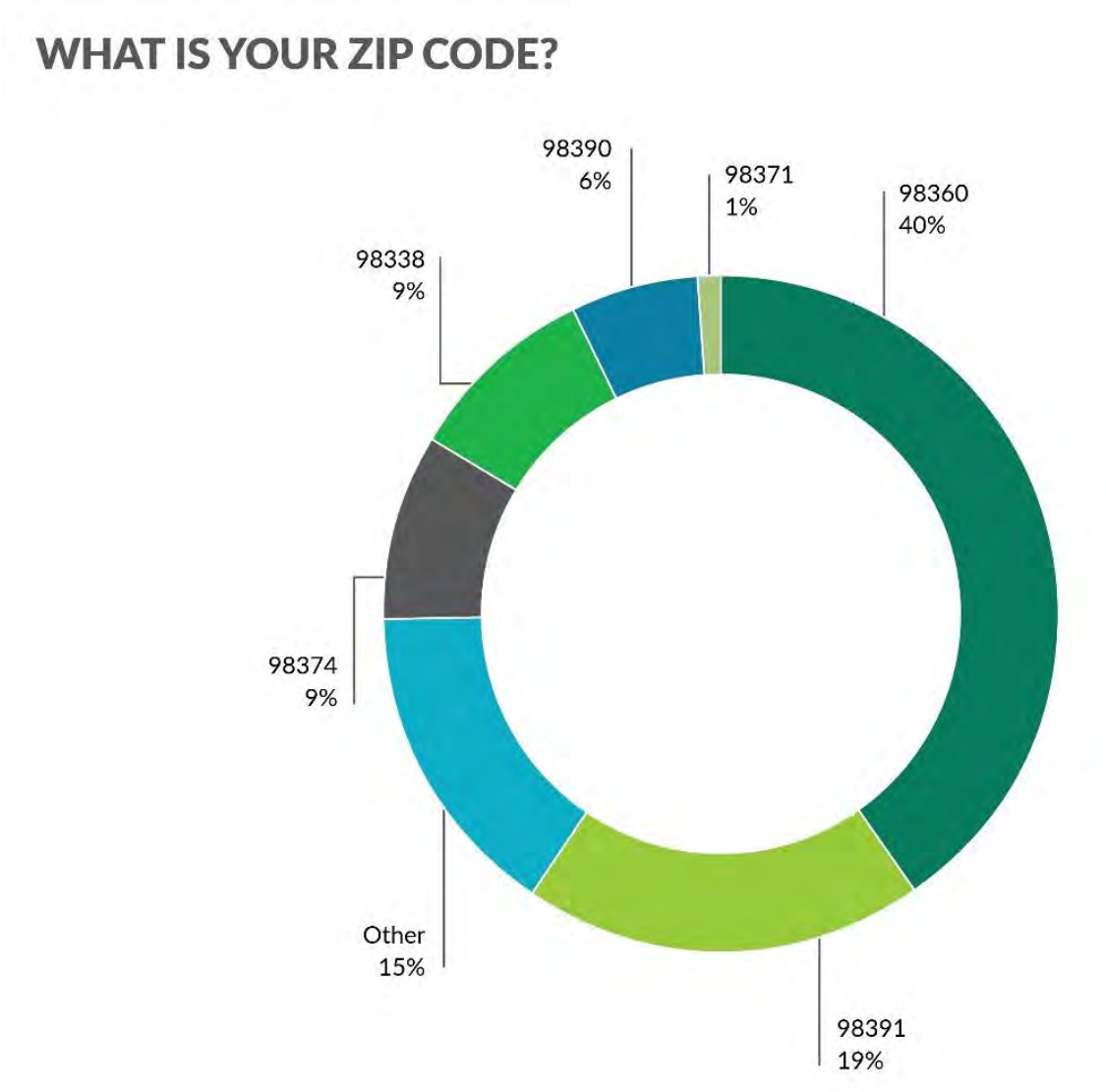


Figure 13. Online Open House Question 2 Response Graph

Question 3 | What types of trips do you take in the study area? Select all that apply:

Answer	Percent
Travel for shopping/errands	76.7%
Travel for recreational activities	71.6%
Visit friends and family	64.8%
Commute to and from work	60.1%
Attend services or activities	45.3%
Commute to and from school	13.3%
Travel for deliveries and freight	6.8%
Other (please explain):	4.2%

Table 7. Online Open House Question 3 Responses

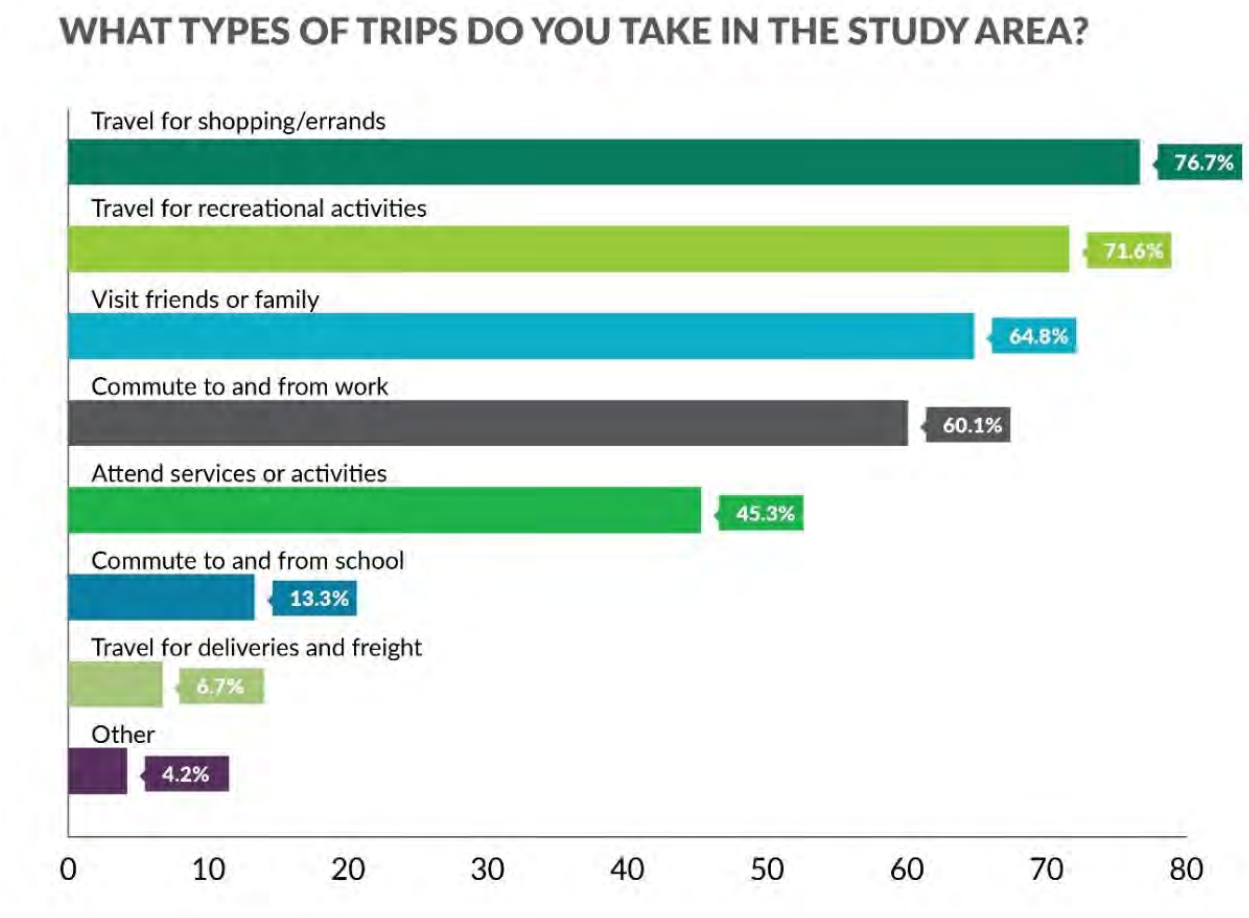


Figure 14. Online Open House Question 3 Response Graph

Question 4 | How often do you travel around or through the study area? Select one:

Answer	Percent
Multiple times per week	72%
At least once a week	15%
At least once a month	11%
Rarely (less than once a month)	2%
Never	0%

Table 8. Online Open House Question 4 Responses

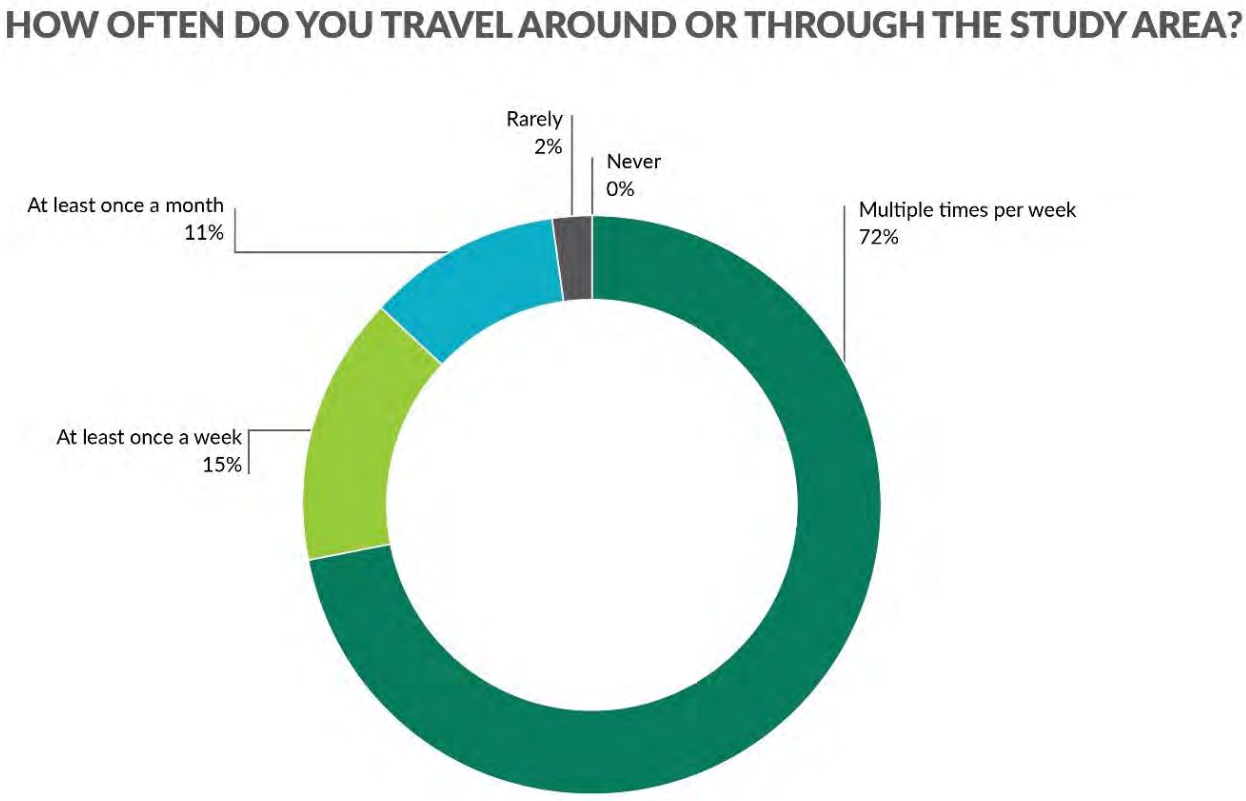


Figure 15. Online Open House Question 4 Response Graph

Question 5 | What are the main ways you get around the study area? Select all that apply:

Answer	Percent
Personal vehicle by yourself	96%
Carpool using vehicle with others	32%
Bicycle	7%
Walk or skateboard	7%
Motorcycle	6%
Commercial vehicle	5%
Other (please explain):	2%
Taxi or other private ride-sharing service (like Uber or Lyft)	1%
Personal mobility device (scooter, wheelchair, etc.)	1%
Vanpool/Paratransit/Microtransit	0%

