City of Tukwila

LOCAL ROAD SAFETY PLAN

Tukwila Transportation Element

MAR 2025

Adopted April 21, 2025 Resolution 2114

About the Local Road Safety Plan

The Local Road Safety Plan (LRSP) provides a roadmap for Tukwila to prioritize investments that support the City's goal of eliminating serious injuries and fatalities on Tukwila streets.

Overview

Vision Zero Goal

Tukwila's goal is to eliminate all serious injury and fatal crashes by 2044 with a 50% reduction by 2034 and a reevaluation of progress being made every four to five years.

Connection to Tukwila's Transportation Element (TE) & Background Report

The City of Tukwila has recently adopted an updated Transportation Element (TE) and Background Report. One of the five goals of these long-range planning documents is **safety** (defined on the right).

Safety

Provide a safe transportation system and placemaking to emphasize Tukwila as a welcoming place, particularly for historically marginalized and vulnerable populations.

The LRSP builds on the TE and Background Report, as safety is a critical piece of an effective transportation system. The LRSP outlines a path forward to increase safety on Tukwila's street network. The plan takes a proactive approach to alleviate key safety concerns and address conflicts before they arise.

The Safe System Approach

The Safe System Approach considers safety for all road users in the planning, design, construction, operation, and maintenance of transportation facilities. The Safe System Approach encompasses more than just government actions, and applies the following principals:

- **Eliminate deaths and serious injuries**
- **Support safe road use**
- **Reduce large crash forces**
- **Responsibility is shared**
- **Strengthen all parts**
- **Safety is proactive**

The Safe System approach is grounded in the belief that death and serious injuries on Tukwila's streets are preventable. The approach considers how the transportation system in its entirety can be improved to eliminate serious and fatal crashes.

To learn more, visit the USDOT FHWA's website: FHWA Zero Deaths and Safe System.

Multidisciplinary Approach

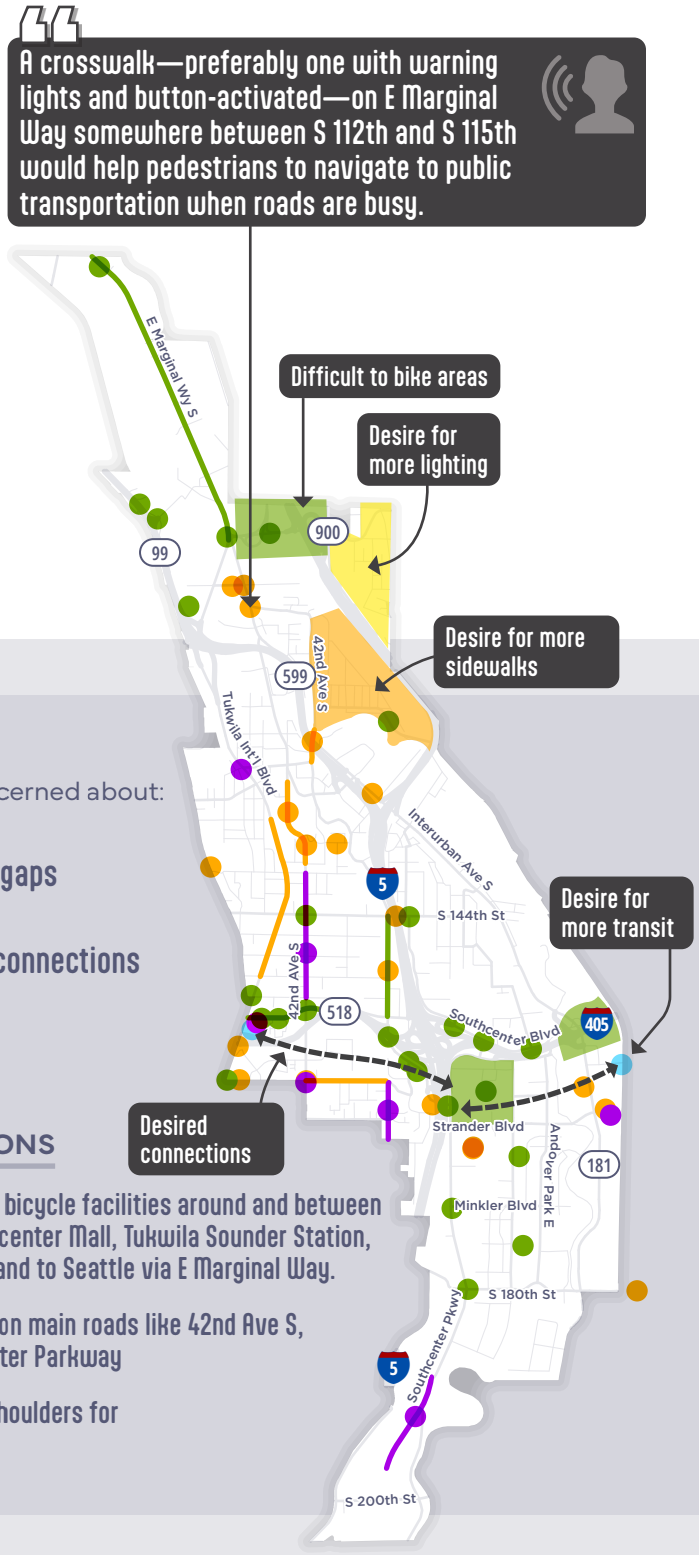
Conversations with Tukwila staff, stakeholders, and the community provided essential input to the development of the LRSP. Community and stakeholder engagement continues to be vital to the success of the LRSP, reflecting diverse community perspectives and building trust to serve as the foundation for the plan. The City of Tukwila conducted these key phases of engagement:

Phase 1: Listening and Learning

Between the online webmap and in-person events as part of the TE update and LRSP development process, there were about **200 comments** related to safety issues, areas of concern, as well as specific ideas for improvement.

Phase 2: Key Stakeholder Feedback

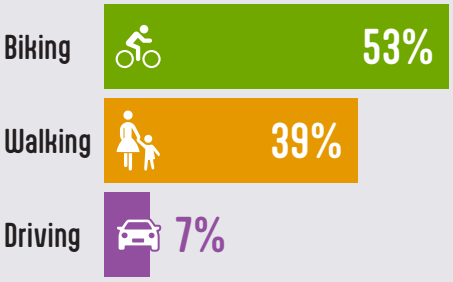
Using community input from Phase 1, the LRSP team identified a draft **High Injury Network (HIN)** which highlights areas with higher rates of serious crashes and common factors that contribute to them. From there, the Advisory Committee reviewed and provided feedback, including confirmation that the HIN locations identified through the engagement process were the highest priority areas to focus on.



Phase 3: Safety Comments Map

The online survey and webmap invited participants to "pin" comments to specific locations of concern by travel mode.

The webmap collected 50 safety comments in total. Nearly half of all comments concerned biking safety, and a third were related to walking, rolling, or crossing safety on city streets. Accounting for upvotes, the following categories make up the majority of safety comments:



TOP ISSUES:

People were most concerned about:

- Filling sidewalk gaps
- Expanding bike connections
- Transit safety

IDEAS & SUGGESTIONS

- Improved pedestrian and bicycle facilities around and between key amenities like Southcenter Mall, Tukwila Sounder Station, and the Interurban Trail, and to Seattle via E Marginal Way.
- Reduced vehicle speeds on main roads like 42nd Ave S, 51st Ave S, and Southcenter Parkway
- Improved sidewalks or shoulders for walking and cycling

Data-driven Approach

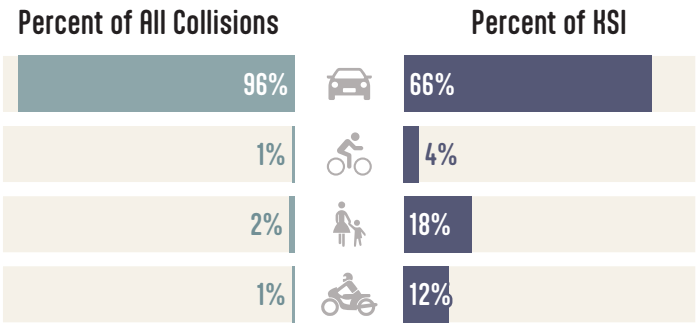
The data analysis considers the number of crashes, breakdown by mode and severity, and primary crash factors and movements preceding the crashes. The data-driven process for the LRSP process includes:

1. Examination of Crash Trends
2. Development of a High-Injury Network
3. Calculation of Higher Crash Risk Factors
4. Selection of Safety Focus Areas
5. Identification of Final Priority Projects

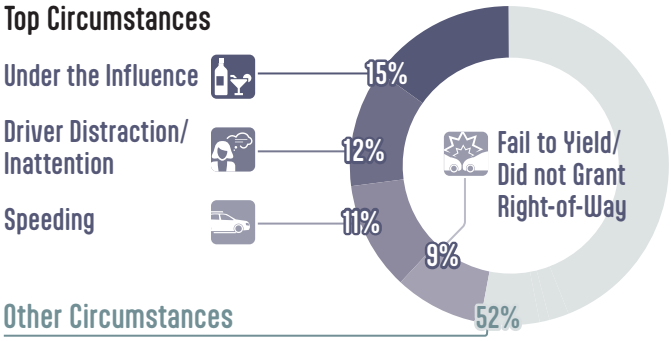
Key Crash Trends

The Tukwila LRSP includes an analysis of WSDOT crash data from 2018 to 2022 on all local roadways within city boundaries to better understand road safety performance. The infographic below summarizes key **Killed or Seriously Injured (KSI)** crash trends using various metrics, including by mode, circumstance, type of movement, and time of day.

Mode-based Trends



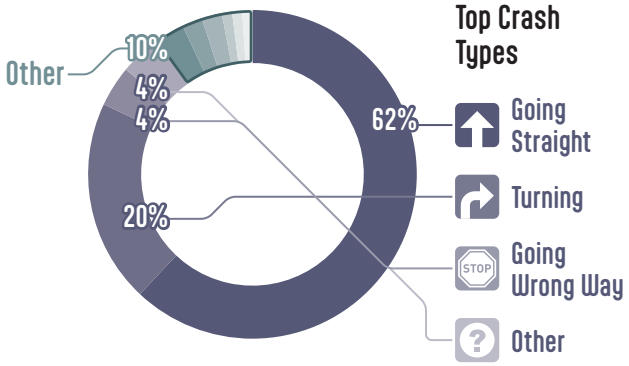
Circumstance-based Trends



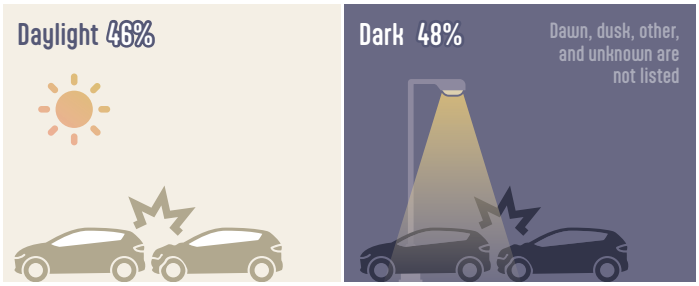
Other Circumstances

- Disregard to Sign or Signal
- Defective Equipment
- Asleep or Ill
- Improper Turn
- Unsafe Starting, Backing, Passing, Parking
- Following Too Closely
- Improper/Failure to Signal
- Over Center Line
- Other/Unknown

Movement-based Trends



Time-based Trends



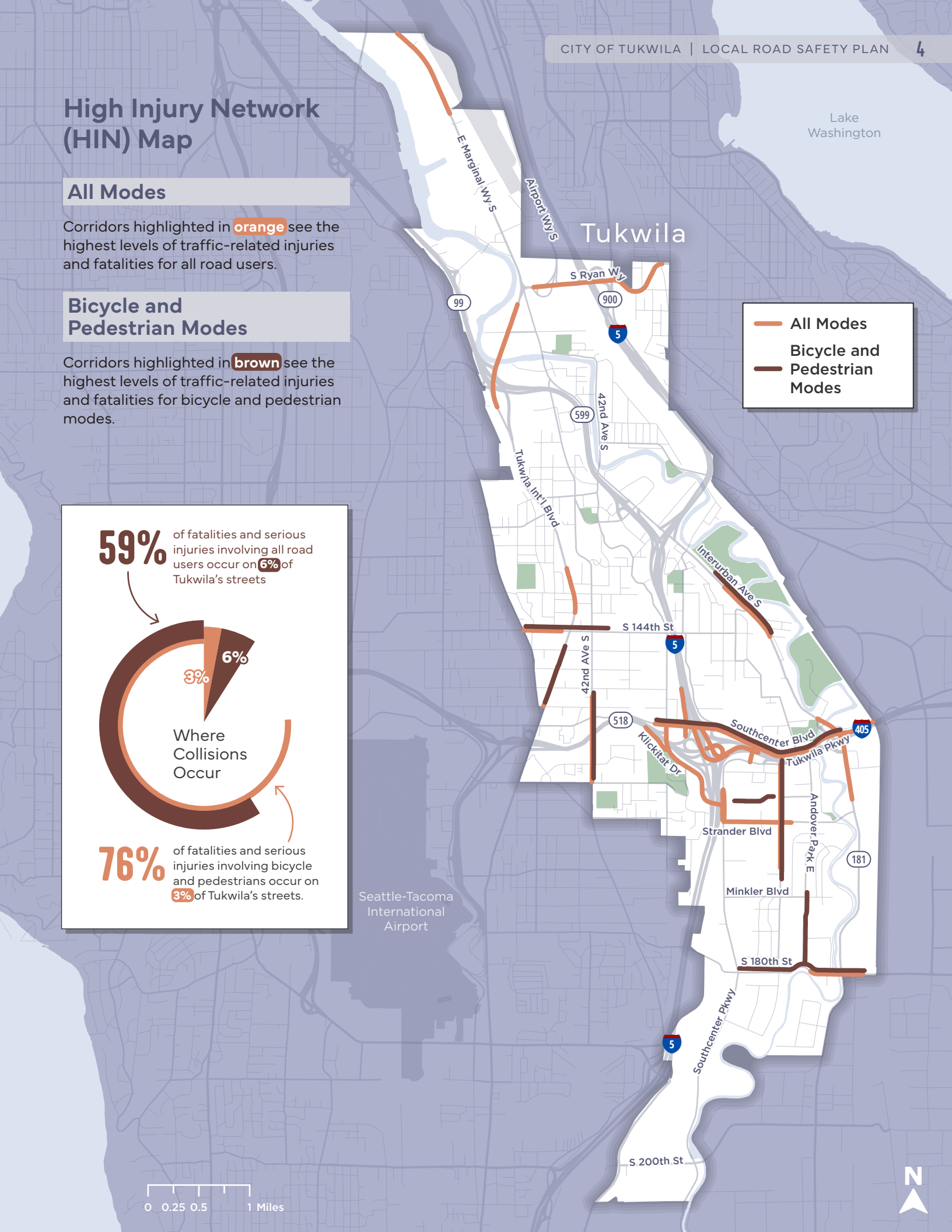
High Injury Network (HIN) Map

All Modes

Corridors highlighted in **orange** see the highest levels of traffic-related injuries and fatalities for all road users.

Bicycle and Pedestrian Modes

Corridors highlighted in **brown** see the highest levels of traffic-related injuries and fatalities for bicycle and pedestrian modes.



How are Projects Prioritized?

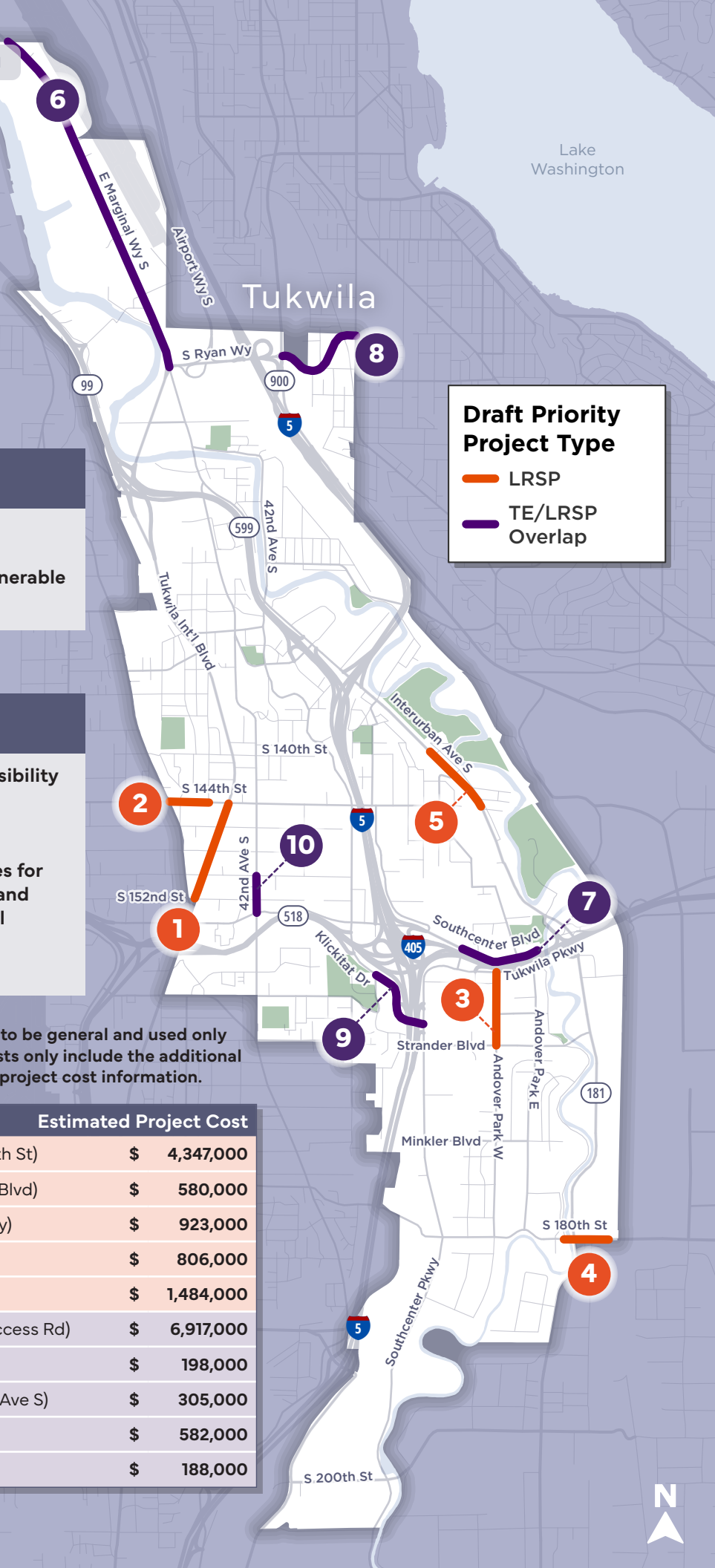
The overall project location prioritization framework includes quantitative and qualitative steps that reflect the priorities of the City identified by the Advisory Committee:

Data Collection

- Vulnerable Road User HIN
- Inclusion on Overall HIN
- Total KSI
- Equity Analysis
- Proximity to Vulnerable Road User

Considerations

- Key factors influencing crash likelihood
- Potential for funding
- Overlap with Transportation Element projects
- Possibility of leveraging other adjacent projects
- Quick-build feasibility
- Connectivity to trail network
- Tukwila School District priorities for walking routes and access to school



The cost estimates in the table below are intended to be general and used only for planning purposes. The TE identified project costs only include the additional safety elements. Please refer to the TE for baseline project cost information.

ID	Project Area	Estimated Project Cost
1	**Tukwila International Blvd** (S 152nd St to S 144th St)	$ 4,347,000
2	**S 144th St** (Military Rd to Tukwila International Blvd)	$ 580,000
3	**Andover Park W** (Strander Blvd to Tukwila Pkwy)	$ 923,000
4	**S 180th St** (Sperry Dr to Interurban Trail)	$ 806,000
5	**Interurban Ave** (140th St to 144th St)	$ 1,484,000
6	**E Marginal Way S** (N City Limits to S Boeing Access Rd)	$ 6,917,000
7	**Southcenter Blvd** (61st Ave S to 66th Ave S)	$ 198,000
8	**S Ryan Way** (Martin Luther King Jr Way to 51st Ave S)	$ 305,000
9	**Klickitat Dr** (53rd Ave S to Southcenter Pkwy)	$ 582,000
10	**42nd Ave S** (Southcenter Blvd to S 150th St)	$ 188,000

Reaching Vision Zero

Tukwila's goal is to eliminate all serious injury and fatal crashes by 2044 with a 50% reduction by 2034 and a reevaluation of progress being made every four to five years.

Successful implementation of this LRSP will require:

Proven Safety Solutions

Utilizing a list of proven safety solutions, both engineering, and non-engineering, that can be implemented to improve transportation facilities.

Funding

Staying up-to-date on relevant grant opportunities and proactively pursue grant funding for the most competitive projects as match funding is available.

Oversight and Accountability

Forming a task force of City staff, residents, outside agencies, and key other stakeholders who will help maintain sustained focus and success in implementing projects and actions identified in the LRSP.

Phasing and Sequencing

Committing to ongoing long-term investment from the City, with different areas of focus over different time horizons (near-term, mid-term, and long-term).

Trust and Communication

Communicating regularly with stakeholders and community members to build trust and support for the City's safety goals.

Regular Updates to the Plan

Updating and tracking the LRSP every other year to identify crash trends, qualify for additional grant opportunities, and assess whether new direction is needed as conditions within the City and region change.

Identifying Targets and Measure Performance

Tracking targets and actions set in the plan to measure safety outcomes and investments, and track performance every other year. For every action or strategy, responsible parties and anticipated timeline are identified.

Several actions are identified as ongoing, indicating that they are actions already underway in the City and anticipated to continue through continued investment.

Scan the QR code to view the full Local Road Safety Plan or visit:

tukwilawa.gov/departments/public-works/transportation/local-road-safety-plan/

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Acknowledgements

Thank you to elected officials, Tukwila staff, community members, and the LRSP Task Force who were engaged throughout the planning process for both in-person and online outreach events. Your input was invaluable in creating a Local Road Safety Plan (LRSP) that reflects the needs of the Tukwila community.

Elected Officials

Thomas McLeod, Mayor
Tosh Sharp, Council President
Mohamed Abdi, Councilmember
Armen Papyan, Councilmember
Jovita McConnell, Councilmember
Dennis Martinez, Councilmember
Hannah Hedrick, Councilmember

LRSP Advisory Committee

Dave Degroot, City of Tukwila Street Department Superintendent
Jo Anderson, City of Tukwila Inclusion and Engagement Manager
Christopher Andre, City of Tukwila Sustainable Transportation Outreach Coordinator
Eric Lund, Deputy Chief, Police Department
Bill Devlin, Traffic Sergeant
Norm Golden, Division Chief of Emergency Management, Puget Sound Regional Fire Authority
Suzie Kelley, Transportation Director, Tukwila School District
Gurman Kaur, Co-Traffic Safety Manager, Target Zero King County

Tukwila Staff

Cyndy Knighton, Senior Program Manager (Transportation)

Fehr & Peers Consultant Team

Taylor Whitaker, RSP_1
Emily Alice Allhart, AICP
Chris Breiland, PE
Sydney Weisman, AICP

Toole Design Consultant Team

Allison Phillips, MSCRP
Adam Russell, RSP_1
Ryan O'Hara, PE

Index of Key Terms

BUILD	Better Utilizing Investments to Leverage Development (BUILD) Grant Program (USDOT)
CRF	Crash Reduction Factor
DUI	Driving Under the Influence
FHWA	Federal Highway Administration
HSIP	Highway Safety Improvement Program
ITE	Institute of Transportation Engineers
KSI	Killed or Severe Injury crashes
LRSP	Local Roadway Safety Plan
NHTSA	National Highway Traffic Safety Administration
PCF	Primary Crash Factor
PDO	Property Damage Only Crashes
PHB	Pedestrian Hybrid Beacon
RRFB	Rectangular Rapid-Flashing Beacon
SS4A	Safe Streets for All Program (USDOT)
USDOT	United States Department of Transportation
WSDOT	Washington State Department of Transportation

Chapter 1: Introduction

From 2018 through 2022 an average of 16 people were seriously injured and 4 people lost their lives each year in traffic-related crashes in Tukwila. The Tukwila LRSP (Local Road Safety Plan) implements a Safe System Approach to proactively reduce and ultimately prevent transportation-related fatalities and serious injuries.

Tukwila's goal is to eliminate all serious injury and fatal crashes by 2044 with a 50% reduction by 2034 and a reevaluation of progress made every 2-3 years.

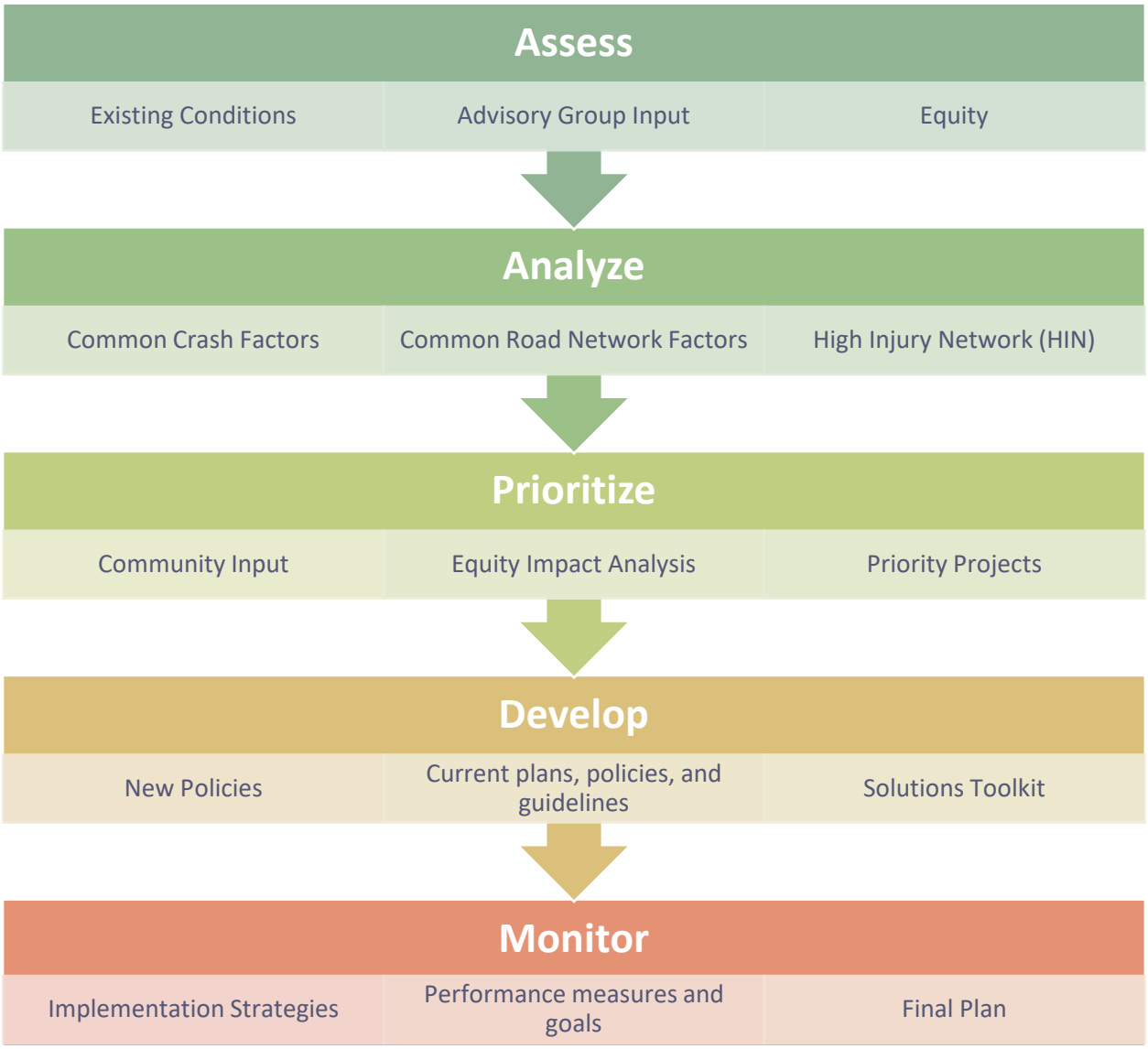
The LRSP serves as a blueprint for Tukwila to achieve this ambitious goal through prioritized investment in infrastructure, education, emergency services, enforcement, and shared awareness.

Figure 1 outlines the key steps in the LRSP development process.

Limitations on Use

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, although they are subject to records requests, 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.

Figure 1. Key Steps in the LRSP Planning Process

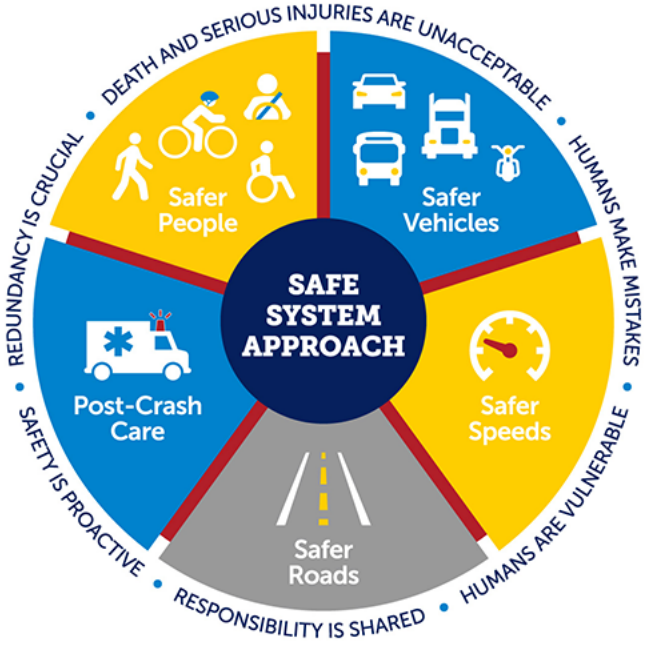


Safe System Approach

FHWA, WSDOT, and the City of Tukwila share a goal to systematically reduce fatal and serious injury crashes through the Safe System Approach, which considers safety for all road users in the planning, design, construction, operation, and maintenance of transportation facilities. The Safe System Approach encompasses more than just government actions, and applies the following principles:

- **Eliminate deaths and serious injuries:** While no crashes are desirable, eliminating crashes that result in fatalities and serious injuries is a priority.

- **Support safe road use:** Road users inevitably make mistakes that lead to crashes, and the transportation system and vehicles can be designed and operated to reduce injury outcomes from those errors. A forgiving system accommodates reasonable and predictable human limitations and behavior (such as diligence, perception, and attention). Roads developed in this manner and that serve as "self-enforcing and self-explaining roads" make it less likely for human errors to occur, and when errors do occur, they result in fewer fatal and serious injury crashes.



Source: FHWA

- **Reduce large crash forces:** Road users have limits for tolerating crash forces before death or serious injury occurs. Therefore, it is important to adopt designs and operational elements that account for and reduce crash speeds and improve impact angles to be within survivable limits.

- **Responsibility is shared:** Eliminating fatal and serious injury crashes requires that all stakeholders (transportation system designers, managers, road users, vehicle manufacturers, policymakers, etc.) work together. The intent is to identify and address elements of road safety over which a given stakeholder has influence.

- **Strengthen all parts:** All parts of the transportation system are strengthened to reinforce each other so that if one part fails, the other parts still protect road users. In this way, redundancy is provided for elements that make up the Safe System.

- **Safety is proactive:** Proactive (systemic safety) approaches address context, contributing factors, and crash types to help reduce the potential or likelihood for fatal and serious injury crashes.

Tukwila Profile

Centered at the crossroads of rivers, trails, highways, and railroads, Tukwila is a suburban city in King County with 12 unique neighborhoods. In 2020, Tukwila had an estimated population of 20,265 residents. Age ranges for residents is relatively balanced, with an estimated median age of 36 years, 12% are 65 years or older and 21% are under 18 years old.[1] The age of Tukwila residents skews slightly younger than that of King County as a whole. Tukwila's population is diverse in multiple aspects, namely in terms of race, ethnicity, spoken languages, and educational attainment.[1] The three most common racial identities represented in Tukwila are White, Asian, and Black constituting 31%, 26%, and 21% of the city's overall population, respectively.[1] In Tukwila, 7.5% of occupied housing units have no vehicle available to them. This rate is lower than the King County value of 10.5% for the same metric.[2] However, in Tukwila there is a higher rate of reliance on cars, trucks, or vans as transportation to work. 79% of workers 16 years and over in Tukwila use a car, truck, or van as a means of transportation to work. This rate is over 10% higher than the same rate for King County.[3]

Tukwila has a wide range of popular destinations, including the regional Southcenter shopping area, the Starfire soccer complex, and several park spaces with multiple trails, shown in **Figure 3**. Notably, the Tukwila Community Center along the Duwamish River hosts a variety of activities and resources for seniors, adults, teens, and young children, including fitness, recreation, and wellness programs, as well as a preschool. These destinations can influence higher rates of walking, biking, and riding transit in the surrounding areas as well as pulling in regional traffic that may be unfamiliar with the City. Although not located within city boundaries, the Seattle-

[1] 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office. Table S0101 https://www.census.gov
[2] 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office. Table S2504 https://www.census.gov
[3] 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office. Table S0801 https://www.census.gov
Note: ACS data was used for consistency among data sources within the Tukwila Profile section and Appendix A. The Decennial Census has limited data on population characteristics other than the population sum. To present a wide range of population characteristics with a consistent source, all data in the Transportation Background Report uses ACS 2020 5-year estimates.

Tacoma International Airport is located just west of Tukwila in the City of SeaTac. Given the close proximity to the major airport, the Tukwila coordinates with SeaTac, the Port of Seattle, and WSDOT to address planned projects near the airport. See **Appendix A** for more information on the population characteristics of the City of Tukwila.

Figure 2. City of Tukwila Boundary

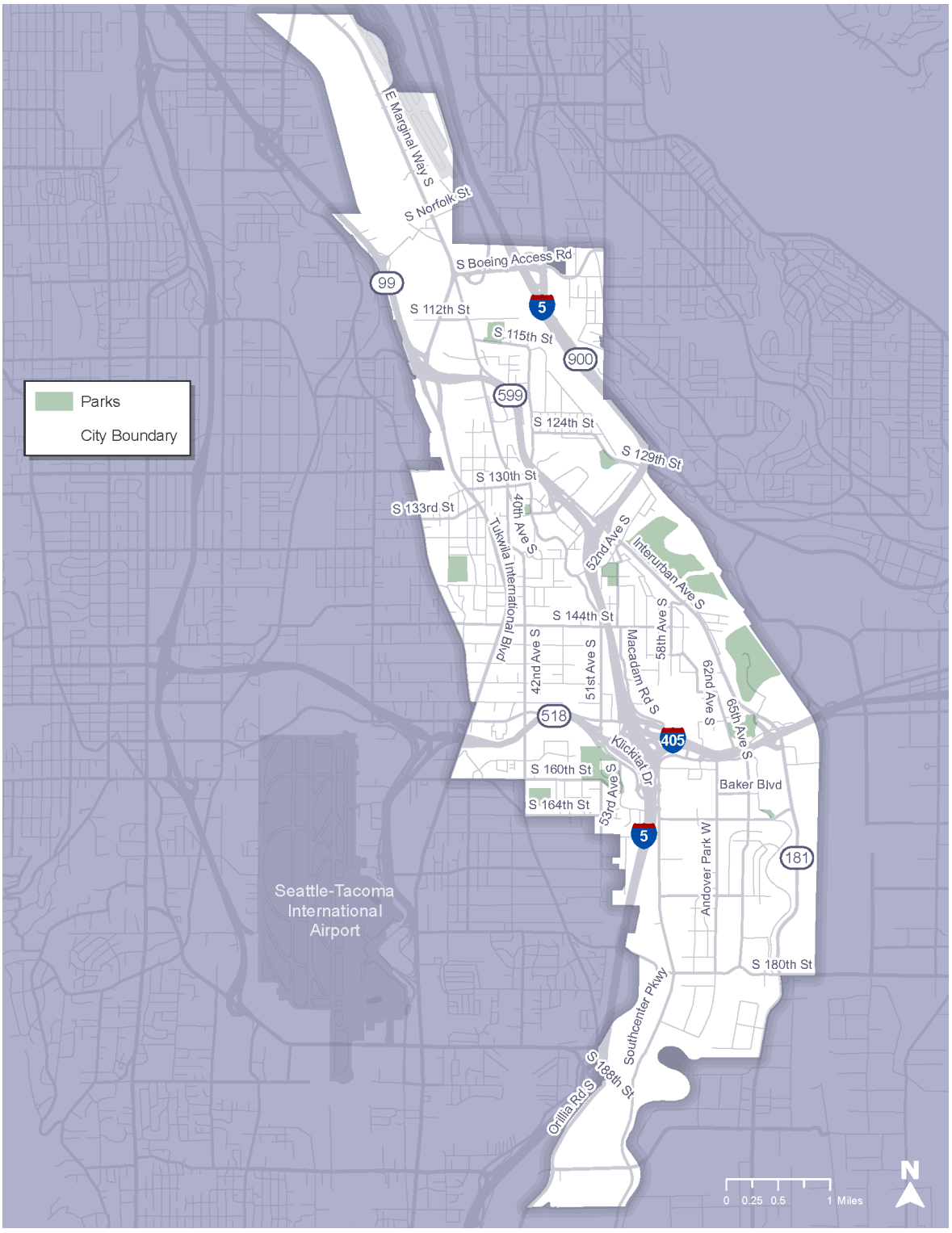
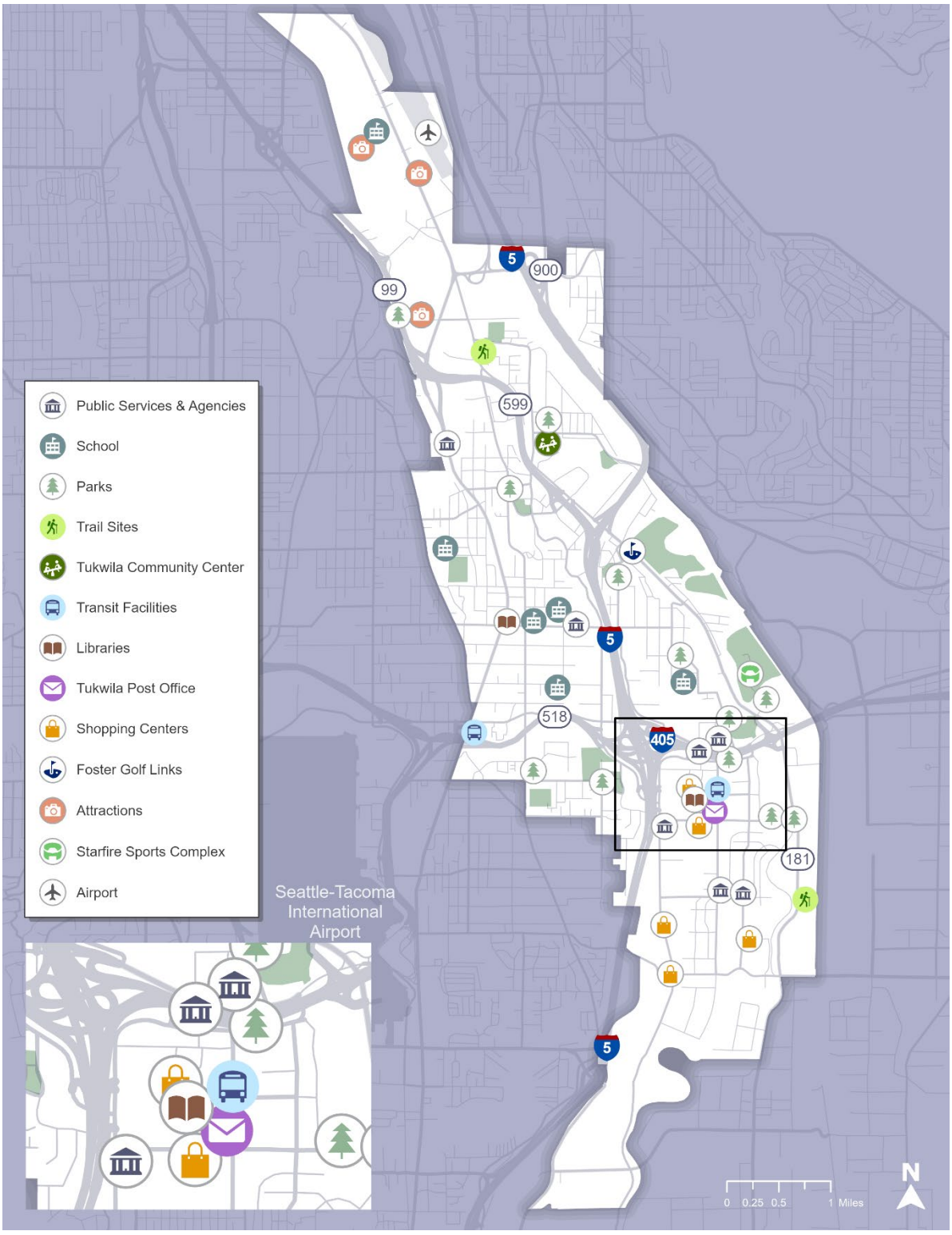


Figure 3. City of Tukwila Key Destinations



Local Planning Context: Safety

In recent years, Tukwila's efforts to improve safety have been visible through a range of plans and infrastructure projects. This LRSP builds upon those prior efforts to both tackle safety explicitly and enhance safety through mode shift goals.

Comprehensive Plan Update 2024

As part of the Comprehensive Plan Update, the city updated the Transportation Element (TE) of the plan, including a detailed Background Report. The updated TE lists safety as one of its five overarching goals.

SAFETY	**Provide a safe transportation system and placemaking to emphasize Tukwila as a welcoming place, particularly for historically marginalized and vulnerable populations.**

The TE reinforces Tukwila's goal to **eliminate traffic deaths and serious injuries on city streets through a series of guiding policies** included in **Appendix B**.

The TE team engaged with people who live, work, and visit Tukwila through community events, pop-ups, focus groups, survey questions, and an interactive map. These tools probed community members with questions about transportation in Tukwila, and many of the comments from these events related back to transportation safety and were incorporated into this LRSP.

Tukwila Capital Improvement Program (CIP)

The Tukwila CIP outlines a financial planning model for funding capital projects in the city. Many of the CIP projects involve safety improvements, traffic calming, and Safe Routes to School improvements. The CIP project list is adopted biannually as part of the City's 2-year budget cycle and also may be adjusted annually to reflect available capital funding, project schedule changes, and updated needs and priorities.

Completed Safety Improvement Projects

Tukwila historically invests transportation facility safety improvements. The following projects provide examples of safety investments in Tukwila in the past 10 years:

- Roadway Projects
  - West Valley Highway and Longacres Way
  - Andover Park West
  - Various speed cushion installations/Neighborhood Traffic Calming Program
  - S 144th Street Project: Tukwila Int'l Blvd to 42nd Avenue S

- Non-motorized and Transit Projects
  - Tukwila Transit Center
  - Green River Trail Connection (Ped Bridge to Christensen Road)
  - Queue jump/Transit Signal Priority improvements at key locations

- Intersection, Signal, and ITS Projects
  - West Valley Highway HAWK Signal
  - Various School Zone Crossings and Signage
  - Rapid Rectangular Flashing Beacons at various locations including Tukwila Int'l. Blvd near Abu Bakr Islamic Center, S 144th Street/46th Avenue S

Demographics

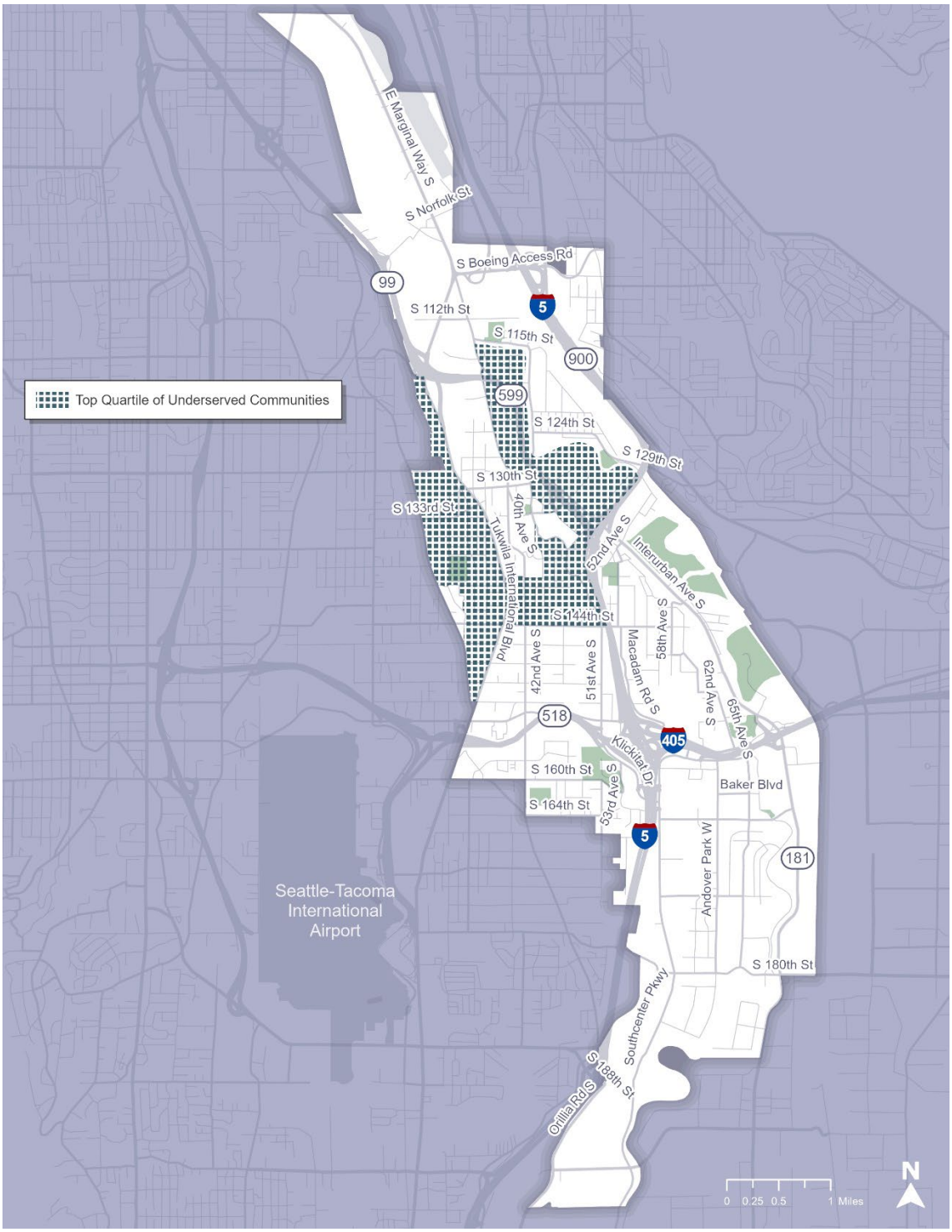
The Safe System Approach emphasizes equity considerations to analyze and improve roadway safety. City departments routinely orient their efforts to ensure equitable outcomes in Tukwila, and it was important that this emphasis be reflected in transportation decisions. There are many ways to measure the effects of equity considerations on transportation policy. This LRSP leverages the TE analysis to be consistent with decisions about prioritizing transportation investments. The LRSP also utilizes the USDOT Equitable Transportation Community (ETC) Explorer Tool; see **Appendix C** for additional information.

