DRAFT Transportation Background Report

City of Tukwila

November 2024

Tukwila Transportation Element

Executive Summary

Tukwila is a vibrant community with diverse residents, businesses, and regional attractions, connected by various transportation options to local and regional destinations. Since incorporating in 1908, Tukwila has grown to a community with a population of 20,265 residents (2020)[1]. In addition to serving its residents, Tukwila is home to jobs from a wide range of sectors such as manufacturing, industry, local businesses, and retail. Tukwila's major shopping area, Southcenter, draws in shoppers from across the Puget Sound region.

In recent years, Tukwila has sought to address traffic congestion and improve multimodal connectivity, especially near Tukwila International Boulevard and in Southcenter. Tukwila also maintains two major regional trails: the Green River Trail and the Interurban Trail. These trails allow people to walk, roll, scooter, and bike throughout the city and to neighboring communities.

There have been several major transit-related transportation investments in the City of Tukwila, including Tukwila International Boulevard Link Station (TIBS), the Southcenter Transit Center, and the Tukwila Sounder Station. The TIBS station boasts high usage and provides much needed transit connections to Tukwila International Boulevard, which has undergone several pedestrian access improvements in recent years. Sound Transit is also planning to add an additional light rail infill station on the north side of the City, near Boeing Access Road. Sound Transit also maintains a Sounder S Line station in Tukwila. The Sounder S Line is a commuter rail that extends from Seattle to Lakewood/Tacoma and provides service during typical peak period hours on weekdays. In addition to rail service, King County Metro and Sound Transit both provide bus routes serving the Tukwila area. The Southcenter Transit Center has improved transit connectivity and ridership increases, especially on the Rapid Ride F Line, have exceeded growth rate expectations.

This Transportation Background Report seeks to proactively build on these investments to support Tukwila's continued evolution over the next 20 years. Tukwila's Comprehensive Plan (The Plan) integrates previous planning efforts and emphasizes multimodal connections, safety, and equity. This Transportation Background Report, including the transportation project list, was

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[1] 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office. Table S0101 https://www.census.gov/

developed in coordination with the community, who helped identify long-term vision for transportation in Tukwila.

The following five goals were developed with input from the Tukwila community and guide the investment decisions outlined in this Transportation Background Report:

EQUITY	**Eliminate systemic barriers to ensure fair access to healthy, affordable, reliable transportation options, livable places, and jobs.**
SAFETY	**Provide a safe transportation system and placemaking to emphasize Tukwila as a welcoming place, particularly for historically marginalized and vulnerable populations.**
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.**

Plan Overview

The Tukwila Transportation Background Report sets a framework for understanding, prioritizing, measuring, and constructing a multimodal transportation network that furthers Tukwila's goals. This document includes seven chapters:

Chapter 1: Introduction

Describes the purpose of the Transportation Background Report and the planning requirements it needs to address. This chapter provides information about Tukwila's history, position in the region, current demographics, and existing land uses.

Chapter 2: Transportation Inventory and Needs Assessment

Describes conditions for all travel modes in the existing transportation system. This chapter also gives an overview of needs identified by the community, opportunities, and challenges.

Chapter 3: Public Outreach

Describes the extensive community outreach that included online engagement, focus groups, pop-ups at public events, and public meetings. The overarching principle of the public outreach was to develop a transportation background report that reflects the diverse perspectives and transportation needs of the community.

Chapter 4: Transportation Vision

Describes Tukwila's layered network approach, which focuses on how the City's transportation network can function, to meet the needs of all users. This chapter introduces the priority networks for each mode, describes the City's vision for how those modes are served, and describes the types of infrastructure that would be needed to achieve that vision. This chapter includes level of service performance standards for streets and intersections, and planning guidance to accommodate transit, biking, and walking.

Chapter 5: Transportation Project List

Describes the Transportation Background Report's prioritized project list, which would provide a safer and more connected multimodal system over the coming decades. This chapter also describes further transportation investments that could be pursued if additional funding opportunities arise.

Chapter 6: Funding

Describes the City's path to implementation, including how the City plans to fund transportation over the life of the plan, strategies that the City will employ to optimize use of its transportation network, and how Tukwila can monitor progress of the Transportation Background Report over time to realize the overarching goals that guided the development of this Background Report.

Contents

Index of Key Terms

TE	Transportation Element
CSAP	Comprehensive Safety Action Plan
LOS	Level of Service
LTS	Level of Traffic Stress
FHWA	Federal Highway Administration
ITE	Institute of Transportation Engineers
KSI	Killed or Severe Injury crashes
LRSP	Local Roadway Safety Plan
RRFB	Rectangular Rapid-Flashing Beacon
SS4A	Safe Streets for All program (USDOT)
SRTS	Safe Routes to School
USDOT	US Department of Transportation
WSDOT	Washington State Department of Transportation
VMT	Vehicle Miles Traveled

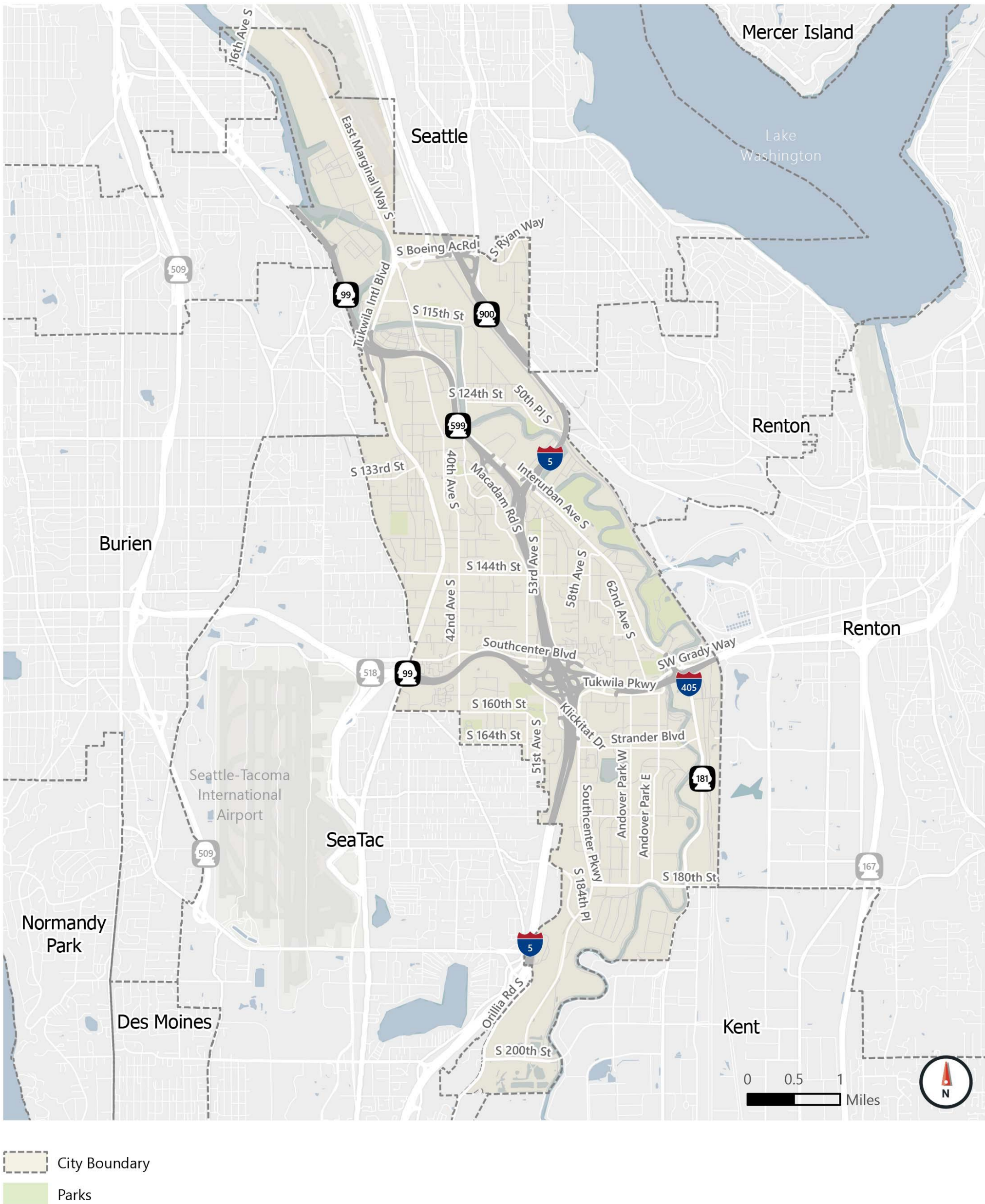
Chapter 1: Introduction

The City of Tukwila's Transportation Background Report (Background Report) provides a framework for transportation investments over the next 20 years and beyond, guided by the community's transportation and mobility priorities. The Background Report was developed through close collaboration between City staff, elected officials, community representatives, and the public at-large to help improve mobility and quality of life in Tukwila. It combines the insights gained from this collaboration with detailed technical analysis to identify transportation investments that will help the City improve mobility for everyone who utilizes transportation systems in Tukwila.

Tukwila Profile

Centered at the crossroads of rivers, trails, highways, and railroads, Tukwila is a suburban city in King County with 12 unique neighborhoods. Tukwila covers approximately 10 square miles of land area and is bordered on the north, south, east, and west by Seattle, Kent, Renton, and SeaTac and Burien, respectively as well as several pockets of unincorporated King County. The City boundary is shown in **Figure 1**. Tukwila was incorporated as a city in 1908 and has evolved into a local leader in retail and commercial sales, warehousing, and distribution of goods and manufacturing. The current Comprehensive Plan, adopted in 2015, highlights the chronology of Tukwila's willingness to grow and change while diligently preserving its strong community values.

Figure 1. City of Tukwila Boundary



City of Tukwila Boundary

Demographics

In 2020, Tukwila had an estimated population of 20,265 residents. Tukwila residents are primarily concentrated in the City's west and east quadrants, consisting of multiple neighborhoods, including Thorndyke, Cascade View, Riverton, Allentown, McMicken, Tukwila Hill, and Foster. Age ranges for residents are relatively balanced, with a median age estimated to be 36 years, 12 percent 65 years or older and 21 percent under 18 years old.[2] Tukwila's population is diverse in multiple aspects, namely in terms of race, ethnicity, spoken languages, and educational attainment.[2] This section highlights various demographic statistics that make Tukwila unique.

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.[2] The diversity of Tukwila is notable in comparison to the same statistics on a national level. Of the nationwide population, those identifying as "White Alone" comprise 70 percent, those identifying as "Asian Alone" comprise six percent, and those identifying as "Black Alone" comprise 13 percent. Additionally, 18 percent of Tukwila residents identify as "Hispanic or Latino," which is comparable to 18 percent nationwide.[2] Tukwila has a high percentage of foreign-born residents; approximately 42 percent of Tukwila residents were born outside of the United States. Of residents born outside of the United States, 54 percent are United States citizens.[2] Slightly over half of the population in Tukwila speak a language other than English at home, with the other dominant languages including Spanish and Vietnamese. About 55 percent of this population subset speak English less than "very well".[2]

The Tukwila community includes people with diverse educational backgrounds. Approximately 28 percent of Tukwila residents over the age of 25 have an educational attainment of a high school diploma (including equivalency). Additionally, 24 percent of Tukwila residents have an educational attainment of a bachelor's degree or higher.[2] About nine percent of Tukwila residents identify as living with a disability.[2] This statistic is important to consider when planning for the transportation needs of all residents. Fourteen percent of Tukwila residents reported an

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[2] 2016-2020 American Community Survey, U.S. Census Bureau's American Community Survey Office. Table S0101
https://www.census.gov/
Note: ACS data was used for consistency among data sources within the Demographics 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.

income level in the past 12 months that is below the national poverty level.[2] Detailed population characteristics of the City of Tukwila are tabulated in **Appendix A**.

Existing Land Use

The City of Tukwila is comprised of 21 zoning districts that prioritize specific land uses within its land area of approximately 10 square miles. **Figure 2** displays the City's Zoning Map.

Tukwila's 12 residential neighborhoods **(Figure 3)** are a mix of smaller-lot, built-out residential areas predominately built before World War II, large multi-family apartment complexes built in the 1960s, 70s, and 80s, and newer neighborhoods characterized by larger houses.

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 4**. 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. Although not located within City boundaries, the Seattle-Tacoma International Airport is located just west of Tukwila in the City of SeaTac. Given the close proximity of the major airport, the City of Tukwila coordinates with SeaTac, the Port of Seattle, and WSDOT to address any planned projects near the airport.

Figure 2. City of Tukwila Existing Zoning Map

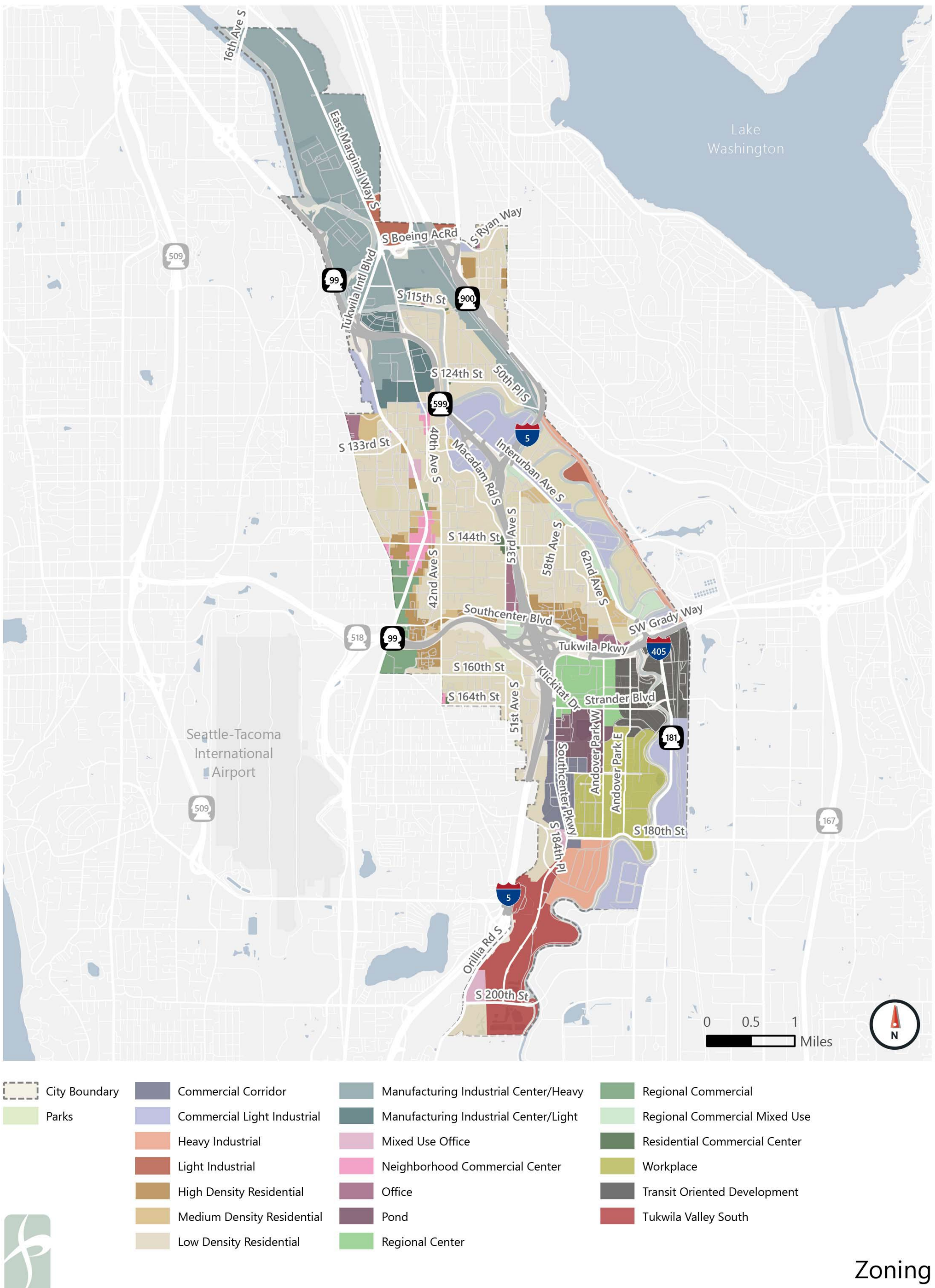
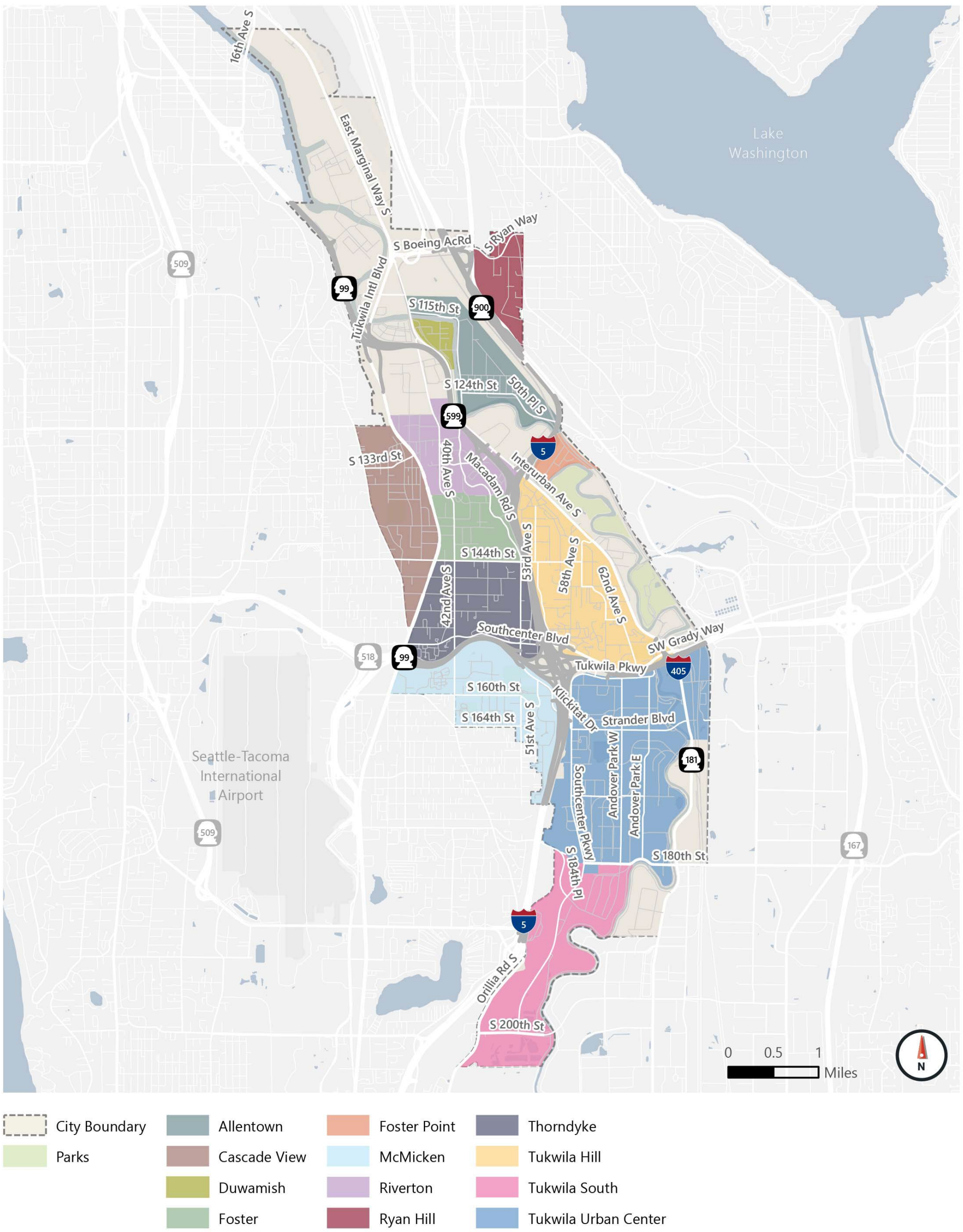
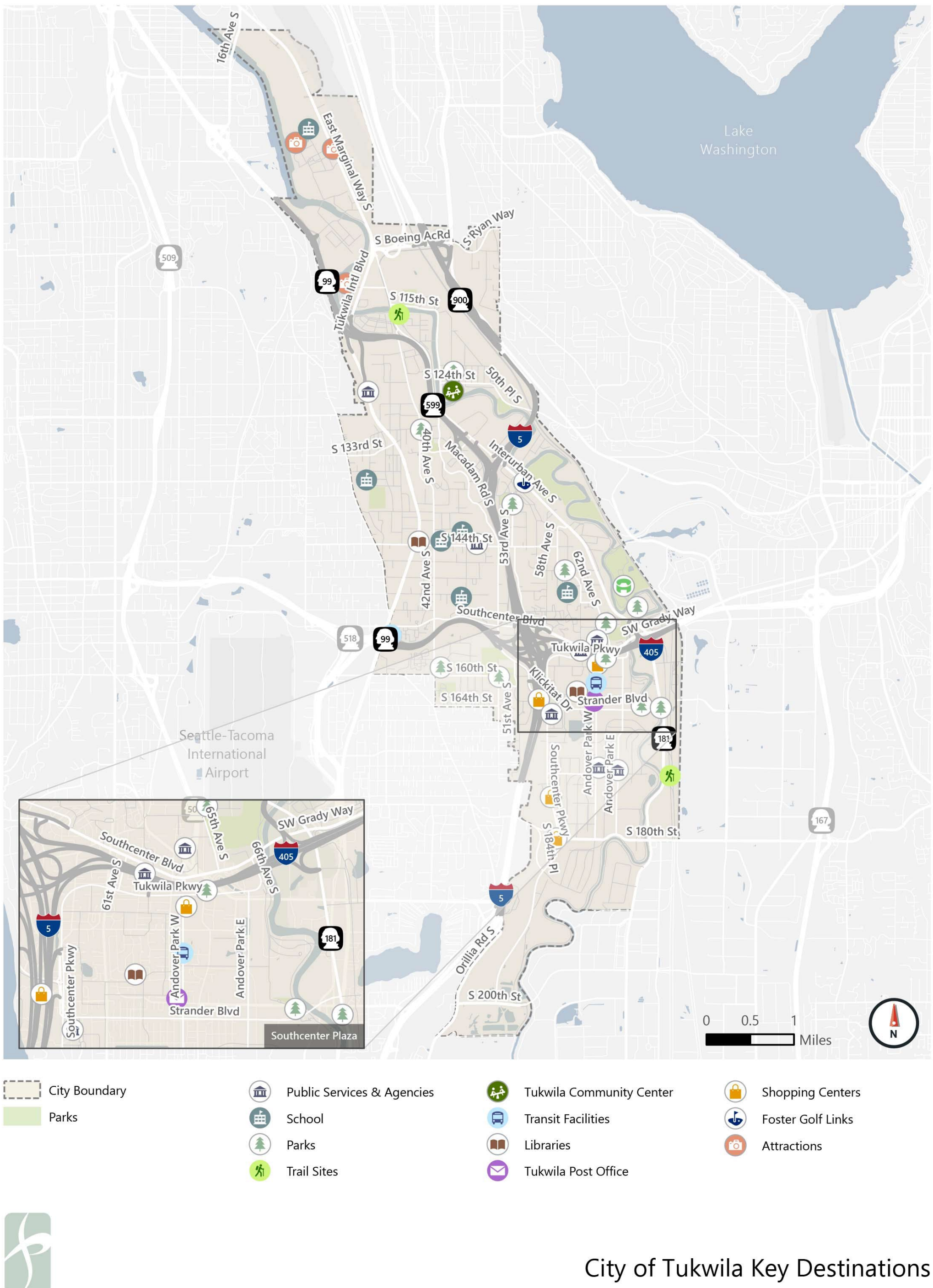


Figure 3. City of Tukwila Neighborhoods



City of Tukwila Neighborhoods

Figure 4. City of Tukwila Key Destinations



Local Planning Context

The City of Tukwila has several plans and policies that guide future development in Tukwila. Some of these plans, such as the Ryan Hill Neighborhood Study, Southcenter Subarea Plan, and Tukwila International Boulevard Neighborhood Plan, focus on development in certain areas or corridors within the City. The 2015 Comprehensive Plan has been the guiding document for City staff and elected officials in making decisions regarding transportation capital project funding, development regulations, and guiding principles for growth in Tukwila through 2035. Each of the plans described below have been reviewed and incorporated into the Transportation Element and Background Report.

City of Tukwila Comprehensive Plan Transportation Element (2015)

The City of Tukwila's Comprehensive Plan adopted in 2015 laid out the City's 20-year vision, derived from the City's core values: respect for the past and present, compassion and support for individuals and families, pride of place, and quality opportunities for working, living, and community involvement. The plan touched on many aspects of community life and development, from the character of neighborhoods and urban design standards to the development of vibrant centers of economic life and the revitalization of residential areas.[3] The plan provided goals and policies for achieving the City's vision through the allocation of jobs and services, housing, parks and recreational opportunities, transportation network investments, and sustainable funding.

Transportation Element (TE) Update (2024)

Tukwila is updating its Comprehensive Plan, including the TE, in 2024. This involved changes to the plan to meet new regional and statewide requirements and ensure that the plan is aligned with the vision for the City.

How is this Background Report related to the TE?

The Background Report serves as an appendix to the TE. The TE outlines policies and actions that the City will take and it refers back to Background Report for more detail on the analysis and plan development process. The TE and the Background Report work together to outline the plan for the City of Tukwila over the next 20 years.

[3] City of Tukwila. City of Tukwila Comprehensive Plan. 2015 https://www.tukwilawa.gov/wp-content/uploads/DCD-Comprehensive-Plan.pdf

Ryan Hill Neighborhood Study (2018)

In 2018, development interest within the Ryan Hill neighborhood, resulting from the area's limited infrastructure and sensitive features, prompted a comprehensive look at the needed land use changes and the types of infrastructure improvements required to support potential redevelopment.[4] The study's primary objectives were to ensure that any development decisions work collectively to achieve neighborhood-driven goals and that development-driven infrastructure improvements, such as sewer, water, and roadways, are coordinated and maximized. More information is available in the plan document on the City's **website**.

Southcenter Subarea Plan (2014)

The City of Tukwila developed the award-winning Southcenter Subarea Plan as a strategy for change and regulatory policy to guide and govern future development within Tukwila's urban center. The Southcenter Subarea Plan outlines the community's aspirations and support strategies for Southcenter as well as the physical outcomes intended to be implemented as new investments create change. Some of Tukwila's industrial uses have already shifted to retail uses, as evidenced by Costco, Lowe's Home Improvement, and Home Depot, all located in former warehouse buildings. In addition, this plan also identifies an initial set of recommended actions and investments that the City can take to accelerate redevelopment strategies. More information is available in the plan document on the City's **website**.

Local Road Safety Plan (LRSP) Development (2025)

Tukwila is in the process of developing an LRSP to address transportation safety in the City. The LRSP, to be adopted in 2025, includes an analysis of existing conditions and systemic safety concerns that feed into a set of safety-related projects on Tukwila streets.

How is this Background Report related to the LRSP?

The Background Report, TE, and LRSP all work together to address transportation needs in Tukwila. The LRSP development informed safety policies in the TE and is integrated in the Safety section of the Background Report. Recommended projects from the LRSP can be found in the LRSP document.

[4] City of Tukwila. Ryan Hill Neighborhood Study. 2018
https://www.tukwilawa.gov/wp-content/uploads/Ryan-Hill-Neighborhood-Study-03.06.18.pdf

Tukwila International Boulevard Neighborhood Plan (2017)

In 2015, Tukwila City Council adopted goals and policies in the Tukwila International Boulevard (TIB) Element of the Tukwila Comprehensive Plan, calling for a transformation of the neighborhood into a more walkable, safer, and attractive destination with TIB as a "main street". In 2017, the TIB Neighborhood Plan was developed to explore strategies for implementing the City's adopted goals and policies for the TIB neighborhood. The City partnered with the Congress for New Urbanism (CNU) to identify recommendations which included: reducing the number of through-lanes on TIB by replacing them with on-street parking and bike lanes; and revising the zoning regulations for new development to allow new land uses and development patterns that are consistent with the walkable vision for TIB[5].

Between 2017 and 2020, there have been various efforts to support the TIB Neighborhood Plan, including[6]:

- Interim zoning code revisions to restrict certain auto-oriented and lodging uses
- Development of preliminary rechannelization alternatives for TIB, including potential impacts, mitigation, cost, and the extent to which they achieve the goals for the TIB District

More information is available in the plan document on the City's **website**.

Tukwila Growth and Transportation Efficiency Center Program (2007)

Under the Washington State Commute Trip Reduction (CTR) Efficiency Act, the City of Tukwila was given the option of developing a Growth and Transportation Efficiency Center (GTEC) program to expand CTR efforts to additional employers and residential groups within a defined area.

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[5] City of Tukwila. Tukwila International Boulevard CNU Legacy Project. 2017
https://indd.adobe.com/view/30a631e0-ee3c-45f4-8f76-a9c83850446a

[6] City of Tukwila. Tukwila International Boulevard Neighborhood Planning. 2020
https://www.tukwilawa.gov/departments/community-development/community-planning/tukwila-international-boulevard-neighborhood-planning/

In 2007, the City developed a GTEC for the Tukwila Urban Center (TUC), a designated regional growth center, through extensive involvement by employers, organizations, and individuals from throughout the City who helped identify strategies to achieve the program's goals. The vision of the TUC GTEC program was based on two primary objectives[7]:

- Bolster the TUC's market position as a regional shopping center by creating an attractive central destination offering housing, shopping, entertainment, and recreation. Connect dispersed retail activities and provide a convenient, walkable, enjoyable, and varied shopping environment.
- Use the (then) planned commuter rail station, Tukwila Transit Center, and other transportation investments as a catalyst to shift development patterns, provide amenities, and create a true center and focal point for the community.

More information is available in the plan document: on the City's **website**.

Tukwila Transit Plan Update (2016)

Last updated in 2016, Tukwila's Transit Plan was targeted to provide clear guidance for transit planning over ten years by outlining recommendations for short-term actions. The developed recommendations were based on public outreach, thorough analyses of demographic data, planning documents, travel demand, and transit service in Tukwila. This plan recommended the following:

- A new express route between Tukwila and Bellevue before the I-405 BRT is implemented, targeting both Tukwila residents as well as Sounder riders.
- Frequency improvements to bus routes serving Tukwila including Rt-124, Rt-150, Rt-128, RapidRide F-Line and A-Line, Rt-156, Rt-906, and Rt-154.
- Maintenance of the Hyde Shuttle which serves seniors (55 and over) and people with disabilities.
- The provision of options to connect Allentown and Tukwila Community Center. Documented options include shuttle service, subsidized taxi/ transportation network companies (TNC) programs, and a community van program.

[7] City of Tukwila. Tukwila Urban Center Growth and Transportation Efficiency Center Program. 2007 https://www.tukwilawa.gov/wp-content/uploads/DCD-CompPlan-Tukwila_GTEC_Plan.pdf

- Long-term transit services changes, transit priority corridors, transportation demand management and outreach to diverse communities, and a few capital recommendations.

More information is available in the plan document on the City's **website**.

Americans with Disabilities Act (ADA) Transition Plan (2016)

The City of Tukwila established its ongoing commitment as an all-inclusive community, providing equal access for all, through the ADA Self-Evaluation and Transition Plan.

As documented in the 2016 draft Plan, the City of Tukwila anticipated the removal of the highest priority barriers within the first two years of the plan's adoption. This is based on the self-assessment, planning-level cost estimates, and available financial resources. The Capital Improvement Program (CIP), allocated $200,000 for 2017 and 2018, but budget constraints in 2019 and 2020 reduced the annual budget to $50,000 per year. The budget was further reduced in 2021 through 2023 due to the impacts of the Covid-19 pandemic on City revenues. In 2024, the annual budget was increased to $100,000, half of the annual recommended budget. For 2025-2026, it is estimated that an annual budget of $61,000 will be available towards ADA improvements and working to ADA compliance of all capital improvements projects and other City-funded construction. An updated ADA Transition Plan is needed to address the existing needs in light of the funding challenges over the recent years, and to plan to meet the City's objective of addressing all known deficiencies within 20 years.[8] Incorporation of the ADA Transition plan is expected by 2029. More information is available in the plan document on the City's **website**.

City of Tukwila's Non-Motorized Walk and Roll Plan (2009)

In 2009, the City developed Tukwila's first pedestrian and bike planning document, "The Walk and Roll Plan" to implement goals of the Comprehensive Plan and adopt a complete streets approach. The Walk and Roll Plan[9] was targeted to ensure that all Tukwila residents know the joy of wandering through the community using trails and sidewalks while also able to experience the sense of accomplishment and freedom associated with the ability to walk or bike

[8] City of Tukwila. ADA Transition Plan. 2016
https://www.tukwilawa.gov/wp-content/uploads/PW-ADA-Draft-ADA-Transition-Plan.pdf
[9] City of Tukwila. City of Tukwila's Non-Motorized Plan. 2009
https://www.tukwilawa.gov/wp-content/uploads/DCD-Walk-and-Roll-Program.pdf

to school, to work, to the store, and the library. The following recommendations were outlined in the Plan:

- Adoption of bike and pedestrian infrastructure designs
- Designation and adoption of "Bike Friendly Routes"
- Continue construction of neighborhood links
- More than the minimum for pedestrian safety
- Railbanking for the future
- Promotion of and participation in biking and walking programs
- Identify and fund Walk and Roll projects in the Capital Improvement Program (CIP)

More information is available in the plan document on the City's **website**.

Regional Planning Context

VISION 2050 (2020)

By 2050, the region's population is anticipated to reach 5.8 million. VISION 2050 sets the stage for updates to countywide planning policies and local comprehensive plans, developed by the region's cities and counties, as illustrated in **Figure 5**.[10] The key themes highlighted in VISION 2050 include:

- Provide opportunities for all
- Increase housing choices and affordability
- Sustain a strong economy
- Significantly reduce greenhouse gas emissions
- Keep the region moving
- Restore the health of the Puget Sound
- Protect a network of open space
- Growth in centers and near transit

Figure 5. Washington State Planning Framework

[10] Puget Sound Regional Council. VISION 2050. 2020 https://www.psrc.org/sites/default/files/2022-02/vision-2050-plan%20%281%29.pdf

- Act collaboratively and support local efforts

More information is available in the plan document on PSRC's **website**.

King County Countywide Planning Policies (2021)

The Countywide Planning Policies (CPPs) implement VISION 2050 by guiding how King County jurisdictions work together and plan for growth. The comprehensive plan for King County and the comprehensive plans for cities and towns in King County are developed from the framework that the CPPs establish.

The 2021 CPPs were designed to provide guidance in advance of the 2024 statutory update of comprehensive plans to incorporate changes to the regional policy framework and to reflect new priorities addressing equity and social justice within communities[11]. The 2021 CPPs update was based on the following:

- 2012 Countywide Planning Policies
- Centering social equity and health
- Integrating regional policy and legislative changes
- Providing clear, concise, and actionable direction for comprehensive plans
- Implementing the Regional Growth Strategy with 2044 growth targets that form the land use basis for periodic comprehensive plan updates

More information is available in the plan document on King County's **website**.

Washington State Growth Management Act

The State's Growth Management Act (GMA) of 1990 requires communities to prepare a transportation plan that ties directly to the City's land use decisions and financial planning. The updated Transportation Element and Background Report support this GMA mandate for the next 20-year planning cycle.

[11] King County. 2021 King County Countywide Planning Policies. 2021 https://kingcounty.gov/~/media/depts/executive/performance-strategy-budget/regional-planning/CPPs/2021-CPPs-Adopted-and-Ratified.ashx?la=en

Chapter 2: Transportation Inventory and Needs Assessment

The subsequent sections document the existing transportation networks within the City and discuss identified opportunities for improvement. The Tukwila transportation network accommodates various modes of getting around, including walking, rolling, scootering, biking, riding public transit, driving, and freight and goods movement

Street Network

Tukwila's street network is comprised of roadways with varying vehicle capacities intended to accommodate various modes of transportation and connect users to local and regional facilities. Streets in Tukwila serve as the foundation of the transportation system, as roadways shape how residents and visitors experience the City. **Table 1** and **Figure 6** describe and map the functional classification of roadways in Tukwila, respectively. **Figure 7** presents posted speed limits on the City's roadway facilities.

The City is dedicated to maintaining healthy roadway conditions along its street network through various rehabilitation investments. Based on a pavement condition assessment conducted in 2020 for more than 200 lane miles of City-owned asphalt roadways, Tukwila's roadway network is generally in good condition. The City's roadway network has an average Pavement Condition Index (PCI) of 68 and a backlog (roads rated below a PCI of 40) one of 5.8 percent of the overall network. Notably, the average PCI for Tukwila streets is slightly above the national average of 60-65.[12]

Because Tukwila's street network is also comprised of state-owned facilities, the City collaborates with the Washington State Department of Transportation (WSDOT). State-owned roadways in Tukwila include Interstate 5, Interstate 405, and state routes 99, 181, 518, 599, and 900 depicted in **Figure 6.**

[12] City of Tukwila. Pavement Management Program – Analysis Report. 2020 http://records.tukwilawa.gov/WebLink/1/edoc/332433/TIC%202020-10-05%20Item%202E%20-%20Report%20-%202020%20Pavement%20Management%20Program%20Analysis%20Report.pdf

Table 1. City of Tukwila Street Functional Classifications

Type	Description	Examples	Photo
Principal Arterial	The primary function of principal arterials is to expedite through-traffic between communities and traffic generated by major shopping and employment centers and serve travel between freeways and lesser classified arterials. Principal arterials carry the highest volume within the City, ranging between 10,000 and 50,000 vehicles per weekday. These roadways generally have sidewalks on both sides, and some have bike facilities.	Tukwila International Boulevard, Interurban Avenue S, East Marginal Way S	 *Tukwila International Boulevard*
Minor Arterial	Minor arterials serve inter-community traffic traveling between neighborhoods and principal and collector arterials. These roadways serve smaller geographic areas than principal arterials. Traffic generators served by minor arterials include schools, hospitals, and community business centers. Minor arterial traffic volumes range from 1,500 to 15,000 vehicles per weekday.	Southcenter Boulevard, Southcenter Parkway, Strander Boulevard	 *Southcenter Boulevard*

Type	Description	Examples	Photo
Collector Arterial	Collector arterials are designed to serve traffic traveling between access streets and higher classification arterials and primarily serve local traffic of a neighborhood or commercial/industrial area. Collector arterial traffic volumes are generally less than 10,000 vehicles per day. Some collector arterials provide transit service, sidewalks, and bike facilities, but there are gaps in Tukwila's network.	S 144th Street, Andover Park W, 42nd Avenue S	 *S 144th Street*
Local Access	Local access roadways connect traffic to arterials, accommodate short trips to neighborhood destinations, and provide local access. Many local access roads lack transit service, sidewalks, and/or bike facilities.	S 143rd Street, 56th Avenue S, 40th Avenue S	 *56th Avenue S*

Source: Tukwila Municipal Code, City of Tukwila, Fehr & Peers. Images are courtesy of Google Maps unless otherwise noted.

Figure 6. Existing Street Functional Classification Map

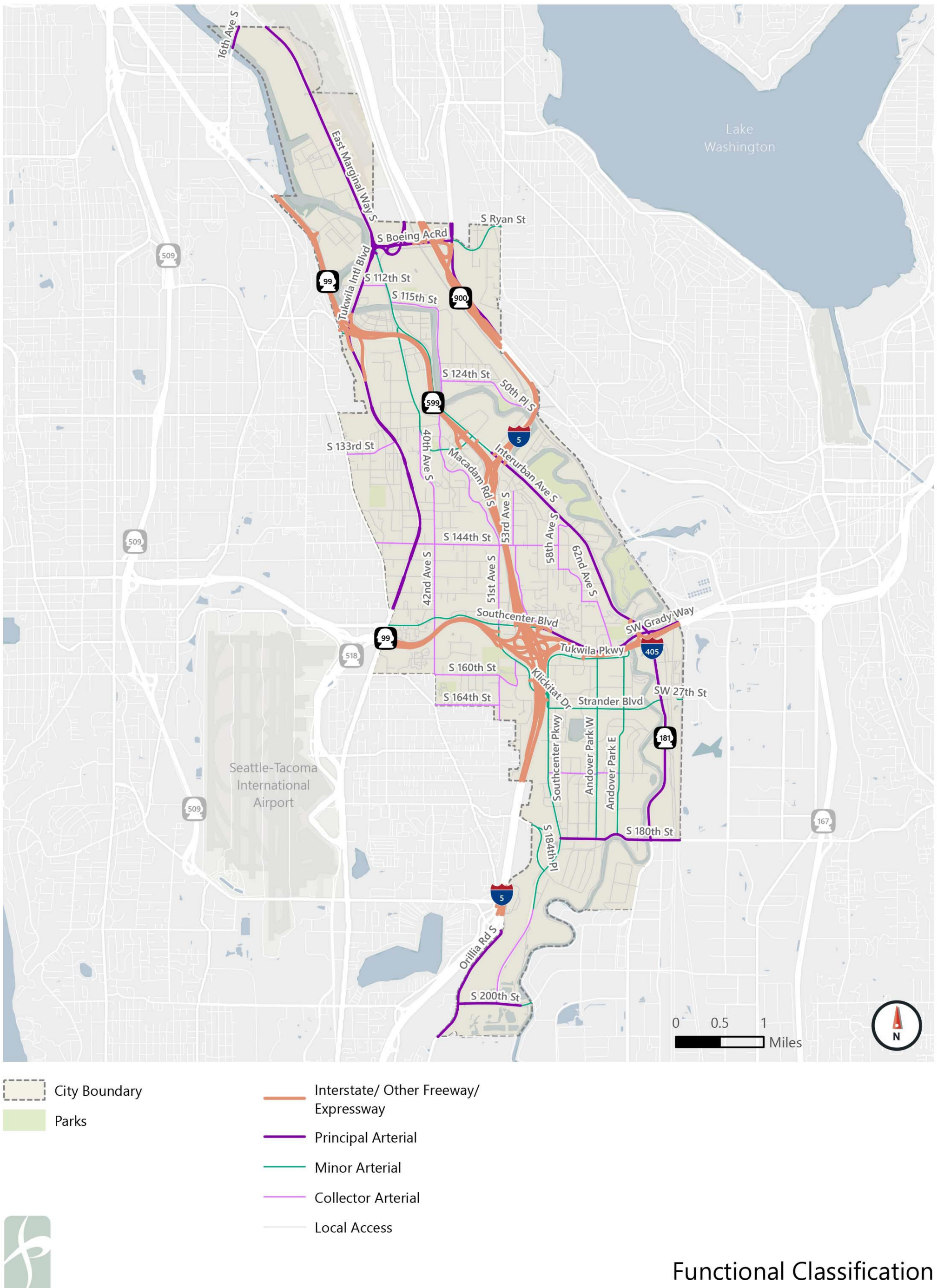
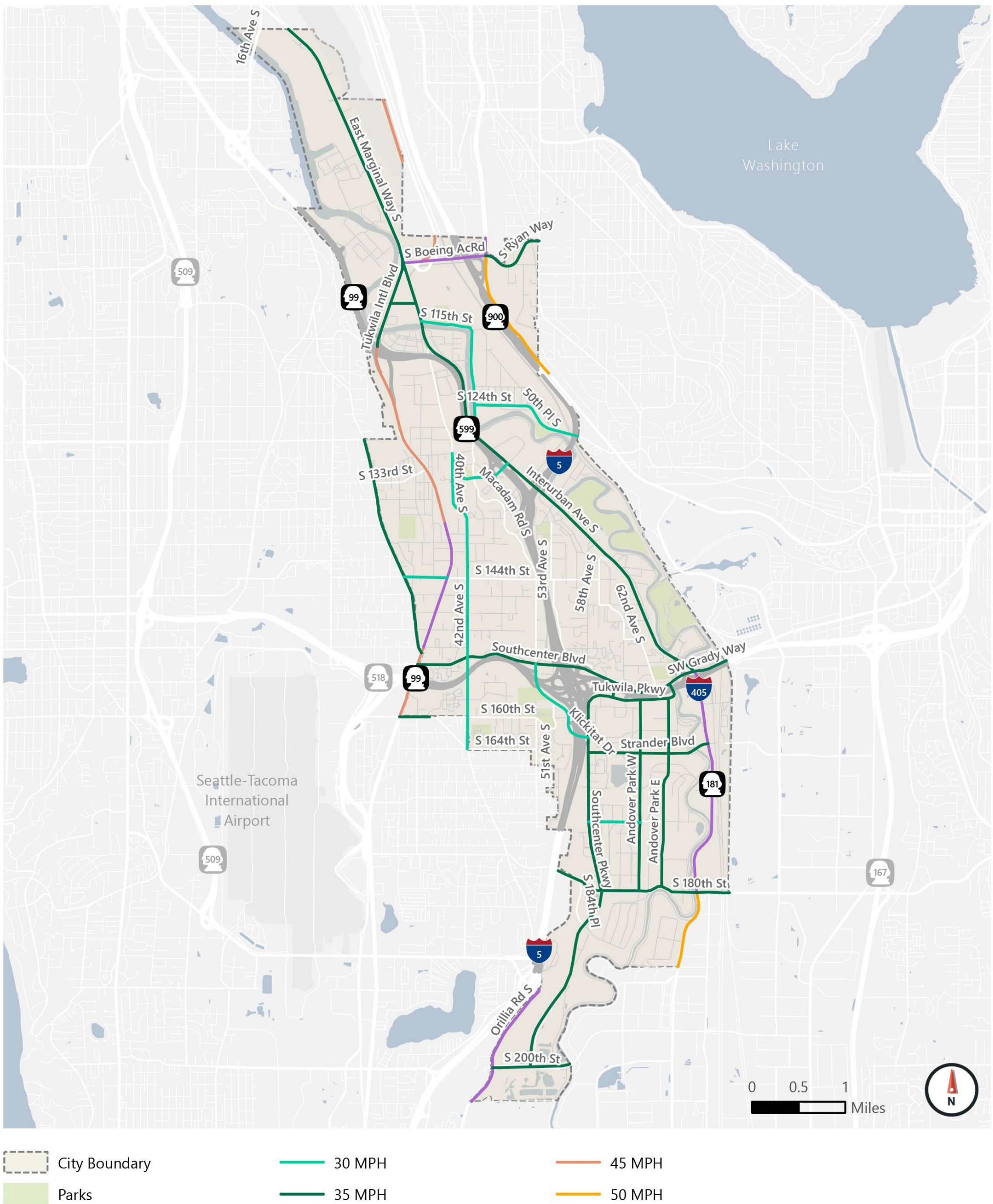


Figure 7. Existing Speed Limits Map



*City streets are 25 mph unless otherwise posted; streets in school zones are 20 mph

Speed Limits

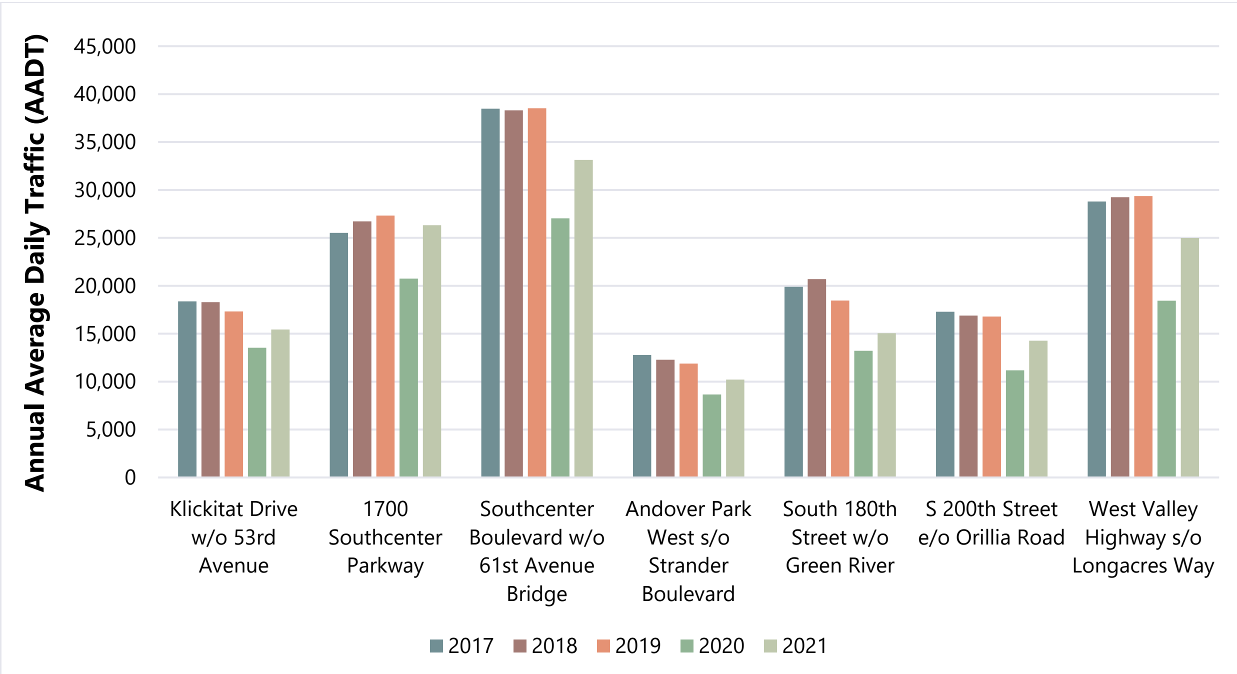
Citywide Traffic Volume Trends

Due to the challenges and unprecedented travel patterns related to COVID-19, pre-pandemic traffic volume data was utilized for the purposes of developing the Transportation Element. Traffic data the City collected in 2018 was used as a starting place, and supplemented by turning movement count data from location-based services (LBS) and navigation global positioning system (GPS) data from anonymized smartphone and vehicle navigation devices. Based on a review of representative locations in Tukwila, these data sets closely matched up with historical counts, with some discrepancies at locations near freeways. As a result, adjustment factors were developed based on the City's traffic database counts to calibrate turning movement count data from these sources to accurately represent baseline conditions.

The City of Tukwila collects and monitors traffic counts at multiple locations across the City monthly to track annual average daily traffic (AADT). As shown in **Figure 8** and **Figure 9**, the busiest locations are Southcenter Boulevard, Boeing Access Road, Southcenter Parkway, and West Valley Highway. Data collected prior to the COVID-19 pandemic from 2017 to 2019 at these locations exceeded 25,000 vehicles. **Figure 8** and **Figure 9** display AADT data from 2020 and 2021. In 2020, the COVID-19 pandemic resulted in abrupt and dramatic changes in travel demand and traffic patterns on all roadway facilities stemming from safety protocols and mass telecommuting. This is reflected in the drop in AADT illustrated in **Figure 8** and **Figure 9**. Data from 2021 show an increase in AADT at study locations; however, travel demand was still less than in pre-pandemic years, which confirms that turning movement count data from 2018 represent a conservative estimate for travel demand.

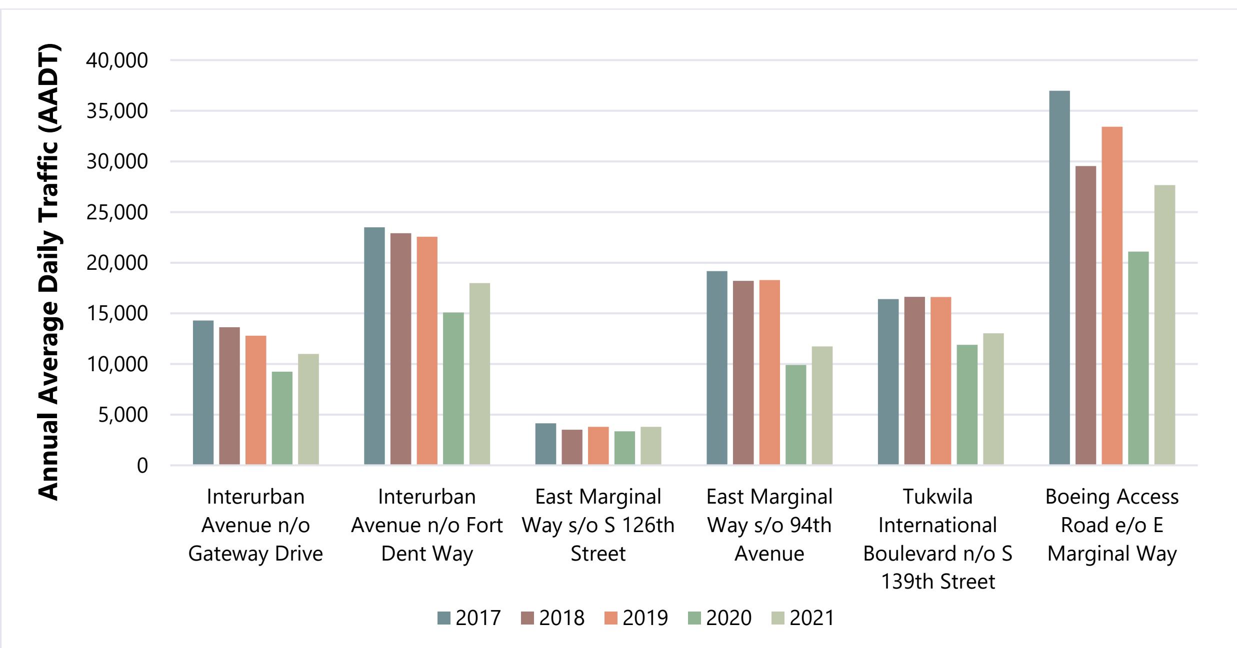
Figure 10 illustrates monthly travel patterns in Tukwila based on total AADT at the count locations. Travel on these corridors peaks during the summer and winter holidays, and volumes are notedly lower in September and October.

Figure 8. Traffic Volume Trends in or near Tukwila Urban Center (2017 - 2021)



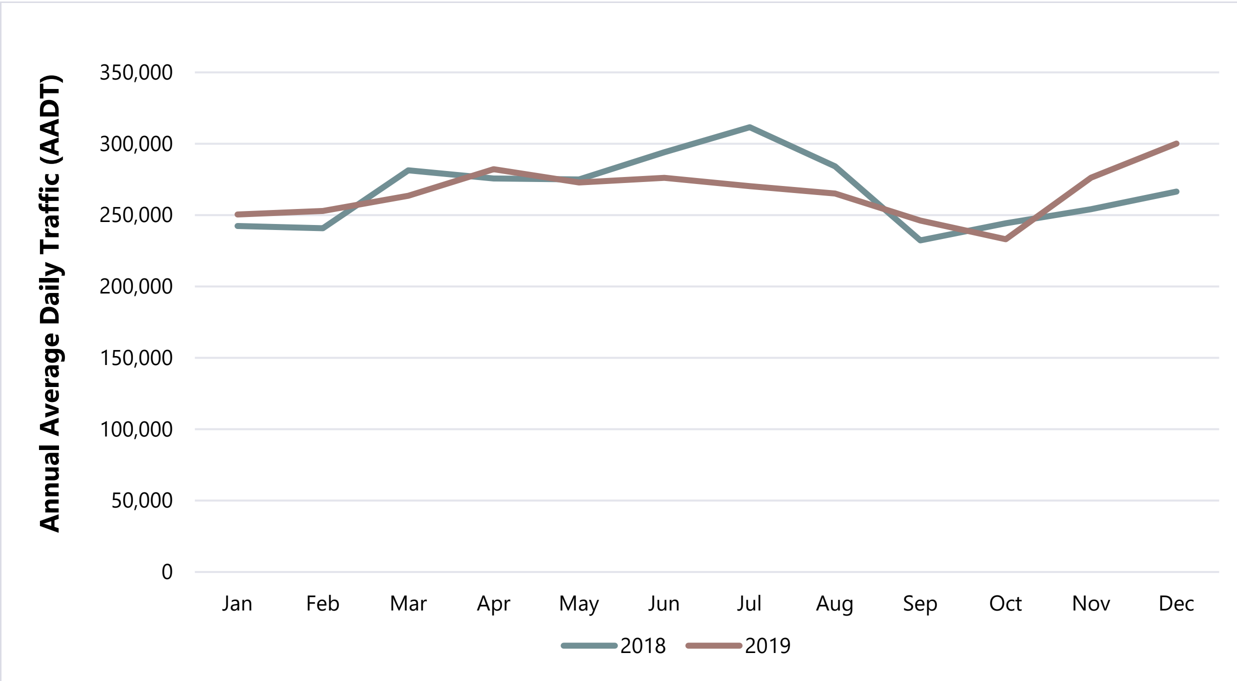
Source: City of Tukwila, Fehr & Peers. 2022.