Table 9. Online Open House Question 5 Responses

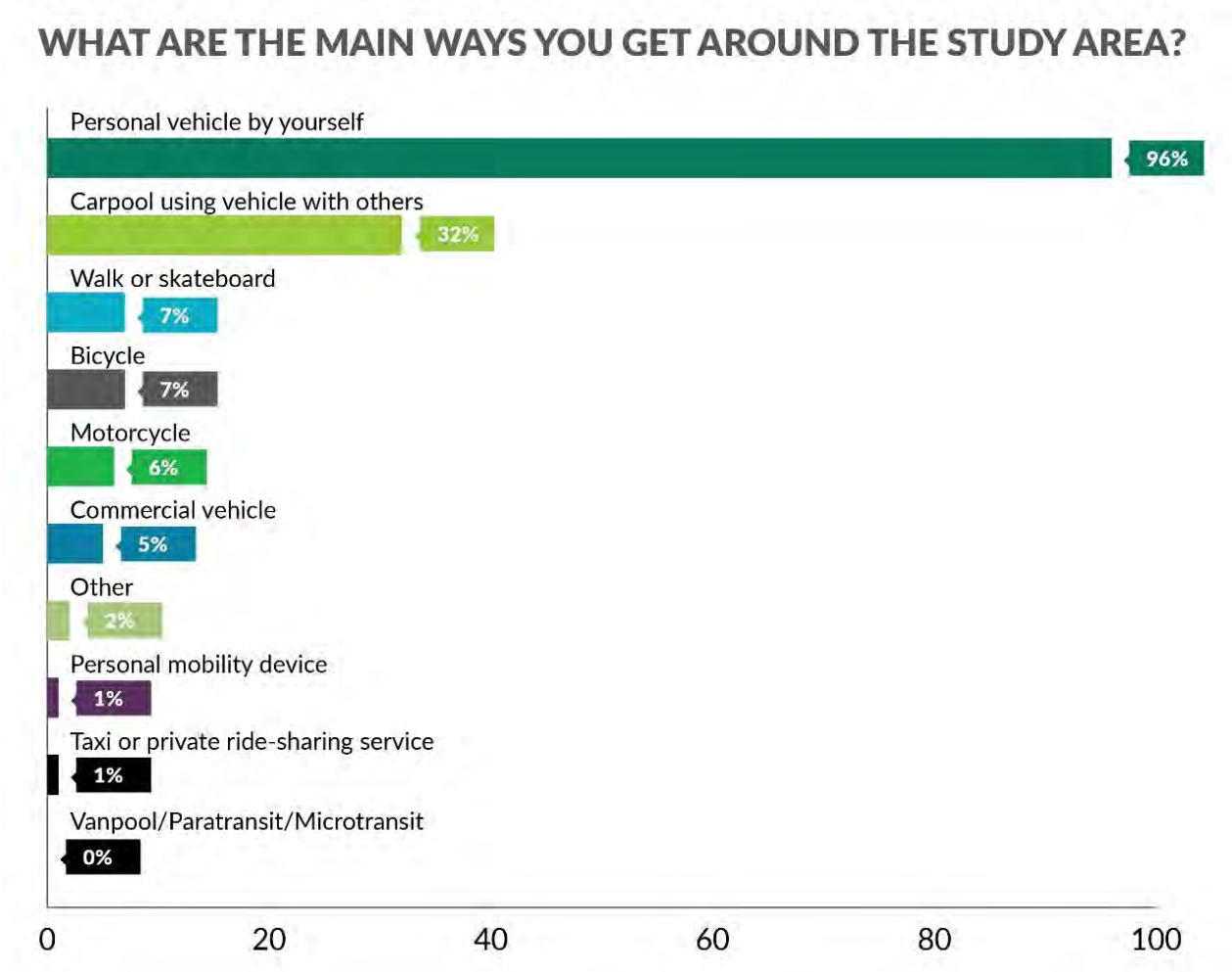


Figure 16. Online Open House Question 5 Response Graph

Question 6 | What are the biggest challenges for you when you travel on or around SR 162 in the study area? Rank 1 being your least challenging and 6 being the biggest challenge.

Overall rankings

Answer	Most Common Ranking (1 = Low, 6 = High)	Percentage
Congestion	6	80%
Safety for all modes, including people walking, rolling, biking, taking transit or driving	5	19%
Lack of infrastructure for people biking, walking, and rolling	1	26%
Lack of transit options	1	20%
Lack of separation between people driving and people walking and biking	1	20%

Table 10. Online Open House Question 6 Responses

Breakdowns by selection

Congestion	Percentage
6	80%
1	11%
5	5%
2	1%
3	1%
4	1%

Safety for all modes, including people walking, rolling, biking, taking transit or driving	Percentage
5	19%
4	17%
3	14%
1	9%
6	8%
2	8%

Lack of infrastructure for people biking, walking, and rolling	Percentage
1	18%
3	16%
2	14%
4	12%
5	6%
6	3%

Lack of transit options	Percentage
1	20%
2	15%
5	12%
4	10%
3	10%
6	7%

Lack of separation between people driving and people walking and biking	Percentage
1	20%
2	15%
3	14%
4	12%
5	7%
6	4%

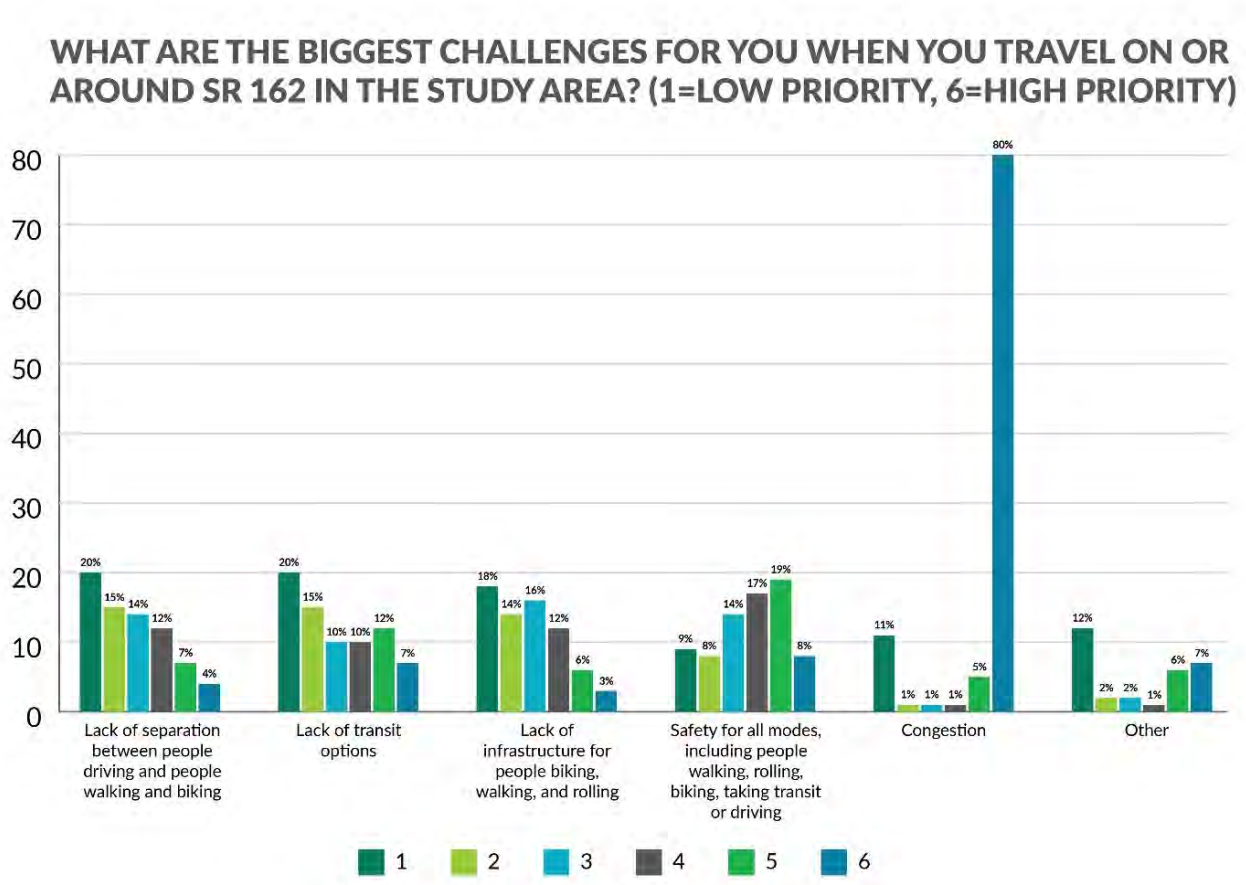


Figure 17. Online Open House Question 6 Response Graph

Question 7 | Are there specific locations or places you would like to see improvements for people traveling biking, walking, rolling, traveling in rideshare, carpool, or driving personal vehicles? (write in answer)
Question 8 | When thinking about how you travel through the study area, what improvements would you like to see in the future? Please describe it in one sentence. (write in answer)

Question 9 | Which of these categories matter most to you regarding the SR 162 study corridor? Choose two:

Answer	Percent
Congestion	94%
Emergency evacuation	31%
Safety	28%
Emergency response times	18%
Crashes	9%
Business access	3%
Active transportation network (walking, biking and rolling options)	3%
Maintenance and preservation	3%
Other (write in)	1%