TUKWILA UNDERSERVED COMMUNITIES

The Tukwila LRSP planning process identified underserved communities based on data that commonly point to having fewer transportation options and attempts to advance equity by

prioritizing projects that benefit these communities. The project lists in both the LRSP and TE incorporate underserved communities' location data in the prioritization process. **Figure 4** displays the top quartile of underserved communities in the City of Tukwila, based on the following metrics: Age, Income, Race, Limited English Proficiency, and Disability.

Figure 4. Top Quartile of Underserved Communities in Tukwila



Source: Tukwila Transportation Element, Fehr & Peers, 2024.

Chapter 2: Outreach

Conversations with Tukwila staff, stakeholders, and the community provided essential input toward development of the LRSP. Community engagement continues to be vital to the success of the LRSP, reflecting diverse community perspectives and building trust to serve as the foundation for the plan. This chapter highlights what we heard from the community and key stakeholders, such as:

- In-person tabling and focus groups
- Tukwila LRSP Task Force
- Online Engagement

Figure 5. Focus Group at Riverton Park United Methodist Church

Source: Fehr & Peers, 2023.

In-Person Engagement

In-person engagement related to safety was conducted as part of the TE outreach series and leveraged with the LRSP.

In-Person Outreach

The TE outreach series had both in-person tabling events as well as targeted focus groups. During the in-person events (tabling and focus groups), the project team captured a total of 128 public comments and ideas related to the city's transportation system. The safety-related project ideas derived from in-person TE engagement are included in **Figure 6**.

In-person tabling events for the TE included:

- Tukwila Community Center
- Tukwila Library
- Tukwila Elementary School
- Saar's Super Saver Foods

In-person focus groups for the TE included:

- Riverton Park United Methodist Church
- Foster High School

Online Survey and Interactive Mapping Outreach

An online survey asked the public to weigh in on draft goals and their preferred modes of transportation and demographics. Of approximately 46 responses to the optional question above, 19 referenced safety concerns in the city.

> *"Biking in Tukwila would be so wonderful, but as it is unbelievably dangerous."*

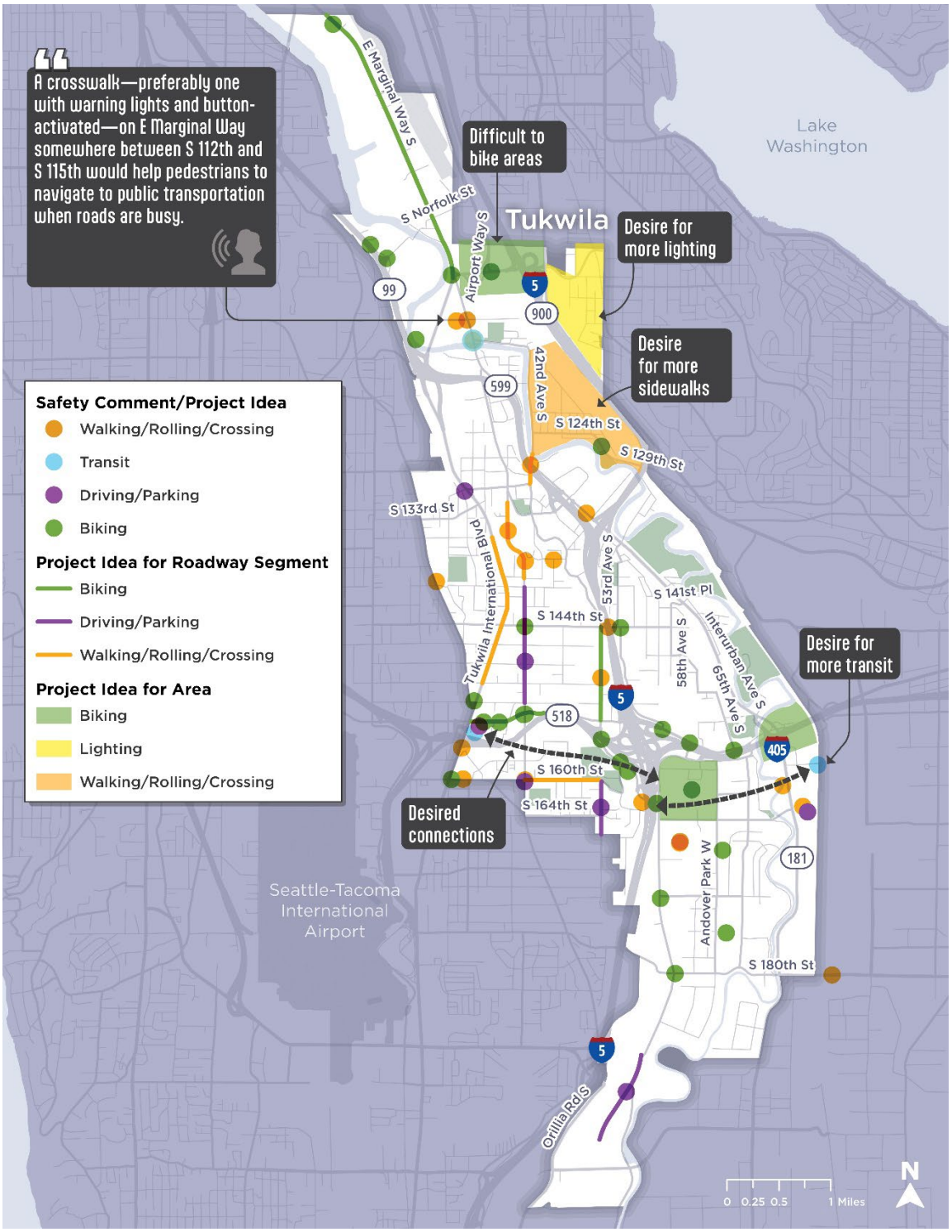
> *"It's nearly impossible to walk in some areas in Tukwila."*

> *"Please make it easier to walk around Tukwila by providing sidewalks and/or physical separation from vehicles. A walkable area is more universally accessible than requiring a vehicle. It also cuts down on pollution and has healthier outcomes for a community."*

> *"In the Southcenter area it is generally hazardous to transit by bike without utilizing the sidewalk, which is not ideal. Similarly, the Community Center is not serviced by bike friendly options from most Tukwila neighborhoods."*

An interactive map was also promoted for community members to share location-specific transportation comments. Safety dominated 50 of the 67 map comments. **Figure 6** displays the locations of safety-related comments added to the interactive map as well as specific safety ideas identified during in-person engagement. See **Appendix D** for more information on TE outreach and engagement.

Figure 6. Safety Comments and Project Ideas



Source: Fehr & Peers, 2024

Tukwila LRSP Task Force

An LRSP Task Force was convened to include representatives from the Streets Department, Inclusion and Engagement team, Sustainable Transportation, Puget Sound Regional Fire Department, Police Department Tukwila School District, and the King County Target Zero Task Force. The group met three times over the course of developing this plan. The first meeting introduced the group to the Safe System Approach, the High Injury Network, and existing crash data trends; the second gave the group an opportunity to provide input on a prioritization process for key locations; while the third meeting gave the group the opportunity to provide input on project locations and solutions. Members of this group were engaged throughout the plan's process to gather feedback, expand outreach representation, and ask questions that informed the plan development.

Chapter 3: Safety Data Analysis

The LRSP's development was informed by data, including crash records, as well as input from city staff and the public. Crash records on roadways in Tukwila from 2018 to 2022 are the primary resource for the LRSP. The data-driven process and the following section describe this process in the LRSP:

- Examination of Existing Conditions: Overview of 2018-2022 crash summaries and safety statistics.
- Identification of Crash Trends: Review of crash statistics to evaluate when, where, and why crashes occur and who is involved.
- Development of High Injury Network: Flagging corridors where there are higher rates of injury related to crashes.
- Development of Factors Influencing Crash Likelihood: Identification of factors related to the most prevalent crash types and contexts.
- Mapping Crash Likelihood Locations: Overlay factors influencing crash likelihood with the street network in Tukwila.

King County

Traffic fatality trends on all roads in King County have increased[4] over the last five years (2018-2022), as shown in **Figure 7**.

WHAT IS A KSI CRASH?

A Fatal Injury is any injury that results in death within 30 days after the motor vehicle crash in which the injury occurred.

A Serious Injury is any injury other than fatal which results in one or more of the following:

- Severe laceration resulting in exposure of underlying tissues/ muscle/organs or resulting in significant loss of blood
- Broken or distorted extremity (arm or leg)
- Crush injuries
- Suspected skull, chest, or abdominal injury other than bruises or minor lacerations
- Significant burns (second and third degree burns over 10% or more of the body)
- Unconsciousness when taken from the crash scene
- Paralysis

Source: https://highways.dot.gov/media/20131

[4] https://wtsc.wa.gov/dashboards/fatalities-dashboard/

Figure 7. King County Fatalities

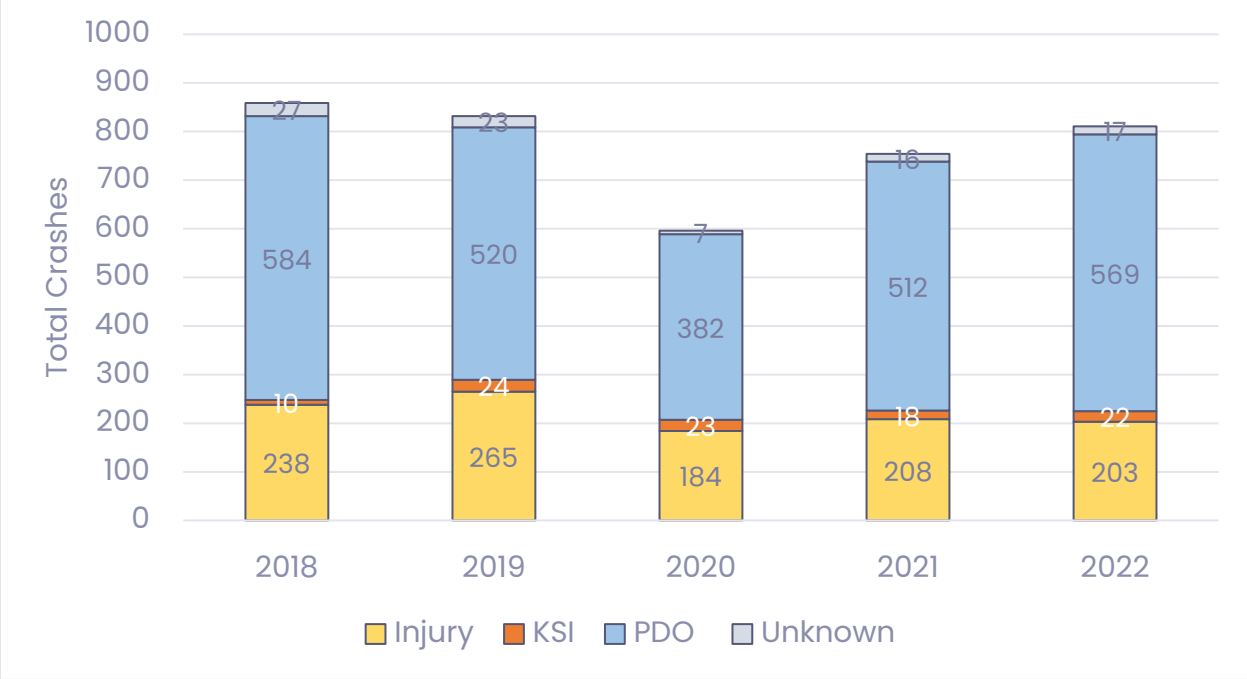
Source: Washington State Traffic Safety Commission Crash Data, 2014-2023.

Tukwila

From 2018 to 2022, there were 3,852 crashes on Tukwila streets, 97 (2.5%) of which were crashes in which someone was killed or seriously injured (KSI). Of the 97 KSI crashes, 22% involved a pedestrian or bicyclist. Pedestrians and bicyclists are overrepresented in KSI crashes and generally experience higher risk of fatal and serious injuries than motorists. **Figure 8** displays total crashes summarized by year and resulting injury. **Figure 9** displays the KSI crashes summarized by year and mode. Similar to King County, Tukwila saw a general trend of increasing KSI crashes over the past five years. **Figure 10** maps the total crashes within the city.[5] See **Appendix E** for additional heatmaps of crashes by mode.

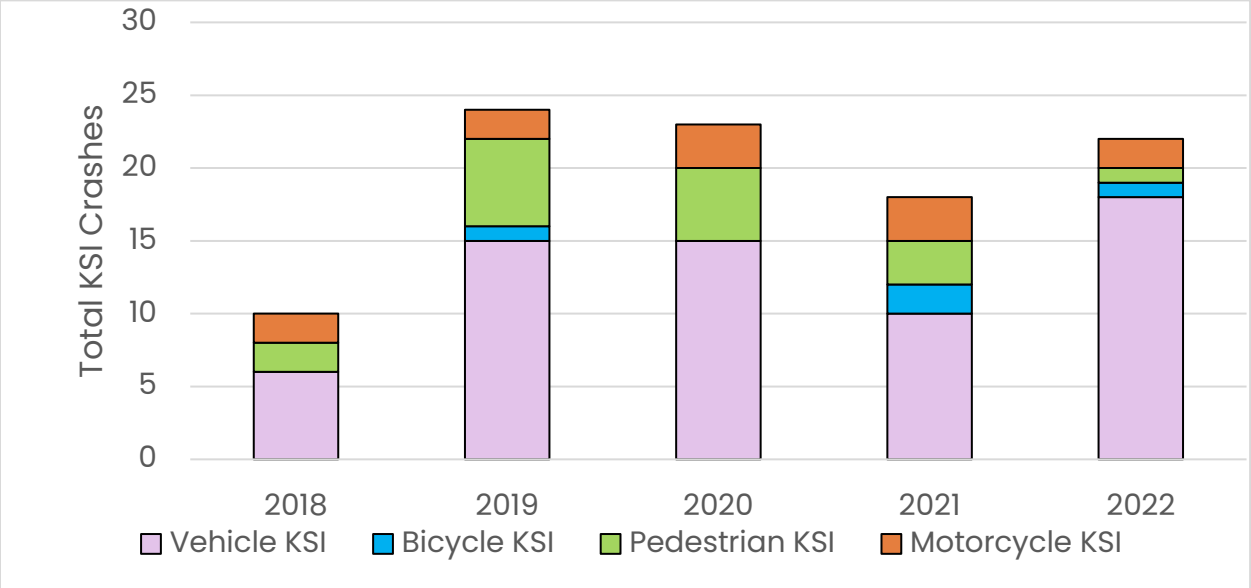
[5] Note: Crashes along the following highways were not included in the analysis: I-5, I-405, SR-518, SR-599, SR-99.

Figure 8. Total Crash Summary by Year and Injury Type



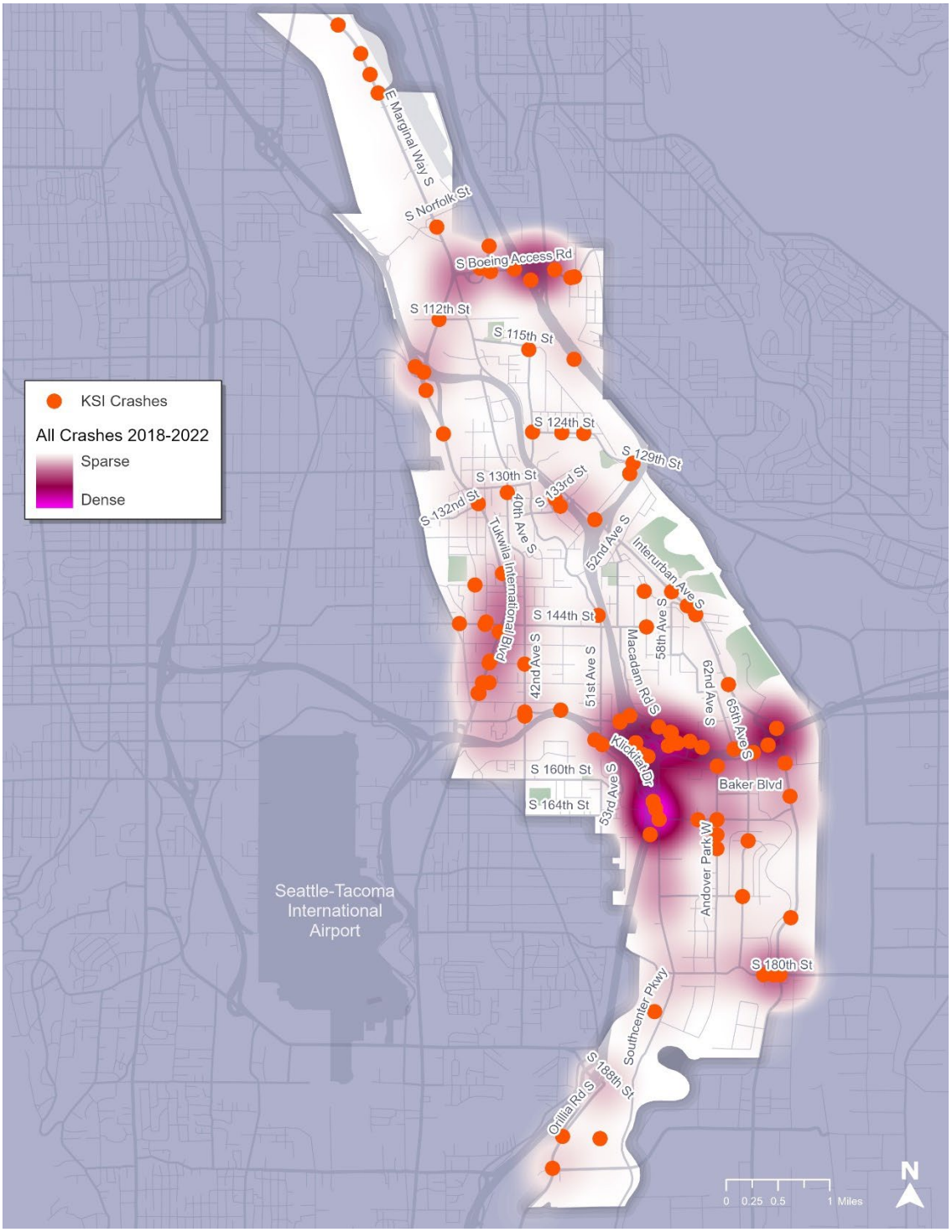
Source: Fehr & Peers, 2024, WSDOT.

Figure 9. KSI Crash Summary by Year and Mode



Source: Fehr & Peers, 2024.

Figure 10. Heatmap of All Crashes

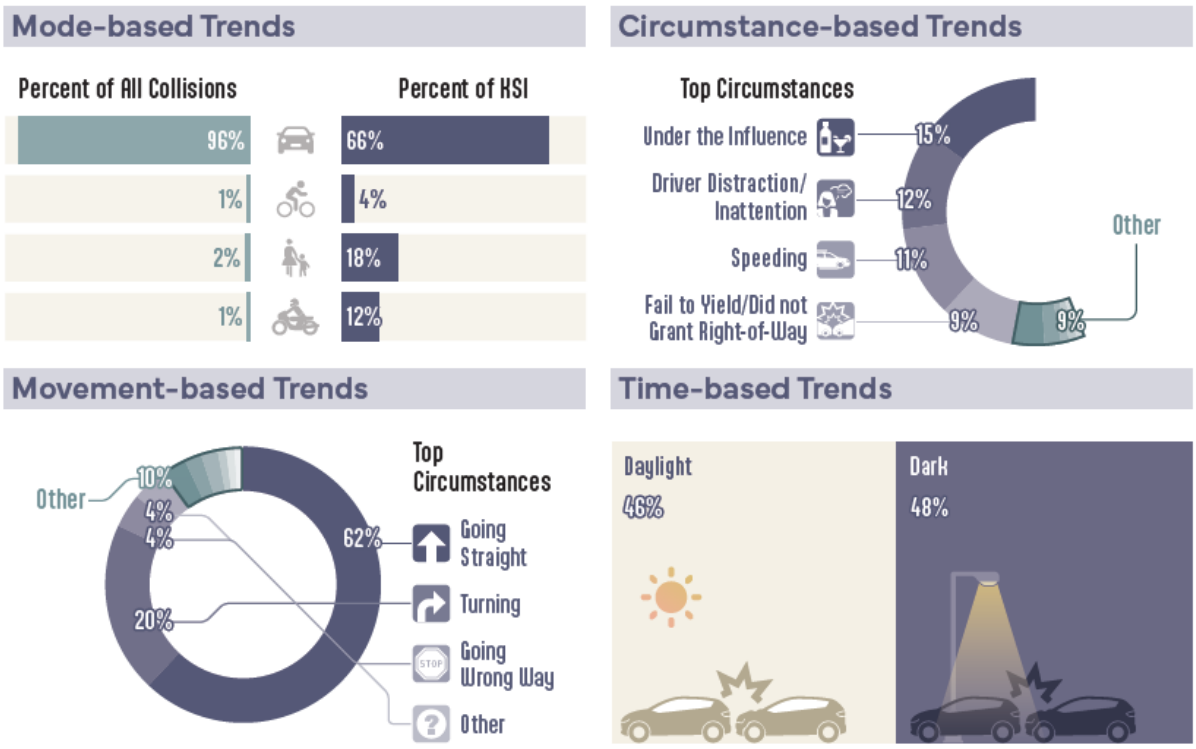


Source: 2018-2022 WSDOT Data, Fehr & Peers, 2024.
Note: Crashes along the following highways were removed from analysis: I-5, I-405, SR-518, SR-599, SR-99.

Identification of Key KSI Crash Trends

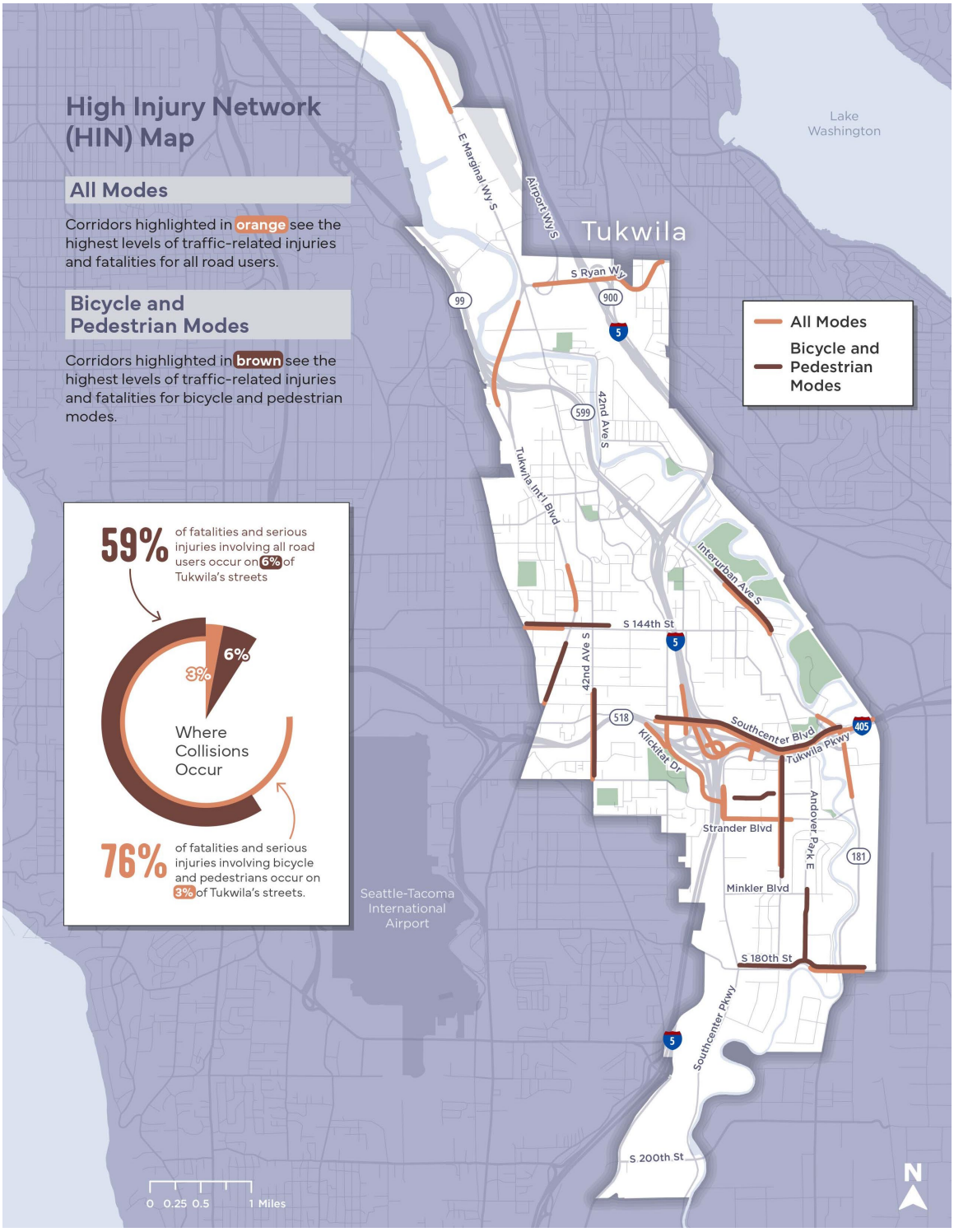
Understanding key crash trends in Tukwila is critical to addressing recurring safety concerns as well as preemptively addressing expected safety concerns. **Figure 11** outlines some recurring KSI crash types. Note that some crashes can involve multiple types in a single event.

Figure 11. KSI Crash Metrics



A High Injury Network (HIN) was developed to understand what corridors present the highest risk of injury resulting from a crash. A HIN identifies stretches of roadway where the highest concentration of crashes, weighted by fatal and serious injuries, occur on the transportation network. **Tukwila's HIN shows that 59% of all KSI crashes occurred on only 6% of city streets.** A Vulnerable Road User HIN was also developed, focusing on pedestrians and bicyclists. Pedestrians and bicyclists especially experience fatal and serious injury crashes at a higher rate compared to vehicles and motorcycles. **The Vulnerable Road User HIN shows that 76% of all Vulnerable Road User KSI crashes occurred on just 3% of city streets.** The results of the analysis are mapped in **Figure 12**.

Figure 12. All Modes and Vulnerable Road Users High Injury Network



Source: Fehr & Peers, 2024.

Table 1 summarizes several patterns that appear in Tukwila's crash history over the five-year period from 2018-2022.

Table 1. Key Crash Trends

Key Trends	Key Data
Mode-Based Trends	**Vehicle-Vehicle crashes** were involved in 96% of crashes and 66% of KSIs.
	Pedestrians were involved in 1.5% of crashes and 18% of KSIs.
	Bicyclists were involved in 0.6% of crashes and 4% of KSIs.
	Motorcyclists were involved in 1.4% of crashes and 12% KSIs.
Circumstance-Based Trends	About 15% of KSIs were **under the Influence** of alcohol or drugs.
	About 12% of KSIs were related to **distracted driving/inattention**.
	Almost 11% of KSIs were related to **speeding.**
	About 9% of KSIs were related to **failure to yield/not granting right of way** to other vehicles or non-motorists.
Crash Type Trends	47% of crashes are classified as **entering at angle** or **rear end.**
	Fixed object crashes account for 15% of all crashes and 24% of KSI crashes.
Intersection Relationship Trends	39% of all crashes occur at an **intersection and are intersection related**.
All-Modes Location-Based Trends	About 58% of KSIs occur on **arterial streets**.
	About 37% of KSIs occur on streets adjacent to **commercial zoning**.
	About 24% of KSIs occur at **signalized arterial intersections**.
	About 24% of KSIs crashes occur near **transit stops**.
	About 27% of KSI crashes occur on **collector streets**.
Vulnerable Road User Location-Based Trends	About 27% of pedestrian crashes occur within ¼ mile of Tukwila **schools**.
	About 96% of all bike crashes occur **outside of bike lanes**.
	About 34% of all pedestrian crashes occur on **collector streets**.
	About 47% of pedestrian crashes were **in the dark**, when streetlights were on.
	About 17% of pedestrian crashes occur at **mid-block locations (not at an intersection) on 25mph Streets**.

Source: WSDOT Crash Data 2018-2022; Fehr & Peers, 2024.

Factors Influencing Crash Likelihood

To identify factors influencing crash occurrences and severity, a comprehensive analysis encompassing five years of crash data from 2018 to 2022 was conducted utilizing land use and roadway information. By merging road and intersection features with crash data, relationships can be identified between contextual factors (such as street data) and the likelihood of certain crash types. This analysis aimed to identify contributing factors and discern emerging trends. The identified factors were categorized based on their potential to cause KSI crashes, as well as those involving Vulnerable Road Users (VRUs) e.g., bicyclists, motorcyclists, and pedestrians. Crash data was joined spatially in GIS to nearby contextual data, which include the following variables:

- Streets, including number of lanes, posted speed limit, and functional classification
- Signalized intersections and traffic beacons
- Land use zoning
- Driveways
- Education facilities and school traffic zones
- Sidewalks
- Bicycle facilities
- Locations of parks
- Proximity to intersections

The crash data was then mapped in ArcGIS. Each crash was assigned to the nearest intersection within 250 feet of a major street or 75 feet of a minor street, or nearest roadway segment if no intersection was within range.

Land use and roadway characteristics that stood out as indicators for where more severe conflicts (and potentially crashes) could occur are identified **Table 2** and mapped in **Appendix F**.

The factors were utilized and evaluated for their presence on the street's roadway network. Roadways were categorized based on the number of factors present at a segment. **Appendix F** displays the crash likelihood factors along Tukwila's street network. These maps were used as an input to identify priority project locations where there is overlap among the crash likelihood factors.

Table 2. Crash Risk Factors

Factor	Mode	Crash Information	Contextual Information
Arterials (minor or principal)	All	Roadways classified as Arterial account for 68% of all crashes and 58% of KSI crashes but only constitute 23% of Tukwila' roadway network. They also account for 91% of bike crashes and 49% of pedestrian crashes.	The city's street dataset classifies arterials as either minor or principal. This factor includes both classifications. Additionally, it is important to note that principal arterials typically have higher speed limits greater than 35 mph as well.
Commercial Land Use	All	Roadways within 70 feet of a parcel zones as 'Commercial' account for 37% of KSI crashes and 41% of all crashes but only makes up 13% of Tukwila's city limits.	The city's zoning classification consists of nineteen categories of which six categories correspond to commercial land uses (Residential Commercial Center, Regional Commercial Mixed Use, Regional Commercial, Neighborhood Commercial Center, Commercial Light Industrial, Commercial Corridor)
Transit Stops	All	25% of KSI crashes and all crashes occur within 150 feet of a transit stop. Transit stops are on a limited set of streets within the City of Tukwila.	KSI crashes occurred within 150 feet of 56 transit stops out of the 374 total transit stops within the City limits.
K-12 Schools	All	13% of KSI crashes and 10% of all crashes occur within a quarter mile of a school. Additionally, 27% of pedestrian crashes are also accounted for within this buffer.	Schools account for higher pedestrian and vehicle volumes especially during start / stop times. There are seven schools within the city limits (Cascade View Elementary, Thorndyke Elementary, Tukwila Elementary, Impact Puget Sound Elementary, Showalter Middle School, Foster Senior High School, Raisbeck Aviation High School)
Collectors	All	20% of all crashes and 27% of KSI crashes occur along streets classified as collectors in Tukwila.	Collectors make up 17% of the city's road network.

Factor	Mode	Crash Information	Contextual Information
Traffic Signals on Arterials	All	Signalized intersections on Arterials experience 37% of all crashes and 24% of KSI crashes.	68 out of 75 traffic signals are on arterials and are typically at major intersections within the city. All signals along arterials were selected.
No Bike Facility	Bicycle	96% of bike crashes occur on roads where no bicycle facility is available.	The City's bike network includes bike lanes and sharrow street markings. Only 4% of streets in Tukwila include a bike lane.
Midblock Locations on 25 mph roads	Pedestrian	17% of all pedestrian crashes occur midblock (not at intersections) on roads with a speed limit of 25 mph.	

Source: WSDOT Crash Data 2018-2022; Fehr & Peers, 2024.

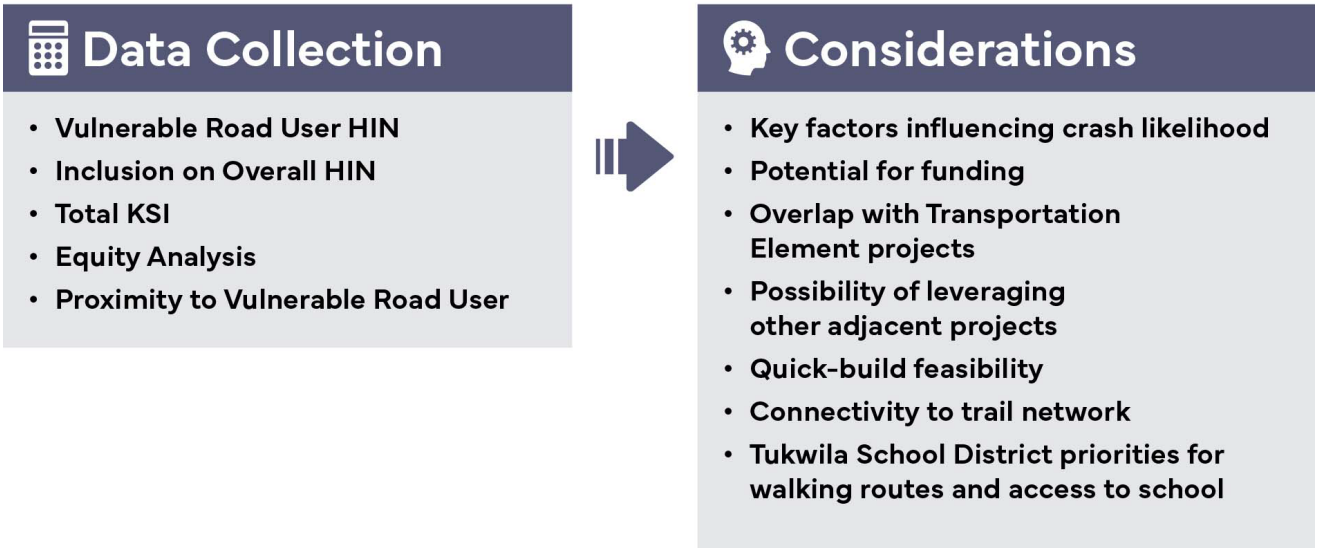
Chapter 4: Assessment of Results

The following section identifies preliminary priority locations, screens and evaluates the locations to establish priority locations, and establishes approaches to address safety concerns at each priority location.

Project Prioritization Framework

The overall project prioritization process includes quantitative and qualitative steps that reflect the priorities established at the second Task Force workshop,[6] shown in **Figure 13**.

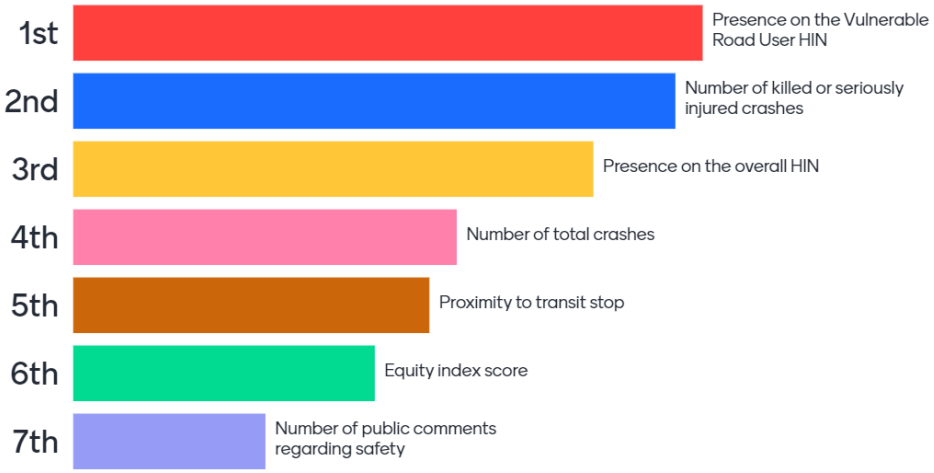
Figure 13. Prioritization Process Overview



During the Task Force workshop, participants ranked proposed prioritization metrics in order of importance. **Figure 14** shows the results of this ranking activity, prioritizing the High Injury Network and KSI crashes.

[6] August 20, 2024

Figure 14. Results of Prioritization Ranking Activity



Following the ranking activity, the Task Force participants' discussion highlighted the importance of additional criteria such as school walking routes, access to school bus stops, connectivity to the trail network, and the ability to leverage adjacent projects. These additional criteria are included in the qualitative step for prioritization.

Table 3 shows the weights given to the quantitative metrics listed above to prioritize intersections, segments, and corridors.[7] See **Appendix G** for more information on prioritization outputs.

[7] Note that total crashes are not included as a prioritization factor because it may take away from the more severe killed and serious injury (KSI) crashes.

Table 3. Quantitative Prioritization Criteria and Weights

Criteria	Data (points)	Weight	Notes
Inclusion on Vulnerable Road User HIN	3 points - complete overlap on HIN 2 points - more than half overlap on HIN 1 points - less than half overlap on HIN 0 points - not on HIN	30%	HIN factor is a 0, 1, 2, or 3-pt factor (depending on how much a segment overlaps)
KSI Crashes (Crash Density)	3 points - Highest 2 points - Middle 1 points - Lowest 0 points - No KSI Crashes	25%	City of Tukwila project lengths are typically </= 2,500 linear feet and 2,500 feet is the length of the longest blocks in Southcenter
Inclusion on overall HIN	3 points – On 0 points - Off	25%	"Yes or no" based on overlap with HIN
Equity Index Score	3 points - Highest Score 2 points - Middle 1 points - Lowest Score 0 points - No value	10%	By score percentile
Proximity to Vulnerable Road User Destinations such as transit stops, schools, and parks	Based on the counts of the nearby destinations, located within 1/2 -mile of high-capacity transit stations and within 1/4 mile of schools and parks.[8] 3 points - more than three destinations 2 points - two 1 points -one 0 points -none	10%	¼-mile radius used to focus project location priorities on areas closest to these destinations.

Source: Toole Design, 2025

[8] For schools and typical King County Metro bus stops, the project team recommends staying with 1/4 mile to focus on improvements immediately at or near the school campus and bus stops. Expanding that would cover most of the city and negate some of the prioritization.

Project Prioritization Results

Following the selection of prioritization criteria and weights, preliminary priority locations were evaluated to determine if the city could identify a project to address specific crashes recorded for each location. For this task, the city evaluated each location to determine what, if any, recently completed, underway, or planned city projects aligned with high scoring locations. For locations that did not include any planned projects, solutions were identified. The resulting set of draft project locations were then evaluated for feasibility, such as inclusion on the Capital Improvement Program (CIP), potential for funding, and the possibility of leveraging other adjacent or ongoing projects.

The city's prioritization steps provide a rigorous yet flexible approach to advancing corridor safety projects. **Figure 15** and **Table 4** show the top priority projects, while **Appendix I** shows the final prioritized projects and information. Based on the assessment framework, Tukwila identified the following:

1. **LRSP Identified Projects:** New high priority projects identified as part of this plan.
2. **TE Identified Projects:** High priority projects identified in the plan with a corresponding TE project.

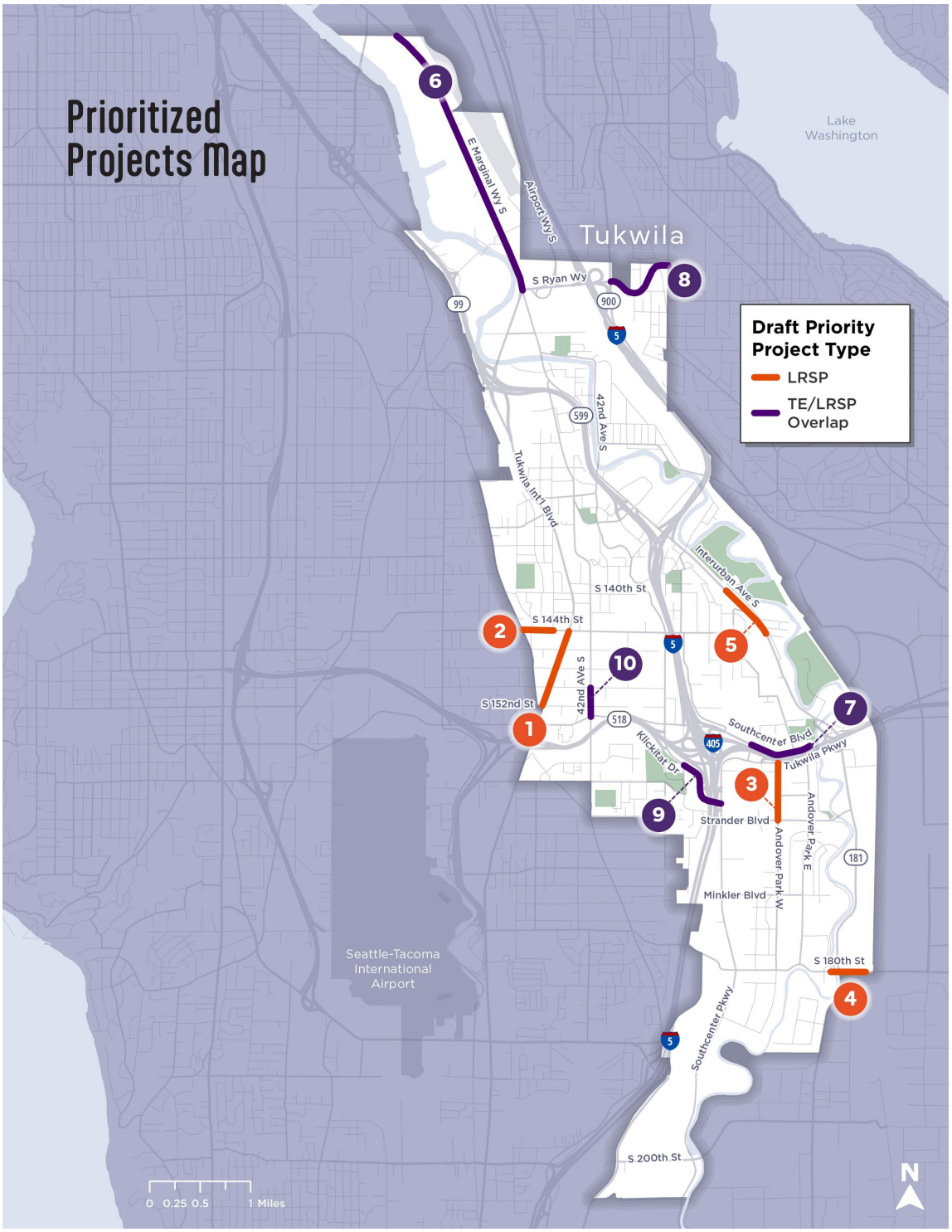
Table 4: Project Extents and Estimated Costs

Project ID	Project Extents	Estimated Project Cost[9]
LRSP Identified Projects		
1	Tukwila International Boulevard (S 152nd St to S 144th St)	$ 4,347,000
2	S 144th St (Military Rd to Tukwila International Blvd)	$ 580,000
3	Andover Park W (Strander Blvd to Tukwila Pkwy)	$ 923,000
4	S 180th Street (Sperry Drive to Interurban Trail)	$ 806,000
5	Interurban Avenue (140th Street to 144th Street)	$ 1,484,000
TE Identified Project[10]		
6	E Marginal Way S (Northern City Limits to S Boeing Access Rd)	$ 6,917,000
7	Southcenter Blvd (61st Ave S to 66th Ave S)	$ 198,000
8	S Ryan Way (Martin Luther King Jr Way to 51st Ave S)	$ 305,000
9	Klickitat Dr (53rd Ave S to Southcenter Pkwy)	$ 582,000
10	42nd Ave S (Southcenter Blvd to S 150th St)	$ 188,000

Source: Toole Design, 2025

[9] *The overall cost opinions are intended to be general and used only for planning purposes.*
[10] *The TE Identified project costs only include the additional safety elements. Refer to the TE for the baseline project cost information.*

Figure 15 Final Priority Project Locations



Source: Fehr & Peers and Toole Design, 2025

Chapter 5: Safe System Implementation

This section presents safety countermeasures and strategies covering the Safe System Approach elements that address the identified crash trends in Tukwila. This section also builds upon the work Tukwila has already done to prioritize safer roadway design through efforts such as project implementation, grant applications, maintenance activities, and adoption of planning documents that identify priorities and future projects. The focus on the Safe System Approach, along with the emphasis on equity, helps to provide alignment with the LRSP vision and goals, and sets Tukwila up for success in recognition of emerging safety best practices.

Safe System Action Plan

To supplement the TE, Tukwila has identified LRSP strategies to advance its safety goals into policies, programs, and operations. The safety action plan, outlined in **Table 4**, is a collection of strategies and actions that compile best practices from communities across North America and beyond. The safety action plan is designed to set a high bar against which the City of Tukwila's Local Road Safety Plan can be measured. These strategies and actions align and feed into the recently updated TE policies. The TE reinforces Tukwila's goal to eliminate traffic deaths and serious injuries on city streets.

Table 4 provides a list of recommended actions that Tukwila can undertake centered around the six elements of Washington State's Safe System Approach:[11] Safer Road Users, Safer Land Use, Safer Vehicles, Safer Speeds, Safer Roads, and Post-Crash Care.

[11] *"Design Manual, Chapter 321 Safety Analysis." 2024. WSDOT. September 1, 2024.* https://www.wsdot.wa.gov/publications/manuals/fulltext/m22-01/321.pdf.