Figure 9. Traffic Volume Trends in Study Locations Across Tukwila (2017 - 2021)



Source: City of Tukwila, Fehr & Peers. 2022.

Figure 10. Monthly Travel Patterns in Tukwila



Source: City of Tukwila, Fehr & Peers. 2022.

Existing Traffic Conditions

The performance of vehicle congestion at intersections within Tukwila is measured using a standard state-of-the-practice methodology known as level of service (LOS). LOS represents the degree of congestion at an intersection based on the average delay per vehicle at a controlled intersection, such as a traffic signal or stop sign. Individual LOS grades are assigned on a letter scale, A through F, with LOS A representing free-flow conditions with no delay and LOS F representing highly congested conditions with long delays, as described in **Table 2** and illustrated in **Figure 11**.

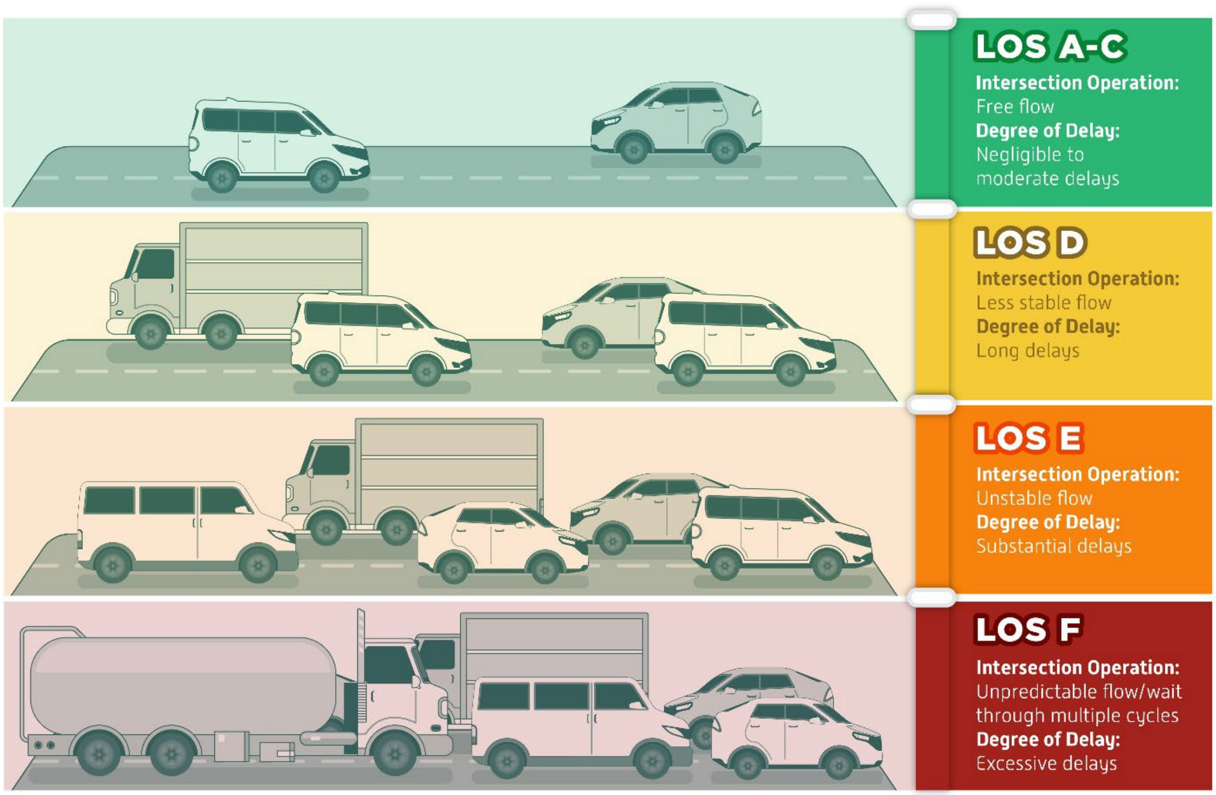
Table 2 shows the definition of each LOS grade detailed in the 6th edition of the Highway Capacity Manual (HCM) methodology, which is based on average control delay per vehicle. The methodology captures the average delay for all vehicles entering the intersection and prescribes how the average delay is measured at different types of intersections: signalized and stop-controlled intersections. Signalized intersections have higher delay thresholds compared with two-way and all-way stop-controlled intersections. When calculating LOS at two-way stop-controlled intersections, the delay from the most congested movement is reported and used.

Table 2. Intersection Level of Service (LOS) Criteria

Level of Service	Signalized Intersection Delay (seconds)	Unsignalized Intersection Delay (seconds)
A	≤ 10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Source: Highway Capacity Manual (HCM) 6th Edition

Figure 11. Intersection Level of Service



Source: Fehr & Peers.

The City's LOS standard requires that roadways and intersections within City limits adhere to the following[3]:

Southcenter Area

- The Southcenter area corridor average is not to exceed LOS E, except for the Strander Boulevard corridor and a portion of the Andover Park East corridors.
- The Strander Boulevard corridor average is not to exceed LOS F, with an average delay not to exceed 120 seconds. The Andover Park East corridor, between Tukwila Parkway and Strander Boulevard, is not to exceed LOS F, with an average delay not to exceed 120 seconds. The S 180th Street corridor average, between Southcenter Parkway and SR 181 (West Valley Highway) is not to exceed LOS F, with an average delay not to exceed 150 seconds.
- SR 181 (West Valley Highway) is not to exceed LOS E/Mitigated per WSDOT standards as a State highway of regional significance.
- 61st Avenue S Bridge/Tukwila Parkway corridor is not to exceed LOS F, with an average delay not to exceed 120 seconds.[13]

Outside of Southcenter

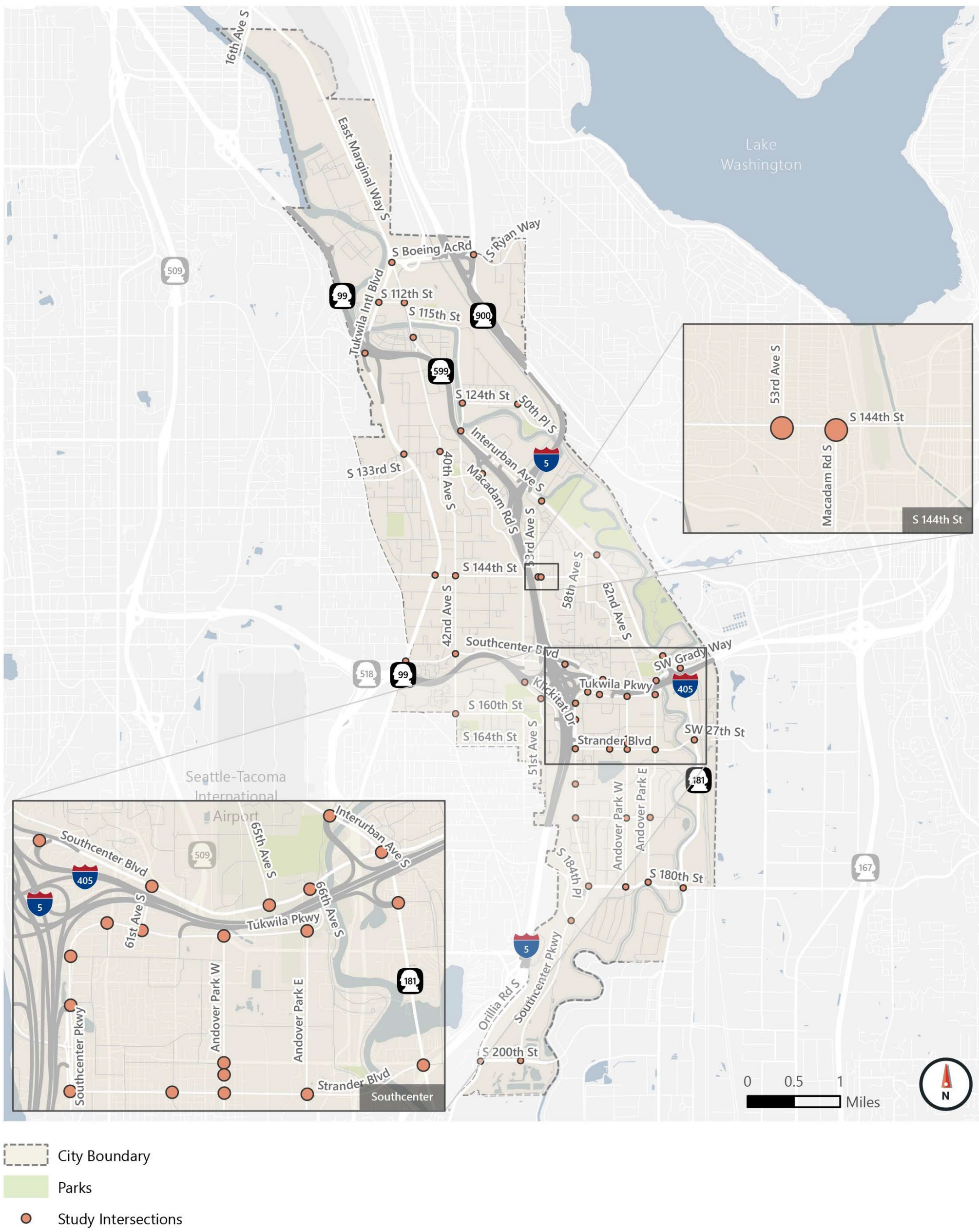
- Southcenter Boulevard/65th Avenue S is not to exceed LOS F with a maximum delay of 90 seconds.[14]
- All other non-residential arterial intersections are not to exceed LOS E.
- The LOS of minor and collector arterials in predominantly residential areas is not to exceed LOS D for each specific arterial.
- As State highway of regional significance, SR 181 (West Valley Highway), SR 99, and SR 599 are subject to a Regional Level of Service Standard established by the Puget Sound Regional Council and WSDOT. The automobile level of service is not to exceed LOS E/Mitigated.
- As State highways of regional significance, I-5, I-405, and SR 518 are subject to a LOS standard established by WSDOT. The automobile level of service is not to exceed LOS D.

Vehicle LOS in Tukwila was evaluated at 54 study intersections (38 signalized and 16 unsignalized) and 11 corridors (comprised of 24 representative intersection locations) presented

[13] Added as part of 2024 Transportation Element update to address anticipated future congestion.
[14] Added as part of 2024 Transportation Element update to address anticipated future congestion.

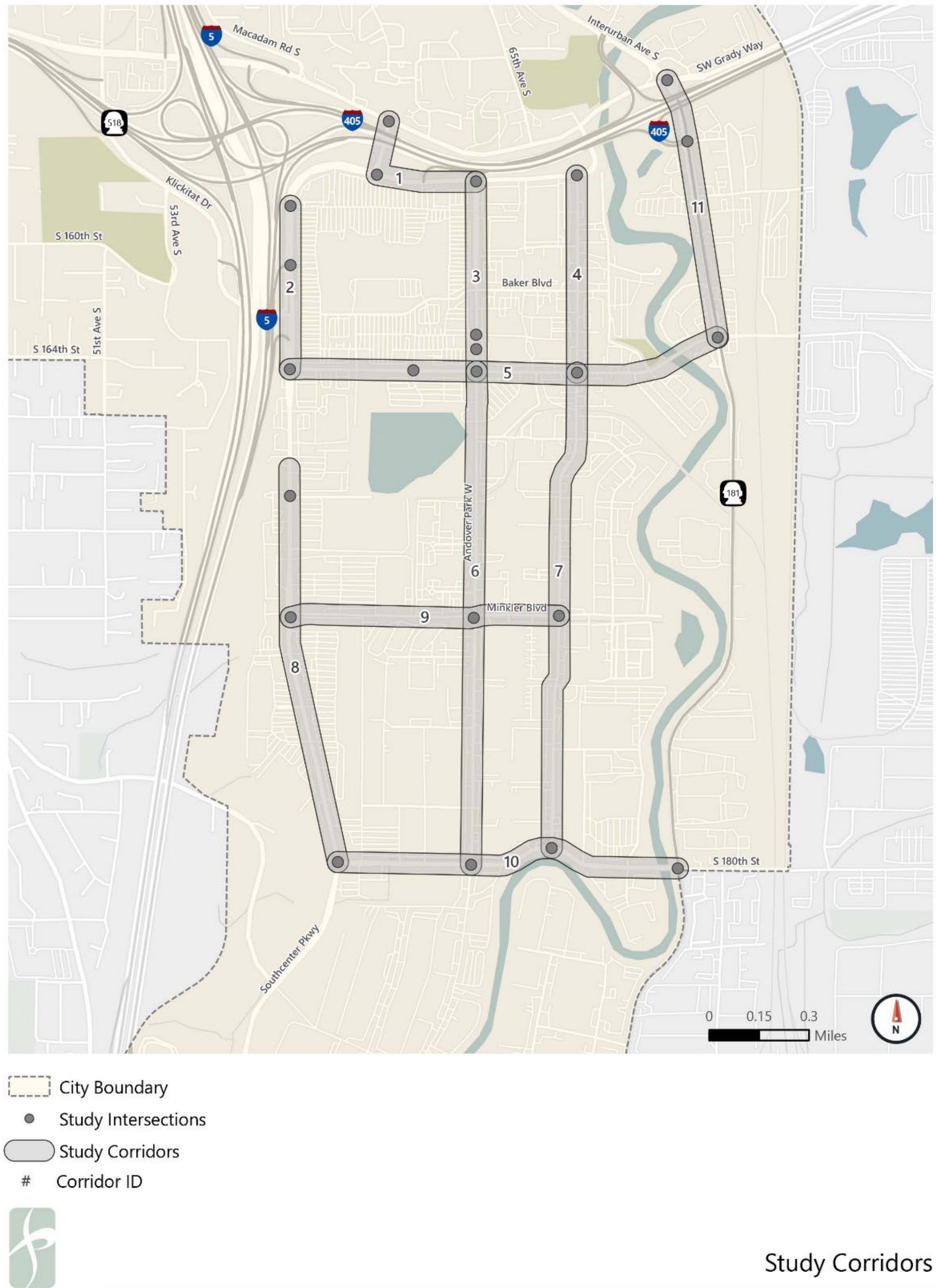
in **Figure 12** and **Figure 13**. The selection of the study intersections was based on previously identified locations with congestion and geographic spread. This approach has been used in various City efforts including the 2015 Comprehensive Plan and the 2018 Concurrency Study.

Figure 12. Study Intersections



Study Intersections

Figure 13. Study Corridors



Citywide Traffic Conditions

Figure 14 shows vehicle LOS, which reflects how the study intersections operate today based on an existing traffic operations analysis conducted using the Synchro version 11 software package. Detailed vehicle LOS and delay results for each intersection are provided in **Appendix C**.

The City's intersection LOS policy only applies to intersections outside the Southcenter area. These study intersections currently operate acceptably under existing conditions during the PM peak hour except at the following location:

- Southcenter Boulevard / I-405 SB Off-ramp (LOS F with an average delay of 92 seconds)

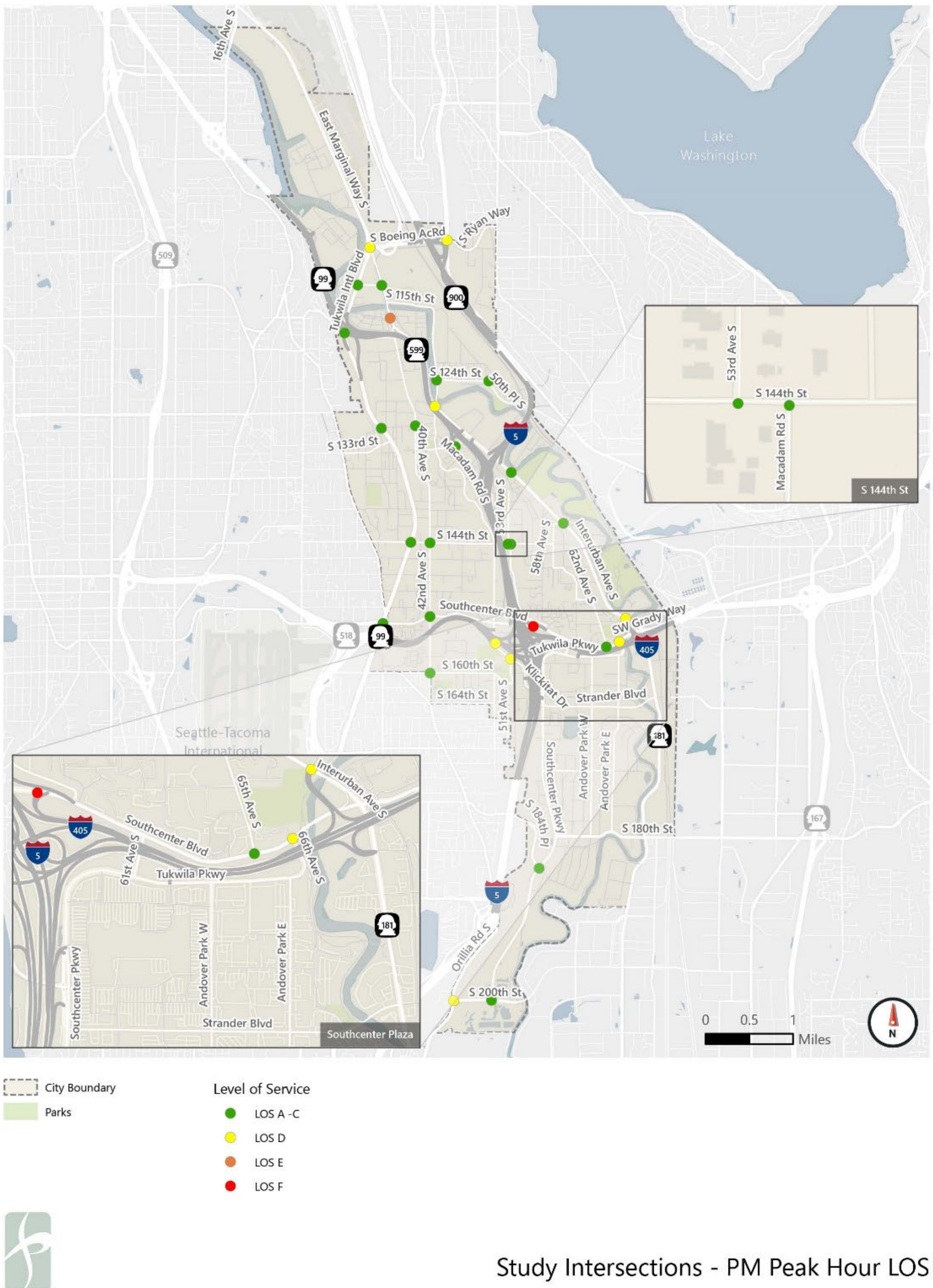
Other notable intersections outside the Southcenter area include:

- South 116th Street / East Marginal Way (LOS E with an average delay of 39 seconds)

For specifically WSDOT facilities, only the following intersection does not meet the regional LOS standard established by the Puget Sound Regional Council and WSDOT:

- Southcenter Boulevard / West Valley Highway (LOS F with an average delay of 80 seconds) exceeds the LOS E/Mitigated standard.

Figure 14: Existing PM Peak Hour LOS in Tukwila



Urban Center Traffic Conditions

The roadway network within the Southcenter area is understood to have non-traditional peak periods due to retail travel patterns. The 11 study corridors depicted in **Figure 13** were evaluated to understand traffic conditions in the Southcenter area during several peak periods as shown in **Figure 15** through **Figure 18**. The analysis periods include weekdays and weekends during midday and PM peak hours. The weekend analysis periods are of particular interest to capture regional ingress and egress traffic to Southcenter. There are markedly higher traffic volumes in Southcenter during weekends compared to weekdays, with increases ranging from 10 percent to 20 percent.

Detailed Synchro/ SimTraffic microsimulation informed the corridor analysis assessments. As illustrated in **Figure 15** through **Figure 18**, the study corridors operate acceptably during all the evaluated analysis periods and meet the City's corridor LOS standards. The corridors operate at LOS E or better during all studied time periods. Noteworthy intersections along these corridors include:

- Southcenter Boulevard / 61st Avenue South (LOS F with an average delay of 98 seconds under weekend mid-day conditions)
- Southcenter Boulevard / West Valley Highway (LOS F with an average delay of 83 seconds under weekend PM conditions)
- South 180th Street / West Valley Highway (LOS E with an average delay of 70 seconds under weekend mid-day conditions)
- South 180th Street / Andover Park East (LOS E with an average delay of 70 seconds under weekend mid-day conditions)

Tables with detailed vehicle LOS and delay results for each intersection and corridor are exhibited in **Appendix B** and **Appendix C**.

Figure 15. Existing (2018) - Weekday Mid-day Peak Hour LOS

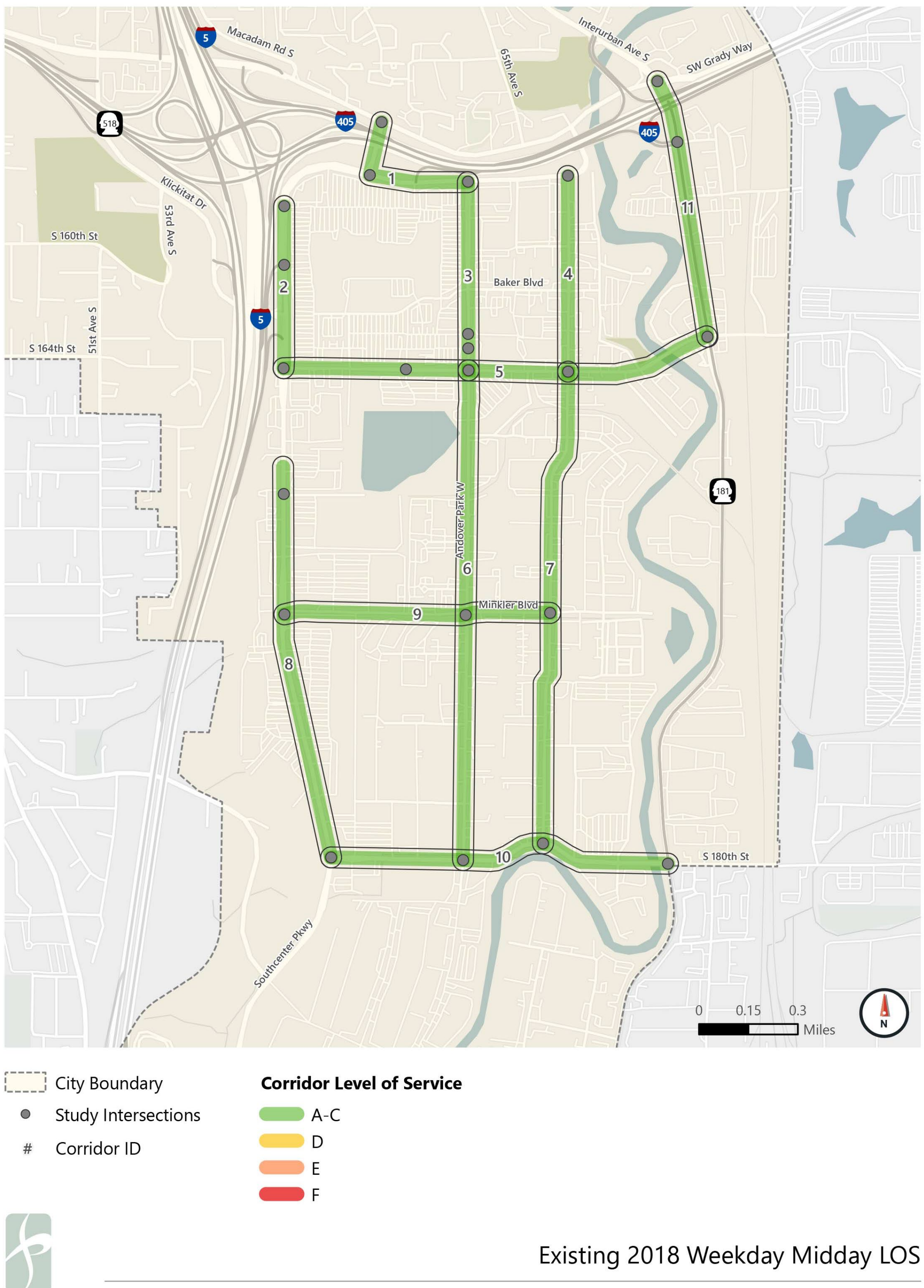


Figure 16. Existing (2018) - Weekday PM Peak Hour LOS

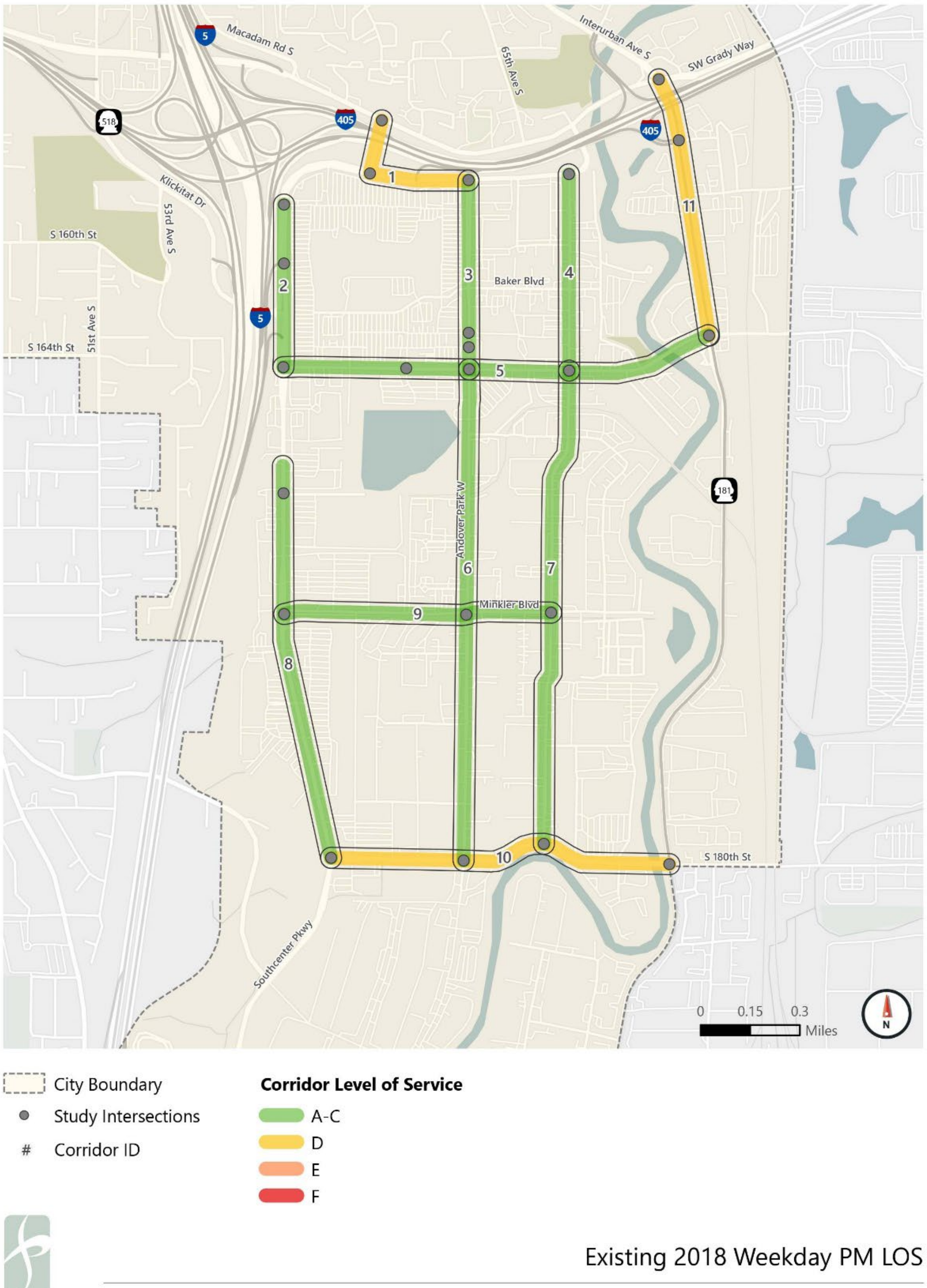


Figure 17. Existing (2018) - Weekend Mid-day Peak Hour LOS

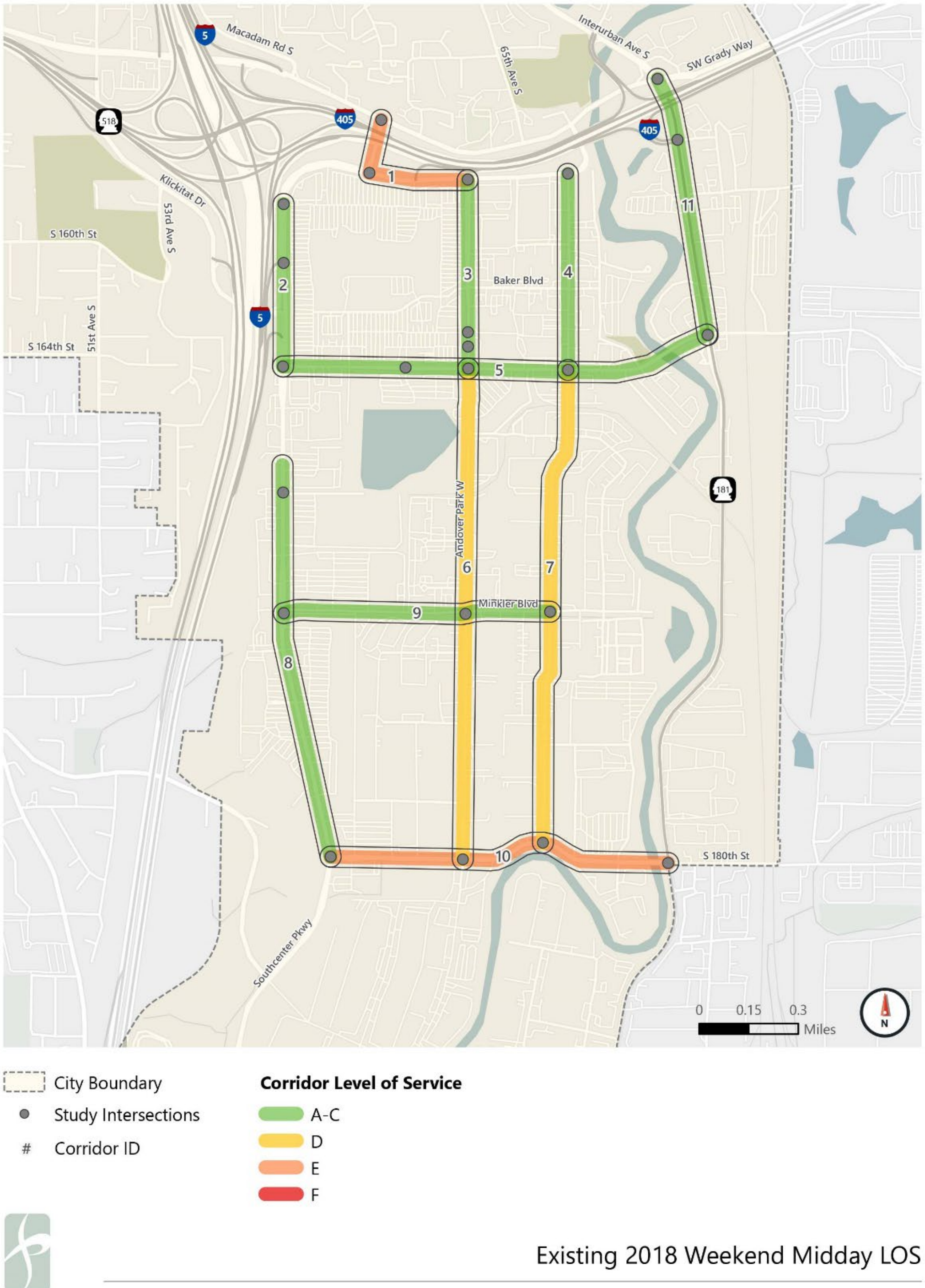
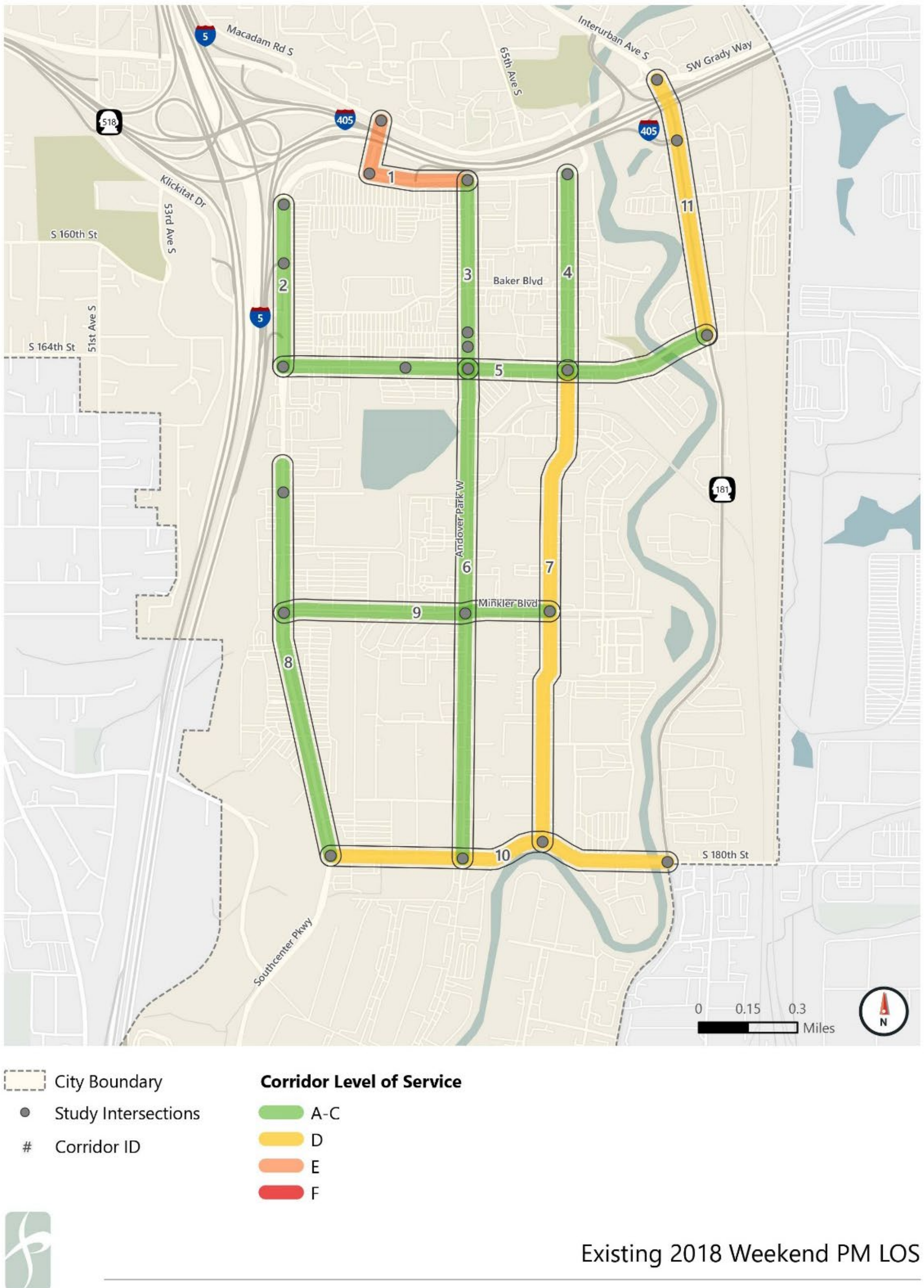


Figure 18. Existing (2018) - Weekend PM Peak Hour LOS



Existing Facilities and Future Needs for Walking and Rolling

Walking and rolling are essential ways people get around Tukwila. Walking and rolling often precedes and concludes trips by other modes. Planning safe and effective pedestrian infrastructure can make these trips easier, cheaper, and more convenient.

Pedestrian infrastructure includes a range of treatments spanning from sidewalks, curb cuts, and crosswalks to trails and shared-use paths. An example of supportive pedestrian infrastructure in Tukwila are pedestrian-actuated Rectangular Rapid Flashing Beacons (RRFB), which are located along several corridors, including Tukwila International Boulevard, as shown in **Figure 19**.

What does "rolling" include?

"Rolling" refers to methods of using pedestrian facilities other than walking. This includes the use of wheelchairs, strollers, mobility devices, and bicycles. Sidewalks, trails, and other pedestrian facilities accommodate those who walk as well as those who rely on mobility devices.

Figure 19. Crosswalk and RRFBs along Tukwila International Boulevard

Source: Fehr & Peers. 2022

Most principal and minor arterials in the City of Tukwila have sidewalk facilities on one or both sides. However, sidewalk facilities tend to be limited to these street designations with many residential areas in Tukwila lacking sidewalks and connectivity across barriers such as I-5. **Figure 20** displays the existing sidewalk network within City limits.

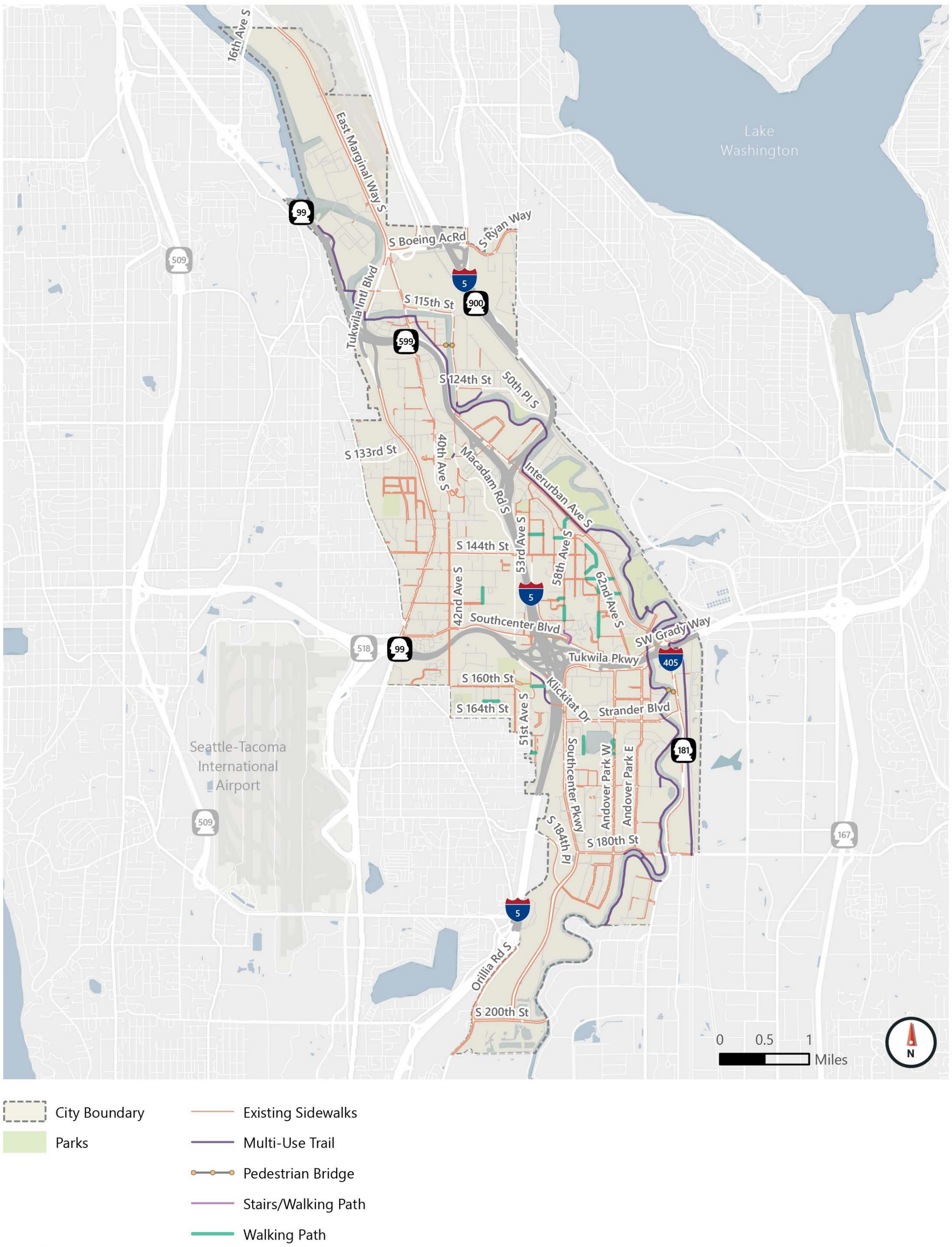
Following the adoption of Tukwila's 2009 Walk and Roll Plan, many pedestrian facilities have been constructed[15] including:

- Cascade View Elementary Safe Routes to School Trail
- Sidewalk in front of Aviation High School
- Sidewalk on South 150th Street (Thorndyke Elementary Safe Routes to School)
- Sidewalks on Interurban Avenue South
- Sidewalks on Tukwila International Boulevard
- Sidewalks on Southcenter Parkway (south of South 180th Street)
- Sidewalks on Southcenter Boulevard (east of I-5)

These projects demonstrate Tukwila's long-standing commitment to multimodal connectivity.

[15] City of Tukwila. Walk & Roll Program. https://www.tukwilawa.gov/departments/community-development/walk-roll-program

Figure 20. Existing Walking and Rolling Network



Sidewalks and Trails

Pedestrian Network Connectivity

The walking and rolling facilities in the City of Tukwila have room to improve overall network connectivity. As noted, residential areas in Tukwila have limited access to sidewalks. This poses a challenge for those relying on pedestrian facilities to reach key destinations such as neighborhood shopping or transit stops. Filling gaps in the network can make the current facilities more functional throughout the City. In addition, many transit stops in the City are not well connected to the sidewalk network. This poses an issue as most transit riders access stops using the pedestrian network. People may resort to walking in travel lanes or on a narrow shoulder, which poses a safety concern. Improving Tukwila's pedestrian network connectivity will, in turn, improve the ability of users of the current infrastructure to reach more destinations.

Existing Facilities and Future Needs for Biking

Biking often facilitates longer trips than walking or rolling with similar benefits to the environment, individuals, and the community.

There are a variety of different biking infrastructure types that can appeal to cyclists with varying levels of experience and confidence. In addition to bikes, other wheeled users include scooters, skateboards, and inline skates. These users tend to use infrastructure geared towards both pedestrians and cyclists, such as shared use paths. A wide range of bicycle facilities is important to ensure that people who bike at all levels can make use of the network. This includes both advanced bicyclists who are comfortable interacting with moving vehicles as well as bicyclists who prefer separated facilities.

Figure 21. Bike lane along Southcenter Boulevard

Source: Fehr & Peers. 2022

Bike facilities currently found in Tukwila include bike lanes (example in **Figure 21**), sharrows, shared-use paths/trails, and designated bike routes. Tukwila currently maintains over six miles of dedicated bike lanes along seven segments. Tukwila's existing bike network is shown in **Figure 22**. While there are bike lanes on some key roadways, such as sections of Southcenter

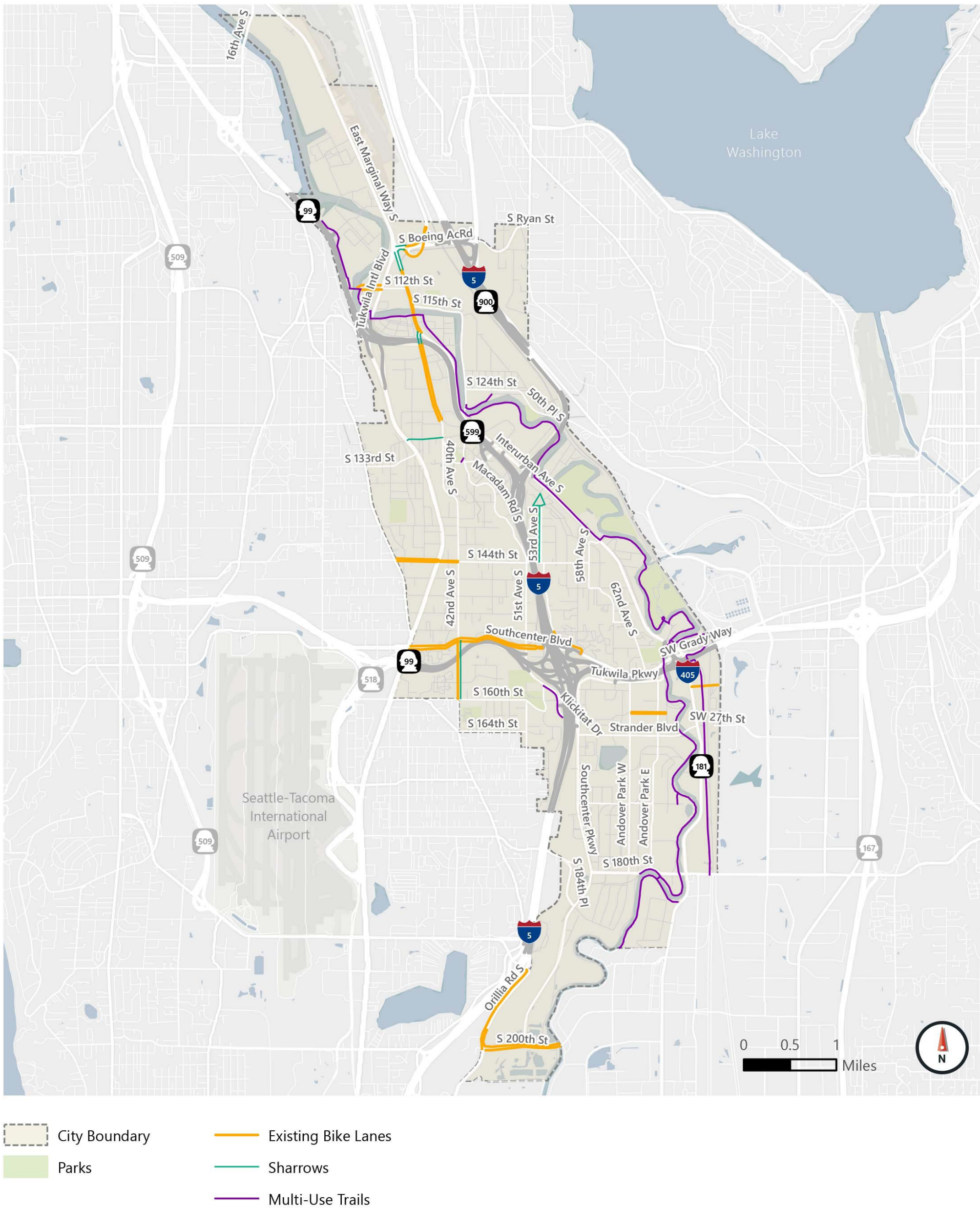
Boulevard, East Marginal Way South, 42nd Avenue South, Baker Boulevard, Orillia Road South, among other roads, there are many gaps in the bike network. These lanes are not connected to each other nor to local shared-use paths.

Following the adoption of Tukwila's 2009 Walk and Roll Plan, the following bike facilities have been constructed by private developers or the City[16]:

- Cascade View Elementary Safe Routes to School Trail
- Bike lane on South 112th Street.
- Bike lanes and sharrows on East Marginal Way
- Bike lanes on ramps to/from Airport Way South
- Bike lanes on Southcenter Boulevard (east of I-5)
- Bike lanes on Baker Boulevard
- Two-way cycle track on Longacres Way
- Bike lane and sharrow on 42nd Ave S

[16] City of Tukwila. Walk & Roll Program. https://www.tukwilawa.gov/departments/community-development/walk-roll-program

Figure 22. Existing Bike Network



Existing Bike Facilities

Bike Network Connectivity

The overall network connectivity of bike facilities in the City of Tukwila can improve. There are several roadway segments with bike facilities, however they are currently disjointed. The connection between bike lanes in Tukwila to local shared-use paths and trails is limited. This limits the ability of cyclists to reach desired destinations utilizing designated bike facilities. Expanding and upgrading Tukwila's bike network connectivity will provide more options for people who bike to reach their desired destinations using their preferred type of bicycle facility.

Existing and Future Transit Needs

This section provides an overview of the transit services currently providing service to and from Tukwila, how these services are utilized, and where there may be additional demand for service in the area.

System Overview

King County Metro (Metro) offers five traditional fixed-route services, two RapidRide routes, one Demand Area Response (DART) route, and Metro Flex on-demand service within the City of Tukwila. Sound Transit provides light rail service on the 1 Line to Tukwila International Boulevard Station and Sounder commuter rail service to Tukwila Station.

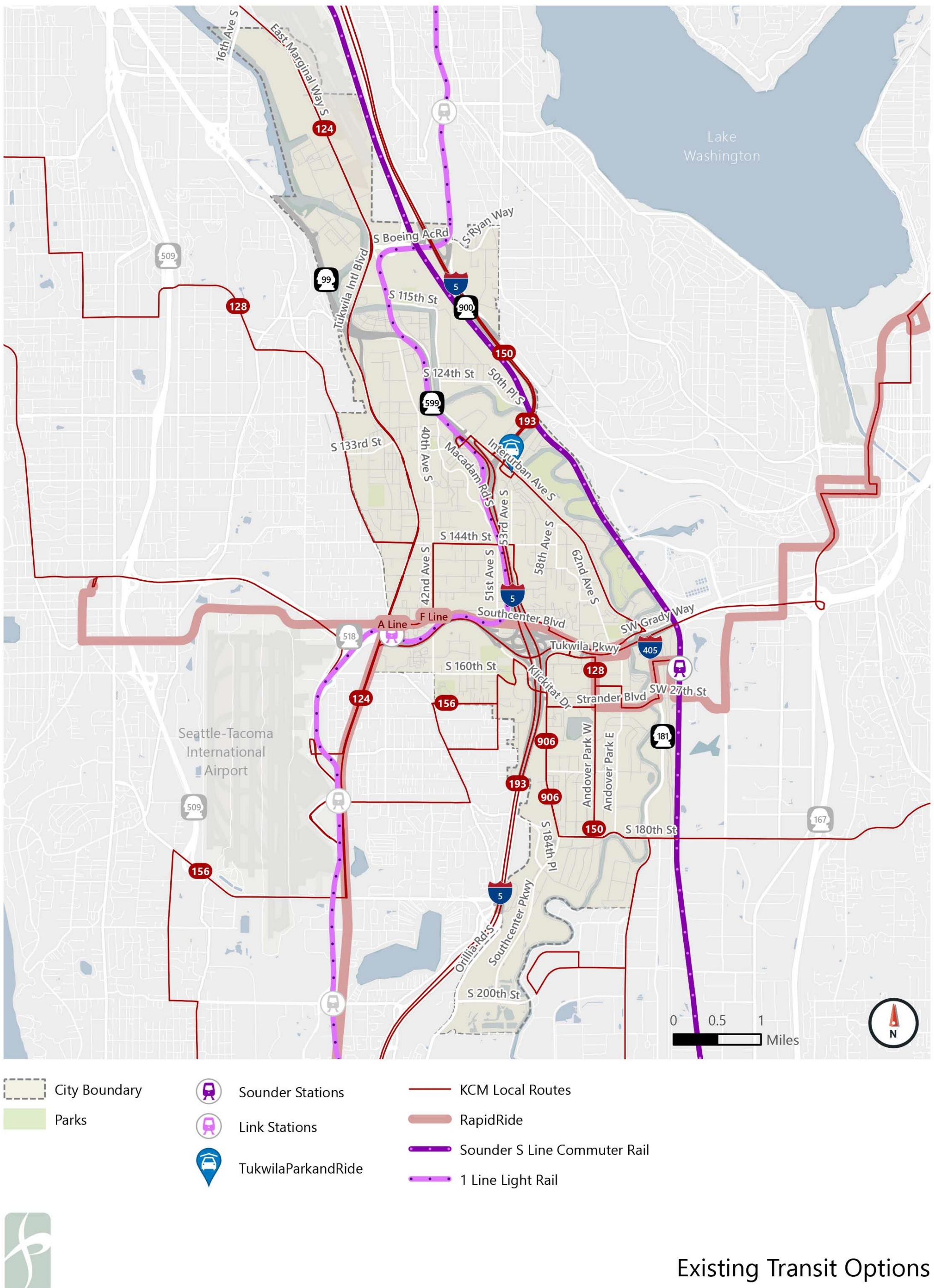
The highest ridership activity occurs at two locations that are served by multiple lines and modes:

- Tukwila International Boulevard Station, served by local bus, RapidRide, and the 1 Line. Average daily boardings in March 2024 for Link light rail were 2,244and bus boardings were 2,472 for a total of 4,716 at the station.

- Tukwila Transit Center near Southcenter Mall, served by local bus and RapidRide F Line. Passengers can connect to the Tukwila Sounder station to the east using the RapidRide F Line. Average daily boardings in this location during March 2024 were 1,414.

The characteristics of these services are summarized in **Figure 23.**

Figure 23. Existing Transit Serving Tukwila (2023)



Service Frequency and Availability

Transit service in Tukwila operates with a range of service frequencies and availability depending on corridor. There are four frequent service bus routes in Tukwila that have service every 15-minute service from 6 a.m. to 7 p.m. on weekdays, including RapidRide A, RapidRide F, Route 124, and Route 150. Route 193 is a commuter express route that only operates during commute times in the peak direction to/from First Hill in Seattle. Route 150 serves Kent and Southcenter before becoming an express route to Downtown Seattle. Routes 156 and 128 serve Tukwila locally including Tukwila International Boulevard, Southcenter, and Interurban Ave South. These routes tend to serve the area with lower frequencies compared to rapid transit options. The 1 Line light rail additionally serves Tukwila International Boulevard Station every 8-10 minutes on weekdays. Sound Transit also operates the Sounder South (S Line) commuter rail through Tukwila Station, connecting to Lakewood, Tacoma, Puyallup, Sumner, Auburn Kent, and Seattle with 13 round trips per day on weekdays only. All transit modes serving Tukwila are outlined in **Table 3**, alongside current service frequencies and spans of service.

Table 3. Service Characteristics by Route

Route	Frequency of Service					Span of Service		
	Weekday			Weekend				
	AM/PM Peak (6A-9A, 3P-7P)	Midday (9A-3P)	Evening (After 7P)	Saturday	Sunday	Weekday	Saturday	Sunday
Route 124	15	15	30	30	30	4:54 AM-4:21 AM	5:49 AM-4:24AM	5:53 AM-4:22 AM
Route 128	20	20	30	30	30	4:50 AM-1:12AM	6:02 AM-1:03 AM	6:03 AM-1:13 AM
Route 150	15	15	30	15-30	15-30	4:45 AM-3:03AM	5:07 AM-3:01 AM	5:52 AM-3:06 AM
Route 156	30	30	30	60	60	5:03 AM-11:26 PM	5:25 AM-11:00 PM	5:28 AM-10:47 PM
Route 193x	20	-	30	-	-	5:21 AM-8:50 AM 3:09 PM – 8:32 PM	-	-
RapidRide A	10	10	10*	10*	10*	24 Hr	24 Hr	24 Hr
RapidRide F	15	15	15*	15*	15*	4:44 AM-12:44 AM	5:59 AM-12:44 AM	6:00 AM-12:48 AM

Route	Frequency of Service					Span of Service		
	Weekday			Weekend				
	AM/PM Peak (6A-9A, 3P-7P)	Midday (9A-3P)	Evening (After 7P)	Saturday	Sunday	Weekday	Saturday	Sunday
DART 906*	20-30	30	30	60	60	4:45 AM-11:51 PM	8:20AM-6:59 PM	8:20 AM-6:57 PM
Sounder South (S Line)	20-30	-	20-30	-	-	4:36 AM-11:22 AM 2:35 PM-7:46 PM	Special Events Only	Special Events Only
1 Line	8	10	8	10	10	4:11 AM-2:14 AM	4:11 AM-2:14 AM	5:06 AM-1:05 AM
Metro Flex	On-Demand	On-Demand	On-Demand	On-Demand	On-Demand	5 AM-1 AM	5 AM-1 AM	6 AM-12 AM

* Some late-night trips may exceed maximum frequency listed

High Frequency Transit

During peak travel times on weekdays, there are four services that provide 15-minute or better frequency:

- Metro Route 150
  - *Service between Kent and Downtown Seattle*
- Metro RapidRide A Line
  - *Service between Federal Way Transit Center and Tukwila International Boulevard Station*
- Metro RapidRide F Line
  - *Service between Burien and Renton*
- Sound Transit 1 Line
  - *Service between Angle Lake and Northgate via Downtown Seattle*

Local Route Frequency

During peak travel times on weekdays, Routes 124, 128, and 156 provide service at 30-minute frequencies or better. These routes serve local stops in Tukwila in addition to serving surrounding communities and Downtown Seattle.