Table 11. Online Open House Question 9 Responses

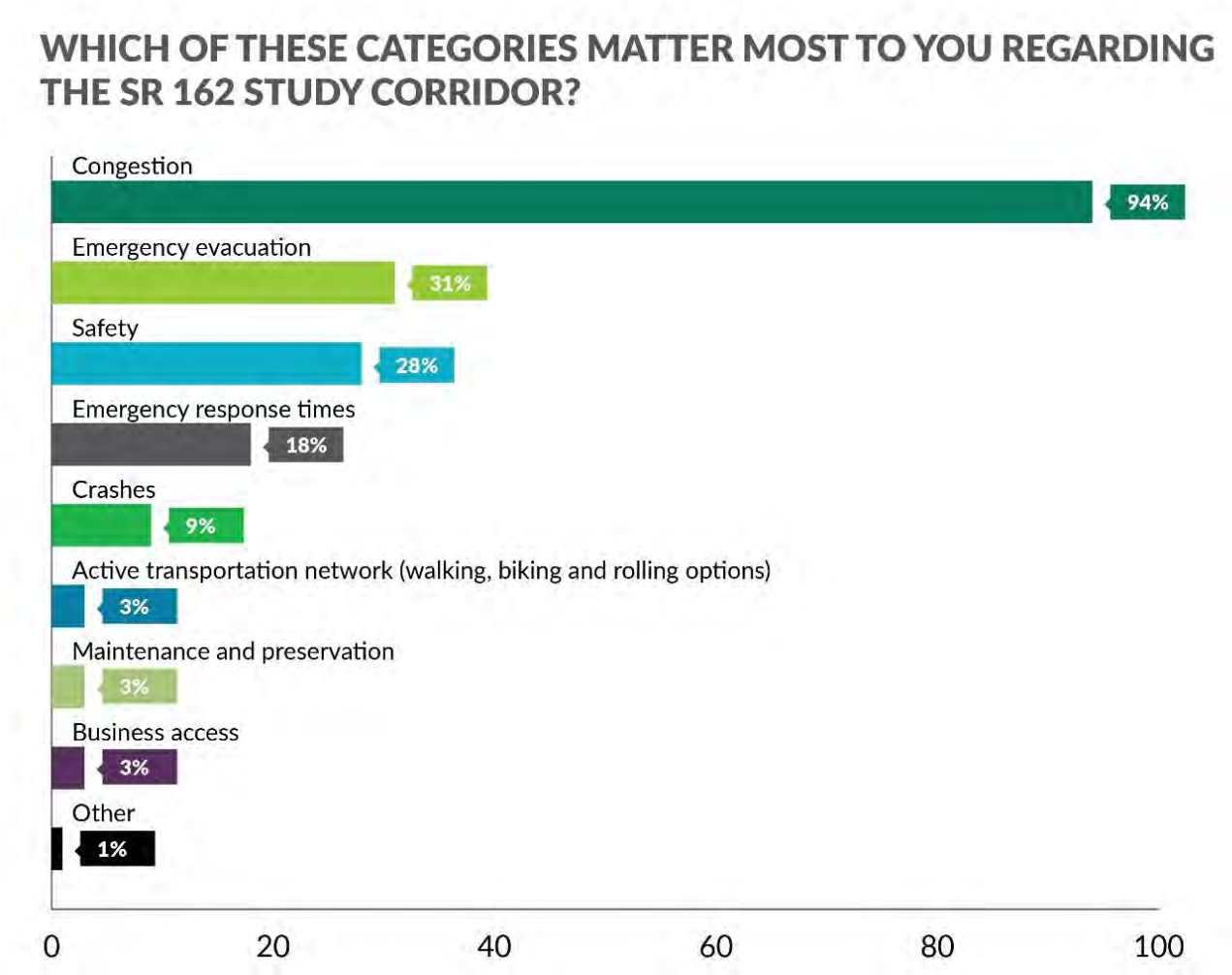


Figure 18. Online Open House Question 9 Response Graph

Optional demographic questions

Question 1 | Gender

Answer	Percent
Female	53%
Male	38%
Prefer not to disclose	8%
Non-binary	1%

Table 12. Online Open House Respondent Gender

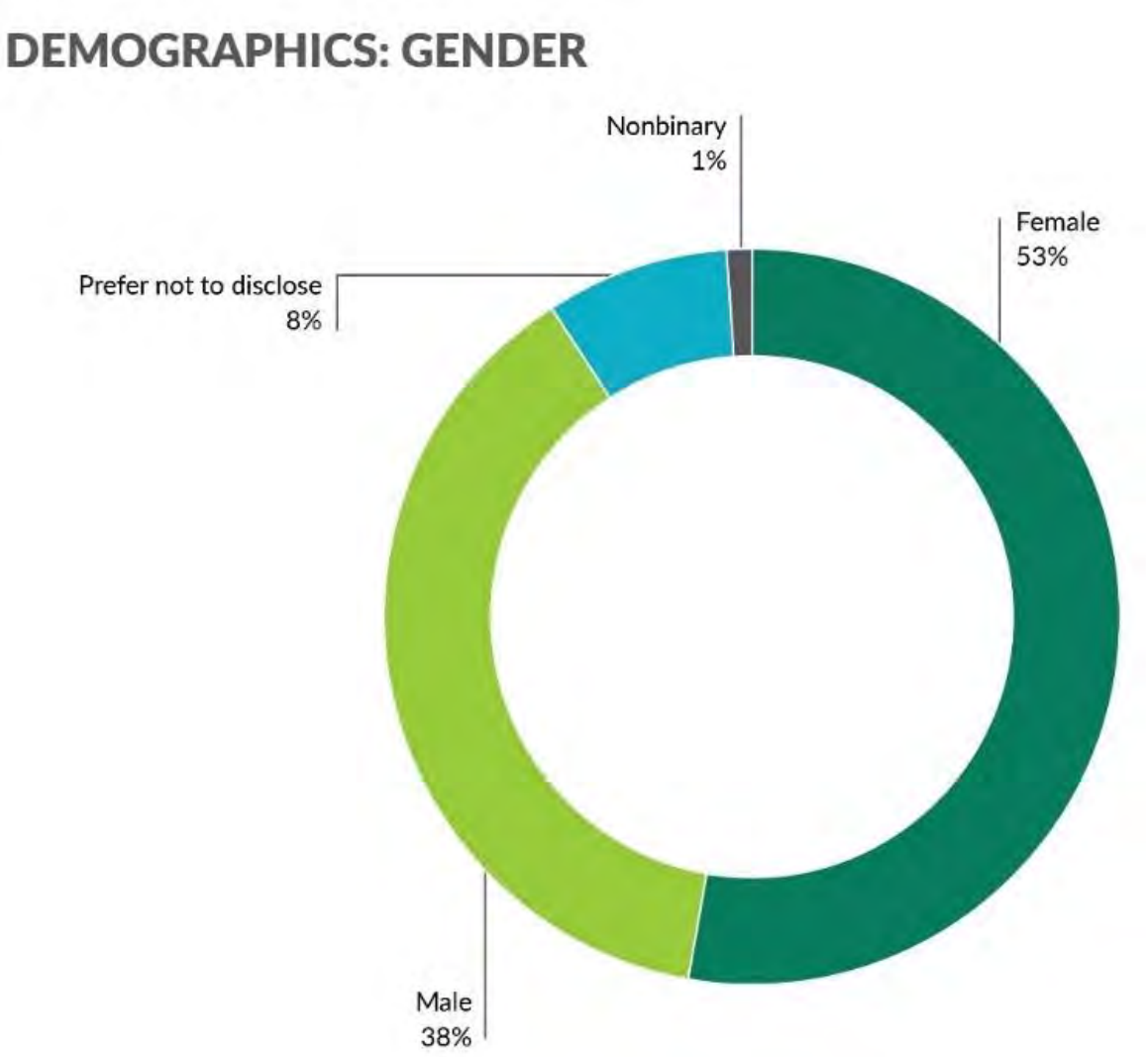


Figure 19. Online Open House Respondent Gender Graph

Question 2 | Disability

Answer	Percent
Yes	8%
Prefer not to disclose	10%
No	82%

Table 13. Online Open House Respondent Disability Status

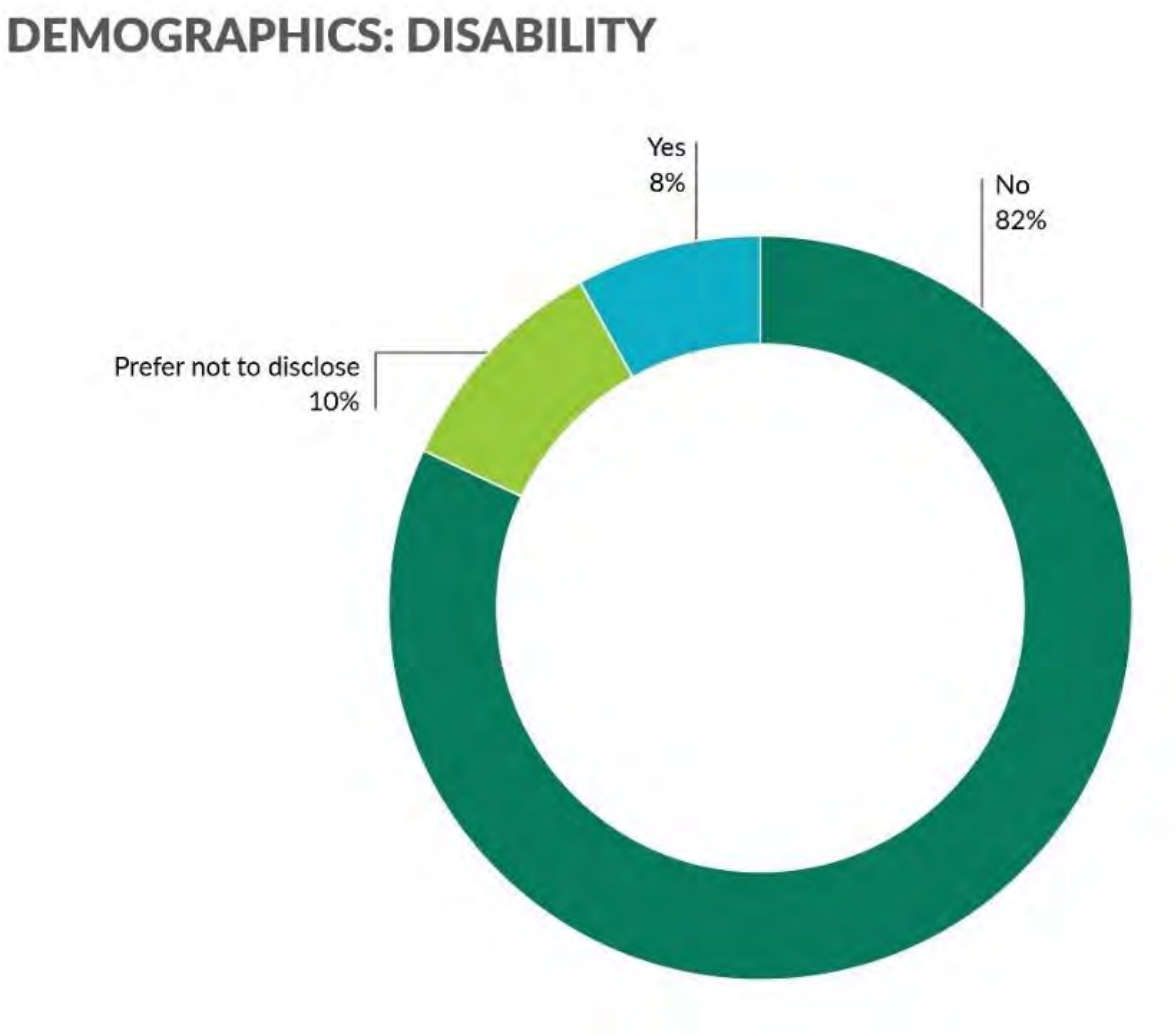


Figure 20. Online Open House Respondent Disability Status Graph

Question 3 | Ethnicity

Answer	Percent
Not Hispanic or Latino	95%
Hispanic or Latino	5%

Table 14. Online Open House Respondent Ethnicity

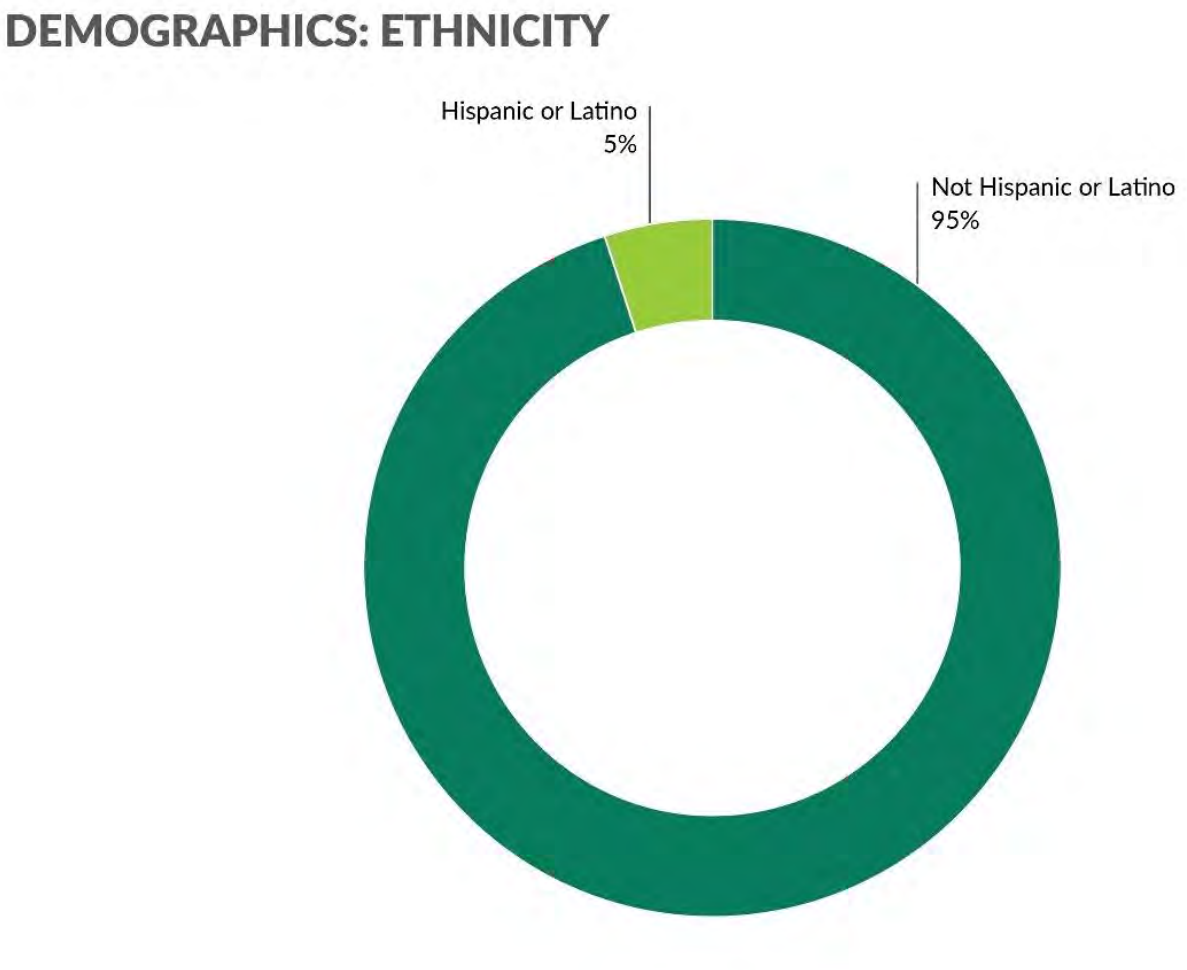


Figure 21. Online Open House Respondent Ethnicity Graph

Question 4 | Race

Answer	Percent
Caucasian	77.0%
Prefer not to disclose	12.3%
Other	2.7%
American Indian / Alaska Native	1.5%
Asian	1.4%
Black or African American	0.7%
Native Hawaiian / Pacific Islander	0.4%