Table 5. Safe System Action Plan Recommended Actions

WSDOT Safe System Element	Approach Type	Impact	Implementation Timeframe (years)	Recommended Action	Primary Road User	Lead Depart.	Supporting Depart, Org. or Jurisdiction	Performance Metric	Funding Resources
Safer Road Users	All	Medium	Short (1-4)	Continue to work with the interdepartmental and agency LRSP Task Force to coordinate and collaborate on traffic safety projects and ensure new transportation projects include safety countermeasures.	All	Public Works (PW)	PW Police (PD) Fire Authority WSDOT Tukwila School District WSDOH	Number of agreements reached Number of joint projects between departments and agencies	N/A
	All	Medium	Medium (5-9)	Promote mode shift to safer and more active forms of transportation (e.g. walking, and bicycling) through travel demand management programs; include strategies to broaden Drivers Ed to a Mobility Education (pedestrian, bicycle, transit, and motor vehicle) curriculum so students are empowered to make informed travel mode choices and are prepared for independent mobility.	Pedestrians Bicyclists	PW WSDOT	Tukwila School District & Community Partners (e.g. Cascade Bike Club)	Number of programs launched Number of student participants Change in mode share	N/A
	Education	Low	Medium (5-9)	Develop motorist, motorcyclist, and active transportation safety training and/or awareness campaigns for Limited English Proficiency populations, children, older adults, and people with disabilities.	All	OSPI City of Tukwila	WTSC WSHCA	Number of people reached Number of trainings Demographics stats	N/A
	Education	Low	Medium (5-9)	Continue to implement safe walking and biking curriculum to elementary schools and implement safe walking and bicycling curriculum to middle school students throughout Tukwila.	Pedestrians Bicyclists	Tukwila School District & Community Partners (e.g. Cascade Bike Club)	PW	Number of programs launched Number of student participants Change in mode share	N/A
	Education	Low	Medium (3-5)	Develop targeted engagement for middle and high school students and families in traffic safety, with a focus on empowering youth leadership to promote safe transportation in their school communities.	All	Tukwila School District & Community Partners (e.g. Cascade Bike Club)		Number of programs launched Number of student participants	N/A
	Education	Low	Short (1-4)	Develop and implement outreach to educate road users about the safety benefits of engineering countermeasures such as roundabouts, roadway reconfiguration, corridor access management, traffic calming, etc. in conjunction with their installation.	All	City of Tukwila	WTSC WSHCA	Number of people reached Number of events	N/A
Safer Land Use	Planning	High	Medium (5-9)	Revise zoning codes to allow mixed use in residential districts to reduce the necessity to drive and provide greater accessibility for people walking and biking to everyday destinations. In turn, this will reduce motor vehicle traffic volumes and vulnerable road user exposure to motor vehicles. *Supporting action*: Reduce or eliminate parking minimums to make these projects more financially feasible and allow more flexible land use options.	Pedestrians Bicyclists	DCD	PW City Council	Number of zoning districts updated to allow neighborhood cafes and small scale retail.Number of short trips by motor vehicle, pedestrians, and bicyclists.	N/A

WSDOT Safe System Element	Approach Type	Impact	Implementation Timeframe (years)	Recommended Action	Primary Road User	Lead Depart.	Supporting Depart, Org. or Jurisdiction	Performance Metric	Funding Resources
	Planning	Medium	Long (10-20)	Work with the school district and other youth and child care providers to encourage the siting of new schools, day care centers, and early childhood education facilities within walking distance of residential areas to provide multiple benefits of improving safety, reducing motor vehicle traffic at arrival and dismissal times, reduce time spent by parents transporting children to school, day care, or other activities, and encouraging more physical activity.	Pedestrians and Bicyclists	DCD Tukwila School District Charter Schools Developers	City Council Child and Youth Care Service Providers	School location in relation to where students live.	N/A
Safer Vehicles	All	Medium	Long (10-20)	Transition government fleets and encourage City contractor fleets to utilize low-mass, safety-enhanced vehicles, equipped with lateral protective devices (LPDs, also known as side guards) and crash avoidance technologies like proximity sensors, speed governors, and telematics systems for monitoring speed and driver behavior.	Motorists	PW	PD Puget Sound Regional Fire Authority WSDOT WDOE	Number of vehicles changed Crash severity reduction	CMAQ Clean Cities Coalition
	All	Medium	Medium (5-9)	Review, update, and maintain local ordinances regarding the appropriate use of emerging micromobility technologies such as e-scooters and e-bikes.	Motorists	PW DCD	PD WSDOT		N/A
Safer Speeds	Engineering	Medium	Medium (5-9)	Reference NACTO City Limits[1] and 2023 updated MUTCD guidance for setting appropriate speed limits depending on the urban context.	Motorists	PW	City Council WSDOT	Number of roads with revised/new speed limits Average speed reduction	SS4A WTSC
	Enforcement	Medium	Medium (5-9)	Continue school zone photo enforcement and expand photo enforcement into more school zones and into non-school zones as allowed by state law and authorized by city code. Allocate revenue generated from ATE to implement street design and improvement measures to address high motor vehicle speeds[2].	Motorists	City Council PW PD Municipal Court	N/A	Reduction in average motor vehicle speed at locations where ATE cameras are installed. Number of speed management projects financed from ATE camera revenue.	WSDOT City Safety Program
	Education	Low	Short (1-4)	Implement well-planned and researched safety awareness campaigns that are part of an overall speed reduction strategy and paired with other measures to support their implementation.	Motorists	PW Communications.	PD	Number of people reached Frequency of message delivery Audience digital engagement stats	WTSC SS4A

[1] "City Limits Setting Safe Speed Limits on Urban Streets." 2020. NACTO. 2020. https://nacto.org/publication/city-limits/ provides further guidance regarding best practices for automated traffic enforcement.

[2] Washington State Law currently allows automated traffic safety enforcement cameras in the following locations: railroad grade crossings; school speed zones; school walk zones; public park speed zones; hospital speed zones; and midblock on arterials. See **RCW** **46.63.260** for more information. They are also allowed to detect stoplight violations, but are restricted to intersections of two or more arterials as described in RCW **46.63.230**

WSDOT Safe System Element	Approach Type	Impact	Implementation Timeframe (years)	Recommended Action	Primary Road User	Lead Depart.	Supporting Depart, Org. or Jurisdiction	Performance Metric	Funding Resources
Safer Roads	Engineering	High	Medium (5-9)	Evaluate all road resurfacing and repainting projects for potential to incorporate: • Road diets/road reconfigurations • Narrower lane widths (11' on arterials and 10' on local streets) • Daylighted intersections/curb bulbouts using quick-build materials • Reduced curb radii • Marked crosswalks	All	PW	DC WSDOT	Number of roads analyzed Number of intersections analyzed List of potential projects	HSIP Overlay and Repair Program WSDOT City Safety Program TBD TIF
	Engineering	High	Short (1-4)	Incorporate quick-build strategies and demonstration projects for rapid roll-out of safety improvements for pedestrians and bicyclists. As funding becomes available, convert temporary improvements to higher quality, more durable permanent improvements.	All	PW	WSDOT City Council	Number of projects	SS4A HSIP WSDOT City Safety Program
	Engineering	High	Medium (5-9)	Reduce pedestrian crossing distances by implementing roadway reconfigurations, reducing lane widths, and providing refuge islands and/or curb bulbs on wider roads based on context. Implement appropriate countermeasures to improve pedestrian crossings on multilane roads with higher speeds.	Pedestrians	PW	WSDOT	Number of roadway reconfiguration/road diets completed; Number of pedestrian refuge islands and/or curb bulbs installed	SS4A WTSC
	Engineering	High	Short (1-4)	Update City design standards and standard details to include best practices in speed management and Level of Traffic Stress standards (e.g., roadway geometries are designed for context-appropriate speeds, separated pedestrian and bicycle facilities are provided on roads with higher motorist speeds and volumes).	All	PW	WSDOT WTSC City Council	Percentage of reviewed policies Number of stakeholder meetings Number of updated policies	SS4A HSIP WSDOT City Safety Program
	Engineering	High	Long (10-20)	Increase road users' visibility to each other through roadway designs that routinely include lighting, raised intersections, and daylighting corners that enhance yielding compliance. Improve lighting at pedestrian crossing locations identified in the prioritized project list map.	All	PW	WSDOT City Council	Percentage of streets Number of streetlights upgraded or installed	HSIP
	Engineering	Medium	Short (1-4)	Review existing Complete Street Ordinance for possible updates using current best safety practices. Build streets using Complete Streets principles to create comfortable spaces that welcome all road users and encourage mode shift. Develop a Complete Streets checklist that incorporates safety for planning street improvements or new streets.	All	WSDOT	PW	Number of measures incorporated New Checklist version published Number of complete streets projects	WTSC TIF
	Engineering	Medium	Medium (5-9)	Develop a citywide crosswalk practice to enhance safety of pedestrian crossings, especially at locations with high pedestrian demand, such as near transit stops, schools, and parks.	Pedestrians	PW WSDOT	King County Metro Sound Transit	Number of crosswalks installed at transit stops; Number of transit stops relocated to far side of intersection; Miles of dedicated transit lanes; Number of transit priority signals	WTSC TIF
	Engineering	Medium	Short (1-4)	Continue to review traffic signal operations to ensure that signals are accessible and provide priority with pedestrian recall and protected pedestrian phasing or leading pedestrian intervals in locations identified in the prioritized project list map.	Pedestrians	PW	WSDOT	Number of signals installed or updated	SS4A HSIP WTSC WSDOT City Safety Program

WSDOT Safe System Element	Approach Type	Impact	Implementation Timeframe (years)	Recommended Action	Primary Road User	Lead Depart.	Supporting Depart, Org. or Jurisdiction	Performance Metric	Funding Resources
	Engineering	Medium	Long (10-20)	Build high comfort (Bicycle Level of traffic Stress[3] - LTS 1 or 2 and Pedestrian Level of Traffic Stress – PLTS 1 or 2) transportation facilities that provide high-quality, low-stress connections for people bicycling and walking to key destinations, including schools, libraries, and community centers, supporting an age-friendly environment.	Pedestrians and Bicyclists	PW		Number of safety improvements in school zones completed;	N/A
Post-Crash Care	All	Medium	Long (10-20)	Establish an Interagency Crash Rapid Response Team to regularly conduct road safety audits at high-risk areas and make necessary infrastructure upgrades.	All	PD	PW WSDOT	Crash Response Time reduction Number of audits completed Number of infrastructure upgrades completed	HSIP SS4A WSDOT City Safety Program
	All	Low	Medium (5-9)	Establish geospatial data collection and reporting standards so that crash statistics are timely and accurate and can be used to identify high-risk areas.	All	PW TIS	PD WSDOT WTSC	New standard launch	HSIP SS4A

Source: Toole Design, 2025

[3] "Low-Stress Bicycling and Network Connectivity." 2017. Mineta Transportation Institute. November 8, 2017. https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity.

Table 6. Implementation Departments and Funding Resources

Acronyms	Departments
DCD	Department of Community Development
OSPI	Office of Superintendent of Public Instruction
PW	Public Works Department
TBD	Transportation Benefit District
TDM	Transportation Demand Management
TIF	Transportation Impact Fee
WASPC	Washington Association of Sheriffs and Police Chiefs
WDOE	Washington Department of Ecology
WSDOH	Washington State Department of Health
WSDOT	Washington State Department of Transportation
WSHCA	Washington State Health Care Authority
WTSC	Washington Traffic Safety Commission

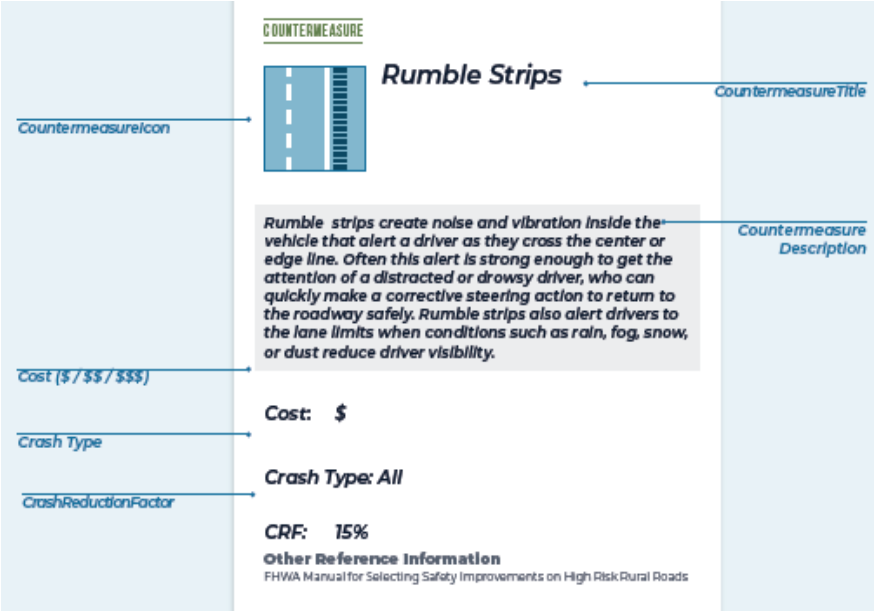
Source: Toole Design, 2025.

Proven Safety Countermeasures

Engineering countermeasures are physical, infrastructure-based improvements to make roadways safer by design. Engineering countermeasures help address the Safe Roads and Safe Speeds elements of the Safe System Approach. These countermeasures can be applied to address safety concerns on the High Injury Network as well as at intersections and corridors that contain elements that increase crash likelihood, even if the location does not have a current history of crashes.

A toolbox of engineering countermeasures is included in **Appendix H**. These countermeasures can serve as a menu of options to help address crash likelihood factors and crash trends identified in **Chapter 3: Safety Data Analysis**. **Figure 17** outlines what information is included in the toolbox. Most of the countermeasures have been identified by FHWA as "Proven Safety Countermeasures" and can be advantageous for use in Highway Safety Improvement Program (HSIP) grant funding applications. There are also many effective safety countermeasures beyond those listed in FHWA, several of which are included in the toolbox.

Figure 16. What You'll See in the Countermeasure Toolbox



Implementation Strategies

Defining projects, actions, countermeasures, and strategies is important, but a coordinated implementation process is a critical step in the LRSP process. Considerations for successful implementation to meet SS4A grant requirements include the following:

Oversight and Accountability – After LRSP adoption, form an advisory committee force made up of stakeholders (such as Public Works and representatives from police, fire, schools) and community members who will help maintain sustained focus and success implementing projects and actions identified in the LRSP. Such a committee would meet regularly to discuss delivery of projects, status of action items, and provide general support to advancing LRSP implementation.

Coordination and Partnerships – Provide regular updates on action plan progress and coordinating with agency partners (see Responsible Parties column in **Table 4**). Regular communication with agency partners helps create sustained support, creates opportunities to

bundle safety projects or initiatives with other related ongoing efforts, and facilitates LRSP implementation.

Communication – Continued communication with stakeholders and community members through the Task Force and regular community outreach builds trust and support for the city's safety goals. These can be completed through strategies such as communication across diverse channels, publication of factsheets on action plan progress, and regular public conversation on the topic of safety.

Phasing and Sequencing – To see meaningful progress in road safety performance, sustained commitment and investment is needed:

- **Short-term** implementation efforts may focus on successful completion of ongoing safety efforts and lower-cost improvements that can be constructed within three years.
- **Medium-term** implementation goals may target larger and more comprehensive safety infrastructure projects and more complex programmatic efforts that require extensive cross-department collaboration.
- **Long-term** implementation goals may focus on initiating significant shifts in the city's approach to planning and design incorporating the Safe System Approach.

Funding – Funding can be a major hurdle to LRSP implementation. Staying up to date on relevant grant opportunities and proactively pursuing grant funding for the most competitive projects can help overcome funding hurdles. Tukwila can take advantage of a variety of regional, state, and federal funding sources to finance safety project planning, design, and construction. Funding (including required matches) and resources generally must be available from the city to provide a successful grant application. See **Table 6** for potential safety funding resources to consider.

Table 7. Safety Funding Sources

Funding Source	Program Purpose
Federal Sources	
Community Development Block Grant (CDBG) Program	The Community Development Block Grant (CDBG) program is a flexible program that provides communities with resources to address a wide range of unique community development needs. Communities often use CDBG funds to construct and repair streets and sidewalks.
Safe Streets and Roads for All (SS4A) Grant Program	The Safe Streets & Roads for All (SS4A) grant program is a new Federal grant program established by the Bipartisan Infrastructure Law centered around the USDOT's National Roadway Safety Strategy and its goal of zero deaths and serious injuries on America's roadways. It will provide $5 billion in grant funding over 5 years to implement safety projects.
Better Utilizing Investments to Leverage Development (BUILD) Grant Program	The Better Utilizing Investments to Leverage Development (BUILD) Grant Program provides grants for surface transportation infrastructure projects with significant local or regional impact. The BUILD program can fund the surface transportation infrastructure elements of a project that may also include housing, employment opportunities, and economic development strategies.
Active Transportation Infrastructure Investment Program (ATIIP)	The Active Transportation Infrastructure Investment Program (ATIIP), funded by FHWA, will award planning and design grants and construction grants for eligible applicants to develop plans for active transportation networks and spines. A goal of both types of ATIIP grants is to integrate active transportation facilities with transit services, where available, to improve access to public transportation.
State Sources	
Urban Sidewalk Program (USP)	The Urban Sidewalk Program (USP), run by the Transportation Improvement Board (TIB), is for counties with urban unincorporated areas and cities with a population greater than 5,000 and funds sidewalk projects.
Urban Arterial Program (UAP)	Financed by the TIB, the Urban Arterial Program (UAP) funds projects in one of the following bands: Safety, Commercial Growth and Development, Mobility, and Physical Condition.
Active Transportation Program (ATP)	Financed by the TIB, the Active Transportation Program (ATP) provides funding to improve pedestrian and cyclist safety, enhanced pedestrian and cyclist mobility and connectivity, or improve the condition of existing facilities.
Complete Streets Program (CSP)	Financed by the TIB, the Complete Streets Program is a funding opportunity for cities and counties that have an adopted complete streets ordinance.
Pedestrian and Bicycle Program	WSDOT offers funding to improve the transportation system to enhance safety and mobility for people who choose to walk or bike. The purpose of the program is to eliminate pedestrian and bicyclist fatal and serious injury traffic crashes, increase the availability of connected

Funding Source	Program Purpose
	pedestrian and bicycle facilities that provide low traffic stress and serve all ages and abilities, and increase the number of people that choose to walk and bike for transportation.
Safe Routes to School Program (SRTS)	The purpose of the Safe Routes to Schools Program (SRTS) offered by WSDOT is to improve safety and mobility for children by enabling and encouraging them to walk and bicycle to school. Funding from this program is for projects within two-miles of primary, middle, and high schools (K-12).
Highway Safety Improvement Program (HSIP)	The Highway Safety Improvement Program (HSIP) focuses on infrastructure projects with nationally recognized crash reduction factors (CRFs). Local HSIP projects must be identified on the basis of crash experience, crash potential, crash rate, or other data-supported means.
Local and Regional Sources	
Transportation Impact Fees (TIF)	Tukwila has an adopted transportation impact fee (TIF) program to facilitate transportation and promote economic well-being within the City. TIF funds are for capacity projects but can include safety elements. TIF funds can only be spent on projects identified in the current TIF rate study.

Source: Fehr & Peers, 2024

Ongoing Evaluation

Ongoing safety program evaluation is necessary to track goal progress and can be a useful tool in future decision-making related to safety investments and required for future grant funding and tracking. Target performance measures recommended for ongoing (every two to three years) tracking are:

- Reduction in average annual crashes
- Reduction in average annual KSI crashes
- Reduction in average annual KSI crashes involving vulnerable road users
- Reduction in average annual KSI crashes on High Injury Network
- **Update the LRSP Regularly:** Update the LRSP every other year to incorporate tracked safety metrics. New approaches may be necessary as safety conditions within the city and region change over time.
- **Stakeholder Engagement:** To supplement quantitative performance measures, input from diverse partners is valuable in adapting the city's safety priorities as projects and programs are rolled out and safety conditions change.

The target performance measures will be evaluated and reported with the bi-annual Safety Report Card. The Safety Report Card will highlight successes and identify areas in need of additional attention and resources. The initial Safety Report Card is shown in **Table 8**. The table includes performance measures documented for 2018-2022. Safety Report Cards in future LRSP updates will include a comparison of previous and current metrics to evaluate how the performance measures track toward the safety goal.

Table 8. Initial Safety Report Card

Performance Measure	2018	2019	2020	2021	2022	Average	2027	2029
KSI crashes	10	24	23	18	22	**19.4**		
Ratio of KSI/All Crashes	1.2%	2.9%	3.9%	2.4%	2.7	**2.6**		
KSI crashes involving vulnerable road users (bike/ped/motorcycle)	4	9	8	8	4	**6.6**		
KSI crashes on all modes HIN	4	16	14	10	13	**11.4**		
Update the LRSP Regularly	Update the LRSP every other year.							
Stakeholder Engagement	Update the stakeholder group every year on performance and tracking metrics.							

Source: 2018-2022 WSDOT Data, Fehr & Peers, 2024.

Appendix A: Tukwila Population Characteristics

[i]*Note: American Community Survey 5-year estimates (2020) were used for consistency across demographic statistics presented under the Demographics section of the document as well as Appendix A. The Decennial Census asks fewer questions than the ACS and there are limited statistics that can be pulled from the Decennial Census aside from total population. To present more information on population characteristics and to maintain consistency, all data was sourced from the 2020 ACS 5-year estimates*

Table A1. Total Population (B01003)

	Estimate
Total	20,265

Source: 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office.

Table A2. Median Age By Sex (B01002)

	Estimate
Total:	36
Male	36
Female	37

Source: 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office.

Table A3. Age (B01001)

	Estimate	Percent
Total:	20,265	
Under 5 Years	1,279	6.3%
5 To 9 Years	1,077	5.3%
10 To 14 Years	1,318	6.5%
15 To 17 Years	618	3.0%
18 And 19 Years	479	2.4%
20 Years	153	0.8%
21 Years	250	1.2%
22 To 24 Years	881	4.3%
25 To 29 Years	2,094	10.3%
30 To 34 Years	1,644	8.1%
35 To 39 Years	1,810	8.9%
40 To 44 Years	1,553	7.7%
45 To 49 Years	1,361	6.7%
50 To 54 Years	1,097	5.4%
55 To 59 Years	1,215	6.0%
60 And 61 Years	534	2.6%
62 To 64 Years	529	2.6%
65 And 66 Years	430	2.1%
67 To 69 Years	349	1.7%
70 To 74 Years	637	3.1%
75 To 79 Years	513	2.5%
80 To 84 Years	225	1.1%
85 Years And Over	219	1.1%

Source: 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office.

Table A4. Race (B02001)

	Estimate	Percent
White Alone	6,234	30.8%
Black or African American Alone	4,157	20.5%
American Indian and Alaska Native Alone	67	0.3%
Asian Alone	5,320	26.3%
Native Hawaiian and Other Pacific Islander Alone	444	2.2%
Some Other Race Alone	2,697	13.3%
Two or More Races:	1,346	6.6%
Two Races Including Some Other Race	180	0.9%
Two Races Excluding Some Other Race, and Three or More Races	1,166	5.8%

Source: 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office.

Table A5. Place of Birth By Nativity and Citizenship Status (B05002)

	Estimate	Percent
Native:	11,828	58.4%
Born Outside The United States:	406	2.0%
Puerto Rico	0	0.0%
U.S. Island Areas	117	0.6%
Born Abroad Of American Parent(S)	289	1.4%
Foreign Born:	8,437	41.6%
Naturalized U.S. Citizen	4,547	22.4%
Europe	373	1.8%
Asia	2,295	11.3%
Africa	1,370	6.8%
Oceania	154	0.8%
Latin America	328	1.6%
Northern America	27	0.1%
Not A U.S. Citizen	3,890	19.2%
Europe	103	0.5%
Asia	1,869	9.2%
Africa	446	2.2%
Oceania	45	0.2%
Latin America	1,424	7.0%
Northern America	3	0.0%

Source: 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office.

Appendix B: Transportation Element Safety Policies

T 2.1. Balance travel efficiency, safety, and quality-of-life by exploring context-sensitive roadway design strategies (including appropriate vehicle lane widths, traffic calming measures, landscaping, and buffers separating vehicle traffic from other modes of travel).

T 2.2. Invest in transportation projects and programs that address safety issues systematically impacting historically marginalized and vulnerable populations.

T 2.3. Design streets to safely accommodate a range of motorized and non-motorized travel modes such that it is comfortable and safe to access destinations without a vehicle.

T 2.4. Design intersections and sidewalks to promote pedestrian safety and foster walking (or using a bicycle, wheelchair or mobility device, scooter, or stroller) as a viable mode of transportation.

T 2.5. Meet or exceed standards for pedestrian facilities, such as sidewalks and crosswalks to encourage residents and visitors to walk or roll for transportation, recreation, and improved health.

T 2.6. Prioritize preserving and maintaining existing transportation facilities to avoid costly replacements and to meet public safety objectives in a cost-effective manner.

T 2.7. Work with school officials and school community members to promote Safe Routes to School projects and programs and require safe routes to school improvements – such as sidewalks and crosswalks – as new development occurs along designated school walk routes.

T 2.8. Partner with transit agencies to improve safety and cleanliness in and around transit stops and stations to encourage ridership.

T 2.9. Set posted speed limits to prioritize the safety of all roadway users with specific consideration given to the severity of potential conflicts (i.e., amount of potential kinetic energy transfer) between vulnerable road users (e.g., people walking, biking) and motor vehicles.

T 2.10. Seek to minimize conflicts between non-motorized modes and freight vehicles.

T 2.11. Provide well-maintained facilities. Coordinate with the Washington State Department of Transportation to keep state facilities in Tukwila free of debris.

T 2.12. Prioritize emergency vehicle routes and access to hospitals and trauma care centers.

T 2.13. Integrate the Safe System Approach into City design guidance, standards and related policies, and project development processes and be consistent with industry best practice.

T 2.14. Implement safety improvements prioritized based on the occurrence of fatal and serious injury crashes, the City's High Injury Network, and/or the presence of systemic characteristics that invoke a fatal or serious injury crash.

T 2.15. Secure funding for implementing safety strategies and long-term maintenance of improvements.

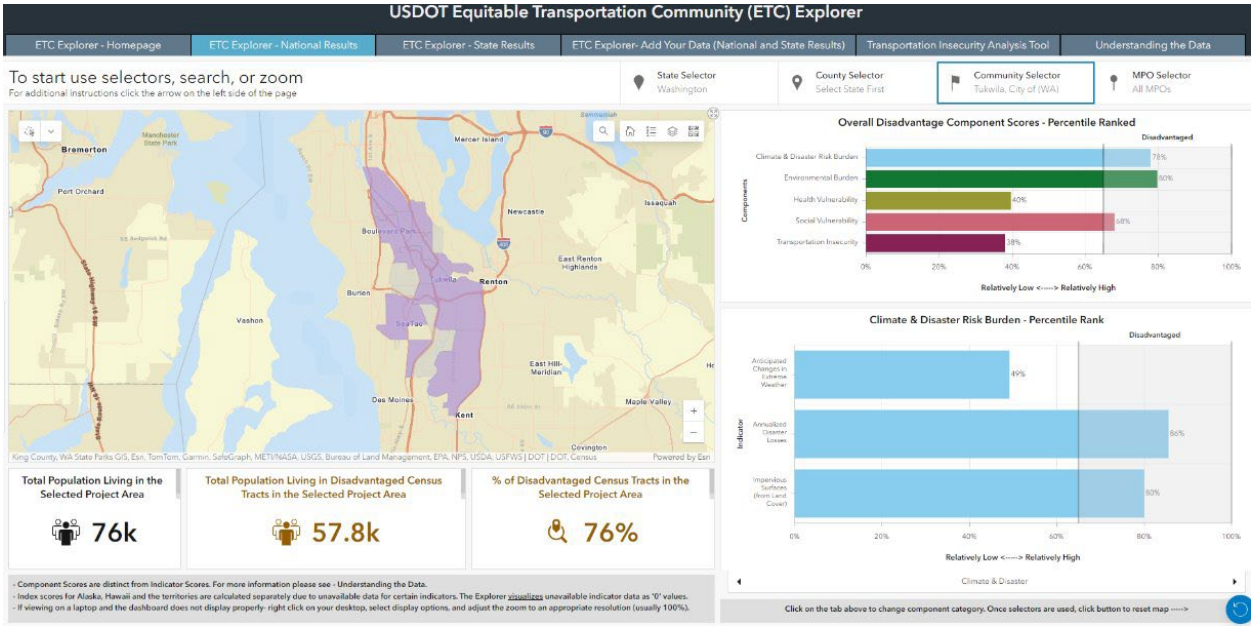
T 2.16. Strive to eliminate traffic fatalities and serious injuries through a Safe System Approach.

Appendix C: Equitable Transportation Community (ETC) Explorer Tool

The Equitable Transportation Community (ETC) Explorer is one social index tool that measures equity by designated census tracts with a significant concentration of disadvantaged populations from a transportation lens. It is one of the demographic "lenses" used by this plan to inform engagement and solutions. ETC Explorer utilizes census data to explore the burden communities experience because of underinvestment in transportation. It measures the burden these communities experience using Climate Change, Energy, Health, Legacy Pollution, Transportation, Water and Wastewater, and Workforce Development.[1]

Figure A1 shows disadvantaged census tracts within Tukwila, identified by the ETC Explorer. Seventy-five percent of Tukwila residents live in these disadvantaged census tracts.

Figure A1. USDOT ETC Explorer Disadvantaged Census Tracts in Tukwila



[1] https://screeningtool.geoplatform.gov/en/methodology#9.9/47.3924/-122.1527

Appendix D: Online Engagement Results

Outreach Overview

As a first step to get the word out, the project team posted and distributed handouts (fact sheets, flyers, and posters) throughout the City and contacted community partners. Fact sheets, flyers, and posters detailed insight into the TE Update and provided a link to a survey and webmap requesting community input. English versions of the fact sheet, flyer, and poster are available in the following section. The shared project material was available in Spanish, Vietnamese, Somali, and English. The locations where the project team shared fact sheets, flyers, and posters included: Tukwila Community Center, Healthpoint Tukwila, Riverton Church, Abu Bakr Islamic Center of Washington, Saint Thomas Parish, Global to Local/Spice Bridge, Tukwila Library, Tukwila Village (senior housing), Saar's Super Saver Foods, Vietnamese Martyrs Parish, Somali Health Organization and Starfire Complex.

In-person events

The in-person events hosted in April 2023 and May 2023 are listed below.

Tabling events:

- Tukwila Community Center
- Tukwila Library
- Tukwila Elementary School
- Saar's Super Saver Foods

Focus groups:

- Riverton Park United Methodist Church
- Foster High School

Figure 17. Focus Group at Riverton Park United Methodist Church

Source: Fehr & Peers. 2023

During the in-person events (tabling and focus groups), the project team captured a total of 128 public comments and ideas related to the City's transportation system. Nearly one-third of comments captured focused on transit. Of the transit comments, many related to safety concerns while using public transit. Of the comments

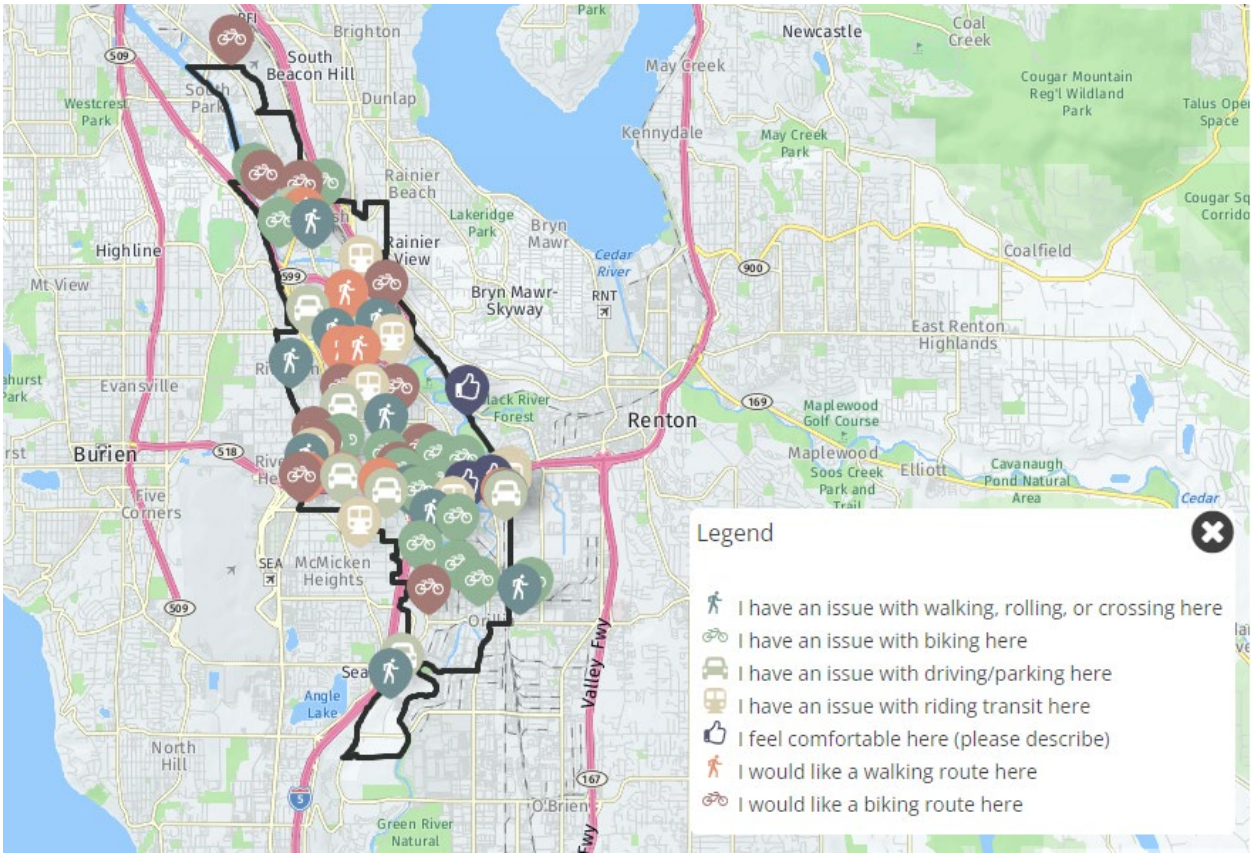
that highlighted issues with driving, about 40 % specified a concern regarding cost or access. Lastly, approximately 15% of comments pointed out walking and biking needs. From the in-person outreach efforts, there was overall support for the draft goals with an emphasis on safety and active transportation.

Online Input

The City of Tukwila website[2] hosted project information related to the TE, including an incentivized[3] online survey and an interactive webmap (**Figure A2**) to solicit feedback from the Tukwila residents and visitors. Responses were collected during April and May 2023. The online survey had questions about the draft goals and transportation experiences, while the webmap sought input on potential needs and improvements in specific locations, such as missing bicycle/pedestrian connections, high-stress crossings, challenging intersections, or near-miss locations. Based on the understanding that Tukwila is a diverse community, all project items were available in Spanish, Vietnamese, Somali, and English. In addition, the Google Translate option was available for all the other languages.

[2] City of Tukwila. Transportation Element Update.
https://www.tukwilawa.gov/departments/public-works/transportation/transportation-element-update/
[3] Survey participation was incentivized with the chance to win a $150 Visa gift card.

Figure A2. Online Webmap



Source: Fehr & Peers. 2023

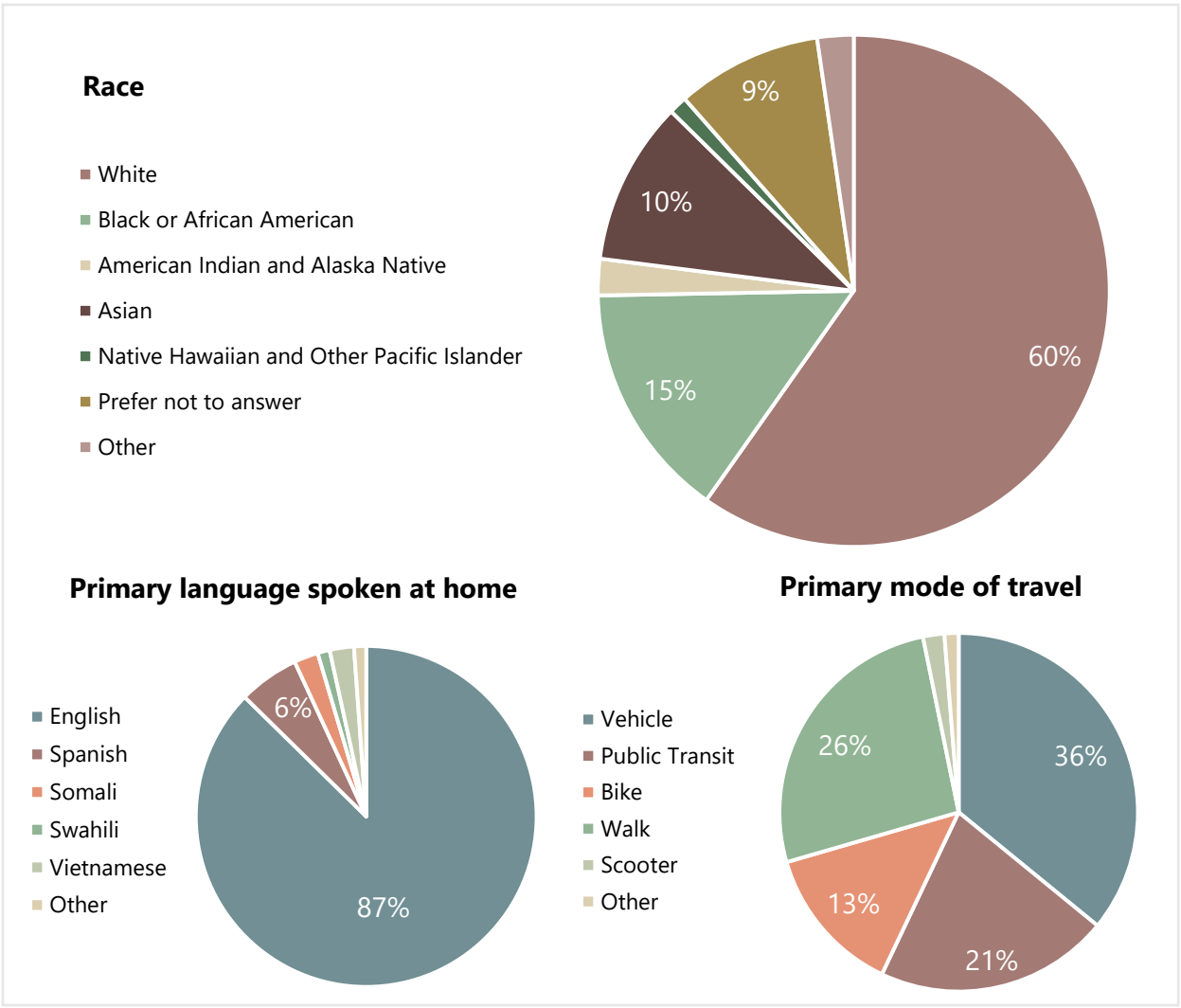
About 80 unique respondents completed the survey and provided feedback on the draft goals in addition to the 67 comments that were added to the interactive webmap. The location-based comments pointed out the lack of bicycle and sidewalk connectivity. Several comments identified abrupt ends of bike lanes on busy streets, including Southcenter Boulevard, and other streets in the vicinity of Southcenter Mall. Similarly, respondents also noted challenges in the Southcenter Mall area for pedestrian connections. Additionally, respondents identified the Tukwila Community Center as an area of interest for sidewalk connections and transit access.

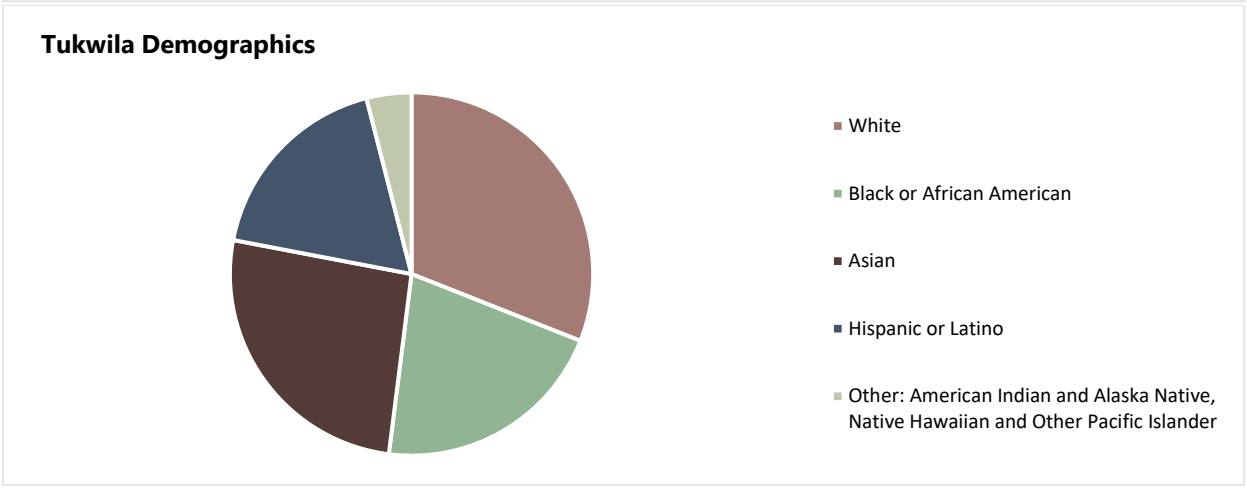
Specifically for transit, several respondents revealed that the available transit routes do not reach all City neighborhoods, particularly the Metro Flex system. On the citywide scale, the community generally needs east-west connections via varying modes of transportation. Driving speed is also a citywide concern. A number of comments pointed out areas where traffic moves faster than the speed limit due to the underutilization of streets.

The project team documented a list of all proposed ideas from the community on improving transportation in Tukwila and these that have been used in developing project recommendations for the Transportation Element.

The respondents' information on demographics and primary mode of travel is provided in **Figure A3**. To draw in participation, the Tukwila communications team posted social media messages on the City's Facebook page. Furthermore, the project team hosted several in-person events described in the previous section to engage with the Tukwila community and direct them to the developed online tools. Respondent data was reviewed and compared to the 2016-2023 census, where the three most common racial identities represented in Tukwila are White, Asian, and Black constituting 31 percent, 26 percent, and 21 percent of the City's overall population, respectively. Additionally, 18 percent of Tukwila residents identify as "Hispanic or Latino," as shown in **Figure A3**.

Figure A3. Respondent Demographics



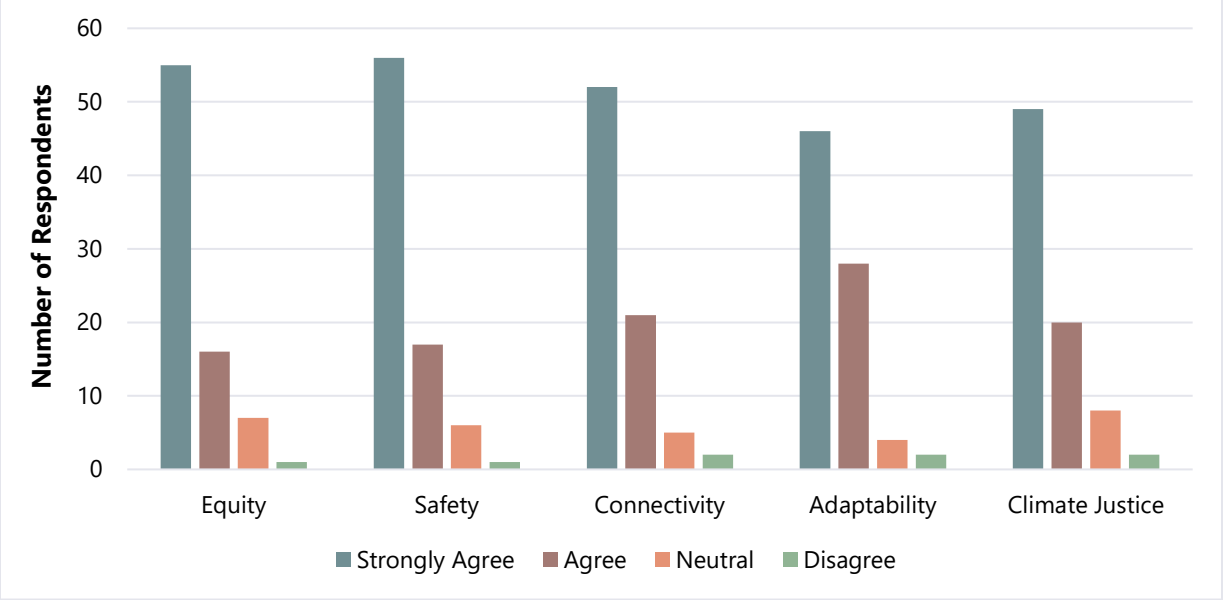


Source: Fehr & Peers. 2023

As shown in **Figure A4**, there was overall support for the draft goals with an emphasis on safety and equity. Anecdotal comments from respondents related to transit safety included:

> "*The stigma surrounding public transit affects my personal experiences with transit. Often the stigma seems to be reinforced as truth when you use transit.*"

Figure A4. Online Input on Draft Transportation Goals



Source: Fehr & Peers. 2023

Multiple comments on transit east-west connectivity and access to the Tukwila Community Center and Allentown neighborhood in general were noted. The respondents highlighted the associated limitations for cyclists and transit riders. They pointed out the need for the City to focus investments on encouraging other travel options besides driving. One suggested protected bike infrastructure along Tukwila International Boulevard, Southcenter Boulevard, Andover, Interurban, and around the Tukwila Community Center as a way to improve connectivity and address related safety concerns.

Outreach Materials

City of Tukwila
Comprehensive Plan Transportation Element

Tukwila Transportation Element

What is a TRANSPORTATION ELEMENT?

The Transportation Element of the Comprehensive Plan is a plan that will serve the community's current and future needs and establish Tukwila's transportation goals and policies for the next 20 years.

Specifically, the TRANSPORTATION ELEMENT will:

- Establish new goals and policies to guide City decision-making
- Improve safety, equity, accessibility, reliability, and connectivity for all road users and goods movement
- Develop a prioritized list of transportation projects and a Local Road Safety Plan
- Make recommendations on how to fund improvements.

You should PARTICIPATE BECAUSE:

- The City needs help making decisions related to transportation
- We need your input on current challenges and ideas about how to improve the transportation network

Project Timeline: This is YOUR Plan!

Spring 2023
Discuss goals
Share ideas & experiences

Help us identify challenges, provide input on needs, and refine draft goals and priorities

Take me to the survey!

Fall 2023
Review draft programs and project lists

Help us refine and prioritize policies, programs, and projects

Spring 2024
Present to Council

Present draft Transportation Element update for Council adoption

FOR MORE INFORMATION OR TO CONTACT US:
Visit TukwilaWA.gov/TukwilaTE

SEAL OF TUKWILA WASHINGTON 1908

FEHR PEERS


SEAL OF TUKWILA WASHINGTON
1908
We would like to
HEAR FROM YOU!
Tukwila Transportation Element
YOUR IDEAS ARE IMPORTANT TO US
Share your thoughts on transportation in Tukwila in our online survey and interactive map.
TukwilaWA.gov/TukwilaTE
Take me to the survey!

City of Tukwila

Comprehensive Plan Transportation Element

Tukwila Transportation Element

How do you want to get around Tukwila? What's important to you?

Tell Us!

The City of Tukwila is launching a plan to improve transportation over the next 20 years.

We need your help to identify issues and opportunities to help people move around the city.

The Transportation Element of the Comprehensive Plan will serve the community's current and future needs and establish Tukwila's transportation goals and policies for the next 20 years.

What you think matters!

It's important to make your voice heard to help the City make transportation decisions.

Share your ideas in our survey and interactive map!

We want to hear from you!

Find us in person at one of our tabling events listed on our website, or use our online form to share your thoughts.

TukwilaWA.gov/TukwilaTE

City of Tukwila
Comprehensive Plan Transportation Element

PROJECT OVERVIEW

The Transportation Element of the Comprehensive Plan is a plan that will serve the community's current and future needs and establish Tukwila's transportation goals and policies for the next 20 years.

Specifically, the TRANSPORTATION ELEMENT will:

- Establish new goals and policies to guide City decision-making
- Improve safety, equity, accessibility, reliability, and connectivity for all road users and goods movement
- Develop a prioritized list of transportation projects and a Local Road Safety Plan
- Make recommendations on how to fund improvements.

You should PARTICIPATE BECAUSE:

- The City needs help making decisions related to transportation
- We need your input on current challenges and ideas about how to improve the transportation network

Project Timeline: This is YOUR Plan!

Transportation Element Goals

In the first round of updates we heard that some of the words we used were hard to understand. Below are the updated goals that will shape the plan.

EQUITY — Ensure fair access to healthy, affordable, reliable transportation options, livable places, and jobs, particularly for historically marginalized and vulnerable populations.

SAFETY — Provide safe transportation infrastructure and improve personal comfort to to emphasize Tukwila as a welcoming place.

CONNECTIVITY — Maintain, expand and enhance Tukwila's multimodal network, particularly walk, bike, roll, and transit, to increase mobility options where needs are greatest.