- Metro Route 124
  - *Service between Tukwila International Boulevard Station and Downtown Seattle*
- Metro Route 128
  - *Service between North Admiral (West Seattle) and Southcenter Mall*
- Metro Route 156
  - *Service between Highline College (Des Moines) and Southcenter Mall*

On Demand Services

During off-peak times when service is not as frequent on local routes, Tukwila residents are able to use two different on-demand services to transport them to stops with more service and higher frequencies.

Dial-A-Ride Transit (DART) is a service operated by King County Metro that operates within communities that have a need for more flexible service due to lower population density, greater distances, and fewer available fixed route options. DART Route 906 serves Tukwila every hour or better and can deviate from its route by request to allow for residents to make connections to other transit options or their home.

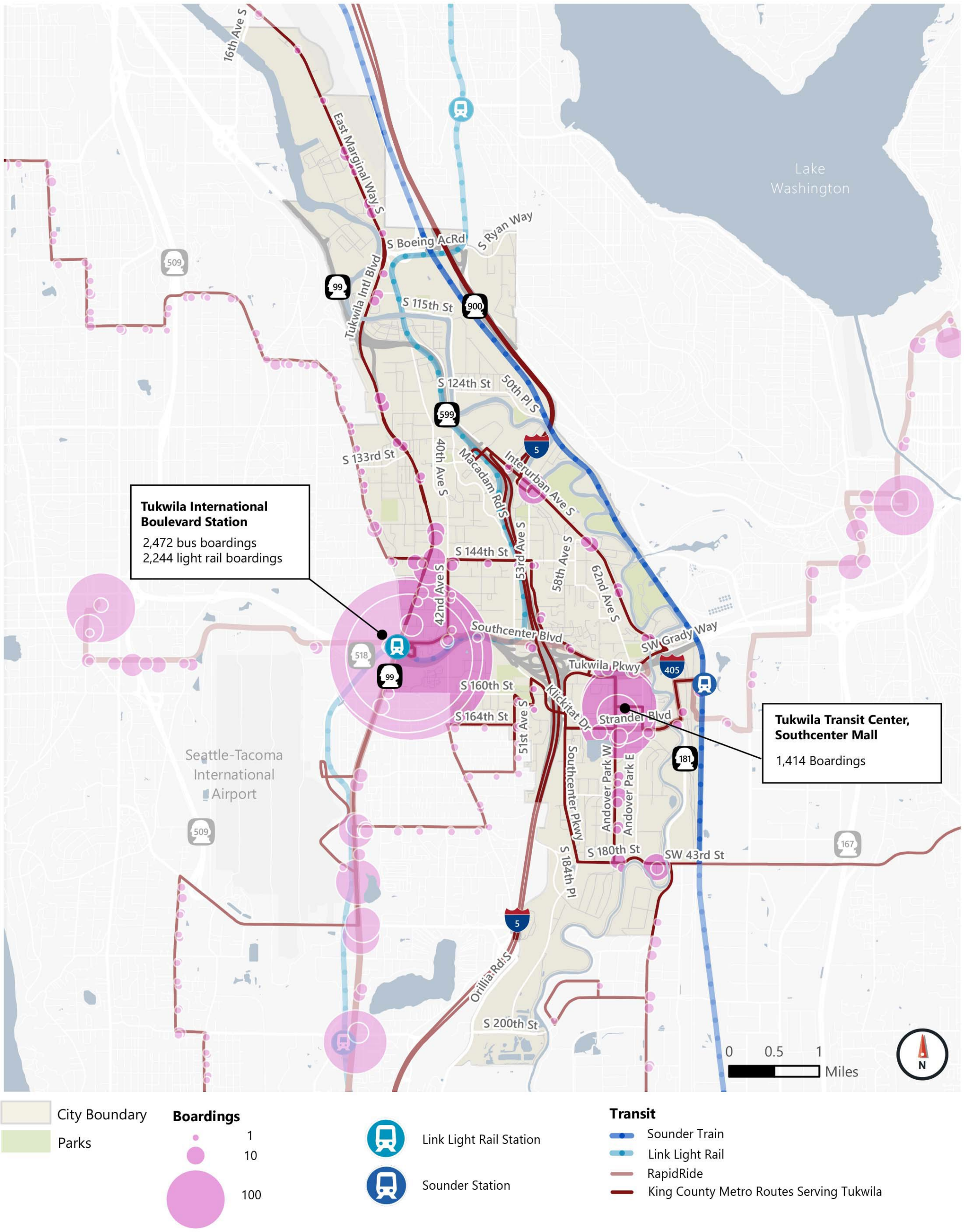
Metro Flex is an on-demand service that is available within a defined boundary of Tukwila. Metro Flex allows anyone within the defined service area to hail a ride using a mobile app or phone call for transportation to a transit stop with frequent service. In Tukwila, Metro Flex can be used within the defined area to provide transportation to Tukwila International Boulevard Station and the Tukwila Community Center.

Ridership and Productivity

Boarding activity in Tukwila is highest at Tukwila International Boulevard Station, with average daily boardings of 4,716 in March 2024 (bus and light rail combined). The next highest boarding activity is at the Tukwila Transit Center located west of Southcenter Mall. The Southcenter area is a large employment hub served by three local routes and the RapidRide F line. The Sound Transit Sounder Station on the east side of the Southcenter area has lower ridership than both Tukwila International Boulevard Station and the Tukwila Transit Center. **Figure 24** shows average daily boardings for these heavily utilized stations and other stops in Tukwila.

Outside of larger transit hubs, the Tukwila International Blvd corridor has notable ridership activity, especially near the intersection of S 144th Street which is located near Tukwila Village, Foster High School, and residential neighborhoods.

Figure 24. Average Daily Boardings by Stop

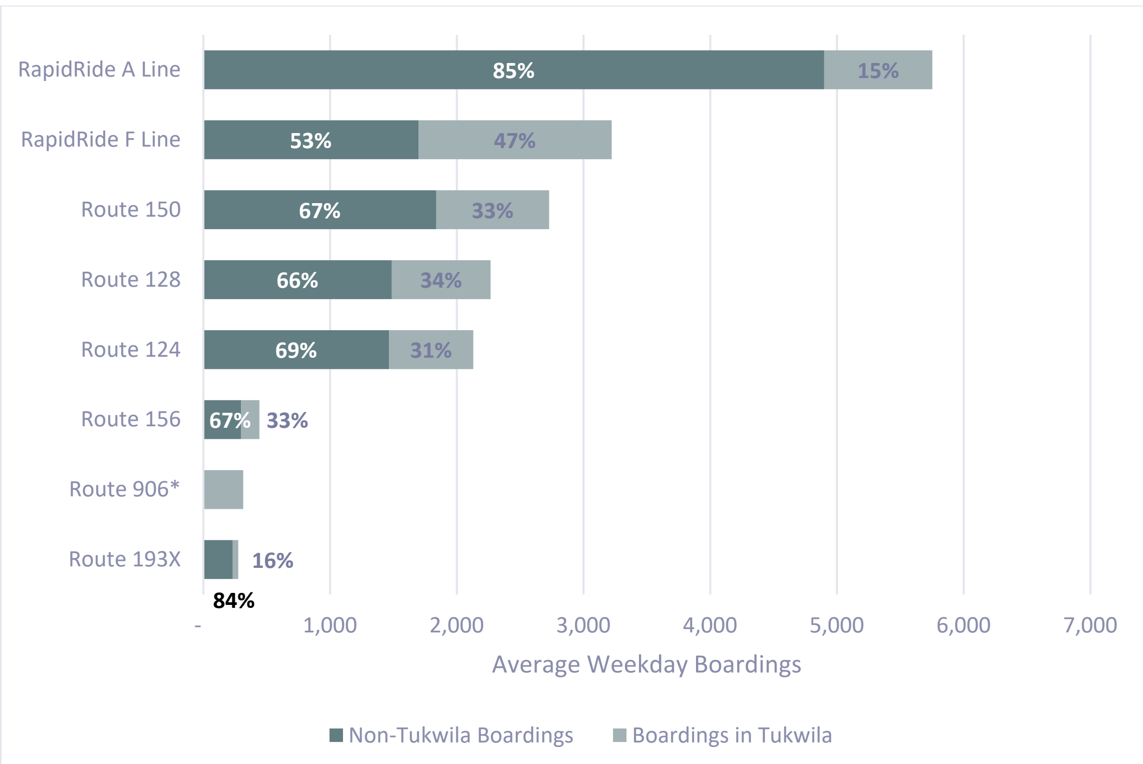


Average Daily Weekday Boardings (March 2024)

Source: King County Metro (2024), Sound Transit (2024)

Figure 25 shows the average weekday boardings for each route serving the City of Tukwila, as well as the percentage of ridership that occurs within Tukwila and outside the City limits. The RapidRide F line, which provides rapid bus service between Burien and Renton, generates almost half of its ridership from Tukwila boardings. This activity indicates strong demand for east-west travel, with Tukwila being a major origin/destination.

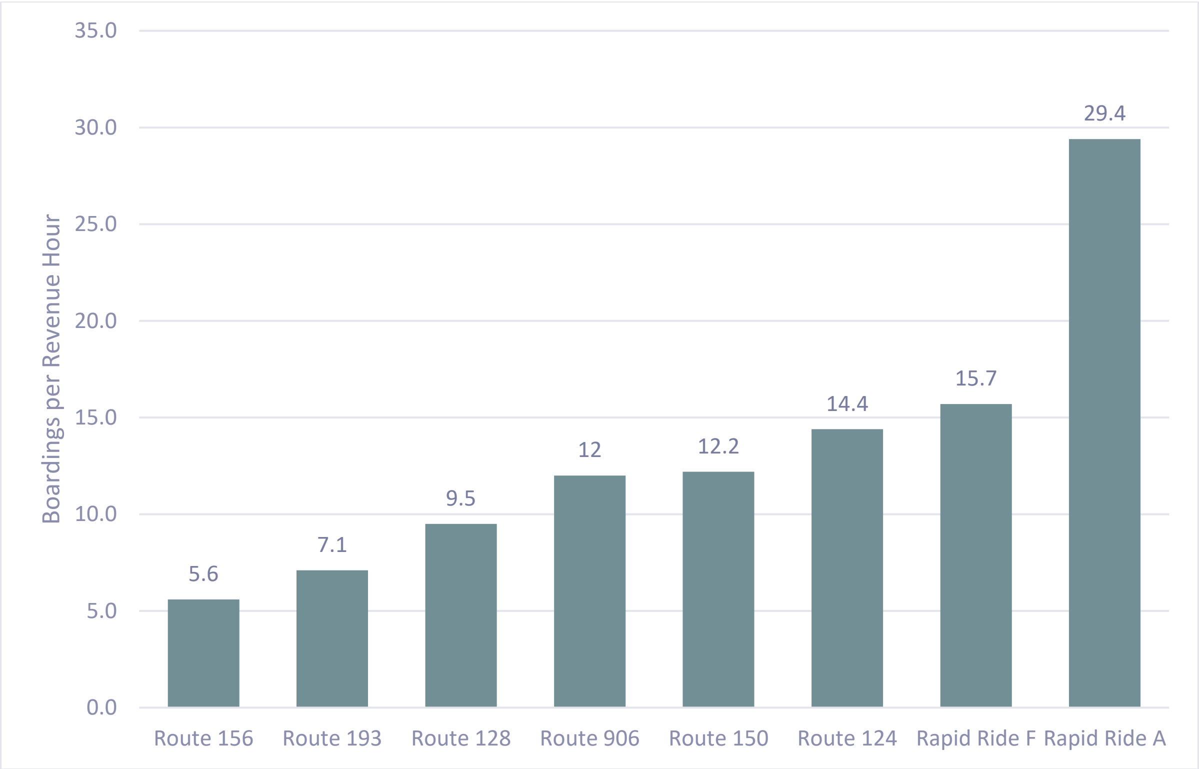
Figure 25. Average Weekday Ridership by Route Operating in Tukwila (2021)



Source: King County Metro, 2020
* Route 906 ridership could not be evaluated by stop and represents all boarding activity inside and outside of Tukwila

Route level productivity, calculated as boardings per revenue hour, is displayed in **Figure 26**. Route productivity provides a measure of service efficiency and shows which routes are most effective at attracting ridership per unit of service. The RapidRide A Line has nearly double the productivity of any other route serving Tukwila. The A Line operates between Tukwila International Boulevard Station and Federal Way Transit Center and serves as an important transit connection for residents to access 1 Line light rail for regional travel and connections to other services. Route 193 carries 16 passengers per trip, which is a better measure of utilization for peak commute type routes as it shows seat utilization and is not being compared with the metrics of all-day routes.

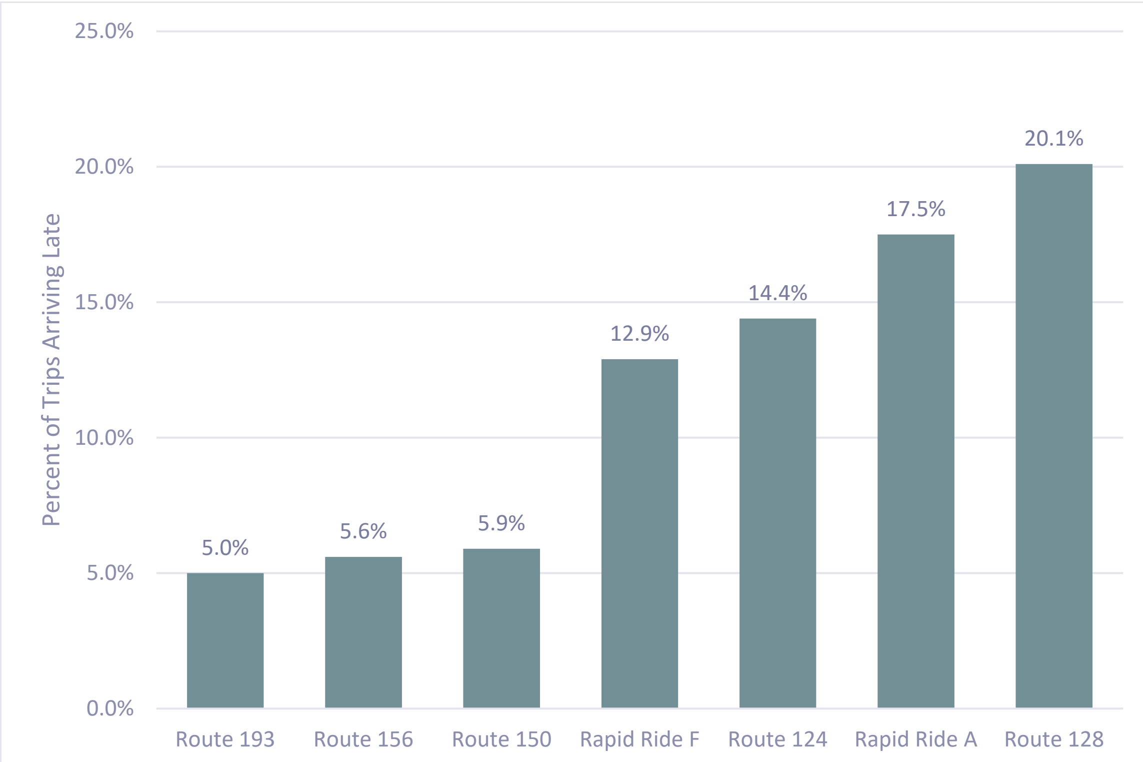
Figure 26. Peak Period Productivity by Route Operating in Tukwila (2021)



On-Time Performance

On-time performance largely impacts the reliability of a transit service and can drive passenger decision making about using transit. **Figure 27** displays the percentage of bus trips arriving late to stops during the full year of 2021, early departure data was not available. King County Metro considers buses on-time if they arrive to a stop up to 1.5 minutes before the scheduled time and up to 5.5 minutes after the scheduled departure. Route 128, RapidRide A, and Route 124 have the highest amount of late trips of any bus service that operates within Tukwila. Routes 193, 156, and 150 operate with the lowest number of trips arriving late.

Figure 27. Percent of Late Arrivals by Route Operating in Tukwila (Fall 2020)



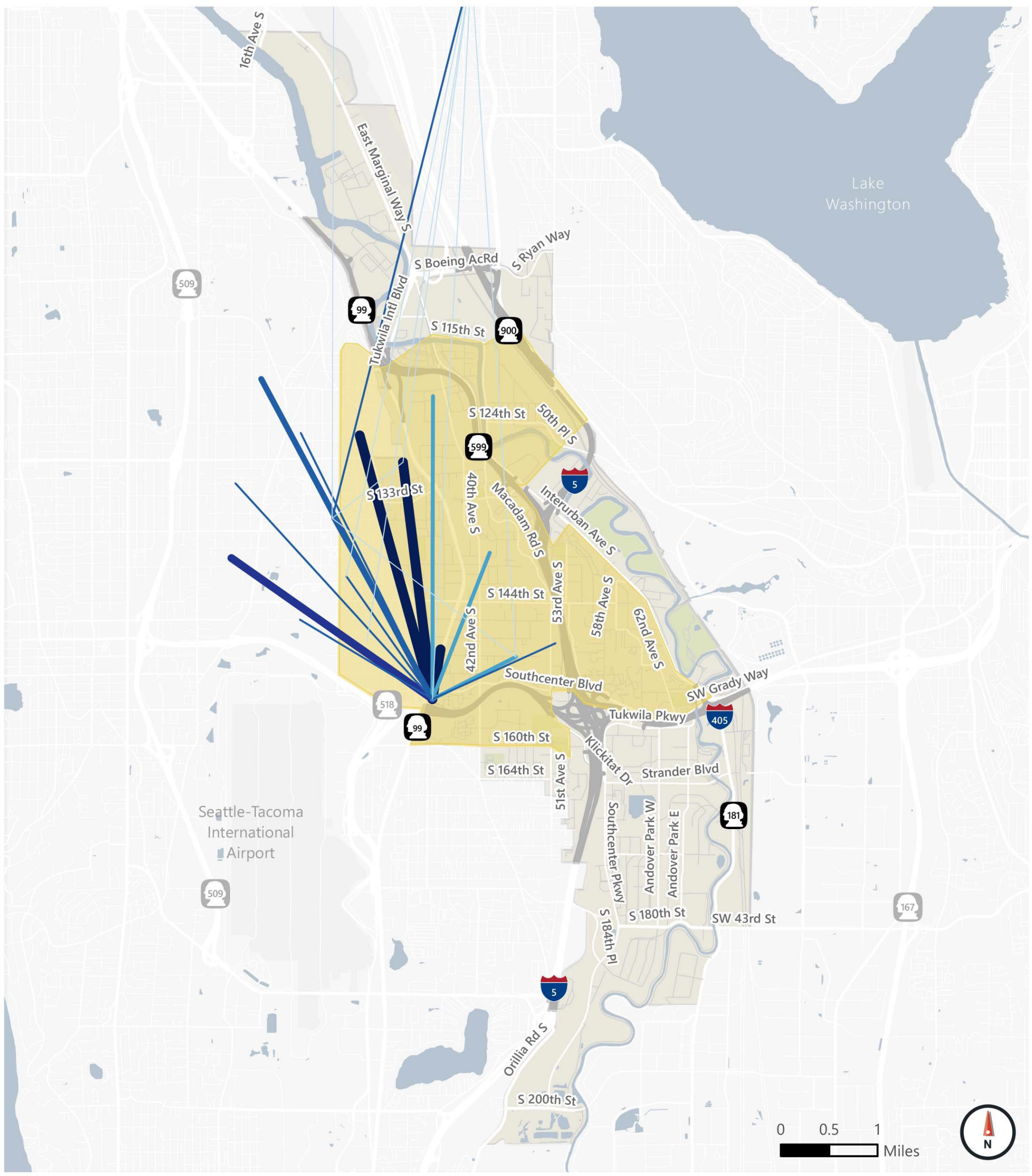
Metro Flex Service

Origins and Destinations

Metro Flex is an on-demand service from King County Metro that connects riders to transit and community hubs that may not be well served by fixed-route or rail service. This analysis shows the predominant ridership patterns of the service.

October 2021 ridership patterns are illustrated in **Figure 28**. The predominant travel patterns are to and from Tukwila International Boulevard Station.

Figure 28. Metro Flex Trip Direction and Popularity



City Boundary
Parks
Tukwila Metro Flex Service Area

Trips
5 or fewer
6 - 25
26 - 50
51 - 75
76 - 100
Over 100

Metro Flex Trip Patterns (October 2021)

Source: King County Metro (2021)

In October 2021, there were 836 Metro Flex trips in Tukwila, of which there were 24 unique origin and destination pairs. The most common pairing provided service between Tukwila International Boulevard Station and a block group approximately 1.5 miles north containing a mix of housing densities and commercial activity including King County Metro's South Base. This pairing accounted for 20% of all 836 trips. The block group is defined at the south near Foster High School and to the north by the Duwamish River. It includes residential neighborhoods north of the school and isolated areas near the Duwamish. Popularity of this trip may be influenced by the King County Metro base and employees potentially using the service. The block group also contains isolated residential areas with limited pedestrian infrastructure, making it difficult to walk to a fixed route bus stop. This aligns with Metro Flex's goal of improving transit access in harder to reach areas.

The second most popular trip pair made up 17% of total ridership, providing service between Tukwila International Boulevard Station and a block group two miles northwest of the station bounded by Tukwila International Boulevard to the west, S 139th St to the south, E Marginal Way to the east, and the Duwamish River to the north. The southern half of the area is residential while the northern half is warehouse commercial near Highway 599.

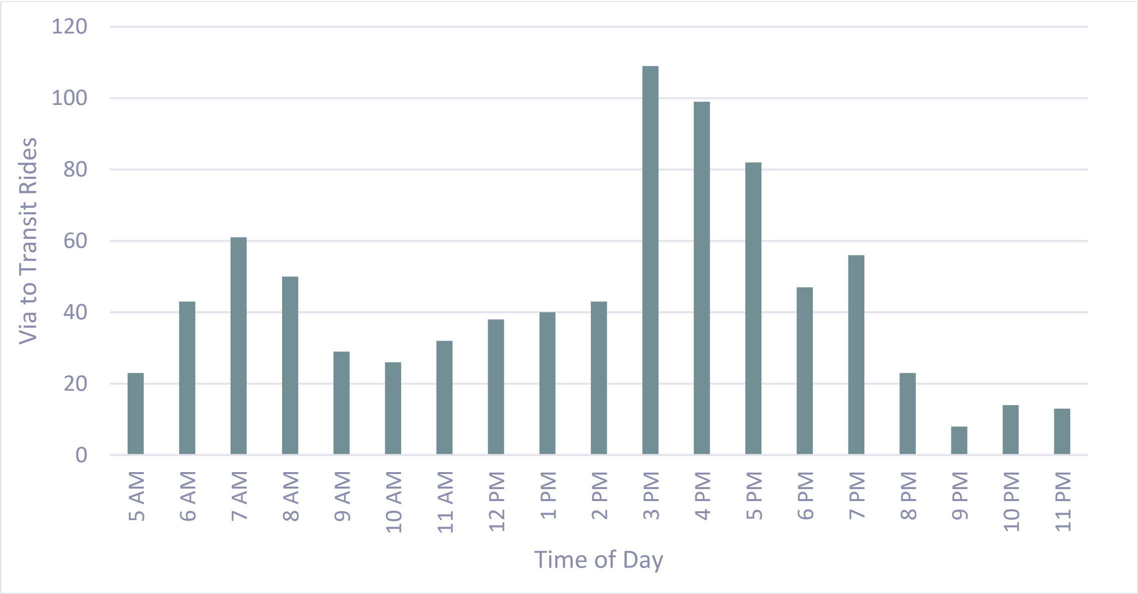
The Tukwila Community Center, which is not on regular bus service, generated only 33 Metro Flex trips. There are also several trips outside of the Tukwila boundary, which is allowed under Metro Flex policy if the requesting passenger is eligible for Access, King County Metro's paratransit service.

Time of Day Evaluation

Over a sample of 30 days of Metro Flex data, the largest number of requests for rides were during the afternoon peak period, from approximately 3 pm to 6 pm. From the location-based analysis of Metro Flex t trips, trips at the most popular times of day indicate the service being used to connect employees to regional transportation options and Tukwila residents from high frequency transit hubs to home locations. **Figure 29** displays the number of Metro Flex trips during the afternoon rush hour.

Metro Flex in Tukwila appears to function primarily as a first/last mile connection during common commute times. The service is also used as an early morning and late-night connection to transit when frequencies are lower, but with fewer riders than during the peak period.

Figure 29. Metro Flex Rides Provided by Time of Day (October 2021)



Market Analysis

Travel Patterns

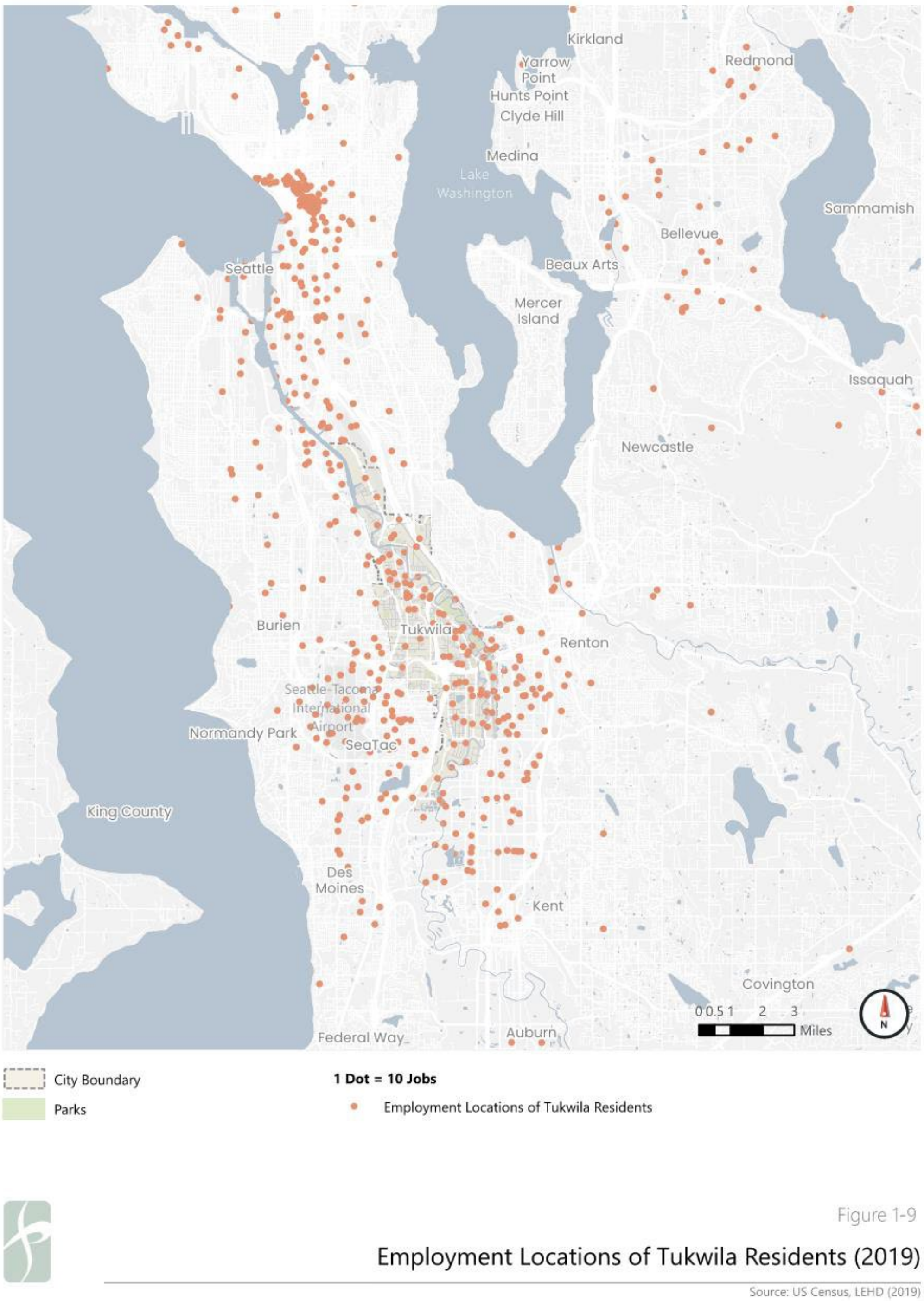
The employment related travel patterns to and from Tukwila were evaluated using 2019 Longitudinal Employer-Household Dynamics (LEHD) data, a product from the U.S. Census. Data that is aggregated at the Census tract level.

Figure 30 and **Figure 31** display work or home locations by point density. Each point represents ten commute destinations or home locations.

Tukwila Residents Work Destination

Tukwila residents primarily commute within King and Pierce counties, with only a handful of employment locations further away. Large employment clusters can be seen in downtown Seattle, Renton, SeaTac Airport, and commercial areas adjacent to the I-5 corridor. Transit service from Tukwila to downtown Seattle is fast and frequent by utilizing Link light rail or Route 150 from areas surrounding Tukwila International Boulevard Station or Tukwila Transit Center. Tukwila residents additionally have access to frequent east/west travel with RapidRide F line which serves employment centers in Southcenter and Renton. Residents may face slower commutes by car or local bus to reach stops with frequent and regional service.

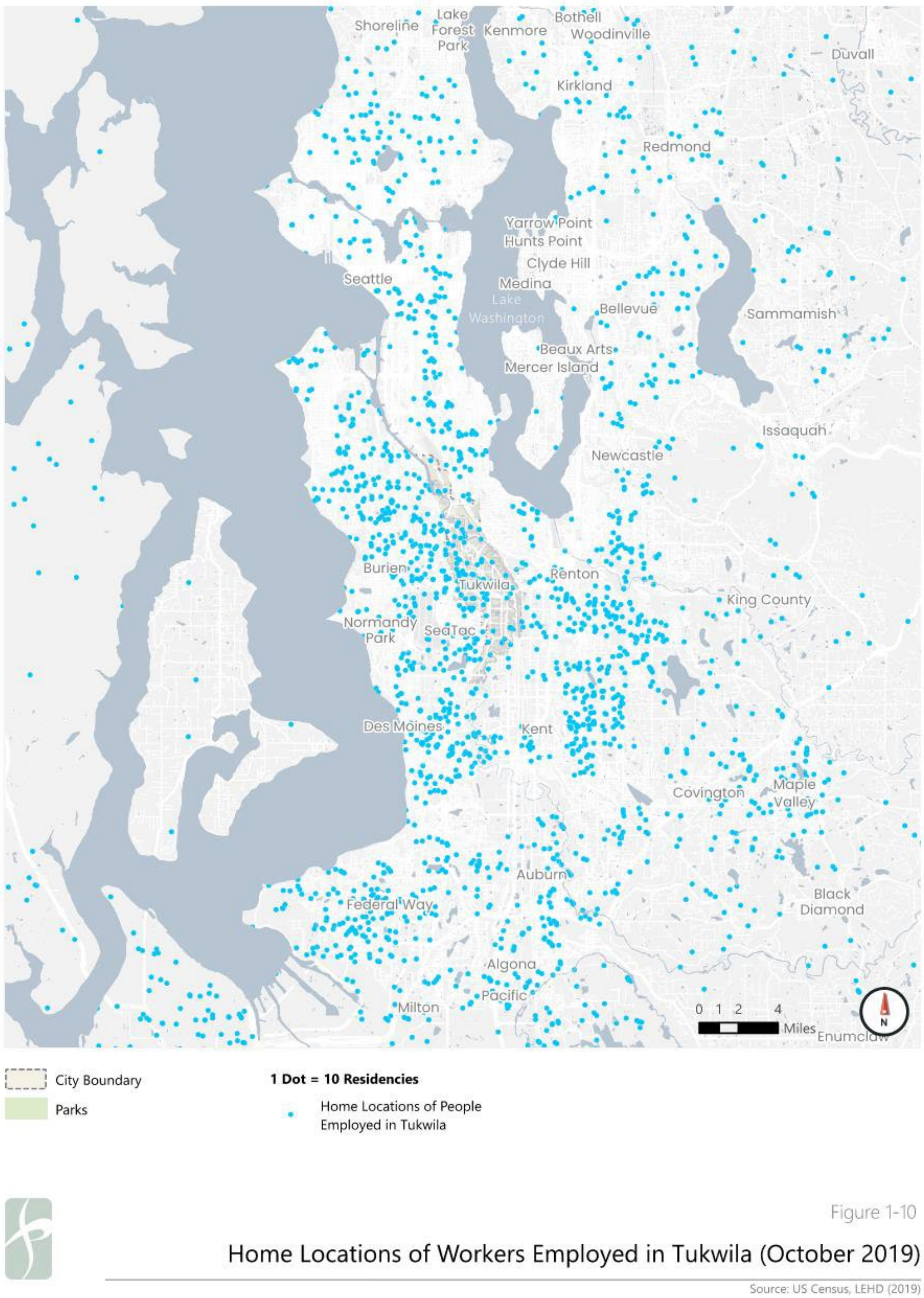
Figure 30. Employment Locations of Tukwila Residents



Tukwila Employee Home Origins

Commuters into Tukwila live throughout King, Pierce, and Kitsap County. The largest concentration of Tukwila commuters live in South Seattle, West Seattle, Federal Way, and unincorporated King County southeast of Renton. Except for unincorporated areas of King County, employees that work in Tukwila have access from surrounding communities to three large transit stations, Tukwila International Boulevard Station, Tukwila Transit Center, and Tukwila Station. These three stations can be accessed by utilizing Link Light Rail, Sounder S Line, RapidRide A or F line, and routes 124, 128, and 156.

Figure 31. Home Locations of Workers Employed in Tukwila



Refer to **Appendix D** for an overview of the transit services to and from Tukwila, how these services are utilized, where there may be additional demand for service in the area, and recommendations for City policy, and actions to be taken.

Freight and Truck Mobility

Freight plays a critical role in the economic vitality of Tukwila as businesses and residents rely on freight shipped via trucks. Truck sizes range from light-duty commercial vans, "single-unit trucks" for package delivery or moving, and garbage trucks that navigate through neighborhoods to large semi-truck trailers connecting to local businesses and Tukwila's Manufacturing/ Industrial Center (MIC). Tukwila's MIC is one of four regional MICs in King County targeted to preserve and enhance manufacturing and industrial activity, facilitating freight transportation and substantial employment opportunities.

Trucks delivering wholesale and retail goods, business supplies, and building materials throughout Tukwila contribute to and are impacted by traffic congestion. The City partners with regional agencies and the State to build and maintain Freight and Goods Transportation System (FGTS) routes. Designated FGTS routes aim to prevent heavy truck traffic on lower-volume streets and promote the use of adequately designed roadways. The Washington State Department of Transportation (WSDOT) classifies roadways using five freight tonnage classifications described in **Table 4**.

Table 4. WSDOT FGTS Classification

Freight Corridor	Description
T-1	More than 10 million tons of freight per year
T-2	Between 4 million and 10 million tons of freight per year
T-3	Between 300,000 and 4 million tons of freight per year
T-4	Between 100,000 and 300,000 tons of freight per year
T-5	At least 20,000 tons of freight in 60 days and less than 100,000 tons per year

Source: WSDOT Washington State Freight and Goods Transportation System (FGTS) 2021 Update, 2021

Multiple roadways in various parts of the City are designated as T-2 and T-3 corridors. **Figure 32** presents an example of a T-3 corridor in Tukwila. As shown in **Figure 33**, Interstate 5 and Interstate 405, which are part of the national Interstate Highway system, are T-1 corridors that run through Tukwila and facilitate the transportation of more than 10 million tons of freight per year. Other T-1 corridors include State Route 599, West Valley Highway, Orillia Road South, East Marginal Way South from Interurban Avenue South to South Boeing Access Road, and South Boeing Access Road from East Marginal Way to Martin Luther King Junior Way South.

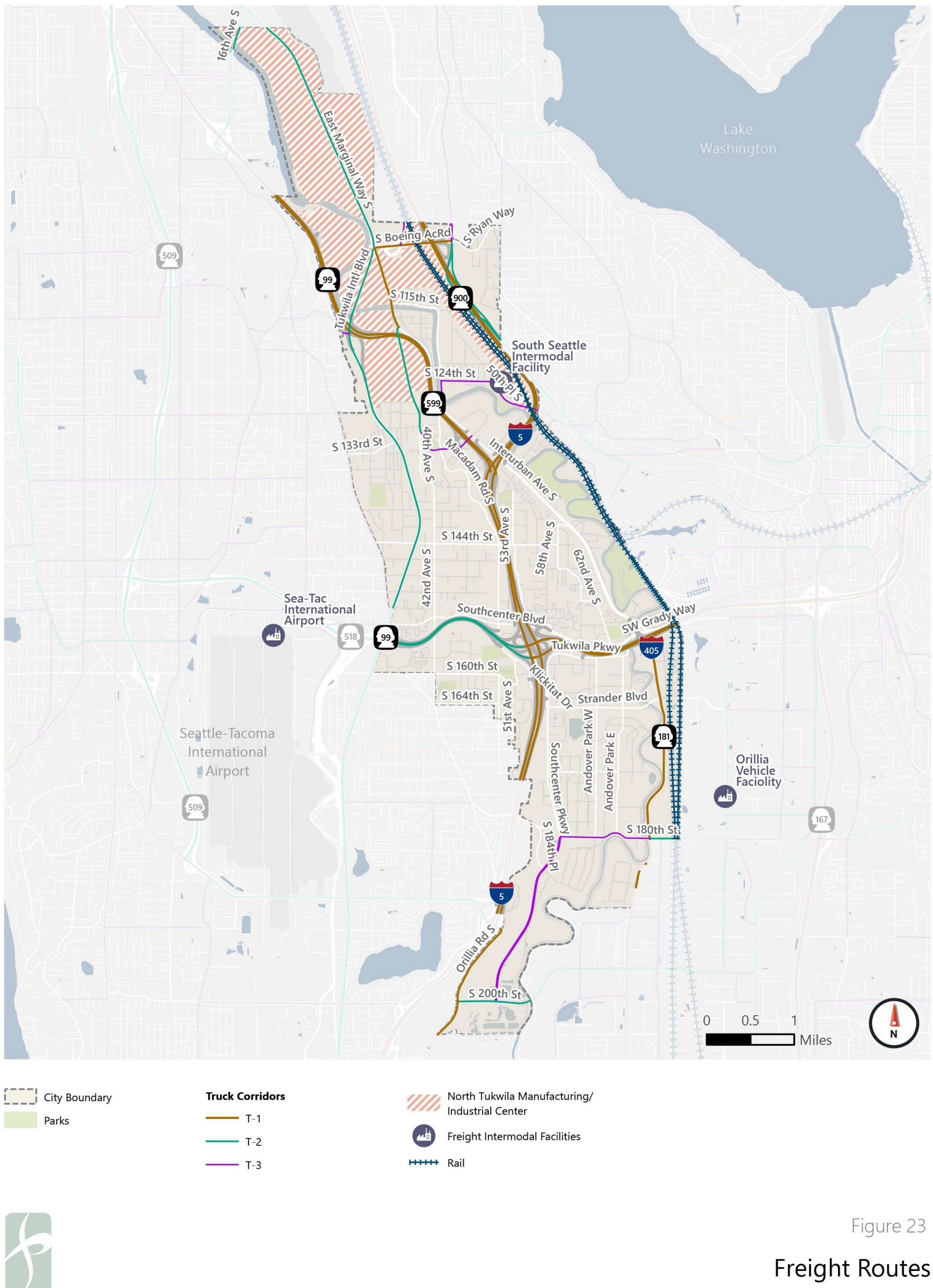
Figure 32. T-3 Corridor – S 129th Street Bridge

Source: Fehr & Peers. 2022

In addition to truck routes, railroad tracks owned by Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) run north-south through Tukwila, as shown in **Figure 33**. These rail networks carry international and domestic cargo to the inland market and serve the Port of Seattle to the north and the Port of Tacoma to the south.

There are various ongoing efforts by the City to balance freight mobility and community needs, including the Allentown Truck Reroute Project, which is proposing alternative routes for freight truck traffic that currently uses the Allentown neighborhood to access BNSF Railway's South Seattle Intermodal Facility.

Figure 33. Freight Routes



Safety

The ultimate goal of traveling is to arrive safely at a destination, regardless of the mode of transportation used. The City of Tukwila has several programs dedicated to ensuring the safety of its transportation system users, including the Local Road Safety Plan (LRSP), Safe Routes to School (SRTS) and a Neighborhood Traffic Calming Program (NTCP). The LRSP, to be adopted in 2025, includes an analysis of existing conditions and systemic safety concerns to determine recommended improvements on Tukwila streets. Tukwila's SRTS program is part of a national movement to make it easier and safer for students to walk or bike to school. Speeding and unnecessary through-traffic in neighborhoods create safety hazards on residential streets; therefore, the NTCP program was developed to improve the livability of the local streets and residential collectors using traffic calming. An example of a traffic calming measure is shown in **Figure 34**.

Figure 34. Speed Cushions in Tukwila

Source: Fehr & Peers. 2022

The City's collision data from 2017 to 2021 obtained from WSDOT was analyzed to identify safety hotspots and overall collision trends in Tukwila. Five years of collision data was analyzed to understand overarching patterns: vehicle collisions with bicyclists, with pedestrians, and with other vehicles. Over the five-year time period, collision counts in Tukwila have generally decreased. Data from 2020 showed an increase in collisions that resulted in serious injuries and fatalities despite a notable drop in the number of collisions across all three modes that year. This is potentially related to the onset of the COVID-19 pandemic, at which times drivers experienced less congestion on roadways and could travel at higher speeds.

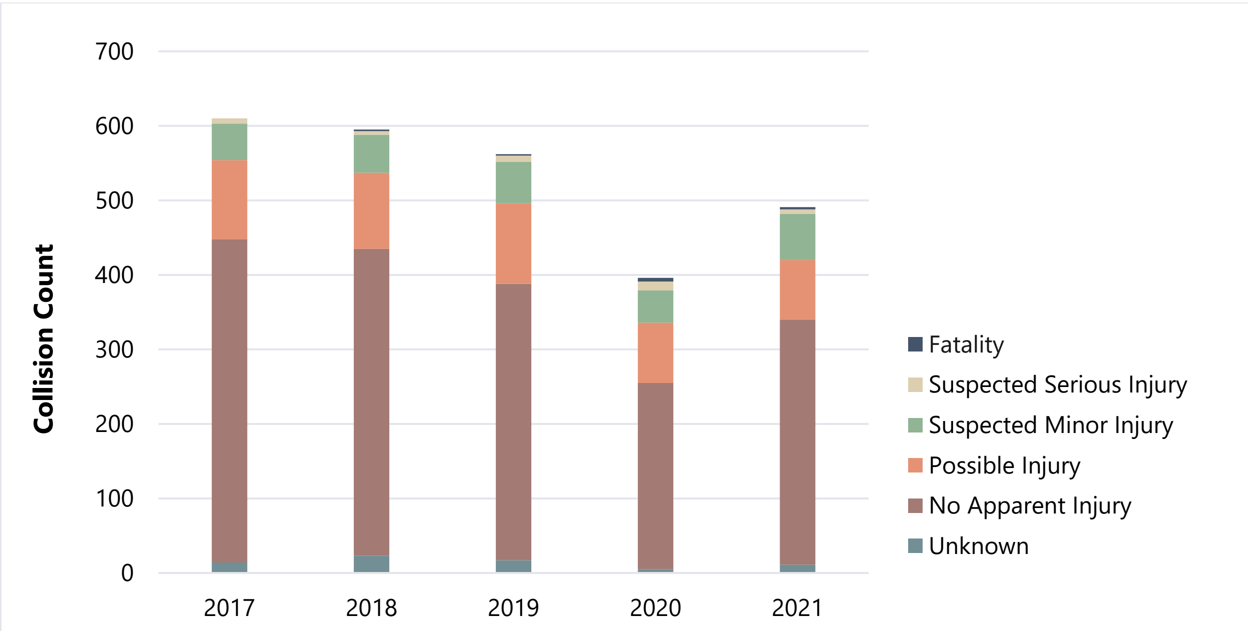
It is critical to consider that vehicle-pedestrian collisions have substantially higher proportions of serious injuries and fatalities as compared to other modes, hovering around 40 percent since 2019. This is substantially higher than the rate among vehicle-vehicle collisions, where killed or seriously injured (KSI) collisions typically make up approximately two percent of collisions. However, in 2020, serious injuries and fatalities resulted from slightly over four percent of vehicle-vehicle collisions. Overall, vulnerable road users in Tukwila, including cyclists and pedestrians, face higher rates of negative outcomes of collisions as compared to rates among vehicle-only collisions.

Vehicle-Vehicle Involved Collisions

While collisions have generally decreased over the period of 2017 to 2021, Tukwila experienced a significant decline in collisions in 2020. As shown in **Figure 35**, the number of collisions involving only vehicles in 2021 increased from 2020 but remained at a level lower than 2019. The top three causes recorded, for vehicle-vehicle collisions that reported a cause, were driver distraction/inattention (24%), failure to yield/did not grant right of way (15%), and improper turning (9%).

A heat map of vehicle-vehicle collisions from 2017-2021 is provided in **Figure 36**. The reported vehicle-vehicle collisions are concentrated in the Southcenter area, as well as along Tukwila International Boulevard. These areas have speed limits of 35 miles per hour which may contribute to elevated rates of collisions. Collisions resulting in fatalities are spread throughout the City, with several fatalities resulting from collisions along South Boeing Access Road, where the speed limit is 40 miles per hour. Higher speeds can result in worse outcomes from collisions.

Figure 35. Vehicle-Vehicle Involved Collisions in Tukwila

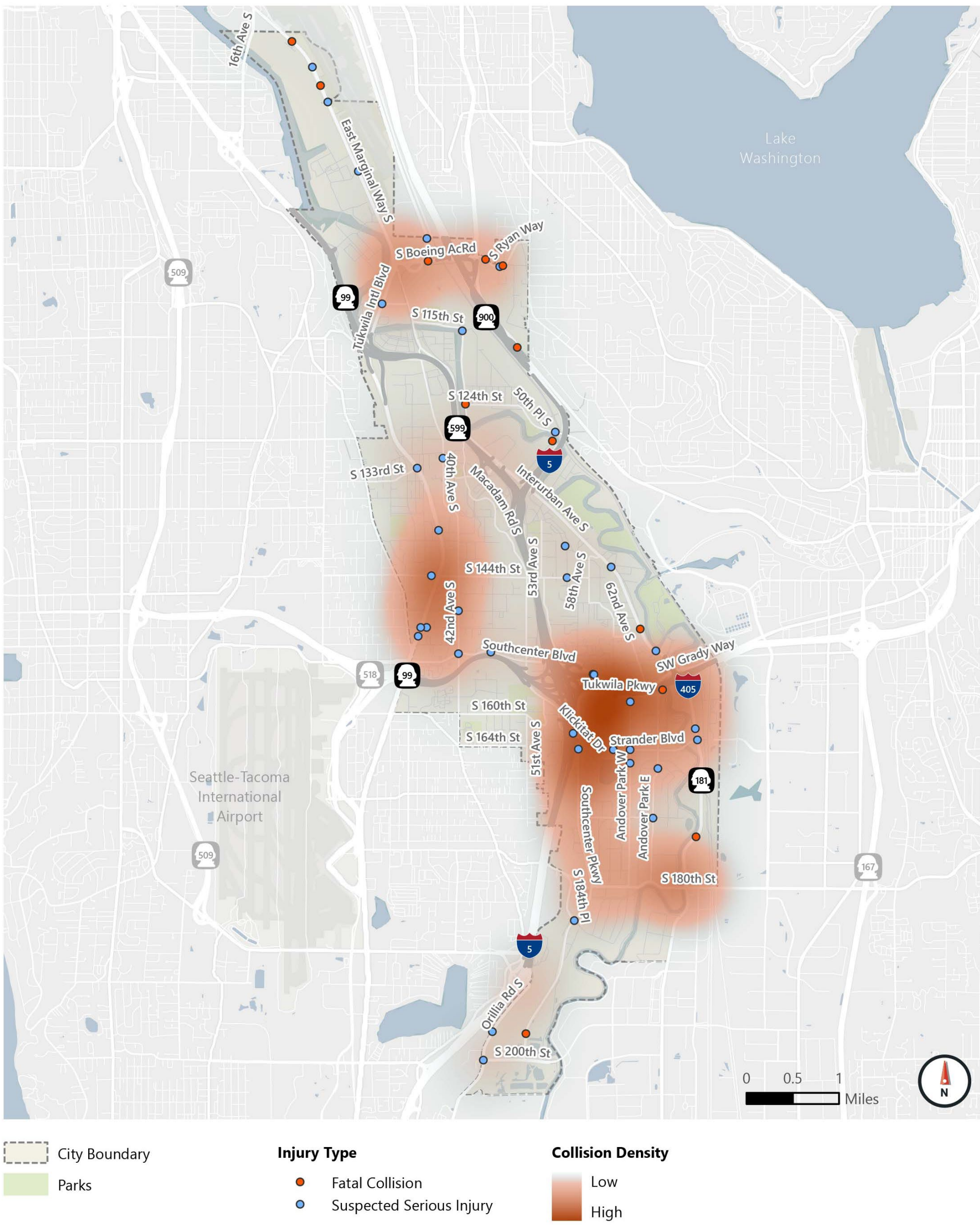


Notes

* Vehicle-vehicle collisions include vehicle crashes that do not involve pedestrians or cyclists. This does include crashes with standing objects.

Source: WSDOT, Fehr & Peers. 2022.

Figure 36. Vehicle-Vehicle Involved Collisions Heat Map, 2017-2021



Vehicle-Vehicle Involved Collisions Heat Map

Vehicle-Bike Involved Collisions

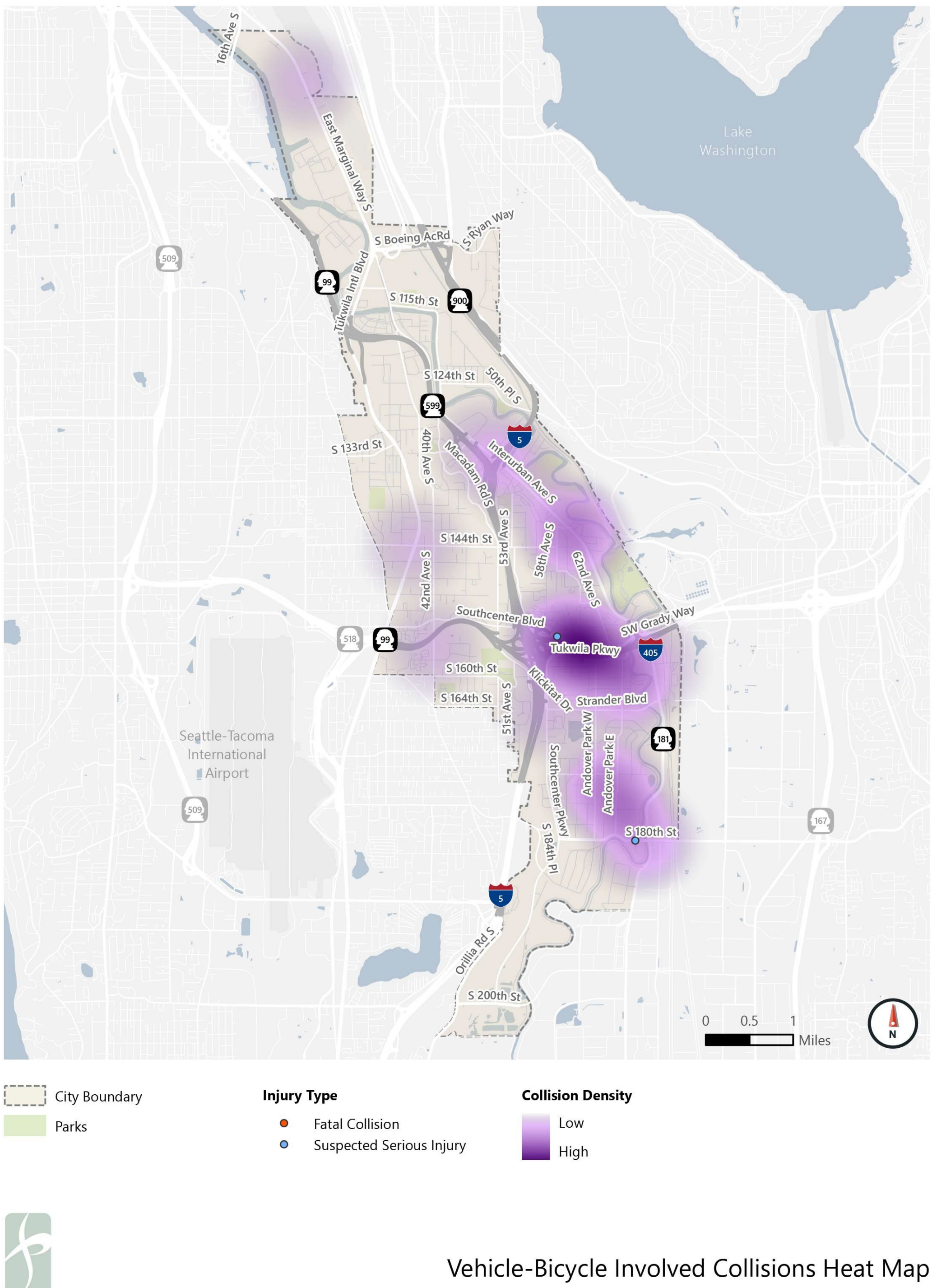
There were no fatalities as a result of a vehicle-bike collision in Tukwila between 2017 and 2021. However, more than 80 percent of vehicle-bike collisions resulted in some form of injury (serious injury, minor injury, or possible injury). Notably, two thirds of vehicle-bike collisions in 2021 resulted in a suspected serious injury. **Figure 37** displays the vehicle-bike involved collisions by year and of the vehicle-bike collisions with a listed cause, driver distraction/inattention (39%), failure to yield/did not grant right of way (35%), and asleep or ill (4%) make up the most common reasons.

Figure 38 displays a heatmap of vehicle-bike collisions. Higher concentrations of bicycle collisions were reported in the area north of Southcenter Mall, along Tukwila Parkway, than other areas within the City. Since there are minimal dedicated bicycle facilities in the area, bicycles must interact with vehicles on these busy streets, which may be related to the elevated number of collisions.