Table 15. Online Open House Respondent Race

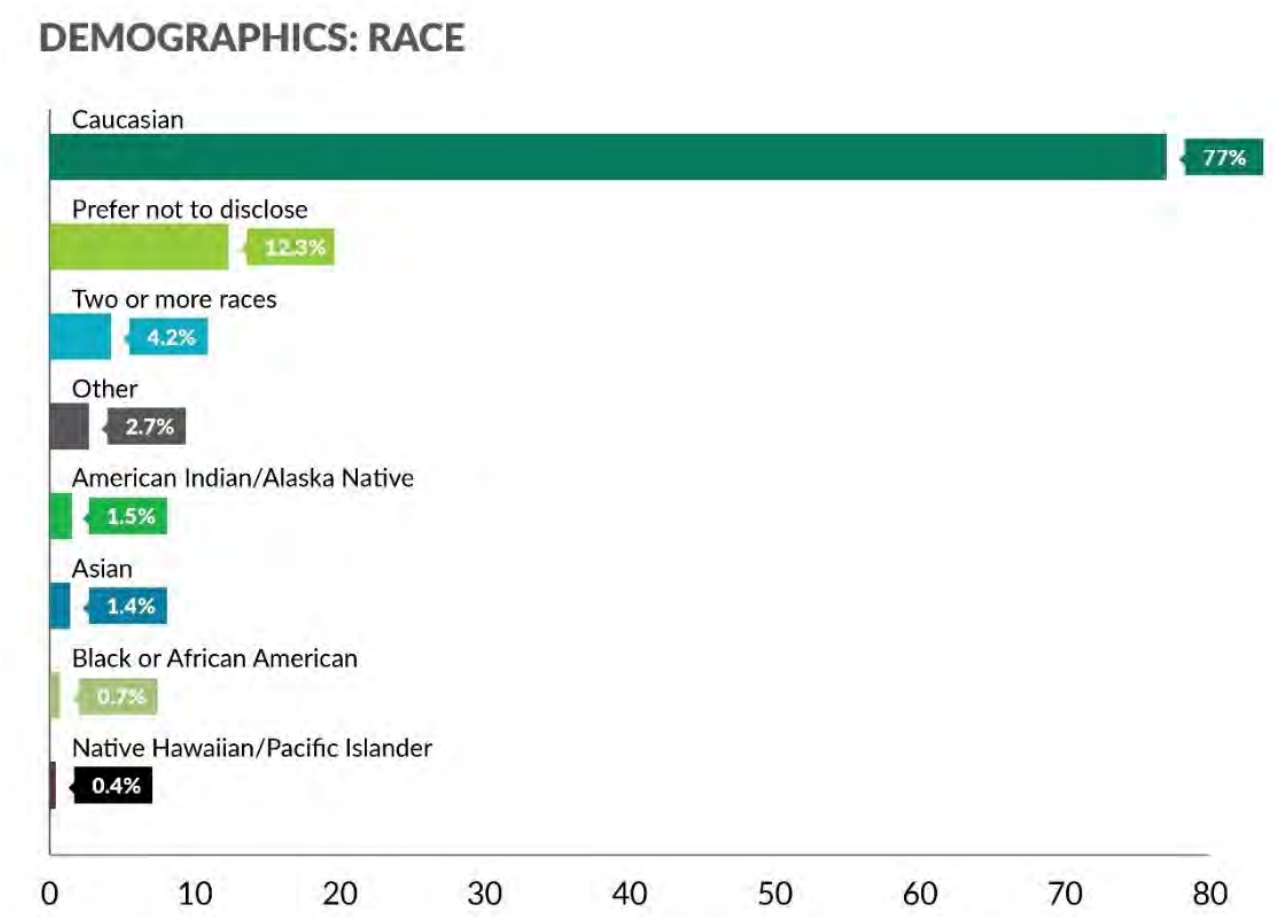


Figure 22. Online Open House Respondent Race Graph

Question 5 | Language

Answer	Percent
English	90%
Prefer not to disclose	4%
Spanish	3%
Other	1%
Tagalog	1%
German	0%
Vietnamese	0%
Russian	0%
Korean	0%
Chinese	0%
Arabic	0%

Table 16. Online Open House Respondent Language

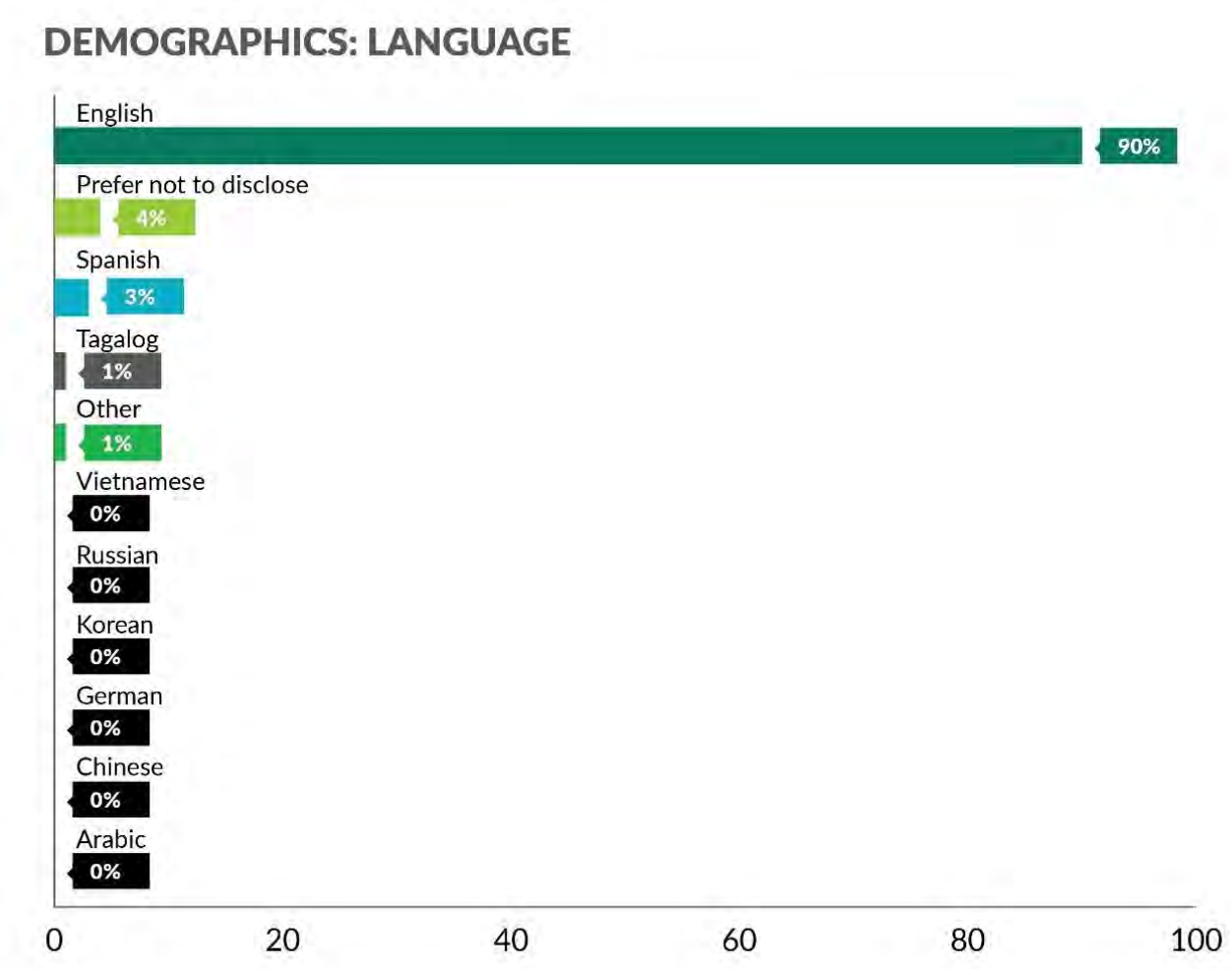


Figure 23. Online Open House Respondent Language Graph

Question 6 | Age

Answer	Percent
35-44	26%
25-34	19%
45-54	18%
55-64	13%
65-79	13%
Prefer not to disclose	6%
18-24	3%
80+	1%
Under 18	0%

Table 17. Online Open House Respondent Age

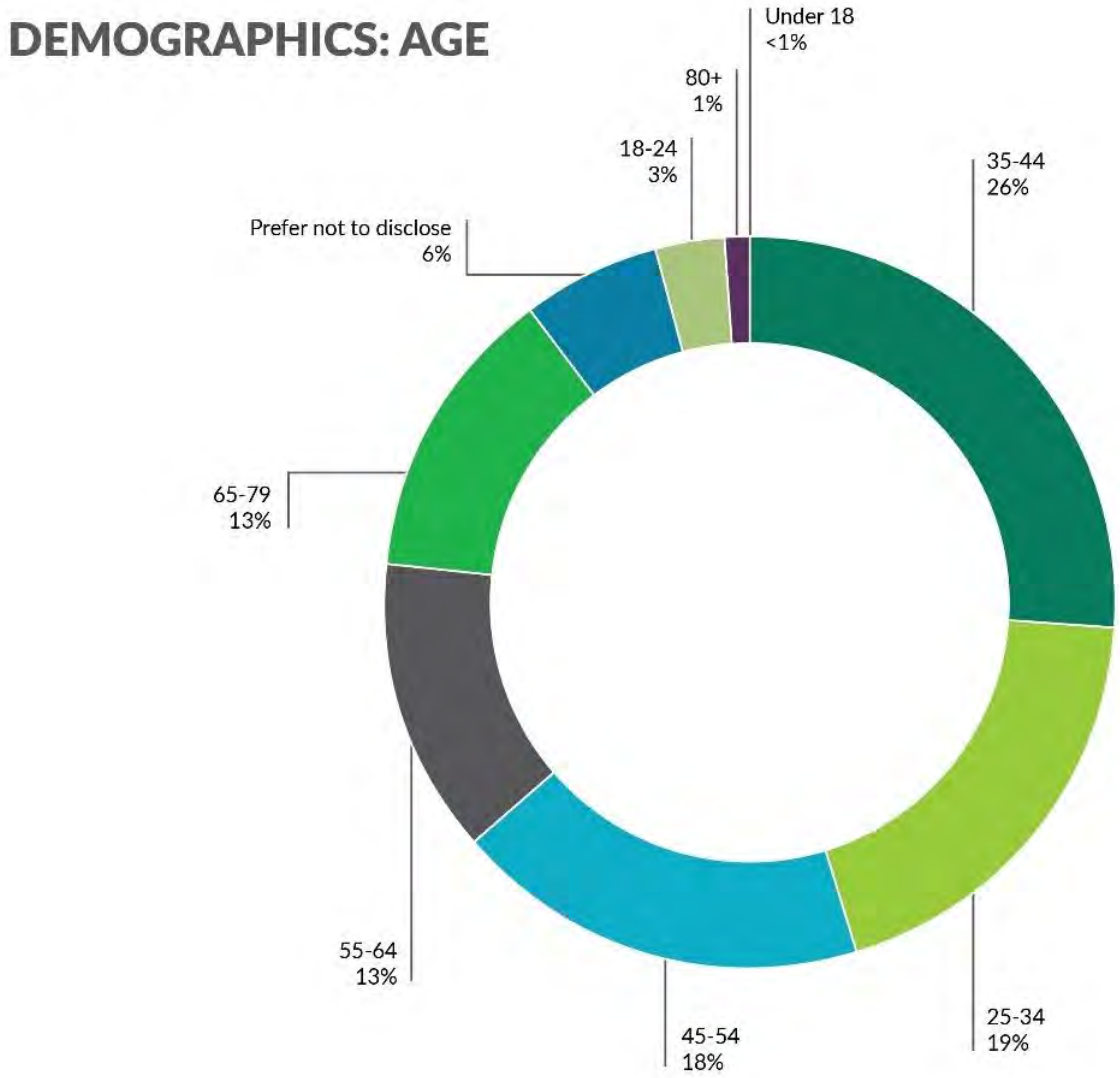


Figure 24. Online Open House Respondent Age Graph

Appendix F. Recommendation Analysis

Subject: **Recommendation Analysis**

Description

This memo includes the analysis files from Synchro and Sidra for the recommended intersection improvements for the SR 162 Center Turn Lane Planning and Pre-Design Study.