ADAPTABILITY — Anticipate and plan for the community's evolving needs, new technologies, and opportunities for mobility.

ENVIRONMENT — Plan, design, and construct transportation projects that reduce greenhouse gas emissions, improve community health, and protect the natural environment.

City of Tukwila
Comprehensive Plan Transportation Element

PUBLIC ENGAGEMENT

"The stigma surrounding public transit affects my personal experiences with transit. Often the stigma seems to be reinforced as truth when you use transit."

"Please make it easier to walk around Tukwila by providing sidewalks and/or physical separation from vehicles. A walkable area is more universally accessible than requiring a vehicle. It also cuts down on pollution and has healthier outcomes for a community."

The City of Tukwila website hosted project information related to the Transportation Element, including an online survey and an interactive webmap to solicit feedback from Tukwila residents and visitors. The project team hosted several in-person events to engage with the Tukwila community and direct them to the developed online tools. The online survey asked about the draft goals and general transportation experiences, while the webmap asked for input on potential needs and improvements in specific locations.

How do people get around?

What do you think about these transportation ideas?

Here are the key themes we heard in the first round of public engagement.

During the in-person events (tabling and focus groups), the project team captured a total of **128 public comments and ideas** related to the City's transportation system.

Nearly one-third of comments captured focused on transit. Of the transit comments, many related to **safety concerns** while using public transit.

Approximately **15%** of comments pointed out **walking and biking needs.**

The key themes noted from community input included:

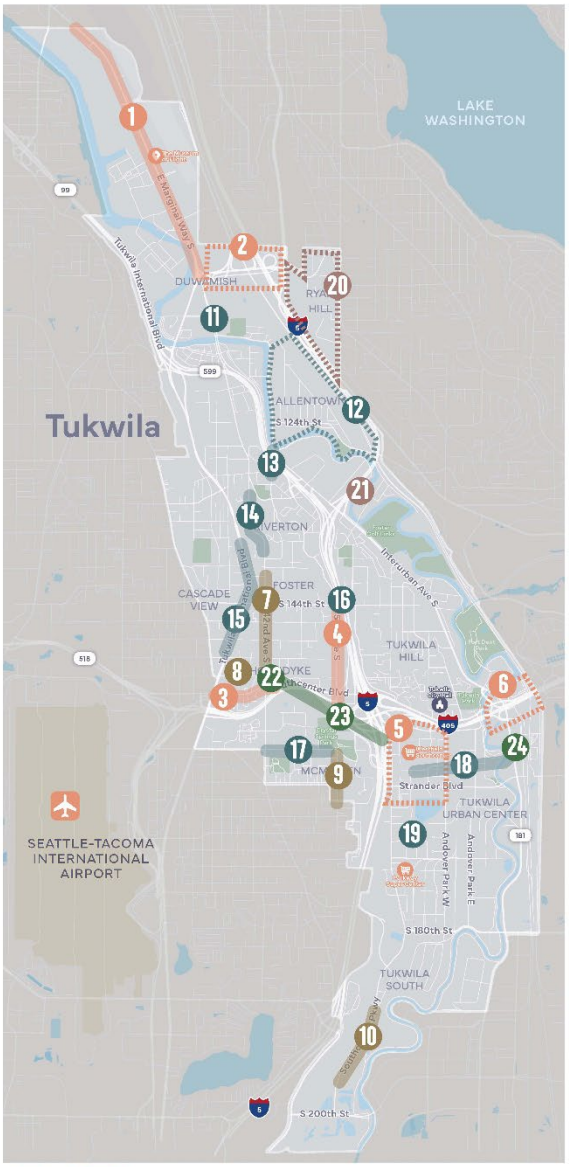
- Transit safety, reliability, and amenities
- Expanding the bicycle network
- Filling sidewalk gaps
- Costs associated with driving

Did we hear you correctly? What did we miss? Vote for your top 3 ideas.

- I like the idea of riding transit but I don't ride as much as I would like to because I'm concerned about my personal safety while riding or waiting for a bus or light rail.
- I really like the transportation connectivity in Tukwila and am happy with our current options.
- I would like to drive more but it's too expensive.
- It's hard to get places by bicycle because the bike facilities feel unconnected.
- There are gaps in the sidewalk network that prevent me from walking places.
- Bike facilities end abruptly, including Southcenter Boulevard and other streets in the vicinity of Southcenter Mall.
- It's challenging to walk around the Southcenter Mall area.
- I would like to be able to walk or ride transit better to the Tukwila Community Center.
- I would ride transit more if it reached more neighborhoods in Tukwila.
- It's hard to get from east to west via all modes of transportation.
- Drivers are speeding, and city roads should be designed to encourage driving slower.
- Driving should be a choice, not an assumption.
- I would like to purchase an electric vehicle, but installing a charger is cost-prohibitive.
- The roads are too bumpy and need to be fixed with new pavement.
- I have concerns about access to Allentown.
- Create more parking options by constructing parking garages and maintaining parking above other elements in the road (e.g., bike lanes).

City of Tukwila
Comprehensive Plan Transportation Element

WHAT DO YOU THINK ABOUT THESE TRANSPORTATION COMMENTS?



TRANSIT

22	Better security and enforcement at TIB Station.
23	Want better transit connections between light rail and Southcenter.
24	Want to get to more places from the Tukwila Sounder Station and have more frequent trips

Here are key themes we heard through public outreach. Did we hear you correctly?

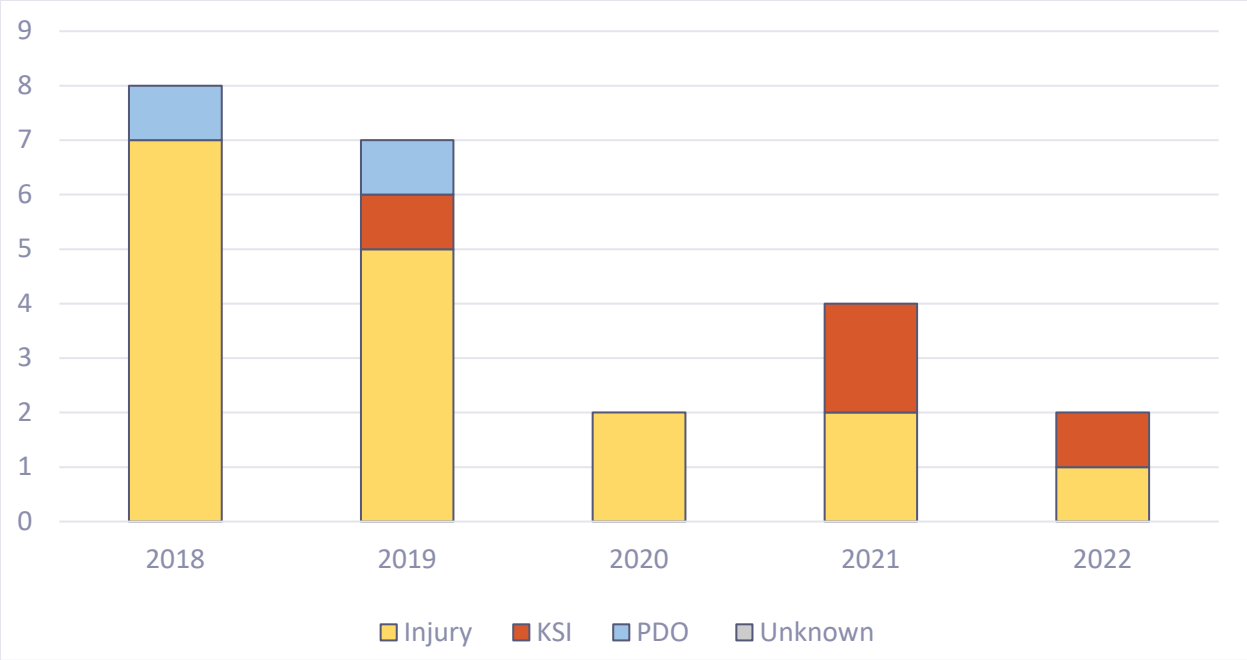
Vote your top 5 ideas!

	COMMENTS	VOTES
BIKING		
1	Want to bike to Seattle via East Marginal Way S.	
2	It's hard to bike to Boeing Field, Georgetown, and SODO.	
3	It's uncomfortable to bike on Southcenter Boulevard.	
4	Want better connections to bike to McMicken via 51st Ave S.	
5	Southcenter Mall is difficult to access by bike.	
6	Want to bike to Renton.	
VEHICLE		
7	Want slower cars on 42nd Ave S.	
8	More parking near Tukwila International Boulevard Station.	
9	Want slower cars on 51st Ave S.	
10	Want slower cars on Southcenter Parkway.	
WALK/ROLL		
11	The intersection of E Marginal Way and S 112th St feels uncomfortable for pedestrians.	
12	Want more sidewalks in Allentown.	
13	Sidewalks missing along Macadam Rd S.	
14	Sidewalks missing along 40th Ave S.	
15	Hard to walk on Tukwila International Blvd with cars parked on sidewalks.	
16	It's uncomfortable to walk or bike across I-5 on the S 144th St bridge.	
17	Sidewalks missing on S 160th St.	
18	It's hard to walk between Southcenter Mall, Tukwila Sounder Station, and the Interurban Trail.	
19	It's hard to walk to and around Tukwila Pond Park.	
OTHER		
20	More lighting in Ryan Hill.	
21	Clean up Green River Trail / Interurban Trail.	

Appendix E: Existing Crash Data Analysis

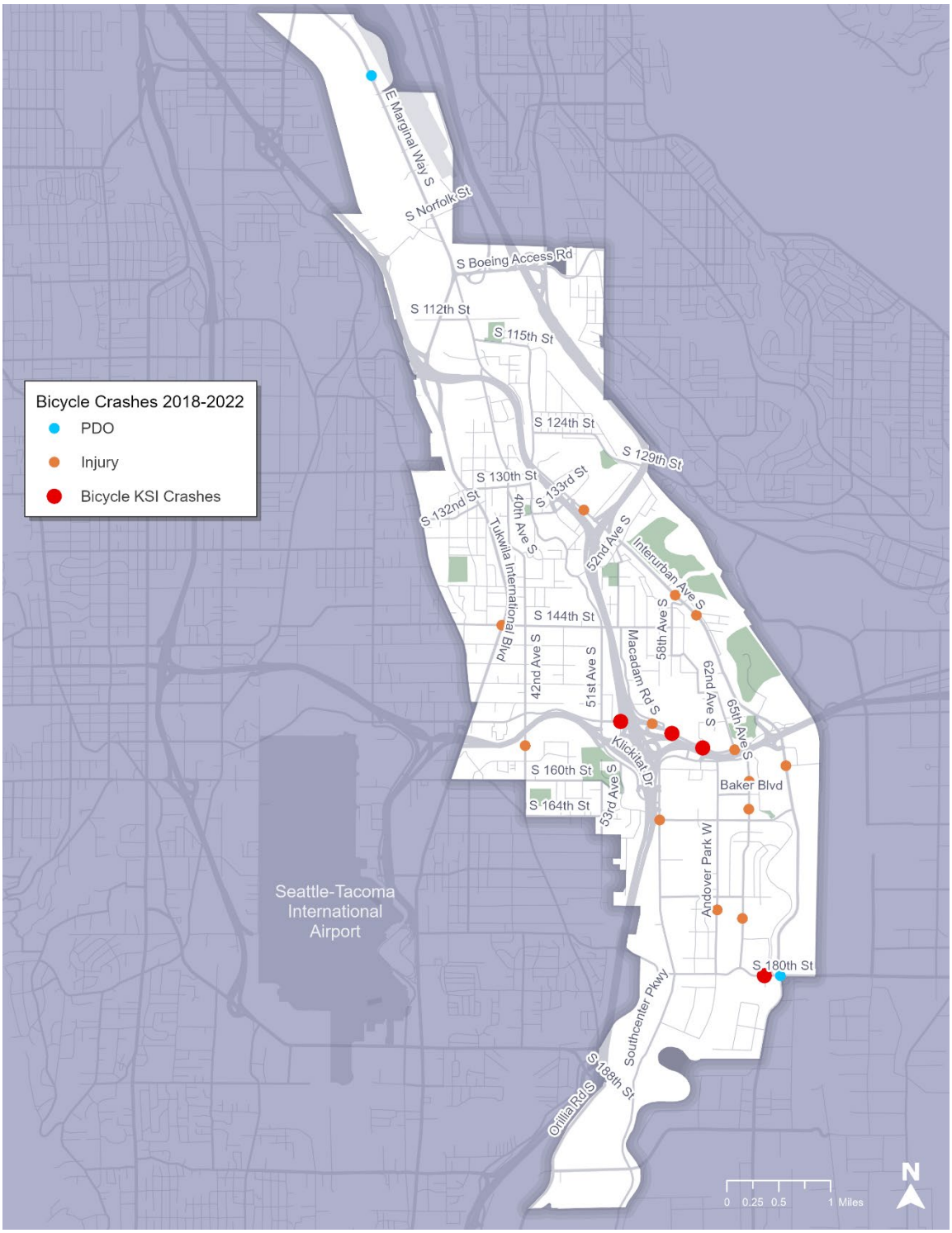
In addition to reviewing the total number of crashes, the study team compiled information on crashes specific to vulnerable road users. There are higher rates of injury and KSI crashes where bicyclists or pedestrians are involved in a crash with a vehicle. In Tukwila, there were 23 vehicle-bicycle crashes resulting in four KSI crashes (approximately 17%) from 2018-2022. **Figure A6** displays vehicle-bicycle crashes summarized by year and resulting injury. **Figure A7** maps the vehicle-bicycle crashes within the City.

Figure A6. Vehicle-Bicycle Crash Summary by Year and Injury Type



Source: Fehr & Peers, 2024

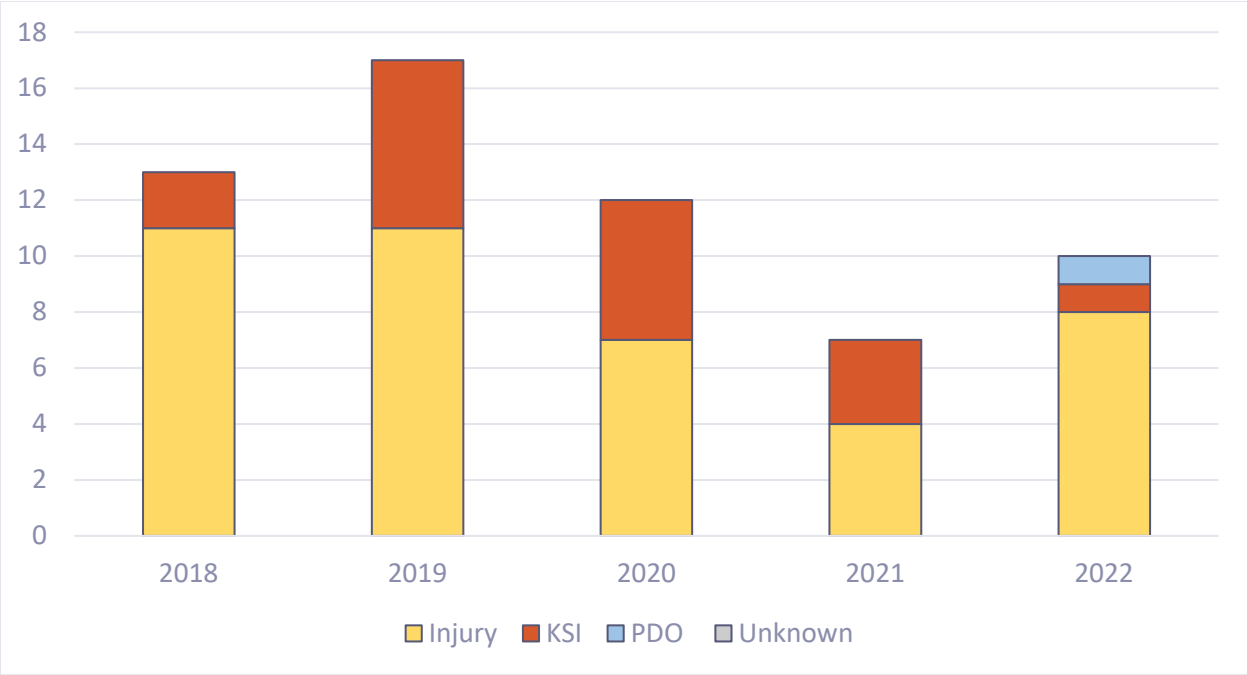
Figure A7. Bicycle Crashes by Severity



Source: Fehr & Peers, 2024

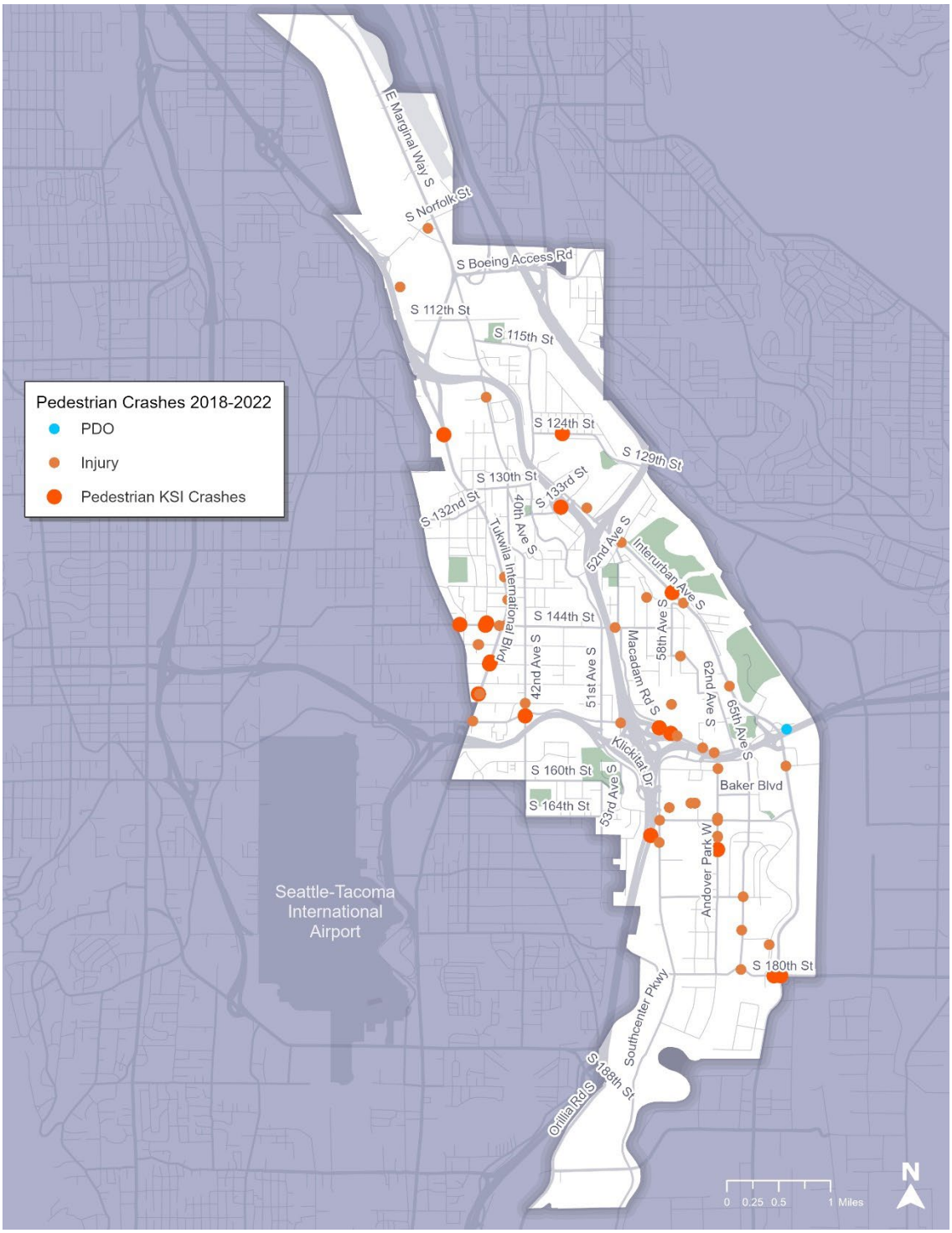
In Tukwila, there were 59 vehicle-pedestrian crashes resulting in 17 KSI crashes, 29% of all pedestrian-involved crashes, from 2018-2022. 11 of the 17 vehicle-pedestrian crashes resulting in a KSI occurred in 2019 and 2020. **Figure A8** displays vehicle-pedestrian crashes summarized by year and resulting injury. **Figure A9** maps the vehicle-pedestrian crashes within the City using a heatmap, with KSI crashes identified with a red dot.

Figure A8. Vehicle-Pedestrian Crash Summary by Year and Injury Type



Source: Fehr & Peers, 2024

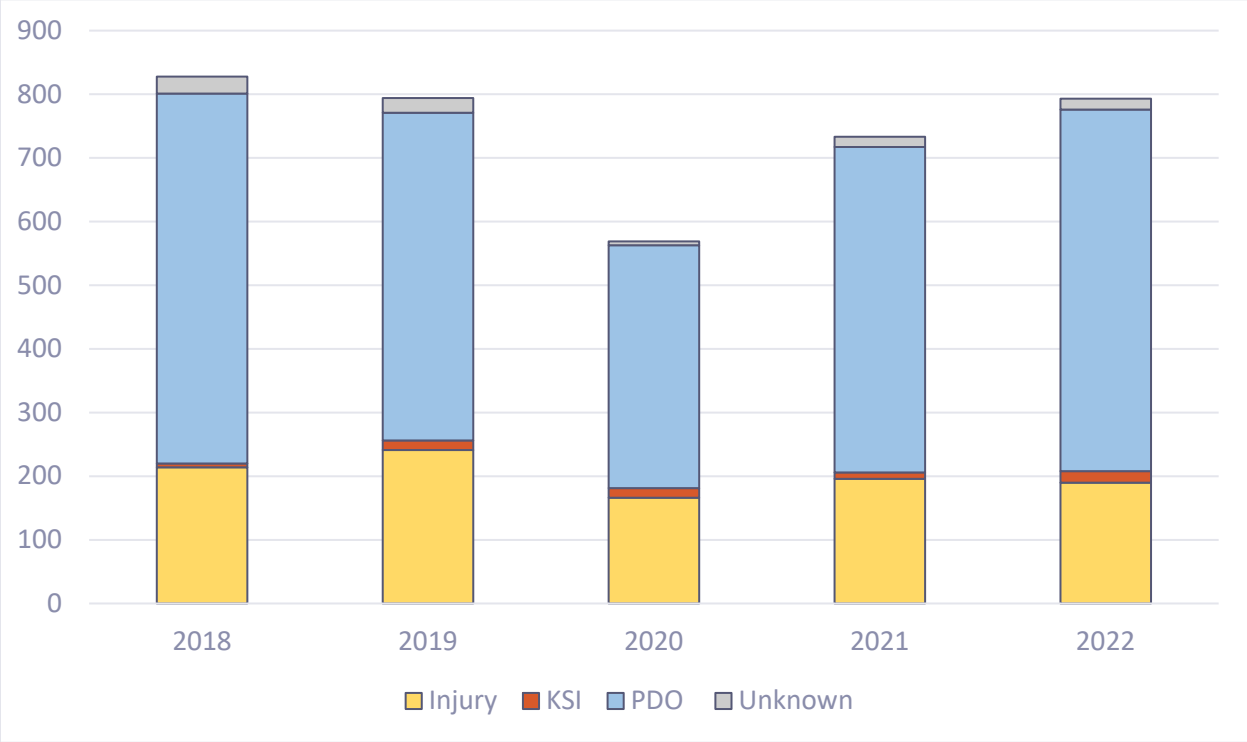
Figure A9. Pedestrian Crashes by Severity



Source: Fehr & Peers, 2024

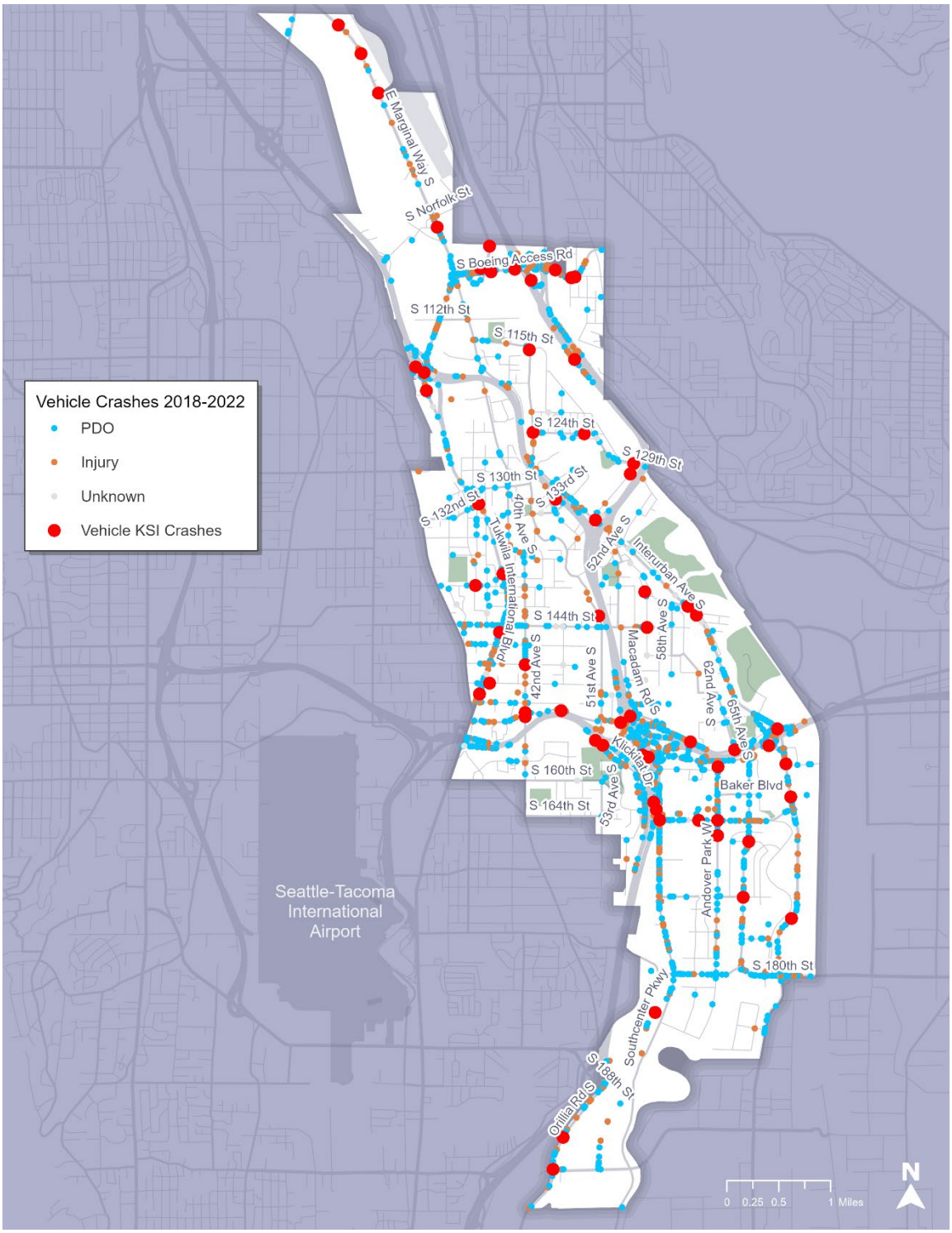
From 2018-2022 in Tukwila, there were 3,717 crashes that only involved vehicles. These crashes resulted in 64 KSIs, approximately 2% of total crashes. In 2022, there were 18 KSIs resulting from vehicle-only crashes. This is the highest number of KSI crashes of the five-year period. **Figure A10** displays the vehicle-vehicle crashes summarized by year and resulting injury. **Figure A11** maps the vehicle-vehicle crashes within the City using a heatmap, with KSI crashes identified with a red dot.

Figure A10. Vehicle-Vehicle Crash Summary by Year and Injury Type



Source: Fehr & Peers, 2024

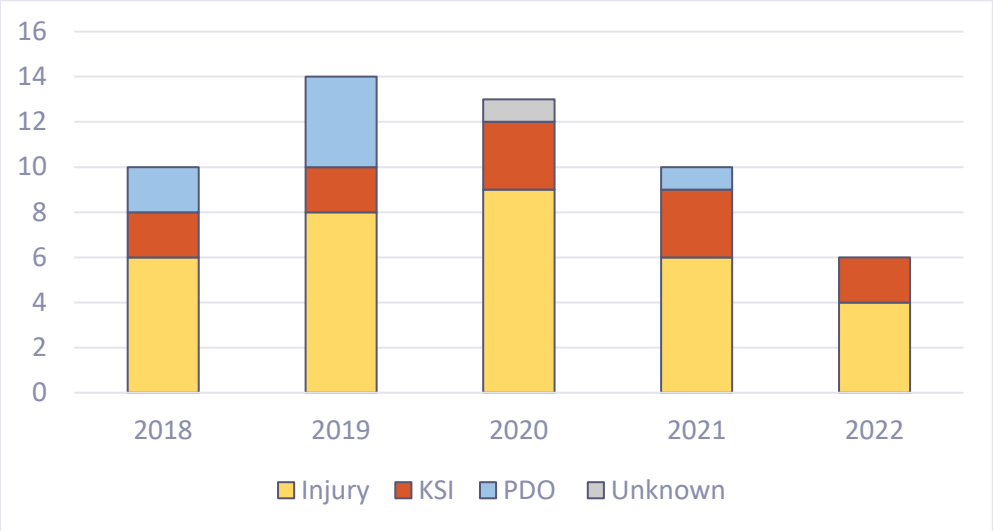
Figure A11. Vehicle Crashes by Severity



Source: Fehr & Peers, 2024

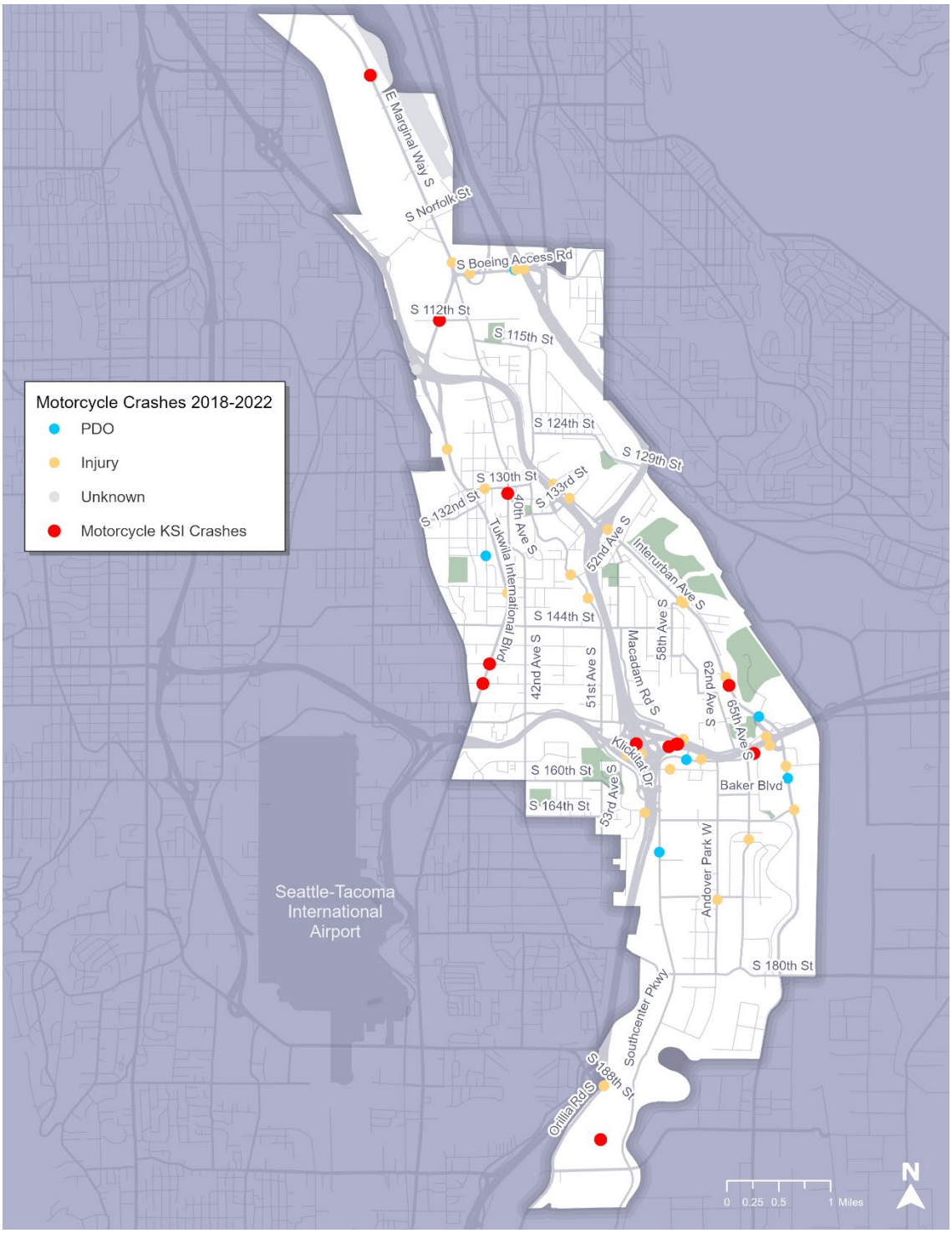
From 2018-2022 in Tukwila, there were 53 crashes that involved motorcycles. 12 of these crashes (22%) resulted in a KSI. Half of the 12 KSI crashes occurred during 2020 and 2021. **Figure A12** displays the vehicle-motorcycle crashes summarized by year and resulting injury. **Figure A13** maps the vehicle-motorcycle crashes within the City using a heatmap, with KSI crashes identified with a red dot.

Figure A12. Vehicle-Motorcycle Crash Summary by Year and Injury Type



Source: Fehr & Peers, 2024

Figure A13. Motorcycle Crashes by Severity

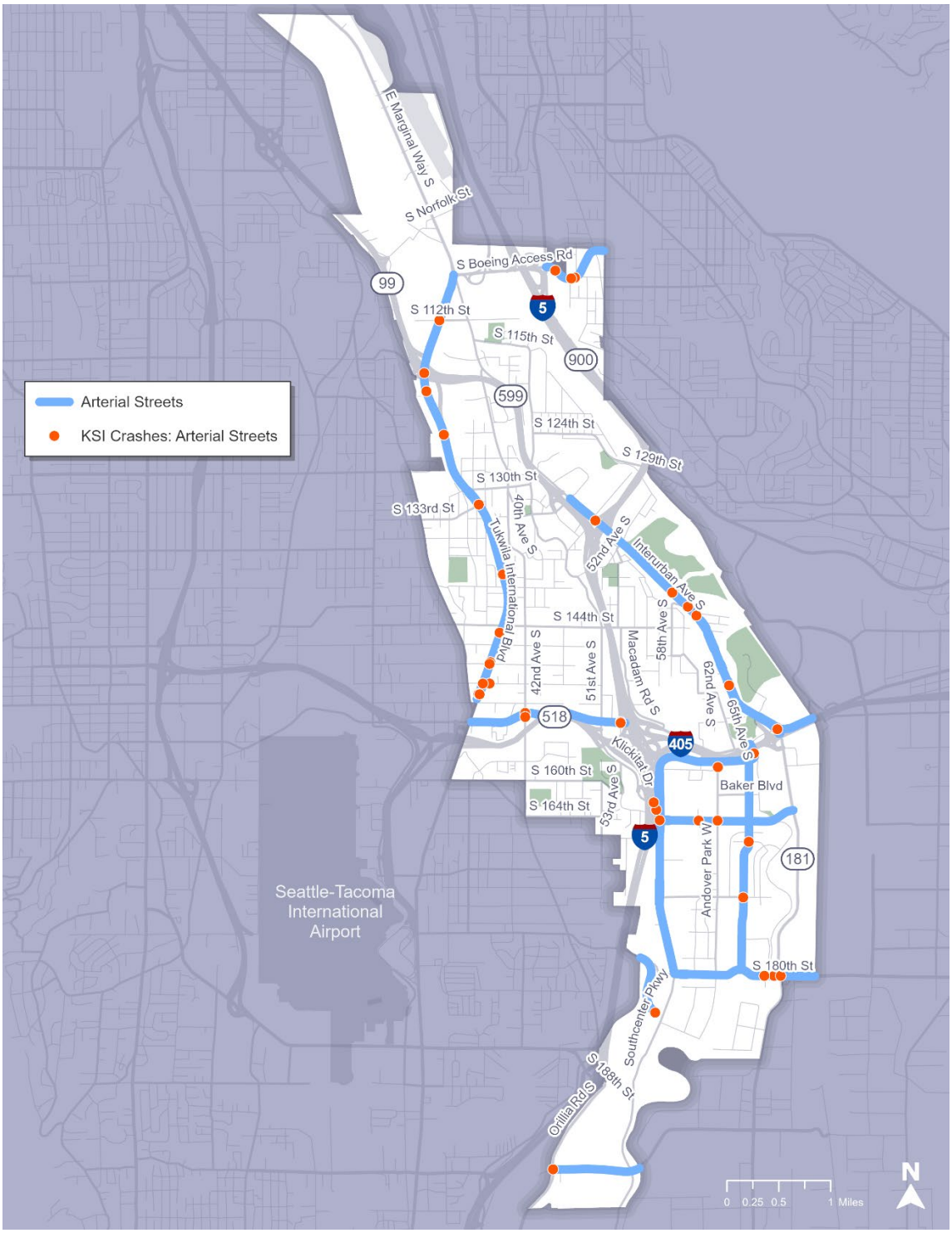


Source: Fehr & Peers, 2024

Appendix F: Crash Likelihood Mapping

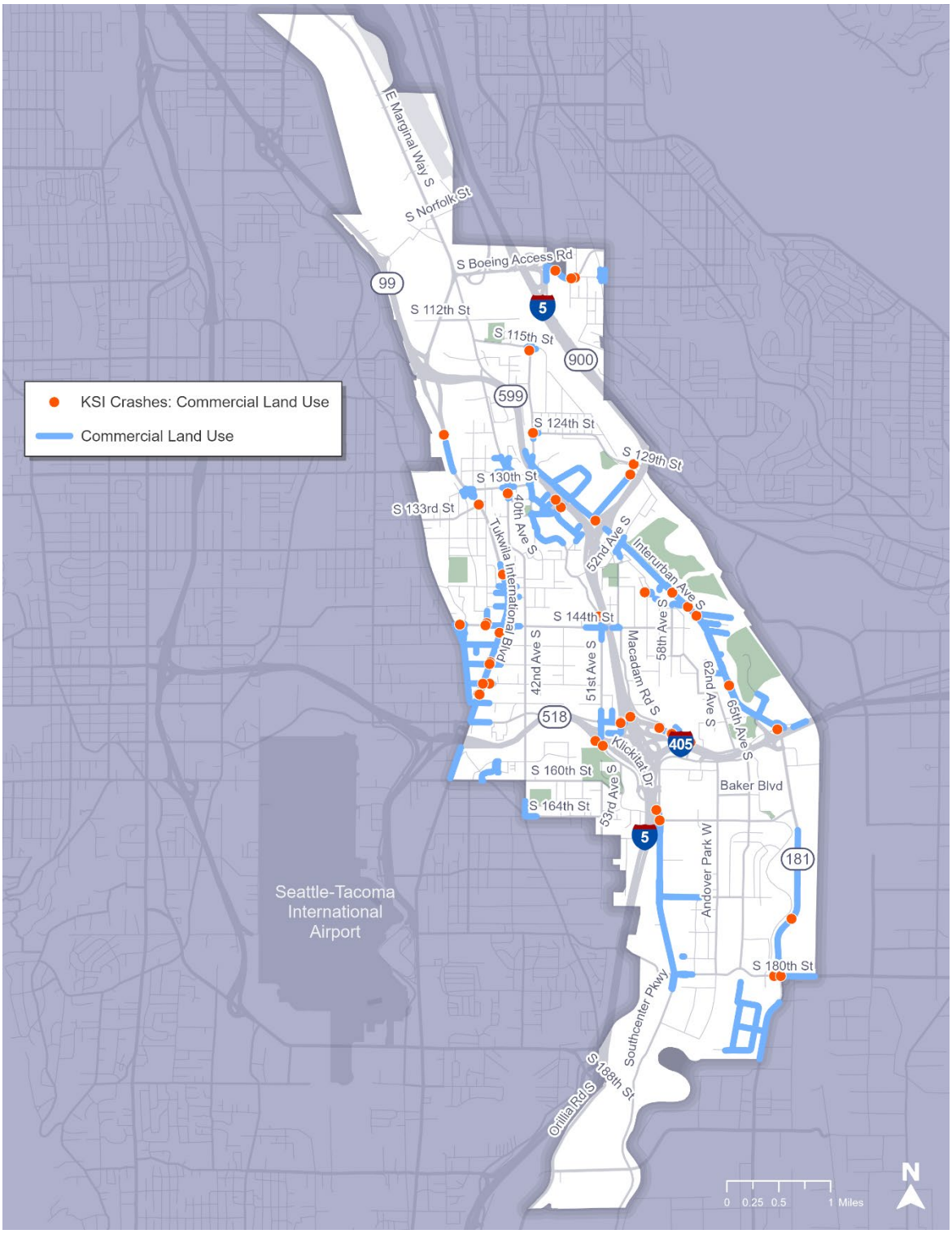
The crash potential factors, outlined in **Table 2**, represent a list of street network attributes that were found to present higher rates of crashes. These attributes were identified at other locations on the city's street network. Identifying where these attributes are also present where no current crash history exists allows the city to understand areas that could be at risk for future crashes. This step in the evaluation process bridges the historical trends to risk-based systemic analysis. Roadways were categorized based on the number of risk factors present at a segment, whether they have a history of crashes or not. **Figure A14** thru **Figure A21** map out each of the eight crash potential factors along Tukwila's street network. These maps were used as an input to identify priority project locations where there is overlap among the crash potential factors.