Figure 37. Vehicle-Bike Involved Collisions in Tukwila

Source: WSDOT, Fehr & Peers. 2022

Figure 38. Vehicle-Bike Involved Collisions Heat Map, 2017-2021

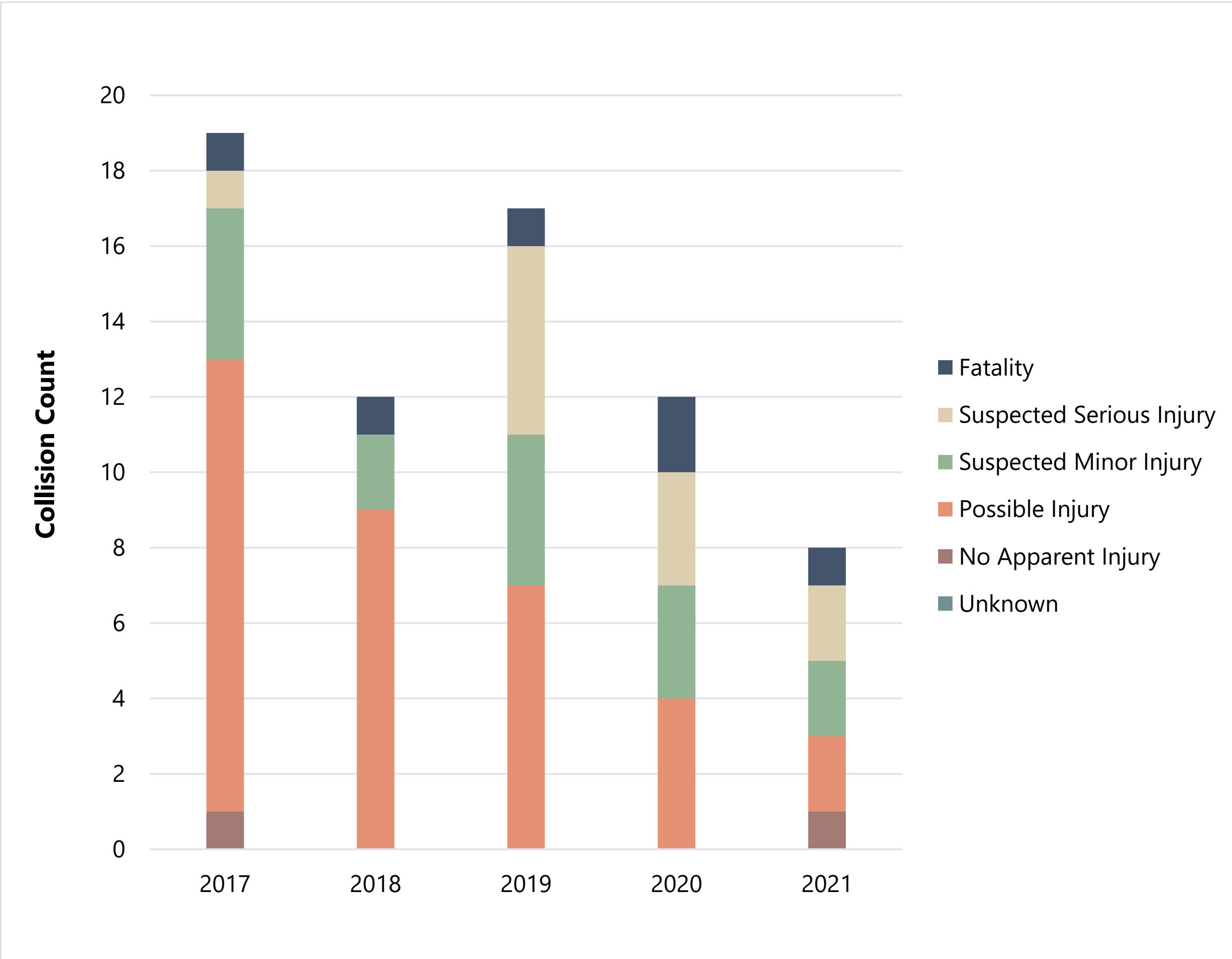


Vehicle-Pedestrian Involved Collisions

Between 2017 and 2021, at least one pedestrian fatality occurred in Tukwila each year. The rate of serious injuries and fatalities resulting from vehicle-pedestrian collisions ranges from eight percent of collisions in 2018 to 42 percent of collisions in 2020. The rate of serious injuries and fatalities resulting from vehicle-pedestrian collisions followed a generally increasing trend from 2017 and 2021. **Figure 39** displays the vehicle-pedestrian involved collisions by year. Of vehicle-pedestrian collisions where a cause was reported, driver distraction/inattention (26%), failure to yield/did not grant right of way (15%), and under the influence (3%) make up the most common causes.

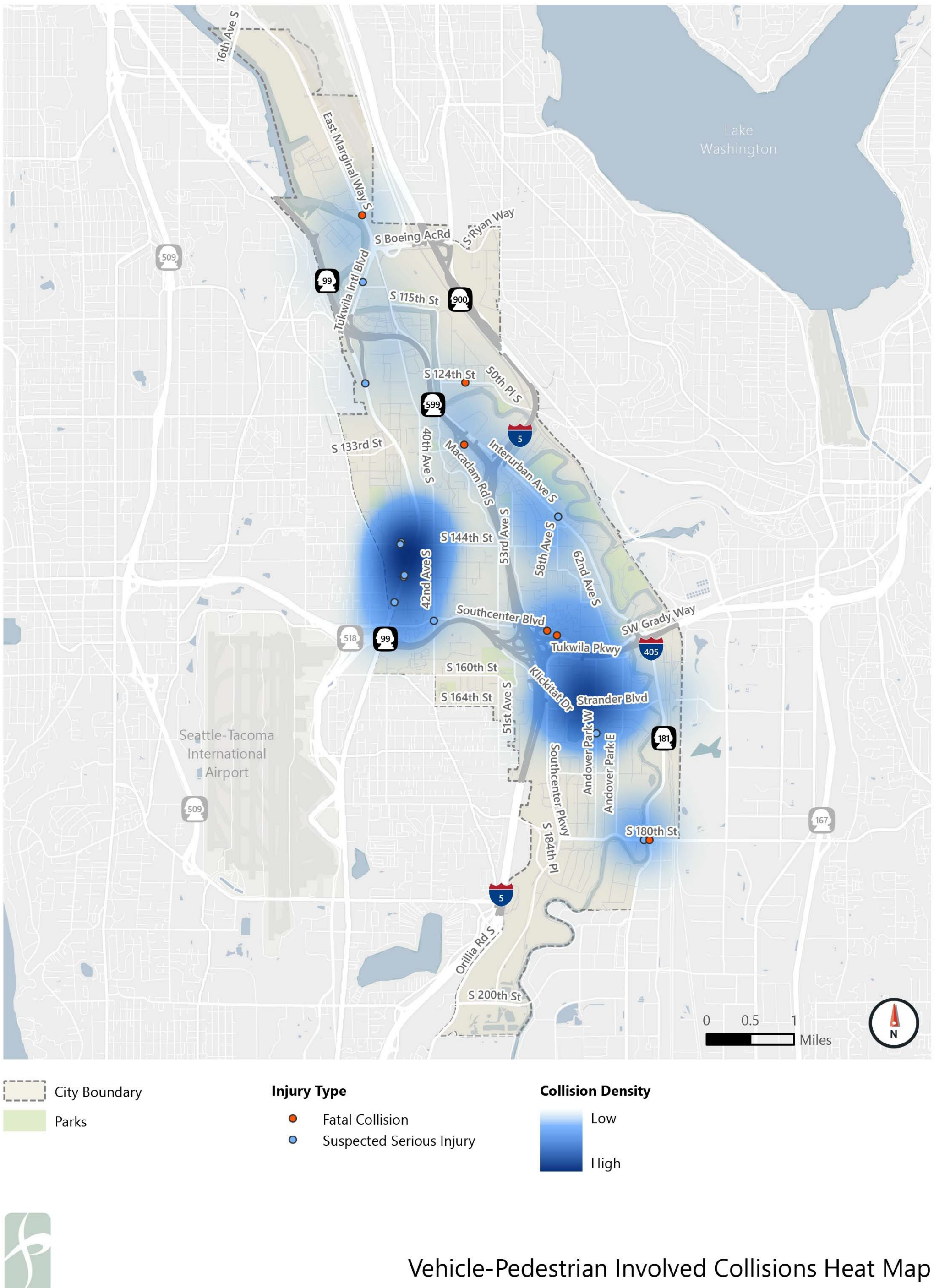
Figure 40 displays a heatmap of vehicle-pedestrian collisions. Higher concentrations of vehicle-pedestrian collisions were reported around Southcenter Mall as well as Tukwila Hill. Surrounding Southcenter Mall, there was one suspected serious injury collision, while there were several suspected serious injury collisions along Tukwila International Boulevard and Military Road. This may be related to the difference between traffic speeds at each location. Although there are increased conflict areas between pedestrians and vehicles near Southcenter Mall, vehicle speeds may be slower which could result in less severe collisions. The fewer conflict areas may allow higher speeds along Tukwila International Boulevard, which could contribute to worse outcomes of collisions. The speed limit in both areas is 35 mph. Collisions resulting in a fatality were spread throughout the City along streets with high speeds or limited pedestrian amenities.

Figure 39. Vehicle-Pedestrian Involved Collisions in Tukwila



Source: WSDOT, Fehr & Peers. 2022

Figure 40. Vehicle-Pedestrian Involved Collisions Heat Map, 2017-2021



Chapter 3: Public Outreach

Community engagement is a key component of the overall Transportation Element process, ensuring that community stakeholders have ample opportunity to identify issues, influence outcomes, and participate in final recommendations. The engagement efforts for this update were targeted to enable collaboration in identifying and resolving issues, facilitated two-way communication, ensured transparency, and built trust. This Background Report summarizes key takeaways from outreach efforts conducted in 2023 and 2024. These standards are intended to reinforce the transportation goals developed as part of the City's TE Update.

Vision and Goals for Transportation

The City views this Transportation Element update as an opportunity to step back and develop a holistic vision for transportation in Tukwila. As pointed out in the subsequent sections, draft goals for Tukwila's transportation system were developed based on input from the community, stakeholders, councilmembers, and City staff. Given the system that Tukwila has today, these goals require ongoing efforts and input from stakeholders and the community.

Process to Develop Vision and Goals

The transportation vision and goals are a product of extensive stakeholder and public engagement efforts conducted in collaboration with City officials and staff.

Community Input

The TE team, in partnership with the Department of Community Development (DCD), conducted multiple community outreach and engagement events in 2023 and 2024. The first outreach effort to Tukwila residents, businesses, and community organizations was held in spring of 2023. These efforts were targeted to ensure that the goals of the Transportation Element aligned with the needs of the community. Emphasis was primarily placed on engaging hard-to-reach communities through tabling events and focus groups. 2024 outreach events focused on project list development to ensure that feedback in 2023 was reflected in the project list development. For more information on the public outreach process, see **Appendix E**.

Recurring Themes

Outreach and engagement efforts in the spring of 2023 holistically catalogued the community's needs regarding the various modes of transportation available in Tukwila. 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. Thirty-six comments from the community involved issues with transit, and over a third of these were specifically regarding safety while using public transit. Of the 17 comments that highlighted issues with driving, about 40 percent specified a concern regarding cost or access. Lastly, 19 comments pointed out walking and biking needs. The interactive webmap presented a platform for respondents to share feedback, concerns, or ideas regarding precise locations or transportation facilities within City limits. In addition, respondents could upvote each other's comments that they agreed with. In total, 67 comments were compiled on the online map. The key themes noted from community input included:

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

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 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 multiple 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 which have been used in developing project recommendations for the Transportation Element.

Plan Goals

Some of the key challenges and opportunities for achieving each goal are listed below.

Goal 1: Equity
Eliminate systemic barriers to ensure fair access to healthy, affordable, reliable transportation options, livable places, and jobs.

Tukwila is one of the most diverse communities in Washington State, with over 40 percent residents who were born in various parts of the globe. Therefore, it is of paramount importance to serve the needs of all people, that decision makers consider diverse perspectives, and to strive to eliminate systemic barriers. In 2017, the Tukwila City Council passed their first Equity Policy (Resolution No. 1921) targeted to provide elected officials, City staff, board members and commissioners with the necessary tools to lead and make decisions with an equity lens. Currently, the Equity Policy Implementation Committee (EPIC) seeks to dismantle historic systemic and institutional injustices, and to reinforce practices that result in inclusion with equitable outcomes.

Specific to transportation, the City frequently engages with the community about transportation issues to provide support to populations who have the greatest need: children, older adults, people with disabilities, lower income communities, and under-served communities. In addition, the Americans with Disabilities Act (ADA) Self-Evaluation and Transition Plan establishes the City of Tukwila's ongoing commitment as an all-inclusive community to providing equal access for all, including those with disabilities.

Goal 2: Safety
Provide a safe transportation system and placemaking to emphasize Tukwila as a welcoming place, particularly for historically marginalized and vulnerable populations.

Safety is important to Tukwila residents and visitors. The City of Tukwila has several programs dedicated to ensuring the safety of its transportation system users, including Safe Routes to School (SRTS) and the Neighborhood Traffic Calming Program (NTCP). The collision analysis described earlier highlights locations where documented crashes resulted in injuries and fatalities or involved the most vulnerable users (pedestrians and cyclists), between 2017 and 2021.

Pedestrians and cyclists face higher rates of negative outcomes of collisions as compared to rates among vehicle-only collisions. Serious injuries and fatalities for vulnerable users were noted along arterials including Southcenter Boulevard, Tukwila International Boulevard and South 144th Street. Addressing these locations through improved multimodal designs and other strategies such traffic calming helps provide a more safe and welcoming system. Most importantly, it is critical to ensure that Tukwila residents and visitors feel safe walking, biking, and connecting to transit, otherwise they will not choose to do so. This resonates with the sentiments shared by the community regarding transit safety concerns.

Using the 2009 Walk and Roll Plan as a starting point, the 2024 Transportation Element (TE) Update presents an opportunity to identify existing facilities needing improvements, to address gaps in the pedestrian and bike networks, and to provide safe and comfortable access to transit facilities. In addition, identifying and addressing gaps in transit amenities such as lighting, benches, and shelters helps improve safety and comfort for transit riders.

Goal 3: Connectivity
Maintain, expand, and enhance Tukwila's multimodal network, particularly walk, bike, roll, and transit, to increase mobility options where needs are greatest.

Having a variety of practical and reliable transportation modes offers Tukwila residents and visitors travel choices, which helps to optimize the capacity of the City's transportation system and reduces reliance on driving. Following the adoption of Tukwila's 2009 Walk and Roll Plan, new bike and pedestrian facilities have been implemented to improve connectivity. Currently, most principal and minor arterials in the City have sidewalk facilities on one or both sides. However, sidewalk facilities tend to be more available on arterials than the collector and local streets. Similarly, bike facilities are limited to a few roadways. While people have expressed desire to use transit, there are also gaps in transit service and inadequate stop amenities that make transit an inconvenient option for many. Developing a network of Complete Streets to accommodate varying modes and all abilities is vital to increasing walking, rolling, biking, and riding transit.

Goal 4: Adaptability
Anticipate and plan for the community's evolving needs, new technologies, and opportunities for mobility.

As indicated by how the COVID-19 pandemic resulted in the abrupt and dramatic changes in travel demand and traffic patterns, there is need for a poised and responsive transportation system capable of adjusting to disruptive trends in transportation. With the TE Update, the City has an opportunity to invest in new technologies, such as optimized signal timing to make intersections more efficient, bike share and/or scooter share programs to provide more modal options, and automated enforcement cameras. Cognizant of funding limitations, the City will need to be strategic in capitalizing upon new technologies and policy choices to create opportunities for mobility.

Goal 5: Environment
Plan, design, and construct transportation projects that reduce greenhouse gas emissions, improve community health, and protect the natural environment.

Transportation is one of the major contributors to air pollution and consequently, climate change. Historically, there have been inequities among populations adversely affected by negative impacts of transportation, such as air pollution. Streets and other transportation facilities are typically hardscaped, which generates runoff and carries contaminants into streams and waterways. Transportation infrastructure in Tukwila should be designed to promote sustainability, reduce pollution, and support clean air and water for all, particularly historically marginalized populations.

Encouraging multimodal, connected transportation options plays a significant role in advancing the goal of protecting the environment. This TE Update looks for opportunities to reduce the negative impacts of the City’s transportation system on the environment by implementing and supporting: expanded accessibility to transit; improving pedestrian and bike transportation options; utilizing intelligent transportation systems (ITS) for traffic management and more efficient transportation operations; and using environmentally-friendly street design elements such as trees, landscaping, planted medians and permeable paving. Additionally, this goal will tie to the Climate Element, which the City will be developing for the Comprehensive Plan by 2029. Transportation will be a major component of the upcoming Climate Element.

Chapter 4: Transportation Vision

Introduction to Layered Network

The City's Transportation Element takes a layered network approach to focus on how Tukwila's transportation network can function as a comprehensive system to meet the needs of all users. While Tukwila aims to develop "complete streets" to address the needs of all users, providing accommodations that serve all modes well on every street can be an unattainable goal in practice, given constraints such as limited right-of-way and available funding. Some user types are incompatible with others, resulting in streets serving all modes undesirable. An example of this is on Andover Park W which serves high volumes of automobiles, pedestrians, and transit, but does not include marked bike lanes: the high volumes of cars and transit moving in and out of driveways and the Tukwila Transit Center is not conducive to safe bike lanes. Existing and planned adjacent and parallel bike facilities accommodate the bikes more safety.

To practically address this challenge, the City plans its street network to serve adjacent land uses. The proposed layered network builds on this current practice to create a high-quality experience for intended users by considering the function of multiple streets and transportation facilities together rather than individually. This approach allows for certain streets to emphasize specific modes or user types while discouraging incompatible uses. For example, a commercial street may be planned to provide a pleasant experience for shoppers on foot, recreational bicyclists, and car parking on the street while discouraging use by "cut-through" traffic. The project team has identified the priority transportation network for each mode: pedestrians, bicyclists, transit, freight, and general-purpose vehicles. Tukwila's key destinations and land use information provide the basis for the proposed layered network (see **Figure 2** and **Figure 4**).

The subsequent sections outline the proposed MMLOS standards and guidelines for each modal network. Standards are "must dos" that are subject to concurrency. Current LOS standards in the City are focused on automobiles and new development must ensure that the adopted intersection or corridor LOS standard can be maintained or achieved before gaining approval by the City.

Auto LOS Guidelines

The current auto LOS policy in the City of Tukwila includes isolated intersection LOS for areas outside of Southcenter and the corridor average approach for the Southcenter area. See the **Existing Traffic Conditions** section of **Chapter 2: Transportation Inventory and Needs Assessment** for more information on existing Auto LOS policies.

Given the City's past success in maintaining the LOS standard while supporting planned growth, the current approach to auto LOS maintains a similar format for evaluating delay. The approach uses standards tailored to specific locations, giving it flexibility and effectiveness in addressing issues that impact specific areas while not unnecessarily restricting the desired growth. However, the City is adjusting the vehicle LOS policy standards to allow for more vehicle congestion and balance systemwide improvements yielded by multimodal projects. The City is emphasizing multimodal options through investing in projects that improve conditions for varying modes.

Appendix B and **Appendix C** present the detailed vehicle LOS and delay results at the study intersections and corridors.

2044 Traffic Conditions

Traffic forecasts based on anticipated land use growth and planned regional transportation investments were developed using the customized Tukwila travel demand model to help inform future transportation needs. The model assumes a growth of 6,729 additional households and 16,155 additional jobs between the 2018 base year and the 2044 horizon year. An average growth in traffic volume of about 40 percent is anticipated between 2018 and 2044.

The 2044 scenario is anticipated to be similar to the assigned growth targets from King County and is generally consistent with the buildable lands and urban growth capacity analysis. The City will continue to monitor the near and long-term traffic patterns and identify any additional needs to meet level of service standards in line with the City's King County growth allocations, particularly in Southcenter.

The anticipated performance of roadway intersections and corridors within Tukwila under 2044 conditions was evaluated using the same methodology as existing conditions. The analysis assumed that all signal timings for intersections in Tukwila would be optimized between 2018 and 2044; however, there would be no adjustments to cycle lengths unless otherwise planned. The following background projects were assumed based on input from City staff:

- Southcenter Boulevard / 66th Avenue South
  - Restripe the east leg from a single left turn pocket, and two through lanes to dual left turns and a single through lane
- Southcenter Boulevard Road Diet
  - Restripe Southcenter Boulevard between 61st Avenue S and 65th Avenue South to reduce the number of lanes. Ongoing coordination with King County Parks could also see a section of the Lake to Sound Trail being built along with the road diet (at County expense).
- Southcenter Boulevard / 65th Avenue South
  - Install a traffic signal
- Andover Park East / Minkler Boulevard
  - Design and construct dedicated left turn lanes on Andover Park East
  - Reconstruct traffic signal; remove split phasing
- Ryan Way Road Diet
  - Restripe Ryan Way between Martin Luther King Junior Way South and 51st Avenue South to provide one travel lane in each direction (eastbound and westbound), improve pedestrian facilities, and possibly provide bike facilities.
  - In advance of the Martin Luther King Junior Way South intersection, taper the traffic lane to match the existing lane configuration

- The Tukwila South Development would include intersection improvements to address potential impacts to South 200th Street / Orillia Road South, South 200th Street / Southcenter Parkway, or other nearby intersections.

Figure 42 presents vehicle LOS results for the study intersections and Southcenter corridors under 2044 conditions. The following intersections are anticipated to operate at a level of service that does not meet the City's LOS policy during the PM peak hour by 2044 and as such a project is identified to meet the standards:

- <u>South 116th Street / East Marginal Way</u> (two-way stop-controlled intersection results in LOS F with 125 seconds of delay)
  - The increase in northbound and southbound traffic volumes on East Marginal Way is expected to limit gaps in traffic flow to permit eastbound left-turn movements.
- <u>South 124th Street / 42nd Avenue South</u> (all-way stop-controlled intersection results in LOS E with 39 seconds of delay)

    - The increase in westbound traffic volumes on South 124th Street degrades the LOS at the intersection below LOS D.
- South 133rd Street / SR 599 Ramps (two-way stop-controlled intersection results in LOS F with over 150 seconds of delay)
    - The overall increase in traffic volumes for all movements is anticipated to degrade southbound operations.
- South 144th Street / 53rd Avenue South (two-way stop-controlled intersection results in LOS F with over 150 seconds of delay)
    - South 144th Street is an important connection over I-5, connecting the west and east parts of Tukwila; expected delays on the minor approach would be due to high through movements.
- South 144th Street / Macadam Road South (two-way stop-controlled intersection results in LOS F with 56 seconds of delay)
    - Eastbound traffic on South 144th Street encounters delays as it is a major east-west connection across I-5.
- Southcenter Boulevard / I-405 SB Off-ramp (two-way stop-controlled intersection results in LOS F with over 150 seconds of delay)
    - The intersection operates at LOS F under existing conditions and is expected to result in higher vehicle delays in 2044 due to increased traffic volumes along Southcenter Boulevard.
    - This intersection is state-owned and within limited access control.
- SR 518 EB Off-ramp / Klickitat Drive (two-way stop-controlled intersection results in LOS F with 60 seconds of delay)
    - The current intersection control would not accommodate increased traffic volumes from SR 518 under future conditions as the approach is currently stop-controlled.

The following intersection, given the planned road diet, is anticipated to operate at a level of service that falls below City's current LOS policy during the PM peak hour by 2044. As such, the 2024 Transportation Element policies have been revised to address the anticipated congestion.

- Southcenter Boulevard / 65 Avenue South (signal-controlled intersection results in LOS F with 83 seconds of delay)
    - Given the road diet on Southcenter Boulevard, there are expected to be delays for westbound traffic along the corridor.

As previously described, the roadway network within Southcenter is understood to have non-traditional peak periods due to retail travel patterns. Eleven study corridors were evaluated to understand traffic conditions during the weekend PM peak period, which is projected to have the most congestion under future conditions. The evaluated corridors currently operate acceptably and meet the City's LOS standard of LOS E average. Under 2044 Growth Target conditions, most of the corridors operate acceptably except for the following corridors that would operate at LOS F:

- 61st Avenue South Bridge/Tukwila Parkway from Southcenter Boulevard to Andover Park West
- West Valley Highway from Southcenter Boulevard to Strander Boulevard

The 2044 Growth Target projections warranted revisions to previous LOS standards in the Southcenter area, as described previously. The City may consider the following strategies to address degrading traffic operations in the Southcenter area:

Table 5: Potential Additional Strategies to Mitigate Southcenter Congestion

Strategy	Description	Potential Limitations/Barriers
Update the City's LOS policy	Allow LOS F operations, with an average delay not to exceed 120 seconds on the impacted corridors.	WSDOT controls the LOS standard on West Valley Highway.
Improve vehicle access into the Southcenter area	Partner with WSDOT/regional partners to provide an east-west connection from Southcenter, e.g., an extension of Strander Boulevard. This would better accommodate increased volumes on West Valley Highway and other key access locations.	A capital project of this size would require extensive WSDOT and regional partner support and collaboration.
Advocate for enhanced transit service	Given that Southcenter is a regional attraction, advocate for enhanced transit service through improved frequency, new routes, or infrastructure investments such as bus lanes or transit signal priority. This may promote transit use and discourage single-occupancy vehicle trips in Southcenter.	Advocacy does not always translate to implementation.
Coordinate with WSDOT	The congestion in the Southcenter area is expected to include SR 181. The City can coordinate with WSDOT to develop specific mitigation measures to meet the standards set by the state.	WSDOT standard is currently set to LOS E/mitigated for SR 181 as a Highway of Regional Significance

Figure 41: Future 2044 - PM Peak Hour LOS in Tukwila

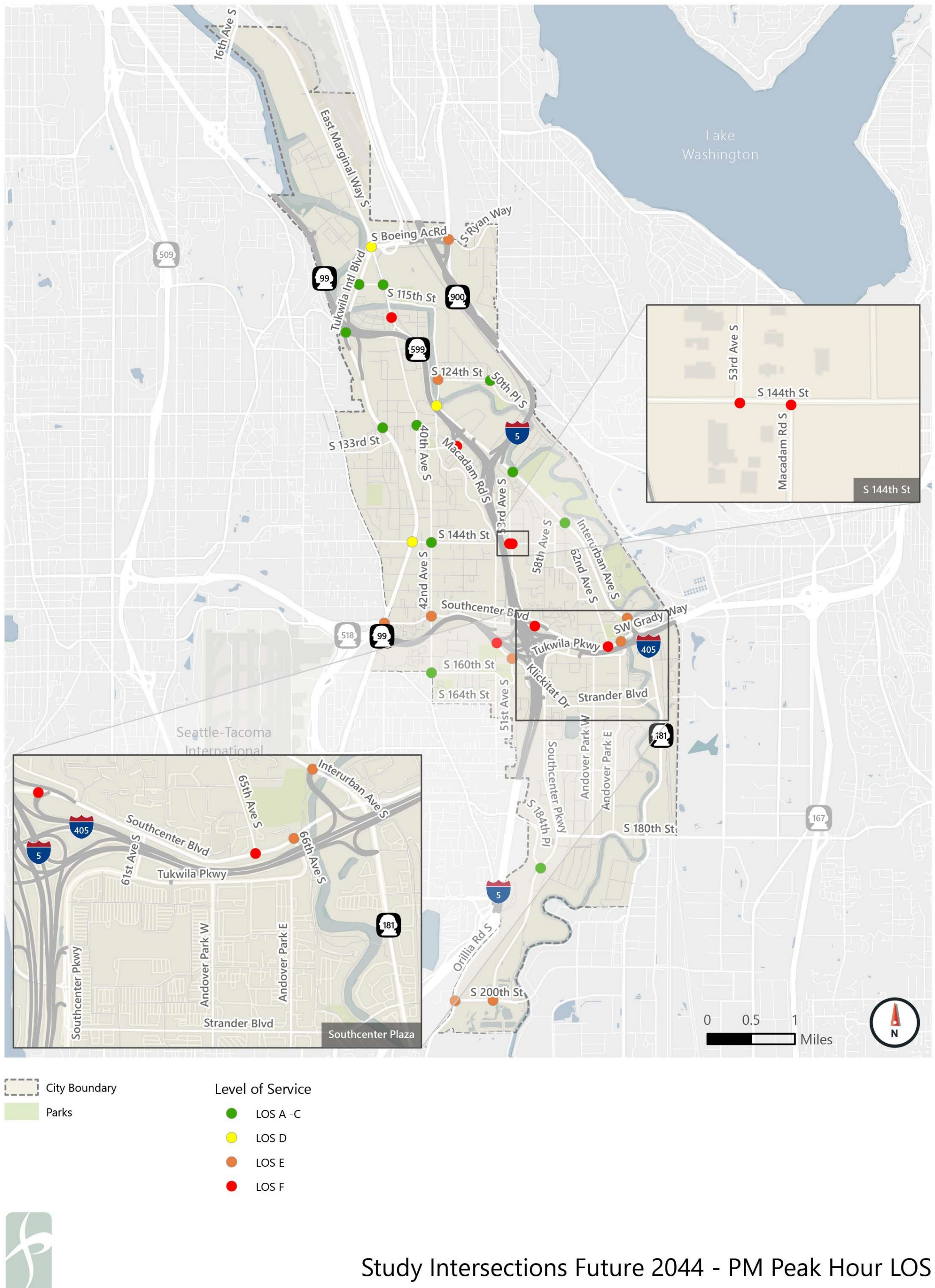
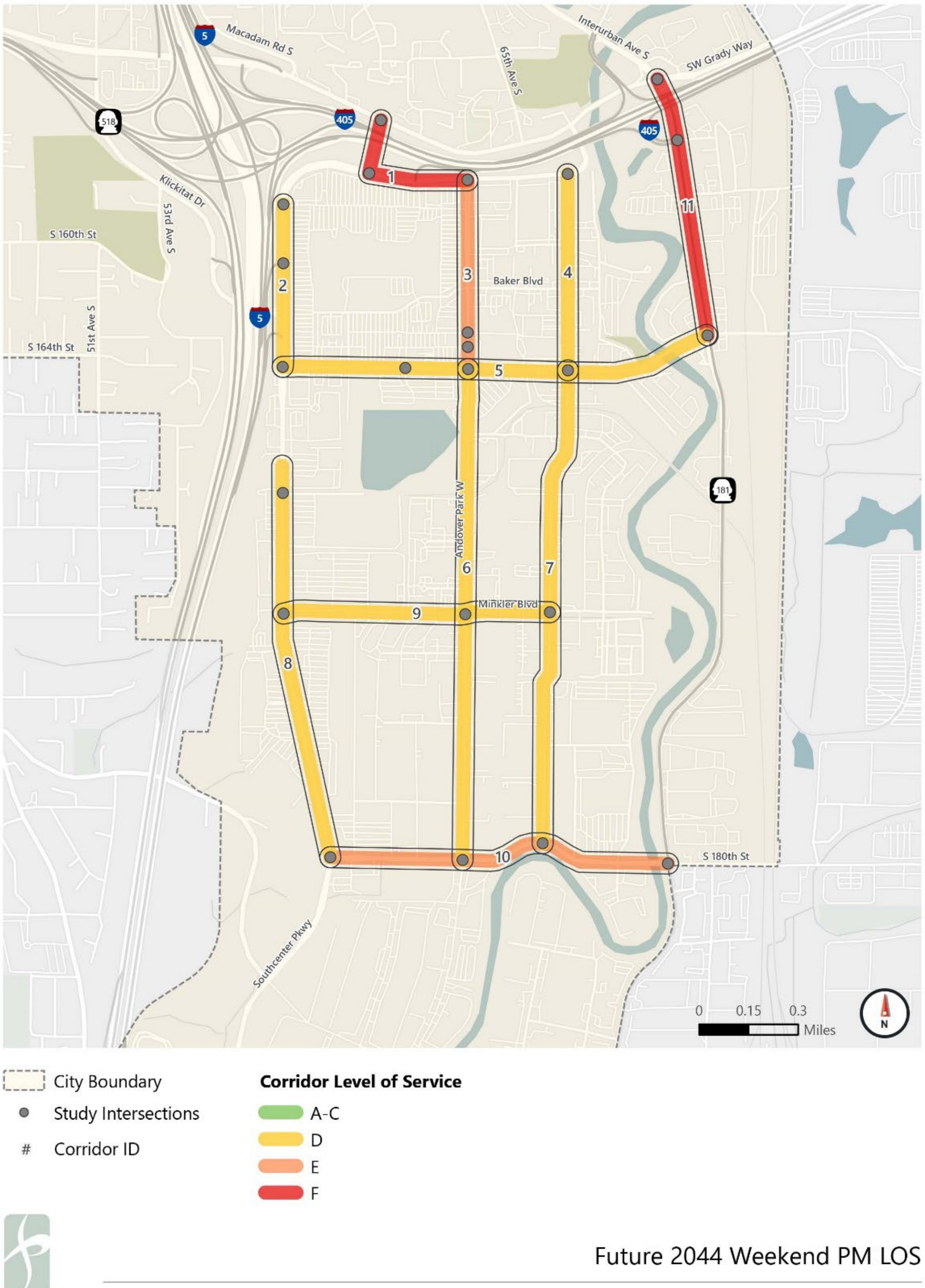


Figure 42. Future 2044 - Weekend PM Peak Hour LOS



New traffic conditions expected in 2044 as a result of land use changes over time can also change the conditions of non-motorize modes. As density increases and non-motorized facilities are improved, it is expected that the share of non-vehicle options increases over time. **Table 6** displays the projected mode share percentages that were derived from traffic modeling.

Table 6. Mode Share Percentages

	2018	2044
Single Occupancy Vehicle (SOV)	51.5%	47.4%
High Occupancy Vehicle (HOV)	40%	39.1%
Walk	4.1%	7.5%
Bike	1.2%	1.5%
Transit	3.2%	4.6%

Pedestrian LOS Standards and Guidelines

Pedestrian LOS standards and guidelines describe the comfort of someone walking. The fundamental expectations for physical space, modal separation, and street crossing amenities are informed by the neighborhood and land use context of a given street. Therefore, pedestrian facility standards and guidelines are tailored to different neighborhood and street contexts. Accordingly, pedestrian LOS standards typically involve design standards applied to each of the various pedestrian environments represented within the City.

The City of Tukwila currently utilizes a consistency-based standards for non-motorized modes, focusing on consistency among planned developments. The non-motorized standards are not currently used for concurrency; however, the previous TE document includes networks and policies that support consistency-based standards. This involves using existing plans to prioritize construction of new sidewalks, bike lanes, and trails.

Table 7 presents a new pedestrian LOS policy, which would apply standards to all streets in Tukwila. The policy outlines the minimum standards required by corridor type; however, the City aspires to provide sidewalks on both sides and amenity zones on residential streets as right of way permits. **Figure 43** maps out the pedestrian level of service standards on all streets outside of the Southcenter area and **Figure 44** maps out the pedestrian standards in the Southcenter area. Utilizing a simplified approach to pedestrian LOS standards allows for flexibility in addressing critical concerns while avoiding design-specific nuances. The goal is to provide safe and convenient pedestrian connectivity, making a sidewalk presence the key focus.

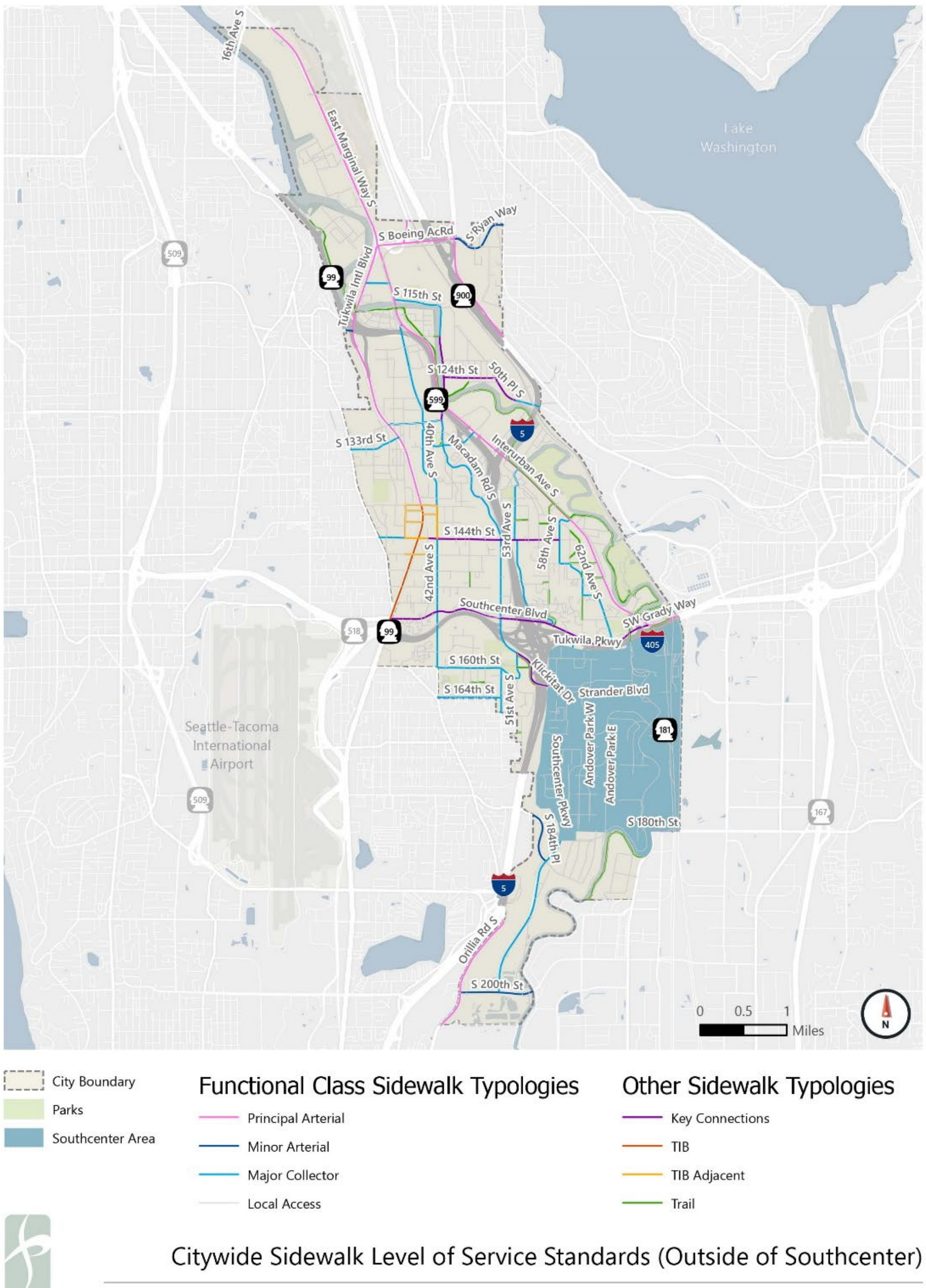
Table 7. Pedestrian LOS Standards by Street Type

	Category	Side of Street	Minimum Sidewalk Width[1]	Minimum Amenity Zone Width[2]	Lighting	Optimal Crossing Frequency
Functional Class	Principal Arterials	Both Sides	8 ft	5 ft	Pedestrian and vehicular-scale decorative street lighting	Within 300 feet of a transit stop or community asset[3] Elsewhere: ≤quarter mile
	Minor Arterial and Collectors	Both Sides	6 ft	5 ft	Vehicular-scale lighting	Within 300 feet of a transit stop or community asset Elsewhere: ≤ quarter mile
	Residential Streets	Both Sides	6 ft	4 ft	Vehicular-scale lighting	Within 300 feet of a transit stop or community asset Elsewhere: ≤ quarter mile
Southcenter	Commercial Corridors, Urban Corridors, and Workplace Corridors	Both Sides	8 ft	5 ft	Pedestrian and vehicular-scale decorative street lighting	≤ 800 feet
	Neighborhood Corridors and Walkable Corridors	Both Sides	15 ft (10 ft on Minkler)	6 ft	Pedestrian and vehicular-scale decorative street lighting	≤ 800 feet
	Freeway Frontage Corridors	One Side	8 ft	5 ft	Pedestrian and vehicular-scale	Within 300 feet of a transit stop or community asset

	Category	Side of Street	Minimum Sidewalk Width[1]	Minimum Amenity Zone Width[2]	Lighting	Optimal Crossing Frequency
					decorative street lighting	Elsewhere: ≤ quarter mile
Other	Trails	N/A	10 ft	N/A	Pedestrian-scale decorative street lighting	N/A
	Key Connections[4]	Both Sides	8 ft	5 ft	Pedestrian and vehicular-scale decorative street lighting	Within 300 feet of a transit stop or community asset Elsewhere: ≤ quarter mile
	Tukwila International Boulevard	Both Sides	8 ft	4 ft	Pedestrian and vehicular-scale decorative street lighting	Within 300 feet of a transit stop or community asset Elsewhere: ≤ quarter mile
	Tukwila International Boulevard Adjacent Streets	Both Sides	5 ft	4 ft	Pedestrian and vehicular-scale decorative street lighting	Within 300 feet of a transit stop or community asset Elsewhere: ≤ quarter mile

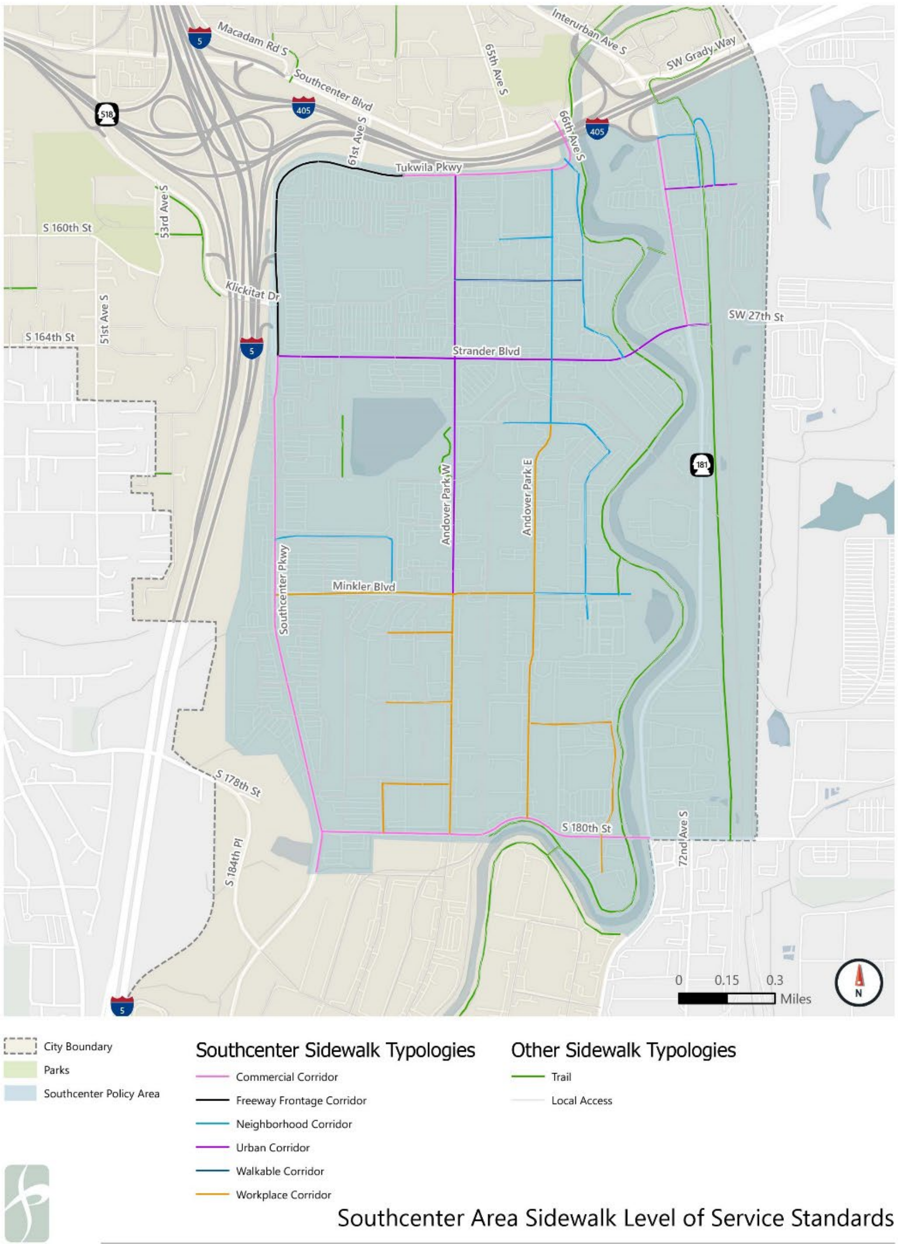
Notes:
[1] The minimum sidewalk width refers to the pedestrian through zone, which serves as an accessible pathway, clear of obstacles.
[2] The amenity zone provides additional space for pedestrians and/or serves as a buffer from vehicle traffic, separate from the minimum sidewalk width. This space may include street furniture, landscaping, or trees.
[3] A community asset is defined as a park, school, community center, neighborhood shopping, or library.
[4] Key Connections policies supersede functional class policies. These locations include east-west access corridors, connections to pedestrian generators/destinations, and critical transit corridors.

Figure 43. Citywide Sidewalk Level of Service Standards (Outside of Southcenter)



Source: City of Tukwila, Fehr & Peers, 2023

Figure 44. Southcenter Sidewalk Level of Service Standards



Source: City of Tukwila, Fehr & Peers, 2023

Based on the existing sidewalk network (see **Figure 20**) as well as the pedestrian standards, key focus areas where there are high levels of pedestrian activity such as the Southcenter area, east-west connections across Tukwila International Boulevard, and the Tukwila Community Center area. Important connections around Southcenter include connections to the Tukwila Sounder station as well as Tukwila Pond Park. Tukwila International Boulevard, particularly between South 140th Street to South 154th Street, hosts many multi-family and affordable housing units, which are commonly associated with higher usage of public transit and walking, and other high pedestrian generators like nearby schools, multiple churches, and a mosque. The Tukwila Community Center has also been identified as a key area for pedestrians.

In addition to existing pedestrian needs, it is important to plan pedestrian facilities prior to future development that would rely on these facilities. International Boulevard/SR 99 and South 160th Street is the location of a potential large-scale mixed-use project with access to the light rail station via a pedestrian bridge. South Boeing Access Road is the location of a planned light rail station that would require increased pedestrian connectivity.

Bike Guidelines

Level of traffic stress (LTS) is the current state of the practice in planning bike facilities. This approach provides a framework for designing bike facilities that meet the needs of the intended users of the system. **Figure 45** describes the four typical categories of cyclists, each requiring different levels of accommodation to feel comfortable using the system.

Figure 45. Bike Level of Traffic Stress and Rider Categories

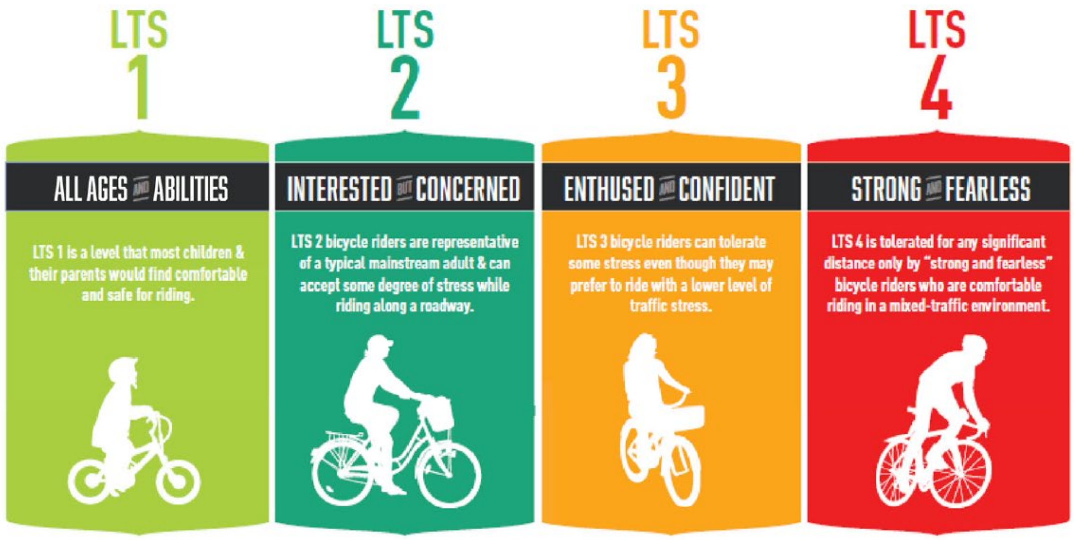


Table 8 and **Table 9** display the various treatments required for each LTS designation along corridors as well as at intersections. With this approach, treatments required to meet each LTS designation along a corridor vary based on speed limit and traffic volume. The contextual nature of the LTS approach acknowledges that the same bike treatment under different street conditions can evoke different levels of stress. For example, a striped bike lane without a buffer may be comfortable for all ages and abilities on slow streets with low traffic volumes. However, as traffic volumes or speeds increase, the riding conditions no longer meet the needs of those in the LTS 1 category. Utilizing the LTS approach for bike conditions provides the City with the opportunity to plan bike networks that address the varying comfort levels of people who bike. Additional information on bike facility types and treatments is provided in **Appendix F**.

Table 8. Bike Level of Traffic Stress and Rider Categories

Speed Limit (MPH)	Arterial Traffic Volume	No Marking	Sharrow Lane Marking	Striped Bike Lane	Buffered Bike Lane (Horizontal)	Protected Bike Lane (Vertical)	Physically Separated Bikeway
≤ 25	< 3k	1	1	1	1	1	1
	3-7k	3	2	2	2	1	1
	≥ 7k	3	3	2	2	1	1
30	< 15k	3	3	2	2	1	1
	15-25k	4	4	3	3	2	1
	≥ 25k	4	4	3	3	3	1
35	< 25k	4	4	3	3	3	1
	≥ 25k	4	4	4	3	3	1
>35	Any	4	4	4	4	3	1

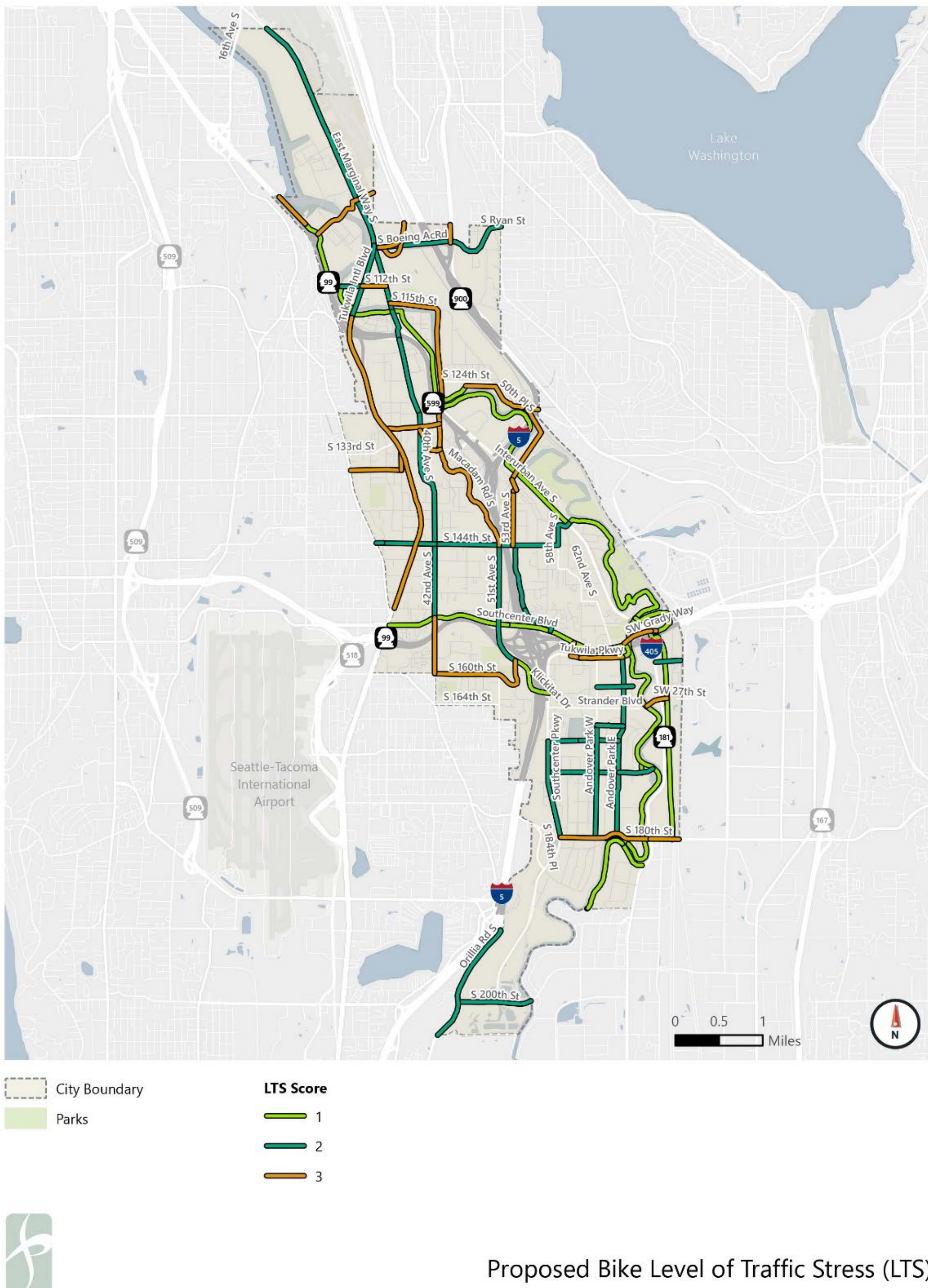
Table 9. Recommended Bike Facility Treatments at an Intersection

Bike LTS	Signal Type	Street Crossing	Approach to Intersection	Approach to Intersection with Right Turn Lane
LTS 1	Bike Signal	Green solid or skip-stripe	Green bike box	Curb ramp to wide sidewalk, Dutch Intersection
LTS 2	Bike Signal	Skip-stripe	Bike box	Green bike lane to left of turn lane
LTS 3	Green Cycle Length	Sharrow lane markings	Automatic signal actuation	Bike lane to left of turn lane
LTS 4	No Specific design guideline for LTS 4			
Trail or Mid-Block Crossing	Full signal, HAWK, or RRFB	Green solid or skip-stripe	N/A	N/A

Note: See Appendix F for detailed descriptions and images of bike facility treatments.

The LTS approach to bike LOS offers a way to develop a network of bike facilities that meet the needs of each rider category. **Figure 46** shows the City's aspirational bicycle LTS network. It considers the current facilities and their LTS designations to identify areas for potential connections. Awareness of the types of people who bike provides insight into the inclusivity of each bike route. Establishing various options for all people who bike allows people to efficiently reach desired destinations.

Figure 46. Proposed Bike Level of Traffic Stress Network



Source: City of Tukwila, Fehr & Peers, 2023

Transit Guidelines

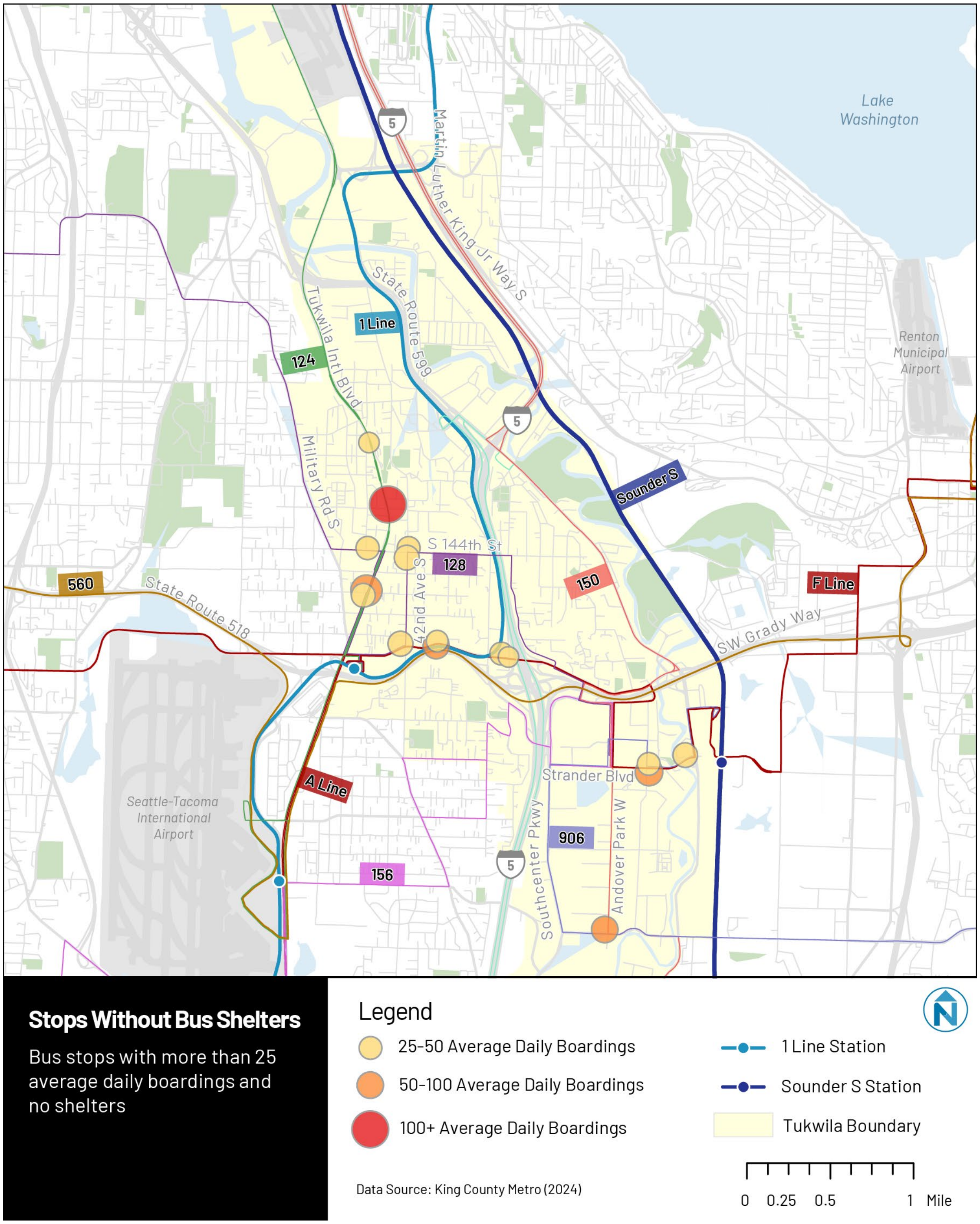
Transit service in Tukwila is provided by King County Metro and Sound Transit and the City's ability to set transit standards is limited. The transit providers maintain routes, headways, and most stop amenities. Given that the City is not the transit provider, the City is only responsible for providing access to established transit stops and maintaining roadway conditions. However, the City will use these guidelines to advocate for improved transit service and higher-quality transit stop amenities along City streets. **Table 10** shows proposed transit treatments based on the corridor type.