Intersection	
Int Delay, s/veh	21.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	390	840	20	50	660
Future Vol, veh/h	0	390	840	20	50	660
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	9	1	7	0	0	11
Mvmt Flow	0	390	840	20	50	660

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	852	0	0	862	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	0	~ 361	-	-	789	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	~ 360	-	-	787	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	106	0	0.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	360	787	-
HCM Lane V/C Ratio	-	-	1.083	0.064	-
HCM Control Delay (s)	-	-	106	9.9	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	14.1	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	50	0	810	680	30
Future Vol, veh/h	0	50	0	810	680	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	54	0	880	739	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	756	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	408	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	408	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	408	-	-
HCM Lane V/C Ratio	-	0.133	-	-
HCM Control Delay (s)	-	15.2	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	210	70	30	620	630	60
Future Volume (veh/h)	210	70	30	620	630	60
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1465	1500	1500	1406	1360	1418
Adj Flow Rate, veh/h	210	20	30	620	630	60
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	0	0	8	12	7
Cap, veh/h	252	230	46	945	694	66
Arrive On Green	0.18	0.18	0.03	0.67	0.57	0.57
Sat Flow, veh/h	1395	1271	1429	1406	1222	116
Grp Volume(v), veh/h	210	20	30	620	0	690
Grp Sat Flow(s),veh/h/ln	1395	1271	1429	1406	0	1339
Q Serve(g_s), s	9.1	0.8	1.3	16.2	0.0	28.8
Cycle Q Clear(g_c), s	9.1	0.8	1.3	16.2	0.0	28.8
Prop In Lane	1.00	1.00	1.00			0.09
Lane Grp Cap(c), veh/h	252	230	46	945	0	760
V/C Ratio(X)	0.83	0.09	0.65	0.66	0.00	0.91
Avail Cap(c_a), veh/h	450	410	116	1361	0	1090
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.7	21.3	29.9	6.0	0.0	12.1
Incr Delay (d2), s/veh	7.0	0.2	14.1	0.8	0.0	8.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.6	3.3	0.0	8.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	31.7	21.5	44.1	6.8	0.0	20.3
LnGrp LOS	C	C	D	A		C
Approach Vol, veh/h	230			650	690	
Approach Delay, s/veh	30.8			8.5	20.3	
Approach LOS	C			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		46.7		15.9	6.5	40.2
Change Period (Y+Rc), s		4.6		4.6	4.5	4.6
Max Green Setting (Gmax), s		60.6		20.2	5.1	51.0
Max Q Clear Time (g_c+I1), s		18.2		11.1	3.3	30.8
Green Ext Time (p_c), s		5.0		0.5	0.0	4.8

Intersection Summary	
HCM 7th Control Delay, s/veh	17.0
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	30	0	650	510	190
Future Vol, veh/h	0	30	0	650	510	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	33	0	707	554	207

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	658	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	464	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	464	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	464	-	-
HCM Lane V/C Ratio	-	0.07	-	-
HCM Control Delay (s)	-	13.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

MOVEMENT SUMMARY

Site: [1] Pioneer 2044 AM with 80th RIRO (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.3.210

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
South: SR 162															
3	L2	All MCs	537	3.0	537	3.0	0.945	25.7	LOS D	29.7	761.0	1.00	0.60	1.00	30.8
8	T1	All MCs	621	3.0	621	3.0	0.945	25.7	LOS D	29.7	761.0	1.00	0.60	1.00	31.3
18	R2	All MCs	11	3.0	11	3.0	0.945	25.7	LOS D	29.7	761.0	1.00	0.60	1.00	31.1
Approach			1168	3.0	1168	3.0	0.945	25.7	LOS D	29.7	761.0	1.00	0.60	1.00	31.1
East: Bowman-Hilton Road															
1	L2	All MCs	11	3.0	11	3.0	0.231	13.8	LOS B	0.8	20.4	0.76	0.76	0.77	28.8
6	T1	All MCs	42	3.0	42	3.0	0.231	13.8	LOS B	0.8	20.4	0.76	0.76	0.77	29.2
16	R2	All MCs	32	3.0	32	3.0	0.231	13.8	LOS B	0.8	20.4	0.76	0.76	0.77	29.0
Approach			85	3.0	85	3.0	0.231	13.8	LOS B	0.8	20.4	0.76	0.76	0.77	29.1
North: SR 162															
7	L2	All MCs	33	3.0	33	3.0	0.804	26.0	LOS D	10.0	257.2	0.95	1.17	1.96	30.8
4	T1	All MCs	474	3.0	474	3.0	0.804	26.0	LOS D	10.0	257.2	0.95	1.17	1.96	31.4
14	R2	All MCs	63	3.0	63	3.0	0.804	26.0	LOS D	10.0	257.2	0.95	1.17	1.96	31.1
Approach			570	3.0	570	3.0	0.804	26.0	LOS D	10.0	257.2	0.95	1.17	1.96	31.3
West: Pioneer Way															
5	L2	All MCs	33	3.0	33	3.0	0.052	4.8	LOS A	0.2	4.8	0.49	0.40	0.49	29.6
2	T1	All MCs	11	3.0	11	3.0	0.052	4.8	LOS A	0.2	4.8	0.49	0.40	0.49	30.1
12	R2	All MCs	200	3.0	200	3.0	0.241	6.9	LOS A	1.0	24.9	0.56	0.45	0.56	30.8
Approach			243	3.0	243	3.0	0.241	6.5	LOS A	1.0	24.9	0.55	0.44	0.55	30.6
All Vehicles			2066	3.0	2066	3.0	0.945	23.0	LOS C	29.7	761.0	0.92	0.74	1.20	31.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [7) 96th St E SB LT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	11	0.0	11	0.0	0.822	14.7	LOS B	12.1	312.3	0.81	0.64	0.88	38.1
8	T1	All MCs	758	5.0	758	5.0	0.822	9.6	LOS A	12.1	312.3	0.81	0.64	0.88	38.2
18	R2	All MCs	200	1.0	200	1.0	0.822	9.1	LOS A	12.1	312.3	0.81	0.64	0.88	38.4
Approach			968	4.1	968	4.1	0.822	9.6	LOS A	12.1	312.3	0.81	0.64	0.88	38.3
East: 96th St E															
1	L2	All MCs	74	6.0	74	6.0	0.656	19.3	LOS B	7.0	176.8	1.00	0.96	1.33	27.8
6	T1	All MCs	1	0.0	1	0.0	0.656	13.2	LOS B	7.0	176.8	1.00	0.96	1.33	28.3
16	R2	All MCs	347	1.0	347	1.0	0.656	13.5	LOS B	7.0	176.8	1.00	0.96	1.33	28.1
Approach			422	1.9	422	1.9	0.656	14.5	LOS B	7.0	176.8	1.00	0.96	1.33	28.0
North: SR 162															
7	L2	All MCs	158	4.0	158	4.0	0.150	11.6	LOS B	0.8	21.2	0.29	0.63	0.29	36.4
4	T1	All MCs	547	15.0	547	15.0	0.424	6.8	LOS A	3.3	91.1	0.35	0.48	0.35	37.9
14	R2	All MCs	11	0.0	11	0.0	0.424	6.1	LOS A	3.3	91.1	0.35	0.48	0.35	39.8
Approach			716	12.4	716	12.4	0.424	7.9	LOS A	3.3	91.1	0.34	0.51	0.34	37.6
West: 96th St E															
5	L2	All MCs	11	0.0	11	0.0	0.016	9.5	LOS A	0.1	1.5	0.53	0.67	0.53	26.5
2	T1	All MCs	1	0.0	1	0.0	0.016	4.7	LOS A	0.1	1.5	0.53	0.67	0.53	26.8
12	R2	All MCs	1	0.0	1	0.0	0.016	5.0	LOS A	0.1	1.5	0.53	0.67	0.53	26.7
Approach			13	0.0	13	0.0	0.016	8.7	LOS A	0.1	1.5	0.53	0.67	0.53	26.5
All Vehicles			2119	6.4	2119	6.4	0.822	10.0	LOS A	12.1	312.3	0.69	0.66	0.79	35.4

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [10) 136th St E (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	22	8.0	22	8.0	0.745	12.1	LOS B	9.8	252.6	0.51	0.47	0.51	37.6
8	T1	All MCs	935	4.0	935	4.0	0.745	6.7	LOS A	9.8	252.6	0.51	0.47	0.51	39.3
Approach			957	4.1	957	4.1	0.745	6.8	LOS A	9.8	252.6	0.51	0.47	0.51	39.3
North: SR 162															
4	T1	All MCs	522	7.0	522	7.0	0.468	6.1	LOS A	3.6	96.7	0.18	0.47	0.18	40.3
14	R2	All MCs	76	19.0	76	19.0	0.468	6.0	LOS A	3.6	96.7	0.18	0.47	0.18	37.7
Approach			598	8.5	598	8.5	0.468	6.1	LOS A	3.6	96.7	0.18	0.47	0.18	39.9
West: 136th St E															
5	L2	All MCs	54	17.0	54	17.0	0.086	8.8	LOS A	0.4	11.0	0.56	0.64	0.56	22.8
12	R2	All MCs	11	13.0	11	13.0	0.086	4.6	LOS A	0.4	11.0	0.56	0.64	0.56	22.9
Approach			65	16.3	65	16.3	0.086	8.1	LOS A	0.4	11.0	0.56	0.64	0.56	22.8
All Vehicles			1620	6.2	1620	6.2	0.745	6.6	LOS A	9.8	252.6	0.39	0.47	0.39	38.4

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [11) 144th St E (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	10	50.0	10	50.0	0.660	12.6	LOS B	7.3	188.6	0.29	0.45	0.29	32.1
8	T1	All MCs	867	3.0	867	3.0	0.660	6.2	LOS A	7.3	188.6	0.29	0.45	0.29	40.4
Approach			878	3.5	878	3.5	0.660	6.3	LOS A	7.3	188.6	0.29	0.45	0.29	40.3
North: SR 162															
4	T1	All MCs	500	5.0	500	5.0	0.384	6.0	LOS A	2.4	63.6	0.11	0.47	0.11	40.9
14	R2	All MCs	10	25.0	10	25.0	0.384	5.9	LOS A	2.4	63.6	0.11	0.47	0.11	37.0
Approach			510	5.4	510	5.4	0.384	6.0	LOS A	2.4	63.6	0.11	0.47	0.11	40.8
West: 144th St E															
5	L2	All MCs	31	8.0	31	8.0	0.047	8.0	LOS A	0.2	5.7	0.52	0.61	0.52	23.0
12	R2	All MCs	10	13.0	10	13.0	0.047	4.2	LOS A	0.2	5.7	0.52	0.61	0.52	23.1
Approach			41	9.3	41	9.3	0.047	7.1	LOS A	0.2	5.7	0.52	0.61	0.52	23.0
All Vehicles			1429	4.4	1429	4.4	0.660	6.2	LOS A	7.3	188.6	0.24	0.46	0.24	39.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [12) 149th St Ct E (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	11	0.0	11	0.0	0.658	11.5	LOS B	7.2	183.0	0.33	0.45	0.33	39.8
8	T1	All MCs	863	3.0	863	3.0	0.658	6.3	LOS A	7.2	183.0	0.33	0.45	0.33	40.2
Approach			874	3.0	874	3.0	0.658	6.4	LOS A	7.2	183.0	0.33	0.45	0.33	40.2
North: SR 162															
4	T1	All MCs	495	5.0	495	5.0	0.400	5.9	LOS A	2.6	68.2	0.09	0.48	0.09	41.0
14	R2	All MCs	42	0.0	42	0.0	0.400	5.5	LOS A	2.6	68.2	0.09	0.48	0.09	41.4
Approach			537	4.6	537	4.6	0.400	5.9	LOS A	2.6	68.2	0.09	0.48	0.09	41.0
West: 149th St Ct E															
5	L2	All MCs	42	0.0	42	0.0	0.052	5.5	LOS A	0.2	6.2	0.50	0.54	0.50	19.1
12	R2	All MCs	11	0.0	11	0.0	0.052	2.4	LOS A	0.2	6.2	0.50	0.54	0.50	19.2
Approach			53	0.0	53	0.0	0.052	4.9	LOS A	0.2	6.2	0.50	0.54	0.50	19.1
All Vehicles			1463	3.5	1463	3.5	0.658	6.1	LOS A	7.2	183.0	0.25	0.47	0.25	38.9