Figure A14. Arterial Streets With Crash Potential Factors



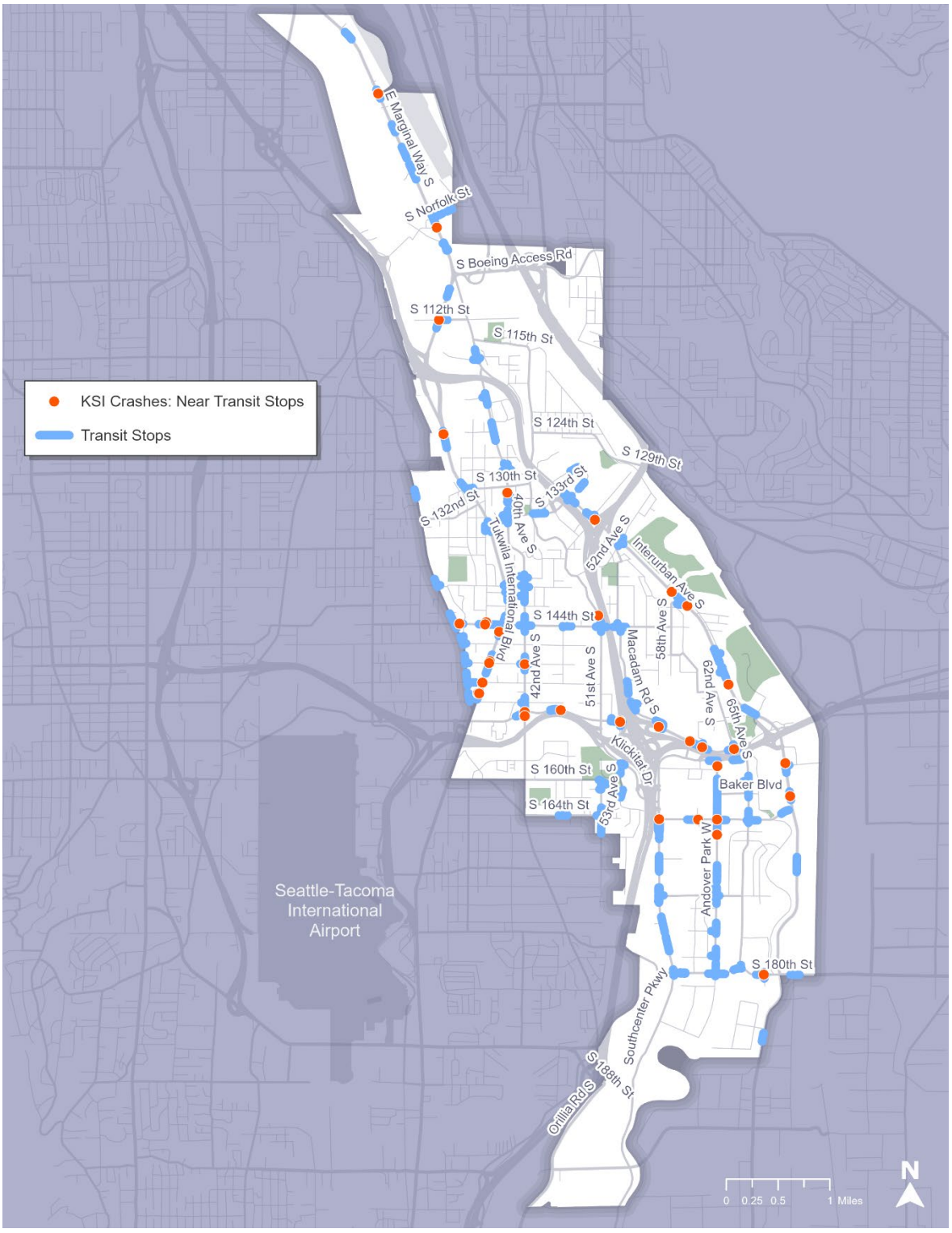
Source: Fehr & Peers, 2024

Figure A15. Streets Adjacent to Commercial Land Use With Crash Potential Factors



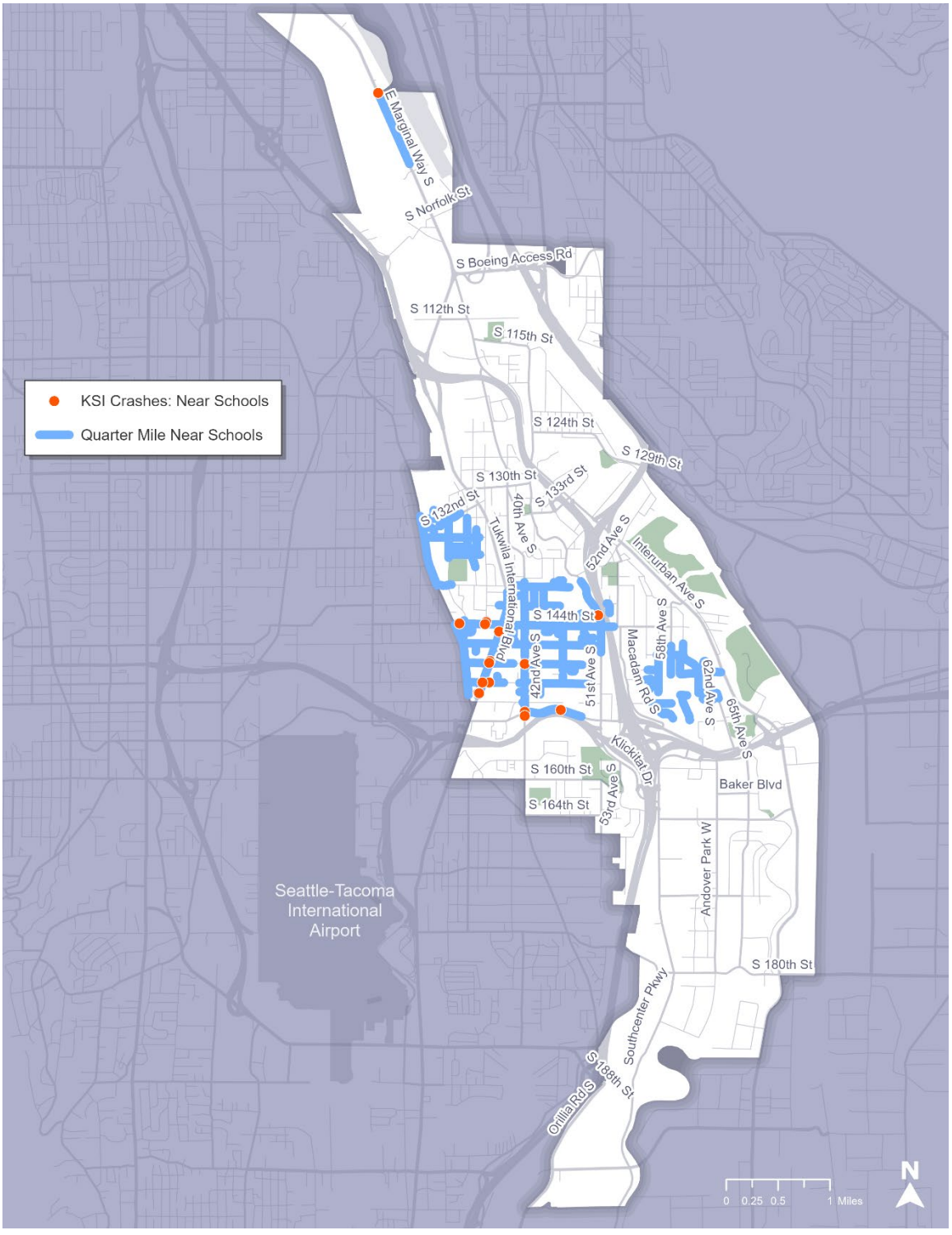
Source: Fehr & Peers, 2024

Figure A16. Streets Adjacent to Transit Stops With Crash Potential Factors



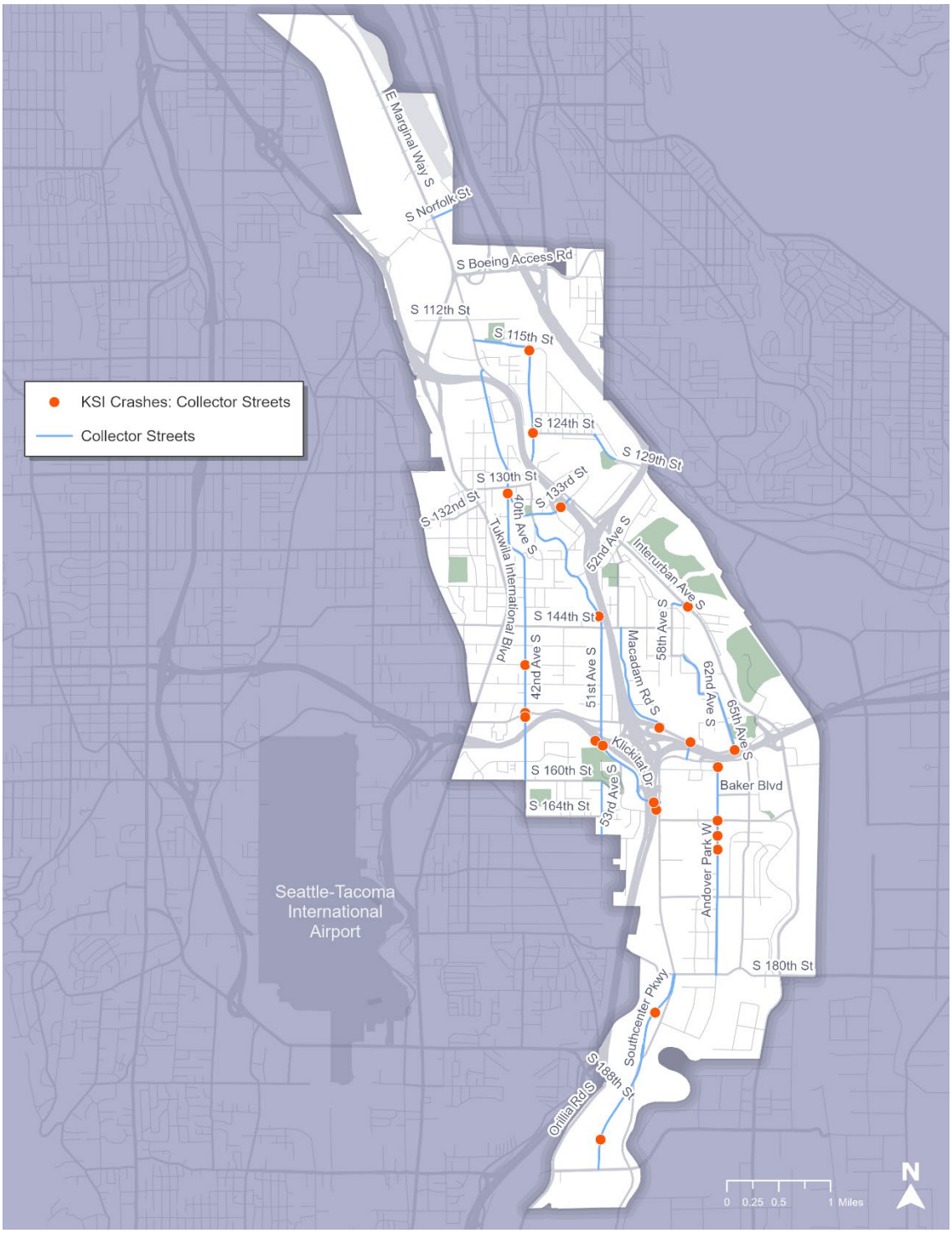
Source: Fehr & Peers, 2024

Figure A17. Streets within a Quarter Mile of Schools With Crash Potential Factors



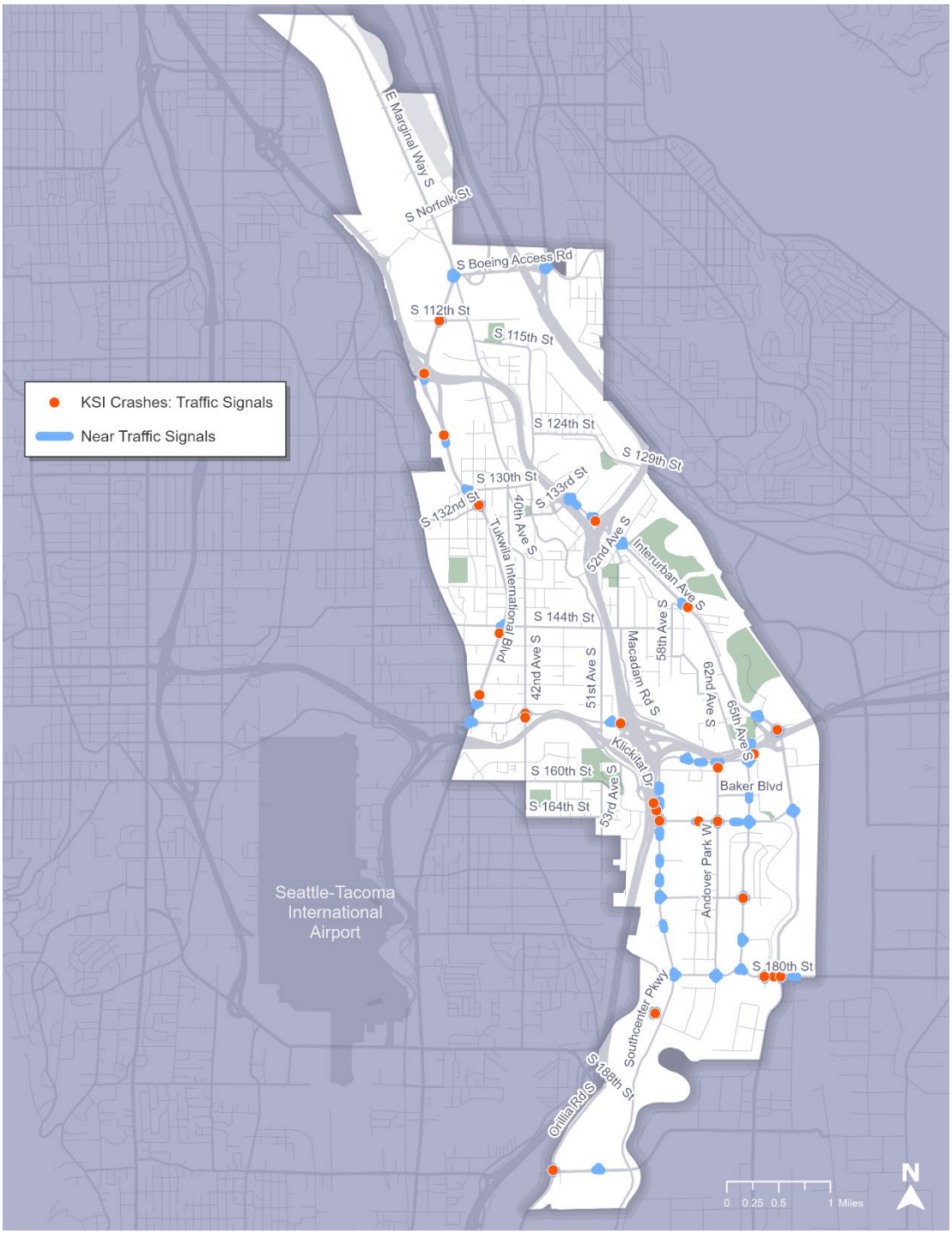
Source: Fehr & Peers, 2024

Figure A18. Collector Streets With Crash Potential Factors



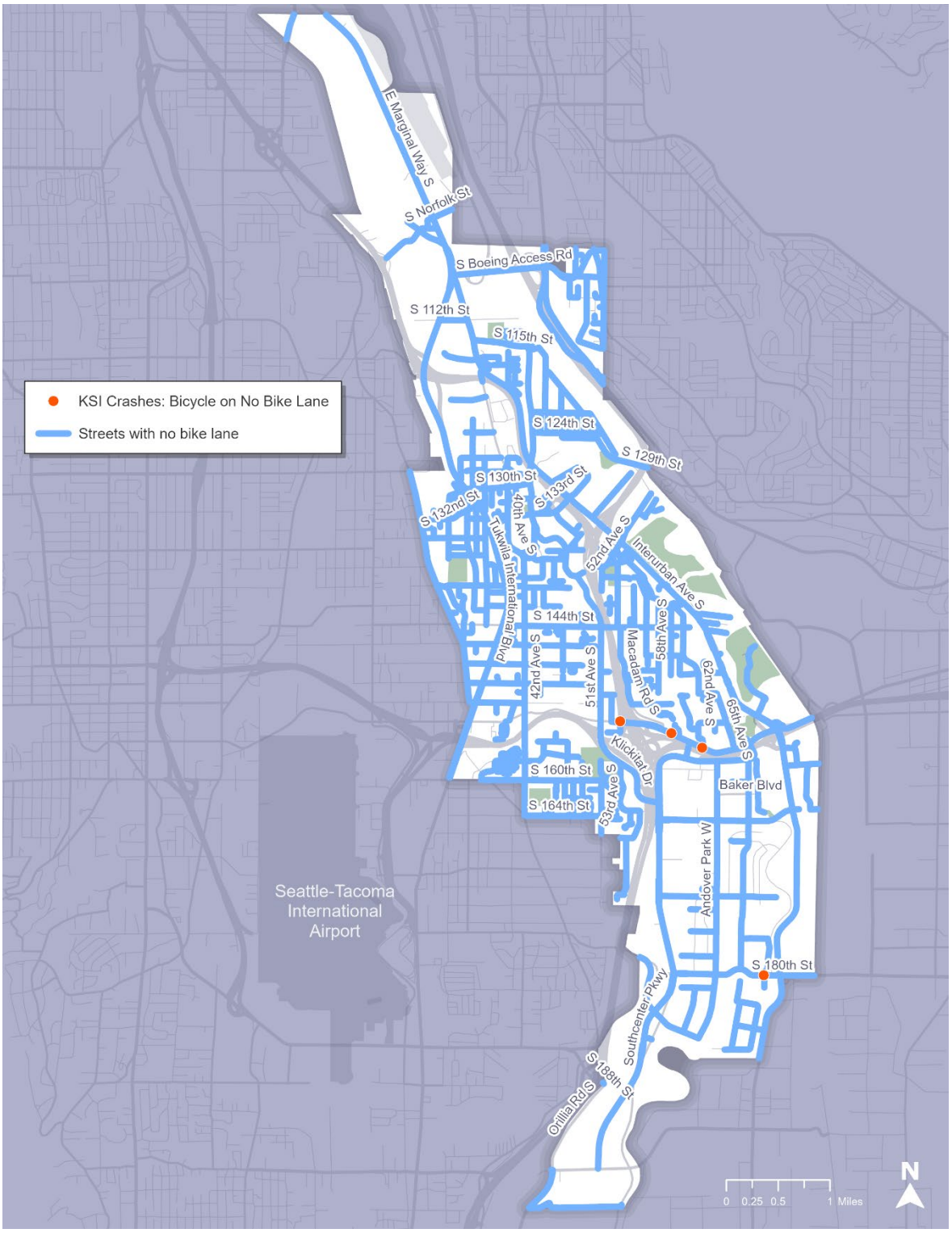
Source: Fehr & Peers, 2024

Figure A19. Signalized Arterial Intersections With Crash Potential Factors



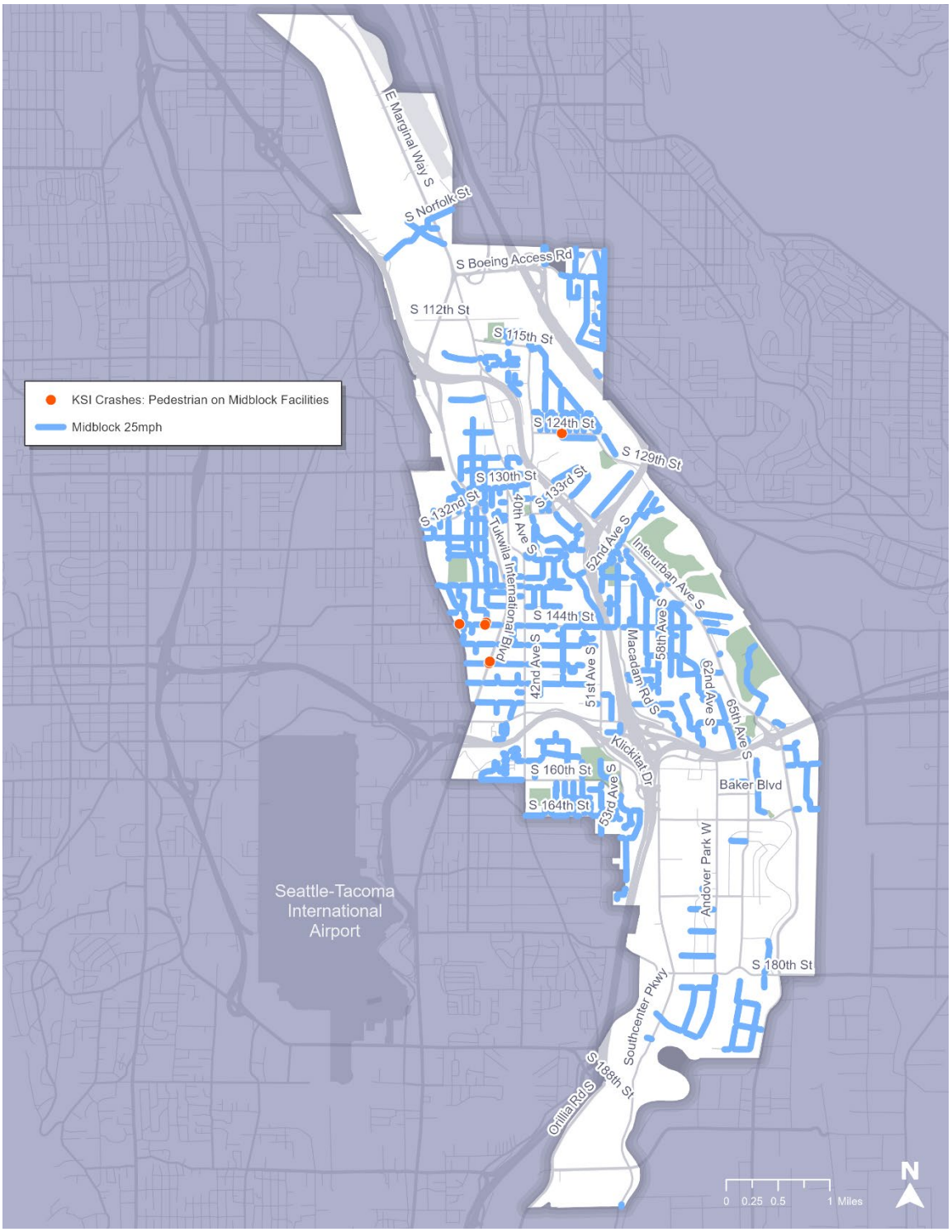
Source: Fehr & Peers, 2024

Figure A20. Streets Without Bike Facilities With Crash Potential Factors



Source: Fehr & Peers, 2024

Figure A21. Mid-Block on 25mph Streets With Crash Potential Factors



Source: Fehr & Peers, 2024

Appendix G: Project Prioritization

Following the ranking activity discussed in Chapter 4, the Task Force participants' discussion highlighted the importance of additional criteria such as school walking routes, access to school bus stops, connectivity to trail network, and the ability to leverage adjacent projects. These additional criteria are included in the qualitative step for prioritization. Weights were given to the quantitative metrics listed to prioritize both intersections, segments, and corridors.

Prioritization Process

The prioritization process was rooted in a quantitative geospatial analysis informed by factor selection and weights determined through coordination with City of Tukwila and the LRSP Task Force.

Streets were considered at the block level and were segmented further for blocks longer than 2,500 feet, given the smaller scale of most safety projects in the city. Highways and on-off-ramps were excluded. Intersections were generated at the intersection of street segments, with similar exclusions for highway intersections.

Street segments and intersection points were then joined to the relevant data sets described in **Table 3**. For the Vulnerable Road User (VRU) HIN, an overlap percentage was calculated based on how much of a segment is covered by that network. The extent of the overlap informed the scoring calculation of how many points a segment receives from that factor. For the overall HIN, a segment received only a "yes" or "no" if it had an overlap exceeding 60% with that network. Points were assigned following the below table, for example 3 points for "yes" and 0 points for "no" on the HIN, and 0, 1, 2, or 3 points for the VRU HIN overlap.

Segments and intersection points were joined to the point data of KSI crashes between 2018 and 2022. Crashes within 250 feet of segments were joined to segments, and within 50 feet of intersections were joined to intersections. Of all segments with KSI crashes, percentiles were calculated for the segments receiving the top third-highest number of KSI crashes (33.3% of segments with the most KSI crashes).

Segments and intersections were joined with data from the Equity Index Score. If a street segment was on the border of, or intersected, two areas with different scores, it received the

score of the area with which it overlapped the most. For all segment intersections, percentiles of resulting scores were generated. Points were assigned according to the scoring table to the top third, middle third, and lowest third percentile groups.

Local destinations data, which included schools, parks, and transit stops, were derived from King County Metro, Tukwila School District, and city data. Segments and intersections were joined to the destination locations by buffered distances: half-mile from high-capacity transit stations (Tukwila International Boulevard Station), quarter-mile from bus stops, schools, and parks. Percentiles were generated for segments and intersections based on the total counts of destinations close to them. Points were assigned according to the scoring table to the top third, middle third, and lowest third percentile groups.

For each factor, once a set number of points was calculated, that point value was multiplied by the corresponding weight listed in the below table. The weighted scores were then summed to create a total score out of 3.0.

Intersections

Figure A22 and **Figure A23** below show the top 30 highest-scoring intersections in Tukwila using the quantitative prioritization framework. It includes intersections of highway ramps and local streets. Note that some prioritized intersections, such as Southcenter Boulevard at I-5 North on-ramp and Macadam Road South may be manually aggregated due to their close proximity. However, they are currently listed separately in the table.

Figure A22. Map showing intersection prioritization outputs

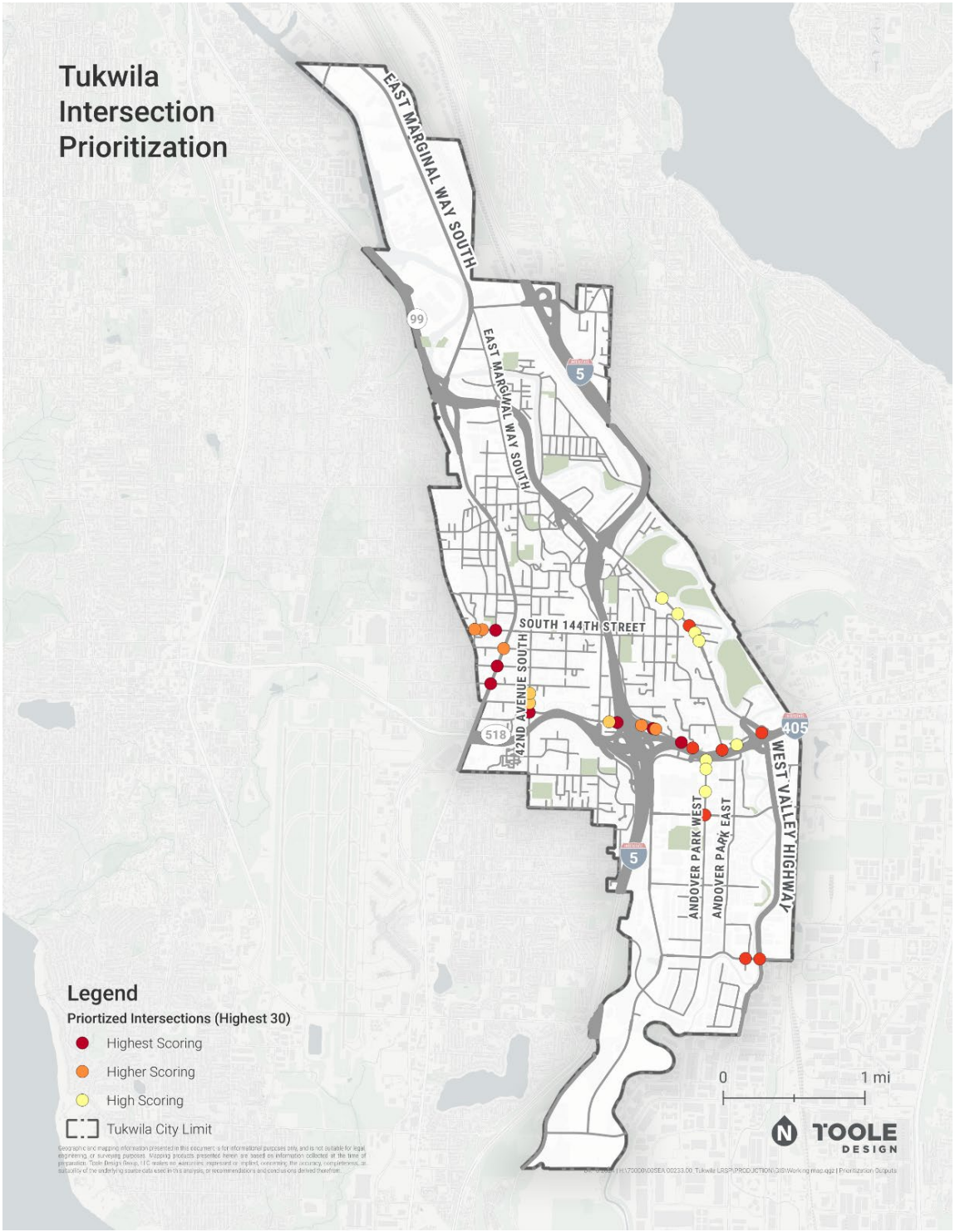


Table A6. Prioritized Intersections

Roadway Name	Intersecting Roadway	Score	Overall Rank (including ties)
Tukwila International Blvd	S 148th St	2.955	1
S 144th St	37th Ave S	2.750	2
42nd Ave S	Southcenter Blvd	2.683	3
53rd Ave S	I-5 Ramp	2.683	3
Tukwila International Blvd	S 150th St	2.455	5
I-405 Ramp	I-5 Ramp	2.450	6
61st Ave S	Southcenter Blvd	2.450	6
62nd Ave S	Southcenter Blvd	2.393	8
65th Ave S	Southcenter Blvd	2.393	8
SW Grady Way	Southcenter Blvd	2.329	10
S 143rd St	Interurban Ave S	2.329	10
S 180th St	West Valley Hwy	2.329	10
S 180th St	Sperry Dr	2.329	10
Andover Park W	Strander Blvd	2.329	10
S 144th St	34th Ln S	2.250	15
S 144th St	34th Ave S	2.250	15
Tukwila International Blvd	S 146th St	2.205	17
Southcenter Blvd	Macadam Rd S	2.200	18
I-405 Ramp	Southcenter Blvd	2.200	18
Southcenter Blvd	52nd Ave S	2.183	20
42nd Ave S	S 152nd St	2.183	20
42nd Ave S	S 151st St	2.183	20
66th Ave S	Southcenter Blvd	2.143	23
Andover Park W	Baker Blvd	2.079	24
Andover Park W	Tukwila Pkwy	2.079	24
Andover Park W	Southcenter Mall	2.079	24
S 143rd Pl	Interurban Ave S	2.079	24
Interurban Ave S	58th Ave S	2.079	24
S 140th St	Interurban Ave S	2.079	24
S 144th St	Interurban Ave S	2.079	24

Segments and Corridors

Figure A23 and **Table A7** below describe the segments and short corridors of prioritized roadway segments, representing the highest 75 scoring segments. Where contiguous segments made a short corridor, the highest-scoring segment on that corridor is recorded. The top 75 segments result in a list of 24 segments or short corridors due to the presence of continuous segments.

Figure A23. Map showing roadway segment prioritization outputs

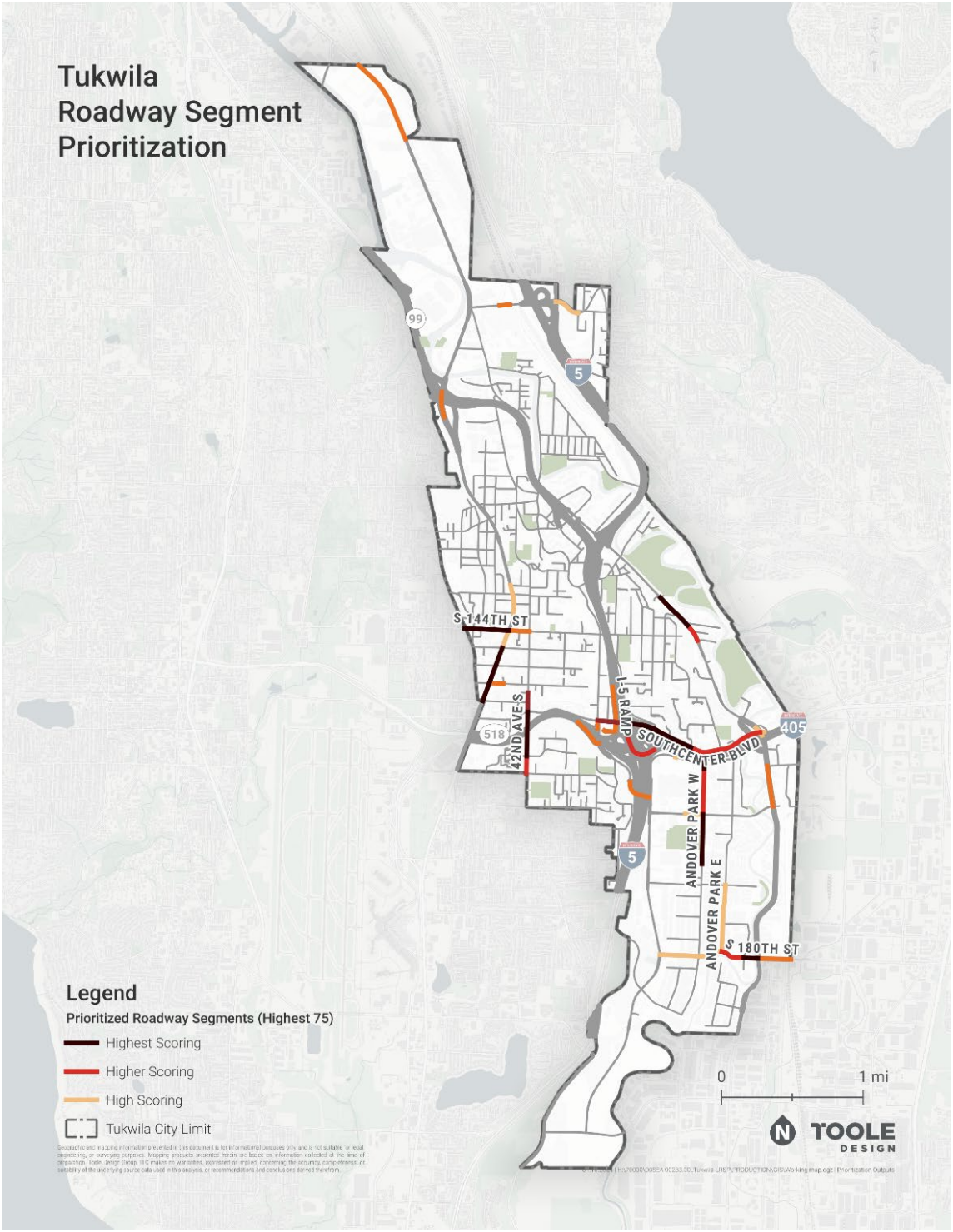


Table A7. Prioritized Segments and Corridors

Roadway Name	From	To	Highest Score	Corridor Rank, by Highest Score (including ties)
Tukwila International Blvd	S 144th St	S 152nd St	2.927	1
Southcenter Blvd	51st Ave	West Valley Hwy	2.885	2
S 144th St	Military Road S/western city limit	42nd Ave S	2.872	3
Andover Park W	Tukwila Pkwy	Corporate Dr N	2.803	4
S 180th St	Southcenter Pkwy	Eastern city limit	2.733	5
Interurban Ave S	S 144th St	57th Ave S	2.698	6
42nd Ave S	S 160th St	S 151st St	2.493	7
I-405 Ramp	Southcenter Blvd	I-405	2.175	8
Klickitat Dr	Southcenter Pkwy	I-5 onramp	1.701	9
Tukwila International Blvd	SR 599	600 ft south of ramp	1.658	10
SR 518 Ramp	SR 518 eastbound	Klickitat Dr	1.651	11
Boeing Access Rd	Airport Way S	Airport Way S northbound ramp	1.636	12
East Marginal Way S	Northern city limits	400 feet south of northern city limit	1.619	13
51st Ave S	SR 518 onramp	Southcenter Blvd	1.588	14
53rd Ave S	Roadway end	Southcenter Blvd	1.588	14
I-5 Ramp	I-5 southbound	Southcenter Blvd	1.588	14
West Valley Hwy	Longacres Wy	Strander Blvd	1.508	15
S 150th St	Tukwila International Blvd	38th Ave S	1.507	16
Strander Blvd	61st Pl S	Andover Park W	1.476	17
Interurban Ave S	Fun Center Wy	I-405	1.476	17
61st Ave S	Southcenter Blvd	Tukwila Pkwy	1.476	17
S Ryan Way	Martin Luther King Jr Way S	47th Ave S	1.448	18
Tukwila International Blvd	S 140th St	S 142nd St	1.347	19
Andover Park E	Minkler Blvd	S 180th St	1.326	20

Appendix H: Countermeasure Toolbox

Safety Countermeasures Toolbox

2025

PRODUCED BY

FEHR & PEERS

Introduction

This document provides a set of tools for improving pedestrian safety on the State Highway System. It was designed to be used to address issues identified during traffic safety investigations conducted while evaluating high collision concentration locations and systemic safety locations. However, these tools may be used more generally to improve pedestrian safety.

This document should not provide the sole source of guidance when resolving a pedestrian safety issue.

Each location and situation is unique, and engineering judgment should be used when applying these tools and selecting the best solution for any location.

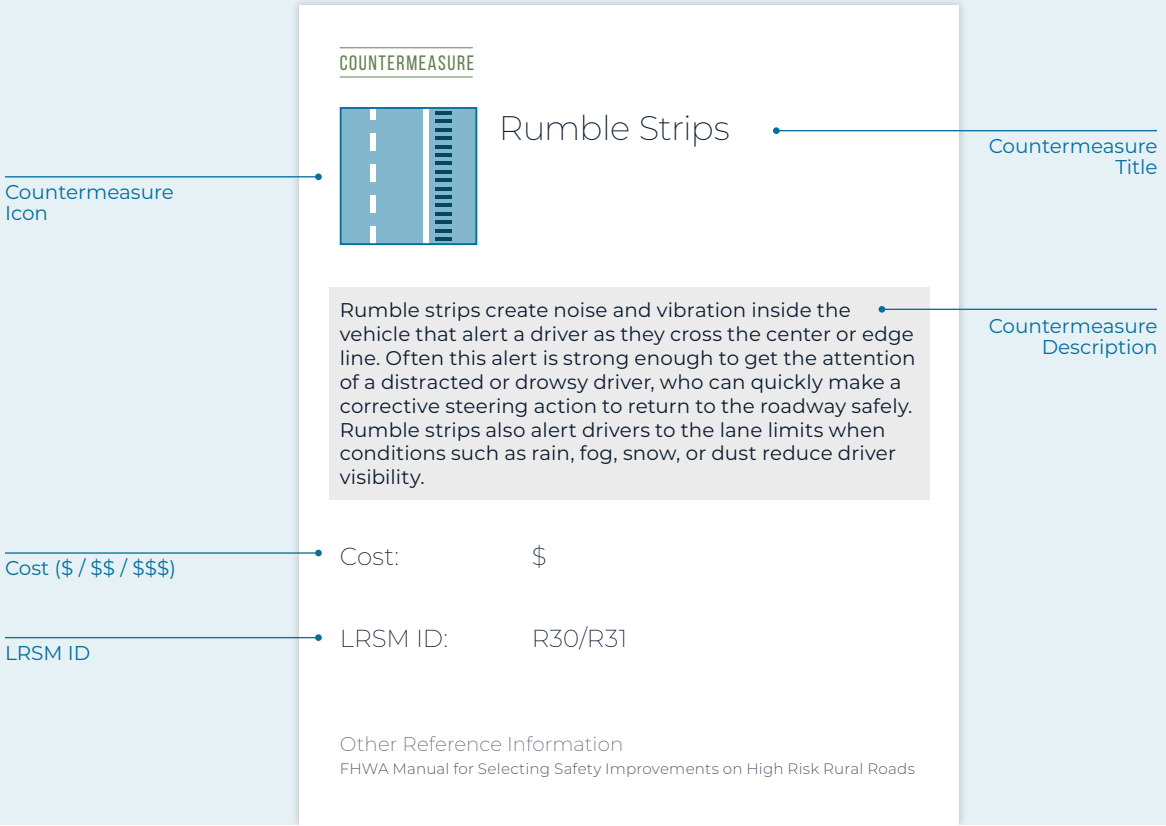
Countermeasure Toolbox

Summary

This Toolbox presents 43 safety countermeasures applicable in different roadway contexts.

Many of the countermeasures have an associated Crash Reduction Factor (CRF) and crash type (i.e., all modes, bicycle and pedestrian crashes only, etc.) as outlined in the California Local Roadway Safety Manual (LRSM). The higher the CRF (1 being the highest), the greater the expected reduction in crashes. Countermeasures not in the LRSM are scored on a "low-medium-high" research availability scale based on proven safety studies. The higher the rating, the greater the availability of rigorous research demonstrating proven safety benefits.

What You'll See in This Toolbox



Index of Countermeasures

BIKEWAYS

INTERSECTIONS & ROADWAYS

OTHER

- Upgrade Lighting to LED
- Red Light Camera

PEDESTRIAN FACILITIES

- Audible Push Button Upgrade
- Add Sidewalk
- Install/Upgrade Pedestrian Crossing at Uncontrolled Locations (Signs and Markings Only)
- Co-Locate Bus Stops and Pedestrian Crossings
- Curb Extensions
- Extended Time Pushbutton
- High-Visibility Crosswalk
- Pedestrian Countdown Timer
- Pedestrian Hybrid Beacon
- Landscape Buffer
- Leading Pedestrian Interval and Pedestrian Recall
- Pedestrian Detection
- Remove Crossing Prohibition
- Restripe Crosswalk
- Upgrade Curb Ramp
- Widen Sidewalk
- Rectangular Rapid Flashing Beacon

SIGNALS

- Retroreflective Tape on Signals
- Supplemental Signal Heads
- Advanced Dilemma Zone Detection
- Extend Pedestrian Crossing Time
- Extend Yellow and All Red Time
- Flashing Yellow Turn Phase
- Pedestrian Scramble
- Prohibit Left Turn
- Prohibit Turns During Pedestrian Phase
- Protected Left Turns
- Prohibit Right-Turn-on-Red
- Separate Right-Turn Phasing
- Shorten Cycle Length
- Signal Interconnectivity and Coordination / Green Wave
- Speed Sensitive Rest in Red Signal
- Upgrade Signal Head

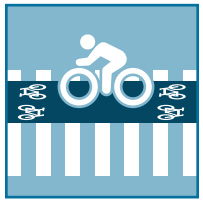
SIGNING & STRIPING

- Advance Stop Bar
- Advance Yield Markings
- Curve Advance Warning Sign
- Flashing Beacon as Advance Warning
- Chevron Signs on Horizontal Curves
- LED-Enhanced Sign
- Painted Centerline and Raised Pavement Markers at Curves on Residential Streets
- Speed Feedback Sign
- Speed Legends on Pavement at Neighborhood Entries
- Striping Through Intersection
- Time-Based Turn Restriction
- Upgrade Intersection Pavement Markings
- Upgrade Signs with Fluorescent Sheeting
- Upgrade Striping
- Upgrade to Larger Warning Signs
- Wayfinding
- Yield To Pedestrians Sign

NON-ENGINEERING

- Improve Crash Data Collection
- Bicycle Safety Education Events
- Youth Education
- Education Campaigns for Vulnerable Groups
- Pilot Demonstration Safety Projects
- Public Information Campaigns
- Keep Roadways Clear of Debris
- Safe Routes to School
- Update City Policies and Standards
- Neighborhood Slow Zones
- Targeted Enforcement and Deterrence

BIKEWAYS



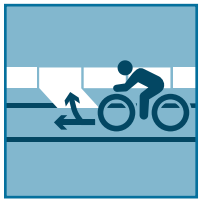
Bicycle Crossing (Solid Green Paint)

Solid green paint across an intersection that signifies the path of the bicycle crossing. Increases visibility and safety of bicyclists traveling through an intersection.

Cost: $

Low Cost / Quick Build alternative available

BIKEWAYS



Bicycle Ramp

Connects bicyclists from the road to the sidewalk or a shared use path.

Cost: $

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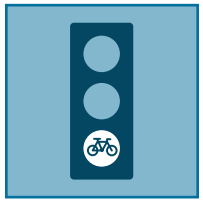
BIKEWAYS

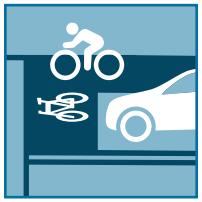


Bicycle Signal/ Exclusive Bike Phase

A traffic signal directing bicycle traffic across an intersection. Separates bicycle movements from conflicting motor vehicle, streetcar, light rail, or pedestrian movements. May be applicable for Class IV facilities when the bikeway is brought up to the intersection.

Cost: $$$

BIKEWAYS



Bike Box

A designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S20PB

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BIKEWAYS

Bike Detection

Bike detection is used at signalized intersections, either through use of push-buttons, in-pavement loops, or by video or infrared cameras, to call a green light for bicyclists and reduce delay for bicycle travel. Discourages red light running by bicyclists and increases convenience of bicycling.

Cost: $$

BIKEWAYS

Bike-Friendly Drain

Bike friendly drains avoid placing grating in the right-of-way that may pose a hazard to bicyclists by increasing their risk of falling.

Cost: $$

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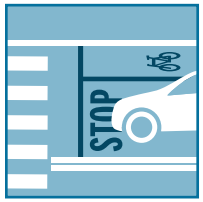
BIKEWAYS



Bike Lane

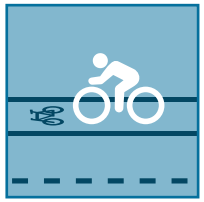
A bike lane provides dedicated street space, typically adjacent to outer vehicle travel lanes, with designated lane markings, pavement legends, and signage. Bike lanes improve safety by reducing conflicts between bicycles and vehicles on the road and by creating a road-narrowing effect with buffers or vertical barriers, which may reduce vehicle speeds.

Cost: $$

Low Cost / Quick Build alternative available

LRSM ID: R32PB

BIKEWAYS



Extend Bike Lane to Intersection

In locations where a bike lane is dropped due to the addition of a right turn pocket, the intersection approach may be restriped to allow for bicyclists to move to the left side of right turning vehicles ahead of reaching the intersection.

Cost: $

Low Cost / Quick Build alternative available

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BIKEWAYS

Floating Transit Island

An in-street transit boarding island is used in conjunction with a Class IV bike facility, separating transit traffic from bicycle traffic, reducing conflict between the two modes, and lowering the risk of collision.

Cost: $$

Low Cost / Quick Build alternative available

BIKEWAYS

Green Conflict Striping

Green conflict striping is green markings painted in a dashed pattern on bike lanes approaching an intersection and/or going through an intersection. Green conflict striping improves safety by increasing the visibility bicyclists and identifying potential conflict points so bicyclists and motorists use caution when traveling toward and through an intersection.

Cost: $

Low Cost / Quick Build alternative available

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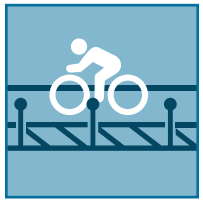
BIKEWAYS



Separated Bikeway

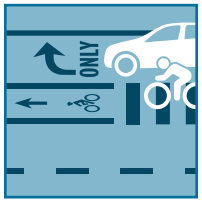
A separated bikeway provides dedicated street space, typically adjacent to outer vehicle travel lanes, with physical separation from vehicle traffic, designated lane markings, pavement legends, and signage. Physical separation may consist of plastic posts, parked vehicles, or a curb. Separated bikeways improve safety by reducing conflicts between bicycles and vehicles on the road and by creating a road-narrowing effect with buffers or vertical barriers, which may reduce vehicle speeds. A raised barrier of plastic posts and painted pavement is a low-Cost:/quick build option.

Cost: $$$

Low Cost / Quick Build alternative available

LRSM ID: R33PB

BIKEWAYS



Mixing Zone

Places a suggested bike lane within the inside portion of a dedicated motor vehicle turn lane. Lane markings delineate space for bicyclists and motorists within the same lane and indicate the intended path for bicyclists to reduce conflict with turning motor vehicles.

Cost: $

Low Cost / Quick Build alternative available

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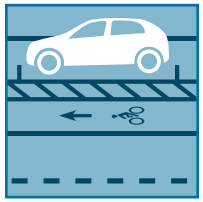
BIKEWAYS



Parking Buffer

Pavement markings denoting door zone of parked vehicles to help bicyclists maintain safe positioning on the roadway

Cost: $

Low Cost / Quick Build alternative available

BIKEWAYS

Shared Sidewalk Sign

Signs communicate to pedestrians that bicyclists may also use the sidewalk and that bicyclists must yield to pedestrians.

Cost: $

Low Cost / Quick Build alternative available

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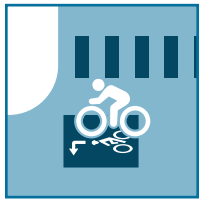
BIKEWAYS



Two-Stage Turn Queue Bike Box

This roadway treatment provides bicyclists with a means of safely making a left turn at a multi-lane signalized intersection from a bike lane or cycle track on the far right side of the roadway. In this way, bicyclists are protected from the flow of traffic while waiting to turn. Usage could be mirrored for right-turns from a one-way street with a left-side bikeway.

Cost: $

Low Cost / Quick Build alternative available

BIKEWAYS

Extend Green Time For Bikes

Prolongs the green phase when bicyclists are present to provide additional time for bicyclists to clear the intersection. Can occur automatically in the signal phasing or when prompted with bicycle detection. Topography should be considered in clearance time.

Cost: $

LRSM ID: S03

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BIKEWAYS

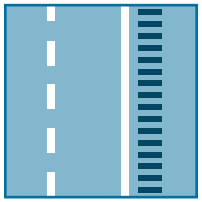
Bicycles May Use Full Lane Sign

A sign placed on roads with lanes that are too narrow to allow safe side-by-side passing to indicate that bicyclists may occupy the full lane. This discourages unsafe passing by motorists.

Cost: $

Low Cost / Quick Build alternative available

INTERSECTIONS & ROADWAYS



Rumble Strips

Rumble strips create noise and vibration inside the vehicle that alert a driver as they cross the center or edge line. Often this alert is strong enough to get the attention of a distracted or drowsy driver, who can quickly make a corrective steering action to return to the roadway safely. Rumble strips also alert drivers to the lane limits when conditions such as rain, fog, snow, or dust reduce driver visibility.

Cost: $

LRSM ID: R30/R31

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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INTERSECTIONS & ROADWAYS

All-Way Stop Control

An all-way stop-controlled intersection requires all vehicles to stop before crossing the intersection. An all-way stop controlled intersection improves safety by removing the need for motorists, bicyclists, and pedestrians on a side-street stop-controlled intersection to cross free-flowing lanes of traffic, which reduces the risk of collision. An "ALL WAY" sign should be placed under the octagonal stop sign at all-way stop-controlled intersections as required by the California Manual on Uniform Traffic Control Devices (MUTCD).

Cost: $

LRSM ID: NS02

INTERSECTIONS & ROADWAYS

Centerline Hardening

Centerline hardening is a technique to make intersections safer for pedestrians by encouraging drivers to make left turns at slower speeds.

Cost: $

Low Cost / Quick Build alternative available

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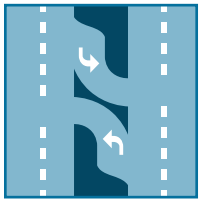
INTERSECTIONS & ROADWAYS

Close Slip Lane

Modifies the corner of an intersection to remove the sweeping right turn lane for vehicles. Results in shorter crossings for pedestrians, reduced speed for turning vehicles, better sight lines, and space for landscaping and other amenities.

Cost: $$$

INTERSECTIONS & ROADWAYS



Directional Median Openings to Restrict Left Turns

A directional median opening restricts specific turning movements, such as allowing a left-turn from a major street but not from a minor street. A directional median opening to restrict left turn improves safety by reducing the number of conflict points.

Cost: $$

Low Cost / Quick Build alternative available

LRSM ID: S14

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INTERSECTIONS & ROADWAYS

Improved Pavement Friction

A roadway must have an appropriate level of pavement friction to ensure that drivers are able to keep their vehicles safely in the lane. Poor pavement conditions, especially wet pavement, have been identified as one of the major contributing factors in roadway departure crashes. When a pavement surface is wet, the level of pavement friction is reduced, and this may lead to skidding or hydroplaning. Pavement friction is critical for changing vehicle direction and ensuring the vehicle remains in its lane. Traditional friction courses or high friction surface treatments should be considered for curves with numerous wet weather crashes or severe curves with higher operating speeds.