Table 10. Recommended Transit Treatments

Stop Component	Corridor Type	
	Local Transit Corridor	Frequent and Express Transit Network Corridor
Weather Protection	Yes, priority with 25+ daily boardings	Yes, for RapidRide stops, priority with 25+ daily boardings on other Frequent/Express stops
Seating	Yes, near community assets	Yes, for RapidRide stops, priority with 25+ daily boardings on other Frequent/Express stops
Paved Bus Door Passenger Zone	Yes, zone length 25-30 feet	Yes, zone length 60 feet
Wayfinding	Yes, priority with 25+ daily boardings	Yes, for RapidRide stops, priority with 25+ daily boardings on other Frequent/Express stops
Other Amenities (trash, lighting, bike parking)	Yes, priority with 25+ daily boardings	Yes, for RapidRide stops, priority with 25+ daily boardings on other Frequent/Express stops

Figure 47 includes the City of Tukwila's current transit network, stop locations, and available amenities. There are still gaps in the transit network, including access to the Tukwila Community Center, and the City will continue advocating for access to key destinations. As shown in **Figure 47**, there are several transit stops without any amenities and this presents an opportunity to address these gaps using the recommended transit stop treatments tabulated in **Table 10**

Figure 47. Existing Transit Network and Stops



Source: City of Tukwila, Fehr & Peers, 2023

Freight Guidelines

As a result of the growth in urban populations, the prevalence of online shopping, and related freight activities, there is an upward trend in goods and parcel delivery in cities. This prompts the need to closely review and develop guidelines to adequately accommodate freight movement and related activities. Current street designs or policies often present challenges for truck/freight operators. Better balance can be achieved by clearly defining freight corridors and developing guidelines to address the following challenges often faced by truck or commercial delivery drivers in cities:

- Large truck operators frequently have difficulty navigating restricted and narrow turns, narrow lanes, and curved or circular travel paths.
- Street furniture, bike parking, trees, signage, bollards, and other curbside or sidewalk obstructions can inhibit delivery activity if they are installed without considering truck needs.
- Inadequate supply of truck parking and delivery spaces results in double parking or parking in the middle of roadways using two-way left-turn lanes, which presents safety and traffic issues for other road users.
- High risk for dangerous collisions in areas where pedestrians and bicyclists are likely to be operating in driver blind spots.
- Poorly designed commercial vehicle load zones which do not accommodate safe and efficient deliveries. The space allocation for deliveries is typically constrained.

As a community that hosts a major Manufacturing/Industrial Center (MIC) and citywide delivery activity, developing freight LOS guidelines is critical to ensure efficient delivery of goods and limited impacts on other transportation modes. The subsequent sections and **Appendix G** present recommendations regarding freight corridors, curb access, and truck parking.

Freight Corridors

The City currently partners with regional agencies and the state to build and maintain freight corridors within the City that are classified as Freight and Goods Transportation System (FGTS) routes (**Figure 33**). Designated FGTS routes aim to prevent heavy truck traffic on lower-volume streets and promote the use of adequately designed roadways. Building on this effort, the City is including implementation strategies in the TE document that address competing needs along freight corridors in the City.

Curb Access

Several agencies are beginning to recognize curb space as valuable real estate that ought to be better understood and designed to improve the quality of life for residents and transportation systems. Prioritizing curb functions based on adjacent land use is an approach that various jurisdictions/ agencies are taking to manage curb access. See **Appendix G** for recommended curb access considerations along designated FGTS routes.

Truck Parking

Truck parking is a critical national transportation issue that cities including Tukwila currently face. Truck drivers need safe and secure parking as well as rest breaks as required by law. But, with more trucks and drivers on the road to serve the significant increase in demand for goods, the scarcity of parking for drivers has increased. Most truck parking in cities is directly related to industrial warehouse development and the production of goods, and these land uses, and the associated zoning are locally controlled.

A nationwide effort to address ongoing truck parking issues has been underway for several years. More locally to Tukwila, there is a real need for truck parking to support residents who are professional truckers without negatively impacting residential and commercial areas. The proposed guideline on this topic is to engage and coordinate with the diverse set of truck parking stakeholders (truck drivers, neighborhoods, City staff, freight facility operators, and other regional, state, and federal agencies) to address/ discuss the following:

- The disconnect between economic development goals to build major freight generators (e.g., industries, malls, dense mixed-use developments, hospitals, etc.) without provisions for truck staging or parking spaces to support truck deliveries and driver needs.
- The common response of banning truck parking when dealing with truck parking concerns (typically learned about through resident complaints). These truck parking bans often result in moving rather than solving the problem.
- Key truck parking components including safety, zoning, environment and sustainability, residential impacts and quality of life, intermodal connections and emerging technology, funding and incentives, communication, and public outreach.

- Educating local planners, development staff, and elected officials to get an understanding of how freight operates, and the truck parking demand generated by local industrial development.

In addressing and discussing the bulleted items, the City should utilize the Federal Highway Administration (FHWA)'s truck parking handbook. It presents resources for the development of truck parking, including factors that influence parking need, quantitative approaches for estimating truck parking demand, design of truck parking facilities, truck parking safety and security, and facility siting to protect community quality of life.[17]

[17] FHWA, Truck Parking Development Handbook, 2022.

Chapter 5: Transportation Project List

This section describes the projects and programs that will support the City's goals, policies, and vision. Implementing the project list would provide a safer and more connected multimodal system while fitting within the City's anticipated budget over the next 20 years.

Project Development

The Transportation Element development process involved several methods of identifying project ideas and transportation needs citywide. Projects were identified through technical analysis, community input, and past plans. After a full project list was developed, prioritization metrics were applied to fit the projects within the expected funding constraints.

Technical Analysis

Several types of analyses were used to pinpoint where transportation challenges are present under current conditions and what challenges Tukwila is expected to face in the next 20 years. These technical analyses identified where the City's set level of service standards are not met under existing and future conditions. Projects were identified to mitigate substandard LOS for each mode.

Vehicle network performance was measured based on the seconds of delay at intersections and average delay along corridors during PM peak hour, midday, and weekend periods. Vehicle projects were identified where:

- Existing conditions failed to meet LOS standard
- Future alternatives show LOS degrading below the standard.

Pedestrian level of service standards were set by determining the required walking and rolling treatments on each type of corridor. Sidewalk presence is the most critical element of the set standard. Identification of sidewalk gaps was completed after inventorying existing facilities and determining where sidewalks were required on one or both sides of the street. Projects were identified for areas where the walking and rolling facilities do not meet the standard.

Bike projects were identified using a methodology similar to pedestrian network improvements. Level of Traffic Stress methodology was used to identify the existing bicycle LTS network. The project team then identified a proposed skeleton LTS network based on current LTS and feasibility. Projects were identified in areas where an LTS improvement is proposed. See Chapter 4. Transportation Vision for more detail on the proposed bike LTS network.

Community Input

The community was heavily involved throughout the process of developing the TE. Community input was synthesized to identify patterns and ultimately create projects out of the ideas shared by the community. See **Chapter 3: Public Outreach** for more details on the engagement process.

Previous Planning Efforts

The 2023-2028 Capital Improvement Program included sections dedicated to Residential Streets as well as Bridges & Arterial Streets. Transportation projects from these sections were incorporated into the TE project list.

Prioritization Metrics

Upon consolidating a full list of potential projects, prioritization metrics were applied to identify which projects would further the City's goals. Criteria and metrics were developed for each of the five transportation goals and projects were scored accordingly. **Table 11** describes the goals, guiding principles, and weighting. **Table 12** includes the project prioritization metrics that were used to identify a fiscally constrained project list.

Table 11. Goals, Guiding Principles, and Weighting for Prioritization

Equity	Safety	Connectivity	Adaptability	Environment
Ensure fair access to healthy, affordable, reliable transportation options, livable places, and jobs, particularly for historically marginalized and vulnerable populations.	Provide safe transportation infrastructure and improve personal comfort to emphasize Tukwila as a welcoming place.	Maintain, expand, and enhance Tukwila's multimodal network, particularly walk, bike, roll, and transit, to increase mobility options where needs are greatest.	Anticipate and plan for the community's evolving needs, new technologies, and opportunities for mobility.	Plan, design, and construct transportation projects that reduce greenhouse gas emissions, improve community health, and protect the natural environment.
20%	35%	20%	10%	15%

Table 12. Scoring Criteria by Goal

Equity	**Community outreach and engagement**	Project is supported by community members. The community is meaningfully engaged in identifying how the project supports community needs and goals.
	Delivery of transportation services	Project provides access to healthy, affordable, reliable transportation options in areas with historically marginalized or vulnerable populations.
Safety	**Safe and comfortable options**	Project improves levels of comfort and desirability of walking, biking, rolling, or using transit.
	Crossing Safety	Project provides new or improved crossing treatment (e.g. restriping, RRFB, curb ramps, crossing island, curb extension, reduced pedestrian exposure, new signal, reduced motor vehicle turning speed, narrowed curb return, etc.).
	Collision history	Project is identified as a priority project in Tukwila's Local Road Safety Plan (LRSP).
Connectivity	**Access**	Project increases route options or interconnectedness and/or closes an existing gap in the walk/bike/roll/transit networks
	Quality of travel choices	Project increases the number of high-quality travel choices, which are defined by mode as follows: a) Pedestrians – facilities are comfortable and accessible b) Bikes - facilities are LTS 1 or 2 c) Transit - service is frequent and reliable or the provision of stop amenities d) Auto - intersection or corridor LOS meets the set standard.
	Person trip capacity	Project provides additional capacity for person trips compared to existing conditions.
Adaptability	**Emerging travel modes and technology**	Project supports or advances emerging travel modes or technology including e-scooters, e-bikes, electric-vehicles, autonomous and connected vehicles
	Intelligent Transportation Systems (ITS)	Project provides opportunities to maximize the efficiency of the transportation system using technology. This includes implementing smart signal or technology upgrades, e.g. fiber optic, signal cabinets, adaptive signal technology or leading pedestrian interval.
	Preparedness for disruptive events	Project supports redundancy to the transportation network and traffic operations improvements. This is pivotal for evacuation planning in preparation of future emergencies/ challenges such as landslides, flooding, earthquakes, unplanned road closures etc.
Environment	**Sustainable transportation**	Project encourages travel to be less impactful on the environment by promoting shared/mass transportation or shortening SOV vehicle trips or shifting to other low- or zero-emission, energy-efficient, affordable modes. This criterion is primarily centered on vehicle miles traveled (VMT) reduction which is linked to Green House Gas emissions, air and noise pollution.
	Protection of ecological resources	Project protects or minimizes impact to ecological resources (plant/animal species and their habitats).

Priority Projects

A priority project list is a critical piece of transportation planning. The City of Tukwila can use the priority project list to determine what capital improvements to include in budgeting. This list outlines the 36 most important projects in Tukwila over the next 20 years.

Each project derived from previous planning efforts, technical analysis, and community input was scored using the criteria and weights outlined above. The projects were then sorted by score to determine the top performing projects that would make up the prioritized project list.

Table 13 includes the priority projects with descriptions and displays the priority projects on a map. The extended project list is included in **Appendix H**. The priority projects appear to have a good likelihood of being funded under current financial expectations. Regular monitoring of level of service compliance and updates to the evolving City needs should be done by the City. Keeping tabs on current needs, and moving forward other projects that have been identified, but not determined as the highest priority needs, will ensure that the City will continue to maintain high levels of service for all users.

To ensure that the City of Tukwila continues to build infrastructure that aligns with its goals, additional funds are set aside for developing safety projects, derived from the Local Road Safety Plan, as well as ADA improvements and other needs Citywide. The cost of developing the projects on the Top Priority list would not use the entirety of the budget expected over the next 20 years. The remaining portion can be used to address safety, ADA, and other emergent needs in Tukwila.

Boeing Access Road Station

Sound Transit's Boeing Access Road Station Project would add a new station to the existing 1 Line of the Link light rail network near South Boeing Access Road, East Marginal Way, and Interstate 5 (I-5) in Tukwila. The project bridges the current 5.5-mile gap between Rainier Beach and Tukwila International Boulevard stations, and would include 300 parking spaces at the station. Sound Transit is currently considering the following locations for the station:

- S Boeing Access Road, west of I-5
- E Marginal Way S, north of S 112th St

The Transportation Element includes policies and implementation strategies to support the city's vision for the station area. Tukwila aims for the station area to become a walkable community destination and supportive of future transit-oriented development, as per strategies T3.5 and T3.15. Priority projects near the station area support this vision, including priority projects C, D, I, J, K, and AD.

More information about the Boeing Access Road Station is available on Sound Transit's **project website**.

Table 13. Prioritized Project List

#	Project Name	Description	Street Name	Start	End	Cost
A	Buffered Lane on 42nd Ave S Section 3	Remove parking on one side and widen sidewalk to create a 12ft shared use path 8ft parking lane, 2-11ft lanes and 8ft sidewalk.	42nd Ave S	S 150th St	S 144 St.	$ 550,000
B	Buffered Lane on 42nd Ave S Section 4	Develop a traffic-calmed bikeway along 42nd Ave S between S 150th St and Southcenter Blvd. On the west side of the street, add striped southbound bike lane between Southcenter Blvd and S 150th St. On the east side of the street, add striped bike lane between Southcenter Blvd and S 151st St. Remove on-street parking to widen the sidewalk on the east side of the street between S 151st St and S 150th St, creating a shared path; add shared lane markings to the roadway.	42nd Ave S	Southcenter Blvd	S 150th St	$ 376,000
C	S Norfolk St Bike Facilities	Add bike facilities on S Norfolk St. If this project moves forward, need to update bike network.	S Norfolk St	E Marginal Way S	Eastern City Limits	$ 497,000
D	E Marginal Way Bike Lanes (E Marginal Way S North Section)	Widen and extend asphalt paving on E Marginal Way S north of S Boeing Access Road. Bike facilities may be desired here, pending BAR Infill station and area redevelopment, could connect to bike facilities on Airport Way if Seattle/Tukwila install, connecting via Norfolk to EMWS If this project moves forward, need to update bike network.	E Marginal Way S	S Boeing Access Rd	Northern City Limits	*Further analysis required to determine planning-level cost estimate*

E	Southcenter Boulevard Bike Lanes Section 2	Add vertical flexi posts to existing bike lanes or raise the bike lane to sidewalk level to create better separation from vehicles.	S 154th St	42nd Ave S	51st Ave S	$ 390,000
F	42nd Ave S Bridge Replacement	Design and construct a replacement structure for the existing 42nd Ave S Bridge near the Tukwila Community Center.	42nd Ave S Bridge	Interurban Ave S	Tukwila Community Center	$ 32,333,000
G	Southcenter Blvd/65th Ave S Signal	Design and construct a traffic signal at the Southcenter Boulevard/65th Avenue S intersection. Intersection will include pedestrian crossings.	Southcenter Blvd	65th Ave S		$ 1,100,000
H	SR 518 EB Off-ramp / Klickitat Drive Intersection Improvements	Design and construct a new traffic signal, lighting, and pedestrian facilities including crosswalks and pedestrian push buttons.	SR 518 EB Off-ramp	Klickitat Drive		$ 850,000
I	E Marginal Way/S 112th Street Intersection Modifications	Design and construct curb/gutter, drainage, lighting, turn lanes, and traffic control.	E Marginal Way	S 112th Street		$ 2,500,000
J	S 115th Street / E Marginal Way Intersection Improvements	Design and construct a new traffic signal, lighting, and pedestrian facilities including crosswalks and pedestrian push buttons. Coordinate the new traffic signal with the Interurban Ave / E Marginal Way signal.	S 115th Street	E Marginal Way		$ 2,000,000
K	Boeing Access Road/E Marginal Way/Tukwila International Boulevard Intersection Feasibility Study	Evaluate the feasibility of modifying the intersection.	Boeing Access Road	E Marginal Way/Tukwila International Boulevard		$ 125,000
L	Andover Park E/Minkler Blvd Intersection	Design and construct left turn lanes on Andover Park East and reconstruct	Andover Park E	Minkler Blvd		$ 1,832,000

		traffic signal. Improve safety and provide needed capacity.				
M	Andover Park E/Industry Dr Intersection	Design and construct traffic signal with Andover Park East left turn lanes and crosswalks.	Andover Park E	Industry Dr		$ 846,000
N	E Marginal Way (BAR - S 112 St)	Design and construct curb, gutter, drainage, lighting, turn lanes, and traffic control.	E Marginal Way	S 115th St	S Boeing Access Rd	$ 3,418,000
O	124th and 50th Intersection Improvements	Add sidewalk facilities from 51st to 49th on north side and reconfigure intersection to bring all movements to a full stop, eliminating the EBRT slip lane. Add protected pedestrian facility on 50th Pl from 124th to connect into the pedestrian facilities south of S 125th.	S 124th St	50th Pl S		$ 750,000
P	S 152nd St Safe Routes to School	Install curb, gutter, and sidewalks on both sides of S 152nd St, including widening pavement width by three feet to construct an on-street parking lane as a buffer between the roadway and sidewalk on the north side.	S 152nd St	42nd Ave S	Tukwila International Boulevard	$ 4,468,000
Q	46th Ave S Safe Routes to School	Install curb, gutter, and sidewalk on the west side of 46th Avenue South. Install a curb bulb-out at the southeastern corner of 46th Ave S and S 144th St and a raised crosswalk on S 144th St with pedestrian-activated flashing beacons.	46th Ave S	S 144th St	S 150th St	$ 2,580,000
R	S 144th St Bridge - Sidewalks	Design of pedestrian improvements to the S 144th Street bridge over I-5, to include structural, civil, environmental, and traffic design to obtain PS&E. Project will widen the existing pedestrian pathway on the bridge from three feet to six feet with a barrier to	S 144th St Bridge	Macadam Rd S	53rd Ave S	$ 3,298,000

		separate automobile and pedestrian traffic.				
S	Macadam Rd S Section 1 Sidewalk	Construct sidewalk on west side of 42nd Ave S from S 124th St to entrance of 42nd Ave S Bridge, construct sidewalk on both sides of 42nd Ave S from entrance of 42nd Ave S Bridge to Interurban Ave S. Construct sidewalk on both sides of Macadam Rd S from Interurban Ave S to S 130th St.	42nd Ave S and Macadam Rd S	S 124th St	S 130th St	$ 992,000
T	S 146th St Sidewalk	Construct sidewalk on south side of entire segment, and extend the sidewalk on the north side to the project extents	S 146th St	35th Ave S	41st Ave S	$ 667,000
U	40th Ave S Sidewalk	Construct sidewalk on both sides of road segment up to existing sidewalk	40th Ave S and 42nd Ave S	East Marginal Way S	S 139th St	$ 3,443,000
V	Strander Blvd Sidewalk	Construct sidewalk on south side of Strander Blvd from Christensen Rd to W Valley Hwy. Construct sidewalk on both sides of Strander Blvd from W Valley Hwy to east boundary of Tukwila city limits	Strander Blvd and SW 27th St	Christensen Rd	Interurban Trail	$ 467,000
W	S 124th St Sidewalk	Construct sidewalk on both sides of S 124th St from 49th Ave S to 50th Pl S	S 124th St	49th Ave S	50th Pl S	$ 2,105,000
X	Minkler Blvd Section 2 Sidewalk	Construct sidewalk on both sides of road segment	Minkler Blvd	Andover Park W	Andover Park E	$ 1,430,000
Y	Tukwila International Blvd Section 2 Sidewalk	Construct sidewalk on east side of Tukwila International Blvd from S 112th St to the HW 99 Exit Ramp. Construct sidewalk on both sides of Tukwila International Blvd from the HW 99 Exit Ramp to 12400 Block.	Tukwila International Blvd	S 112th St	12400 Block	$ 2,050,000
Z	E Marginal Way S Section 2 Sidewalk	Construct sidewalk on both sides of road segment	E Marginal Way S	Interurban Ave S	S 120th Pl	$ 803,000

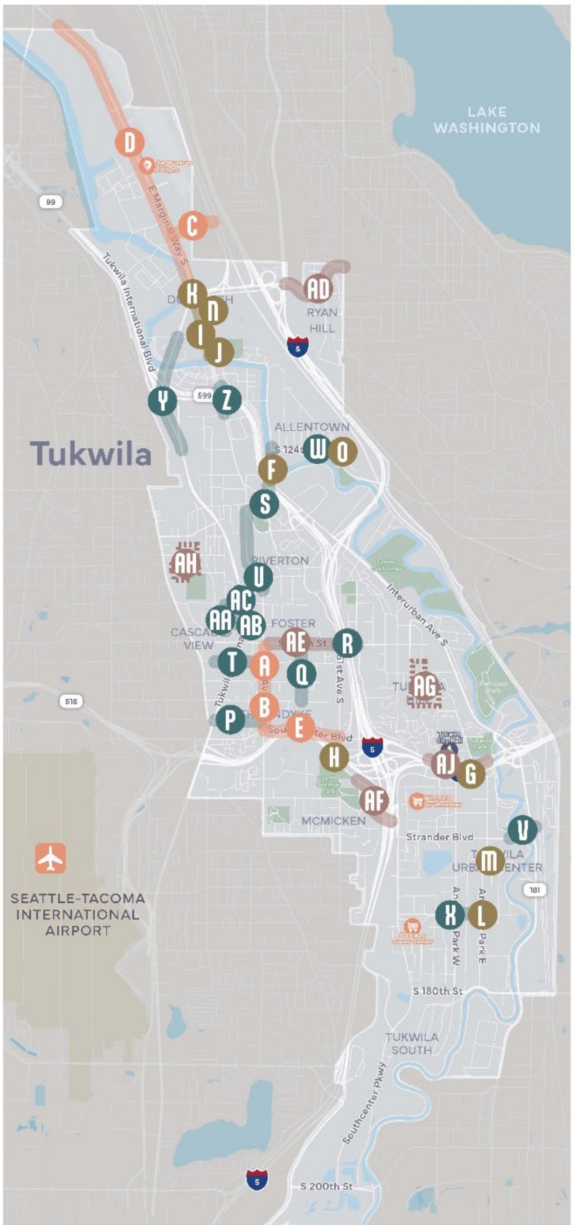
AA	37th Ave S Sidewalk	Construct sidewalk on east side of 37th Ave S from S 140th St to S 142nd St east segment. Construct sidewalk on both sides of 37th Ave S from S 142nd St east segment to S 142nd St west segment	37th Ave S	S 140th St	S 142nd St	$ 530,000
AB	S 142nd St Sidewalk	Construct sidewalk on both sides of road segment	S 142nd St	37th Ave S	Tukwila International Blvd	$ 541,000
AC	S 141st St Section 1 Sidewalk	Construct sidewalk on both sides of road segment	S 141st St	37th Ave S	Tukwila International Blvd	$ 510,000
AD	Ryan Way Road Diet	Resurface and rechannel S Ryan Way to improve failing pavement and improve safety. Add pedestrian and bicycle facilities where appropriate. Signalize intersection with 47th Avenue S to accommodate future growth and improve safety.	S Ryan Way	Martin Luther King Jr Way S	51st Ave S	$ 14,371,000
AE	S 144th Street Complete Street	Restripe and remove parking on one side to accommodate 2-10ft lanes, 1-2ft buffer, and 1-10ft two-way cycle track. Construct sidewalk facilities on the south side of the street.	S 144th St	42nd Ave S	51st Ave S	$ 869,000
AF	Klickitat Dr Complete Street	Multimodal improvements to improve connectivity and accessibility of existing path (wayfinding, signage, width improvements, etc. wherever possible)	Klickitat Dr	53rd Ave S	Southcenter Pkwy	*Further analysis required to determine auxiliary costs.* Planning-level cos estimate

						without: $500,000
AG	Tukwila Elementary School Transportation Improvements	Traffic calming and safety improvements surrounding Tukwila Elementary School.				$ 3,220,000
AH	Cascade View Elementary School Transportation Improvements	Traffic calming and safety improvements surrounding Cascade View Elementary School				$ 1,050,000
AI	School Safety Traffic Calming Program	Traffic calming and safety improvements surrounding schools in Tukwila				$ 770,000
AJ	Southcenter Boulevard Road Diet	Resurface and rechannel Southcenter Boulevard to increase multimodal options and improve safety. Add pedestrian and bicycle facilities where appropriate.	Southcenter Boulevard	61st Ave S	66th Ave S	$ 686,000

Figure 48. Map of Top Priority Projects

TOP PRIORITY PROJECT LIST

Here are the top priority projects derived from previous plans, community outreach, and technical analysis.



CIP Projects identified in bold are included in the City's Capital Improvement Program (CIP) near-term (six-year) budget. The CIP is a dynamic process, with anticipated projects being changed, added, and deleted from the CIP when reviewed every two years.

BICYCLE

	A	Buffered Lane in 42nd Ave S Section 3
	B	Buffered Lane in 42nd Ave S Section 4
	C	S Norfolk St Bike Facilities
	D	E Marginal Way Bike Lanes (E Marginal Way S North Section)
	E	Southcenter Boulevard Bike Lanes Section 2

VEHICLE

CIP	F	**42nd Ave S Bridge Replacement**
CIP	G	**Southcenter Blvd/65th Ave S Signal**
	H	SR 518 EB Off-ramp / Klickitat Drive Intersection Improvements
	I	E Marginal Way/S 112th Street Intersection Modifications
	J	S 115th Street / E Marginal Way Intersection Improvements
	K	Boeing Access Road/E Marginal Way/ Tukwila International Boulevard Intersection Feasibility Study
CIP	L	**Andover Park E/Minkler Blvd Intersection**
CIP	M	**Andover Park E/Industry Dr Intersection**
CIP	N	**E Marginal Way (BAR - S 112 St)**
CIP	O	**124th and 50th Intersection Improvements**

PEDESTRIAN

CIP	P	**S 152nd St Safe Routes to School**
CIP	Q	**46th Ave S Safe Routes to School**
CIP	R	**S 144th St Bridge - Sidewalks**
	S	Macadam Rd S Section 1 Sidewalk
	T	S 146th St Sidewalk
	U	40th Ave S Sidewalk
	V	Strander Blvd Sidewalk
	W	S 124th St Sidewalk
	X	Minkler Blvd Section 2 Sidewalk
	Y	Tukwila International Blvd Section 2 Sidewalk
	Z	E Marginal Way S Section 2 Sidewalk
	AA	37th Ave S Sidewalk
	AB	S 142nd St Sidewalk
	AC	S 141st St Section 1 Sidewalk

COMPLETE STREET

CIP	AD	**Ryan Way Road Diet**
	AE	S 144th Street Complete Street
	AF	Klickitat Dr Complete Street
	AG	Tukwila Elementary School Transportation Improvements
	AH	Cascade View Elementary School Transportation Improvements
	AI	School Safety Traffic Calming Program
	AJ	Southcenter Boulevard Road Diet

Chapter 6: Funding

Funding

Transportation infrastructure and maintenance reflects one of Tukwila's largest budget items. Transportation is funded through a mix of dedicated transportation funds (i.e., funding must be allocated to the expansion and maintenance of the City's transportation system) and general funds. This distinction is important since general funds have the greatest flexibility and can be allocated by City Council to most any need within Tukwila. Thus, general fund dollars are often highly competitive and subject to the most pressing needs in the City. Dedicated transportation funds range from impact fees paid by developers, to the tax collected by the City on commercial parking (largely parking for Sea-Tac Airport) to local, state, and federal grants. **Figure 49** shows the dedicated transportation funding by source for 2023. As shown, grants, the solid waste utility tax, parking tax, and traffic impact fees constitute more than 80% of Tukwila's dedicated transportation funding. Of those sources, grants, the parking tax, and traffic impact fees can be somewhat volatile depending on economic cycles.

Figure 49. 2023 Dedicated Transportation Revenues

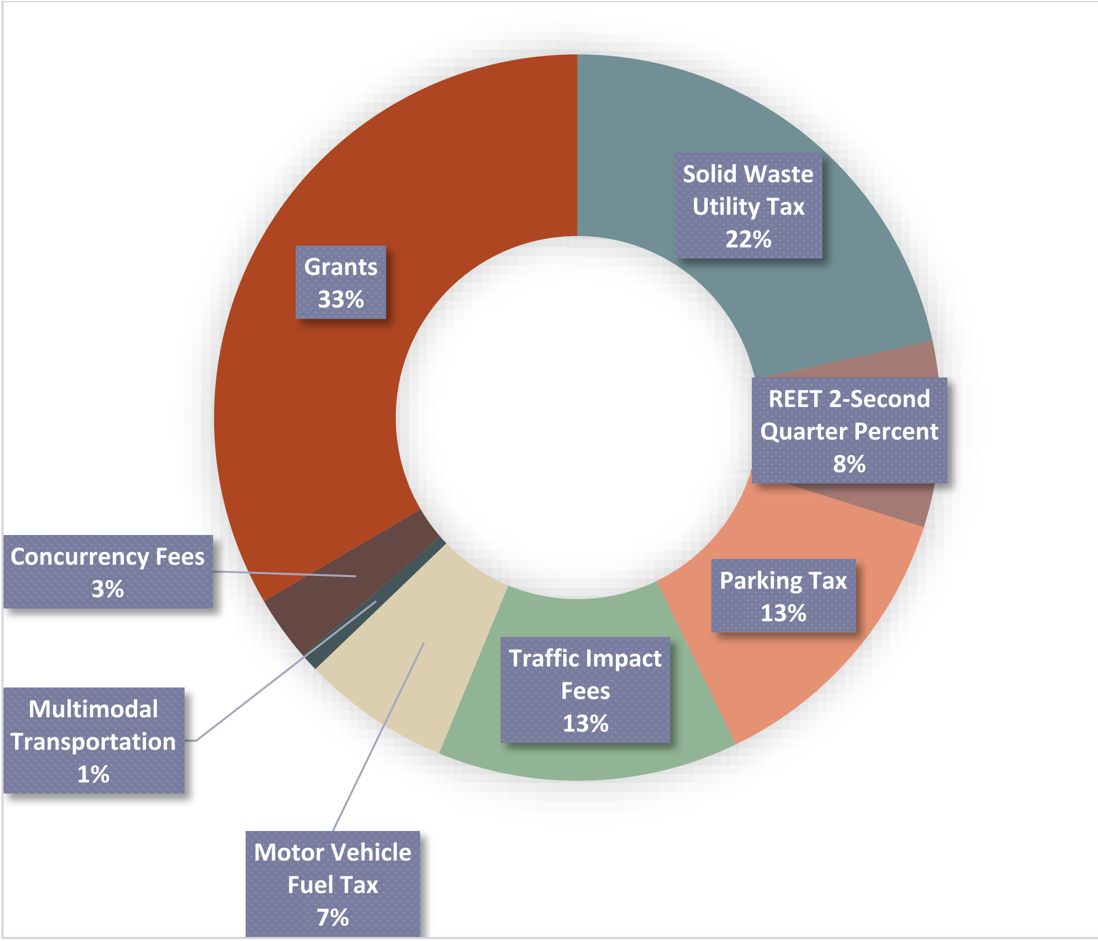
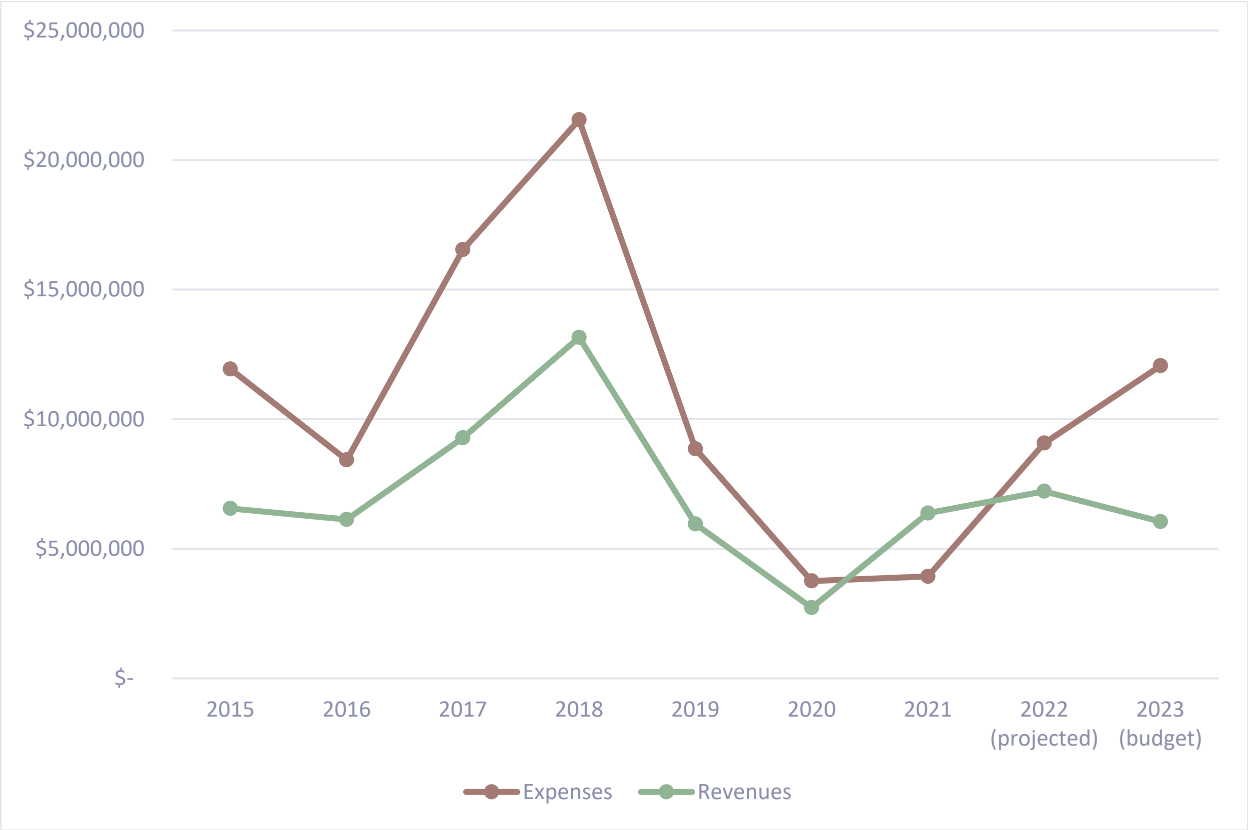


Figure 50 shows an analysis of transportation expenses versus dedicated transportation revenues over the past nine years. The expenses cover all aspects of maintenance and enhancements to the transportation system and include items such as repaving streets, improving sidewalks and bicycle facilities, safety improvements, bridge inspections and repairs, and safety projects. As shown in the figure, in all but one year, Tukwila's transportation expenses exceeded revenues with the difference generally being made up by the general fund. In aggregate, the average annual revenues for Tukwila over the past 9 years are $7.05 million and the average expenditures are $10.68 million. As shown in **Figure 49**, Tukwila blends dedicated transportation revenues with general funds to build and maintain its transportation network. This mixed funding approach is common for many communities in Washington State and allows the city to be nimble in how it takes advantage of grant funds that may require a local match.

Figure 50. Historic Transportation Revenues and Expenses



Annualizing the 20-year capital and maintenance program yields an average annual expenditure of $7-10.7 million (in constant dollar terms). This suggests that Tukwila's transportation investment will be similar year-over-year compared to the past 9 years. Thus, the share of general fund investment is also expected to be about the same, year-over-year. Looking forward, it is reasonable that Tukwila could sustain the current level of transportation revenues and expenses, which over 20 years could fund capital and maintenance program in the range of **$140 million-$214 million**. However, there are some transportation funding challenges the City must consider when planning and implementing the projects identified in the Transportation Element during future biennial budgeting. Specific challenges include:

- The grant funding over the past several years has been very robust with a historic infusion of federal funding; future federal budgets may have fewer grant funding dollars available.

- While Washington State has regularly raised the gas tax over the past 20 years, the share allocated to cities has not changed since 1990; every year, inflation erodes the purchasing power of the gas tax and as vehicles become more fuel efficient (further eroding the purchasing power by the increasing popularity of hybrid and electric vehicles) the gas tax will continue to be less meaningful as a funding source.

- There may be more competition for general funds in the future, making them less available for transportation projects.

Despite these challenges, there are both untapped dedicated transportation revenue sources that Tukwila could consider pursuing, along with potential replacements for the gas tax that could restore funding and ensure that electric vehicles also help fund the system.

- Both the state and federal government are exploring a "road user charge" which would either supplement or entirely replace the gas tax. Any new funding source is likely to raise additional revenues compared to the existing gas tax to account for the lack of indexing to inflation in the prior decades.

- There are several dedicated transportation funding programs that could be leveraged by Tukwila to increase transportation revenues or reduce reliance on general fund transfers:
    - Transportation benefit district sales tax
    - Transportation benefit district car tab fee
    - Other utility taxes (in addition to the sewer tax)
    - Dedicated transportation property tax levy
    - Local improvement district

Transportation Demand Management (TDM)

This Background Report has thus far focused on completing Tukwila's multimodal transportation network via the layered network approach. The network proposed for each mode represents the supply side of the transportation network. On the opposite side of the coin is the demand for the multimodal transportation network. The demand side is addressed with TDM.

The concept of TDM has evolved from a focus on commuters and strategies for reducing single occupancy vehicle demand at peak times to a focus on maximizing the modal choices of all travelers and trip types. This new focus includes a broader set of diverse strategies. The Federal Highway Administration (FHWA) defines TDM as:

> *"… providing travelers, regardless of whether they drive alone, with travel choices, such as work location, route, time of travel and mode. In the broadest sense, demand management is defined as providing travelers with effective choices to improve travel reliability."*

The emphasis for TDM is on personal mobility rather than vehicular mobility. TDM strives to treat roadway, transit, bicycle facilities and sidewalk capacity as valuable, limited assets to be carefully managed. TDM strategies that strive to manage the demand on the limited multimodal transportation network include, encouraging ride sharing (car- and vanpooling); providing active transportation subsidies (e.g., transit passes); providing telecommuting, flex schedules, and compressed work weeks; and enforcing parking fees/restrictions.

Other TDM strategies can range from simple marketing programs to complex land use decisions. City land use policies can reduce dependence on private automobile travel by focusing growth in specific locations and changing land use development patterns. Land use densities, mixed-use activity, urban design, transit station areas, and other concentrated points of activity support frequent transit service and pedestrian facilities. The City's TDM program is focused on maximizing multimodal options for all trip types and travelers.

TDM Strategies

There are various ways that commuters can travel to work and individuals can travel for other purposes that reduce the number of single occupancy vehicle trips:

- **Transit Service** – Public transit options are provided by Sound Transit and King County Metro. As part of the ST3 regional transit package and King County Metro's long-range plan (Metro Connects), transit options will expand to include new commuter express bus services and more geographic coverage within the city.
- **Vanpool and Rideshare Programs** – Tukwila partners with King County Metro for vanpools and rideshare solutions primarily for commute trips, though other trip purposes, such as to school, are being explored. The vanpool program requires a minimum of 5 and a maximum of 15 individuals per vehicle with similar commutes.

King County Metro also offers rideshare solutions to local businesses to fulfill first and last mile connectivity to and from transit services.

- **Walking/Rolling/Biking** – Every trip begins and ends with walking. The existing pedestrian network supports walking for some trip types, particularly in areas with higher density and a mix of land uses, however, the City recognizes that the pedestrian network is not complete. Sound Transit and King County Metro buses are equipped to accommodate passengers with bicycles. Bicycling can be a viable mode for commuters who live further than walking distance from transit services and whose schedules are too inflexible to use vanpool programs. As the pedestrian and bicycling networks are constructed and development occurs in dense, mixed-use areas, these modal options are anticipated to be increasingly viable and popular. Many of the prioritized projects, policies, and actions in this plan provide guidance and next steps to both construct the pedestrian/bicycling networks and increase the attractiveness and viability of walking/biking as travel options.

- **Alternative Work Schedules** – Alternative work schedule options are beneficial to both employees and employers. Businesses can provide coverage for additional hours, and employees are able to work their schedules around transit and vanpool/ridesharing availability. Alternative schedules include flextime, compressed work weeks, and staggered shifts. These options are a significant component of the CTR program in Tukwila.

Alternative Work Schedule Definitions:

- **Flextime:** Employees work a set number of hours with start/end times and days of the week agreed upon with the employer.
- **Compressed Work Week:** Employees work fewer days by working longer shifts, reducing their total VMT by eliminating some trips.
- **Staggered Shifts:** Employees start and end their workday outside the peak periods of commute travel.

- **Telecommuting and Remote Working** – In the Puget Sound region, full-time and part-time telecommuting has increased over the last decade. The COVID pandemic forced many businesses, non-profits, and government agencies to quickly implement telework for employees that can work remotely. To facilitate this shift, unique solutions were implemented to address technology and resource barriers. Many businesses, non-profits, and government agencies are likely to have significantly higher levels of telework than before the pandemic due to the widespread development of these programs.

Commute Trip Reduction (CTR) Program

CTR Program Overview – In 1991, the Washington State legislature passed the Commute Trip Reduction (CTR) Law to reduce traffic congestion, improve air quality, and decrease fuel consumption. In 2006, the Washington State Legislature passed the Commute Trip Reduction Efficiency Act (RCW 70A.15.4000). The goal of the CTR Efficiency Act is to improve the efficiency of the overall transportation system by focusing on the most congested areas of the state and increasing the planning coordination between local, regional, and state organizations.

The Washington State CTR Law is unlike many of the required trip reduction programs established in other states through federal air pollution regulations. Washington's CTR program relies on a partnership between the public and private sectors to make progress towards meeting goals. The CTR Law is incorporated into the Washington State Clean Air Act.

CTR Guidelines

Who's affected?

Employers with 100 or more full-time employees (scheduled 35+ hours/week) that begin their workday between 6:00 AM and 9:00 AM at least two days per week at a single worksite for 12 continuous months of the year.

What is required for CTR impacted employers?

- Appoint/maintain an Employee Transportation Coordinator (ETC) to be the contact between the employer and the city.
- Biannually submit a program report to the city for review/approval.
- Exercise a good faith effort by collaborating with the city.
- Biannually conduct a CTR employee survey to measure commute mode share.

Tukwila's CTR Program – The City of Tukwila adopted its CTR ordinance (Ordinance No. 2201) in 2008. As a result, employees are commuting greater distances, extending the hours of peak congestion.

Tukwila's CTR program provides information and connects employees to a variety of alternative commute options including flex schedules, compressed work weeks, teleworking, transit, and ridesharing. The City also actively coordinates with transit organizations such as King County Metro that administer marketing campaigns.

TDM and Transportation System Performance – Tracking progress on implementing TDM strategies will be incorporated into the systemwide performance measures developed for the Six-Year Transportation Improvement Program (TIP) to maximize the efficiency of the current and future transportation system.

Appendix A: Tukwila Population Characteristics

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: Vehicle LOS Results for the Urban Center Corridor Analysis, and Mid-Day & PM Peak Hour

Table B1. Existing 2018 Corridor LOS - Weekday Mid-day Peak Hour

Corridor ID	Southcenter Corridor	Intersection ID	Intersection Delay (s)	Average Delay* (s)	Corridor LOS
1	61st Avenue S Bridge/Tukwila Parkway from Southcenter Boulevard to Andover Park W	31	38	35	C
		22	44		
		52	17		
2	Southcenter Parkway/Strander Boulevard from Nordstrom Entrance to 61st Place S	29	2	12	B
		33	19		
		34	13		
3	Andover Park W from Tukwila Parkway to Strander Boulevard	36	4	17	B
		37	5		
		38	32		
		52	17		
4	Andover Park E from Tukwila Parkway to Strander Boulevard	39	31	25	C
		53	17		
5	Strander Boulevard from Southcenter Parkway to W Valley Highway	34	13	24	C
		35	13		
		38	32		
		39	31		
		40	26		
6	Andover Park W from Strander Boulevard to S 180th Street	38	32	30	C
		42	30		
		45	27		
7	Andover Park E from Strander Boulevard to S 180th Street	39	31	26	C
		43	23		
		46	23		
8	Southcenter Parkway from S 168th Street to S 180th Street	41	11	10	A
		44	17		
		54	4		
9	Minkler Boulevard from Southcenter Parkway to Andover Park E	41	11	21	C
		42	30		
		43	23		
10	S 180th Street from Southcenter Parkway to W Valley Highway	44	17	29	C
		45	27		
		46	23		
		47	40		
11	W Valley Highway from Southcenter Boulevard to Strander Boulevard	25	29	28	C
		32	27		
		40	26		

Notes:
*The tabulated corridor average delay is volume weighted.
Source: Fehr & Peers, IDAX Data Solutions, StreetLight Data, 2018.

Table B2. Existing 2018 Corridor LOS - Weekday PM Peak Hour

Corridor ID	Southcenter Corridor	Intersection ID	Intersection Delay (s)	Average Delay* (s)	Corridor LOS
1	61st Avenue S Bridge/Tukwila Parkway from Southcenter Boulevard to Andover Park W	31	38	55	D
		22	96		
		52	22		
2	Southcenter Parkway/Strander Boulevard from Nordstrom Entrance to 61st Place S	29	3	14	B
		33	19		
		34	16		
3	Andover Park W from Tukwila Parkway to Strander Boulevard	36	4	18	B
		37	4		
		38	30		
		52	22		
4	Andover Park E from Tukwila Parkway to Strander Boulevard	39	30	24	C
		53	15		
5	Strander Boulevard from Southcenter Parkway to W Valley Highway	34	16	24	C
		35	17		
		38	30		
		39	30		
		40	28		
6	Andover Park W from Strander Boulevard to S 180th Street	38	30	30	C
		42	26		
		45	32		
7	Andover Park E from Strander Boulevard to S 180th Street	39	30	27	C
		43	20		
		46	27		
8	Southcenter Parkway from S 168th Street to S 180th Street	41	12	13	B
		44	22		
		54	5		
9	Minkler Boulevard from Southcenter Parkway to Andover Park E	41	12	18	B
		42	26		
		43	20		
10	S 180th Street from Southcenter Parkway to W Valley Highway	44	22	40	D
		45	32		
		46	27		
		47	61		
11	W Valley Highway from Southcenter Boulevard to Strander Boulevard	25	80	53	D
		32	35		
		40	28		

Notes:

*The tabulated corridor average delay is volume weighted.

Source: Fehr & Peers, IDAX Data Solutions, StreetLight Data, 2018.

Table B3. Existing 2018 Corridor LOS - Weekend Mid-day Peak Hour

Corridor ID	Southcenter Corridor	Intersection ID	Intersection Delay (s)	Average Delay* (s)	Corridor LOS
1	61st Avenue S Bridge/Tukwila Parkway from Southcenter Boulevard to Andover Park W	31	35	56	E
		22	98		
		52	22		
2	Southcenter Parkway/Strander Boulevard from Nordstrom Entrance to 61st Place S	29	6	20	B
		33	32		
		34	21		
3	Andover Park W from Tukwila Parkway to Strander Boulevard	36	6	22	C
		37	12		
		38	38		
		52	22		
4	Andover Park E from Tukwila Parkway to Strander Boulevard	39	39	30	C
		53	18		
5	Strander Boulevard from Southcenter Parkway to W Valley Highway	34	21	28	C
		35	20		
		38	38		
		39	39		
		40	26		
6	Andover Park W from Strander Boulevard to S 180th Street	38	38	41	D
		42	26		
		45	51		
7	Andover Park E from Strander Boulevard to S 180th Street	39	39	49	D
		43	23		
		46	70		
8	Southcenter Parkway from S 168th Street to S 180th Street	41	23	15	B
		44	19		
		54	4		
9	Minkler Boulevard from Southcenter Parkway to Andover Park E	41	23	24	C
		42	26		
		43	23		
10	S 180th Street from Southcenter Parkway to W Valley Highway	44	19	56	E
		45	51		
		46	70		
		47	70		
11	W Valley Highway from Southcenter Boulevard to Strander Boulevard	25	34	30	C
		32	26		
		40	26		

Notes:
*The tabulated corridor average delay is volume weighted.
Source: Fehr & Peers, IDAX Data Solutions, StreetLight Data, 2018.

Table B4. Existing 2018 Corridor LOS - Weekend PM Peak Hour

Corridor ID	Southcenter Corridor	Intersection ID	Intersection Delay (s)	Average Delay* (s)	Corridor LOS
1	61st Avenue S Bridge/Tukwila Parkway from Southcenter Boulevard to Andover Park W	31	46	65	E
		22	98		
		52	44		
2	Southcenter Parkway/Strander Boulevard from Nordstrom Entrance to 61st Place S	29	13	30	C
		33	54		
		34	22		
3	Andover Park W from Tukwila Parkway to Strander Boulevard	36	6	27	C
		37	8		
		38	37		
		52	44		
4	Andover Park E from Tukwila Parkway to Strander Boulevard	39	40	31	C
		53	16		
5	Strander Boulevard from Southcenter Parkway to W Valley Highway	34	22	29	C
		35	19		
		38	37		
		39	40		
		40	28		
6	Andover Park W from Strander Boulevard to S 180th Street	38	37	30	C
		42	30		
		45	23		
7	Andover Park E from Strander Boulevard to S 180th Street	39	40	36	D
		43	23		
		46	41		
8	Southcenter Parkway from S 168th Street to S 180th Street	41	21	16	B
		44	21		
		54	4		
9	Minkler Boulevard from Southcenter Parkway to Andover Park E	41	21	24	C
		42	30		
		43	23		
10	S 180th Street from Southcenter Parkway to W Valley Highway	44	21	48	D
		45	23		
		46	41		
		47	83		
11	W Valley Highway from Southcenter Boulevard to Strander Boulevard	25	53	41	D
		32	34		
		40	28		

Notes:
*The tabulated corridor average delay is volume weighted.
Source: Fehr & Peers, IDAX Data Solutions, StreetLight Data, 2018.

Table B5. 2044 Growth Targets Corridor LOS - Weekend PM Peak Hour

Corridor ID	Southcenter Corridor	Intersection ID	Intersection Delay (s)	Average Delay* (s)	Corridor LOS
1	**61st Avenue S Bridge/Tukwila Parkway from Southcenter Boulevard to Andover Park W**	31	54	**89**	**F**
		22	127		
		52	87		
2	Southcenter Parkway/Strander Boulevard from Nordstrom Entrance to 61st Place S	29	20	50	D
		33	98		
		34	31		
3	Andover Park W from Tukwila Parkway to Strander Boulevard	36	20	59	E
		37	29		
		38	75		
		52	87		
4	Andover Park E from Tukwila Parkway to Strander Boulevard	39	56	43	D
		53	25		
5	Strander Boulevard from Southcenter Parkway to W Valley Highway	34	31	47	D
		35	40		
		38	75		
		39	56		
		40	33		
6	Andover Park W from Strander Boulevard to S 180th Street	38	75	54	D
		42	42		
		45	35		
7	Andover Park E from Strander Boulevard to S 180th Street	39	56	52	D
		43	15		
		46	73		
8	Southcenter Parkway from S 168th Street to S 180th Street	41	73	41	D
		44	25		
		54	21		
9	Minkler Boulevard from Southcenter Parkway to Andover Park E	41	73	48	D
		42	42		
		43	15		
10	S 180th Street from Southcenter Parkway to W Valley Highway	44	25	62	E
		45	35		
		46	73		
		47	94		
11	**W Valley Highway from Southcenter Boulevard to Strander Boulevard**	25	158	**112**	**F**
		32	98		
		40	33		

Notes:

*The tabulated corridor average delay is volume weighted.

Bold text highlight corridors with LOS exceeding the City's current policy.

Source: Fehr & Peers, 2024.