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	200	710	50	0	1460
Future Vol, veh/h	0	200	710	50	0	1460
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	3	2	5	1	2
Mvmt Flow	0	204	724	51	0	1490

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	750	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.23	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.327	-	-	-	-
Pot Cap-1 Maneuver	0	410	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	410	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	410	-
HCM Lane V/C Ratio	-	-	0.498	-
HCM Control Delay (s)	-	-	22.2	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	2.7	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	30	0	710	980	70
Future Vol, veh/h	0	30	0	710	980	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	33	0	772	1065	76

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1103	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	257	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	257	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	257	-	-
HCM Lane V/C Ratio	-	0.127	-	-
HCM Control Delay (s)	-	21	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	50	60	620	780	210
Future Volume (veh/h)	130	50	60	620	780	210
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1488	1500	1500	1488	1477	1500
Adj Flow Rate, veh/h	137	11	63	653	821	221
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	0	0	1	2	0
Cap, veh/h	156	140	76	1229	831	224
Arrive On Green	0.11	0.11	0.05	0.83	0.74	0.74
Sat Flow, veh/h	1417	1271	1429	1488	1121	302
Grp Volume(v), veh/h	137	11	63	653	0	1042
Grp Sat Flow(s),veh/h/ln	1417	1271	1429	1488	0	1422
Q Serve(g_s), s	13.7	1.1	6.3	19.5	0.0	101.6
Cycle Q Clear(g_c), s	13.7	1.1	6.3	19.5	0.0	101.6
Prop In Lane	1.00	1.00	1.00			0.21
Lane Grp Cap(c), veh/h	156	140	76	1229	0	1055
V/C Ratio(X)	0.88	0.08	0.83	0.53	0.00	0.99
Avail Cap(c_a), veh/h	204	183	79	1247	0	1069
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.9	57.3	67.3	3.9	0.0	17.9
Incr Delay (d2), s/veh	27.2	0.2	49.2	0.4	0.0	24.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	0.0	3.3	4.6	0.0	35.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	90.1	57.5	116.5	4.3	0.0	42.3
LnGrp LOS	F	E	F	A		D
Approach Vol, veh/h	148			716	1042	
Approach Delay, s/veh	87.7			14.2	42.3	
Approach LOS	F			B	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		123.1		20.4	12.1	111.0
Change Period (Y+Rc), s		4.6		4.6	4.5	4.6
Max Green Setting (Gmax), s		120.2		20.6	7.9	107.8
Max Q Clear Time (g_c+I1), s		21.5		15.7	8.3	103.6
Green Ext Time (p_c), s		5.1		0.2	0.0	2.8

Intersection Summary	
HCM 7th Control Delay, s/veh	35.3
HCM 7th LOS	D

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	0	680	640	190
Future Vol, veh/h	0	20	0	680	640	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	0	739	696	207

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	800	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	385	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	385	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	385	-	-
HCM Lane V/C Ratio	-	0.056	-	-
HCM Control Delay (s)	-	14.9	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

MOVEMENT SUMMARY

Site: [1] Pioneer 2044 PM with 80th RIRO (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.3.210

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed mph
South: SR 162															
3	L2	All MCs	302	3.0	302	3.0	0.810	20.8	LOS C	17.0	435.3	0.98	1.07	1.88	30.8
8	T1	All MCs	462	3.0	462	3.0	0.810	20.8	LOS C	17.0	435.3	0.98	1.07	1.88	31.3
18	R2	All MCs	11	3.0	11	3.0	0.810	20.8	LOS C	17.0	435.3	0.98	1.07	1.88	31.1
Approach			775	3.0	775	3.0	0.810	20.8	LOS C	17.0	435.3	0.98	1.07	1.88	31.1
East: Bowman-Hilton Road															
1	L2	All MCs	11	3.0	11	3.0	0.173	10.7	LOS B	0.6	15.6	0.70	0.70	0.70	29.2
6	T1	All MCs	22	3.0	22	3.0	0.173	10.7	LOS B	0.6	15.6	0.70	0.70	0.70	29.8
16	R2	All MCs	43	3.0	43	3.0	0.173	10.7	LOS B	0.6	15.6	0.70	0.70	0.70	29.5
Approach			76	3.0	76	3.0	0.173	10.7	LOS B	0.6	15.6	0.70	0.70	0.70	29.6
North: SR 162															
7	L2	All MCs	32	3.0	32	3.0	0.750	17.7	LOS C	12.1	310.4	0.89	0.92	1.57	31.3
4	T1	All MCs	614	3.0	614	3.0	0.750	17.7	LOS C	12.1	310.4	0.89	0.92	1.57	31.8
14	R2	All MCs	55	3.0	55	3.0	0.750	17.7	LOS C	12.1	310.4	0.89	0.92	1.57	31.6
Approach			701	3.0	701	3.0	0.750	17.7	LOS C	12.1	310.4	0.89	0.92	1.57	31.8
West: Pioneer Way															
5	L2	All MCs	260	3.0	260	3.0	0.389	10.0	LOS A	1.9	47.4	0.67	0.62	0.79	28.9
2	T1	All MCs	22	3.0	22	3.0	0.389	10.0	LOS A	1.9	47.4	0.67	0.62	0.79	29.4
12	R2	All MCs	538	3.0	538	3.0	0.743	21.3	LOS C	7.2	185.3	0.88	1.03	1.65	30.8
Approach			820	3.0	820	3.0	0.743	17.4	LOS C	7.2	185.3	0.80	0.89	1.35	30.1
All Vehicles			2372	3.0	2372	3.0	0.810	18.4	LOS C	17.0	435.3	0.88	0.95	1.57	30.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c >1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [7) 96th St E SB LT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	11	0.0	11	0.0	0.777	17.3	LOS B	10.4	262.9	0.88	0.81	1.12	37.0
8	T1	All MCs	609	2.0	609	2.0	0.777	12.1	LOS B	10.4	262.9	0.88	0.81	1.12	37.6
18	R2	All MCs	185	1.0	185	1.0	0.777	11.7	LOS B	10.4	262.9	0.88	0.81	1.12	37.2
Approach			804	1.7	804	1.7	0.777	12.1	LOS B	10.4	262.9	0.88	0.81	1.12	37.5
East: 96th St E															
1	L2	All MCs	217	1.0	217	1.0	0.476	12.7	LOS B	3.8	96.4	0.85	0.77	0.91	29.4
6	T1	All MCs	11	0.0	11	0.0	0.476	7.3	LOS A	3.8	96.4	0.85	0.77	0.91	29.9
16	R2	All MCs	152	0.0	152	0.0	0.476	7.4	LOS A	3.8	96.4	0.85	0.77	0.91	29.7
Approach			380	0.6	380	0.6	0.476	10.4	LOS B	3.8	96.4	0.85	0.77	0.91	29.5
North: SR 162															
7	L2	All MCs	348	1.0	348	1.0	0.334	12.4	LOS B	2.1	53.2	0.51	0.66	0.51	36.3
4	T1	All MCs	837	2.0	837	2.0	0.630	7.6	LOS A	5.9	150.1	0.66	0.58	0.66	38.8
14	R2	All MCs	11	0.0	11	0.0	0.630	7.1	LOS A	5.9	150.1	0.66	0.58	0.66	38.6
Approach			1196	1.7	1196	1.7	0.630	9.0	LOS A	5.9	150.1	0.61	0.60	0.61	38.0
West: 96th St E															
5	L2	All MCs	11	0.0	11	0.0	0.061	12.0	LOS B	0.3	7.1	0.73	0.79	0.73	26.4
2	T1	All MCs	11	0.0	11	0.0	0.061	7.2	LOS A	0.3	7.1	0.73	0.79	0.73	26.7
12	R2	All MCs	11	0.0	11	0.0	0.061	7.5	LOS A	0.3	7.1	0.73	0.79	0.73	26.6
Approach			33	0.0	33	0.0	0.061	8.9	LOS A	0.3	7.1	0.73	0.79	0.73	26.6
All Vehicles			2413	1.5	2413	1.5	0.777	10.2	LOS B	10.4	262.9	0.74	0.70	0.83	36.0

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [10) 136th St E (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	10	0.0	10	0.0	0.511	11.5	LOS B	4.5	114.1	0.37	0.47	0.37	39.6
8	T1	All MCs	653	1.0	653	1.0	0.511	6.3	LOS A	4.5	114.1	0.37	0.47	0.37	40.4
Approach			663	1.0	663	1.0	0.511	6.4	LOS A	4.5	114.1	0.37	0.47	0.37	40.4
North: SR 162															
4	T1	All MCs	1163	1.0	1163	1.0	0.880	6.0	LOS D	24.7	626.7	0.35	0.41	0.35	40.5
14	R2	All MCs	51	18.0	51	18.0	0.880	5.9	LOS D	24.7	626.7	0.35	0.41	0.35	37.2
Approach			1214	1.7	1214	1.7	0.880	6.0	LOS A	24.7	626.7	0.35	0.41	0.35	40.4
West: 136th St E															
5	L2	All MCs	71	5.0	71	5.0	0.246	16.8	LOS B	1.7	42.7	0.92	0.81	0.92	21.3
12	R2	All MCs	41	3.0	41	3.0	0.246	12.5	LOS B	1.7	42.7	0.92	0.81	0.92	21.4
Approach			112	4.3	112	4.3	0.246	15.2	LOS B	1.7	42.7	0.92	0.81	0.92	21.3
All Vehicles			1990	1.6	1990	1.6	0.880	6.7	LOS A	24.7	626.7	0.39	0.45	0.39	38.4

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [11) 144th St E (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	10	0.0	10	0.0	0.486	11.2	LOS B	4.4	111.2	0.18	0.46	0.18	40.4
8	T1	All MCs	649	2.0	649	2.0	0.486	6.0	LOS A	4.4	111.2	0.18	0.46	0.18	41.0
Approach			660	2.0	660	2.0	0.486	6.1	LOS A	4.4	111.2	0.18	0.46	0.18	41.0
North: SR 162															
4	T1	All MCs	1165	1.0	1165	1.0	0.867	6.0	LOS D	20.8	524.3	0.30	0.42	0.30	40.7
14	R2	All MCs	41	0.0	41	0.0	0.867	5.6	LOS D	20.8	524.3	0.30	0.42	0.30	40.4
Approach			1206	1.0	1206	1.0	0.867	6.0	LOS A	20.8	524.3	0.30	0.42	0.30	40.7
West: 144th St E															
5	L2	All MCs	21	0.0	21	0.0	0.082	15.3	LOS B	0.5	13.6	0.88	0.77	0.88	21.6
12	R2	All MCs	21	0.0	21	0.0	0.082	11.3	LOS B	0.5	13.6	0.88	0.77	0.88	21.7
Approach			41	0.0	41	0.0	0.082	13.3	LOS B	0.5	13.6	0.88	0.77	0.88	21.7
All Vehicles			1907	1.3	1907	1.3	0.867	6.2	LOS A	20.8	524.3	0.27	0.44	0.27	40.1

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [12) 149th St Ct E (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 162															
3	L2	All MCs	21	0.0	21	0.0	0.492	11.3	LOS B	4.4	109.8	0.27	0.46	0.27	39.9
8	T1	All MCs	639	1.0	639	1.0	0.492	6.1	LOS A	4.4	109.8	0.27	0.46	0.27	40.8
Approach			660	1.0	660	1.0	0.492	6.3	LOS A	4.4	109.8	0.27	0.46	0.27	40.7
North: SR 162															
4	T1	All MCs	1103	1.0	1103	1.0	0.846	6.3	LOS A	17.4	438.0	0.39	0.42	0.39	40.4
14	R2	All MCs	62	3.0	62	3.0	0.846	6.0	LOS A	17.4	438.0	0.39	0.42	0.39	39.5
Approach			1165	1.1	1165	1.1	0.846	6.3	LOS A	17.4	438.0	0.39	0.42	0.39	40.3
West: 149th St Ct E															
5	L2	All MCs	41	3.0	41	3.0	0.168	12.6	LOS B	1.1	28.3	0.89	0.76	0.89	18.2
12	R2	All MCs	41	4.0	41	4.0	0.168	9.6	LOS A	1.1	28.3	0.89	0.76	0.89	18.2
Approach			82	3.5	82	3.5	0.168	11.1	LOS B	1.1	28.3	0.89	0.76	0.89	18.2
All Vehicles			1907	1.2	1907	1.2	0.846	6.5	LOS A	17.4	438.0	0.37	0.45	0.37	38.4