Cost: $$

LRSM ID: R21

Other Reference Information
FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

INTERSECTIONS & ROADWAYS

Safety Edge

When a vehicle leaves the traveled way and encounters a pavement-shoulder drop-off, it can be difficult for the driver to return safely to the roadway. A safety edge is a treatment intended to minimize drop-off-related crashes. With this treatment, the shoulder pavement edge is sloped at an angle (30-35 degrees) to make it easier for a driver to safely reenter the roadway after inadvertently driving onto the shoulder. This treatment is designed to be a standard policy for any overlay project.

Cost: $

Other Reference Information
FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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INTERSECTIONS & ROADWAYS

Guardrail

Guardrail redirects a vehicle away from embankment slopes or fixed objects and dissipates the energy of an errant vehicle. Guardrail is installed to reduce the severity of lane departure crashes. However, guardrail can reduce crash severity only for those conditions where striking the guardrail is less severe than going down an embankment or striking a fixed object.

Cost: $$

LRSM ID: R04

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

INTERSECTIONS & ROADWAYS

Median Barrier

Barrier in the center of the roadway that physically separates opposing vehicular traffic. Median barriers can also help control access to and from side streets and driveways, reducing conflict points.

Cost: $$$

Low Cost / Quick Build alternative available

LRSM ID: R03

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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INTERSECTIONS & ROADWAYS

Roundabout

A roundabout is a type of circular intersection in which road traffic is permitted to flow in one direction around a central island, and priority is typically given to traffic already in the junction. The types of conflicts that occur at roundabouts are different from those occurring at conventional intersections; namely, conflicts from crossing and left-turn movements are not present in a roundabout. The geometry of a roundabout forces drivers to reduce speeds as they proceed through the intersection; the range of vehicle speeds is also narrowed, reducing the severity of crashes when they do occur. Pedestrians only have to cross one direction of traffic at a time at roundabouts, thus reducing the potential for vehicle/pedestrian conflicts.

Cost: $$$

Low Cost / Quick Build alternative available

LRSM ID: S16/NS04

INTERSECTIONS & ROADWAYS

Signal

Traffic signals at intersections control the flow of traffic. Traffic signals have the potential to reduce the most severe type crashes but will likely cause an increase in rear-end collisions. A reduction in overall injury severity is likely the largest benefit of traffic signal installation.

Cost: $$$

LRSM ID: NS03

Other Reference Information

Currently the CMF Clearinghouse has only one reference for ped/vehicle collisions which indicates an increase in crash likelihood. However, a majority of references for all crash types show a decrease in collisions. See additional reference: FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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INTERSECTIONS & ROADWAYS

Superelevation at Horizontal Curve Locations

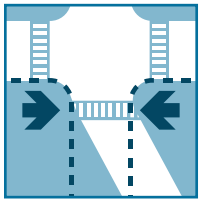
Superelevation is the rotation of the pavement on the approach to and through a horizontal curve and is intended to assist the driver in negotiating the curve by counteracting the lateral acceleration produced by tracking. In other words, the road is designed so that the pavement rises as it curves, offsetting the horizontal sideways momentum of the approaching vehicle.

Cost: $$

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

INTERSECTIONS & ROADWAYS



Intersection Reconstruction and Tightening

Irregular intersections can be overbuilt and confusing, presenting safety hazards to all users. “Squaring up” an intersection as close to 90 degrees as possible involves intersection reconstruction to provide better visibility for all road users, also reducing high speed turns and reducing pedestrian crossing length.

Cost: $$$

Low Cost / Quick Build alternative available

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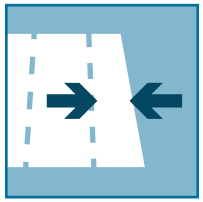
INTERSECTIONS & ROADWAYS

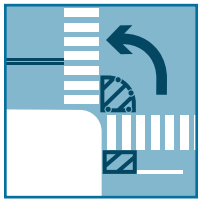


Lane Narrowing

Lane narrowing reduces lane widths to encourage motorists to travel at slower speeds. Lane Narrowing improves safety by lowering the risk of collision among bicyclists, pedestrians, and other motorists.

Cost: $

INTERSECTIONS & ROADWAYS



Left Turn Enhanced Daylighting/Slow Turn Wedge

Uses paint and bollards to extend the curb and slow left turns at intersections of one-way to one-way or two-way streets. Widening the turning radii of left-turning vehicles expands the field of vision for drivers and increases the visibility of pedestrians.

Cost: $

Low Cost / Quick Build alternative available

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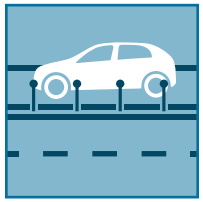
INTERSECTIONS & ROADWAYS



Paint and Plastic Median

A painted median with plastic posts between the two directions of travel. Reduces vehicular speeding and discourages risky turning movements, increasing pedestrian safety.

Cost: $

Low Cost / Quick Build alternative available

INTERSECTIONS & ROADWAYS

Paint and Plastic Mini Circle

Mini circles use paint and soft hit posts to replace stop-controlled intersections with a circular design that slows traffic and eliminates left turns, also reducing conflict points with pedestrians. Also helps traffic flow more efficiently.

Cost: $

Low Cost / Quick Build alternative available

Other Reference Information

FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=34

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INTERSECTIONS & ROADWAYS

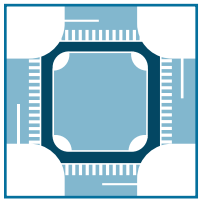
Partial Closure/ Diverter

A roadway treatment that restricts through vehicle movements using physical diversion while allowing bicyclists and pedestrians to proceed through an intersection in all directions.

Cost: $

Low Cost / Quick Build alternative available

INTERSECTIONS & ROADWAYS



Protected Intersection

Protected intersections use corner islands, curb extensions, and colored paint to delineate bicycle and pedestrian movements across an intersection. Slower driving speeds and shorter crossing distance increase safety for pedestrians. Separates bicycles from pedestrians

Cost: $$$

Low Cost / Quick Build alternative available

Other Reference Information

Evolution of the Protected Intersection, Alta Planning and Design, December 2015. https://altaplanning.com/wp-content/uploads/Evolution-of-the-Protected-Intersection_ALTA-2015.pdf

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INTERSECTIONS & ROADWAYS

Raised Crosswalk

A Raised Crosswalk is a pedestrian crosswalk that is typically elevated 3-6 inches above the road or at sidewalk level. A Raised Crosswalk improves safety by increasing crosswalk and pedestrian visibility and slowing down motorists.

Cost: $$

LRSM ID: R36PB

INTERSECTIONS & ROADWAYS

Raised Intersection

Elevates the intersection to bring vehicles to the sidewalk level. Serves as a traffic calming measure by extending the sidewalk context across the road.

Cost: $$$

Other Reference Information

Note: some studies in CMF Clearinghouse show an increase in crashes. See additional source below showing decrease. (1) Perkins+Will Consultant Team. “Pedestrians at Multi-Modal Intersections.” Better Market Street Existing Conditions & Best Practices, Part Two: Best Practices 36-58, City & County of San Francisco, San Francisco. http://www.bettermarketstreetsf.org/about-reports-existing-conditions.html (2) Bhatt, Shailen, Natalie Barnhart, Mark Luszcz, Tom Meyer, & Michael Sommers. “Delaware Traffic Calming Design Manual.” Delaware Department of Transportation, State of Delaware, Dover, DE. https://nacto.org/wp-content/uploads/2015/04/DE-Trafc-Calming-Manual_2012.pdf (3) King, Michael R, Jon A Carnegie, and Reid Ewing. “Pedestrian Safety through a Raised Median and Redesigned Intersections.” Journal of the Transportation Research Board 1828 (1), 56-66, Transportation Research Board, Washington, DC. https://trid.trb.org/view/663867 (4) Fitzpatrick, Kay, Mark D Wooldridge, and Joseph D Blaschke. “Urban Intersection Design Guide: Volume 1–Guidelines.” Texas Transportation Institute, Texas A&M University System, Texas Department of Transportation, Austin, TX. https://static.tti.tamu.edu/tti.tamu.edu/documents/0-4365-P2.pdf

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INTERSECTIONS & ROADWAYS

Raised Median

Curbed sections in the center of the roadway that are physically separated from vehicular traffic. Raised medians can also help control access to and from side streets and driveways, reducing conflict points.

Cost: $$

Low Cost / Quick Build alternative available

LRSM ID: S12/NS14/R08

INTERSECTIONS & ROADWAYS

Refuge Island

A Raised Median, or Refuge Island, is a raised barrier in the center of the roadway that can restrict certain turning movements and provide a place for pedestrians to wait if they are unable to finish crossing the intersection. A Raised Median improves safety by reducing the number of potential conflict points with designated zones for vehicles to turn, and a pedestrian refuge island improves safety by reducing the exposure time for pedestrians crossing the intersection. Pedestrian refuge areas constructed from paint and plastic may be implemented as part of a low-Cost:/quick build project.

Cost: $$

Low Cost / Quick Build alternative available

LRSM ID: NS19PB

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INTERSECTIONS & ROADWAYS

Reduced Left-Turn Conflict Intersection

Geometric designs that alter how left-turn movements occur can simplify decisions and minimize the potential for related crashes. Two highly effective designs that rely on U-turns to complete certain left-turn movements are known as the restricted crossing U-turn (RCUT) and the median U-turn (MUT).

Cost: $$$

LRSM ID: NS16

INTERSECTIONS & ROADWAYS

Right Turn Slip Lane

A right turn slip lane is a traffic lane provided at an intersection to allow vehicles to turn right without actually entering it and interfering with through traffic. Where the main intersection is controlled by traffic signals, a slip lane is often controlled by yield or stop sign.

Cost: $$$

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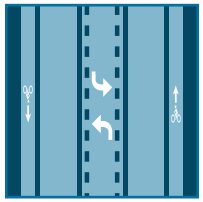
INTERSECTIONS & ROADWAYS



Road Diet

A Road Diet reduces roadway space dedicated to vehicle travel lanes to create room for bicycle facilities, wider sidewalks, or center turn lanes. A Road Diet improves safety by reducing vehicle speeds and creating designated space for all road users.

Cost: $$

Low Cost / Quick Build alternative available

LRSM ID: R14

INTERSECTIONS & ROADWAYS

Speed Hump or Speed Table

These traffic calming devices use vertical defection to raise the entire wheelbase of a vehicle and encourage motorists to travel at slower speeds to avoid damage to the undercarriage of an automobile.

Cost: $

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INTERSECTIONS & ROADWAYS

Splitter Island

A raised area that separates the two directions of travel on the minor street approach at an unsignalized intersection or roundabout. Helps channelize traffic in opposing directions of travel. Typically installed at skewed intersections or where speeds on minor roads are high. Provides a refuge for pedestrians.

Cost: $$

Low Cost / Quick Build alternative available

LRSM ID: NS13

INTERSECTIONS & ROADWAYS

Straighten Crosswalk

Straightening crosswalks improves sight lines, making pedestrians more visible to oncoming drivers, and may shorten the crossing distance, reducing the length of time required for pedestrians to cross an intersection.

Cost: $

Low Cost / Quick Build alternative available

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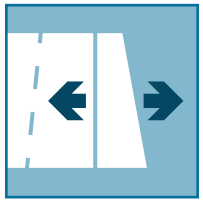
INTERSECTIONS & ROADWAYS



Widen/Pave Shoulder

Widened and paved shoulders, which may also include flattening the slopes along the sides of the roadway, create a separated space for bicyclists and also provide motor vehicle safety benefits, such as space for inoperable vehicles to pull out of the travel lane. The addition of a paved shoulder to an existing road can help to reduce run-off-road crashes. Benefits can be realized for high risk rural roads without paved shoulders, regardless of existing lane pavement width. Adding paved shoulders within horizontal curve sections may help agencies maximize benefits of the treatment while minimizing Cost:s as opposed to adding paved shoulders to an entire corridor.

Cost: $$

LRSM ID: R15

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

OTHER

Back-In Angled Parking

Back-In Angled Parking requires motorists to back into an angled on-street parking spot and to drive forward when exiting a parking spot. Back-in angled parking improves safety by increasing visibility of passing vehicles and bicycles while exiting a spot, particularly if large adjacent vehicles obstruct sight, and allows trunk unloading to happen on the curb instead of in the street.

Cost: $

Low Cost / Quick Build alternative available

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OTHER

Access Management/ Close Driveway

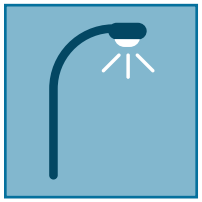
Vehicles entering and exiting driveways may conflict with pedestrians and with vehicles on the main road, especially at driveways within 250 feet of intersections. Closing driveways near intersections with high collision rates related to driveways may reduce potential conflicts.

Cost: $$

Other Reference Information

The CMF Clearinghouse has limited research related to vehicle/ pedestrian crashes. See additional reference: FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=20

OTHER



Intersection Lighting

Lighting is added at an intersection. Adding intersection and/or pedestrian-scale lighting at intersections improves safety by increasing visibility of all road users. This countermeasure is most effective at reducing or preventing collisions at intersections at night.

Cost: $$

LRSM ID: NS01

Other Reference Information

Pedestrian-Level Lighting: FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=8

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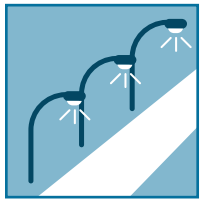
OTHER



Segment Lighting

Providing roadway lighting improves safety during nighttime conditions by increasing driver awareness, increasing sight distance, and improving visibility of pedestrians and bicyclists.

Cost: $$

LRSM ID: R01

OTHER

Create or Increase Clear Zone

A clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway. The width of the clear zone should be based on risk (also called exposure). Key factors in assessing risk include traffic volumes, speeds, and slopes. Clear roadsides reduce risk from fixed objects (such as utility poles) as well as terrain that may increase the likelihood of a rollover. Creating or increasing clear zones within horizontal curve sections may help agencies maximize benefits of the treatment while minimizing Cost:s, as opposed to providing a clear zone throughout an entire corridor.

Cost: $$

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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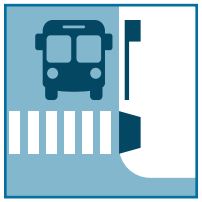
OTHER

Curbside Management

Curbside management can better prioritize reliable transit and safe bicycling infrastructure, freight deliveries, passenger pick-ups/drop-offs, green stormwater infrastructure, public spaces, and parking management.

Cost: $

OTHER



Far-Side Bus Stop

Far-side bus stops are located immediately after an intersection, allowing the bus to pass through the intersection before stopping for passenger loading and unloading. Far-side stops encourage pedestrians to cross behind the bus for greater visibility and can improve transit service reliability.

Cost: $

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OTHER

Delineators, Reflectors, and/or Object Markers

Delineators, reflectors and/or object markers are intended to warn drivers of an approaching curve or fixed object that cannot easily be removed. They are generally less Cost:ly than Chevron Signs as they don't require posts to place along the roadside, avoiding an additional object with which an errant vehicle can crash into.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: R27

OTHER

Impact Attenuators

Impact attenuators bring an errant vehicle to a more-controlled stop or redirect the vehicle away from a rigid object. Impact attenuators are typically used to shield rigid roadside objects such as concrete barrier ends, steel guardrail ends and bridge pillars from oncoming automobiles. Attenuators should only be installed where it is impractical for the objects to be removed.

Cost: $$

LRSM ID: R05

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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OTHER

Median Guardrail

The installation of median guardrail is most suitable for use in traversable medians having no or little change in grade and cross slope. While these systems may not reduce the frequency of crashes due to roadway departure, they can help prevent a lane-departure crash from becoming a head-on collision.

Cost: $$

OTHER

Speed Limit Reduction

Setting speed limits to reflect the surrounding context of the roadway and that meet with driver expectations can help improve driver respect for speed limits. Speed limits that appear inconsistent may be ignored by the majority of drivers and this may contribute to lack of respect for speed limit and other traffic laws.

Cost: $

Other Reference Information

TRB Study on Setting Speed Limits; also Richard, C. M., Magee, K., Bacon-Abdelmoteleb, P., & Brown, J. L. (2018, April). Countermeasures that work: A highway safety countermeasure guide for State Highway Safety Offices, Ninth edition (Report No. DOT HS 812 478). Washington, DC: National Highway Traffic Safety Administration.

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OTHER

Relocate Select Hazardous Utility Poles

Relocating or removing utility poles from within the clear zone alleviates the potential for fixed-object crashes. If utility poles cannot be completely eliminated from within the clear zone, efforts can be made to either relocate the poles to a greater offset from the road or delineated.

Cost: $$

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

OTHER

Remove Obstructions For Sightlines

Remove objects that may prevent drivers and pedestrians from having a clear sightline. May include installing red curb at intersection approaches to remove parked vehicles (also called “daylighting”), trimming or removing landscaping, or removing or relocating large signs.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: NS11

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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OTHER

Upgrade Lighting to LED

Upgrading Lighting to LED replaces high-pressure sodium light bulbs with LED light bulbs in street lights. Upgrading Lighting to LED improves safety by increasing the visibility of pedestrians in crosswalks through greater color contrast and larger areas of light distribution.

Cost: $$

OTHER

Red Light Camera

A red light camera enforces traffic signal compliance by capturing the image of a vehicle that has entered an intersection in spite of the traffic signal indicating red. The automatic photographic evidence is used by authorities to enforce traffic laws and issue traffic violation tickets.

Cost: $$

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PEDESTRIAN FACILITIES

Audible Push Button Upgrade

Push buttons must comply with the Americans with Disability Act (ADA) standards for accessibility. Pushbuttons should be visible and conveniently located for pedestrians waiting at a crosswalk. Accessible pedestrian signals, including audible push buttons, improve access for pedestrians who are blind or have low vision. DIB 82-06 includes accessibility design guidance.

Cost: $

Other Reference Information

Audible Push Button Upgrade and Extended Time Pushbutton: FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=52

PEDESTRIAN FACILITIES

Add Sidewalk

Adding sidewalks provides a separated and continuous facility for people to walk along the roadway. Adding sidewalks improves safety by minimizing collisions with pedestrians walking in the road.

Cost: $$

LRSM ID: R34PB

Other Reference Information

Data in the CMF Clearinghouse is currently limited to bicycle/vehicle collisions. See additional reference: FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=1

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PEDESTRIAN FACILITIES

Install/Upgrade Pedestrian Crossing at Uncontrolled Locations (Signs and Markings Only)

A pedestrian crossing at an intersection or on a segment provides a formalized location for people to cross the street, reducing the risk of people crossing outside crosswalks where drivers are not expecting them. Crosswalk striping, signs, and other enhanced safety features alert drivers that there may be a pedestrian crossing.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: R35PB

PEDESTRIAN FACILITIES

Co-Locate Bus Stops and Pedestrian Crossings

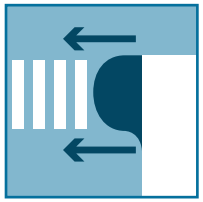
Place bus stops and pedestrian crossings in close proximity to allow transit riders to cross the street safely.

Cost: $

Low Cost / Quick Build alternative available

→ Back to Index

PEDESTRIAN FACILITIES



Curb Extensions

A curb extension is a traffic calming measure which widens the sidewalk for a short distance to enhance the pedestrian crossing. This reduces the crossing distance and allowing pedestrians and drivers to see each other when parked vehicles would otherwise block visibility. Paint and plastic curb extensions are a low-cot/quick build option.

Cost: $$

Low Cost / Quick Build alternative available

LRSM ID: NS21PB

Other Reference Information

(1) Application of Pedestrian Crossing Treatments for Streets and Highways, NCHRP, 2016. https://www.nap.edu/catalog/24634/application-of-pedestrian-crossing-treatments-for-streets-and-highways (2) Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments, NCHRP, 2017. https://www.nap.edu/catalog/24627/development-of-crash-modifcation-factors-for-uncontrolled-pedestrian-crossing-treatments (3) Evaluation of Pedestrian-Related Roadway Measures, Pedestrian and Bicycle Information Center, 2014. http://www.pedbikeinfo.org/cms/downloads/PedestrianLitReview_April2014.pdf

PEDESTRIAN FACILITIES

Extended Time Pushbutton

A pushbutton that can be pressed to request extra time for using the crosswalk, beyond the standard crossing time. Ideal near senior-serving land uses.

Cost: $

Other Reference Information

Audible Push Button Upgrade and Extended Time Pushbutton: FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=52

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PEDESTRIAN FACILITIES

High-Visibility Crosswalk

A high-visibility crosswalk has a striped pattern with ladder markings made of high-visibility material, such as thermoplastic tape, instead of paint. A high-visibility crosswalk improves safety by increasing the visibility of marked crosswalks and provides motorists a cue to slow down and yield to pedestrians.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S18/NS20

PEDESTRIAN FACILITIES

Pedestrian Countdown Timer

Displays “countdown” of seconds remaining on the pedestrian signal. Countdown indications improve safety for all road users, and are required for all newly installed traffic signals where pedestrian signals are installed.

Cost: $$

LRSM ID: S17PB

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PEDESTRIAN FACILITIES

Pedestrian Hybrid Beacon

A pedestrian-hybrid beacon (PHB) is used at unsignalized intersections or mid-block crosswalks to notify oncoming motorists to stop with a series of red and yellow lights. Unlike a traffic signal, the PHB rests in dark until a pedestrian activates it via pushbutton or other form of detection.

Cost: $$$

LRSM ID: NS23PB

PEDESTRIAN FACILITIES

Landscape Buffer

Separating drivers from bicyclists and pedestrians using landscaping provides more space between the modes and can produce a traffic calming effect by encouraging drivers to drive at slower speeds, lowering the risk of crashing.

Cost: $$

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PEDESTRIAN FACILITIES

Leading Pedestrian Interval and Pedestrian Recall

At intersection locations that have a high volume of turning vehicle and have high pedestrian vs. vehicle crashes, a leading pedestrian interval gives pedestrians the opportunity to enter an intersection 3 - 7 seconds before vehicles are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn left or right.

Cost: $

LRSM ID: S21PB

Other Reference Information

Pedestrian Phase Recall: Evaluation of Pedestrian-Related Roadway Measures, Pedestrian and Bicycle Information Center, 2014. http://www.pedbikeinfo.org/cms/downloads/PedestrianLitReview_April2014.pdf

PEDESTRIAN FACILITIES

Pedestrian Detection

An intersection treatment that relies on sensors to detect when a pedestrian is waiting at a crosswalk and automatically triggers the pedestrian “WALK” phase. Reduces crossings at inappropriate times and ensures that pedestrians have enough time to safely cross the roadway.

Cost: $$

Other Reference Information

FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=11

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PEDESTRIAN FACILITIES

Remove Crossing Prohibition

Removes existing crossing prohibitions and provides marked crosswalk and other safety enhancements for pedestrians to cross the street.

Cost: $

Low Cost / Quick Build alternative available

PEDESTRIAN FACILITIES

Restripe Crosswalk

Periodic restriping of crosswalks is necessary to ensure the traffic markings are visible. Crosswalk may be restriped with high visibility markings.

Cost: $

Low Cost / Quick Build alternative available

Other Reference Information

FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=4

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PEDESTRIAN FACILITIES

Upgrade Curb Ramp

Tactile warning devices must be detectable to visually impaired pedestrians. Curb ramps must follow the DIB 82-06 design guidelines.

Cost: $$

Other Reference Information

FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=3

PEDESTRIAN FACILITIES

Widen Sidewalk

Widening sidewalks provides a more comfortable space for pedestrians, particularly in locations with high volumes of pedestrians, and provides space to accommodate people in wheelchairs. Widening sidewalks improves safety by minimizing collisions with pedestrians walking in the road.

Cost: $$

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PEDESTRIAN FACILITIES

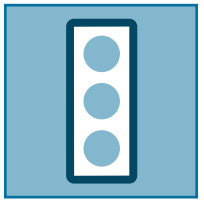
Rectangular Rapid Flashing Beacon

A rectangular rapid flashing beacon (RRFB) is a pedestrian-activated flashing light with additional signage to alert motorists of a pedestrian crossing. An RRFB improves safety by increasing the visibility of marked crosswalks and provides motorists a cue to slow down and yield to pedestrians.

Cost: $$

LRSM ID: NS22PB

SIGNALS



Retroreflective Tape on Signals

Retroreflective borders enhance the visibility of traffic signals for aging and color vision impaired drivers enabling them to understand which signal indication is illuminated. Retroreflective borders may also alert drivers to signalized intersections during periods of power outages when the signals would otherwise be dark, and non–reflective signal heads and backplates would not be visible.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S02

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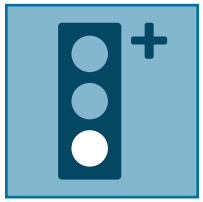
SIGNALS



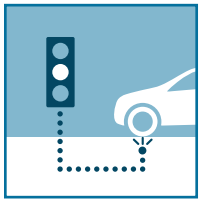
Supplemental Signal Heads

Additional signal heads allow drivers to anticipate signal changes farther away from intersections. Supplemental traffic signals may be placed on the near side of an intersection, far-left, far-right, or very high.

Cost: $$

LRSM ID: S02

SIGNALS



Advanced Dilemma Zone Detection

The Advanced Dilemma-Zone Detection system adjusts the start time of the yellow-signal phase (i.e. earlier or later) based on observed vehicle locations and speeds. The Advanced Dilemma-Zone Detection system improves safety by minimizing the number of drivers that are faced with the dilemma of determining if they should stop at the intersection or drive through the intersection based on their speed and distance from the intersection.

Cost: $$

LRSM ID: S04

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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SIGNALS

Extend Pedestrian Crossing Time

Increases time for pedestrian walk phases, especially to accommodate vulnerable populations, such as children and the elderly.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S03

SIGNALS

Extend Yellow and All Red Time

Extending yellow and all red time increases the time allotted for the yellow and red lights during a signal phase. Extending yellow and all red time improves safety by allowing drivers and bicyclists to safely cross through a signalized intersection before conflicting traffic movements are permitted to enter the intersection.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S03

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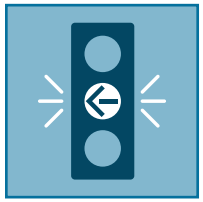
SIGNALS

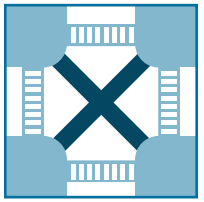


Flashing Yellow Turn Phase

Flashing yellow turn arrow alerts drivers to proceed with caution and decide if there is a sufficient gap in oncoming traffic to safely make a turn. To be used only when a pedestrian walk phase is not called. Protected-only phases should be used when pedestrians are present.

Cost: $$

SIGNALS



Pedestrian Scramble

A form of pedestrian “WALK” phase at a signalized intersection in which all vehicular traffic is required to stop, allowing pedestrians to safely cross through the intersection in any direction, including diagonally.

Cost: $

LRSM ID: S03

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SIGNALS

Prohibit Left Turn

Prohibitions of left turns at locations where a turning vehicle may conflict with pedestrians in the crosswalk or where opposing traffic volume is high. Reduces pedestrian interaction with vehicles when crossing.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S15/NS16

SIGNALS

Prohibit Turns During Pedestrian Phase

Restricts left or right turns during the pedestrian crossing phase at locations where a turning vehicle may conflict with pedestrians in the crosswalk. This restriction may be displayed with a blank-out sign.

Cost: $

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SIGNALS

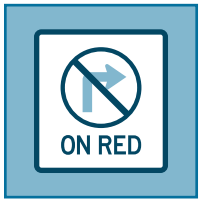
Protected Left Turns

A protected left turn can be implemented at signalized intersections (with existing left turns pockets) that currently have a permissive left-turn or no left-turn protection that have a high frequency of angle crashes involving left turning, opposing through vehicles, and non-motorized road users. Left turns are widely recognized as the highest-risk movements at signalized intersections. Providing protected left-turn phases for signalized intersections significantly improve the safety for left-turn maneuvers by removing the need for the drivers to navigate through gaps in oncoming/opposing through vehicles.

Cost: $$

LRSM ID: S06/S07

SIGNALS



Prohibit Right-Turn-on-Red

Prohibiting right-run-on-red movements should be considered at skewed intersections, or where exclusive pedestrian "WALK" phases, Leading Pedestrian Intervals (LPIs), sight distance issues, or high pedestrian volumes are present. Can help prevent crashes between vehicles turning right on red from one street and through vehicles on the cross street, and crashes involving pedestrians.

Cost: $

Low Cost / Quick Build alternative available

Other Reference Information

Currently the CMF Clearinghouse does not include specific studies; however, permitting right-turns-on-red shows an increase in ped/vehicle crashes. Additional information is available at the FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=49

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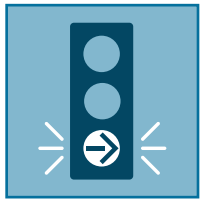
SIGNALS



Separate Right-Turn Phasing

Provides a green arrow phase for right-turning vehicles. Avoids conflicts between right-turning traffic and bicyclists or pedestrians crossing the intersection on their right.

Cost: $$$

Other Reference Information

(1) Evaluation of Pedestrian-Related Roadway Measures, Pedestrian and Bicycle Information Center, 2014. http://www.pedbikeinfo.org/cms/downloads/PedestrianLitReview_April2014.pdf (2) FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

SIGNALS

Shorten Cycle Length

Traffic signal cycle lengths have a significant impact on the quality of the urban realm and consequently, the opportunities for bicyclists, pedestrians, and transit vehicles to operate safely along a corridor. Long signal cycles, compounded over multiple intersections, can make crossing a street or walking even a short distance prohibitive and frustrating. Short cycle lengths of 60–90 seconds are ideal for urban areas.

Cost: $

Low Cost / Quick Build alternative available

Other Reference Information

FHWA Pedestrian Safety Guide and Countermeasure Selection System. http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=45

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SIGNALS

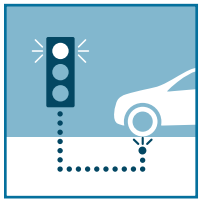
Signal Interconnectivity and Coordination / Green Wave

Certain timing, phasing, and control strategies can produce multiple safety benefits. Sometimes capacity improvements come along with the safety improvements and other times adverse effects on delay or capacity occur. The emphasis of improving signal coordination for this countermeasure is to provide an opportunity for slow speed signal coordination. Coordinating signals to allow for bicyclist progression, also known as a 'green wave,' gives bicyclists and pedestrians more time to safely cross through the 'green wave' intersections.

Cost: $$

LRSM ID: S03

SIGNALS



Speed Sensitive Rest in Red Signal

At certain hours (e.g. late night) a signal remains red for all approaches or certain approaches until a vehicle arrives at the intersection. If the vehicle is going faster than the desired speed, the signal will not turn green until after vehicle stops. If the vehicle is going the desired speed the signal will change to green before the vehicle arrives. This signal timing provides operational benefit to drivers traveling at the desired speed limit. Can be paired with variable speed warning signs.

Cost: $$

LRSM ID: R26

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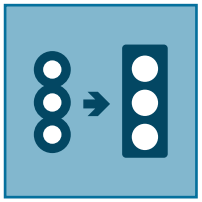
SIGNALS



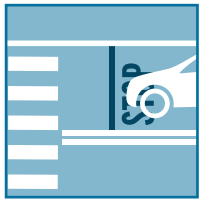
Upgrade Signal Head

Upgrading Signal Heads replaces existing 8-inch signal heads with 12-inch signal heads to comply with the California MUTCD's 2014 guidelines. Upgrading signal heads improves safety by providing better visibility of intersection signals and by aiding drivers' advanced perception of upcoming intersections.

Cost: $

LRSM ID: S02

SIGNING & STRIPING



Advance Stop Bar

An advanced stop bar is a horizontal stripe painted ahead of the crosswalk at stop signs and signals to indicate where drivers should stop. An advanced stop bar improves safety by reducing instances of vehicles encroaching on the crosswalk. Creating a wider stop bar or setting the stop bar further back may be appropriate for locations with known crosswalk encroachment issues.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S20PB

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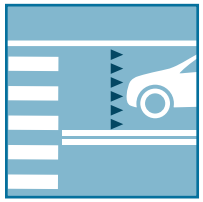
SIGNING & STRIPING



Advance Yield Markings

Yield lines are placed 20 to 50 feet in advance of multi-lane pedestrian crossings to increase visibility of pedestrians. They can reduce the likelihood of a multiple-threat crash.

Cost: $

Low Cost / Quick Build alternative available

SIGNING & STRIPING

Curve Advance Warning Sign

A curve advance warning sign notifies drivers of an approaching curve and may include an advisory speed limit as drivers navigate around the curve. This warning sign is ideally combined with other infrastructure that alerts drivers of the curve, such as chevron signs, delineators, and flashing beacons. A curve advance warning sign improves safety by giving drivers additional time to slow down for the curve.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: R24

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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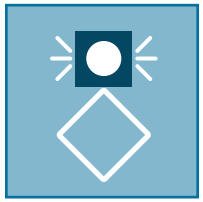
SIGNING & STRIPING



Flashing Beacon as Advance Warning

A flashing beacon as Advanced Warning is a blinking light with signage to notify motorists of an upcoming intersection or crosswalk. A flashing beacon improves safety by providing motorists more time to be aware of and slow down for an intersection or yield to pedestrians crossing a crosswalk.

Cost: $$

LRSM ID: S10

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

SIGNING & STRIPING

Chevron Signs on Horizontal Curves

Post-mounted chevrons are intended to warn drivers of an approaching curve and provide tracking information and guidance to the drivers. They can be beneficial on roadways that have an unacceptable level of crashes on relatively sharp curves during periods of light and darkness.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: R23

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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SIGNING & STRIPING

LED-Enhanced Sign

An LED-Enhanced Sign has LED lights embedded in the sign to outline the sign itself or the words and symbols on the sign. The LEDs may be set to flash or operate in a steady mode. An LED-enhanced sign improves safety by improving the visibility of signs at locations with visibility limitations or with a documented history of drivers failing to see or obey the sign (e.g. at STOP signs).

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: NS08

SIGNING & STRIPING

Painted Centerline and Raised Pavement Markers at Curves on Residential Streets

A raised pavement marker is a small device attached to the road and used as a positioning guide for drivers.

Cost: $

Low Cost / Quick Build alternative available

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SIGNING & STRIPING

Speed Feedback Sign

A speed feedback sign notifies drivers of their current speed, usually followed by a reminder of the posted speed limit. A speed feedback sign improves safety by providing a cue for drivers to check their speed and slow down, if necessary.

Cost: $

Low Cost / Quick Build alternative available

SIGNING & STRIPING

Speed Legends on Pavement at Neighborhood Entries

Speed legends are numerals painted on the roadway indicating the current speed limit in miles per hour. They are usually placed near speed limit signposts.

Cost: $

Low Cost / Quick Build alternative available

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SIGNING & STRIPING

Striping Through Intersection

Adding clear pavement markings can guide motorists through complex intersections. Intersections where the lane designations are not clearly visible to approaching motorists and/or intersections noted as being complex and experiencing crashes that could be attributed to a driver's unsuccessful attempt to navigate the intersection can benefit from this treatment.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: S09

SIGNING & STRIPING

Time-Based Turn Restriction

Restricts left-turns or right-turns during certain time periods when there may be increased potential for conflict (e.g., peak periods, school hours).

Cost: $

Low Cost / Quick Build alternative available

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SIGNING & STRIPING

Upgrade Intersection Pavement Markings

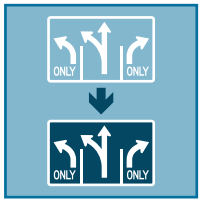
Upgrading intersection pavement marking can include "Stop Ahead" markings and the addition of centerlines and stop bars. Upgrading intersection pavement markings can improve safety by increasing the visibility of intersections for drivers approaching and at the intersection.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: NS07

SIGNING & STRIPING



Upgrade Signs with Fluorescent Sheeting

Upgrading signs with fluorescent sheeting replaces existing signs with new signs that can clearly display warnings by reflecting headlamp light back to vehicles. Upgrading signs with fluorescent sheeting improves safety by increasing visibility of signs to drivers at night.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: R22

Other Reference Information

FHWA Manual for Selecting Safety Improvements on High Risk Rural Roads

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SIGNING & STRIPING

Upgrade Striping

Restripe lanes with reflective striping to improve striping visibility and clarify lane assignment, especially where the number of lanes changes.

Cost: $

Low Cost / Quick Build alternative available

SIGNING & STRIPING

Upgrade to Larger Warning Signs

Upgrading to larger warning signs replaces existing signs with physically larger signs with larger warning information. Upgrading to larger warning signs improves safety by increasing visibility of the information provided, particularly for older drivers.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: NS06

→ Back to Index

SIGNING & STRIPING

Wayfinding

A network of signs that highlight nearby pedestrian and bicycle facilities. Can help to reduce crossings at locations with poor sight distance or limited crossing enhancements.

Cost: $

SIGNING & STRIPING

Yield To Pedestrians Sign

"Yield Here to Pedestrians" signs alert drivers about the presence of pedestrians. These signs are required with advance yield lines. Other sign types can be placed on the centerline in the roadway.

Cost: $

Low Cost / Quick Build alternative available

LRSM ID: NS06

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NON-ENGINEERING: BETTER DATA

Improve Crash Data Collection

Improve the accuracy, breadth, and consistency of crash data by creating a near-miss and unreported crash database, developing a standardized electronic reporting form for all crashes, forming agreements with shared mobility operators to acquire crash data, and/or creating a multi-jurisdiction crash database that can be updated by paramedics, police, City staff, and hospitals.

Non-Engineering Countermeasure

NON-ENGINEERING: EDUCATION

Bicycle Safety Education Events

Partner with local bike shops and other partners to host events/fairs to educate residents on bicycle safety. For example, host rides to introduce residents to new bicycle facilities as they are opened; offer tune ups at safety fairs.

Non-Engineering Countermeasure

→ Back to Index

NON-ENGINEERING: EDUCATION

Youth Education

Launch a countywide transportation safety education campaign targeting youth that covers a wide range of topics, such as alcohol and drug impairment, speeding, and potentially distracted driving. Local schools can also be partners in promoting safe driver behavior during school pick-up and drop offs. Educational campaigns that involve both students and parents can be more impactful as they involve parents, who are actually driving, and students, who may not only remind their parents but also retain safe driving behavior if they eventually drive.

Non-Engineering Countermeasure

NON-ENGINEERING: EDUCATION

Education Campaigns for Vulnerable Groups

Launch targeted public education campaigns for seniors, non-English speaking populations, or other vulnerable groups.

Non-Engineering Countermeasure

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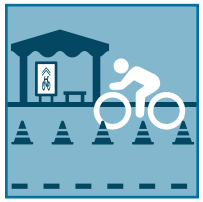
NON-ENGINEERING: EDUCATION



Pilot Demonstration Safety Projects

Implement pilot demonstration safety projects. Projects can either be implemented on a temporary basis (tactical urbanism) or permanent basis with room for modification (quick builds).

Non-Engineering Countermeasure

NON-ENGINEERING: EDUCATION

Public Information Campaigns

Launch public safety education campaigns. Example campaign topics include safe speeds, yielding to pedestrians, distracted driving, drinking and driving, awareness of bicyclists and pedestrians, appropriate crosswalk behavior, rail safety, moving over for EMS vehicles, etc. Campaigns may include yard signs, wall boards/posters in prime injury-corridor neighborhoods, ads on bus exteriors, radio ads, etc. Public education may also involve making safety and crash data publicly available on project websites, the local agency's data portal, social media, and other avenues as appropriate.

Non-Engineering Countermeasure

→ Back to Index

NON-ENGINEERING: MAINTENANCE

Keep Roadways Clear of Debris

A smoothly paved surface free of debris enhances safety for vehicles and bicyclists.

Non-Engineering Countermeasure

NON-ENGINEERING: PARTNERSHIPS

Safe Routes to School

Establish a Safe Routes to School (SRTS) program in partnership with school districts.

Non-Engineering Countermeasure

→ Back to Index

NON-ENGINEERING: POLICIES AND PROGRAMS

Update City Policies and Standards

Update policies, standards, and guidelines on topics such as signal timing, street design, street lighting, complete streets, and pedestrian crossings to incorporate current best practices and improve safety for all modes.

Non-Engineering Countermeasure

NON-ENGINEERING: POLICIES AND PROGRAMS

Neighborhood Slow Zones

Develop a neighborhood slow zone program to allow neighborhoods to request treatments to slow motor vehicles to 15 to 20 mph using traffic calming features, signs, and markings. Selected locations are typically in areas serving children, seniors, public transit users, commercial activity, and pedestrian/bicycle activity.

Non-Engineering Countermeasure

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NON-ENGINEERING: POLICIES AND PROGRAMS

Targeted Enforcement and Deterrence

When developing a program of targeted enforcement and deterrence, use collision history and corridors on the High Injury Network as one criterion for where to concentrate enforcement efforts. Add extra patrols to look for distracted drivers as part of a statewide distracted driving campaign, with focus on where data indicates that the most traffic safety benefit can be realized. Implement deterrence policies that are highly visible, such as publicized sobriety checkpoints, saturation patrol, and other forms of high visibility enforcement that are effective for safety outcomes.

Non-Engineering Countermeasure

→ Back to Index

Appendix I: Final Prioritized Projects

LRSP Project #1:
Tukwila International Boulevard (S 152nd St to S 144th St)

Project Narrative

EXTENT	North of S 152nd St and south of S 144th St
TOTAL PROJECT COST OPINION	$4,347,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Commercial, institutional, and medium-density residential
CROSS SECTION	Two travel lanes in each direction, with a center turn lane and intermittent landscaped median
SPEED LIMIT	35 MPH
AADT	13,000
CRASH PATTERNS	143 crashes within the corridor between 2018 and 2022, including seven fatal or severe injury (KSI) crashes
PRIORTIZATION SCORING	The highest-ranking segment in this corridor is the southernmost block, north of 152nd St, which has a score of 2.93 (3.0 is the highest possible score). This segment has the highest score in the city.

Crash History Addressed

The following crash types resulted in KSI crashes and are listed in order of prevalence:

- **Pedestrian**: Any crash involving a pedestrian. Pedestrian crashes along Tukwila International Boulevard included two crashes where a vehicle traveling straight struck a pedestrian, and one where a vehicle turning right struck a pedestrian.
- **Angle**: Angle crashes involve a driver hitting another drive at an angle, or the "Angle (T)" WSDOT crash classification.[1]
- **Fixed object**: Any crash where one driver strikes a fixed object, usually at the side of the road.
- **From opposite direction – Head-on**: A crash occurring where vehicles traveling in opposite directions hit each other directly.

Proposed Countermeasures

A series of countermeasures were selected for Tukwila International Boulevard to address the most severe and common crash types. The countermeasures include corridor-wide measures and spot improvements at specific locations. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.

Proposed Tukwila International Blvd cross section

Corridor Improvements

- Extended **landscaped median** between S 152nd and S 150th Streets, S 150th and S 148th Streets, and S 148th and S 146th Streets. The landscaped median is proposed, in part, as access management, to limit left turn movements into driveways along the corridor.
- **Corridor access management** is proposed along the corridor at key driveways to reduce conflicts between vehicles, pedestrians, and bicyclists, and may be accomplished by closing or restricting access to those driveways.
- A **road diet** to one lane in each direction, with a **separated bike lane** along the corridor extent, is recommended. If a road diet is implemented, it should be applied further north of the project extent to S 140th Street. Left turn lanes will remain in the center at intersections. Proposed cost ranges in the below table reflect use of a concrete barrier, but bikeway separation materials may include materials such as flex posts and/or landscaping.
    - A road diet, and accompanying separated bike lane, is a longer-term solution that may be applied to the project pending safety efficacy of other countermeasures. Additional

[1] https://wsdot.wa.gov/sites/default/files/2022-01/NHFP-crash-data-dictionary.pdf

countermeasures and study applied to surrounding streets such as 42nd Ave S may be necessary to calm cut-through traffic.

Spot Improvements

- Raised **pedestrian refuge islands** allow for two-stage pedestrian crossings in the middle of long blocks, improving accessibility along the corridor. They are proposed at the following midblock locations:
    - Between S 150th and S 148th
    - Between S 148th and S 146th
- **Rectangular Rapid Flashing Beacons (**RRFBs) are proposed at the below locations. At each intersection, high visibility marked crosswalks with curb ramps should be added on each corner of the intersection to facilitate east-west crossings.
    - S 150th St
    - Between S 150th St and S 148th St
    - S 148th St
    - Between S 148th St and S 146th St
    - S 146th St
    - Between S 146th St and S 144th St
- **Curb Extensions** are proposed for the side street crossings to reduce the crossing distance for pedestrians. There is already a curb extension on the west side of S 150th St. Curb extensions are not proposed for crossing Tukwila International Boulevard, because those would conflict with the proposed bike lanes. Curb extensions are recommended at the following locations. If a corridor-wide lane reconfiguration is not advanced, curb extensions at these and additional locations may be used to narrow lanes and reduce turning speeds at intersections.
    - The east side of S 150th St
    - Both sides of S 148th St
    - Both sides of S 146th St
- **Floating Bus Islands** are proposed for the four existing bus stop locations on the corridor to enable the separated bike lanes to route behind the bus stop. These would require coordination with and concurrence of King County Metro.