Intersection 22 **61st Avenue S/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	630	633	100.5%	36.8	2.5	D
	Through						
	Right Turn	77	75	97.9%	37.8	5.4	D
	Subtotal	707	709	100.2%	37.0	2.5	D
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	344	341	99.2%	27.1	5.9	C
	Right Turn	833	818	98.2%	33.3	35.3	C
	Subtotal	1,177	1,159	98.5%	31.5	26.5	C
WB	Left Turn	185	185	99.8%	53.0	13.9	D
	Through	577	590	102.3%	10.8	1.2	B
	Right Turn						
	Subtotal	762	775	101.7%	21.1	3.4	C
Total		2,646	2,642	99.9%	29.7	11.3	C

Intersection 25 **W Valley Highway/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	95	99	104.6%	40.3	10.2	D
	Through	464	454	97.8%	27.9	3.2	C
	Right Turn	491	486	98.9%	13.1	4.1	B
	Subtotal	1,050	1,039	98.9%	22.1	2.8	C
SB	Left Turn	160	156	97.6%	38.9	5.9	D
	Through	437	426	97.5%	27.1	1.9	C
	Right Turn	308	310	100.6%	13.0	2.7	B
	Subtotal	905	892	98.6%	24.4	2.3	C
EB	Left Turn	130	120	92.5%	43.6	5.0	D
	Through	464	458	98.7%	34.2	2.8	C
	Right Turn	126	128	101.7%	7.6	1.7	A
	Subtotal	720	706	98.1%	31.1	2.0	C
WB	Left Turn	237	243	102.7%	75.3	30.9	E
	Through	715	717	100.3%	35.4	5.9	D
	Right Turn	237	227	95.9%	12.8	2.8	B
	Subtotal	1,189	1,188	99.9%	39.5	9.5	D
Total		3,864	3,825	99.0%	30.0	3.2	C

Intersection 29 **Southcenter Parkway/Northwest Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	713	719	100.8%	1.7	0.3	A
	Right Turn	45	48	105.6%	1.6	0.2	A
	Subtotal	758	766	101.1%	1.7	0.3	A
SB	Left Turn	20	16	81.5%	8.0	3.3	A
	Through	535	519	97.0%	0.6	0.1	A
	Right Turn						
	Subtotal	555	536	96.5%	0.8	0.2	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	90	87	96.6%	13.3	3.0	B
	Through						
	Right Turn	53	53	100.8%	10.0	3.7	B
	Subtotal	143	140	98.1%	12.1	3.2	B
Total		1,456	1,442	99.0%	2.4	0.5	A

Intersection 30 **Northwest Mall Driveway/Tukwila Parkway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	15	15	100.7%	21.9	22.1	C
	Through						
	Right Turn	108	107	99.1%	10.2	3.0	B
	Subtotal	123	122	99.3%	10.9	3.6	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	751	756	100.6%	1.4	0.1	A
	Right Turn	15	16	104.7%	1.3	1.1	A
	Subtotal	766	771	100.7%	1.4	0.1	A
WB	Left Turn	93	90	96.9%	12.1	2.4	B
	Through	540	522	96.6%	5.5	0.6	A
	Right Turn						
	Subtotal	633	612	96.7%	6.5	0.7	A
Total		1,522	1,505	98.9%	4.2	0.5	A

Intersection 31 **61st Avenue S/Tukwila Parkway** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	651	639	98.2%	67.8	18.9	E
	Through						
	Right Turn	367	357	97.4%	34.7	16.0	C
	Subtotal	1,018	997	97.9%	56.7	18.0	E
EB	Left Turn	314	322	102.4%	42.4	6.7	D
	Through	545	542	99.4%	16.2	4.6	B
	Right Turn						
	Subtotal	859	863	100.5%	25.8	3.7	C
WB	Left Turn						
	Through	266	253	95.2%	28.9	5.8	C
	Right Turn	393	387	98.4%	14.6	3.1	B
	Subtotal	659	640	97.1%	20.4	4.5	C
Total		2,536	2,500	98.6%	37.0	7.7	D

Intersection 32 **W Valley Highway/I-405 NB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	164	159	97.2%	59.5	9.4	E
	Through	604	590	97.6%	17.4	5.2	B
	Right Turn	30	34	112.0%	14.2	8.2	B
	Subtotal	798	783	98.1%	25.4	4.1	C
SB	Left Turn	36	36	100.8%	82.6	16.6	F
	Through	697	696	99.9%	25.4	3.4	C
	Right Turn	67	63	93.7%	13.3	4.8	B
	Subtotal	800	796	99.4%	26.7	3.5	C
EB	Left Turn	413	415	100.5%	47.5	5.2	D
	Through	32	33	103.8%	48.4	13.3	D
	Right Turn	552	556	100.8%	13.2	3.4	B
	Subtotal	997	1,005	100.8%	28.9	3.1	C
WB	Left Turn	16	16	97.5%	61.7	22.7	E
	Through	5	5	96.0%	30.6	33.7	C
	Right Turn	33	36	110.3%	9.2	4.7	A
	Subtotal	54	57	105.2%	30.2	12.4	C
Total		2,649	2,639	99.6%	27.3	2.0	C

SimTraffic Post-Processor **Tukwila TE**
Average Results from 11 Runs **Existing 2018 Conditions**
Volume and Delay by Movement **Weekday MD Peak Hour**

Intersection 33 **Southcenter Parkway/I-5 Exit 153 Off-ramp** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	389	390	100.3%	12.1	2.1	B
	Right Turn	85	83	97.8%	2.8	1.1	A
	Subtotal	474	473	99.9%	10.5	1.7	B
SB	Left Turn	34	32	92.9%	44.7	13.8	D
	Through	591	574	97.1%	12.1	1.8	B
	Right Turn						
	Subtotal	625	605	96.8%	14.0	1.5	B
EB	Left Turn	308	319	103.4%	39.8	4.5	D
	Through	67	66	97.8%	41.3	7.0	D
	Right Turn	65	67	103.2%	1.2	0.2	A
	Subtotal	440	451	102.5%	34.0	4.5	C
WB	Left Turn	75	69	92.5%	41.4	4.4	D
	Through						
	Right Turn	61	59	97.0%	4.0	0.5	A
	Subtotal	136	129	94.6%	25.0	6.4	C
Total		1,675	1,658	99.0%	19.3	2.4	B

Intersection 34 **Southcenter Parkway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	679	682	100.4%	7.2	0.9	A
	Right Turn	301	303	100.7%	7.8	1.4	A
	Subtotal	980	985	100.5%	7.4	1.0	A
SB	Left Turn	231	231	100.2%	40.6	5.1	D
	Through	759	732	96.5%	6.4	1.0	A
	Right Turn						
	Subtotal	990	964	97.3%	15.4	1.3	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	159	156	98.1%	41.3	4.5	D
	Through						
	Right Turn	249	250	100.4%	5.5	1.3	A
	Subtotal	408	406	99.5%	19.1	1.6	B
Total		2,378	2,354	99.0%	12.7	0.9	B

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 11 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekday MD Peak Hour**

Intersection 35 **61st Place S/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	66	62	94.5%	27.4	4.9	C
	Through	19	19	99.5%	38.2	10.9	D
	Right Turn	41	41	100.2%	10.0	4.9	A
	Subtotal	126	122	97.1%	22.6	5.7	C
SB	Left Turn	53	52	98.9%	31.0	7.1	C
	Through	29	29	100.7%	35.9	10.7	D
	Right Turn	90	93	102.8%	13.7	6.2	B
	Subtotal	172	174	101.2%	23.6	5.5	C
EB	Left Turn	107	103	96.2%	10.9	2.5	B
	Through	355	360	101.4%	10.1	2.4	B
	Right Turn	100	101	100.7%	4.7	2.2	A
	Subtotal	562	564	100.3%	9.2	1.8	A
WB	Left Turn	68	65	95.1%	10.0	2.4	B
	Through	261	261	100.1%	10.5	1.8	B
	Right Turn	105	100	95.0%	7.1	3.0	A
	Subtotal	434	426	98.1%	9.6	1.9	A
Total		1,294	1,286	99.4%	12.7	1.8	B

Intersection 36 **Andover Park W/Tire Center Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	87	80	91.8%	10.1	2.5	B
	Through	391	380	97.1%	3.5	0.7	A
	Right Turn						
	Subtotal	478	459	96.1%	4.7	1.0	A
SB	Left Turn						
	Through	535	518	96.8%	2.3	0.5	A
	Right Turn	68	71	104.0%	1.8	1.4	A
	Subtotal	603	589	97.6%	2.3	0.6	A
EB	Left Turn						
	Through						
	Right Turn	145	148	102.3%	7.8	3.1	A
	Subtotal	145	148	102.3%	7.8	3.1	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,226	1,197	97.6%	4.0	0.8	A

Intersection 37 **Andover Park W/Southeast Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	478	459	96.1%	2.3	0.4	A
	Right Turn						
	Subtotal	478	459	96.1%	2.3	0.4	A
SB	Left Turn						
	Through	628	616	98.1%	5.9	1.9	A
	Right Turn	52	51	97.7%	5.6	3.7	A
	Subtotal	680	667	98.0%	5.9	1.9	A
EB	Left Turn						
	Through						
	Right Turn	48	47	97.9%	11.6	5.0	B
	Subtotal	48	47	97.9%	11.6	5.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,206	1,173	97.2%	4.8	1.3	A

Intersection 38 **Andover Park W/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	70	64	91.7%	49.2	6.1	D
	Through	293	289	98.5%	37.3	9.5	D
	Right Turn	68	64	94.1%	22.9	9.4	C
	Subtotal	431	417	96.7%	36.9	8.4	D
SB	Left Turn	160	155	96.8%	53.7	8.0	D
	Through	441	435	98.6%	39.0	4.5	D
	Right Turn	75	72	96.4%	33.5	7.5	C
	Subtotal	676	662	97.9%	42.1	4.4	D
EB	Left Turn	75	74	98.4%	54.2	12.6	D
	Through	321	325	101.1%	16.0	2.7	B
	Right Turn	53	54	101.1%	6.6	1.6	A
	Subtotal	449	452	100.7%	21.4	3.5	C
WB	Left Turn	121	124	102.1%	54.3	10.3	D
	Through	289	289	100.0%	16.8	2.5	B
	Right Turn	110	99	89.5%	9.3	1.7	A
	Subtotal	520	511	98.3%	24.7	3.9	C
Total		2,076	2,042	98.4%	32.5	2.6	C

SimTraffic Post-Processor **Tukwila TE**
Average Results from 11 Runs **Existing 2018 Conditions**
Volume and Delay by Movement **Weekday MD Peak Hour**

Intersection 39 **Andover Park E/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	116	107	92.2%	45.4	7.4	D
	Through	372	363	97.5%	31.6	5.4	C
	Right Turn	103	102	99.1%	24.4	4.9	C
	Subtotal	591	572	96.8%	33.2	3.8	C
SB	Left Turn	81	80	98.6%	48.5	6.3	D
	Through	370	378	102.1%	29.5	5.1	C
	Right Turn	67	66	97.9%	27.3	7.3	C
	Subtotal	518	523	101.0%	32.3	4.9	C
EB	Left Turn	55	53	96.0%	55.3	14.8	E
	Through	382	377	98.6%	29.9	3.7	C
	Right Turn	119	117	98.1%	22.0	3.7	C
	Subtotal	556	546	98.2%	30.7	4.1	C
WB	Left Turn	190	193	101.6%	51.2	9.4	D
	Through	397	400	100.8%	18.2	1.8	B
	Right Turn	54	50	92.2%	16.5	6.8	B
	Subtotal	641	643	100.3%	27.9	3.4	C
Total		2,306	2,284	99.0%	31.0	2.0	C

Intersection 40 **W Valley Highway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	231	239	103.6%	44.1	9.6	D
	Through	544	534	98.1%	14.0	5.6	B
	Right Turn	10	11	112.0%	7.9	8.9	A
	Subtotal	785	784	99.9%	23.5	6.5	C
SB	Left Turn	3	3	100.0%	28.9	32.9	C
	Through	766	776	101.3%	31.0	8.2	C
	Right Turn	330	326	98.7%	12.3	3.4	B
	Subtotal	1,099	1,105	100.5%	25.8	6.4	C
EB	Left Turn	304	296	97.3%	40.6	5.9	D
	Through	11	12	110.0%	44.8	25.1	D
	Right Turn	216	213	98.8%	13.2	3.4	B
	Subtotal	531	521	98.2%	29.8	4.4	C
WB	Left Turn	11	9	82.7%	39.5	19.6	D
	Through	3	3	100.0%	27.4	32.1	C
	Right Turn						
	Subtotal	14	12	86.4%	46.8	21.7	D
Total		2,429	2,423	99.7%	26.0	5.3	C

Intersection 41 **Southcenter Parkway/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	9	92.0%	5.9	4.5	A
	Through	547	534	97.7%	8.5	1.1	A
	Right Turn	74	73	98.0%	8.3	2.7	A
	Subtotal	631	616	97.6%	8.4	1.1	A
SB	Left Turn	130	128	98.5%	10.8	1.9	B
	Through	567	537	94.7%	6.0	0.9	A
	Right Turn	63	62	97.9%	5.4	2.7	A
	Subtotal	760	727	95.7%	6.8	0.9	A
EB	Left Turn	23	23	99.6%	38.1	8.5	D
	Through						
	Right Turn	35	37	106.3%	36.7	9.7	D
	Subtotal	58	60	103.6%	37.5	5.3	D
WB	Left Turn	59	57	96.1%	36.3	10.2	D
	Through	17	18	108.2%	41.3	15.9	D
	Right Turn	126	127	100.8%	15.3	4.9	B
	Subtotal	202	202	100.0%	23.6	5.3	C
Total		1,651	1,605	97.2%	10.8	0.9	B

Intersection 42 **Andover Park W/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	50	48	95.8%	34.1	8.2	C
	Through	323	314	97.2%	34.1	6.4	C
	Right Turn	36	36	99.2%	25.8	10.8	C
	Subtotal	409	398	97.2%	33.5	5.5	C
SB	Left Turn	72	70	97.1%	26.0	9.4	C
	Through	382	382	99.9%	32.7	6.2	C
	Right Turn	55	56	101.1%	30.4	7.6	C
	Subtotal	509	507	99.6%	31.5	5.8	C
EB	Left Turn	72	68	94.4%	32.0	4.5	C
	Through	178	180	101.2%	35.9	6.3	D
	Right Turn	107	107	100.1%	12.1	3.3	B
	Subtotal	357	355	99.5%	28.3	4.3	C
WB	Left Turn	23	23	99.6%	35.9	15.8	D
	Through	197	202	102.6%	36.7	4.0	D
	Right Turn	88	90	102.4%	8.2	2.2	A
	Subtotal	308	315	102.3%	28.3	3.6	C
Total		1,583	1,575	99.5%	30.6	3.0	C

Intersection 43 **Andover Park E/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	152	151	99.1%	22.6	4.7	C
	Through	422	405	96.0%	23.0	3.4	C
	Right Turn	17	18	102.9%	20.3	7.5	C
	Subtotal	591	573	97.0%	22.8	3.7	C
SB	Left Turn	32	34	105.9%	16.0	3.6	B
	Through	425	428	100.6%	21.4	2.9	C
	Right Turn	65	67	103.1%	16.3	4.0	B
	Subtotal	522	529	101.2%	20.4	2.4	C
EB	Left Turn	66	64	97.1%	36.1	9.9	D
	Through	55	57	104.2%	28.9	7.9	C
	Right Turn	165	165	100.1%	18.8	7.2	B
	Subtotal	286	287	100.2%	24.5	6.9	C
WB	Left Turn	55	55	99.3%	33.7	12.2	C
	Through	91	95	104.8%	23.2	4.7	C
	Right Turn	70	71	101.4%	13.0	3.3	B
	Subtotal	216	221	102.3%	21.9	4.0	C
Total		1,615	1,609	99.7%	22.3	2.2	C

Intersection 44 **Southcenter Parkway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	197	187	95.0%	22.2	3.7	C
	Right Turn	237	235	99.0%	6.9	1.3	A
	Subtotal	434	422	97.2%	13.7	2.6	B
SB	Left Turn	293	277	94.7%	19.3	2.5	B
	Through	253	242	95.8%	19.7	3.1	B
	Right Turn						
	Subtotal	546	520	95.2%	19.5	2.6	B
EB	Left Turn						
	Through	115	116	100.7%	26.3	3.9	C
	Right Turn						
	Subtotal	115	116	100.7%	26.3	3.9	C
WB	Left Turn	285	280	98.1%	27.3	3.6	C
	Through						
	Right Turn	303	299	98.7%	5.6	1.5	A
	Subtotal	588	579	98.4%	16.3	2.4	B
Total		1,683	1,636	97.2%	17.4	1.7	B

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 11 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekday MD Peak Hour**

Intersection 45 — **Andover Park W/S 180th Street** — **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	4	4	87.5%	51.1	30.8	D
	Through	48	45	94.2%	44.2	13.9	D
	Right Turn	76	78	102.8%	11.2	4.3	B
	Subtotal	128	127	99.1%	26.1	7.0	C
SB	Left Turn	355	354	99.7%	43.6	8.7	D
	Through	61	59	96.7%	51.9	15.2	D
	Right Turn	44	44	100.9%	43.5	15.8	D
	Subtotal	460	457	99.4%	44.7	9.7	D
EB	Left Turn	69	65	93.8%	49.6	6.6	D
	Through	499	480	96.2%	16.3	1.7	B
	Right Turn	16	16	101.3%	9.9	6.3	A
	Subtotal	584	561	96.0%	20.3	1.9	C
WB	Left Turn	78	78	99.4%	52.4	7.8	D
	Through	536	525	97.9%	20.9	3.3	C
	Right Turn	368	361	98.0%	18.1	3.4	B
	Subtotal	982	963	98.1%	22.7	2.7	C
Total		2,154	2,108	97.9%	26.9	2.5	C

Intersection 46 — **Andover Park W/S 180th Street** — **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	255	250	98.1%	48.3	12.5	D
	Through						
	Right Turn	210	209	99.4%	48.4	22.0	D
	Subtotal	465	459	98.7%	48.3	16.7	D
EB	Left Turn	92	85	92.4%	49.2	8.3	D
	Through	838	829	98.9%	8.4	1.3	A
	Right Turn						
	Subtotal	930	914	98.3%	11.9	1.7	B
WB	Left Turn						
	Through	772	760	98.5%	19.6	2.2	B
	Right Turn	314	311	98.9%	18.6	2.1	B
	Subtotal	1,086	1,071	98.6%	19.3	2.1	B
Total		2,481	2,444	98.5%	22.1	4.4	C

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 11 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekday MD Peak Hour**

Intersection 47 **W Valley Highway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	384	372	96.8%	65.5	14.5	E
	Through	402	401	99.7%	24.5	2.6	C
	Right Turn	148	144	97.2%	6.6	1.5	A
	Subtotal	934	917	98.1%	38.6	7.1	D
SB	Left Turn	263	275	104.5%	48.6	4.0	D
	Through	477	491	102.9%	27.5	3.4	C
	Right Turn	104	103	98.9%	20.5	3.9	C
	Subtotal	844	869	102.9%	33.4	1.8	C
EB	Left Turn	88	79	89.4%	58.3	14.0	E
	Through	648	642	99.0%	51.3	12.6	D
	Right Turn	490	484	98.8%	41.6	16.7	D
	Subtotal	1,226	1,204	98.2%	48.0	13.1	D
WB	Left Turn	102	101	98.6%	54.2	6.8	D
	Through	663	664	100.1%	38.5	3.6	D
	Right Turn	152	143	94.1%	10.1	2.0	B
	Subtotal	917	907	98.9%	36.0	3.1	D
Total		3,921	3,897	99.4%	39.9	5.2	D

Intersection 52 **Andover Pk W/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	411	398	96.7%	37.5	3.5	D
	Through						
	Right Turn	158	152	96.3%	6.2	1.1	A
	Subtotal	569	550	96.6%	29.0	2.7	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	282	282	99.9%	11.6	3.5	B
	Right Turn	300	296	98.7%	7.6	2.4	A
	Subtotal	582	578	99.3%	9.5	2.7	A
WB	Left Turn	217	206	95.1%	14.2	1.9	B
	Through	303	295	97.5%	7.0	2.3	A
	Right Turn						
	Subtotal	520	502	96.5%	9.9	2.0	A
Total		1,671	1,629	97.5%	16.4	1.6	B

Intersection 53 **Andover Pk E/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	216	206	95.3%	43.7	3.2	D
	Through						
	Right Turn	352	341	97.0%	12.3	2.0	B
	Subtotal	568	547	96.3%	24.0	2.1	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	310	301	97.1%	21.2	2.0	C
	Right Turn	130	132	101.4%	14.1	5.0	B
	Subtotal	440	433	98.4%	19.1	2.5	B
WB	Left Turn	328	333	101.6%	15.6	2.9	B
	Through	304	296	97.5%	6.7	1.7	A
	Right Turn						
	Subtotal	632	630	99.6%	11.6	2.4	B
Total		1,640	1,610	98.2%	17.7	1.7	B

Intersection 54 **Southcenter Pkwy/S 168th St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	1	0	0.0%	0.0	0.0	A
	Through	944	948	100.5%	4.8	1.7	A
	Right Turn	1	1	80.0%	4.0	11.9	A
	Subtotal	946	949	100.3%	4.8	1.7	A
SB	Left Turn	20	20	100.0%	47.8	7.5	D
	Through	1,002	972	97.0%	1.7	0.4	A
	Right Turn	7	6	90.0%	3.1	4.9	A
	Subtotal	1,029	998	97.0%	2.6	0.4	A
EB	Left Turn	5	5	102.0%	47.8	33.8	D
	Through						
	Right Turn	2	2	85.0%	36.8	43.7	D
	Subtotal	7	7	97.1%	50.0	27.2	D
WB	Left Turn	5	6	110.0%	43.4	28.2	D
	Through						
	Right Turn	21	24	112.9%	49.2	13.2	D
	Subtotal	26	29	112.3%	46.1	12.0	D
Total		2,008	1,983	98.8%	4.5	1.1	A

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekday PM Peak Hour**

Intersection 22 **61st Avenue S/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	821	802	97.6%	40.3	8.7	D
	Through						
	Right Turn	82	80	97.6%	46.4	10.2	D
	Subtotal	903	882	97.6%	41.0	8.6	D
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	446	385	86.4%	95.6	9.8	F
	Right Turn	1,337	1,118	83.6%	186.7	17.4	F
	Subtotal	1,783	1,503	84.3%	163.6	12.2	F
WB	Left Turn	235	229	97.2%	119.0	47.0	F
	Through	691	697	100.8%	17.3	6.4	B
	Right Turn						
	Subtotal	926	925	99.9%	42.9	15.6	D
Total		3,612	3,309	91.6%	96.1	6.8	F

Intersection 25 **W Valley Highway/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	113	115	101.6%	69.5	11.9	E
	Through	804	781	97.2%	67.6	12.9	E
	Right Turn	424	423	99.7%	48.5	12.8	D
	Subtotal	1,341	1,319	98.3%	61.7	12.5	E
SB	Left Turn	294	260	88.4%	166.3	21.6	F
	Through	849	738	86.9%	190.7	10.9	F
	Right Turn	360	314	87.1%	210.1	14.6	F
	Subtotal	1,503	1,311	87.2%	190.5	10.0	F
EB	Left Turn	123	123	99.8%	43.5	4.9	D
	Through	645	638	98.8%	30.0	3.1	C
	Right Turn	194	201	103.8%	13.1	2.7	B
	Subtotal	962	962	99.9%	28.0	2.0	C
WB	Left Turn	178	168	94.4%	48.8	8.1	D
	Through	695	704	101.2%	31.8	2.9	C
	Right Turn	529	529	100.0%	25.2	12.3	C
	Subtotal	1,402	1,401	99.9%	31.7	5.7	C
Total		5,208	4,992	95.9%	80.5	3.4	F

Intersection 29 **Southcenter Parkway/Northwest Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	531	531	100.0%	1.6	0.2	A
	Right Turn	125	121	96.8%	1.7	0.2	A
	Subtotal	656	652	99.4%	1.6	0.2	A
SB	Left Turn	50	43	85.8%	5.3	1.2	A
	Through	579	518	89.5%	0.6	0.1	A
	Right Turn						
	Subtotal	629	561	89.2%	1.0	0.2	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	112	111	99.5%	11.6	3.2	B
	Through						
	Right Turn	100	97	97.0%	7.6	2.5	A
	Subtotal	212	208	98.3%	9.8	2.9	A
Total		1,497	1,421	94.9%	2.6	0.5	A

Intersection 30 **Northwest Mall Driveway/Tukwila Parkway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	8	80.0%	16.2	19.3	C
	Through						
	Right Turn	140	138	98.7%	6.8	2.6	A
	Subtotal	150	146	97.5%	7.3	2.8	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	626	624	99.6%	1.0	0.2	A
	Right Turn	5	5	102.0%	0.6	0.1	A
	Subtotal	631	629	99.6%	1.0	0.2	A
WB	Left Turn	197	170	86.1%	12.3	1.7	B
	Through	619	553	89.3%	6.2	0.4	A
	Right Turn						
	Subtotal	816	722	88.5%	7.7	0.6	A
Total		1,597	1,497	93.8%	4.8	0.5	A

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekday PM Peak Hour**

Intersection 31 **61st Avenue S/Tukwila Parkway** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	911	771	84.6%	70.5	5.5	E
	Through						
	Right Turn	661	574	86.8%	32.5	3.2	C
	Subtotal	1,572	1,344	85.5%	54.2	5.5	D
EB	Left Turn	371	368	99.2%	44.1	7.6	D
	Through	395	395	100.0%	19.4	3.0	B
	Right Turn						
	Subtotal	766	763	99.6%	31.8	5.5	C
WB	Left Turn						
	Through	155	148	95.2%	24.8	5.9	C
	Right Turn	532	517	97.1%	7.3	1.9	A
	Subtotal	687	664	96.7%	11.4	2.3	B
Total		3,025	2,771	91.6%	38.0	2.3	D

Intersection 32 **W Valley Highway/I-405 NB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	452	449	99.4%	56.9	7.6	E
	Through	947	932	98.4%	30.9	14.9	C
	Right Turn	10	10	96.0%	25.5	18.2	C
	Subtotal	1,409	1,390	98.7%	39.3	11.9	D
SB	Left Turn	27	25	93.7%	68.7	22.8	E
	Through	918	823	89.7%	34.6	4.3	C
	Right Turn	276	253	91.7%	22.6	3.6	C
	Subtotal	1,221	1,102	90.2%	32.6	4.4	C
EB	Left Turn	344	339	98.6%	54.6	8.0	D
	Through	12	14	117.5%	53.2	20.4	D
	Right Turn	512	521	101.8%	12.8	2.5	B
	Subtotal	868	875	100.7%	29.8	4.7	C
WB	Left Turn	16	15	91.9%	56.3	18.6	E
	Through	19	21	108.4%	63.8	14.9	E
	Right Turn	50	52	103.6%	21.8	11.1	C
	Subtotal	85	87	102.5%	39.0	11.2	D
Total		3,583	3,454	96.4%	34.9	5.5	C

Intersection 33 **Southcenter Parkway/I-5 Exit 153 Off-ramp** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	456	456	100.1%	10.8	1.3	B
	Right Turn	165	156	94.8%	4.9	1.4	A
	Subtotal	621	613	98.7%	9.3	1.1	A
SB	Left Turn	26	24	91.5%	42.7	8.9	D
	Through	665	603	90.7%	16.1	2.7	B
	Right Turn						
	Subtotal	691	627	90.7%	17.2	2.4	B
EB	Left Turn	136	131	96.3%	37.4	6.6	D
	Through	93	93	100.0%	37.4	6.8	D
	Right Turn	132	130	98.1%	1.4	0.3	A
	Subtotal	361	353	97.9%	24.8	3.5	C
WB	Left Turn	184	189	102.7%	48.9	8.2	D
	Through						
	Right Turn	64	65	101.3%	4.2	0.9	A
	Subtotal	248	254	102.3%	37.8	8.6	D
Total		1,921	1,847	96.1%	19.0	1.6	B

Intersection 34 **Southcenter Parkway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	842	842	100.0%	10.7	1.3	B
	Right Turn	409	411	100.4%	13.7	2.6	B
	Subtotal	1,251	1,253	100.1%	11.6	1.6	B
SB	Left Turn	314	297	94.6%	43.5	9.4	D
	Through	1,246	1,203	96.5%	5.2	0.7	A
	Right Turn						
	Subtotal	1,560	1,500	96.1%	12.6	2.6	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	341	338	99.0%	48.6	6.7	D
	Through						
	Right Turn	592	590	99.7%	12.6	1.8	B
	Subtotal	933	928	99.5%	25.9	3.0	C
Total		3,744	3,680	98.3%	15.6	1.7	B

Intersection 35 **61st Place S/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	168	169	100.7%	36.0	8.9	D
	Through	52	52	100.0%	35.3	9.1	D
	Right Turn	122	120	98.7%	17.5	4.1	B
	Subtotal	342	342	99.9%	29.2	6.3	C
SB	Left Turn	72	72	100.6%	26.7	6.3	C
	Through	30	29	97.0%	36.0	8.6	D
	Right Turn	128	129	100.8%	15.5	4.3	B
	Subtotal	230	231	100.2%	21.8	6.0	C
EB	Left Turn	107	105	98.4%	15.2	2.3	B
	Through	319	315	98.8%	10.4	2.7	B
	Right Turn	180	168	93.6%	4.8	1.0	A
	Subtotal	606	589	97.2%	9.6	1.8	A
WB	Left Turn	72	66	91.5%	16.3	4.2	B
	Through	480	477	99.4%	16.7	2.7	B
	Right Turn	220	218	99.2%	14.6	3.7	B
	Subtotal	772	761	98.6%	16.1	2.6	B
Total		1,950	1,922	98.6%	17.1	2.7	B

Intersection 36 **Andover Park W/Tire Center Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	114	119	104.7%	8.9	2.5	A
	Through	534	525	98.3%	4.2	1.0	A
	Right Turn						
	Subtotal	648	644	99.4%	5.0	1.3	A
SB	Left Turn						
	Through	474	438	92.4%	1.8	0.2	A
	Right Turn	42	42	100.7%	1.6	0.5	A
	Subtotal	516	480	93.1%	1.8	0.2	A
EB	Left Turn						
	Through						
	Right Turn	73	72	98.5%	4.6	1.0	A
	Subtotal	73	72	98.5%	4.6	1.0	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,237	1,197	96.7%	3.6	0.7	A

Intersection 37 **Andover Park W/Southeast Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	648	645	99.6%	2.3	0.5	A
	Right Turn						
	Subtotal	648	645	99.6%	2.3	0.5	A
SB	Left Turn						
	Through	514	478	93.0%	4.3	2.4	A
	Right Turn	33	33	100.0%	2.4	1.3	A
	Subtotal	547	511	93.4%	4.2	2.3	A
EB	Left Turn						
	Through						
	Right Turn	90	83	91.9%	8.6	4.3	A
	Subtotal	90	83	91.9%	8.6	4.3	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,285	1,239	96.4%	3.6	1.4	A

Intersection 38 **Andover Park W/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	141	143	101.3%	46.4	5.5	D
	Through	398	396	99.4%	31.3	5.5	C
	Right Turn	70	65	93.3%	17.1	5.8	B
	Subtotal	609	604	99.1%	33.7	3.5	C
SB	Left Turn	137	129	93.9%	49.4	6.2	D
	Through	343	319	92.9%	39.2	6.3	D
	Right Turn	124	113	91.5%	33.1	6.4	C
	Subtotal	604	561	92.8%	40.4	5.6	D
EB	Left Turn	111	114	102.8%	52.2	6.2	D
	Through	299	294	98.2%	16.6	2.8	B
	Right Turn	103	101	98.4%	5.6	0.9	A
	Subtotal	513	509	99.2%	21.8	2.6	C
WB	Left Turn	126	116	91.7%	50.1	10.4	D
	Through	507	504	99.4%	22.8	4.0	C
	Right Turn	139	136	98.1%	18.7	5.9	B
	Subtotal	772	756	97.9%	26.1	4.1	C
Total		2,498	2,429	97.2%	30.5	3.1	C

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekday PM Peak Hour**

Intersection 39 **Andover Park E/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	170	169	99.2%	45.8	5.4	D
	Through	437	430	98.4%	31.9	4.0	C
	Right Turn	111	111	99.6%	30.2	6.6	C
	Subtotal	718	709	98.8%	34.8	3.5	C
SB	Left Turn	134	130	97.0%	41.5	5.8	D
	Through	281	274	97.5%	32.2	2.4	C
	Right Turn	100	95	95.1%	22.7	6.3	C
	Subtotal	515	499	96.9%	33.0	2.0	C
EB	Left Turn	76	71	92.9%	45.8	5.7	D
	Through	339	329	97.2%	22.6	3.0	C
	Right Turn	105	102	97.2%	14.0	5.4	B
	Subtotal	520	502	96.6%	24.4	2.9	C
WB	Left Turn	144	134	92.8%	57.4	17.2	E
	Through	472	460	97.5%	22.0	3.3	C
	Right Turn	124	118	95.2%	17.9	3.4	B
	Subtotal	740	712	96.2%	28.3	3.4	C
Total		2,493	2,422	97.2%	30.4	1.4	C

Intersection 40 **W Valley Highway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	258	260	100.7%	45.1	6.9	D
	Through	721	720	99.9%	21.7	4.1	C
	Right Turn	7	8	112.9%	5.8	8.4	A
	Subtotal	986	988	100.2%	27.5	4.6	C
SB	Left Turn	28	24	84.3%	60.6	20.4	E
	Through	878	831	94.6%	34.8	5.8	C
	Right Turn	457	432	94.5%	16.9	2.6	B
	Subtotal	1,363	1,286	94.4%	29.1	4.4	C
EB	Left Turn	328	312	95.2%	41.2	3.4	D
	Through	13	13	99.2%	36.7	15.0	D
	Right Turn	298	291	97.7%	14.5	4.5	B
	Subtotal	639	616	96.4%	28.6	2.9	C
WB	Left Turn	17	17	98.2%	56.8	25.1	E
	Through	10	9	91.0%	36.4	22.5	D
	Right Turn	20	21	106.0%	11.5	8.2	B
	Subtotal	47	47	100.0%	31.0	12.4	C
Total		3,035	2,937	96.8%	28.4	2.5	C

Intersection 41 **Southcenter Parkway/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	5	5	96.0%	7.0	7.4	A
	Through	777	778	100.1%	10.4	2.0	B
	Right Turn	83	85	101.8%	10.0	2.1	A
	Subtotal	865	867	100.2%	10.4	2.0	B
SB	Left Turn	193	181	93.8%	21.5	5.9	C
	Through	977	952	97.4%	4.4	1.4	A
	Right Turn	8	8	93.8%	3.2	4.6	A
	Subtotal	1,178	1,140	96.8%	7.1	2.1	A
EB	Left Turn	7	5	77.1%	35.6	18.0	D
	Through						
	Right Turn	5	4	86.0%	27.9	29.2	C
	Subtotal	12	10	80.8%	35.6	17.5	D
WB	Left Turn	189	183	96.6%	46.1	9.3	D
	Through	2	4	195.0%	13.3	25.1	B
	Right Turn	147	146	99.5%	16.4	7.5	B
	Subtotal	338	333	98.4%	34.0	9.2	C
Total		2,393	2,350	98.2%	12.1	2.8	B

Intersection 42 **Andover Park W/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	64	65	101.3%	27.8	4.9	C
	Through	374	368	98.5%	28.5	4.0	C
	Right Turn	31	33	107.7%	20.4	9.6	C
	Subtotal	469	467	99.5%	28.0	3.9	C
SB	Left Turn	45	41	91.8%	27.4	8.7	C
	Through	379	354	93.3%	27.6	5.3	C
	Right Turn	93	89	95.8%	19.9	4.3	B
	Subtotal	517	484	93.6%	26.1	5.1	C
EB	Left Turn	54	52	96.1%	28.9	6.8	C
	Through	142	140	98.3%	31.5	3.4	C
	Right Turn	62	60	96.6%	6.6	1.0	A
	Subtotal	258	251	97.4%	24.9	2.1	C
WB	Left Turn	47	49	104.9%	28.5	5.2	C
	Through	136	136	100.1%	31.0	4.1	C
	Right Turn	91	88	97.1%	6.4	1.0	A
	Subtotal	274	274	99.9%	23.1	3.1	C
Total		1,518	1,476	97.2%	25.9	2.5	C

Intersection 43 **Andover Park E/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	99	100	100.7%	23.6	4.1	C
	Through	364	358	98.3%	22.4	2.4	C
	Right Turn	19	16	82.1%	17.3	7.7	B
	Subtotal	482	473	98.1%	22.5	2.3	C
SB	Left Turn	15	14	90.7%	15.1	6.9	B
	Through	491	473	96.4%	20.8	2.1	C
	Right Turn	103	99	96.0%	16.8	4.8	B
	Subtotal	609	586	96.2%	20.1	2.2	C
EB	Left Turn	66	60	90.9%	29.6	7.0	C
	Through	10	10	104.0%	12.8	9.2	B
	Right Turn	142	141	99.3%	10.2	2.6	B
	Subtotal	218	211	97.0%	16.3	3.8	B
WB	Left Turn	74	73	98.4%	23.1	5.8	C
	Through	72	75	104.7%	22.1	4.5	C
	Right Turn	50	50	100.2%	9.9	3.6	A
	Subtotal	196	198	101.2%	19.8	3.3	B
Total		1,505	1,468	97.6%	20.3	1.8	C

Intersection 44 **Southcenter Parkway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	328	338	103.0%	29.3	4.1	C
	Right Turn	252	256	101.4%	6.4	1.4	A
	Subtotal	580	594	102.3%	19.9	2.6	B
SB	Left Turn	322	313	97.1%	22.6	3.3	C
	Through	586	571	97.4%	25.2	3.0	C
	Right Turn						
	Subtotal	908	884	97.3%	24.3	3.0	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	639	621	97.2%	27.1	3.9	C
	Through						
	Right Turn	379	383	100.9%	8.3	2.5	A
	Subtotal	1,018	1,003	98.6%	20.1	2.7	C
Total		2,506	2,481	99.0%	21.5	1.9	C

Intersection 45 **Andover Park W/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	23	24	103.0%	51.1	13.4	D
	Through	72	68	94.2%	56.4	10.7	E
	Right Turn	70	67	95.0%	12.0	5.7	B
	Subtotal	165	158	95.8%	37.2	6.3	D
SB	Left Turn	330	309	93.6%	52.6	8.9	D
	Through	27	25	91.1%	71.4	19.8	E
	Right Turn	183	177	96.7%	58.0	19.5	E
	Subtotal	540	510	94.5%	55.8	11.3	E
EB	Left Turn	76	76	99.9%	61.2	7.2	E
	Through	484	475	98.2%	15.2	4.2	B
	Right Turn	8	8	97.5%	8.6	14.0	A
	Subtotal	568	559	98.4%	22.2	3.7	C
WB	Left Turn	37	38	102.2%	72.2	14.6	E
	Through	824	813	98.7%	24.1	3.0	C
	Right Turn	206	216	104.6%	20.8	4.4	C
	Subtotal	1,067	1,067	100.0%	25.3	3.0	C
Total		2,340	2,294	98.0%	32.0	2.7	C

Intersection 46 **Andover Park W/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	295	280	94.9%	52.0	10.0	D
	Through						
	Right Turn	170	168	98.9%	58.8	16.1	E
	Subtotal	465	448	96.4%	54.5	12.0	D
EB	Left Turn	126	120	95.4%	63.3	15.4	E
	Through	758	729	96.1%	9.2	2.3	A
	Right Turn						
	Subtotal	884	849	96.0%	16.8	2.6	B
WB	Left Turn						
	Through	897	900	100.4%	22.0	3.5	C
	Right Turn	184	181	98.3%	20.6	4.0	C
	Subtotal	1,081	1,081	100.0%	21.7	3.4	C
Total		2,430	2,378	97.9%	26.6	2.4	C

Intersection 47 **W Valley Highway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	352	356	101.0%	62.1	11.3	E
	Through	583	579	99.3%	33.0	2.1	C
	Right Turn	123	116	94.5%	8.5	3.7	A
	Subtotal	1,058	1,051	99.3%	40.8	5.0	D
SB	Left Turn	470	445	94.7%	164.8	46.2	F
	Through	714	713	99.9%	48.6	10.0	D
	Right Turn	100	101	100.5%	38.8	13.5	D
	Subtotal	1,284	1,259	98.0%	89.6	20.9	F
EB	Left Turn	67	62	92.2%	60.8	10.9	E
	Through	652	637	97.7%	62.0	10.6	E
	Right Turn	502	480	95.7%	68.8	19.3	E
	Subtotal	1,221	1,179	96.6%	65.0	12.5	E
WB	Left Turn	166	160	96.3%	65.8	11.3	E
	Through	784	790	100.8%	47.7	7.6	D
	Right Turn	289	286	98.9%	19.2	5.2	B
	Subtotal	1,239	1,236	99.7%	43.9	7.5	D
Total		4,802	4,725	98.4%	60.9	4.9	E

Intersection 52 **Andover Pk W/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	471	462	98.0%	41.9	3.2	D
	Through						
	Right Turn	163	163	99.8%	6.8	1.1	A
	Subtotal	634	624	98.5%	32.5	2.4	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	387	343	88.7%	23.0	3.3	C
	Right Turn	313	284	90.6%	21.8	3.2	C
	Subtotal	700	627	89.6%	22.4	3.0	C
WB	Left Turn	281	272	96.9%	16.8	3.4	B
	Through	397	383	96.4%	6.7	1.5	A
	Right Turn						
	Subtotal	678	655	96.6%	11.0	1.7	B
Total		2,012	1,906	94.7%	21.7	1.1	C

Intersection 53 **Andover Pk E/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	298	280	94.1%	24.4	7.1	C
	Through						
	Right Turn	390	387	99.3%	7.6	1.7	A
	Subtotal	688	667	97.0%	14.9	3.7	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	382	351	91.9%	22.1	6.8	C
	Right Turn	168	155	92.2%	13.8	5.7	B
	Subtotal	550	506	92.0%	19.7	6.2	B
WB	Left Turn	219	219	99.8%	16.2	2.3	B
	Through	380	374	98.4%	9.0	1.3	A
	Right Turn						
	Subtotal	599	593	98.9%	11.6	1.5	B
Total		1,837	1,766	96.1%	15.2	2.8	B

Intersection 54 **Southcenter Pkwy/S 168th St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	3	3	93.3%	39.6	30.1	D
	Through	1,048	1,044	99.7%	5.9	1.2	A
	Right Turn	6	6	95.0%	3.1	4.6	A
	Subtotal	1,057	1,053	99.6%	6.1	1.3	A
SB	Left Turn	22	20	91.4%	51.4	9.7	D
	Through	1,333	1,294	97.1%	2.2	0.7	A
	Right Turn	3	4	123.3%	0.8	0.9	A
	Subtotal	1,358	1,318	97.0%	3.2	0.9	A
EB	Left Turn	5	5	94.0%	53.1	34.5	D
	Through						
	Right Turn						
	Subtotal	5	5	94.0%	53.1	34.5	D
WB	Left Turn	12	11	88.3%	34.7	13.1	C
	Through						
	Right Turn	20	19	95.0%	51.5	16.2	D
	Subtotal	32	30	92.5%	43.8	7.4	D
Total		2,452	2,405	98.1%	5.1	1.0	A

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend MD Peak Hour**

Intersection 22 **61st Avenue S/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	938	887	94.6%	30.2	4.8	C
	Through						
	Right Turn	70	71	101.1%	29.6	5.5	C
	Subtotal	1,008	958	95.1%	30.1	4.7	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	311	238	76.6%	105.3	12.1	F
	Right Turn	1,398	1,064	76.1%	214.6	17.5	F
	Subtotal	1,709	1,302	76.2%	195.4	13.8	F
WB	Left Turn	160	156	97.3%	52.3	10.5	D
	Through	559	557	99.7%	12.9	1.8	B
	Right Turn						
	Subtotal	719	713	99.2%	22.0	3.8	C
Total		3,436	2,973	86.5%	98.1	3.9	F

Intersection 25 **W Valley Highway/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	65	64	98.3%	56.8	7.6	E
	Through	387	384	99.3%	29.3	3.7	C
	Right Turn	472	480	101.7%	13.2	2.6	B
	Subtotal	924	928	100.5%	23.0	2.5	C
SB	Left Turn	127	133	104.3%	52.3	4.5	D
	Through	480	481	100.2%	30.4	5.5	C
	Right Turn	398	408	102.4%	20.6	6.9	C
	Subtotal	1,005	1,021	101.6%	29.5	5.3	C
EB	Left Turn	86	88	102.2%	52.2	10.3	D
	Through	619	611	98.7%	43.1	5.0	D
	Right Turn	113	114	100.4%	8.0	1.4	A
	Subtotal	818	813	99.3%	39.1	5.2	D
WB	Left Turn	226	235	103.9%	58.6	7.0	E
	Through	824	824	100.0%	40.8	7.4	D
	Right Turn	179	176	98.5%	16.5	6.8	B
	Subtotal	1,229	1,235	100.5%	40.8	6.4	D
Total		3,976	3,997	100.5%	33.8	2.9	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Tukwila TE
Existing 2018 Conditions
Weekend MD Peak Hour

Intersection 29 **Southcenter Parkway/Northwest Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,048	938	89.5%	0.4	0.1	A
	Right Turn	225	196	87.3%	0.4	0.1	A
	Subtotal	1,273	1,134	89.1%	0.4	0.1	A
SB	Left Turn	155	125	80.7%	14.3	4.5	B
	Through	781	647	82.8%	0.5	0.2	A
	Right Turn						
	Subtotal	936	772	82.5%	2.8	1.0	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	66	66	99.2%	46.9	19.3	E
	Through						
	Right Turn	157	155	98.9%	35.9	22.0	E
	Subtotal	223	221	99.0%	39.3	21.2	E
Total		2,432	2,127	87.4%	5.6	2.5	A

Intersection 30 **Northwest Mall Driveway/Tukwila Parkway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	5	4	78.0%	16.8	31.7	C
	Through						
	Right Turn	134	134	99.7%	13.8	10.3	B
	Subtotal	139	138	98.9%	14.1	10.3	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	925	842	91.1%	4.4	1.1	A
	Right Turn	280	251	89.7%	3.6	1.0	A
	Subtotal	1,205	1,094	90.7%	4.2	1.1	A
WB	Left Turn	170	141	82.9%	50.3	27.9	F
	Through	931	768	82.5%	8.1	2.5	A
	Right Turn						
	Subtotal	1,101	909	82.6%	14.7	6.3	B
Total		2,445	2,140	87.5%	9.4	3.3	A

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Tukwila TE
Existing 2018 Conditions
Weekend MD Peak Hour

Intersection 31 **61st Avenue S/Tukwila Parkway** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	810	625	77.2%	67.5	8.1	E
	Through						
	Right Turn	748	595	79.5%	30.6	4.8	C
	Subtotal	1,558	1,220	78.3%	49.4	6.4	D
EB	Left Turn	367	341	92.9%	45.6	3.0	D
	Through	692	636	92.0%	19.2	2.4	B
	Right Turn						
	Subtotal	1,059	977	92.3%	28.7	2.7	C
WB	Left Turn						
	Through	353	318	90.1%	32.6	3.2	C
	Right Turn	641	615	96.0%	16.6	2.7	B
	Subtotal	994	933	93.9%	22.1	2.0	C
Total		3,611	3,130	86.7%	34.8	2.0	C

Intersection 32 **W Valley Highway/I-405 NB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	85	75	87.6%	59.2	10.8	E
	Through	461	460	99.7%	17.4	2.4	B
	Right Turn	85	82	96.4%	13.1	4.6	B
	Subtotal	631	616	97.6%	22.0	2.2	C
SB	Left Turn	20	19	92.5%	71.5	20.8	E
	Through	727	739	101.7%	21.0	3.7	C
	Right Turn	72	76	105.3%	10.5	4.1	B
	Subtotal	819	833	101.7%	21.2	3.8	C
EB	Left Turn	449	455	101.3%	51.2	5.4	D
	Through	21	21	101.9%	58.1	17.4	E
	Right Turn	371	365	98.4%	5.6	1.4	A
	Subtotal	841	841	100.0%	31.8	2.8	C
WB	Left Turn	10	11	108.0%	83.8	33.5	F
	Through	10	9	88.0%	52.8	33.6	D
	Right Turn	14	15	105.7%	7.3	2.7	A
	Subtotal	34	34	101.2%	43.4	9.3	D
Total		2,325	2,325	100.0%	25.7	1.6	C

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend MD Peak Hour**

Intersection 33 | **Southcenter Parkway/I-5 Exit 153 Off-ramp** | **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	799	654	81.8%	18.0	2.8	B
	Right Turn	250	206	82.2%	10.2	2.7	B
	Subtotal	1,049	859	81.9%	16.2	2.5	B
SB	Left Turn	121	101	83.5%	61.9	9.7	E
	Through	726	608	83.8%	19.7	2.3	B
	Right Turn						
	Subtotal	847	709	83.8%	25.6	3.1	C
EB	Left Turn	250	249	99.4%	100.8	53.1	F
	Through	122	119	97.9%	100.1	51.1	F
	Right Turn	210	216	102.7%	2.1	0.4	A
	Subtotal	582	584	100.3%	66.6	37.1	E
WB	Left Turn	164	167	102.1%	55.4	7.8	E
	Through						
	Right Turn	224	228	101.8%	7.0	1.3	A
	Subtotal	388	396	101.9%	28.8	4.3	C
Total		2,866	2,548	88.9%	32.3	8.1	C

Intersection 34 | **Southcenter Parkway/Strander Boulevard** | **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	997	955	95.8%	14.4	2.6	B
	Right Turn	456	430	94.2%	22.2	9.4	C
	Subtotal	1,453	1,385	95.3%	16.9	4.7	B
SB	Left Turn	407	308	75.6%	53.2	17.2	D
	Through	1,382	1,031	74.6%	10.4	2.2	B
	Right Turn						
	Subtotal	1,789	1,339	74.8%	20.2	5.1	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	327	321	98.0%	52.9	3.8	D
	Through						
	Right Turn	527	519	98.4%	16.1	2.7	B
	Subtotal	854	839	98.3%	30.0	2.2	C
Total		4,096	3,563	87.0%	21.1	3.2	C

Intersection 35 **61st Place S/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	123	121	98.3%	36.3	5.1	D
	Through	39	40	103.6%	33.8	11.9	C
	Right Turn	41	39	95.9%	9.1	4.5	A
	Subtotal	203	201	98.8%	31.1	2.7	C
SB	Left Turn	35	31	88.6%	50.6	24.5	D
	Through	47	47	100.4%	55.4	18.8	E
	Right Turn	206	208	101.2%	34.0	15.2	C
	Subtotal	288	287	99.5%	39.7	15.6	D
EB	Left Turn	204	175	85.6%	19.9	3.4	B
	Through	496	413	83.3%	13.5	3.2	B
	Right Turn	163	144	88.6%	5.8	2.0	A
	Subtotal	863	732	84.8%	13.4	2.6	B
WB	Left Turn	53	51	96.0%	14.0	5.6	B
	Through	399	380	95.3%	16.0	2.4	B
	Right Turn	125	125	99.9%	12.3	3.7	B
	Subtotal	577	556	96.4%	15.1	1.8	B
Total		1,931	1,775	91.9%	20.0	3.7	C

Intersection 36 **Andover Park W/Tire Center Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	75	64	85.3%	8.4	2.8	A
	Through	488	436	89.3%	3.3	0.4	A
	Right Turn						
	Subtotal	563	500	88.8%	3.9	0.6	A
SB	Left Turn						
	Through	587	533	90.8%	4.6	2.1	A
	Right Turn	37	30	81.1%	4.1	4.9	A
	Subtotal	624	563	90.2%	4.6	2.0	A
EB	Left Turn						
	Through						
	Right Turn	180	187	103.7%	15.2	11.6	C
	Subtotal	180	187	103.7%	15.2	11.6	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,367	1,250	91.4%	6.1	2.8	A

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend MD Peak Hour**

Intersection 37 **Andover Park W/Southeast Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	563	500	88.8%	2.2	0.3	A
	Right Turn						
	Subtotal	563	500	88.8%	2.2	0.3	A
SB	Left Turn						
	Through	743	698	94.0%	11.9	4.7	B
	Right Turn	24	21	87.5%	9.2	6.1	A
	Subtotal	767	719	93.8%	11.8	4.7	B
EB	Left Turn						
	Through						
	Right Turn	102	97	95.5%	57.3	54.6	F
	Subtotal	102	97	95.5%	57.3	54.6	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,432	1,317	91.9%	11.9	7.4	B

Intersection 38 **Andover Park W/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	66	59	89.1%	50.4	7.8	D
	Through	332	294	88.4%	40.9	4.9	D
	Right Turn	92	87	94.6%	31.0	9.9	C
	Subtotal	490	439	89.7%	40.5	4.9	D
SB	Left Turn	190	176	92.4%	79.2	11.9	E
	Through	502	471	93.9%	46.6	7.8	D
	Right Turn	153	148	96.8%	40.1	7.4	D
	Subtotal	845	795	94.1%	53.1	8.0	D
EB	Left Turn	128	106	83.0%	63.5	7.8	E
	Through	381	320	84.0%	15.4	3.3	B
	Right Turn	63	56	88.4%	7.1	1.8	A
	Subtotal	572	482	84.3%	24.2	3.2	C
WB	Left Turn	96	95	99.3%	53.6	9.3	D
	Through	358	350	97.6%	22.5	4.1	C
	Right Turn	103	100	97.2%	18.3	7.4	B
	Subtotal	557	545	97.8%	26.9	4.1	C
Total		2,464	2,261	91.8%	38.1	2.6	D

SimTraffic Post-Processor **Tukwila TE**
Average Results from 10 Runs **Existing 2018 Conditions**
Volume and Delay by Movement **Weekend MD Peak Hour**

Intersection 39 **Andover Park E/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	198	184	93.1%	53.8	9.9	D
	Through	360	327	90.7%	34.5	4.3	C
	Right Turn	85	77	90.5%	27.8	7.2	C
	Subtotal	643	588	91.4%	40.0	3.5	D
SB	Left Turn	37	34	91.1%	63.7	14.7	E
	Through	411	399	97.1%	53.0	5.7	D
	Right Turn	75	71	95.2%	47.3	11.8	D
	Subtotal	523	504	96.4%	53.0	5.2	D
EB	Left Turn	124	107	86.6%	61.1	8.7	E
	Through	383	331	86.4%	26.1	4.1	C
	Right Turn	167	151	90.1%	18.9	5.2	B
	Subtotal	674	589	87.4%	30.8	4.3	C
WB	Left Turn	211	215	102.1%	68.2	10.7	E
	Through	378	383	101.2%	21.4	3.4	C
	Right Turn	96	94	97.8%	16.6	3.5	B
	Subtotal	685	692	101.0%	35.5	5.2	D
Total		2,525	2,373	94.0%	39.0	2.1	D

Intersection 40 **W Valley Highway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	196	196	99.7%	42.0	6.7	D
	Through	313	322	103.0%	19.8	4.7	B
	Right Turn	10	13	125.0%	15.9	15.4	B
	Subtotal	519	530	102.2%	28.0	5.3	C
SB	Left Turn	50	50	99.8%	52.4	18.7	D
	Through	626	629	100.4%	31.7	6.8	C
	Right Turn	362	364	100.6%	12.2	3.4	B
	Subtotal	1,038	1,042	100.4%	25.9	5.4	C
EB	Left Turn	224	196	87.6%	36.9	6.4	D
	Through	22	21	93.2%	37.7	23.2	D
	Right Turn	238	204	85.8%	7.5	1.5	A
	Subtotal	484	421	87.0%	22.2	2.8	C
WB	Left Turn	10	10	100.0%	27.9	21.6	C
	Through	17	20	115.9%	35.1	18.0	D
	Right Turn	15	16	104.0%	10.3	6.9	B
	Subtotal	42	45	107.9%	26.3	12.1	C
Total		2,083	2,039	97.9%	25.7	4.0	C

Intersection 41 **Southcenter Parkway/Minkler Boulevard** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	10	11	107.0%	13.5	12.3	B
	Through	970	939	96.8%	17.8	2.6	B
	Right Turn	106	104	97.7%	18.1	3.7	B
	Subtotal	1,086	1,054	97.0%	17.8	2.6	B
SB	Left Turn	170	130	76.7%	29.2	6.7	C
	Through	1,055	824	78.1%	14.2	2.5	B
	Right Turn	84	67	79.3%	14.4	4.5	B
	Subtotal	1,309	1,021	78.0%	16.1	2.3	B
EB	Left Turn	56	52	93.2%	51.1	8.5	D
	Through						
	Right Turn	32	33	104.1%	43.0	10.0	D
	Subtotal	88	86	97.2%	47.2	7.3	D
WB	Left Turn	219	200	91.1%	57.9	8.1	E
	Through	10	10	104.0%	36.1	36.6	D
	Right Turn	217	199	91.6%	32.0	3.9	C
	Subtotal	446	409	91.6%	45.3	6.1	D
Total		2,929	2,569	87.7%	22.8	2.2	C

Intersection 42 **Andover Park W/Minkler Boulevard** **Signal**

		Demand	Served Volume (vph)		Total Delay (sec/veh)		
Direction	Movement	Volume (vph)	Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	96	91	95.0%	29.7	6.6	C
	Through	280	253	90.2%	31.4	5.5	C
	Right Turn	10	10	97.0%	20.9	16.8	C
	Subtotal	386	353	91.6%	30.8	5.5	C
SB	Left Turn	100	92	91.9%	21.5	6.1	C
	Through	364	340	93.3%	25.5	4.6	C
	Right Turn	169	159	94.0%	18.8	3.7	B
	Subtotal	633	590	93.2%	23.1	4.5	C
EB	Left Turn	93	80	85.6%	32.3	6.7	C
	Through	131	116	88.6%	32.6	5.5	C
	Right Turn	75	62	82.5%	9.3	3.1	A
	Subtotal	299	258	86.2%	26.8	4.4	C
WB	Left Turn	27	26	95.2%	38.3	12.1	D
	Through	174	165	95.0%	32.2	6.6	C
	Right Turn	83	79	95.7%	6.3	1.7	A
	Subtotal	284	270	95.2%	25.9	4.3	C
Total		1,602	1,472	91.9%	26.2	2.0	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Tukwila TE
Existing 2018 Conditions
Weekend MD Peak Hour

Intersection 43 **Andover Park E/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	166	158	94.9%	22.5	3.1	C
	Through	565	518	91.8%	23.2	2.7	C
	Right Turn	21	20	96.7%	13.5	7.1	B
	Subtotal	752	696	92.6%	22.7	2.6	C
SB	Left Turn	15	16	108.7%	23.1	10.6	C
	Through	568	549	96.7%	25.7	2.7	C
	Right Turn	74	68	92.0%	22.7	3.8	C
	Subtotal	657	633	96.4%	25.3	2.5	C
EB	Left Turn	40	33	83.3%	30.5	13.0	C
	Through	50	47	93.4%	25.7	8.7	C
	Right Turn	151	138	91.1%	13.3	3.7	B
	Subtotal	241	218	90.3%	18.6	6.0	B
WB	Left Turn	17	16	94.7%	31.7	14.3	C
	Through	44	44	99.5%	22.5	7.0	C
	Right Turn	15	16	106.0%	10.3	6.0	B
	Subtotal	76	76	99.7%	21.2	6.0	C
Total		1,726	1,623	94.0%	23.2	2.2	C

Intersection 44 **Southcenter Parkway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	311	312	100.3%	29.0	3.8	C
	Right Turn	215	219	101.6%	7.1	1.2	A
	Subtotal	526	531	100.9%	19.9	2.3	B
SB	Left Turn	417	334	80.1%	21.0	3.4	C
	Through	491	401	81.7%	20.7	2.6	C
	Right Turn						
	Subtotal	908	735	81.0%	20.9	2.2	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	352	345	98.0%	25.8	5.9	C
	Through						
	Right Turn	675	632	93.6%	11.0	1.1	B
	Subtotal	1,027	977	95.1%	16.2	2.0	B
Total		2,461	2,242	91.1%	18.6	1.3	B