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
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Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Appendix G. Study Advisory Group Comments

Chapter	Agency/Organization/Company	Comment
Executive Summary	Pierce County PPW	Change "increase" fire and law..response time to "decrease"
Executive Summary	Pierce County PPW	Related to future upgrades to the Foothills Trail, clarify if compliance with "transportation facility standards" is referring to the WSDOT Active Transportation Guide or another design document.
General	Pierce County Parks	Pierce County Parks is ready to engage in additional conversation regarding use of the Foothills Trail (improvements, access, maintenance, regulations, additional engagement, etc.) Maintaining trail access during construction (via temporary detour or reroute) will be an important consideration for our department and trail users.
General	Pierce County Parks	Even with improvements, the distance between the Foothills Trail+SR162 and proximity of the trail to housing (i.e., trail to the west of SR162, significant percentage of housing to the east) prevent easily accessible ped/bike access via Foothills for local residents moving within the corridor. At a minimum, safe crossings across SR162, clearly delineated access points, and detailed signage/wayfinding will be necessary to direct active transportation users back and forth from the trail.
	Commencement Bay Corrugated	I'm questioning the study's estimate of future growth. Tehaleh is going to be 10,000 homes and once the road connection to 162 is completed the amount of vehicle traffic could go up by 50%.
1	Pierce County PPW	Under the "Land Use" section, provide clarification regarding the growth near the corridor. The last sentence about possible cluster homes is speculative and should be removed.
3	SR162 Community Group	I take this to mean you prioritize mobility over safety. Access = safety risk. If mobility is prioritized over access/safety, then all of the uncontrolled access points are at a higher risk for crashes than any other section of this corridor. Is this not true?
3	SR162 Community Group	That is a total of 88 uncontrolled access points. That does not include businesses and farms that are completely dependent on safe access on and off this corridor for their success. These must be included as risk issues on this corridor. Will you be including businesses and farms to the access points on this corridor?

3	SR162 Community Group	It is this very development that is the root of our traffic problems on this corridor.
3	SR162 Community Group	North/South State Routes in PC that branch off Hwy 512 or 167 have multiple lanes approximatley reaching as far as 224th St E to the South except for SR 162. More than 59% of respondents supported more thru lanes. Why is there no consideration for adding lanes in the study?
3	SR162 Community Group	Evacuation was not addressed in this study as if it were a non-issue based upon the City of Orting's Emergency Preparedness Plan and City of Puyallup's Emergency Management Plan. Excluding the valley residents outside of these city limits who for the most part could never walk up and out in time of lahar.
3	SR162 Community Group	Excellent statement that clarifies how critical the uncontrolled access points on this corridor are. All of the residents who live in these homes are at risk entering this corridor when mobility is valued higher than access safety. Consider the multiplying factor for each of these homes. Will you add a statement on the multiplying factor typical of residential neighborhoods and communities to better represent the impact to the traffic on this corridor and the risk factors at each point of entry on the corridor?
3	SR162 Community Group	What you say here is true, but omits other important sources of needed access: Our businesses and farms along this corridor. Without safe access onto and off from this corridor, customers will not patronize these businesses and farms. No one would walk or ride a bike for the products or services any of these businesses offer. All of them are something you would need to drive to. I see nothing in this report that refers to the economy of this area and the businesses, farms and industry that are dependent on the service of this corridor. Will you add that to the narrative or devote a topic section to it?
3	SR162 Community Group	This is an exceptional record considering the volume of traffic this corridor carries. For clarity and comparison, please provide some projection on how the proposed improvements to the corridor will preserve or improve the crash record on this corridor.

3	SR162 Community Group	What was the Predictive Method measuring in this consideration of safety? I'd like to know more about this. What factors were taken into consideration to make this assessment? Did it include the volume of traffic, the speed of the traffic, the space between vehicles, the volume of traffic that needs left turn access this corridor, as well as the volume of traffic that needs to make a left turn off the corridor onto side streets, driveways, businesses, and farms? This corridor has a high safety factor (few collisions) so it would be very hard to improve the safety performance on this corridor if it was measuring against that, with or without a center turn lane. So "measurably improve" compared to what?
3	Pierce County Parks	Clarify the time of day of the noted crash - did it occur between "8:00 AM and 9:00 AM" or "8:00 PM and 9:00 PM"?
3	SR162 Community Group	Are these safety and crash potential numbers based on current numbers or the projected doubled current future numbers?
4	Pierce County PPW	Add references to the "Preliminary Alternative ID" numbers from Table 3 to the descriptions for Alternatives A, B, and C
4, 5	Pierce County Councilmember	Growth assumptions are only one part of modeling, facility capacities also affect operations. The County's Comprehensive Plan update looked at two alternative facility types for SR 162 in 2044. This included both a two-lane facility and a four-lane facility, both with a channelized center turn lane. Yet, the study assumes only a two-lane facility (albeit with different turn lane and intersection/roundabout options). As noted on lines 2030-2031, the existing corridor has limited ability to accommodate traffic volumes and Table 57, Figure 19, and Figure 20 show that many intersections are currently operating at level-of-service of D, E, or F (D is the adopted standard). Clearly, a two-lane facility will not be able to handle anticipated 2044 traffic volumes. This study should evaluate alternatives and make recommendations based on a four-lane facility to get a realistic picture of safety and operational needs in the corridor.

4	SR162 Community Group	There are many RIRO locations on this corridor: 8 on the east side of 162 between 74th and River Grove; 11 on the west side of 162 between Pioneer and 96th; 9 on the east side of 162 between the Pioneer and 96th; 14 on the east side of SR162 between Military Road and 128th. *(We realize this segment of the highway is an independent study, but begs to be addressed anyway on the possibility these improvements will be implemented before the improvements to this Military – 128th section are done. These people need to know how WSDOT is accommodating their safety in the event the improvements to this segment are delayed.)*; 13 between 128th and 136th; 8 between 136th and 144th; 7 between 144th and 149th. How do all of this traffic having to travel "out of direction" to turn left impact the traffic on this corridor? How does it change the volume of traffic in each of the segments of this corridor?
5	SR162 Community Group	How does this, the raised barrier, impact emergency services trying to get through congested traffic?
5	Pierce County Parks	Recognize that there has not been detailed design regarding required Foothills Trail upgrades at this point, but curious whether improvements were discussed/vetted during community engagement. Lighting in a rural area and 24-hour access may cause concerns for local community. Additional engagement may be required to discuss upgrades.
5	City of Sumner	Restricting 74th St Ct to RIRO is acceptable for normal operations, but not for emergency evacuation when this entire neighborhood that is adjacent to the river will be channelled through one intersection at Rivergove Dr E. Left turns should not be physically blocked.
5	SR162 Community Group	Can the proposed improvements to SR162 happen before these access points are established? The Foothills Trail is a County Park. What role/voice do they have in this plan?

5	City of Sumner	The report states that "Minimal access points exist along SR-162 between Rivergrove Drive and Pioneer Way and therefore do not necessitate a center turn lane." However, there are multiple residences on both sides of SR-162 that only abut SR-162. Will left turn access to/from SR-162 be maintained via the current center turn lane or will this be removed? Please clarify.
5	SR162 Community Group	There are 11 access points between Rivergrove and Pioneer, not counting 80th St. E. One is PSE at 80th. Please provide the maximum you consider to be minimal because 11 seems like a lot to us.
5	Pierce County PPW	The first paragraph under the "Complete Streets" section indicates that active transportation improvements will not be provided on the SR 162 corridor segment from Pioneer Way E to SR 410 (except at intersections) since the highway is not being widened. The appropriate state code or policy should be cited to justify this omission. WSDOT should consider Complete Streets improvements along this corridor segment to improve safety and to avoid a gap in the active transportation network. The existing and future Level of Traffic Stress (LTS) rating for this corridor segment should be identified in this chapter.
5	Pierce County PPW	To improve safety and traffic flow, WSDOT should consider outside shoulder widths of 8 feet to accommodate the large slow-moving agricultural vehicles that are commonly travel on SR 162.
5	Pierce County PPW	Consistent with the rural character goals of the Alderton-McMillin Community Plan, asphalt paths (as shown in Figure 9 on page 43) should be identified as a design alternative to concrete sidewalks under the "Complete Streets" section. The existing and future Level of Traffic Stress (LTS) rating for this corridor segment should be identified in this chapter.

5	SR162 Community Group	The segment of the SR162 corridor between Pioneer and Military Road is primarily agriculture/rural and does not apply to Complete Streets, making it unnecessary to have a connection to Foothills Trail. All residents seeking use of the trail drive to trail heads. Residents DO NOT walk along the SR162 50mph highway and would not choose to even with sidewalks. Crossing a heavily traveled 50mph highway even with crosswalk warning signals will be dangerous (high volume of fast-moving combination trucks amplifies the risk).
5	SR162 Community Group	All raised median sections must be accompanied by wider shoulders to accommodate emergency services to pass pulled off vehicles.
5	SR162 Community Group	Can the study include a map of the MOA future construction plans that includes the design and right of way acquisition for 4 lanes on SR 162 between 128th and Military Road East and a roundabout at Military Road East?
5	Pierce County PPW	To improve safety and traffic flow, WSDOT should consider outside shoulder widths of 8 feet to accommodate the large slow-moving agricultural vehicles that are commonly travel on SR 162.
5	Pierce County PPW	Consistent with the rural character goals of the Alderton-McMillin Community Plan, asphalt paths (as shown in Figure 9 on page 43) should be identified as a design alternative to concrete sidewalks under the "Complete Streets" section. The existing and future Level of Traffic Stress (LTS) rating for this corridor segment should be identified in this chapter.
6	SR162 Community Group	We need to emphasize that the critical (high volume) 149th St be the priority here.
6	Pierce County PPW	To improve safety for vulnerable road users and to maintain WSDOT's LTS 2 standard, WSDOT should prioritize the implementation of connections, wayfinding signage, and ADA upgrades to the Foothills Trail as part of the proposed near-term improvements of smaller and less expensive projects.

6	SR162 Community Group	There is no mention of the center turn lane between 100th St E and Military Road. That is an essential part of this study and the legislative directive. The "Near Term" projects seem quite appropriate, but the Future Considerations are not clear and does not appear to be considering the Center Turn Lane between 100th St. E. and Military Road. This study is titled Center Turn lane Study. So where is the Center Turn Lane in this implementation plan and cost assessments for it?
	SR162 Community Group	It is clear that a majority of the corridor crashes are rear-end (many of which are unreported) due to stop and go conditions. These conditions are due to congestion and left turns. Left turns cause the greatest risk for serious crashes during less congested periods when traffic is flowing at the 50mph levels.
	Washington Rock	The Future Year Forecasting Method does not include information about the increase in traffic from the new roundabout connecting Tehaleh to SR 162 (which is estimated to be an additional 30,000 vehicles per day within 10 years). This will not only impact the commutes of tens of thousands of people but will also impact transportation of commodities such as timber, sand and gravel, etc. More time on the road leads to higher prices, making local businesses less competitive and increasing materials costs. Will you please recalibrate your considerations including this additional traffic?