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Active Mode Facilities			
Separated Bicycle Lanes	**Corridor**	**45%**	**$$$$**
Floating Bus Islands	**Spot**	**Not available**	**$$$**
Crossings and Signals			
Raised Refuge Islands	**Spot**	**32%**	**$$**
Curb Extensions and Ramps	**Spot**	**Not available**	**$$**
Rectangular Rapid Flashing Beacons (RRFBs)	**Spot**	**69%**	**$$$**
Other Road Design			
Access Control (via median)	**Corridor**	**35%**	**$$$$**
Landscaped Medians	**Corridor**	**35%**	**$$$$**
Road/Lane Diet	**Corridor**	**19-47%**	**$$$**
		Total Project Cost	**$$$$$**

Local Road Safety Project #1: Tukwila International Blvd (S 152nd St to S 144th St)

Crash Types

- Angle
- Rear End
- Pedestrian

Corridor-Wide Countermeasures:

- Separated Bike Lane
- Landscaped Median
- Corridor Access Management

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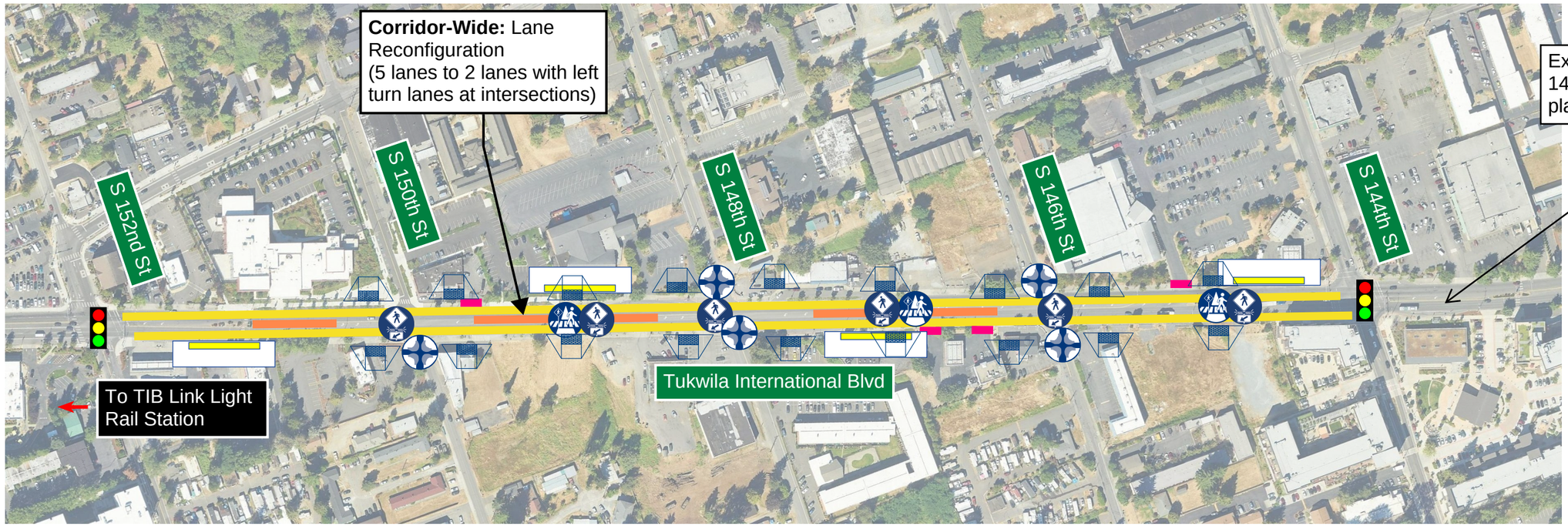
Spot Improvements:

- Curb Extension
- Rectangular Rapid Flashing Beacons
- Raised Refuge Islands
- Curb Ramp
- Floating Bus Island



Preliminary Opinion of Probable Construction Cost

City of Tukwila
Local Road Safety Plan
LRSP Project # 1: Tukwila International Blvd (S 152nd St to S 144th St)

Prepared By: Ryan O'Hara, PE, Toole Design
Date: 3/17/2025

Project Length 2800 FT 0.5 Miles

DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT
Mobilization (10%)	1	LS	$ 140,000	$ 140,000
Stormwater (15%)	1	LS	$ 210,000	$ 210,000
Maintenance of Traffic (10%)	1	LS	$ 140,000	$ 140,000
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 70,000	$ 70,000
Separated Bike Lane - With Concrete Barrier	0.5	MI	$ 610,000	$ 330,000
Landscaped Median Island$_3$	0.3	MI	$ 1,180,000	$ 300,000
Raised Pedestrian Refuge Island	2	EA	$ 10,000	$ 20,000
Curb Return (Extension) and Ramp	12	EA	$ 10,000	$ 120,000
Curb Ramp	6	EA	$ 5,200	$ 32,000
Floating Bus Island	4	EA	$ 51,000	$ 210,000
Rectangular Rapid Flashing Beacon (Solar)	6	EA	$ 60,000	$ 360,000
Subtotal				$ 1,932,000
Contingency (50%)				$ 966,000
Total Opinion of Probable Construction Costs				**$ 2,898,000**
Preliminary Engineering (25%)				$ 724,500
Construction Management (25%)				$ 724,500
Total Project Cost				**$ 4,347,000**

General Assumptions and Exclusions:

1. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.
2. Unit prices were developed from projects in western Washington in the past 5 years.
3. Landscaped Median Island does not include landscaping cost.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

LRSP Project #2: S 144th St (Military Rd to Tukwila International Blvd)

Project Narrative

EXTENT	Military Rd to Tukwila International Blvd
TOTAL PROJECT COST OPINION	$580,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Commercial and medium-density residential
CROSS SECTION	One travel lane in each direction, one striped bike lane in each direction, with a center turn lane between 37th Ave S and Tukwila International Blvd
SPEED LIMIT	30 MPH
AADT	Unknown
CRASH PATTERNS	44 crashes within the corridor between 2018 and 2022, including three fatal or severe injury (KSI) crashes
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 2.87 out of a maximum of 3.00.

Crash History Addressed

This segment of S 144th St saw three KSI crashes between 2018 and 2022. The collision factors for those were:

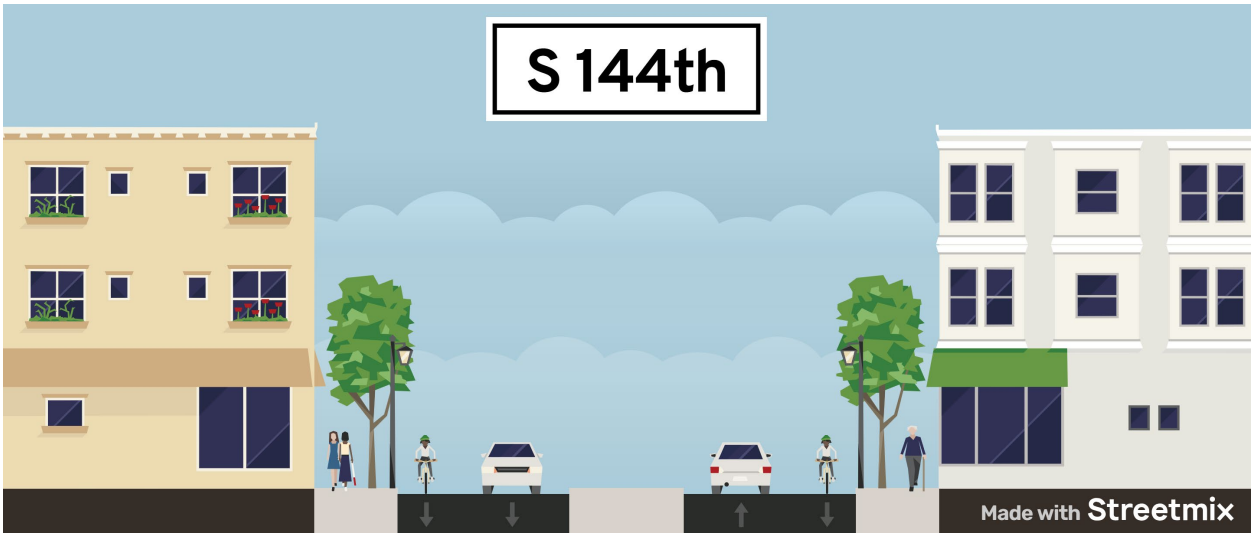
- **Pedestrian (2)**: Any crash involving a pedestrian. The pedestrian crash on S 144th was a vehicle striking a pedestrian while traveling straight.
- **Fixed object**: Any crash where one driver strikes a fixed object, usually at the side of the road.

Proposed Countermeasures

A series of countermeasures were selected for S 144th St to address the most severe and common crash types. In particular, many countermeasures focus on improving pedestrian connectivity along the street and creating safer crossings to the nearby residential buildings and commercial destinations. They also support access to the park at the corner of 37th Ave S.

The countermeasures include spot improvements at specific locations along the corridor. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.

Countermeasures were selected to address pedestrian collisions by creating new and more visible crossings that connect the destinations on this corridor (apartment buildings, Cascade View Community Park, local grocery and retail stores) and to calm vehicle speeds through medians and curb extensions.



Proposed S 144th St cross section, including pedestrian refuge (center)

Spot Improvements

- **Sidewalk improvements**, including rebuilding the sidewalk, gutter, and curb at The Samara Apartments 3434 S 144th Street where there is currently a large driveway at the east entrance. Limiting the extent of area the driveway that crosses the sidewalk would reduce pedestrian exposure to drivers using the driveway of that apartment complex and improve the predictability of pedestrian-driver interactions.
- Installation of two new mid-block crossings would improve pedestrian access and connectivity across the long block in the middle of the corridor. Each would include a **rectangular rapid flashing beacon** (RRFB) to alert cross-traffic of pedestrians crossing here. These are proposed at:
    - 34th Ln S
    - Between 37th Ave S and Tukwila International Blvd, at the parking lot entrance
- A raised **pedestrian refuge island** would be placed at two locations to allow a two-stage crossing for pedestrians and further calm traffic.
    - 37th Ave S, on the western leg
    - At the proposed midblock crossing between 37th Ave S and Tukwila International Blvd

- **Curb extensions** are proposed at the intersection of 37th Ave S and S 144th St, to reduce crossing distances and calm turning vehicles.

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Crossings and Signals			
Raised Refuge Islands	**Spot**	**32%**	**$$**
Rectangular Rapid Flashing Beacons (RRFBs)	**Spot**	**69%**	**$$**
Curb Extensions and Ramps	**Spot**	**Not available**	**$$**
Other Road Design			
Rebuild Sidewalk Curb and Gutter	**Spot**	**Not available**	**$$**
		Total Cost	**$$$$**

Local Road Safety Project #2: S 144th St (Military Rd S to Tukwila International Blvd)

Crash Types

- Angle
- Rear End
- Pedestrian

Corridor-Wide Countermeasures:

Sidewalk

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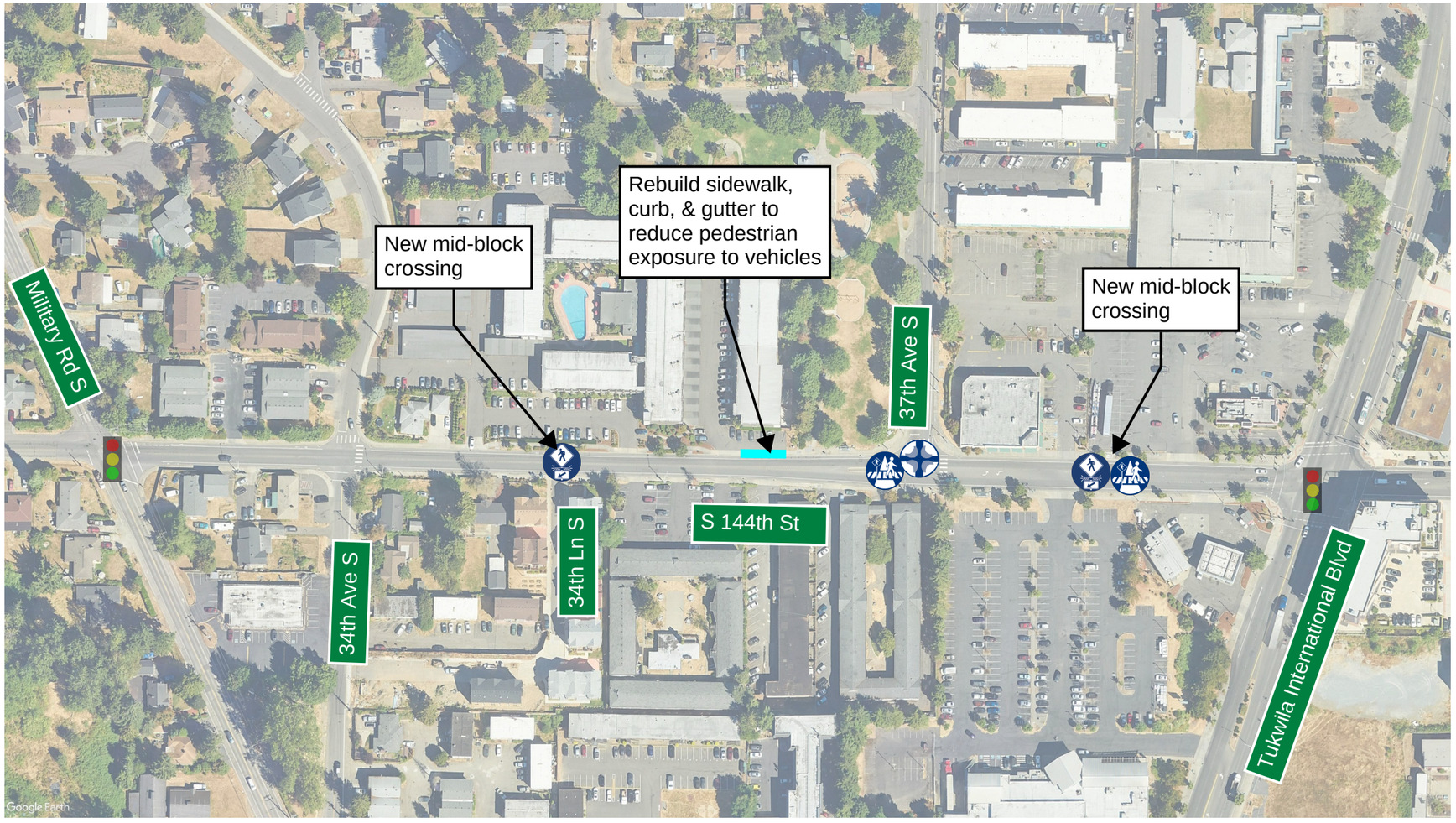
Spot Improvements:

Curb Extension

Rectangular Rapid Flashing Beacons

Raised Refuge Islands



Preliminary Opinion of Probable Construction Cost

Prepared By: Ryan O'Hara, PE, Toole Design

City of Tukwila

Local Road Safety Plan

Date: 3/17/2025

LRSP Project #2: S 144th St (Military Rd to Tukwila International Blvd)

Project Length 1200 FT 0.2 Miles

TREATMENT	QTY	UNIT	UNIT PRICE	COST
Mobilization (5%)	1	LS	$ 9,900	$ 9,900
Stormwater (15%)	1	LS	$ 29,700	$ 29,700
Maintenance of Traffic (5%)	1	LS	$ 9,900	$ 9,900
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 9,900	$ 9,900
Rectangular Rapid Flashing Beacon (Solar)	2	EA	$ 60,000	$ 120,000
Curb Return (Extension) and Ramp	4	EA	$ 10,000	$ 40,000
Rebuild Sidewalk Curb and Gutter	60	LF	$ 300	$ 18,000
Landscaped Median Island$_5$	2	EA	$ 10,000	$ 20,000
Subtotal				$ 257,400
Contingency (50%)				$ 128,700
Total Opinion of Probable Construction Costs				**$ 386,100**
Preliminary Engineering (25%)				$ 96,525
Construction Management (25%)				$ 96,525
Total Project Cost				**$ 580,000**

General Assumptions and Exclusions:

1. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.
2. Unit prices were developed from projects in western Washington in the past 5 years.
3. Landscaped Median Island does not include landscaping cost.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

LRSP Project #3:
Andover Park W (Strander Blvd to Tukwila Pkwy)

Project Narrative

EXTENT	North of Strander Blvd, south of Tukwila Pkwy
TOTAL PROJECT COST OPINION	$923,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Commercial, retail and parking
CROSS SECTION	Two travel lanes in each direction, with a center turn lane and intermittent landscaped median
SPEED LIMIT	30 MPH
AADT	14,000
CRASH PATTERNS	74 crashes between 2018 and 2022, two of which were fatal or severe injury (KSI) crashes
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 2.8 out of a maximum of 3.00. This corridor experienced 74 crashes between 2018 and 2022.

Crash History Addressed

This portion of Andover Park W experienced two KSI crashes between 2018 and 2022. The collision factors for those were:

- **Angle Crash**: Angle crashes involve a driver hitting another vehicle at an angle, or the "Angle (T)" WSDOT crash classification.[1]
- **From opposite direction, left turn**: A collision where one driver is traveling straight and the other driver is turning left. This may occur where a driver is attempting to turn into a driveway or side street.

Along Andover Park W, half of crashes were related to an intersection, and 35% took place at driveways.

Proposed Countermeasures

Countermeasures selected seek to address turning-related collisions by enhancing intersections and managing locations of turning conflicts. The countermeasures include corridor-wide measures and spot improvements at specific locations. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.

Countermeasures also build upon transit needs on the corridor and improve pedestrian access from the street to nearby retail destinations. They also address the long block lengths (over 1,000 feet) between controlled crossings.

Proposed Andover Park W cross-section

Corridor Improvements

- **Driveway access management** along the corridor would reduce conflicts by limiting left turns out of all parking lot driveways via extended center median, below. For most driveways, this would reinforce and formalize existing signed limitations. Where not existing currently, new signage would be added. To increase compliance, the intersection of Baker Blvd should be evaluated to allow (with signage) U-turns, reducing the need for left turns from driveways.
    - Access management countermeasures will need to be evaluated to ensure changes do not disrupt access needs of Fire Department and Emergency Medical Services (EMS), particularly to bypass traffic via the median. This also applies to the below countermeasure.

[1] https://wsdot.wa.gov/sites/default/files/2022-01/NHFP-crash-data-dictionary.pdf

- **Extending the landscaped center median** at key locations would limit left turns off Andover Park W into parking lots, reducing conflicts with opposite direction traffic.
- A road diet would create space for **bus lanes** along this corridor, serving the regional bus stops at Baker Blvd and Andover Park W. The lane reconfiguration would reduce Andover Park by one vehicle travel lane in each direction.

Spot Improvements

- Signal timing revision for westbound left turns to **protected-only left turn phasing**, from existing protected/permissive phasing, at the intersection of Andover Park and Tukwila Parkway would reduce conflicts between people crossing and traffic turning left.
- Installation of two new mid-block crossings would improve pedestrian access and connectivity along Andover Park's long blocks. Each would include a **rectangular rapid flashing beacon** (RRFB) to alert cross-traffic of pedestrians crossing here. They would also utilize the extended landscaped median as pedestrian refuges to facilitate two-stage crossings. These are proposed at:
    - Westfield Southcenter driveway south of Firestone building, north of Strander Blvd
    - Park West shopping center driveway, north of Baker Blvd
- **Curb extensions** are proposed at the southern midblock crossing location, adjacent to the Firestone building, to calm turning traffic speeds and improve visibility at the driveway.

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Corridor Access Management	**Systemic**	**25-31%**	**$$**
Crossings and Signals			
Raised Refuge Islands	**Spot**	**32%**	**$$**
Rectangular Rapid Flashing Beacons (RRFBs)	**Spot**	**69%**	**$$$**
Curb Extensions	**Spot**	**Not available**	**$$**
Protected Left Phase Signal Conversion	**Spot**	**33%**	**$$**
Other Road Design			
Access Control (via asphalt or mountable median)	**Corridor**	**35%**	**$$**
Landscaped Median Island Extension	**Corridor**	**35%**	**$$**
Bus Lanes	**Corridor**	**Not available**	**$$$**
		Total Cost	**$$$$**

Local Road Safety Project #3: Andover Park W (Tukwila Parkway to Strander Blvd)

Crash Types

- Left turn
- Rear end
- Pedestrian

Corridor-Wide Countermeasures:

- Protected Bike Lane
- Landscaped Median
- Driveway Access Management
- Shared Use Path
- Bus ONLY Lane

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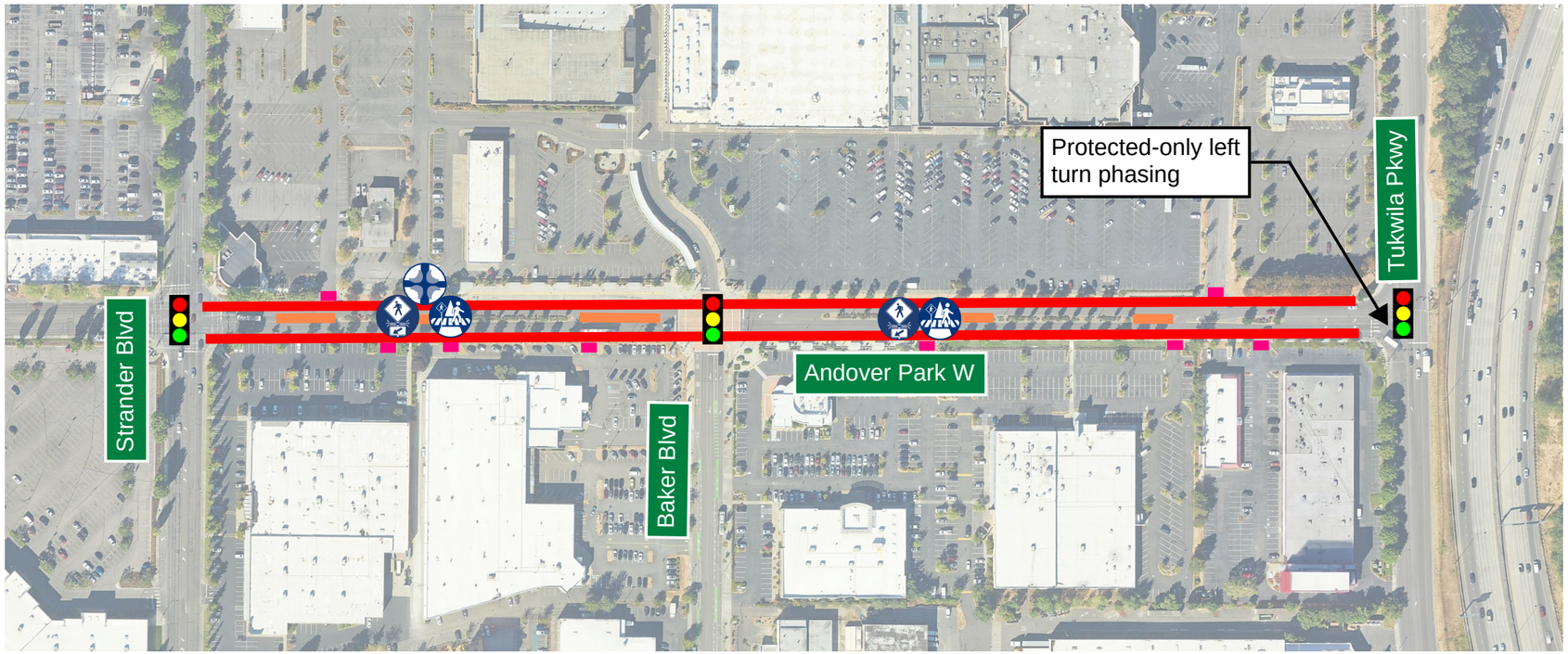
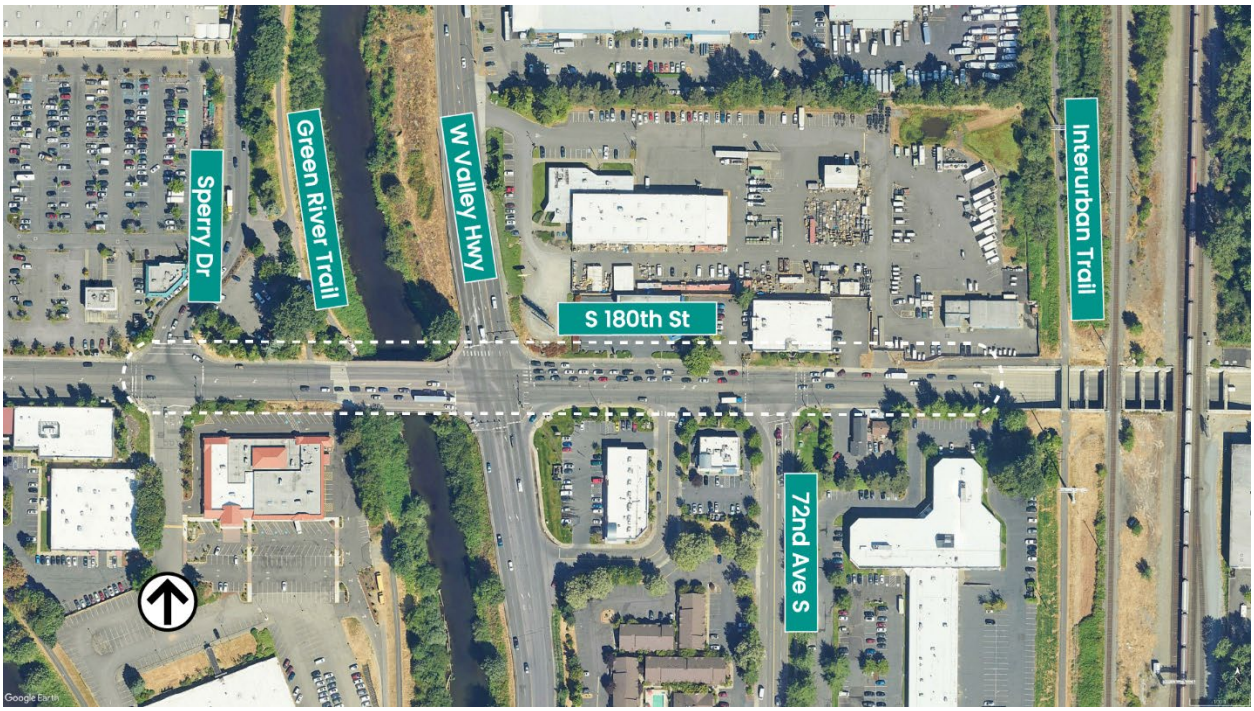
Spot Improvements:

- Curb Extension
- Rectangular Rapid Flashing Beacons
- Raised Refuge Islands



LRSP Project #4:
S 180th Street (Sperry Drive to Interurban Trail)



Project Narrative

EXTENT	Sperry Dr to Interurban Trail
TOTAL PROJECT COST OPINION	$806,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Commercial and retail
CROSS SECTION	Two travel lanes in each direction, with a center turn lane. At Valley Hwy, eastbound 180th gains a dedicated right turn lane.
SPEED LIMIT	35 MPH
AADT	15,000
CRASH PATTERNS	This segment of 180th experienced 76 crashes between 2018 and 2022, including three KSI crashes. All KSI crashes involved vulnerable road users (bicyclists and pedestrians).
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 2.73 out of a maximum of 3.00, in part due to high scores from vulnerable road user crashes and proximity to destinations.

Crash History Addressed

This portion of S 180th Street experienced three KSI crashes between 2018 and 2022. The collision factors for those were:

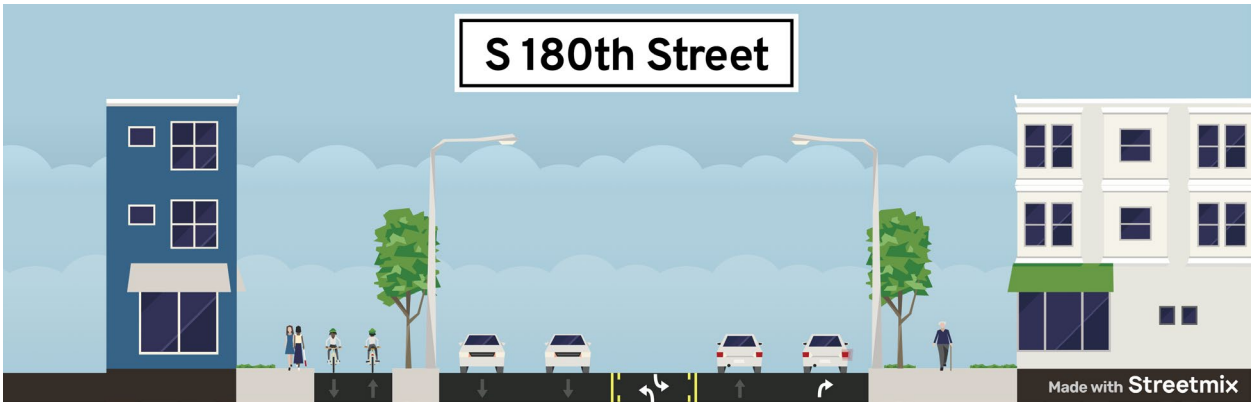
- **Pedestrian-involved collision (2)**: Any collision involving a driver striking a pedestrian.
- **Bicyclist-involved collision**: Any collision involving a driver striking a bicyclist.

Other prevalent crash types included angle crashes, rear end crashes, and sideswipe. The majority of crashes (88%) were related to intersections.

Proposed Countermeasures

Countermeasures proposed for S 180th Street focus on addressing vulnerable road user needs in the short corridor. As 180th connects two regional trails, the Green River Trail on the east and Interurban Trail on the east, a connection is proposed to reduce pedestrian and bicyclist exposure to traffic. Future coordination with the City of Renton to the east of the project extents could improve access by connecting to a third trail about 500 feet to the east, the Springbrook Trail.

The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.



Proposed S 180th Street cross section, looking east

Corridor Improvements

- A **shared use path** is proposed along a portion of this corridor, between W Valley Hwy and 200 feet west of the Interurban Trail to improve safety of both and bicyclists along this corridor. The path would connect the two trail access points. The path is recommended for the northern side of the street, widening the sidewalk south, utilizing right-of-way from reduced lane widths along that segment. Wayfinding signs would support connections between the Green River and Interurban Trails.
    - Lane width reductions should be evaluated for feasibility given freight truck volumes along this segment.

Spot Improvements

- **"No turn on red"** restrictions are proposed for southbound and westbound approaches to Sperry Dr, as a method of reducing conflicts between turning drivers and pedestrians and bicyclists crossing Sperry or 180th to access the Green River Trail and the proposed shared use path.
    - **"No turn on red"** restrictions are also proposed for the west approach of the intersection of W Valley Highway, to limit conflicts between shared use path users and turning vehicles.
- Rebuilding of curb returns to reduce the curb radii would slow turning vehicle speeds and improve pedestrian safety and motor vehicle safety along the corridor at these locations:
    - W Valley Hwy
    - 71st Avenue S
    - 72nd Avenue S

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Crossings and Signals			
No Turn on Red Restriction	**Spot**	**Not available**	**$**
Active Transportation			
Shared Use Path	**Corridor**	**25% (bike crashes)**	**$$$**
		Total Cost	**$$$$**

Local Road Safety Project #4: S 180th ST (Sperry Dr to Interurban Tr)

Crash Types

- Angle
- Rear end
- Pedestrian

Corridor-Wide Countermeasures:

- Shared Use Path
- Road Diet

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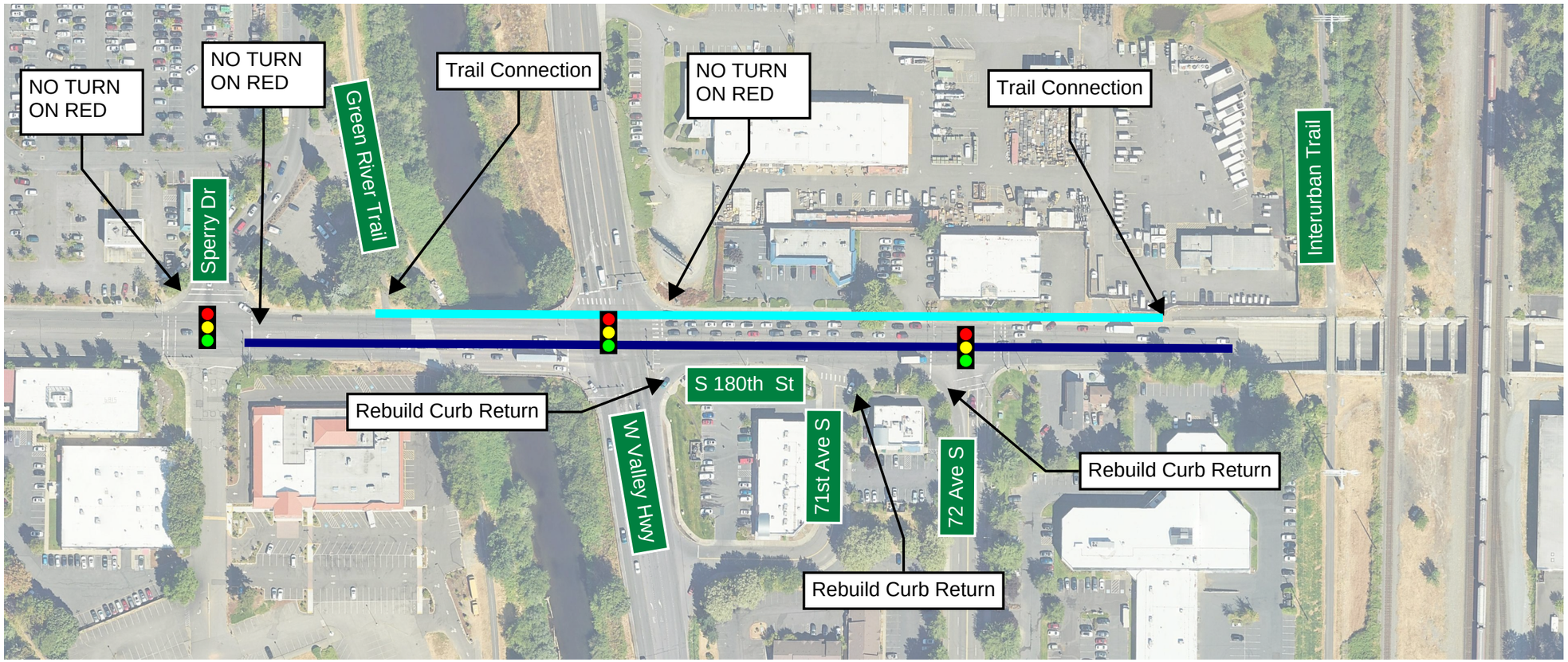
Spot Improvements:

- Rectangular Rapid Flashing Beacons
- Raised Refuge Islands



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Preliminary Opinion of Probable Construction Cost

Prepared By: Ryan O'Hara, PE, Toole Design

City of Tukwila

Local Road Safety Plan

Date: 3/17/2025

LRSP #4: S 180th ST (Sperry Dr to Interurban Tr)

Project Length 1000 FT 0.2 Miles

TREATMENT	QTY	UNIT	UNIT PRICE	COST
Mobilization (5%)	1	LS	$ 14,000	$ 14,000
Stormwater (15%)	1	LS	$ 42,000	$ 42,000
Maintenance of Traffic (5%)	1	LS	$ 14,000	$ 14,000
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 14,000	$ 14,000
Shared-Use Path	0.2	MI	$ 1,100,000	$ 220,000
Rebuild Curb Return	3	EA	$ 10,000	$ 30,000
Wayfinding Sign	6	EA	$ 500	$ 3,000
Sign, Traffic, Pole Mounted	3	EA	$ 400	$ 1,200
Remove Paint Striping	4000	LF	$ 2	$ 8,000
Paint Line, 4 In Stripe	2000	LF	$ 4	$ 8,000
Remove Traffic Arrow	10	EA	$ 200	$ 2,000
Plastic Traffic Arrow	10	EA	$ 200	$ 2,000
Subtotal				$ 358,200
Contingency (50%)				$ 179,100
Total Opinion of Probable Construction Costs				**$ 537,300**
Preliminary Engineering (25%)				$ 134,325
Construction Management (25%)				$ 134,325
Total Project Cost				**$ 806,000**

General Assumptions and Exclusions:

1. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.
2. Unit prices were developed from projects in western Washington in the past 5 years.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

LRSP Project #5:
Interurban Avenue (140th Street to 144th Street)

Project Narrative

EXTENT	140th St to 144th St
TOTAL PROJECT COST OPINION	$1,484,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Office, commercial, institutional, and residential
CROSS SECTION	Two travel lanes in each direction, with a center turn lane
SPEED LIMIT	35 MPH
AADT	17,000
CRASH PATTERNS	23 crashes within the corridor between 2018 and 2022, including three fatal or severe injury (KSI) crashes
PRIORTIZATION SCORING	The highest-scoring segment of this corridor was 2.7 out of 3.0. Interurban Ave scored highly on vulnerable road user crashes and proximity to destinations.

Crash History Addressed

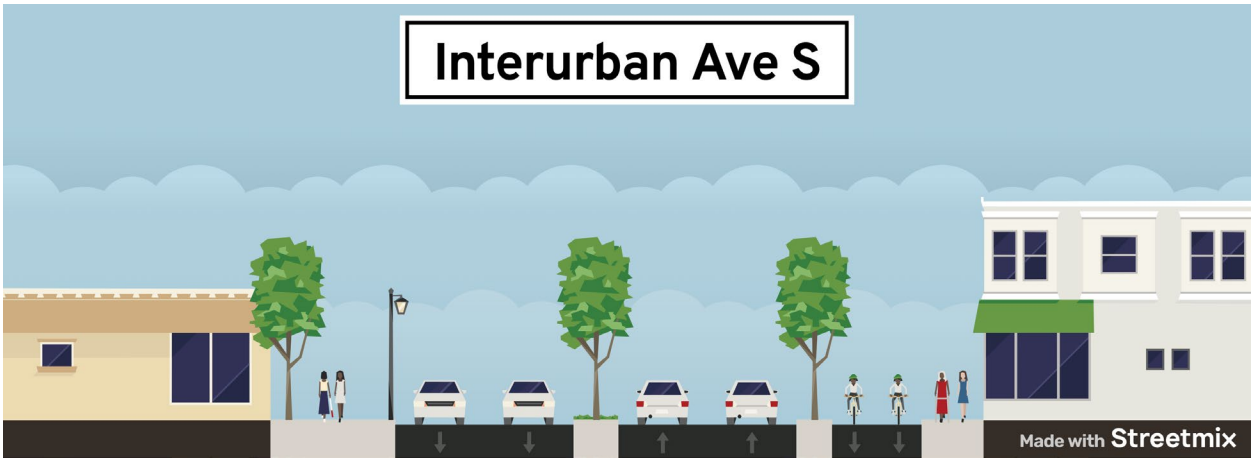
The following crash types resulted in KSI crashes:

- **Pedestrian**: Any crash involving a pedestrian.
- **Angle**: Angle crashes involve a driver hitting another motor vehicle at an angle, or the "Angle (T)" WSDOT crash classification.[1]
- **From opposite direction – Head-on**: A crash occurring where vehicles traveling in opposite directions hit each other directly.

Proposed Countermeasures

A series of countermeasures were selected for Interurban Ave to address the most severe and common crash types. Key interventions address pedestrian connectivity and the high instance of angle crashes from driveways of local businesses and minor street intersections. They also support users of the Green River Trail in this corridor, which runs along the eastern side of Interurban Avenue from Interstate 5 to 58th Ave S.

The countermeasures include corridor-wide measures and spot improvements at specific locations. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.



Proposed cross section of Interurban Ave S, looking north

Corridor Improvements

- Two segments of **landscaped median** would extend the treatment present from south of this corridor's extent into this commercial and retail area. The median would limit turning conflicts by limiting left turns into some driveways, restricting conditions that create some angle crashes. Further study may be required to determine regarding if allowing u-turns at signalized intersections may be necessary to accommodate travel pattern changes. The median would be added at these locations:
    - Between 57th Ave S and S 141st Pl
    - Between 141st Pl S and S 143rd St

[1] https://wsdot.wa.gov/sites/default/files/2022-01/NHFP-crash-data-dictionary.pdf

- Extending south beyond 143rd St, connecting to the existing median

Spot Improvements

- A **new pedestrian crossing** at S 140th St would reduce the long distances between marked crossings for pedestrians. Utilizing the proposed landscaped median, the crossing would have a **raised refuge** to allow pedestrians to cross in two stages. There would be a **Pedestrian Hybrid Beacon** (PHB) installed at this location to control cross-traffic along Interurban Ave S and allow pedestrians to cross.
- **Trail wayfinding** and **green conflict striping** is proposed for the intersection of Interurban Ave and 58th Ave. Conflict striping at the driveway of the Riverside Casino can make drivers more alert to the presence of people walking and bicycling along the trail. Further, wayfinding signage can reinforce for users that the trail runs along Interurban Ave at this location, and that south of the intersection it turns east towards the river.

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Active Mode Facilities			
Green Conflict Striping	**Spot**	**Not available**	**$**
Crossings and Signals			
Raised Refuge Islands	**Spot**	**32%**	**$$**
Pedestrian Hybrid Beacon Signal	**Spot**	**69%**	**$$$**
Other Road Design			
Landscaped Medians	**Corridor**	**35%**	**$$$$**
		Total Cost	**$$$$$**

Local Road Safety Project #5: Interurban Ave S (S 140th St to S 144th St)

Crash Types

- Angle
- Pedestrian

Corridor-Wide Countermeasures:

- Landscaped Median

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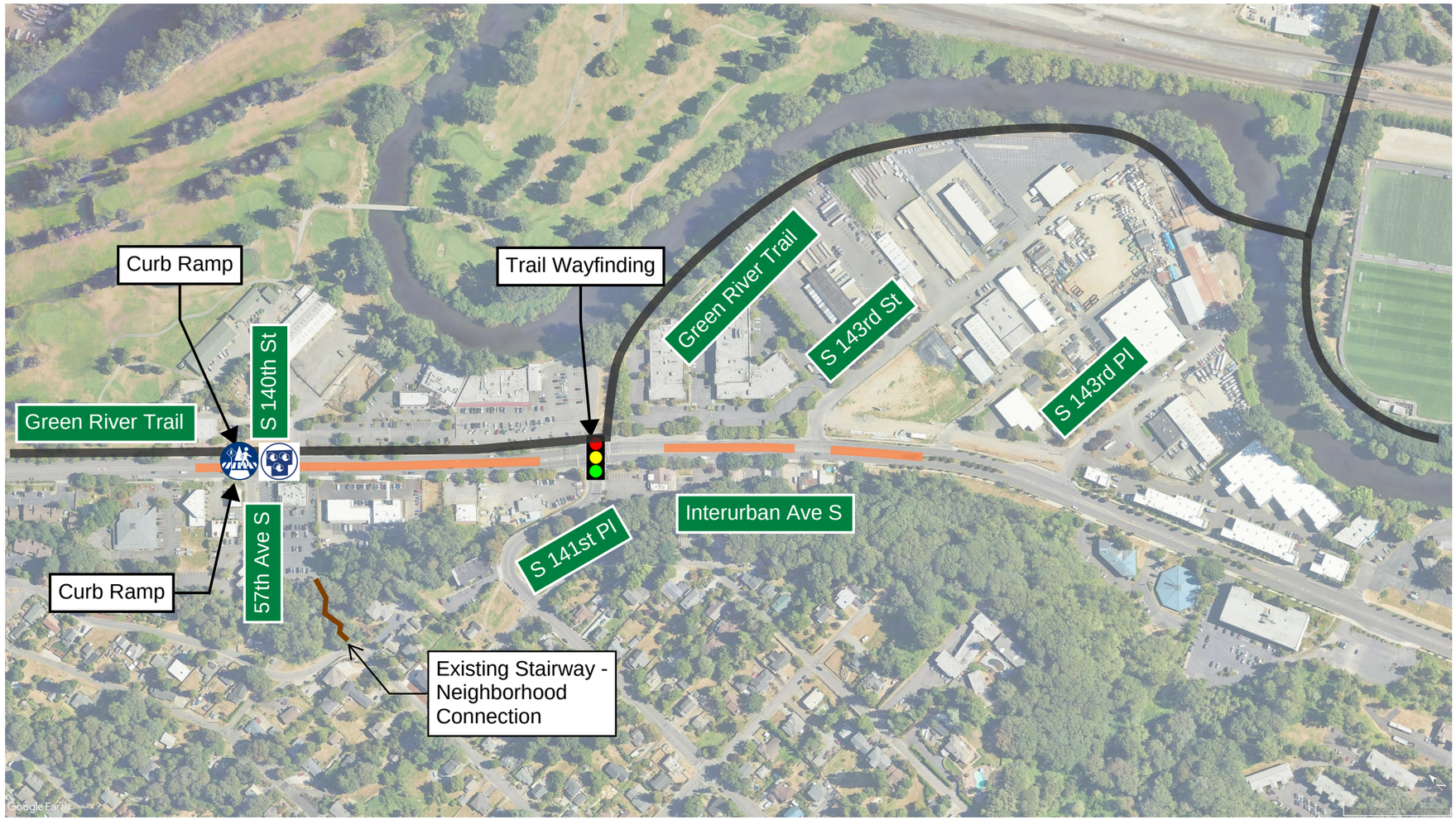
Spot Improvements:

- Pedestrian Hybrid Beacon (PHB)
- Raised Refuge Islands



Legend

- Existing Shared-Use Path
- Existing Trail

Preliminary Opinion of Probable Construction Cost

City of Tukwila
Local Road Safety Plan
LRSP #5: Interurban Ave S (S 140th St to S 144th St)

Prepared By: Ryan O'Hara, PE, Toole Design
Date: 3/17/2025

Project Length 2400 FT 0.5 Miles

TREATMENT	QTY	UNIT	UNIT PRICE	COST
Mobilization (5%)	1	LS	$ 26,000	$ 26,000
Stormwater (15%)	1	LS	$ 76,000	$ 76,000
Maintenance of Traffic (5%)	1	LS	$ 26,000	$ 26,000
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 26,000	$ 26,000
Landscaped Median Island$_3$	0.3	MI	$ 1,174,000	$ 353,000
Raised Pedestrian Refuge Island	1	EA	$ 10,000	$ 10,000
Hawk Signal	1	EA	$ 131,000	$ 131,000
Curb Ramp	2	EA	$ 5,200	$ 10,400
Trail Wayfinding Signs	2	EA	$ 500	$ 1,000
Subtotal				$ 659,400
Contingency (50%)				$ 329,700
Total Opinion of Probable Construction Costs				**$ 989,100**
Preliminary Engineering (25%)				$ 247,275
Construction Management (25%)				$ 247,275
Total Project Cost				**$ 1,484,000**

General Assumptions and Exclusions:

1. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.
2. Unit prices were developed from projects in western Washington in the past 5 years.
3. Landscaped Median Island does not include landscaping cost.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 35% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: easement and right-of-way acquisition; permitting, inspection, or construction management; engineering, surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, traffic control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

TE/LRSP Overlap Project #6:
E Marginal Way S (Northern City Limits to S Boeing Access Rd)

Project Narrative

EXTENT	Northern City Limits to S Boeing Access Rd
TOTAL PROJECT COST OPINION (ADDITIONAL SAFETY TREATMENTS)	$6,917,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Industrial
CROSS SECTION	Two travel lanes in each direction
CRASH PATTERNS	77 crashes within this corridor between 2018 and 2022, including five fatal or severe injury (KSI) crashes
SPEED LIMIT	35 MPH
AADT	12,000
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 1.62 out of a maximum of 3.00.

Crash History Addressed

Five KSI crashes occurred on this extent between 2018 and 2022. The collision factors for those were:

- **Fixed Object**: A crash involving a vehicle striking a stationary object outside of the roadway. For this crash, the object was recorded as a signal pole.

- **Rear-end:** Crashes involving two drivers traveling in the same direction, as one driver strikes the car in front.
- **Sideswipe:** Crashes involving two drivers traveling in the same direction, with one driver striking the vehicle next to them.
- **Rollover:** A crash in which a vehicle tips onto its side or roof due to a destabilizing force such as sliding or roadway departure. This KSI crash involved a motorcycle.

Along this segment of E Marginal Way S, 58% of crashes were related to intersection conditions.

Proposed Countermeasures

The Tukwila Transportation Element (TE) proposes an extension of a shared use path throughout this corridor. Additional countermeasures are recommended to address crashes relating to speeding and roadway departures (fixed object, rollover) as well as angle and pedestrian crashes at intersections. Today, a shared use path runs from the Museum of Flight south to S Norfolk Street on the east side of E Marginal Way S. Extension of this path north by widening the sidewalk will expand the low-stress bicycle network through its connection to the Green River Trail further south via painted bike lanes on Marginal Way beyond the corridor limits. It would also support connections to a proposed Sound Transit Link light rail station location at Boeing Access Road.

The countermeasures include corridor-wide measures and spot improvements at specific locations. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.

E Marginal Way proposed cross section, looking south

Corridor Improvements

- The sidewalk to the east side of E Marginal Way would be widened to become a **shared use path** as described in the Tukwila TE. This project would extend the shared use path from the Museum of Flight to the northern city limits.
- A **lane reconfiguration** would reduce E Marginal Way S from two to one general purpose lanes in each direction.
- The reconfiguration would create additional space for a **bus lane** along the corridor. Further study of LOS impacts and coordination with King County Metro should be considered to determine feasibility of this lane configuration. Conversion of general purpose lanes to bus lanes would limit potential conflicts for sideswipe and angle crashes for drivers.

Spot Improvements

Raised refuge islands are recommended at three locations to facilitate two-stage crossings, calm traffic by occupying the center lane, and better separate crossing pedestrians from vehicle traffic. Feasibility and placement of the islands should be coordinated with local stakeholders due to large-scale aviation transportation along the corridor.