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend MD Peak Hour**

Intersection 45 | **Andover Park W/S 180th Street** | **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	6	7	113.3%	33.3	27.5	C
	Through	20	20	101.5%	44.7	16.6	D
	Right Turn	100	104	104.4%	10.9	3.2	B
	Subtotal	126	132	104.4%	17.2	3.3	B
SB	Left Turn	415	384	92.5%	33.0	6.2	C
	Through	15	14	93.3%	33.9	12.5	C
	Right Turn	81	76	94.3%	29.7	10.4	C
	Subtotal	511	474	92.8%	32.6	6.3	C
EB	Left Turn	117	106	90.7%	57.4	7.8	E
	Through	642	575	89.6%	18.5	3.0	B
	Right Turn	20	19	93.5%	13.0	9.7	B
	Subtotal	779	700	89.8%	24.5	3.2	C
WB	Left Turn	65	62	95.2%	102.4	26.4	F
	Through	1,100	1,032	93.8%	72.0	18.3	E
	Right Turn	275	252	91.7%	76.0	18.0	E
	Subtotal	1,440	1,346	93.5%	74.4	18.0	E
Total		2,856	2,651	92.8%	50.6	8.3	D

Intersection 46 | **Andover Park W/S 180th Street** | **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	396	382	96.3%	81.3	32.7	F
	Through						
	Right Turn	315	294	93.4%	118.5	63.4	F
	Subtotal	711	676	95.0%	98.1	45.7	F
EB	Left Turn	230	206	89.4%	69.7	14.8	E
	Through	927	856	92.3%	9.5	1.8	A
	Right Turn						
	Subtotal	1,157	1,062	91.8%	21.3	3.8	C
WB	Left Turn						
	Through	1,125	1,079	95.9%	92.3	19.1	F
	Right Turn	342	311	90.9%	97.1	19.1	F
	Subtotal	1,467	1,390	94.7%	93.3	18.9	F
Total		3,335	3,127	93.8%	69.5	9.7	E

Intersection 47 **W Valley Highway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	399	379	94.9%	210.7	69.7	F
	Through	227	230	101.5%	25.1	4.1	C
	Right Turn	100	106	105.6%	3.7	0.6	A
	Subtotal	726	715	98.4%	120.7	37.4	F
SB	Left Turn	170	176	103.5%	55.0	6.3	E
	Through	333	327	98.2%	28.4	3.3	C
	Right Turn	135	143	105.9%	21.4	5.0	C
	Subtotal	638	646	101.2%	34.3	4.3	C
EB	Left Turn	45	40	88.4%	69.8	11.8	E
	Through	830	793	95.5%	41.1	13.3	D
	Right Turn	463	427	92.3%	29.2	11.4	C
	Subtotal	1,338	1,260	94.2%	38.1	12.2	D
WB	Left Turn	43	43	99.3%	125.0	59.8	F
	Through	953	918	96.3%	100.0	51.3	F
	Right Turn	158	156	98.7%	69.9	56.2	E
	Subtotal	1,154	1,116	96.7%	97.3	52.1	F
Total		3,856	3,737	96.9%	70.5	17.7	E

Intersection 52 **Andover Pk W/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	470	424	90.1%	47.3	4.9	D
	Through						
	Right Turn	132	125	94.3%	5.7	1.1	A
	Subtotal	602	548	91.1%	38.5	5.1	D
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	348	298	85.7%	15.6	3.8	B
	Right Turn	361	306	84.8%	10.9	3.2	B
	Subtotal	709	604	85.2%	13.2	3.5	B
WB	Left Turn	285	277	97.0%	17.7	3.6	B
	Through	404	392	96.9%	9.1	1.2	A
	Right Turn						
	Subtotal	689	668	97.0%	12.7	1.6	B
Total		2,000	1,820	91.0%	21.6	2.3	C

Intersection 53 **Andover Pk E/Tukwila Pkwy** **Signal**

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend MD Peak Hour**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	200	184	91.9%	28.9	5.7	C
	Through						
	Right Turn	315	282	89.7%	5.1	0.9	A
	Subtotal	515	466	90.5%	14.3	2.5	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	359	312	87.0%	30.6	6.1	C
	Right Turn	121	109	90.4%	23.4	6.1	C
	Subtotal	480	422	87.9%	28.8	5.7	C
WB	Left Turn	363	358	98.7%	18.1	3.2	B
	Through	489	483	98.7%	10.2	1.7	B
	Right Turn						
	Subtotal	852	841	98.7%	13.7	1.9	B
Total		1,847	1,729	93.6%	17.6	2.5	B

Intersection 54 **Southcenter Pkwy/S 168th St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	5	3	60.0%	23.7	38.4	C
	Through	1,403	1,340	95.5%	4.4	0.9	A
	Right Turn	3	3	83.3%	0.7	1.3	A
	Subtotal	1,411	1,345	95.3%	4.5	0.9	A
SB	Left Turn	18	14	80.0%	59.3	20.8	E
	Through	1,485	1,164	78.4%	1.9	0.6	A
	Right Turn	6	4	73.3%	1.1	0.8	A
	Subtotal	1,509	1,183	78.4%	2.7	0.7	A
EB	Left Turn	6	5	86.7%	61.5	51.4	E
	Through						
	Right Turn	4	4	100.0%	44.2	42.5	D
	Subtotal	10	9	92.0%	62.9	40.7	E
WB	Left Turn	5	4	84.0%	37.2	50.7	D
	Through						
	Right Turn	13	12	95.4%	51.8	20.3	D
	Subtotal	18	17	92.2%	54.7	18.4	D
Total		2,948	2,554	86.6%	4.4	0.8	A

Intersection 22 **61st Avenue S/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	962	892	92.7%	36.1	3.3	D
	Through						
	Right Turn	250	238	95.2%	38.2	5.3	D
	Subtotal	1,212	1,130	93.2%	36.5	3.4	D
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	421	329	78.2%	101.4	9.2	F
	Right Turn	1,374	1,062	77.3%	207.9	17.2	F
	Subtotal	1,795	1,391	77.5%	181.3	15.2	F
WB	Left Turn	175	174	99.4%	88.9	27.4	F
	Through	550	547	99.4%	16.8	2.8	B
	Right Turn						
	Subtotal	725	721	99.4%	35.4	9.4	D
Total		3,732	3,241	86.8%	97.8	4.0	F

Intersection 25 **W Valley Highway/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	79	77	97.3%	60.3	8.6	E
	Through	474	471	99.4%	34.1	3.9	C
	Right Turn	606	589	97.1%	26.2	5.6	C
	Subtotal	1,159	1,137	98.1%	32.1	3.4	C
SB	Left Turn	173	174	100.3%	48.1	7.2	D
	Through	483	503	104.1%	32.3	6.5	C
	Right Turn	305	305	100.1%	23.4	7.3	C
	Subtotal	961	982	102.1%	32.3	5.5	C
EB	Left Turn	144	134	92.7%	70.2	26.5	E
	Through	809	800	98.9%	97.0	43.9	F
	Right Turn	59	59	99.5%	50.5	47.6	D
	Subtotal	1,012	992	98.0%	90.2	41.8	F
WB	Left Turn	222	218	98.3%	76.5	23.7	E
	Through	880	874	99.3%	63.6	12.8	E
	Right Turn	197	193	98.1%	34.3	13.9	C
	Subtotal	1,299	1,285	98.9%	61.1	13.2	E
Total		4,431	4,396	99.2%	53.4	6.6	D

Intersection 29 **Southcenter Parkway/Northwest Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,052	1,013	96.3%	0.3	0.1	A
	Right Turn	196	190	96.7%	0.3	0.1	A
	Subtotal	1,248	1,203	96.4%	0.3	0.1	A
SB	Left Turn	139	115	82.9%	13.9	3.6	B
	Through	1,054	887	84.2%	0.8	0.2	A
	Right Turn						
	Subtotal	1,193	1,002	84.0%	2.3	0.5	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	145	135	93.0%	123.0	49.1	F
	Through						
	Right Turn	100	101	100.8%	112.7	51.5	F
	Subtotal	245	236	96.2%	119.0	50.3	F
Total		2,686	2,441	90.9%	12.8	4.2	B

Intersection 30 **Northwest Mall Driveway/Tukwila Parkway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	5	4	88.0%	19.0	30.0	C
	Through						
	Right Turn	275	257	93.3%	102.3	72.2	F
	Subtotal	280	261	93.2%	102.1	72.2	F
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	1,102	1,072	97.3%	8.8	7.7	A
	Right Turn	50	47	93.0%	5.6	5.1	A
	Subtotal	1,152	1,119	97.1%	8.6	7.6	A
WB	Left Turn	155	130	83.7%	24.0	6.5	C
	Through	1,188	999	84.1%	6.3	0.4	A
	Right Turn						
	Subtotal	1,343	1,129	84.0%	8.4	1.0	A
Total		2,775	2,508	90.4%	16.3	7.7	C

Intersection 31 **61st Avenue S/Tukwila Parkway** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	776	611	78.7%	66.2	8.9	E
	Through						
	Right Turn	773	625	80.8%	33.7	3.1	C
	Subtotal	1,549	1,236	79.8%	49.6	6.4	D
EB	Left Turn	620	592	95.5%	59.8	11.7	E
	Through	757	731	96.6%	22.6	5.9	C
	Right Turn						
	Subtotal	1,377	1,323	96.1%	40.3	7.1	D
WB	Left Turn						
	Through	570	504	88.4%	87.8	19.0	F
	Right Turn	592	543	91.6%	17.5	4.3	B
	Subtotal	1,162	1,047	90.1%	50.5	10.7	D
Total		4,088	3,606	88.2%	46.1	5.3	D

Intersection 32 **W Valley Highway/I-405 NB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	152	149	97.9%	57.8	8.2	E
	Through	601	571	95.1%	16.3	4.3	B
	Right Turn	12	12	100.8%	18.7	12.3	B
	Subtotal	765	732	95.7%	24.8	3.1	C
SB	Left Turn	10	11	111.0%	69.7	50.9	E
	Through	655	662	101.0%	25.8	3.1	C
	Right Turn	99	99	100.4%	12.0	4.2	B
	Subtotal	764	772	101.1%	24.7	3.7	C
EB	Left Turn	538	547	101.7%	68.8	17.2	E
	Through	37	36	97.3%	83.0	30.2	F
	Right Turn	453	455	100.5%	7.9	1.8	A
	Subtotal	1,028	1,038	101.0%	44.8	11.2	D
WB	Left Turn	23	22	95.7%	65.7	27.8	E
	Through	10	10	97.0%	50.2	34.1	D
	Right Turn	20	22	111.0%	11.7	6.1	B
	Subtotal	53	54	101.7%	44.1	12.4	D
Total		2,610	2,597	99.5%	33.7	4.4	C

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend PM Peak Hour**

Intersection 33 — **Southcenter Parkway/I-5 Exit 153 Off-ramp** — **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	621	612	98.6%	19.7	3.5	B
	Right Turn	223	219	98.3%	12.1	5.6	B
	Subtotal	844	831	98.5%	17.7	3.8	B
SB	Left Turn	117	103	87.8%	61.2	12.5	E
	Through	1,082	905	83.6%	27.3	3.1	C
	Right Turn						
	Subtotal	1,199	1,007	84.0%	31.0	3.2	C
EB	Left Turn	320	278	86.7%	230.5	46.5	F
	Through	103	100	97.1%	237.3	49.8	F
	Right Turn	137	131	95.5%	20.7	25.1	C
	Subtotal	560	508	90.8%	181.9	42.7	F
WB	Left Turn	201	203	100.8%	55.7	5.4	E
	Through						
	Right Turn	307	313	101.8%	7.9	1.4	A
	Subtotal	508	515	101.4%	28.0	2.6	C
Total		3,111	2,862	92.0%	53.5	7.2	D

Intersection 34 — **Southcenter Parkway/Strander Boulevard** — **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,092	1,074	98.4%	16.6	2.5	B
	Right Turn	450	436	96.8%	22.4	7.4	C
	Subtotal	1,542	1,510	97.9%	18.3	3.7	B
SB	Left Turn	360	325	90.3%	44.2	12.1	D
	Through	1,225	1,090	89.0%	15.3	2.8	B
	Right Turn						
	Subtotal	1,585	1,415	89.3%	21.7	3.1	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	345	342	99.1%	47.9	8.0	D
	Through						
	Right Turn	498	496	99.7%	16.0	2.8	B
	Subtotal	843	838	99.5%	29.2	3.3	C
Total		3,970	3,763	94.8%	22.1	2.2	C

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend PM Peak Hour**

Intersection 35 **61st Place S/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	142	139	98.2%	34.8	7.3	C
	Through	22	23	102.3%	38.0	17.8	D
	Right Turn	63	63	100.6%	10.0	5.4	A
	Subtotal	227	225	99.3%	27.9	5.4	C
SB	Left Turn	79	80	101.1%	46.5	12.9	D
	Through	30	30	99.3%	43.4	22.6	D
	Right Turn	186	190	102.0%	24.5	15.6	C
	Subtotal	295	299	101.5%	32.8	14.9	C
EB	Left Turn	140	131	93.6%	20.4	3.8	C
	Through	472	447	94.6%	12.9	1.2	B
	Right Turn	175	163	93.0%	6.6	1.2	A
	Subtotal	787	740	94.1%	13.0	1.2	B
WB	Left Turn	78	77	98.7%	14.8	4.3	B
	Through	391	385	98.4%	19.0	3.6	B
	Right Turn	189	180	95.1%	14.3	4.4	B
	Subtotal	658	641	97.5%	17.2	3.1	B
Total		1,967	1,906	96.9%	19.1	3.2	B

Intersection 36 **Andover Park W/Tire Center Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	153	141	92.2%	9.3	1.8	A
	Through	479	463	96.7%	4.5	0.7	A
	Right Turn						
	Subtotal	632	605	95.6%	5.7	0.9	A
SB	Left Turn						
	Through	563	511	90.8%	4.5	1.8	A
	Right Turn	52	46	88.8%	3.2	1.4	A
	Subtotal	615	558	90.7%	4.3	1.7	A
EB	Left Turn						
	Through						
	Right Turn	176	176	99.8%	10.1	3.6	B
	Subtotal	176	176	99.8%	10.1	3.6	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,423	1,338	94.0%	5.7	1.4	A

Intersection 37 **Andover Park W/Southeast Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	632	605	95.7%	2.8	0.5	A
	Right Turn						
	Subtotal	632	605	95.7%	2.8	0.5	A
SB	Left Turn						
	Through	689	640	92.9%	11.0	4.7	B
	Right Turn	50	47	93.6%	7.2	3.1	A
	Subtotal	739	687	92.9%	10.7	4.5	B
EB	Left Turn						
	Through						
	Right Turn	91	92	101.1%	27.0	12.5	D
	Subtotal	91	92	101.1%	27.0	12.5	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,462	1,384	94.6%	8.4	3.2	A

Intersection 38 **Andover Park W/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	111	109	98.6%	59.2	7.8	E
	Through	392	372	94.9%	43.8	8.8	D
	Right Turn	78	70	89.5%	27.4	9.6	C
	Subtotal	581	551	94.9%	44.7	7.3	D
SB	Left Turn	150	138	92.1%	78.4	10.7	E
	Through	514	479	93.1%	47.1	7.1	D
	Right Turn	116	111	95.5%	41.7	6.7	D
	Subtotal	780	727	93.3%	52.2	6.6	D
EB	Left Turn	100	95	95.0%	68.9	7.0	E
	Through	465	444	95.5%	17.5	3.1	B
	Right Turn	49	50	101.2%	7.2	3.3	A
	Subtotal	614	589	95.8%	24.6	3.5	C
WB	Left Turn	76	70	92.1%	56.3	8.2	E
	Through	431	424	98.4%	23.1	3.0	C
	Right Turn	140	138	98.3%	18.9	6.2	B
	Subtotal	647	632	97.7%	25.6	3.0	C
Total		2,622	2,499	95.3%	37.2	4.0	D

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend PM Peak Hour**

Intersection 39 **Andover Park E/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	190	180	94.5%	72.3	14.1	E
	Through	477	462	96.8%	47.3	8.8	D
	Right Turn	163	153	94.0%	43.3	14.4	D
	Subtotal	830	795	95.7%	52.0	9.7	D
SB	Left Turn	101	95	93.9%	60.0	8.1	E
	Through	349	339	97.1%	43.4	4.9	D
	Right Turn	81	78	96.3%	39.5	7.6	D
	Subtotal	531	512	96.4%	45.5	4.9	D
EB	Left Turn	83	79	94.6%	67.7	11.2	E
	Through	539	514	95.3%	28.0	2.7	C
	Right Turn	157	147	93.8%	22.7	5.6	C
	Subtotal	779	739	94.9%	31.1	3.0	C
WB	Left Turn	148	142	96.2%	56.2	5.2	E
	Through	430	429	99.7%	22.2	5.2	C
	Right Turn	75	78	104.5%	20.2	8.3	C
	Subtotal	653	650	99.5%	29.5	5.0	C
Total		2,793	2,695	96.5%	39.7	3.6	D

Intersection 40 **W Valley Highway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	270	263	97.5%	44.9	6.1	D
	Through	372	367	98.6%	17.1	4.3	B
	Right Turn	10	9	92.0%	6.2	6.3	A
	Subtotal	652	639	98.1%	29.0	4.2	C
SB	Left Turn						
	Through	593	603	101.7%	35.0	5.0	C
	Right Turn	351	352	100.4%	11.6	2.4	B
	Subtotal	944	956	101.2%	26.6	4.0	C
EB	Left Turn	431	403	93.4%	40.5	7.3	D
	Through	24	24	101.7%	41.1	16.0	D
	Right Turn	292	273	93.6%	10.6	2.8	B
	Subtotal	747	700	93.8%	29.1	5.1	C
WB	Left Turn	10	11	107.0%	33.5	15.0	C
	Through	15	18	118.0%	39.4	18.0	D
	Right Turn	10	11	109.0%	7.2	6.1	A
	Subtotal	35	39	112.3%	27.1	6.5	C
Total		2,378	2,335	98.2%	28.0	3.5	C

Intersection 41 — **Southcenter Parkway/Minkler Boulevard** — **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	15	14	93.3%	17.3	8.8	B
	Through	913	912	99.9%	18.0	2.7	B
	Right Turn	139	141	101.6%	18.5	4.1	B
	Subtotal	1,067	1,067	100.0%	18.0	2.8	B
SB	Left Turn	221	200	90.5%	33.3	7.6	C
	Through	1,134	1,041	91.8%	13.0	2.0	B
	Right Turn	154	141	91.8%	12.2	3.5	B
	Subtotal	1,509	1,382	91.6%	15.8	2.3	B
EB	Left Turn	70	69	99.0%	57.8	10.2	E
	Through						
	Right Turn	30	33	110.7%	48.5	16.1	D
	Subtotal	100	103	102.5%	55.5	10.4	E
WB	Left Turn	137	127	92.8%	48.3	6.8	D
	Through	15	17	112.0%	53.9	18.8	D
	Right Turn	155	144	92.8%	24.7	6.0	C
	Subtotal	307	288	93.7%	37.6	6.5	D
Total		2,983	2,839	95.2%	20.6	1.9	C

Intersection 42 — **Andover Park W/Minkler Boulevard** — **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	48	40	82.5%	36.5	11.9	D
	Through	319	309	96.9%	33.5	6.9	C
	Right Turn	25	25	98.4%	24.0	9.4	C
	Subtotal	392	373	95.3%	33.2	6.9	C
SB	Left Turn	83	74	89.2%	30.8	7.6	C
	Through	345	321	93.0%	31.6	7.7	C
	Right Turn	117	110	94.3%	25.4	7.8	C
	Subtotal	545	505	92.7%	30.2	7.7	C
EB	Left Turn	129	121	93.7%	31.0	6.7	C
	Through	214	206	96.2%	34.0	8.9	C
	Right Turn	112	109	96.9%	16.4	6.8	B
	Subtotal	455	435	95.7%	29.1	7.3	C
WB	Left Turn	28	27	96.8%	37.9	13.4	D
	Through	115	115	100.2%	36.7	9.2	D
	Right Turn	104	101	96.6%	6.4	1.2	A
	Subtotal	247	243	98.3%	24.6	6.9	C
Total		1,639	1,557	95.0%	29.9	5.6	C

Intersection 43 **Andover Park E/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	154	149	96.9%	25.6	3.3	C
	Through	647	628	97.1%	24.2	1.6	C
	Right Turn	15	13	85.3%	12.7	9.5	B
	Subtotal	816	790	96.8%	24.3	1.7	C
SB	Left Turn						
	Through	596	577	96.8%	25.4	3.4	C
	Right Turn	47	45	95.1%	20.3	8.4	C
	Subtotal	643	621	96.6%	25.0	3.6	C
EB	Left Turn	57	53	93.7%	30.5	5.8	C
	Through	10	13	126.0%	23.7	11.2	C
	Right Turn	255	238	93.1%	14.9	4.3	B
	Subtotal	322	304	94.3%	18.4	4.2	B
WB	Left Turn	9	7	80.0%	20.5	19.3	C
	Through	46	46	100.9%	24.6	8.4	C
	Right Turn	18	18	101.1%	10.0	5.6	A
	Subtotal	73	72	98.4%	19.6	5.4	B
Total		1,854	1,787	96.4%	23.3	1.2	C

Intersection 44 **Southcenter Parkway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	326	326	99.9%	28.4	3.7	C
	Right Turn	319	319	99.9%	11.1	2.0	B
	Subtotal	645	644	99.9%	20.1	2.6	C
SB	Left Turn	518	475	91.7%	24.0	5.3	C
	Through	557	515	92.5%	22.6	5.4	C
	Right Turn						
	Subtotal	1,075	990	92.1%	23.3	5.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	346	335	96.7%	29.5	6.1	C
	Through						
	Right Turn	458	451	98.5%	10.3	3.1	B
	Subtotal	804	786	97.7%	18.7	4.0	B
Total		2,524	2,420	95.9%	20.9	3.5	C

SimTraffic Post-Processor | **Tukwila TE**
Average Results from 10 Runs | **Existing 2018 Conditions**
Volume and Delay by Movement | **Weekend PM Peak Hour**

Intersection 45 **Andover Park W/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	20	100.0%	51.4	19.4	D
	Through	12	12	101.7%	63.9	29.4	E
	Right Turn	20	21	103.5%	8.1	4.0	A
	Subtotal	52	53	101.7%	40.9	15.6	D
SB	Left Turn	366	342	93.5%	42.1	6.3	D
	Through	6	7	108.3%	24.9	31.3	C
	Right Turn	81	76	93.7%	36.6	9.4	D
	Subtotal	453	425	93.7%	41.1	6.4	D
EB	Left Turn	69	66	95.5%	54.6	14.4	D
	Through	712	678	95.3%	12.8	3.6	B
	Right Turn	10	10	104.0%	7.0	7.1	A
	Subtotal	791	755	95.4%	16.6	3.0	B
WB	Left Turn	12	10	83.3%	65.8	16.6	E
	Through	841	817	97.1%	19.7	2.8	B
	Right Turn	308	292	94.8%	20.0	2.6	C
	Subtotal	1,161	1,119	96.4%	20.3	2.5	C
Total		2,457	2,351	95.7%	23.2	2.2	C

Intersection 46 **Andover Park W/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	417	395	94.6%	44.1	6.3	D
	Through						
	Right Turn	167	160	95.6%	47.0	8.9	D
	Subtotal	584	554	94.9%	45.0	6.5	D
EB	Left Turn	236	216	91.4%	116.4	73.5	F
	Through	862	816	94.7%	19.4	21.3	B
	Right Turn						
	Subtotal	1,098	1,032	94.0%	40.9	27.9	D
WB	Left Turn						
	Through	994	970	97.5%	38.9	4.1	D
	Right Turn	330	323	97.7%	44.4	5.5	D
	Subtotal	1,324	1,292	97.6%	40.2	4.5	D
Total		3,006	2,878	95.7%	41.1	10.6	D

Intersection 47 **W Valley Highway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	324	327	101.0%	113.4	56.8	F
	Through	251	248	98.9%	28.1	5.0	C
	Right Turn	72	72	100.0%	3.9	1.2	A
	Subtotal	647	647	100.0%	71.5	31.6	E
SB	Left Turn	235	241	102.5%	54.8	5.6	D
	Through	394	404	102.5%	31.0	5.4	C
	Right Turn	172	175	101.9%	23.7	3.0	C
	Subtotal	801	820	102.4%	36.5	3.6	D
EB	Left Turn	91	84	92.1%	89.9	10.9	F
	Through	990	916	92.6%	69.9	10.1	E
	Right Turn	468	424	90.6%	59.3	6.7	E
	Subtotal	1,549	1,424	91.9%	68.2	8.3	E
WB	Left Turn	70	72	102.1%	153.5	65.9	F
	Through	992	946	95.3%	137.3	65.7	F
	Right Turn	198	189	95.3%	118.9	74.7	F
	Subtotal	1,260	1,206	95.7%	135.5	66.9	F
Total		4,257	4,097	96.2%	82.6	18.1	F

Intersection 52 **Andover Pk W/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	374	353	94.4%	64.1	27.4	E
	Through						
	Right Turn	127	125	98.5%	7.0	1.0	A
	Subtotal	501	478	95.4%	48.4	18.2	D
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	377	329	87.2%	17.0	6.2	B
	Right Turn	456	402	88.1%	16.3	6.6	B
	Subtotal	833	731	87.7%	16.6	6.3	B
WB	Left Turn	258	251	97.4%	72.9	80.3	E
	Through	404	384	94.9%	70.7	81.9	E
	Right Turn						
	Subtotal	662	635	95.9%	71.5	80.5	E
Total		1,996	1,844	92.4%	44.0	30.9	D

Intersection 53 **Andover Pk E/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	167	158	94.5%	41.6	21.8	D
	Through						
	Right Turn	301	294	97.8%	5.3	0.9	A
	Subtotal	468	452	96.6%	18.0	9.6	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	312	279	89.3%	20.2	4.2	C
	Right Turn	192	173	89.9%	13.6	3.2	B
	Subtotal	504	451	89.5%	17.7	3.4	B
WB	Left Turn	232	235	101.4%	13.2	2.2	B
	Through	495	485	98.0%	12.6	7.2	B
	Right Turn						
	Subtotal	727	720	99.1%	12.8	5.2	B
Total		1,699	1,624	95.6%	15.7	5.1	B

Intersection 54 **Southcenter Pkwy/S 168th St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	2	2	110.0%	35.5	46.9	D
	Through	1,230	1,212	98.6%	4.1	1.0	A
	Right Turn	1	1	130.0%	2.8	9.0	A
	Subtotal	1,233	1,216	98.6%	4.3	1.0	A
SB	Left Turn	18	17	96.1%	58.8	14.9	E
	Through	1,255	1,130	90.0%	2.0	1.0	A
	Right Turn	9	8	85.6%	2.7	3.2	A
	Subtotal	1,282	1,155	90.1%	3.0	1.1	A
EB	Left Turn	7	8	108.6%	63.4	50.7	E
	Through						
	Right Turn						
	Subtotal	7	8	108.6%	47.0	39.8	D
WB	Left Turn	5	5	98.0%	28.8	29.2	C
	Through						
	Right Turn	13	14	103.8%	59.8	34.0	E
	Subtotal	18	18	102.2%	56.3	18.9	E
Total		2,540	2,397	94.4%	4.3	1.1	A

Intersection 22 **61st Avenue S/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	1,360	922	67.8%	49.2	13.3	D
	Through						
	Right Turn	500	335	67.0%	54.2	13.3	D
	Subtotal	1,860	1,258	67.6%	50.5	13.1	D
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	800	414	51.7%	214.4	31.7	F
	Right Turn	1,750	932	53.3%	224.2	23.2	F
	Subtotal	2,550	1,346	52.8%	220.4	18.4	F
WB	Left Turn	290	205	70.7%	362.8	24.8	F
	Through	1,070	790	73.9%	26.3	3.1	C
	Right Turn						
	Subtotal	1,360	995	73.2%	99.0	6.5	F
Total		5,770	3,598	62.4%	127.2	5.2	F

Intersection 25 **W Valley Highway/Southcenter Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	150	124	82.5%	236.1	86.3	F
	Through	680	577	84.8%	73.8	18.7	E
	Right Turn	690	569	82.4%	50.4	10.2	D
	Subtotal	1,520	1,269	83.5%	81.2	20.1	F
SB	Left Turn	230	190	82.5%	339.6	58.1	F
	Through	640	587	91.8%	204.1	26.5	F
	Right Turn	400	352	87.9%	195.5	24.4	F
	Subtotal	1,270	1,129	88.9%	225.3	25.2	F
EB	Left Turn	250	179	71.7%	284.1	79.3	F
	Through	1,380	999	72.4%	195.4	9.5	F
	Right Turn	100	73	72.9%	154.8	25.6	F
	Subtotal	1,730	1,251	72.3%	206.6	15.9	F
WB	Left Turn	410	286	69.7%	182.3	34.8	F
	Through	1,610	1,148	71.3%	132.8	6.4	F
	Right Turn	360	251	69.7%	117.4	15.9	F
	Subtotal	2,380	1,684	70.8%	139.0	7.8	F
Total		6,900	5,333	77.3%	158.3	11.0	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Tukwila TE
2044 No Action w Updated Growth
Weekend PM Peak Hour

Intersection 29 **Southcenter Parkway/Northwest Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,500	1,289	85.9%	7.6	3.7	A
	Right Turn	310	267	86.0%	0.8	0.4	A
	Subtotal	1,810	1,556	85.9%	6.5	3.1	A
SB	Left Turn	310	185	59.6%	107.0	57.1	F
	Through	1,330	813	61.1%	2.2	2.1	A
	Right Turn						
	Subtotal	1,640	998	60.8%	22.8	12.9	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	240	28	11.5%	578.0	194.3	F
	Through						
	Right Turn	170	18	10.5%	613.0	209.7	F
	Subtotal	410	46	11.1%	497.0	226.6	F
Total		3,860	2,599	67.3%	19.6	4.9	C

Intersection 30 **Northwest Mall Driveway/Tukwila Parkway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	2	24.0%	110.1	103.2	F
	Through						
	Right Turn	465	145	31.2%	229.8	65.4	F
	Subtotal	475	148	31.1%	229.4	65.4	F
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	1,590	1,228	77.2%	73.0	23.2	F
	Right Turn	80	62	77.0%	64.8	21.9	F
	Subtotal	1,670	1,290	77.2%	72.7	23.1	F
WB	Left Turn	170	107	63.2%	60.3	31.7	F
	Through	1,630	1,002	61.5%	5.1	0.6	A
	Right Turn						
	Subtotal	1,800	1,109	61.6%	10.6	4.1	B
Total		3,945	2,547	64.6%	53.9	10.9	F

Intersection 31 **61st Avenue S/Tukwila Parkway** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	1,050	590	56.2%	86.5	9.3	F
	Through						
	Right Turn	990	545	55.1%	34.0	4.7	C
	Subtotal	2,040	1,135	55.6%	62.1	7.8	E
EB	Left Turn	885	582	65.7%	98.1	18.3	F
	Through	1,170	789	67.4%	22.9	6.6	C
	Right Turn						
	Subtotal	2,055	1,370	66.7%	54.1	5.6	D
WB	Left Turn						
	Through	810	566	69.8%	67.7	11.3	E
	Right Turn	975	676	69.4%	29.7	9.3	C
	Subtotal	1,785	1,242	69.6%	46.9	5.4	D
Total		5,880	3,747	63.7%	53.7	3.7	D

Intersection 32 **W Valley Highway/I-405 NB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	230	211	91.6%	89.1	25.6	F
	Through	900	801	89.0%	92.2	52.8	F
	Right Turn	20	17	87.0%	94.9	60.2	F
	Subtotal	1,150	1,029	89.5%	91.7	46.4	F
SB	Left Turn	10	7	68.0%	68.2	44.4	E
	Through	990	818	82.6%	26.0	3.8	C
	Right Turn	150	121	80.8%	15.0	4.5	B
	Subtotal	1,150	946	82.2%	25.0	4.1	C
EB	Left Turn	600	455	75.8%	261.7	32.4	F
	Through	40	29	71.8%	258.7	36.2	F
	Right Turn	500	409	81.7%	111.6	17.4	F
	Subtotal	1,140	892	78.2%	194.2	19.1	F
WB	Left Turn	30	30	101.0%	77.4	21.9	E
	Through	10	11	107.0%	86.8	20.8	F
	Right Turn	20	22	112.0%	27.2	18.2	C
	Subtotal	60	63	105.7%	60.8	10.0	E
Total		3,500	2,930	83.7%	97.7	18.3	F

Intersection 33 **Southcenter Parkway/I-5 Exit 153 Off-ramp** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	970	827	85.2%	88.6	37.7	F
	Right Turn	400	343	85.8%	74.0	22.1	E
	Subtotal	1,370	1,170	85.4%	84.3	31.0	F
SB	Left Turn	160	82	51.4%	63.8	6.5	E
	Through	1,410	758	53.7%	30.0	5.5	C
	Right Turn						
	Subtotal	1,570	840	53.5%	33.4	5.2	C
EB	Left Turn	350	256	73.2%	336.8	40.7	F
	Through	110	87	79.0%	359.3	36.6	F
	Right Turn	150	104	69.4%	290.3	41.8	F
	Subtotal	610	447	73.3%	329.9	27.1	F
WB	Left Turn	320	311	97.2%	73.3	32.1	E
	Through						
	Right Turn	490	489	99.7%	51.3	51.6	D
	Subtotal	810	800	98.7%	60.7	40.5	E
Total		4,360	3,257	74.7%	97.8	16.7	F

Intersection 34 **Southcenter Parkway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,340	1,173	87.6%	29.7	6.5	C
	Right Turn	590	519	87.9%	64.8	25.2	E
	Subtotal	1,930	1,692	87.7%	40.6	12.3	D
SB	Left Turn	430	266	61.7%	37.9	5.1	D
	Through	1,470	931	63.3%	12.4	2.0	B
	Right Turn						
	Subtotal	1,900	1,196	63.0%	18.3	2.5	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	450	413	91.8%	51.4	4.6	D
	Through						
	Right Turn	660	613	92.8%	18.6	2.2	B
	Subtotal	1,110	1,026	92.4%	32.4	2.6	C
Total		4,940	3,915	79.2%	31.0	5.4	C

Intersection 35 **61st Place S/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	160	149	93.4%	63.8	67.7	E
	Through	30	27	90.3%	88.8	95.1	F
	Right Turn	70	67	95.1%	88.9	157.7	F
	Subtotal	260	243	93.5%	69.2	88.7	E
SB	Left Turn	130	122	93.8%	177.9	268.6	F
	Through	50	46	92.6%	166.6	258.6	F
	Right Turn	300	283	94.5%	146.7	241.2	F
	Subtotal	480	452	94.1%	152.5	240.2	F
EB	Left Turn	200	159	79.3%	44.9	51.8	D
	Through	690	562	81.5%	32.9	36.7	C
	Right Turn	250	197	78.6%	13.9	15.8	B
	Subtotal	1,140	917	80.5%	30.7	32.7	C
WB	Left Turn	130	118	90.7%	28.6	3.7	C
	Through	640	558	87.2%	33.8	5.9	C
	Right Turn	310	280	90.4%	34.3	6.8	C
	Subtotal	1,080	956	88.6%	33.3	5.4	C
Total		2,960	2,569	86.8%	40.4	18.5	D

Intersection 36 **Andover Park W/Tire Center Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	240	207	86.3%	19.3	13.0	C
	Through	780	687	88.1%	15.0	13.2	B
	Right Turn						
	Subtotal	1,020	894	87.7%	16.1	13.0	C
SB	Left Turn						
	Through	790	596	75.4%	9.0	4.2	A
	Right Turn	70	49	69.7%	10.2	3.8	B
	Subtotal	860	644	74.9%	9.2	4.1	A
EB	Left Turn						
	Through						
	Right Turn	290	286	98.7%	59.7	44.9	F
	Subtotal	290	286	98.7%	59.7	44.9	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,170	1,825	84.1%	20.3	10.8	C

Intersection 37 **Andover Park W/Southeast Mall Driveway** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,020	894	87.7%	7.6	6.7	A
	Right Turn						
	Subtotal	1,020	894	87.7%	7.6	6.7	A
SB	Left Turn						
	Through	1,010	828	81.9%	22.6	5.5	C
	Right Turn	70	57	81.4%	21.1	3.1	C
	Subtotal	1,080	885	81.9%	22.5	5.3	C
EB	Left Turn						
	Through						
	Right Turn	130	120	92.0%	257.5	134.8	F
	Subtotal	130	120	92.0%	257.5	134.8	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,230	1,899	85.1%	29.1	9.3	D

Intersection 38 **Andover Park W/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	180	149	83.0%	136.4	83.0	F
	Through	630	561	89.0%	98.8	87.0	F
	Right Turn	130	115	88.2%	80.5	76.2	F
	Subtotal	940	825	87.7%	103.2	84.0	F
SB	Left Turn	200	169	84.6%	86.0	12.2	F
	Through	780	645	82.7%	56.6	8.5	E
	Right Turn	160	133	83.1%	48.2	10.0	D
	Subtotal	1,140	947	83.1%	60.5	8.9	E
EB	Left Turn	150	124	82.5%	231.0	125.0	F
	Through	670	558	83.3%	32.3	10.8	C
	Right Turn	70	60	86.3%	9.7	2.1	A
	Subtotal	890	742	83.4%	60.8	23.1	E
WB	Left Turn	130	121	92.7%	90.3	19.4	F
	Through	740	673	90.9%	74.7	17.1	E
	Right Turn	240	210	87.6%	86.9	20.7	F
	Subtotal	1,110	1,003	90.4%	79.3	17.6	E
Total		4,080	3,517	86.2%	75.0	21.5	E

Intersection 39 **Andover Park E/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	280	250	89.3%	107.3	25.7	F
	Through	690	622	90.2%	74.9	29.1	E
	Right Turn	240	221	92.1%	75.1	30.3	E
	Subtotal	1,210	1,093	90.4%	83.1	27.3	F
SB	Left Turn	110	103	93.3%	65.0	22.3	E
	Through	390	358	91.8%	44.4	7.0	D
	Right Turn	90	82	91.2%	41.2	10.4	D
	Subtotal	590	543	92.0%	48.9	7.0	D
EB	Left Turn	100	80	79.7%	68.8	13.4	E
	Through	670	583	87.1%	48.7	7.0	D
	Right Turn	200	178	88.9%	47.2	7.9	D
	Subtotal	970	841	86.7%	50.3	7.4	D
WB	Left Turn	240	220	91.8%	62.5	9.1	E
	Through	700	639	91.2%	28.3	4.2	C
	Right Turn	120	119	99.0%	26.2	5.8	C
	Subtotal	1,060	978	92.2%	35.5	4.0	D
Total		3,830	3,455	90.2%	56.4	9.6	E

Intersection 40 **W Valley Highway/Strander Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	410	406	99.0%	52.8	19.5	D
	Through	560	569	101.7%	18.5	5.9	B
	Right Turn	20	21	104.0%	16.3	10.5	B
	Subtotal	990	996	100.6%	31.5	8.8	C
SB	Left Turn						
	Through	870	721	82.9%	39.2	9.1	D
	Right Turn	460	381	82.8%	16.5	3.3	B
	Subtotal	1,330	1,102	82.8%	31.4	7.0	C
EB	Left Turn	560	494	88.1%	51.4	11.9	D
	Through	30	28	92.3%	45.1	17.7	D
	Right Turn	380	337	88.7%	14.6	5.1	B
	Subtotal	970	858	88.5%	37.0	8.0	D
WB	Left Turn	10	9	89.0%	44.7	21.9	D
	Through	20	23	115.0%	44.9	20.1	D
	Right Turn	10	12	115.0%	19.8	12.0	B
	Subtotal	40	43	108.5%	39.2	10.7	D
Total		3,330	3,000	90.1%	33.1	6.6	C

Intersection 41 **Southcenter Parkway/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	18	90.5%	104.9	43.0	F
	Through	1,230	1,024	83.3%	142.3	41.8	F
	Right Turn	190	161	84.7%	151.7	37.9	F
	Subtotal	1,440	1,203	83.6%	143.2	41.2	F
SB	Left Turn	250	190	76.0%	51.6	10.1	D
	Through	1,280	942	73.6%	11.9	2.0	B
	Right Turn	170	125	73.6%	14.1	3.6	B
	Subtotal	1,700	1,257	74.0%	18.1	2.6	B
EB	Left Turn	120	113	93.9%	111.4	65.8	F
	Through						
	Right Turn	50	49	98.6%	90.2	82.7	F
	Subtotal	170	162	95.3%	104.3	68.3	F
WB	Left Turn	170	155	91.0%	43.3	8.3	D
	Through	20	20	98.0%	37.4	18.5	D
	Right Turn	190	171	89.9%	39.3	14.4	D
	Subtotal	380	345	90.8%	41.1	8.2	D
Total		3,690	2,968	80.4%	73.5	12.7	E

Intersection 42 **Andover Park W/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	70	60	86.1%	44.9	8.8	D
	Through	490	426	87.0%	46.5	7.7	D
	Right Turn	40	35	87.5%	36.2	10.1	D
	Subtotal	600	522	86.9%	45.5	7.8	D
SB	Left Turn	120	98	82.0%	38.0	8.5	D
	Through	490	409	83.4%	45.0	10.1	D
	Right Turn	170	145	85.0%	38.6	8.6	D
	Subtotal	780	652	83.5%	42.4	9.1	D
EB	Left Turn	140	122	87.0%	47.4	7.4	D
	Through	230	186	81.0%	50.4	9.2	D
	Right Turn	120	111	92.8%	19.8	7.7	B
	Subtotal	490	420	85.6%	41.6	7.8	D
WB	Left Turn	30	29	97.0%	41.0	13.1	D
	Through	200	189	94.7%	47.2	5.9	D
	Right Turn	130	119	91.5%	9.4	2.9	A
	Subtotal	360	337	93.7%	34.9	5.3	C
Total		2,230	1,930	86.6%	41.8	5.8	D

Intersection 43 **Andover Park E/Minkler Boulevard** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn	250	228	91.3%	21.1	3.7	C
	Through	1,050	951	90.6%	9.8	1.1	A
	Right Turn	20	19	96.5%	9.8	3.5	A
	Subtotal	1,320	1,199	90.8%	12.1	1.4	B
SB	Left Turn						
	Through	640	579	90.5%	17.7	0.7	B
	Right Turn	50	46	91.8%	15.5	4.2	B
	Subtotal	690	625	90.6%	17.6	0.8	B
EB	Left Turn	70	55	78.6%	23.3	5.0	C
	Through	30	26	86.7%	23.5	11.4	C
	Right Turn	290	240	82.6%	14.3	3.5	B
	Subtotal	390	321	82.2%	16.6	3.7	B
WB	Left Turn	10	10	96.0%	10.4	10.9	B
	Through	60	60	99.8%	25.6	3.0	C
	Right Turn	20	19	95.0%	12.4	7.9	B
	Subtotal	90	89	98.3%	22.1	3.5	C
Total		2,490	2,233	89.7%	14.8	0.9	B

Intersection 44 **Southcenter Parkway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph)		Total Delay (sec/veh)		
			Average	Percent	Average	Std. Dev.	LOS
NB	Left Turn						
	Through	520	517	99.4%	28.5	3.5	C
	Right Turn	510	519	101.7%	15.9	3.5	B
	Subtotal	1,030	1,036	100.5%	22.2	2.5	C
SB	Left Turn	580	441	76.0%	30.4	3.9	C
	Through	630	494	78.5%	28.1	5.1	C
	Right Turn						
	Subtotal	1,210	935	77.3%	29.2	4.3	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	460	381	82.8%	35.3	7.3	D
	Through						
	Right Turn	600	489	81.5%	15.5	4.0	B
	Subtotal	1,060	870	82.1%	24.4	3.9	C
Total		3,300	2,841	86.1%	25.2	2.9	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Tukwila TE
2044 No Action w Updated Growth
Weekend PM Peak Hour

Intersection 45 **Andover Park W/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	50	50	99.8%	42.3	9.2	D
	Through	30	30	100.3%	37.1	7.0	D
	Right Turn	50	58	116.8%	10.5	2.5	B
	Subtotal	130	138	106.5%	27.3	3.4	C
SB	Left Turn	500	424	84.8%	46.4	10.2	D
	Through	10	9	85.0%	40.6	26.0	D
	Right Turn	100	84	84.3%	44.5	14.2	D
	Subtotal	610	517	84.7%	45.9	10.6	D
EB	Left Turn	80	69	85.9%	55.7	12.6	E
	Through	820	720	87.8%	15.5	4.5	B
	Right Turn	10	9	93.0%	14.3	10.9	B
	Subtotal	910	798	87.7%	19.1	3.8	B
WB	Left Turn	10	8	78.0%	83.4	18.7	F
	Through	1,060	866	81.7%	41.0	21.2	D
	Right Turn	390	323	82.7%	48.6	21.5	D
	Subtotal	1,460	1,197	82.0%	43.5	20.9	D
Total		3,110	2,650	85.2%	35.5	10.2	D

Intersection 46 **Andover Park W/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	470	412	87.7%	129.8	49.1	F
	Through						
	Right Turn	190	159	83.8%	162.4	54.7	F
	Subtotal	660	571	86.5%	138.3	49.6	F
EB	Left Turn	330	290	87.8%	68.3	11.2	E
	Through	1,040	911	87.6%	5.7	0.9	A
	Right Turn						
	Subtotal	1,370	1,201	87.7%	21.4	3.9	C
WB	Left Turn						
	Through	1,270	1,038	81.7%	86.8	10.2	F
	Right Turn	470	385	81.9%	89.1	8.7	F
	Subtotal	1,740	1,423	81.8%	87.4	9.5	F
Total		3,770	3,195	84.7%	72.7	10.0	E

Intersection 47 **W Valley Highway/S 180th Street** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	400	396	99.0%	105.5	76.0	F
	Through	310	308	99.4%	32.1	3.7	C
	Right Turn	90	97	107.9%	4.2	1.2	A
	Subtotal	800	801	100.2%	63.1	37.0	E
SB	Left Turn	250	248	99.3%	73.3	27.4	E
	Through	410	408	99.4%	55.1	18.9	E
	Right Turn	180	178	98.7%	66.6	63.2	E
	Subtotal	840	834	99.3%	61.7	22.2	E
EB	Left Turn	105	92	88.0%	70.2	13.3	E
	Through	1,060	951	89.7%	29.7	3.8	C
	Right Turn	490	431	88.0%	16.1	2.8	B
	Subtotal	1,655	1,474	89.1%	28.4	3.4	C
WB	Left Turn	110	80	72.6%	205.9	22.6	F
	Through	1,520	1,175	77.3%	212.6	59.1	F
	Right Turn	310	232	74.9%	193.5	42.3	F
	Subtotal	1,940	1,487	76.7%	209.3	53.4	F
Total		5,235	4,596	87.8%	94.0	11.8	F

Intersection 52 **Andover Pk W/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	500	413	82.7%	203.8	114.1	F
	Through						
	Right Turn	150	128	85.3%	114.0	109.2	F
	Subtotal	650	541	83.3%	179.3	110.9	F
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	760	477	62.7%	29.9	6.3	C
	Right Turn	670	416	62.1%	32.8	8.9	C
	Subtotal	1,430	893	62.4%	31.2	6.9	C
WB	Left Turn	410	385	93.9%	95.6	68.6	F
	Through	670	618	92.3%	94.4	77.2	F
	Right Turn						
	Subtotal	1,080	1,003	92.9%	95.4	73.2	F
Total		3,160	2,437	77.1%	87.5	47.2	F

Intersection 53 **Andover Pk E/Tukwila Pkwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	240	203	84.5%	149.0	156.6	F
	Through						
	Right Turn	430	388	90.3%	14.1	16.6	B
	Subtotal	670	591	88.2%	48.8	37.5	D
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	600	396	66.1%	14.8	5.4	B
	Right Turn	310	210	67.6%	12.9	4.7	B
	Subtotal	910	606	66.6%	14.2	4.9	B
WB	Left Turn	400	415	103.6%	22.1	6.9	C
	Through	840	829	98.7%	20.4	23.7	C
	Right Turn						
	Subtotal	1,240	1,244	100.3%	21.0	16.2	C
Total		2,820	2,441	86.6%	25.2	14.3	C

Intersection 54 **Southcenter Pkwy/S 168th St** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,750	1,494	85.4%	33.2	15.9	C
	Right Turn						
	Subtotal	1,750	1,494	85.4%	33.2	15.9	C
SB	Left Turn	20	12	61.5%	65.5	23.6	E
	Through	1,550	1,078	69.5%	2.2	1.3	A
	Right Turn	10	8	75.0%	1.2	1.2	A
	Subtotal	1,580	1,098	69.5%	3.2	1.3	A
EB	Left Turn	40	40	99.8%	60.8	8.6	E
	Through						
	Right Turn						
	Subtotal	40	40	99.8%	60.8	8.6	E
WB	Left Turn	10	9	94.0%	60.1	29.1	E
	Through						
	Right Turn	20	24	120.0%	69.0	47.8	E
	Subtotal	30	33	111.3%	68.0	41.3	E
Total		3,400	2,665	78.4%	21.2	8.3	C

Appendix C: Vehicle LOS Results for the Study Intersection Analysis PM Peak Hour

Table C1. Existing 2018 PM Peak Hour LOS in Tukwila

ID	Intersection Location	Intersection Control	Average Delay (s)	LOS
1^	Boeing Access Road / E Marginal Way	Signal	37	D
2^	Boeing Access Road / Martin Luther King Way	Signal	43	D
3	S 112th Street / Tukwila International Boulevard	Signal	8	A
4	S 112th Street / E Marginal Way	TWSC	17	C
5	S 116th Way / Tukwila International Boulevard	Signal	20	B
6	S 116th Street / E Marginal Way	TWSC	39	E
7	S 130th Street / Tukwila International Blvd	Signal	9	A
8	S 130th Street / East Marginal Way	AWSC	10	A
9	42nd Avenue S / Interurban Avenue S	Signal	35	D
10	S 124th Street / 42nd Avenue S	AWSC	13	B
11	S 124th Street / 50th Pl S	AWSC	8	A
12	S 133rd Street / SR 599 Ramps	TWSC	24	C
13	52nd Avenue S / Interurban Avenue S	Signal	8	A
14	S 144th Street / Tukwila International Boulevard	Signal	27	C
15	S 144th Street / 42nd Avenue S	Signal	13	B
16	S 144th Street / 53rd Avenue S	TWSC	25	C
17	S 144th Street / Macadam Road S	TWSC	14	B
18	58th Avenue S / Interurban Avenue S	Signal	10	A
19	Southcenter Boulevard / Tukwila International Boulevard	Signal	33	C
20	Southcenter Blvd / 42nd Avenue S	Signal	24	C
21	**Southcenter Boulevard / I-405 SB Off-ramp**	**TWSC**	**92**	**F**
22*	Southcenter Boulevard / 61st Avenue S	Signal	96	F
23^	Southcenter Boulevard / 66th Avenue S	Signal	39	D
24	I-405 SB Ramps / W Valley Highway	Signal	43	D
25*	**Southcenter Boulevard / W Valley Highway**	**Signal**	**80**	**F**
26	S 160th Street / 42nd Avenue S	AWSC	12	B
27	SR 518 EB Off-ramp / Klickitat Drive	TWSC	28	D
28^	Klickitat Drive / 53rd Avenue S	Signal	53	D
29*	Southcenter Parkway / Northwest Mall Driveway	TWSC	3	A
30*	Tukwila Parkway / Northwest Mall Driveway	TWSC	5	A
31*	Tukwila Parkway / 61st Avenue S	Signal	38	D
32*	I-405 NB Ramps / W Valley Highway	Signal	35	D
33*	I-5 Exit 153 Off-ramp / Southcenter Parkway	Signal	19	B
34*	Strander Boulevard / Southcenter Parkway	Signal	16	B
35*	Strander Boulevard / 61st Place S	Signal	17	B
36*	Andover Park W / Tire Center Driveway	TWSC	4	A

ID	Intersection Location	Intersection Control	Average Delay (s)	LOS
37*	Andover Park W / Southeast Mall Driveway	TWSC	4	A
38*	Strander Boulevard / Andover Park W	Signal	30	C
39*	Strander Boulevard / Andover Park E	Signal	30	C
40*	Strander Boulevard / W Valley Highway	Signal	28	C
41*	Minkler Boulevard / Southcenter Parkway	Signal	12	B
42*	Minkler Boulevard / Andover Park W	Signal	26	C
43*	Minkler Boulevard / Andover Park E	Signal	20	C
44*	S 180th Street / Southcenter Parkway	Signal	22	C
45*	S 180th Street / Andover Park W	Signal	32	C
46*	S 180th Street / Andover Park E	Signal	27	C
47*	S 180th Street / W Valley Highway	Signal	61	E
48	Southcenter Parkway / S 184th Pl	Signal	20	B
49^	S 200th Street / Orillia Road S	Signal	41	D
50^	S 200th Street / Southcenter Parkway	Signal	22	C
51	Southcenter Boulevard / 65th Avenue S	TWSC	21	C
52*	Tukwila Parkway / Andover Park W	Signal	22	C
53*	Tukwila Parkway / Andover Park E	Signal	15	B
54*	Southcenter Parkway / S 168th Street	Signal	5	A

Notes:
^Intersections analyzed using HCM 2000 methodology instead of HCM 6th edition due to unusual geometry or unusual signal phasing.
*Study intersections within the Southcenter area where the City's corridor LOS policy applies. The tabulated vehicle delay values for these intersections are from SimTraffic analysis; these were used to determine corridor LOS based on a vehicle-volume-weighted average. For two-way stop-controlled intersections in this subset, the average intersection delay for all approaches is reported.
Bold text highlight study intersections with LOS exceeding the City's current policy or WSDOT standards.
Source: Fehr & Peers, IDAX Data Solutions, StreetLight Data, 2018.