	SR162 Community Group	It appears you are considering only the growth in the cities of Bonney Lake and Orting. As mentioned, the traffic burden for this corridor is not from our neighboring cities, it is from unincorporated Pierce County. Tehaleh specifically and other communities on the Bonney Lake Plateau that will be using the new Tehaleh highway to SR162. If it were not for that new highway, this study would not be necessary. If it were not for the continued development on south Hill in the area north of 200th, this study would not be necessary. Combined, the future traffic on this corridor will be incomprehensible. It appears you have not included the anticipated traffic from the unincorporated and rapidly developing areas that will be feeding this corridor in a very significant way. The mission of this study is to assess how best to improve this corridor to best serve all the future traffic on this corridor. Unless the future traffic is accurately identified, the very foundation of this study is faulty at best. How will this corridor function with the proposed improvements when you consider the traffic from these unincorporated areas? This appears to be a flaw in the very foundation of this study.
	Pierce County Councilmember	Appendix C describes the methodology and assumptions used to assess traffic operations for the study. At lines 2001-2006, it acknowledges that Pierce County's traffic volumes model was used to analyze both existing and future year (2044) traffic volumes. The growth rates used for the study used the same assumptions incorporated into the model for the study of the County's Comprehensive Plan update. The study acknowledges that no adjustments were made. As a result, it is unsurprising that lines 2025-2027 conclude that the volumes in the model are comparable to the projections in the Comprehensive Plan. Yet, refinements would have right-sized assumptions to capture important changes in the status of development projects in and near the vicinity of Tehaleh, such as Hillside and Plateau 465.
	SR162 Community Group	Growth number projections are eliminating the fastest growing areas of Pierce County and those are the unincorporated areas that impact traffic numbers on SR162

	SR162 Community Group	The future impact on traffic volumes on the SR 162 corridor from the new Tehaleh Rd is missing. Why are these projections not included in the study? Since this is critical to the traffic volume impact on SR 162 can the projections from the Tehaleh and Falling Waters developments be included in the study?
	SR162 Community Group	If you are only going to look at two segments, I find it very odd that you chose the 149th to Williams Blvd segment. The most interesting and critical segment is between 128th St. E. and Military Road. While this study does not include improvements to this segment, knowing the volume of traffic in this bottleneck would be informative. Is there anything that limits you to two segments? I am sure we all would like to see this comparison in each segment.
	SR162 Community Group	I find it interesting that you are concerned with route directness and "out of direction travel" for non motorized travel but not for motorized travel and the increased traffic that puts on the corridor. Please provide some information on the additional traffic the "out of direction travel" the RIRO only requirement adds to this corridor. AND time to destination impact of out of direction travel. Will you add a section that addresses time to destination between Orting and SR410 and between SR410 and Orting?
	SR162 Community Group	Neither map shows any type of legend symbol for future roundabout plans at Military Rd. All of the maps that include future plans should have at least an asterisk at the Military Road intersection for future roundabout. Otherwise all of the maps make it appear that WSDOT will not be making any improvements at Military Road. Could you please include a map that includes future mitigation plans at Military Road East?
	SR162 Community Group	Perhaps an error on the map? 136th Ave E that is showing on the map should be corrected to read as 136th St Ct E.
	SR162 Community Group	The counts for pedestrian crossings at the listed intersections are crossings parallel to SR162, not across it. The highest volume of pedestrians crossing SR162 will be at 128th St E and is not included in this study.

	SR162 Community Group	Four pedestrian crashes in five years in a corridor that carries 100,000 vehicles in that same period shows that this is a very safe corridor for pedestrians OR AS IS THE CASE, there are very few of them ever walking this corridor. Why must we make such accommodations for such an insignificant number?
	Washington Rock	Despite 31% of people in the survey expressing concern about emergency evacuation and 18% expressing concern about access for emergency services, the study continues to advocate walking routes as the main form of evacuation. It does not adequately address the capacity of roadways in case of a lahar. The map on line 785 shows that the majority of areas in the valley require over 16 minutes of walking to leave the valley, with several regions requiring 31+ minutes. Central Orting is flanked by the Puyallup River on the west and the Carbon River on the east. The only route out of this area, other than SR 162, is the Calistoga Levee bridge. The evacuation plan for Pierce County on Line 22 does not explain whether local residents are aware of the emphasis on walking rather than vehicle travel and how this would be reinforced. There is no indication in the study about how people with physical disabilities will be accommodated in the event of an evacuation. The study does not seem to address the role of SR 162 in facilitating an evacuation.
	Orting City Administrator	I have significant concerns about whether the proposed improvements address congestion for Orting residents, particularly given the city's position as a major pinch point for traffic generated by ongoing and planned development in East Pierce County. This is the third SR 162 corridor study that has attempted to address congestion, yet the recommended package offers only localized improvements rather than a comprehensive strategy for relief within and near Orting. This congestion not only affects Orting residents but also undermines travel reliability for the entire East Pierce County region. The analysis shows measurable benefits in certain segments and intersections, but the cumulative effect for daily commuters in Orting appears incremental rather than meaningful. A stronger focus on capacity improvements would have been a helpful exercise.

	Orting City Administrator	I am concerned that the study does not adequately explore alternatives to the Complete Streets strategy in areas where local comprehensive plans indicate such treatments are incompatible with the rural character. RCW 47.04.035 specifically requires WSDOT to provide "context-sensitive solutions" when planning, designing, and constructing facilities, which provides a clear mechanism for relief when certain Complete Streets elements do not fit the local context. The Alderton–McMillin Community Plan, for example, discourages sidewalks in rural areas. Given this statutory flexibility, the report should have explicitly evaluated whether invoking the context-sensitive provision was appropriate for rural segments of SR 162. Without a demonstrated pedestrian demand or local policy support for urban-style facilities, advancing these treatments appears inconsistent with both local planning guidance and the intent of RCW 47.04.035.
	Orting City Administrator	Public transit options were not evaluated in a substantive way. The study notes the absence of current service along SR 162 and the limitations of the Pierce Transit service area, but it does not analyze how the lack of transit alternatives contributes to corridor congestion or consider even a qualitative assessment of potential demand, especially given the fact that many of our most vulnerable populations, like those with functional and access needs, rely on transit as a primary source of transportation. Given the scale of planned growth in East Pierce County, the omission leaves an incomplete picture of the transportation network's ability to meet future mobility needs.

	Orting City Administrator	The study does not evaluate how the proposed improvements will perform in a lahar evacuation scenario. Orting, along with much of East Pierce County, is uniquely vulnerable to such an event, and SR 162 is a critical evacuation route for thousands of residents. Both the City of Orting's and Pierce County's adopted emergency plans identify lahar evacuation as a top lifesafety priority. While the report references the need to keep the roadway clear for emergency vehicles and includes some active transportation enhancements to facilitate pedestrian evacuation, it does not appear to model or test the corridor's evacuation capacity under peak-load conditions. This is a significant omission, as the design features most beneficial for daily safety and congestion relief may not be those that best support rapid, large-scale evacuation. A more rigorous evacuation performance analysis should be incorporated to ensure the recommended improvements strengthen the region's ability to respond to this life-safety threat.
	Orting City Administrator	The traffic modeling also raises concerns. The study states that its projected 2044 traffic volumes are consistent with anticipated population growth in Orting and Bonney Lake—approximately 6% and 16% respectively—but this assumption appears to overlook major sources of future traffic demand. In particular, it does not appear that the model fully accounts for the buildout of Tehaleh, which is planned for roughly 10,000 households—making it effectively a new city larger than Bonney Lake—nor the traffic from areas around 200th and Meridian that use Orting to access SR 167 via SR 161 and SR 162. When 128th Avenue is extended into Tehaleh, SR 162 will become a key corridor for thousands of additional daily trips. Relying on population growth rates in existing jurisdictions as a proxy for future traffic demand risks significantly underestimating congestion impacts in the corridor.

Table 1. Study Advisory Group Comments

CITY OF ORTING

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Phone: (360) 893-2219
www.cityoforting.org

Via email: sr162ctlstudy@wsdot.wa.gov

August 13, 2025

Re: Draft SR 162 Center Turn Land Planning and Predesign Study Comments

Dear Richard Warren,

Thank you for the opportunity to review the draft SR 162 Center Turn Lane Planning and Pre- Design Study. I appreciate the considerable effort invested in data collection, stakeholder engagement, and technical analysis, and I would like to commend several positive aspects of the report. In particular, WSDOT's robust public outreach effort—collecting several thousand comments on the project—demonstrates a genuine commitment to community engagement and transparency which I know the Orting valley appreciates.

The study's emphasis on safety is well-supported by thorough crash analysis, targeted intersection improvements, and access management strategies. The proposed incorporation of roundabouts, right-in/right-out restrictions, and selective channelized turn lanes reflects an evidence-based approach to reducing collisions, improving traffic flow, and reducing long-term maintenance. These recommendations align with Washington State's Target Zero goal to eliminate traffic fatalities and serious injuries, and the coordination with emergency service providers—including EPIC-EM—shows an awareness of the corridor's role in life-safety response. The consideration of design features that maintain or enhance emergency response times is also an important strength of the report and our community.

That said, I have significant concerns about whether the proposed improvements address congestion for Orting residents, particularly given the city's position as a major pinch point for traffic generated by ongoing and planned development in East Pierce County. This is the third SR 162 corridor study that has attempted to address congestion, yet the recommended package offers only localized improvements rather than a comprehensive strategy for relief within and near Orting. This congestion not only affects Orting residents but also undermines travel reliability for the entire East Pierce County region. The analysis shows measurable benefits in certain segments and intersections, but the cumulative effect for daily commuters in Orting appears incremental rather than meaningful. A stronger focus on capacity improvements would have been a helpful exercise.

The traffic modeling also raises concerns. The study states that its projected 2044 traffic volumes are

consistent with anticipated population growth in Orting and Bonney Lake—approximately 6% and 16% respectively—but this assumption appears to overlook major sources of future traffic demand. In particular, it does not appear that the model fully accounts for the buildout of Tehaleh, which is planned for roughly 10,000 households—making it effectively a new city larger than Bonney Lake—nor the traffic from areas around 200th and Meridian that use Orting to access SR 167 via SR 161 and SR 162. When 128th Avenue is extended into Tehaleh, SR 162 will become a key corridor for thousands of additional daily trips. Relying on population growth rates in existing jurisdictions as a proxy for future traffic demand risks significantly underestimating congestion impacts in the corridor.

I am also concerned that the study does not adequately explore alternatives to the Complete Streets strategy in areas where local comprehensive plans indicate such treatments are incompatible with the rural character. RCW 47.04.035 specifically requires WSDOT to provide "context-sensitive solutions" when planning, designing, and constructing facilities, which provides a clear mechanism for relief when certain Complete Streets elements do not fit the local context. The Alderton–McMillin Community Plan, for example, discourages sidewalks in rural areas. Given this statutory flexibility, the report should have explicitly evaluated whether invoking the context-sensitive provision was appropriate for rural segments of SR 162. Without a demonstrated pedestrian demand or local policy support for urban-style facilities, advancing these treatments appears inconsistent with both local planning guidance and the intent of RCW 47.04.035.

Additionally, public transit options were not evaluated in a substantive way. The study notes the absence of current service along SR 162 and the limitations of the Pierce Transit service area, but it does not analyze how the lack of transit alternatives contributes to corridor congestion or consider even a qualitative assessment of potential demand, especially given the fact that many of our most vulnerable populations, like those with functional and access needs, rely on transit as a primary source of transportation. Given the scale of planned growth in East Pierce County, the omission leaves an incomplete picture of the transportation network's ability to meet future mobility needs.

Finally, the study does not evaluate how the proposed improvements will perform in a lahar evacuation scenario. Orting, along with much of East Pierce County, is uniquely vulnerable to such an event, and SR 162 is a critical evacuation route for thousands of residents. Both the City of Orting's and Pierce County's adopted emergency plans identify lahar evacuation as a top life- safety priority. While the report references the need to keep the roadway clear for emergency vehicles and includes some active transportation enhancements to facilitate pedestrian evacuation, it does not appear to model or test the corridor's evacuation capacity under peak-load conditions. This is a significant omission, as the design features most beneficial for daily safety and congestion relief may not be those that best support rapid, large-scale evacuation. A more rigorous evacuation performance analysis should be incorporated to ensure the recommended improvements strengthen the region's ability to respond to this life-safety threat.

While I recognize and value the study's safety-first orientation and multimodal vision, I encourage WSDOT to revisit its congestion reduction strategy, and to reconsider the application of Complete Streets treatments where they are inconsistent with adopted local land use and transportation policies. I also urge a stronger emphasis on public transit evaluation and lahar evacuation readiness to ensure that future investments in SR 162 maximize life-safety and mobility benefits for the communities of Orting and the broader East Pierce County region.

Thank you for considering these comments. I look forward to continuing to work with WSDOT and our regional partners to advance solutions that meet the needs of Orting residents and the East Pierce County community.

Sincerely,

Scott Larson
City Administrator