- Between S 96th Place and Norfolk Street
- 8123 E Marginal Way
- South of 81st Place

Additionally, **Rectangular Rapid Flashing Beacons** (RRFBs) are proposed at the below locations. Pedestrian Hybrid Beacons may also be considered given At each intersection, high visibility marked crosswalks with curb ramps should be added on each corner of the intersection to facilitate east-west crossings.

- Between S 96th Place and Norfolk Street
- 8123 E Marginal Way

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Active Mode Facilities			
Shared Use Path	**Corridor**	**25% (vehicle-bicycle)**	**$$$$$**
Crossings and Signals			
Raised Refuge Islands	**Spot**	**32%**	**$$**
Rectangular Rapid Flashing Beacons (RRFBs)	**Spot**	**69%**	**$$$**
Other Road Design			
Bus Lanes	**Corridor**	**Not available**	**$$**
		Total Project Cost	**$$$$$**

TE Overlap Project #6: E Marginal Way S (7755 E Marginal Way S to S Boeing Access Rd)

Crash Types

- Angle
- Pedestrian

Corridor-Wide Countermeasures:

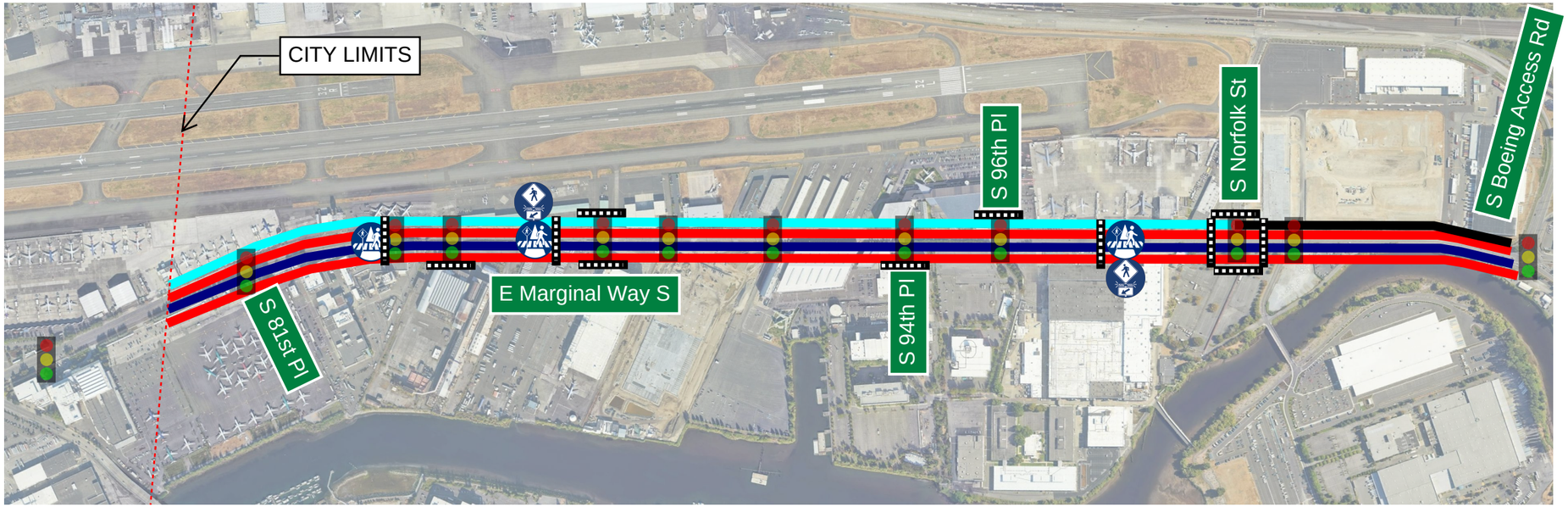
- Shared Use Path
- Bus Only Lane
- Road Diet

Spot Improvements:

- Raised Refuge Islands
- High Visibility Crosswalks
- Rapid Rectangular Flashing Beacon

Legend

- Existing Traffic Signal
- Existing Shared Use Path



Preliminary Opinion of Probable Construction Cost

Prepared By: Ryan O'Hara, PE,
Toole Design
Date: 4/2/2025

City of Tukwila
Local Road Safety Plan
TE Overlap Project #6: E Marginal Way Northern City Limit to S Boeing Access Rd)

The project costs identified below only include the additional safety elements. Refer to the TE for the baseline project cost information.

Project Length 10000 FT 1.9 Miles

TREATMENT	QTY	UNIT	UNIT PRICE	COST
Mobilization (10%)	1	LS	$ 220,000	$ 220,000
Stormwater (15%)	1	LS	$ 330,000	$ 330,000
Maintenance of Traffic (10%)	1	LS	$ 220,000	$ 220,000
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 110,000	$ 110,000
Shared-Use Path	1.5	MI	$ 1,100,000	$ 1,650,000
Bus Only Lane	1.9	MI	$ 170,000	$ 323,000
High Visibility Crosswalks	12	EA	$ 4,200	$ 50,400
Rectangular Rapid Flashing Beacon (Solar)	2	EA	$ 60,000	$ 120,000
Curb Ramp	4	EA	$ 5,200	$ 20,800
Raised Pedestrian Refuge Island	3	EA	$ 10,000	$ 30,000
Lump Sump Item Costs				$ 880,000
Total of Unit Items				$ 2,194,200
Subtotal				$ 3,074,200
Contingency (50%)				$ 1,537,100
Total Opinion of Probable Construction Costs				**$ 4,611,300**
Preliminary Engineering (25%)				$ 1,152,825
Construction Management (25%)				$ 1,152,825
Total Project Cost				**$ 6,917,000**

General Assumptions and Exclusions:

1. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.
2. Unit prices were developed from projects in western Washington in the past 5 years.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

TE/LRSP Overlap Project #7:
Southcenter Blvd (61st Ave S to 66th Ave S)

Project Narrative

EXTENT	61st Ave S to 66th Ave S
TOTAL PROJECT COST OPINION (ADDITIONAL SAFETY TREATMENTS)	$198,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Light commercial, open space, institutional
CROSS SECTION	Two travel lanes in each direction with a center turn lane
CRASH PATTERNS	93 crashes within this corridor between 2018 and 2022, including two fatal or severe injury (KSI) crashes
SPEED LIMIT	35 MPH
AADT	33,000
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 2.2 out of a maximum of 3.00.

Crash History Addressed

Two KSI crashes occurred on this extent between 2018 and 2022. The collision factors for those were:

- **Angle:** Angle crashes involve a motorist hitting another motorist at an angle, or the "Angle (T)" WSDOT crash classification.[1]

[1] https://wsdot.wa.gov/sites/default/files/2022-01/NHFP-crash-data-dictionary.pdf

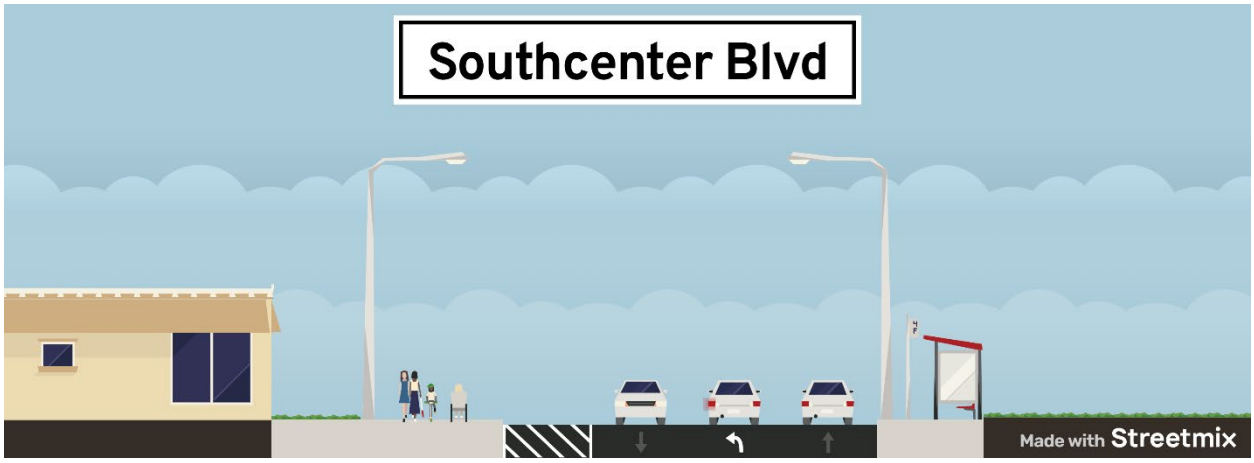
- **Bicycle-involved:** Any crash involving a bicyclist. The contributing factor recorded for this crash was the failure of the motorist to yield proper right-of-way to the bicyclist.

Along this segment of Southcenter Blvd, 84% of crashes were related to intersection conditions.

Proposed Countermeasures

Recommended countermeasures along Southcenter Blvd seek to better separate active transportation users from vehicle traffic in the corridor, and to reduce conflicts from turning vehicles. The below countermeasures include and build upon the planned project, a shared-use path that connects to the Green River Trail to the east of the corridor. The Green River Trail is also expected to connect to the forthcoming Lake to Sound Trail, which will connect to the broader Regional Trail Network.

The countermeasures include corridor-wide measures and spot improvements at specific locations. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.



Cross section of Southcenter Blvd, facing east

Corridor Improvements

- The TE project proposes a **lane reconfiguration**, which would reduce the roadway to one lane in each direction with a left turn lane.
- Per the TE project plans, the reduction in vehicle travel lanes would create space for a **shared use path** on the northern side of Southcenter Blvd, connecting users to the Green River Trail.

Spot Improvements

- In addition to the TE project, a **raised pedestrian refuge island** is proposed at the intersection of 62nd Ave S and Southcenter Blvd. The island would support the existing Rectangular Rapid Flashing Beacon and crossing at that location, allowing two-stage crossings to access the King County Metro bus stop on the southern side of the roadway. It also facilitates connections to the sidewalk crossing the I-405 via the 61st Ave S overpass.

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Active Mode Facilities			
Shared Use Path	**Corridor**	**25% (vehicle-bicycle)**	**$$$$$**
Crossings and Signals			
Raised Refuge Islands	**Spot**	**32%**	**$$**
Other Road Design			
Road/Lane Diets	**Corridor**	**19-47%**	**$$$$**
		Total Project Cost	**$$$$$**

TE Overlap Project #7: Southcenter Blvd (61st Ave S to Green River Trail)

Crash Types

- Angle
- Cyclist

TE Overlap Corridor-Wide Countermeasures:

- Planned Shared Use Path
- Planned Road Diet

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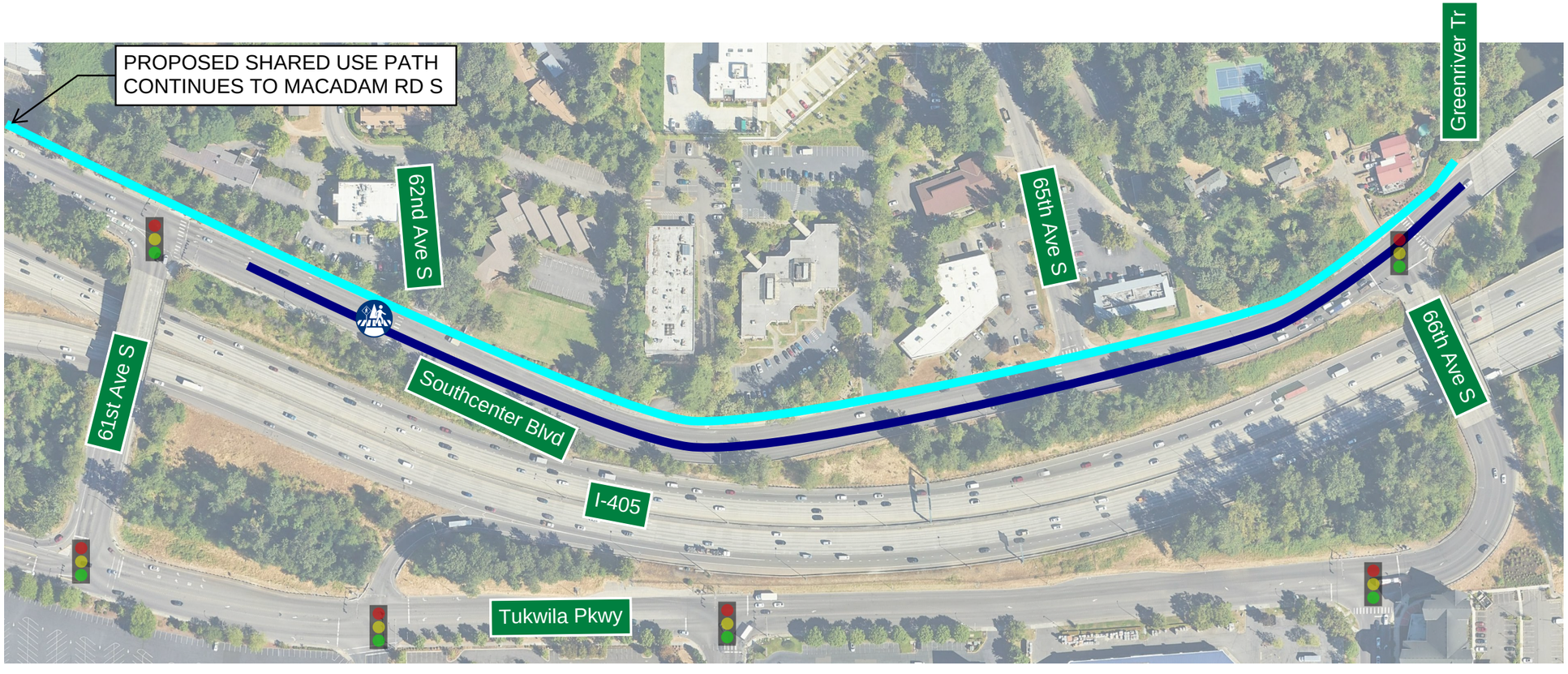
Spot Improvements:

- Rectangular Rapid Flashing Beacons
- Raised Refuge Islands



Preliminary Opinion of Probable Construction Cost

City of Tukwila
Local Road Safety Plan
TE Project #7: Southcenter Blvd (61st Ave S to 66 Ave S)

Prepared By: Ryan O'Hara, PE, Toole Design
Date: 4/2/2025

The project costs identified below only include the additional safety elements. Refer to the TE for the baseline project cost information.

Project Length 3200 FT 0.6 Miles

DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT
Mobilization (10%)	1	LS	$ 6,280	$ 6,280
Stormwater (15%)	1	LS	$ 9,420	$ 9,420
Maintenance of Traffic (10%)	1	LS	$ 6,280	$ 6,280
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 3,140	$ 3,140
Raised Pedestrian Refuge Island	1	EA	$ 10,000	$ 10,000
Pavement Markings	9	EA	$ 4,000	$ 36,000
High Visibility Crosswalks	4	EA	$ 4,200	$ 16,800
Subtotal				$ 87,920
Contingency (50%)				$ 43,960
Total Opinion of Probable Construction Costs				**$ 131,880**
Preliminary Engineering (25%)				**$ 32,970**
Construction Management (25%)				**$ 32,970**
Total Project Cost				**$ 198,000**

General Assumptions and Exclusions:

1. Additional Safety Treatments to 10% Plan by Parametrix 10/07/2024.

2. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.

3. Unit prices were developed from projects in western Washington in the past 5 years.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

TE/LRSP Project #8:
S Ryan Way (Martin Luther King Jr Way to 51st Ave S)

Project Narrative

EXTENT	Martin Luther King, Jr Way S to 51st Ave S
TOTAL PROJECT COST OPINION (ADDITIONAL SAFETY TREATMENTS)	$305,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Industrial, low-density residential
CROSS SECTION	Two travel lanes in each direction
CRASH PATTERNS	79 crashes between 2018 and 2022, including three fatal or severe injury (KSI) crashes
SPEED LIMIT	35 MPH
AADT	Unavailable
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 1.45 out of a maximum of 3.00.

Crash History Addressed

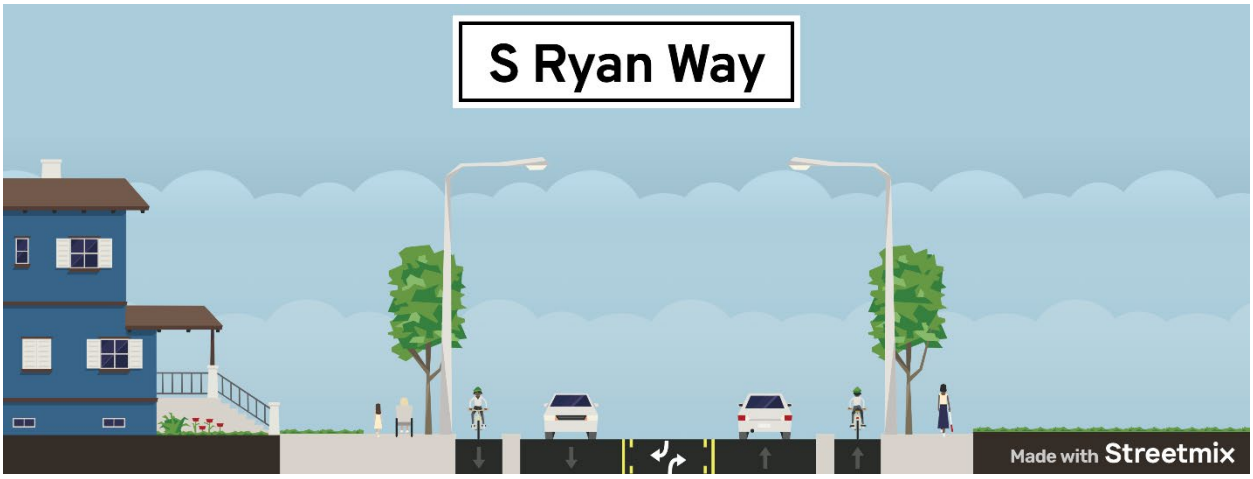
Three KSI crashes occurred on this extent between 2018 and 2022. The collision factors for those were:

- **Fixed Object**: A crash involving a vehicle striking a stationary object outside of the roadway. For this crash, the object was recorded as a tree or stump.
- **Sideswipe, Opposite Direction**: A crash involving two drivers traveling in opposite directions, with one vehicle striking the other on its side.
- **Head-On:** A crash involving two drivers colliding directly while traveling in opposite directions.

Along this segment of S Ryan Way, 54% of crashes were related to intersection conditions.

Proposed Countermeasures

Recommended countermeasures reflect the planned Transportation Element (TE) project at these extents. An additional crossing is proposed at the intersection of S Ryan Way and S 107th St/47th Ave S. Two of the three KSI collisions recorded between 2018 and 2022 occurred at the curve in the roadway near that intersection. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.



Cross section of S Ryan Way, looking east, from west of 47th Ave S

Corridor Improvements

- Under the TE project, **lane reconfiguration** would reduce Ryan Way from two to one lane in each direction, with the roadway center composed of a combination of concrete center median and center two-way left turn lane. At 47th Ave S (southern intersection, downhill), a center merging area is proposed to facilitate left turns from expected traffic from a development slated in that area.
    - As part of the reconfiguration, a realignment of 47th Ave S (northern intersection, uphill) is proposed such that the street intersects with S Ryan Way in a perpendicular manner with improved sight lines.
- The TE project proposes **improved sidewalk** along the north side of the corridor, near 47th Ave S. Improved curb ramps at intersections are also proposed.
- Per the TE project, the reduction in vehicle travel lanes would create space for a **protected bike lane** along the corridor, connecting to the existing striped bike lane that runs north-south on 51st Ave.
- The TE project proposes a **center median** for S Ryan Way from S 107th St to the eastern end of the corridor. For this extent, the median replaces the center turn lane.

Spot Improvements

- A **Rapid Rectangular Flashing Beacon** is recommended for the intersection of S 107th St/47th Ave S with Ryan Way. This crossing would allow more comfortable pedestrian crossings within the

corridor: the only marked north-south crossings are at either terminus of the extent, one half-mile apart. Further, this curve is where two of the three KSI crashes occurred.

- **Enhanced delineation for horizontal curves**, such as **chevron signing**, is recommended at the steep curve at 47th Ave S and the curve approaching 51st Ave S from the west.
- **Street lighting** improvements are proposed at intersections along the corridor to improve visibility. Lighting is particularly recommended at:
    - East of Martin Luther King, Jr Way S
    - Approaching 47th Ave S (northern intersection) from the east and west
    - At the Beacon Ave S underpass

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Active Mode Facilities			
Separated Bicycle Lanes	**Corridor**	**45%**	**$$**
Crossings and Signals			
Rectangular Rapid Flashing Beacons (RRFBs)	**Spot**	**69%**	**$$**
Other Road Design			
Road/Lane Diet	**Corridor**	**19-47%**	**$$$**
Horizontal Curve Delineation	**Spot**	**25%**	**$**
		Total Project Cost	**$$$**

TE Overlap Project #8: S Ryan Way (MLK Jr Way S to 51st Ave S)

Crash Types

- Rear End
- Angle
- Left Turn

Planned TE Improvements:

- Planned Protected Bike Lanes
- Planned Landscaped Median
- Planned Road Diet

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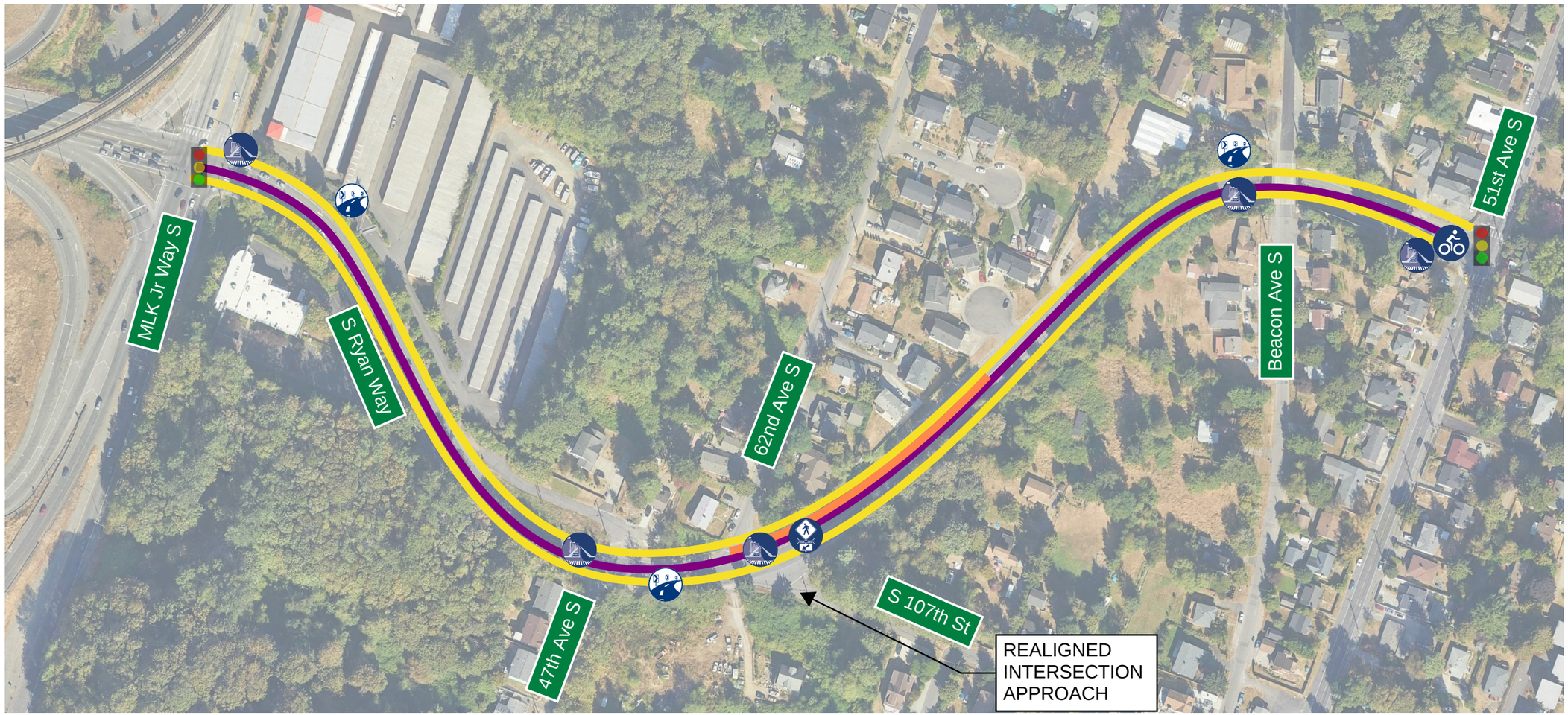
Additional Spot Improvements:

- Rectangular Rapid Flashing Beacons
- Bicycle Box
- Enhanced Delineation for Horizontal Curves
- Lighting



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Preliminary Opinion of Probable Construction Cost

City of Tukwila
Local Road Safety Plan
TE Project #8: S Ryan Way (MLK Jr Way S to 51st Ave S)

Prepared By: Ryan O'Hara, PE, Toole Design
Date: 4/2/2025

The project costs identified below only include the additional safety elements. Refer to the TE for the baseline project cost information.

Project Length 3200 FT 0.6 Miles

DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT
Mobilization (10%)	1	LS	$ 9,700	$ 9,700
Stormwater (15%)	1	LS	$ 14,500	$ 14,500
Maintenance of Traffic (10%)	1	LS	$ 9,700	$ 9,700
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 4,900	$ 4,900
Rectangular Rapid Flashing Beacon (Solar)	1	EA	$ 60,000	$ 60,000
Bicycle Box	1	EA	$ 500	$ 500
High Visibility Crosswalks	5	EA	$ 4,200	$ 21,000
Enhanced Delineation for Horizontal Curves and Signage	3	EA	$ 5,000	$ 15,000
Subtotal				$ 135,300
Contingency (50%)				$ 67,650
Total Opinion of Probable Construction Costs				**$ 202,950**
Preliminary Engineering (25%)				$ 50,738
Construction Management (25%)				$ 50,738
Total Project Cost				**$ 305,000**

General Assumptions and Exclusions:

1. Additional Safety Treatements to 10% Plan by KPG PSOMAS June 2024.

2. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.

3. Unit prices were developed from projects in western Washington in the past 5 years.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

TE/LRSP Project #9:
Klickitat Dr (53rd Ave S to Southcenter Pkwy)

Project Narrative

EXTENT	53rd Ave S to Southcenter Pkwy
TOTAL PROJECT COST OPINION (ADDITIONAL SAFETY TREATMENTS)	$582,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Residential, open space
CROSS SECTION	One lane in each direction, with a center left turn lane. Expands to two lanes in each direction south of the I-5 S on-ramp. A shared-use path parallels the roadway to the south.
SPEED LIMIT	30 MPH
AADT	15,000
CRASH PATTERNS	68 crashes within this corridor between 2018 and 2022, including one fatal or severe injury (KSI) crash
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 1.7 out of a maximum of 3.00.

Crash History Addressed

One KSI crash occurred on this extent between 2018 and 2022. The collision factor for that crash was:

- **Angle:** Angle crashes involve a driver hitting another driver at an angle, or the "Angle (T)" WSDOT crash classification.[1]

Along this segment of Klickitat Dr, 83% of crashes were related to intersection conditions.

Proposed Countermeasures

Proposed improvements along this extent of Klickitat Dr build upon the Transportation Element (TE) project, which proposes enhancements to the existing multimodal path to the south of the roadway. The path, which begins at 53rd Ave S, connects the neighborhood to the west of the I-5 to commercial and retail destinations east of the I-5. Further, the roadway features several severe curves, which introduces opportunities for sideswipe crashes when combined with freeway off-ramp merges.

The countermeasures include corridor-wide measures and spot improvements at specific locations. The list below is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.

Corridor Improvements

- Installation of **profiled thermoplastic pavement markings** is recommended to maintain visibility of lanes through the curving conditions of this corridor and increase driver attentiveness.

Spot Improvements

- At the intersection with 53rd Ave S, a conversion of the current permissive/protected left-turn signal to a **protected-only left-turn signal** is recommended to reduce conflicts between turning vehicles and pedestrians and bicyclists using the shared use path.
- At the same location, **gateway treatments** can be applied to improve visibility of the path: pavement markings may be applied to mark the beginning of the trail and delineate bollards, as well as signage denoting "No Motor Vehicles." Existing bollard spacing and materials should be inspected to determine if it may pose a risk to bicyclists.

[1] https://wsdot.wa.gov/sites/default/files/2022-01/NHFP-crash-data-dictionary.pdf

Example highlighting presence of biking and walking traffic crossing at entrance to shared use path. Signs denoting "No Motor Vehicles" are also recommended.

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Crossings and Signals			
Protected Left Turn Signal	**Spot**	**28%**	**$$**
Other Road Design			
High Visibility Thermoplastic Pavement Markings	**Corridor**	**10%**	**$$$**
		Total Project Cost	**$$$$**

TE Overlap Project #9: Klickitat Dr (53rd Ave S to Southcenter Pkwy)

Crash Types

- Left turn

Corridor-Wide Countermeasures:

- Profiled Thermoplastic Lines

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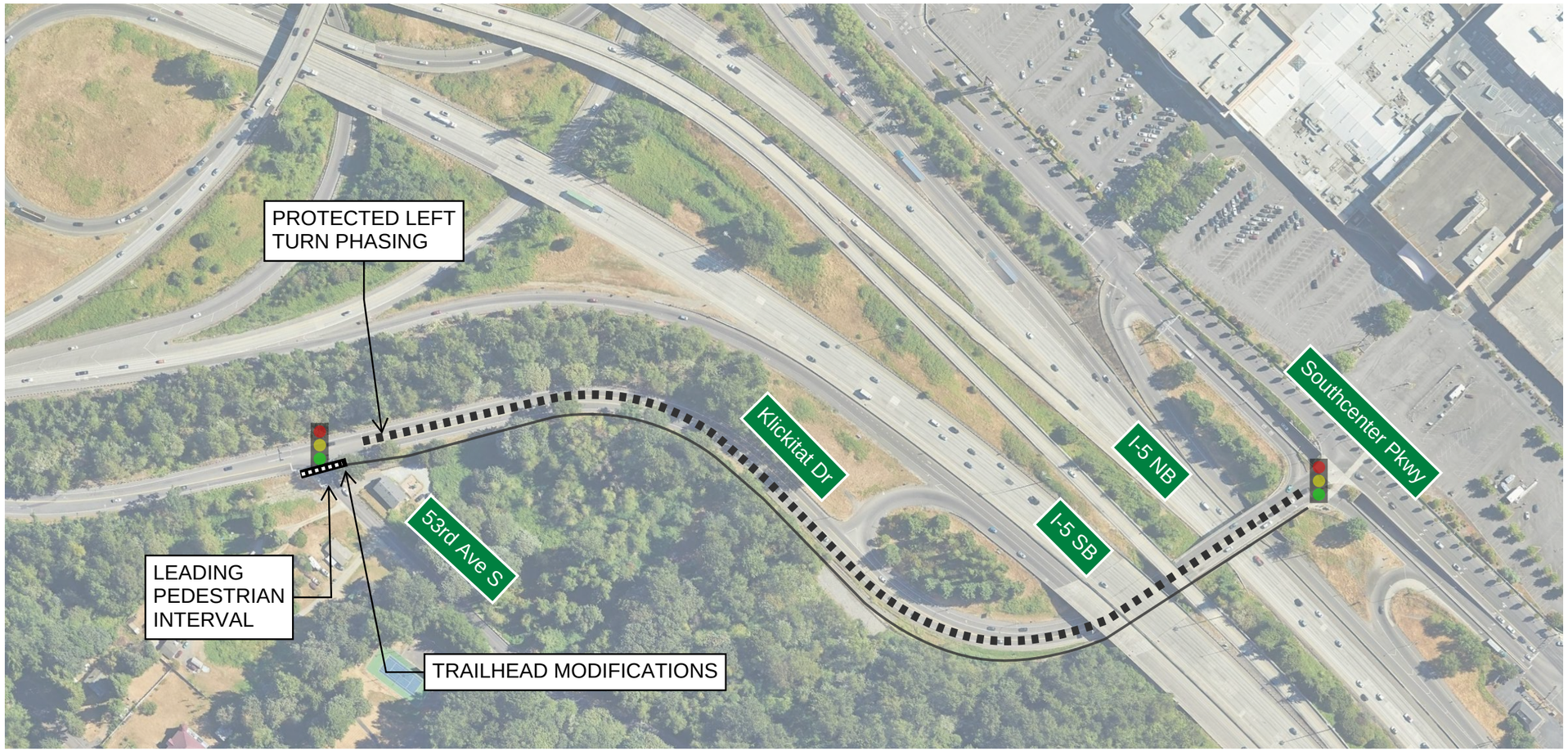
Spot Improvements:

- High Visibility Crosswalks

Legend

- Existing Shared-Use Path



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Preliminary Opinion of Probable Construction Cost

City of Tukwila
Local Road Safety Plan
TE Project #9: Klickitat Dr (53rd Ave S to Southcenter Pkwy)

Prepared By: Ryan O'Hara, PE, Toole Design
Date: 4/2/2025

The project costs identified below only include the additional safety elements. Refer to the TE for the baseline project cost information.

Project Length 2000 FT 0.4 Miles

DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT
Mobilization (10%)	1	LS	$ 18,500	$ 18,500
Stormwater (15%)	1	LS	$ 27,700	$ 27,700
Maintenance of Traffic (10%)	1	LS	$ 18,500	$ 18,500
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 9,300	$ 9,300
Profiled Thermoplastic Markings	8000	LF	$ 20	$ 160,000
Signal Timing / Phasing Changes	1	LS	$ 10,000	$ 10,000
Trailhead Modifications	1	LS	$ 10,000	$ 10,000
High Visibility Crosswalks	1	EA	$ 4,200	$ 4,200
Sign, Traffic, Post Mounted	1	EA	$ 150	$ 150
Subtotal				$ 258,400
Contingency (50%)				$ 129,200
Total Opinion of Probable Construction Costs				**$ 387,600**
Preliminary Engineering (25%)				$ 96,900
Construction Management (25%)				$ 96,900
Total Project Cost				**$ 582,000**

General Assumptions and Exclusions:

1. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.
2. Unit prices were developed from projects in western Washington in the past 5 years.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

TE/LRSP Overlap Project #10:
42nd Ave S (Southcenter Blvd to S 150th St)

Project Narrative

EXTENT	Southcenter Blvd to S 150th St
TOTAL PROJECT COST OPINION (ADDITIONAL SAFETY TREATMENTS)	$188,000
JURISDICTION	City of Tukwila
LAND USE CONTEXT	Residential
CROSS SECTION	One lane in each direction, with a dedicated left turn lane at Southcenter Blvd
SPEED LIMIT	30 MPH
AADT	Unknown
CRASH PATTERNS	25 crashes within this corridor between 2018 and 2022, including one fatal or severe injury (KSI) crash
PRIORTIZATION SCORING	The highest scoring segment in this corridor received a 2.19 out of a maximum of 3.00.

Crash History Addressed

This segment of 42nd Ave S saw one KSI crash between 2018 and 2022. The collision factor for that collision was:

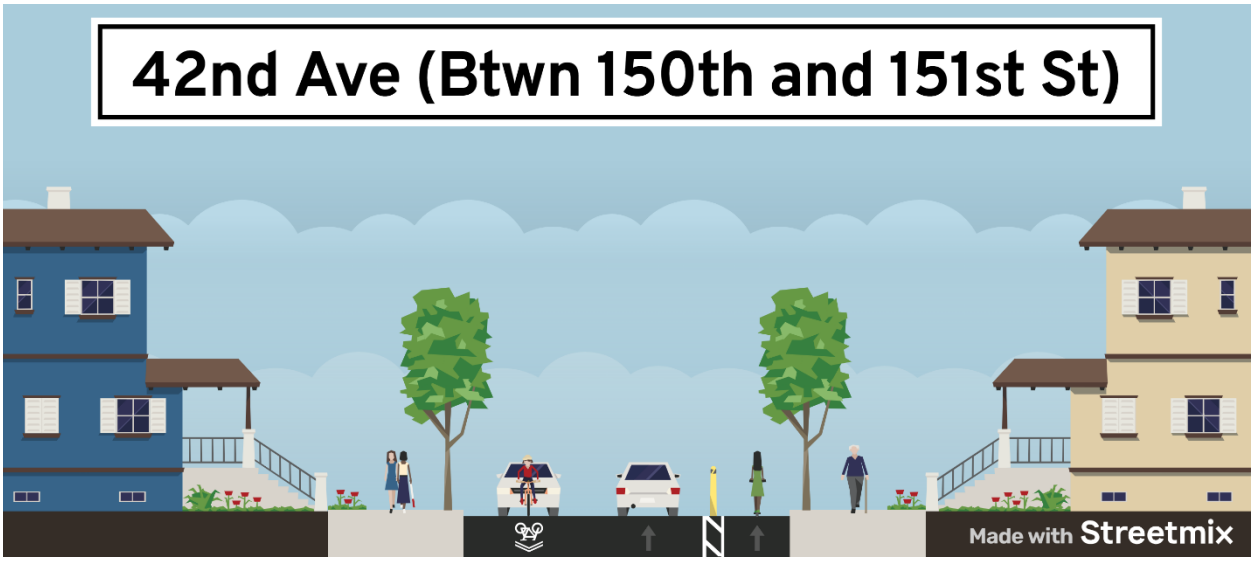
- **Angle crash**: Angle crashes involve a driver hitting another drive at an angle, or the "Angle (T)" WSDOT crash classification.[1]

[1] https://wsdot.wa.gov/sites/default/files/2022-01/NHFP-crash-data-dictionary.pdf

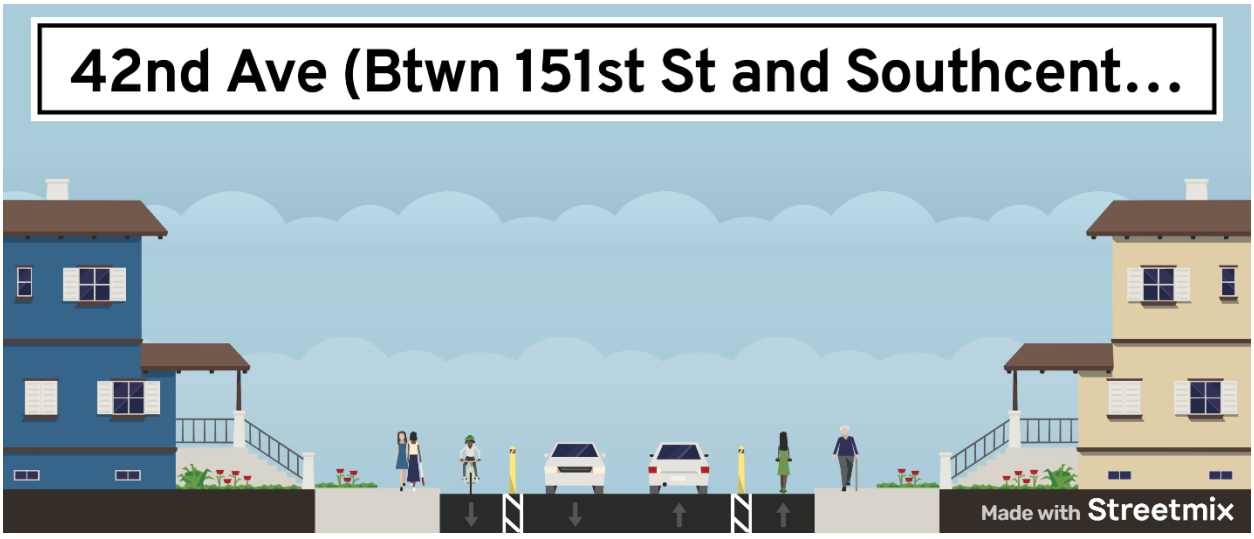
Proposed Countermeasures

A series of countermeasures were selected for 42nd Ave S to build upon a planned Transportation Element project in this extent. The TE includes a traffic-calmed bikeway between S 150th Street and Southcenter Blvd, which this recommendation expands to a separated bikeway concept. The bikeway supports a connection to the facility on Southcenter Blvd north towards Thorndyke Elementary School and the surrounding neighborhood. The separated bike lane was selected to separate bicyclists from vehicular traffic and reduce speeds at turns to eliminate severe angle crashes near intersections.

The proposed countermeasure for this site is not inclusive of proposed systemic, citywide countermeasures such as lane marking visibility improvements and high-visibility crosswalks.



Proposed 42nd Ave S cross section, between S 150th St and S 151st St, looking north



Proposed 42nd Ave S cross section, between S 151st St and Southcenter Blvd, looking north

Corridor Improvements

- A **separated bicycle lane** is proposed for 42nd Ave S on this corridor. The bike lane would be placed adjacent to the curb, separated from traffic via a plastic flex posts. Due to the narrowing of the roadway north of S 151st St, the separated lane would function as a shared lane on the west side of the roadway for one block. The eastern side of the roadway (see cross sections, above), would be continuous.
    - As the lanes are reconfigured to accommodate the bikeway, it is recommended that curb radii at the north leg of Southcenter Blvd, S 151st St, and S 152nd St, be reduced from 30' to 15' or less to slow turning drivers.

Cost

Approximate planning level costs for each countermeasure are included below. These reflect individual costs and do not include contingencies or other costs. The final page of this document provides a more detailed preliminary opinion of probable construction cost for the entire proposed project.

$	Low – typically $5,000 or less
$$	Medium – typically $5,000 to $100,000
$$$	Moderate – typically $100,000 to $300,000
$$$$	High – typically $300,000 to $999,999
$$$$$	Highest – typically $1,000,000 or more

	Type	Effectiveness (Crash Reduction Factor)	Cost
Systemic			
High Visibility Crosswalks	**Systemic/Spot**	**45%**	**$**
Active Mode Facilities			
Separated Bicycle Lanes	**Corridor**	**45%**	**$$**
		Total Project Cost	**$$$**

TE Overlap Project #10: 42nd Ave S (Southcenter Blvd to S 150th St)

Crash Types

- Angle
- Pedestrian

Corridor-Wide Countermeasures:

- Separated Bike Lane
- Shared Bike Lane

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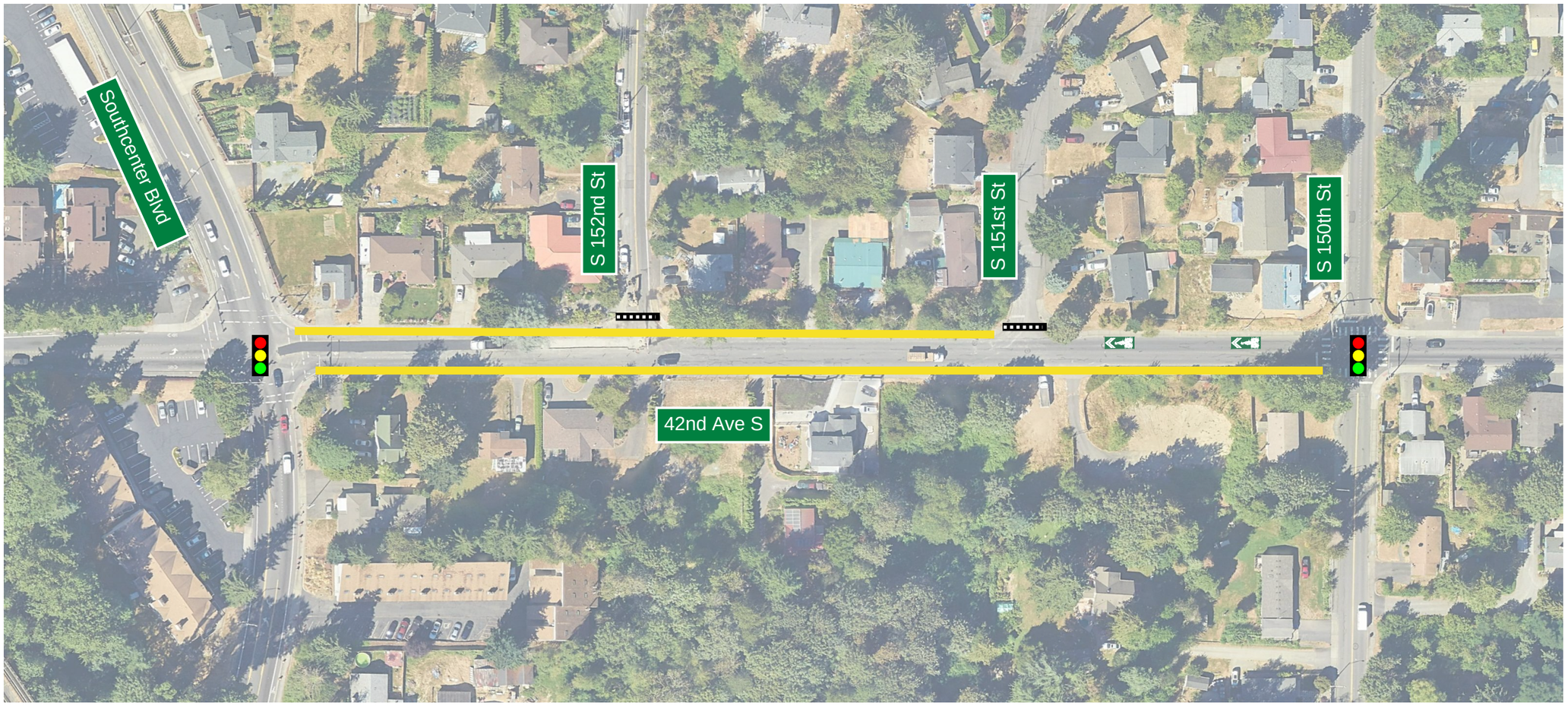
Spot Improvements:

- High Visibility Crosswalks



Preliminary Opinion of Probable Construction Cost

Prepared By: Ryan O'Hara, PE, Toole Design

City of Tukwila

Local Road Safety Plan

Date: 4/2/2025

TE Overlap 10: 42nd Ave S (Southcenter Blvd to S 150th St)

The project costs identified below only include the additional safety elements. Refer to the TE for the baseline project cost information.

Project Length 1000 FT 0.2 Miles

TREATMENT	QTY	UNIT	UNIT PRICE	COST
Mobilization (10%)	1	LS	$ 6,700	$ 6,700
Maintenance of Traffic (10%)	1	LS	$ 6,700	$ 6,700
Site Preparation, Clearing and Grubbing (5%)	1	LS	$ 3,300	$ 3,300
Separated Bike Lane - Flex Posts	0.2	MI	$ 282,000	$ 56,400
High Visibility Crosswalks	2	EA	$ 4,200	$ 8,400
Remove Paint Striping	1000	LF	$ 2	$ 2,000
Subtotal				$ 83,500
Contingency (50%)				$ 41,750
Total Opinion of Probable Construction Costs				**$ 125,250**
Preliminary Engineering (25%)				$ 31,313
Construction Management (25%)				$ 31,313
Total Project Cost				**$ 188,000**

General Assumptions and Exclusions:

1. Stormwater costs are assumed to be 15% of the Construction Cost Subtotal.
2. Unit prices were developed from projects in western Washington in the past 5 years.

Disclaimer: Opinions of probable costs were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 50% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2025 dollars and were assigned based on historical cost data from historical bid item data from final design projects in western Washington in the last 5 years. Cost opinions do not include: public outreach, funding planning, or client manaement services, easement and right-of-way acquisition; permitting; surveying, geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance, lighting, landscaping, stormwater quality and control, or utility relocation. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.