Table C2. 2044 Growth Targets - PM Peak Hour LOS in Tukwila

ID	Intersection Location	Intersection Control	Average Delay (s)	LOS
1^	Boeing Access Road / E Marginal Way	Signal	54	D
2^	Boeing Access Road / Martin Luther King Way	Signal	56	E
3	S 112th Street / Tukwila International Boulevard	Signal	13	B
4	S 112th Street / E Marginal Way	TWSC	21	C
5	S 116th Way / Tukwila International Boulevard	Signal	31	C
6	**S 116th Street / E Marginal Way**	**TWSC**	**125**	**F**
7	S 130th Street / Tukwila International Blvd	Signal	17	B
8	S 130th Street / East Marginal Way	AWSC	19	C
9	42nd Avenue S / Interurban Avenue S	Signal	49	D
10	**S 124th Street / 42nd Avenue S**	**AWSC**	**39**	**E**
11	S 124th Street / 50th Pl S	AWSC	9	A
12	**S 133rd Street / SR 599 Ramps**	**TWSC**	**>150**	**F**
13	52nd Avenue S / Interurban Avenue S	Signal	9	A
14	S 144th Street / Tukwila International Boulevard	Signal	39	D
15	S 144th Street / 42nd Avenue S	Signal	18	B
16	**S 144th Street / 53rd Avenue S**	**TWSC**	**>150**	**F**
17	**S 144th Street / Macadam Road S**	**TWSC**	**56**	**F**
18	58th Avenue S / Interurban Avenue S	Signal	14	B
19	Southcenter Boulevard / Tukwila International Boulevard	Signal	62	E
20	Southcenter Blvd / 42nd Avenue S	Signal	73	E
21	**Southcenter Boulevard / I-405 SB Off-ramp**	**TWSC**	**>150**	**F**
23^	Southcenter Boulevard / 66th Avenue S	Signal	66	E
24	I-405 SB Ramps / W Valley Highway	Signal	63	E
26	S 160th Street / 42nd Avenue S	AWSC	21	C

ID	Intersection Location	Intersection Control	Average Delay (s)	LOS
27	**SR 518 EB Off-ramp / Klickitat Drive**	**TWSC**	**60**	**F**
28^	Klickitat Drive / 53rd Avenue S	Signal	72	E
40*	**Strander Boulevard / W Valley Highway**	**Signal**	**118**	**F**
48	Southcenter Parkway / S 184th Pl	Signal	26	C
49^	S 200th Street / Orillia Road S	Signal	74	E
50^	S 200th Street / Southcenter Parkway	Signal	74	E
51	**Southcenter Boulevard / 65th Avenue S**	**Signal**	**83**	**E**

Notes:
^Intersections analyzed using HCM 2000 methodology instead of HCM 6th edition due to unusual geometry or unusual signal phasing.
Bold text highlight study intersections with LOS exceeding the City's current policy or WSDOT standards.
Source: Fehr & Peers, 2024.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	483	13	308	789	180	0	59	231	566	289	769
Future Volume (vph)	121	483	13	308	789	180	0	59	231	566	289	769
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95	1.00	0.97	1.00	0.88
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3487		1752	3505	1568		3167	1417	3400	1845	2760
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3487		1752	3505	1568		3167	1417	3400	1845	2760
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	126	503	14	321	822	188	0	61	241	590	301	801
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	217	0	0	22
Lane Group Flow (vph)	126	515	0	321	822	188	0	61	24	590	301	779
Confl. Peds. (#/hr)			3	3			2		4	4		2
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	14%	14%	14%	3%	3%	3%
Turn Type	Split	NA		Split	NA	Free		NA	Prot	Split	NA	custom
Protected Phases	2	2		3	3			1	1	4	4	1 2 4
Permitted Phases		2				Free						
Actuated Green, G (s)	29.3	29.3		39.7	39.7	130.7		13.1	13.1	32.6	32.6	83.0
Effective Green, g (s)	29.3	29.3		39.7	39.7	130.7		13.1	13.1	32.6	32.6	83.0
Actuated g/C Ratio	0.22	0.22		0.30	0.30	1.00		0.10	0.10	0.25	0.25	0.64
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	762	781		532	1064	1568		317	142	848	460	1752
v/s Ratio Prot	0.04	c0.15		0.18	c0.23			0.02	0.02	c0.17	0.16	c0.28
v/s Ratio Perm						0.12						
v/c Ratio	0.17	0.66		0.60	0.77	0.12		0.19	0.17	0.70	0.65	0.44
Uniform Delay, d1	40.8	46.2		38.8	41.4	0.0		53.9	53.8	44.5	44.0	12.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	2.0		1.9	3.5	0.2		0.3	0.6	2.5	3.3	0.2
Delay (s)	41.0	48.2		40.7	44.9	0.2		54.2	54.4	47.0	47.3	12.3
Level of Service	D	D		D	D	A		D	D	D	D	B
Approach Delay (s)		46.8			37.6			54.4			30.7	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	327	686	597	222	187	26	102	717	239	76	850	394
Future Volume (vph)	327	686	597	222	187	26	102	717	239	76	850	394
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		1.00	0.95		1.00	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	2748	1752	3435		1770	3392		1770	5085	2710
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	2748	1752	3435		1770	3392		1770	5085	2710
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	341	715	622	231	195	27	106	747	249	79	885	410
RTOR Reduction (vph)	0	0	443	0	6	0	0	22	0	0	0	299
Lane Group Flow (vph)	341	715	179	231	216	0	106	974	0	79	885	111
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	7		8	4		2	6		5	1	
Permitted Phases			7									1
Actuated Green, G (s)	30.9	36.1	36.1	21.1	26.3		18.3	45.0		7.2	33.9	33.9
Effective Green, g (s)	30.9	36.1	36.1	21.1	26.3		18.3	45.0		7.2	33.9	33.9
Actuated g/C Ratio	0.25	0.29	0.29	0.17	0.21		0.15	0.36		0.06	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	436	1018	791	294	720		258	1217		101	1374	732
v/s Ratio Prot	c0.19	c0.20		c0.13	0.06		0.06	c0.29		0.04	c0.17	
v/s Ratio Perm			0.07									0.04
v/c Ratio	0.78	0.70	0.23	0.79	0.30		0.41	0.80		0.78	0.64	0.15
Uniform Delay, d1	44.1	39.9	34.0	50.0	41.8		48.7	36.2		58.3	40.4	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.9	2.2	0.1	12.9	0.2		1.1	3.8		31.6	1.0	0.1
Delay (s)	53.0	42.1	34.2	62.9	42.0		49.7	39.9		89.9	41.5	34.9
Level of Service	D	D	C	E	D		D	D		F	D	C
Approach Delay (s)		41.4			52.7			40.9			42.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	4	17	85	3	9	4	570	69	27	1634	5
Future Volume (veh/h)	2	4	17	85	3	9	4	570	69	27	1634	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	2	4	1	87	3	1	4	582	43	28	1667	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	4	4	4	2	2	2	3	3	3	2	2	2
Cap, veh/h	274	135	34	275	128	43	10	2008	893	57	2168	7
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.01	0.57	0.57	0.03	0.60	0.60
Sat Flow, veh/h	1377	1418	355	1398	1339	446	1767	3526	1568	1781	3634	11
Grp Volume(v), veh/h	2	0	5	87	0	4	4	582	43	28	815	857
Grp Sat Flow(s),veh/h/ln	1377	0	1773	1398	0	1785	1767	1763	1568	1781	1777	1868
Q Serve(g_s), s	0.1	0.0	0.1	3.0	0.0	0.1	0.1	4.2	0.6	0.8	16.9	17.0
Cycle Q Clear(g_c), s	0.2	0.0	0.1	3.1	0.0	0.1	0.1	4.2	0.6	0.8	16.9	17.0
Prop In Lane	1.00		0.20	1.00		0.25	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	274	0	169	275	0	170	10	2008	893	57	1060	1115
V/C Ratio(X)	0.01	0.00	0.03	0.32	0.00	0.02	0.42	0.29	0.05	0.49	0.77	0.77
Avail Cap(c_a), veh/h	837	0	894	847	0	901	321	4695	2089	503	2545	2677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	0.0	20.3	21.7	0.0	20.3	24.6	5.5	4.7	23.6	7.5	7.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.0	10.5	0.0	0.0	2.4	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.9	0.0	0.0	0.1	1.0	0.1	0.3	3.8	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	20.4	22.0	0.0	20.3	35.0	5.5	4.7	25.9	7.9	7.9
LnGrp LOS	C	A	C	C	A	C	D	A	A	C	A	A
Approach Vol, veh/h		7			91			629			1700	
Approach Delay, s/veh		20.4			21.9			5.7			8.2	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	33.2		9.7	5.3	34.6		9.7
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	14.0	66.0		25.0	9.0	71.0		25.0
Max Q Clear Time (g_c+I1), s	2.8	6.2		2.2	2.1	19.0		5.1
Green Ext Time (p_c), s	0.0	2.8		0.0	0.0	10.6		0.1

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Intersection						
Int Delay, s/veh	2.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	88	65	249	574	45
Future Vol, veh/h	18	88	65	249	574	45
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	18	90	66	254	586	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	996	610	633	0	-	0
Stage 1	610	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.17	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.263	-	-	-
Pot Cap-1 Maneuver	265	485	926	-	-	-
Stage 1	533	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	246	485	925	-	-	-
Mov Cap-2 Maneuver	246	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	675	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	1.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	925	-	416	-	-
HCM Lane V/C Ratio	0.072	-	0.26	-	-
HCM Control Delay (s)	9.2	-	16.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	263	98	21	0	0	0	27	315	60	642	722	518
Future Volume (veh/h)	263	98	21	0	0	0	27	315	60	642	722	518
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	184	218	3				28	321	0	655	737	0
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	2
Cap, veh/h	284	298	253				41	842		717	2192	
Arrive On Green	0.16	0.16	0.16				0.02	0.24	0.00	0.40	0.62	0.00
Sat Flow, veh/h	1781	1870	1585				1781	3647	0	1781	3554	1585
Grp Volume(v), veh/h	184	218	3				28	321	0	655	737	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				1781	1777	0	1781	1777	1585
Q Serve(g_s), s	6.7	7.7	0.1				1.1	5.3	0.0	24.2	7.0	0.0
Cycle Q Clear(g_c), s	6.7	7.7	0.1				1.1	5.3	0.0	24.2	7.0	0.0
Prop In Lane	1.00		1.00				1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	284	298	253				41	842		717	2192	
V/C Ratio(X)	0.65	0.73	0.01				0.69	0.38		0.91	0.34	
Avail Cap(c_a), veh/h	845	887	751				230	919		1408	3268	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.4	27.8	24.6				33.8	22.3	0.0	19.7	6.5	0.0
Incr Delay (d2), s/veh	2.5	3.5	0.0				18.6	0.3	0.0	5.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	3.6	0.0				0.6	2.0	0.0	9.7	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.9	31.3	24.7				52.4	22.6	0.0	24.7	6.5	0.0
LnGrp LOS	C	C	C				D	C		C	A	
Approach Vol, veh/h		405						349	A		1392	A
Approach Delay, s/veh		30.6						24.9			15.1	
Approach LOS		C						C			B	

Timer - Assigned Phs	1	2		4	5	6
Phs Duration (G+Y+Rc), s	33.0	20.5		16.1	6.6	46.9
Change Period (Y+Rc), s	4.5	5.5		4.5	4.5	5.5
Max Green Setting (Gmax), s	55.5	16.5		33.5	9.5	62.5
Max Q Clear Time (g_c+I1), s	26.2	7.3		9.7	3.1	9.0
Green Ext Time (p_c), s	2.3	1.2		1.9	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	7											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	56	0	154	0	0	17	18	303	6	45	642	19
Future Vol, veh/h	56	0	154	0	0	17	18	303	6	45	642	19
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	225	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	6	6	6	0	0	0	9	9	9	7	7	7
Mvmt Flow	57	0	157	0	0	17	18	309	6	46	655	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1118	1112	669	1187	1118	316	676	0	0	317	0	0
Stage 1	759	759	-	350	350	-	-	-	-	-	-	-
Stage 2	359	353	-	837	768	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.1	6.5	6.2	4.19	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.5	4	3.3	2.281	-	-	2.263	-	-
Pot Cap-1 Maneuver	181	205	451	167	209	729	883	-	-	1215	-	-
Stage 1	393	409	-	671	636	-	-	-	-	-	-	-
Stage 2	651	624	-	364	414	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	168	192	449	103	196	726	881	-	-	1213	-	-
Mov Cap-2 Maneuver	168	192	-	103	196	-	-	-	-	-	-	-
Stage 1	384	393	-	656	622	-	-	-	-	-	-	-
Stage 2	621	610	-	227	397	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.7	10.1	0.5	0.5
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	881	-	-	311	726	1213	-	-
HCM Lane V/C Ratio	0.021	-	-	0.689	0.024	0.038	-	-
HCM Control Delay (s)	9.2	-	-	38.7	10.1	8.1	-	-
HCM Lane LOS	A	-	-	E	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	4.8	0.1	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	265	39	418	0	79	932
Future Volume (veh/h)	265	39	418	0	79	932
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	270	37	427	0	81	951
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	359	49	981	0	506	1744
Arrive On Green	0.23	0.23	0.28	0.00	0.08	0.49
Sat Flow, veh/h	1539	211	3741	0	1781	3647
Grp Volume(v), veh/h	308	0	427	0	81	951
Grp Sat Flow(s),veh/h/ln	1755	0	1777	0	1781	1777
Q Serve(g_s), s	5.9	0.0	3.6	0.0	1.0	6.7
Cycle Q Clear(g_c), s	5.9	0.0	3.6	0.0	1.0	6.7
Prop In Lane	0.88	0.12		0.00	1.00	
Lane Grp Cap(c), veh/h	409	0	981	0	506	1744
V/C Ratio(X)	0.75	0.00	0.44	0.00	0.16	0.55
Avail Cap(c_a), veh/h	1453	0	5884	0	1598	5884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	0.0	10.8	0.0	7.1	6.4
Incr Delay (d2), s/veh	2.8	0.0	0.3	0.0	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.9	0.0	0.2	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.7	0.0	11.1	0.0	7.2	6.7
LnGrp LOS	B	A	B	A	A	A
Approach Vol, veh/h	308		427			1032
Approach Delay, s/veh	15.7		11.1			6.7
Approach LOS	B		B			A

Timer - Assigned Phs	1	2			6		8
Phs Duration (G+Y+Rc), s	7.8	15.0			22.8		13.5
Change Period (Y+Rc), s	5.0	5.0			5.0		5.0
Max Green Setting (Gmax), s	25.0	60.0			60.0		30.0
Max Q Clear Time (g_c+I1), s	3.0	5.6			8.7		7.9
Green Ext Time (p_c), s	0.1	2.8			7.5		0.9

Intersection Summary	
HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	102	61	42	93	4	64	40	47	12	160	35
Future Vol, veh/h	19	102	61	42	93	4	64	40	47	12	160	35
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	1	1	1	0	0	0	2	2	2	1	1	1
Mvmt Flow	19	104	62	43	95	4	65	41	48	12	163	36
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.5	9.4	9.3	9.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	42%	10%	30%	6%
Vol Thru, %	26%	56%	67%	77%
Vol Right, %	31%	34%	3%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	151	182	139	207
LT Vol	64	19	42	12
Through Vol	40	102	93	160
RT Vol	47	61	4	35
Lane Flow Rate	154	186	142	211
Geometry Grp	1	1	1	1
Degree of Util (X)	0.21	0.248	0.199	0.283
Departure Headway (Hd)	4.899	4.804	5.062	4.821
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	726	741	702	739
Service Time	2.978	2.88	3.143	2.894
HCM Lane V/C Ratio	0.212	0.251	0.202	0.286
HCM Control Delay	9.3	9.5	9.4	9.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	1	0.7	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	179	24	143	146	8	48	117	251	26	317	85
Future Volume (veh/h)	12	179	24	143	146	8	48	117	251	26	317	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1811	1811	1811	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	12	183	0	146	149	0	49	119	70	27	323	79
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	6	6	6	4	4	4	2	2	2
Cap, veh/h	721	757		172	175		146	519	438	349	409	100
Arrive On Green	0.40	0.40	0.00	0.20	0.20	0.00	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1795	1885	1598	875	893	1535	967	1841	1554	1192	1450	355
Grp Volume(v), veh/h	12	183	0	295	0	0	49	119	70	27	0	402
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1767	0	1535	967	1841	1554	1192	0	1805
Q Serve(g_s), s	0.4	6.4	0.0	16.0	0.0	0.0	4.9	4.9	3.4	1.8	0.0	20.5
Cycle Q Clear(g_c), s	0.4	6.4	0.0	16.0	0.0	0.0	25.4	4.9	3.4	6.7	0.0	20.5
Prop In Lane	1.00		1.00	0.49		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	721	757		347	0		146	519	438	349	0	509
V/C Ratio(X)	0.02	0.24		0.85	0.00		0.34	0.23	0.16	0.08	0.00	0.79
Avail Cap(c_a), veh/h	721	757		568	0		223	665	562	444	0	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	19.8	0.0	38.6	0.0	0.0	44.8	27.5	26.9	30.1	0.0	33.1
Incr Delay (d2), s/veh	0.0	0.8	0.0	6.6	0.0	0.0	1.3	0.2	0.2	0.1	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.0	0.0	7.6	0.0	0.0	1.2	2.2	1.2	0.5	0.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	20.5	0.0	45.2	0.0	0.0	46.1	27.7	27.1	30.1	0.0	38.1
LnGrp LOS	B	C		D	A		D	C	C	C	A	D
Approach Vol, veh/h		195	A		295	A		238			429	
Approach Delay, s/veh		20.4			45.2			31.3			37.6	
Approach LOS		C			D			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		44.0		32.1		23.6		32.1				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		40.0		36.0		32.0		36.0				
Max Q Clear Time (g_c+I1), s		8.4		22.5		18.0		27.4				
Green Ext Time (p_c), s		1.2		2.1		1.5		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	35.4
HCM 6th LOS	D

Notes
Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	286	14	66	278	149	123
Future Vol, veh/h	286	14	66	278	149	123
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	11	11	6	6	2	2
Mvmt Flow	292	14	67	284	152	126
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	14.5	12.4	12.5
HCM LOS	B	B	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	95%	55%
Vol Thru, %	19%	0%	45%
Vol Right, %	81%	5%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	344	300	272
LT Vol	0	286	149
Through Vol	66	0	123
RT Vol	278	14	0
Lane Flow Rate	351	306	278
Geometry Grp	1	1	1
Degree of Util (X)	0.477	0.497	0.423
Departure Headway (Hd)	4.895	5.841	5.485
Convergence, Y/N	Yes	Yes	Yes
Cap	734	618	655
Service Time	2.934	3.874	3.524
HCM Lane V/C Ratio	0.478	0.495	0.424
HCM Control Delay	12.4	14.5	12.5
HCM Lane LOS	B	B	B
HCM 95th-tile Q	2.6	2.8	2.1

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	19	149	5	6	102	3
Future Vol, veh/h	19	149	5	6	102	3
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	152	5	6	104	3
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.6	7.6	8.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	97%	0%	0%	45%
Vol Thru, %	0%	100%	0%	55%
Vol Right, %	3%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	19	149	11
LT Vol	102	0	0	5
Through Vol	0	19	0	6
RT Vol	3	0	149	0
Lane Flow Rate	107	19	152	11
Geometry Grp	2	7	7	5
Degree of Util (X)	0.132	0.025	0.17	0.014
Departure Headway (Hd)	4.419	4.729	4.027	4.555
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	800	750	880	791
Service Time	2.505	2.505	1.803	2.555
HCM Lane V/C Ratio	0.134	0.025	0.173	0.014
HCM Control Delay	8.2	7.6	7.6	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.6	0

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	105	74	6	54	120	464	5	31	50	144	20	15
Future Vol, veh/h	105	74	6	54	120	464	5	31	50	144	20	15
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	90	-	-	75	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	10	10	10
Mvmt Flow	107	76	6	55	122	473	5	32	51	147	20	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	122	0	0	84	0	0	546	527	81	567	530	123
Stage 1	-	-	-	-	-	-	295	295	-	232	232	-
Stage 2	-	-	-	-	-	-	251	232	-	335	298	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.2	6.6	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.2	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.2	5.6	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.59	4.09	3.39
Pot Cap-1 Maneuver	1459	-	-	1500	-	0	445	453	973	422	443	907
Stage 1	-	-	-	-	-	0	709	665	-	753	698	-
Stage 2	-	-	-	-	-	0	749	709	-	662	653	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	1459	-	-	1497	-	-	385	404	971	345	395	906
Mov Cap-2 Maneuver	-	-	-	-	-	-	385	404	-	345	395	-
Stage 1	-	-	-	-	-	-	656	615	-	698	672	-
Stage 2	-	-	-	-	-	-	687	683	-	551	604	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.3	2.3	11.9	23.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	609	1459	-	-	1497	-	369
HCM Lane V/C Ratio	0.144	0.073	-	-	0.037	-	0.495
HCM Control Delay (s)	11.9	7.7	-	-	7.5	-	23.9
HCM Lane LOS	B	A	-	-	A	-	C
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0.1	-	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	3	36	4	1	10	28	838	13	18	968	60
Future Volume (veh/h)	49	3	36	4	1	10	28	838	13	18	968	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.96	0.96		0.96	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1841	1841	1841	1826	1826	1826
Adj Flow Rate, veh/h	50	3	6	4	1	2	29	855	12	18	988	38
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	0	0	0	4	4	4	5	5	5
Cap, veh/h	407	19	272	266	77	80	48	1746	25	32	1683	741
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.03	0.49	0.49	0.02	0.49	0.49
Sat Flow, veh/h	1264	107	1502	674	424	439	1753	3530	50	1739	3469	1527
Grp Volume(v), veh/h	53	0	6	7	0	0	29	424	443	18	988	38
Grp Sat Flow(s),veh/h/ln	1371	0	1502	1537	0	0	1753	1749	1831	1739	1735	1527
Q Serve(g_s), s	1.1	0.0	0.1	0.0	0.0	0.0	0.6	6.3	6.3	0.4	8.0	0.5
Cycle Q Clear(g_c), s	1.3	0.0	0.1	0.1	0.0	0.0	0.6	6.3	6.3	0.4	8.0	0.5
Prop In Lane	0.94		1.00	0.57		0.29	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	427	0	272	423	0	0	48	865	906	32	1683	741
V/C Ratio(X)	0.12	0.00	0.02	0.02	0.00	0.00	0.60	0.49	0.49	0.57	0.59	0.05
Avail Cap(c_a), veh/h	1152	0	1073	1209	0	0	805	2854	2988	709	5484	2413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	0.0	13.2	13.2	0.0	0.0	18.9	6.6	6.6	19.1	7.3	5.3
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	0.0	11.3	0.4	0.4	15.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.0	0.0	0.0	0.4	1.4	1.5	0.3	1.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	0.0	13.2	13.2	0.0	0.0	30.1	7.0	7.0	34.2	7.6	5.4
LnGrp LOS	B	A	B	B	A	A	C	A	A	C	A	A
Approach Vol, veh/h		59			7			896			1044	
Approach Delay, s/veh		13.7			13.2			7.8			8.0	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.1	5.1	23.0		11.1	4.7	23.4				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		28.0	18.0	62.0		28.0	16.0	64.0				
Max Q Clear Time (g_c+I1), s		3.3	2.6	10.0		2.1	2.4	8.3				
Green Ext Time (p_c), s		0.2	0.0	9.0		0.0	0.0	6.4				
Intersection Summary												
HCM 6th Ctrl Delay			8.1									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	166	77	102	231	31	97	350	60	58	724	83
Future Volume (veh/h)	113	166	77	102	231	31	97	350	60	58	724	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	115	169	65	104	236	28	99	357	18	59	739	25
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	1	1	1	4	4	4	2	2	2
Cap, veh/h	149	378	146	136	477	57	129	1094	476	84	1017	442
Arrive On Green	0.08	0.30	0.30	0.08	0.29	0.29	0.07	0.31	0.31	0.05	0.29	0.29
Sat Flow, veh/h	1781	1272	489	1795	1646	195	1753	3497	1523	1781	3554	1544
Grp Volume(v), veh/h	115	0	234	104	0	264	99	357	18	59	739	25
Grp Sat Flow(s),veh/h/ln	1781	0	1761	1795	0	1841	1753	1749	1523	1781	1777	1544
Q Serve(g_s), s	4.7	0.0	8.1	4.3	0.0	8.9	4.2	5.9	0.6	2.4	14.0	0.9
Cycle Q Clear(g_c), s	4.7	0.0	8.1	4.3	0.0	8.9	4.2	5.9	0.6	2.4	14.0	0.9
Prop In Lane	1.00		0.28	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	0	524	136	0	533	129	1094	476	84	1017	442
V/C Ratio(X)	0.77	0.00	0.45	0.76	0.00	0.50	0.77	0.33	0.04	0.70	0.73	0.06
Avail Cap(c_a), veh/h	356	0	822	383	0	884	468	1773	772	261	1375	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	21.3	34.0	0.0	22.1	34.1	19.7	17.9	35.2	24.1	19.4
Incr Delay (d2), s/veh	8.2	0.0	0.6	8.6	0.0	0.7	9.1	0.2	0.0	10.1	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	3.3	2.2	0.0	3.8	2.0	2.2	0.2	1.2	5.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.8	0.0	21.9	42.6	0.0	22.8	43.2	20.0	18.0	45.3	25.8	19.5
LnGrp LOS	D	A	C	D	A	C	D	B	B	D	C	B
Approach Vol, veh/h		349			368			474			823	
Approach Delay, s/veh		28.5			28.4			24.7			27.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	28.4	10.7	27.3	10.5	26.5	11.3	26.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	11.0	38.0	16.0	35.0	20.0	29.0	15.0	36.0
Max Q Clear Time (g_c+I1), s	4.4	7.9	6.3	10.1	6.2	16.0	6.7	10.9
Green Ext Time (p_c), s	0.0	3.3	0.2	1.4	0.2	5.2	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	191	47	56	194	55	42	108	70	54	196	41
Future Volume (veh/h)	37	191	47	56	194	55	42	108	70	54	196	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.91		0.83	0.90		0.83	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1870	1856	1856	1885	1885	1885
Adj Flow Rate, veh/h	38	195	36	57	198	43	43	110	53	55	200	35
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	2	2	2	2	3	3	1	1	1
Cap, veh/h	112	410	70	136	368	72	203	493	215	194	664	107
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	133	1334	227	201	1196	235	246	950	414	230	1278	207
Grp Volume(v), veh/h	269	0	0	298	0	0	206	0	0	290	0	0
Grp Sat Flow(s),veh/h/ln	1694	0	0	1632	0	0	1609	0	0	1715	0	0
Q Serve(g_s), s	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.1	0.0	0.0	8.3	0.0	0.0	3.7	0.0	0.0	5.2	0.0	0.0
Prop In Lane	0.14		0.13	0.19		0.14	0.21		0.26	0.19		0.12
Lane Grp Cap(c), veh/h	592	0	0	576	0	0	911	0	0	965	0	0
V/C Ratio(X)	0.45	0.00	0.00	0.52	0.00	0.00	0.23	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	933	0	0	902	0	0	911	0	0	965	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.3	0.0	0.0	16.7	0.0	0.0	7.6	0.0	0.0	7.9	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.7	0.0	0.0	0.6	0.0	0.0	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.0	3.1	0.0	0.0	1.3	0.0	0.0	2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	0.0	0.0	17.4	0.0	0.0	8.1	0.0	0.0	8.7	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		269			298			206			290	
Approach Delay, s/veh		16.8			17.4			8.1			8.7	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.0		22.8		35.0		22.8				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		30.0		30.0		30.0		30.0				
Max Q Clear Time (g_c+I1), s		5.7		9.1		7.2		10.3				
Green Ext Time (p_c), s		1.3		1.7		1.9		1.9				

Intersection Summary			
HCM 6th Ctrl Delay			13.1
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	86	315	236	53	144	137
Future Vol, veh/h	86	315	236	53	144	137
Conflicting Peds, #/hr	2	0	0	2	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	88	321	241	54	147	140

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	297	0	-	0	769	272
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	499	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1276	-	-	-	369	767
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	610	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1274	-	-	-	337	764
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	609	-

Approach	EB		WB		SB
HCM Control Delay, s	1.7		0		24.6
HCM LOS					C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1274	-	-	-	463
HCM Lane V/C Ratio	0.069	-	-	-	0.619
HCM Control Delay (s)	8	0	-	-	24.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	4.1

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	131	328	16	156	133	14
Future Vol, veh/h	131	328	16	156	133	14
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	1	0	0	1	1
Mvmt Flow	134	335	16	159	136	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	471	0	497	306
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	193	-
Critical Hdwy	-	-	4.1	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.2	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1101	-	534	736
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	842	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1099	-	523	733
Mov Cap-2 Maneuver	-	-	-	-	523	-
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	538	-	-	1099	-
HCM Lane V/C Ratio	0.279	-	-	0.015	-
HCM Control Delay (s)	14.3	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.1	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	5	130	18	5	5	114	761	39	5	1486	71
Future Volume (veh/h)	36	5	130	18	5	5	114	761	39	5	1486	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1693	1693	1693	1841	1841	1841	1826	1826	1826
Adj Flow Rate, veh/h	37	5	14	18	5	1	116	777	38	5	1516	70
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	14	14	14	4	4	4	5	5	5
Cap, veh/h	214	22	119	162	32	4	150	2231	109	12	1954	90
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.09	0.66	0.66	0.01	0.58	0.58
Sat Flow, veh/h	1293	294	1599	706	435	50	1753	3393	166	1739	3377	155
Grp Volume(v), veh/h	42	0	14	24	0	0	116	400	415	5	776	810
Grp Sat Flow(s),veh/h/ln	1588	0	1599	1190	0	0	1753	1749	1811	1739	1735	1798
Q Serve(g_s), s	0.0	0.0	0.5	0.2	0.0	0.0	3.7	5.8	5.8	0.2	19.6	19.8
Cycle Q Clear(g_c), s	1.2	0.0	0.5	1.4	0.0	0.0	3.7	5.8	5.8	0.2	19.6	19.8
Prop In Lane	0.88		1.00	0.75		0.04	1.00		0.09	1.00		0.09
Lane Grp Cap(c), veh/h	236	0	119	198	0	0	150	1150	1191	12	1004	1040
V/C Ratio(X)	0.18	0.00	0.12	0.12	0.00	0.00	0.77	0.35	0.35	0.43	0.77	0.78
Avail Cap(c_a), veh/h	766	0	697	796	0	0	611	1525	1579	607	1513	1568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	0.0	24.8	25.0	0.0	0.0	25.7	4.4	4.4	28.4	9.2	9.3
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.0	3.2	0.1	0.1	9.1	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.2	0.3	0.0	0.0	1.6	1.3	1.3	0.1	5.4	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	25.0	25.1	0.0	0.0	28.9	4.5	4.5	37.5	10.3	10.4
LnGrp LOS	C	A	C	C	A	A	C	A	A	D	B	B
Approach Vol, veh/h		56			24			931			1591	
Approach Delay, s/veh		25.2			25.1			7.5			10.4	
Approach LOS		C			C			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	42.7		9.3	9.9	38.2		9.3				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	20.0	50.0		25.0	20.0	50.0		30.0				
Max Q Clear Time (g_c+I1), s	2.2	7.8		3.2	5.7	21.8		3.4				
Green Ext Time (p_c), s	0.0	4.5		0.1	0.1	11.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	257	254	159	283	130	227	424	80	116	898	100
Future Volume (veh/h)	225	257	254	159	283	130	227	424	80	116	898	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.95	1.00		0.94	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	230	262	78	162	289	113	232	433	32	118	916	44
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	3	3
Cap, veh/h	628	340	276	585	419	159	275	1418	593	150	1162	495
Arrive On Green	0.18	0.18	0.18	0.16	0.16	0.16	0.15	0.40	0.40	0.08	0.33	0.33
Sat Flow, veh/h	3456	1870	1520	3563	2547	965	1781	3554	1486	1767	3526	1501
Grp Volume(v), veh/h	230	262	78	162	210	192	232	433	32	118	916	44
Grp Sat Flow(s),veh/h/ln	1728	1870	1520	1781	1870	1642	1781	1777	1486	1767	1763	1501
Q Serve(g_s), s	5.5	12.5	4.2	3.7	9.9	10.4	11.9	7.8	1.2	6.2	22.1	1.9
Cycle Q Clear(g_c), s	5.5	12.5	4.2	3.7	9.9	10.4	11.9	7.8	1.2	6.2	22.1	1.9
Prop In Lane	1.00		1.00	1.00		0.59	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	628	340	276	585	307	270	275	1418	593	150	1162	495
V/C Ratio(X)	0.37	0.77	0.28	0.28	0.68	0.71	0.84	0.31	0.05	0.79	0.79	0.09
Avail Cap(c_a), veh/h	1396	756	614	1212	636	559	739	2834	1185	357	2061	878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	36.6	33.2	34.4	37.0	37.2	38.7	19.3	17.4	42.2	28.6	21.8
Incr Delay (d2), s/veh	0.4	3.7	0.6	0.3	2.7	3.5	7.0	0.1	0.0	8.9	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	5.9	1.5	1.6	4.7	4.3	5.5	3.0	0.4	2.9	8.8	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	40.3	33.7	34.7	39.7	40.7	45.7	19.5	17.4	51.1	29.8	21.9
LnGrp LOS	C	D	C	C	D	D	D	B	B	D	C	C
Approach Vol, veh/h		570			564			697			1078	
Approach Delay, s/veh		36.9			38.6			28.1			31.8	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	41.5		21.1	18.5	35.0		19.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	19.0	75.0		38.0	39.0	55.0		32.0
Max Q Clear Time (g_c+I1), s	8.2	9.8		14.5	13.9	24.1		12.4
Green Ext Time (p_c), s	0.2	2.9		2.6	0.6	6.9		2.8

Intersection Summary	
HCM 6th Ctrl Delay	33.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	377	65	207	430	185	35	121	68	144	205	73
Future Volume (veh/h)	34	377	65	207	430	185	35	121	68	144	205	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	385	61	211	439	180	36	123	51	147	209	64
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	2	2	2	1	1	1	1	1	1
Cap, veh/h	235	519	82	401	504	207	66	198	82	187	311	95
Arrive On Green	0.04	0.33	0.33	0.10	0.40	0.40	0.04	0.16	0.16	0.10	0.23	0.23
Sat Flow, veh/h	1767	1562	247	1781	1258	516	1795	1254	520	1795	1377	422
Grp Volume(v), veh/h	35	0	446	211	0	619	36	0	174	147	0	273
Grp Sat Flow(s),veh/h/ln	1767	0	1809	1781	0	1774	1795	0	1774	1795	0	1799
Q Serve(g_s), s	0.8	0.0	14.5	4.8	0.0	21.3	1.3	0.0	6.1	5.3	0.0	9.2
Cycle Q Clear(g_c), s	0.8	0.0	14.5	4.8	0.0	21.3	1.3	0.0	6.1	5.3	0.0	9.2
Prop In Lane	1.00		0.14	1.00		0.29	1.00		0.29	1.00		0.23
Lane Grp Cap(c), veh/h	235	0	602	401	0	710	66	0	280	187	0	406
V/C Ratio(X)	0.15	0.00	0.74	0.53	0.00	0.87	0.55	0.00	0.62	0.79	0.00	0.67
Avail Cap(c_a), veh/h	572	0	955	620	0	937	406	0	937	406	0	950
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	19.6	13.5	0.0	18.3	31.4	0.0	26.1	29.0	0.0	23.4
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.4	0.0	7.2	2.6	0.0	2.3	2.7	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	5.6	1.7	0.0	9.0	0.6	0.0	2.6	2.3	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.8	0.0	20.3	13.9	0.0	25.5	34.0	0.0	28.3	31.7	0.0	25.4
LnGrp LOS	B	A	C	B	A	C	C	A	C	C	A	C
Approach Vol, veh/h		481			830			210			420	
Approach Delay, s/veh		19.9			22.5			29.3			27.6	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	15.5	11.9	27.0	7.4	19.9	7.4	31.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	15.0	35.0	15.0	35.0	15.0	35.0	15.0	35.0
Max Q Clear Time (g_c+I1), s	7.3	8.1	6.8	16.5	3.3	11.2	2.8	23.3
Green Ext Time (p_c), s	0.1	1.0	0.2	1.7	0.0	1.6	0.0	3.2

Intersection Summary	
HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1523	0	0	579	0	97	0	190	0	0	0
Future Vol, veh/h	0	1523	0	0	579	0	97	0	190	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	0	0	0
Mvmt Flow	0	1554	0	0	591	0	99	0	194	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	-	0	-	-	-	0	2145	-	-
Stage 1	-	-	-	-	-	-	1554	-	-
Stage 2	-	-	-	-	-	-	591	-	-
Critical Hdwy	-	-	-	-	-	-	6.615	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.815	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.415	-	-
Follow-up Hdwy	-	-	-	-	-	-	3.5095	-	-
Pot Cap-1 Maneuver	0	-	0	0	-	-	~ 48	0	0
Stage 1	0	-	0	0	-	-	162	0	0
Stage 2	0	-	0	0	-	-	555	0	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	-	~ 48	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	0	-
Stage 1	-	-	-	-	-	-	162	0	-
Stage 2	-	-	-	-	-	-	555	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	91.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBT	WBR
Capacity (veh/h)	129	-	-	-	-
HCM Lane V/C Ratio	0.767	-	-	-	-
HCM Control Delay (s)	91.8	0	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	4.5	-	-	-	-

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	477	92	512	653	1	190	0	522	0	2	2
Future Volume (vph)	3	477	92	512	653	1	190	0	522	0	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.0	5.7			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.88		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	
Flpb, ped/bikes	0.98	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (prot)	1706	3379		1770	3538			1770	2641		1772	
Flt Permitted	0.39	1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (perm)	705	3379		1770	3538			1770	2641		1772	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	497	96	533	680	1	198	0	544	0	2	2
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	469	0	2	0
Lane Group Flow (vph)	3	576	0	533	681	0	0	198	75	0	2	0
Confl. Peds. (#/hr)	15		1	1		15			9	9		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA		Prot	NA		Split	NA	Perm		NA	
Protected Phases		4		3			2	2		1	1	
Permitted Phases	4				8				2		1	
Actuated Green, G (s)	21.4	21.4		43.1	69.5			13.7	13.7		1.1	
Effective Green, g (s)	21.4	21.4		43.1	69.5			13.7	13.7		1.1	
Actuated g/C Ratio	0.21	0.21		0.43	0.70			0.14	0.14		0.01	
Clearance Time (s)	5.7	5.7		5.0	5.7			5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0		3.0	2.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	150	723		762	2458			242	361		19	
v/s Ratio Prot		c0.17		c0.30				c0.11			c0.00	
v/s Ratio Perm	0.00				0.19				0.03			
v/c Ratio	0.02	0.80		0.70	0.28			0.82	0.21		0.11	
Uniform Delay, d1	31.0	37.2		23.2	5.8			41.9	38.3		49.0	
Progression Factor	1.00	1.00		0.95	2.63			1.04	2.07		1.00	
Incremental Delay, d2	0.1	6.1		3.1	0.2			17.0	0.1		0.9	
Delay (s)	31.1	43.4		25.1	15.3			60.6	79.5		49.9	
Level of Service	C	D		C	B			E	E		D	
Approach Delay (s)		43.3			19.6			74.4			49.9	
Approach LOS		D			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	97	499	169	59	43	502	776	165	80	860	64
Future Volume (veh/h)	73	97	499	169	59	43	502	776	165	80	860	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1900	1900	1900	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	74	99	475	172	60	24	512	792	153	82	878	24
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	4	4	4	0	0	0	3	3	3	4	4	4
Cap, veh/h	239	320	756	205	145	58	599	1145	221	104	1008	422
Arrive On Green	0.31	0.31	0.31	0.11	0.11	0.11	0.17	0.39	0.39	0.06	0.27	0.27
Sat Flow, veh/h	771	1031	1557	1810	1282	513	3428	2941	568	1753	3681	1541
Grp Volume(v), veh/h	173	0	475	172	0	84	512	475	470	82	878	24
Grp Sat Flow(s),veh/h/ln	1802	0	1557	1810	0	1795	1714	1763	1746	1753	1841	1541
Q Serve(g_s), s	9.2	0.0	28.3	11.6	0.0	5.4	18.1	28.1	28.1	5.8	28.4	1.4
Cycle Q Clear(g_c), s	9.2	0.0	28.3	11.6	0.0	5.4	18.1	28.1	28.1	5.8	28.4	1.4
Prop In Lane	0.43		1.00	1.00		0.29	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	559	0	756	205	0	203	599	686	680	104	1008	422
V/C Ratio(X)	0.31	0.00	0.63	0.84	0.00	0.41	0.86	0.69	0.69	0.79	0.87	0.06
Avail Cap(c_a), veh/h	559	0	756	232	0	230	1015	846	838	224	1149	481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	0.0	23.9	54.3	0.0	51.6	50.1	31.9	31.9	58.0	43.3	33.5
Incr Delay (d2), s/veh	1.4	0.0	3.9	21.2	0.0	1.3	0.4	0.2	0.2	12.4	6.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	10.9	6.5	0.0	2.5	7.7	11.8	11.7	2.9	13.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.3	0.0	27.8	75.6	0.0	52.9	50.4	32.1	32.1	70.4	50.1	33.5
LnGrp LOS	C	A	C	E	A	D	D	C	C	E	D	C
Approach Vol, veh/h		648			256			1457			984	
Approach Delay, s/veh		29.5			68.1			38.5			51.4	
Approach LOS		C			E			D			D	

Timer - Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		42.8	25.8	38.2		18.1	11.4	52.7
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		17.0	37.0	39.0		16.0	16.0	60.0
Max Q Clear Time (g_c+I1), s		30.3	20.1	30.4		13.6	7.8	30.1
Green Ext Time (p_c), s		0.0	1.7	3.8		0.2	0.1	6.8

Intersection Summary		
HCM 6th Ctrl Delay		42.8
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✢			✢			✢			✢	
Traffic Vol, veh/h	11	26	10	22	22	23	5	210	19	32	388	30
Future Vol, veh/h	11	26	10	22	22	23	5	210	19	32	388	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles, %	3	3	3	5	5	5	1	1	1	3	3	3
Mvmt Flow	11	27	10	22	22	23	5	214	19	33	396	31
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	9.2	9.9	13.5
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	23%	33%	7%
Vol Thru, %	90%	55%	33%	86%
Vol Right, %	8%	21%	34%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	234	47	67	450
LT Vol	5	11	22	32
Through Vol	210	26	22	388
RT Vol	19	10	23	30
Lane Flow Rate	239	48	68	459
Geometry Grp	1	1	1	1
Degree of Util (X)	0.311	0.074	0.104	0.575
Departure Headway (Hd)	4.69	5.542	5.479	4.51
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	762	640	649	799
Service Time	2.743	3.627	3.56	2.554
HCM Lane V/C Ratio	0.314	0.075	0.105	0.574
HCM Control Delay	9.9	9.1	9.2	13.5
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	1.3	0.2	0.3	3.7

Intersection						
Int Delay, s/veh	1.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	56	582	0	816	321	0
Future Vol, veh/h	56	582	0	816	321	0
Conflicting Peds, #/hr	2	2	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	50	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	57	594	0	833	328	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1163	-	-	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Critical Hdwy	6.41	-	-	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	-	-	-	-	-
Pot Cap-1 Maneuver	216	0	0	-	-	0
Stage 1	732	0	0	-	-	0
Stage 2	428	0	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	216	-	-	-	-	-
Mov Cap-2 Maneuver	216	-	-	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	428	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	27.6		0		0	
HCM LOS	D					

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	216	-	-
HCM Lane V/C Ratio	-	0.265	-	-
HCM Control Delay (s)	-	27.6	0	-
HCM Lane LOS	-	D	A	-
HCM 95th %tile Q(veh)	-	1	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1010	103	190	773	79	127
Future Volume (vph)	1010	103	190	773	79	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	1840		1770	1863	1675	
Flt Permitted	1.00		0.07	1.00	0.98	
Satd. Flow (perm)	1840		134	1863	1675	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1063	108	200	814	83	134
RTOR Reduction (vph)	2	0	0	0	55	0
Lane Group Flow (vph)	1169	0	200	814	162	0
Turn Type	NA		pm+pt	NA	Perm	
Protected Phases	4		3	8		
Permitted Phases			8		2	
Actuated Green, G (s)	50.5		66.7	66.7	13.4	
Effective Green, g (s)	50.5		66.7	66.7	13.4	
Actuated g/C Ratio	0.56		0.74	0.74	0.15	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	2.5	
Lane Grp Cap (vph)	1031		302	1379	249	
v/s Ratio Prot	c0.64		0.08	c0.44		
v/s Ratio Perm			0.41		c0.10	
v/c Ratio	1.13		0.66	0.59	0.65	
Uniform Delay, d1	19.8		25.3	5.4	36.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	72.4		5.4	0.7	5.1	
Delay (s)	92.2		30.6	6.1	41.2	
Level of Service	F		C	A	D	
Approach Delay (s)	92.2			10.9	41.2	
Approach LOS	F			B	D	

Intersection Summary			
HCM 2000 Control Delay	53.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	337	19	152	53	75	10	37	153	5	18	522	435
Future Volume (veh/h)	337	19	152	53	75	10	37	153	5	18	522	435
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	344	19	41	54	77	2	38	156	1	18	533	199
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	457	120	259	82	264	224	387	1504	671	627	1447	645
Arrive On Green	0.13	0.23	0.23	0.05	0.14	0.14	0.04	0.42	0.42	0.02	0.41	0.41
Sat Flow, veh/h	3456	527	1138	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	344	0	60	54	77	2	38	156	1	18	533	199
Grp Sat Flow(s),veh/h/ln	1728	0	1666	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	6.8	0.0	2.0	2.1	2.6	0.1	0.9	1.9	0.0	0.4	7.4	6.0
Cycle Q Clear(g_c), s	6.8	0.0	2.0	2.1	2.6	0.1	0.9	1.9	0.0	0.4	7.4	6.0
Prop In Lane	1.00		0.68	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	457	0	379	82	264	224	387	1504	671	627	1447	645
V/C Ratio(X)	0.75	0.00	0.16	0.66	0.29	0.01	0.10	0.10	0.00	0.03	0.37	0.31
Avail Cap(c_a), veh/h	1219	0	1175	628	1320	1118	949	1504	671	1344	1504	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	0.0	21.9	33.2	27.3	26.2	11.6	12.3	11.8	11.7	14.7	14.2
Incr Delay (d2), s/veh	0.9	0.0	0.2	3.3	0.6	0.0	0.0	0.1	0.0	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.8	1.0	1.2	0.0	0.3	0.7	0.0	0.1	2.7	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	0.0	22.1	36.5	27.9	26.2	11.6	12.5	11.8	11.7	14.7	14.3
LnGrp LOS	C	A	C	D	C	C	B	B	B	B	B	B
Approach Vol, veh/h		404			133			195			750	
Approach Delay, s/veh		29.3			31.4			12.3			14.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	21.1	7.6	33.9	14.4	15.0	6.5	35.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	50.0	25.0	30.0	25.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	4.1	4.0	2.9	9.4	8.8	4.6	2.4	3.9
Green Ext Time (p_c), s	0.1	0.3	0.0	2.6	0.6	0.5	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	0	467	0	756	1	848	122	263	804	0
Future Volume (vph)	2	0	0	467	0	756	1	848	122	263	804	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		5.0		5.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00		1.00		0.88	1.00	0.95		0.97	0.95	
Frt		1.00		1.00		0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.95		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1805		1752		2760	1736	3406		3155	3252	
Flt Permitted		0.95		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1805		1752		2760	1736	3406		3155	3252	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2	0	0	477	0	771	1	865	124	268	820	0
RTOR Reduction (vph)	0	0	0	0	0	363	0	7	0	0	0	0
Lane Group Flow (vph)	0	2	0	477	0	408	1	982	0	268	820	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	11%	11%	11%
Turn Type	Split	NA		Prot		pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3		4		4 1	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		8.8		35.5		56.6	5.1	43.8		16.1	54.8	
Effective Green, g (s)		8.8		35.5		56.6	5.1	43.8		16.1	54.8	
Actuated g/C Ratio		0.07		0.28		0.44	0.04	0.34		0.13	0.43	
Clearance Time (s)		6.0		5.0			6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		2.0			2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		124		488		1228	69	1172		399	1401	
v/s Ratio Prot		c0.00		c0.27		0.15	0.00	c0.29		c0.08	0.25	
v/s Ratio Perm												
v/c Ratio		0.02		0.98		0.33	0.01	0.84		0.67	0.59	
Uniform Delay, d1		55.2		45.5		23.0	58.6	38.4		53.0	27.6	
Progression Factor		1.00		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		34.4		0.1	0.0	5.2		3.5	0.4	
Delay (s)		55.2		79.9		23.1	58.7	43.6		56.5	28.0	
Level of Service		E		E		C	E	D		E	C	
Approach Delay (s)		55.2			44.8			43.6			35.0	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	127.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	141	253	754	173	289	476
Future Volume (vph)	141	253	754	173	289	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1597	3195	3374		3433	1583
Flt Permitted	0.17	1.00	1.00		0.95	1.00
Satd. Flow (perm)	279	3195	3374		3433	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	150	269	802	184	307	506
RTOR Reduction (vph)	0	0	8	0	0	430
Lane Group Flow (vph)	150	269	978	0	307	76
Heavy Vehicles (%)	13%	13%	4%	4%	2%	2%
Turn Type	pm+pt	NA	NA		Prot	Prot
Protected Phases	7	4	8		6	6
Permitted Phases	4					
Actuated Green, G (s)	59.6	59.6	40.5		13.4	13.4
Effective Green, g (s)	59.6	59.6	40.5		13.4	13.4
Actuated g/C Ratio	0.67	0.67	0.46		0.15	0.15
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	396	2146	1540		518	239
v/s Ratio Prot	c0.06	0.08	c0.29		c0.09	0.05
v/s Ratio Perm	0.19					
v/c Ratio	0.38	0.13	0.63		0.59	0.32
Uniform Delay, d1	8.4	5.2	18.4		35.1	33.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.0	0.6		1.2	0.3
Delay (s)	8.6	5.2	19.1		36.3	33.9
Level of Service	A	A	B		D	C
Approach Delay (s)		6.4	19.1		34.8	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	88.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection						
Int Delay, s/veh	1.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	482	709	91	66	43
Future Vol, veh/h	34	482	709	91	66	43
Conflicting Peds, #/hr	7	0	0	7	0	6
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	160	-	-	-	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	35	492	723	93	67	44

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	823	0	-	0	1093	421
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	316	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	803	-	-	-	212	587
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	718	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	798	-	-	-	200	580
Mov Cap-2 Maneuver	-	-	-	-	313	-
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	16.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	798	-	-	-	313	580
HCM Lane V/C Ratio	0.043	-	-	-	0.215	0.076
HCM Control Delay (s)	9.7	-	-	-	19.6	11.7
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	650	20	410	1040	240	0	70	390	760	310	780
Future Volume (vph)	160	650	20	410	1040	240	0	70	390	760	310	780
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95	1.00	0.97	1.00	0.88
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3486		1752	3505	1568		3167	1417	3400	1845	2760
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3486		1752	3505	1568		3167	1417	3400	1845	2760
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	684	21	432	1095	253	0	74	411	800	326	821
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	372	0	0	7
Lane Group Flow (vph)	168	703	0	432	1095	253	0	74	39	800	326	814
Confl. Peds. (#/hr)			3	3			2		4	4		2
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	14%	14%	14%	3%	3%	3%
Turn Type	Split	NA		Split	NA	Free		NA	Prot	Split	NA	custom
Protected Phases	2	2		3	3			1	1	4	4	1 2 4
Permitted Phases		2				Free						
Actuated Green, G (s)	33.8	33.8		49.0	49.0	147.8		14.0	14.0	35.0	35.0	90.8
Effective Green, g (s)	33.8	33.8		49.0	49.0	147.8		14.0	14.0	35.0	35.0	90.8
Actuated g/C Ratio	0.23	0.23		0.33	0.33	1.00		0.09	0.09	0.24	0.24	0.61
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	777	797		580	1162	1568		299	134	805	436	1695
v/s Ratio Prot	0.05	c0.20		0.25	c0.31			0.02	0.03	c0.24	0.18	c0.29
v/s Ratio Perm						0.16						
v/c Ratio	0.22	0.88		0.74	0.94	0.16		0.25	0.29	0.99	0.75	0.48
Uniform Delay, d1	46.3	55.1		43.9	48.0	0.0		62.0	62.3	56.3	52.3	15.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	11.3		5.2	14.6	0.2		0.4	1.2	30.0	6.9	0.2
Delay (s)	46.4	66.4		49.0	62.7	0.2		62.5	63.5	86.3	59.2	15.8
Level of Service	D	E		D	E	A		E	E	F	E	B
Approach Delay (s)		62.5			50.5			63.3			52.0	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	147.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	540	700	690	240	200	40	140	880	300	90	900	500
Future Volume (vph)	540	700	690	240	200	40	140	880	300	90	900	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		1.00	0.95		1.00	0.91	0.88
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	2746	1752	3407		1770	3389		1770	5085	2707
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	2746	1752	3407		1770	3389		1770	5085	2707
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	568	737	726	253	211	42	147	926	316	95	947	526
RTOR Reduction (vph)	0	0	489	0	11	0	0	22	0	0	0	397
Lane Group Flow (vph)	568	737	237	253	242	0	147	1220	0	95	947	129
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		2
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	7		8	4		2	6		5	1	
Permitted Phases			7									1
Actuated Green, G (s)	49.0	34.1	34.1	26.0	11.1		31.0	56.6		9.1	34.7	34.7
Effective Green, g (s)	49.0	34.1	34.1	26.0	11.1		31.0	56.6		9.1	34.7	34.7
Actuated g/C Ratio	0.35	0.24	0.24	0.18	0.08		0.22	0.40		0.06	0.24	0.24
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	611	851	660	321	266		386	1352		113	1244	662
v/s Ratio Prot	c0.32	0.21		c0.14	0.07		0.08	c0.36		0.05	c0.19	
v/s Ratio Perm			0.09									0.05
v/c Ratio	0.93	0.87	0.36	0.79	0.91		0.38	0.90		0.84	0.76	0.19
Uniform Delay, d1	44.7	51.7	44.8	55.3	64.9		47.2	40.0		65.6	49.7	42.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.6	9.2	0.3	12.1	32.0		0.6	8.6		40.1	2.8	0.1
Delay (s)	65.3	60.9	45.1	67.3	96.9		47.8	48.6		105.7	52.5	42.6
Level of Service	E	E	D	E	F		D	D		F	D	D
Approach Delay (s)		56.5			82.1			48.5			52.4	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	55.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	141.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	50	110	10	10	30	870	70	30	1890	20
Future Volume (veh/h)	10	10	50	110	10	10	30	870	70	30	1890	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	11	11	17	116	11	2	32	916	48	32	1989	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	2	2	2	3	3	3	2	2	2
Cap, veh/h	264	86	133	252	204	37	56	2284	1016	57	2333	25
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.03	0.65	0.65	0.03	0.65	0.65
Sat Flow, veh/h	1370	649	1003	1374	1538	280	1767	3526	1569	1781	3602	38
Grp Volume(v), veh/h	11	0	28	116	0	13	32	916	48	32	979	1031
Grp Sat Flow(s),veh/h/ln	1370	0	1652	1374	0	1818	1767	1763	1569	1781	1777	1863
Q Serve(g_s), s	0.6	0.0	1.2	6.5	0.0	0.5	1.4	9.9	0.9	1.4	34.6	34.9
Cycle Q Clear(g_c), s	1.1	0.0	1.2	7.7	0.0	0.5	1.4	9.9	0.9	1.4	34.6	34.9
Prop In Lane	1.00		0.61	1.00		0.15	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	264	0	220	252	0	242	56	2284	1016	57	1151	1207
V/C Ratio(X)	0.04	0.00	0.13	0.46	0.00	0.05	0.57	0.40	0.05	0.56	0.85	0.85
Avail Cap(c_a), veh/h	510	0	517	499	0	568	111	3263	1452	134	1667	1748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	0.0	30.6	34.0	0.0	30.3	38.2	6.7	5.1	38.2	11.1	11.1
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.5	0.0	0.0	3.3	0.0	0.0	3.3	2.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.5	2.1	0.0	0.2	0.7	2.9	0.2	0.7	10.9	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	30.7	34.5	0.0	30.3	41.5	6.7	5.1	41.4	13.1	13.2
LnGrp LOS	C	A	C	C	A	C	D	A	A	D	B	B
Approach Vol, veh/h		39			129			996			2042	
Approach Delay, s/veh		30.7			34.0			7.8			13.6	
Approach LOS		C			C			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	56.8		15.6	7.5	56.8		15.6				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	6.0	74.0		25.0	5.0	75.0		25.0				
Max Q Clear Time (g_c+I1), s	3.4	11.9		3.2	3.4	36.9		9.7				
Green Ext Time (p_c), s	0.0	4.8		0.1	0.0	14.9		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			12.8									
HCM 6th LOS			B									

Intersection						
Int Delay, s/veh	2.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	100	70	320	640	60
Future Vol, veh/h	20	100	70	320	640	60
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	21	105	74	337	674	63

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1192	707	738	0	-	0
Stage 1	707	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.17	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.263	-	-	-
Pot Cap-1 Maneuver	202	427	846	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	184	427	845	-	-	-
Mov Cap-2 Maneuver	184	-	-	-	-	-
Stage 1	437	-	-	-	-	-
Stage 2	608	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	845	-	350	-	-
HCM Lane V/C Ratio	0.087	-	0.361	-	-
HCM Control Delay (s)	9.7	-	21	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.3	-	1.6	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	110	30	0	0	0	40	520	80	760	860	640
Future Volume (veh/h)	350	110	30	0	0	0	40	520	80	760	860	640
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	242	292	6				42	547	0	800	905	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2				2	2	2	2	2	2
Cap, veh/h	341	358	303				54	665		843	2239	
Arrive On Green	0.19	0.19	0.19				0.03	0.19	0.00	0.47	0.63	0.00
Sat Flow, veh/h	1781	1870	1585				1781	3647	0	1781	3554	1585
Grp Volume(v), veh/h	242	292	6				42	547	0	800	905	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				1781	1777	0	1781	1777	1585
Q Serve(g_s), s	12.0	14.1	0.3				2.2	13.9	0.0	40.5	11.9	0.0
Cycle Q Clear(g_c), s	12.0	14.1	0.3				2.2	13.9	0.0	40.5	11.9	0.0
Prop In Lane	1.00		1.00				1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	341	358	303				54	665		843	2239	
V/C Ratio(X)	0.71	0.82	0.02				0.78	0.82		0.95	0.40	
Avail Cap(c_a), veh/h	624	655	555				170	679		1040	2414	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.7	36.5	30.9				45.4	36.8	0.0	23.7	8.6	0.0
Incr Delay (d2), s/veh	2.7	4.6	0.0				21.5	7.9	0.0	15.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	6.9	0.0				1.3	6.5	0.0	19.1	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	41.1	31.0				66.9	44.7	0.0	39.0	8.8	0.0
LnGrp LOS	D	D	C				E	D		D	A	
Approach Vol, veh/h		540						589	A		1705	A
Approach Delay, s/veh		39.8						46.3			23.0	
Approach LOS		D						D			C	

Timer - Assigned Phs	1	2		4	5	6
Phs Duration (G+Y+Rc), s	49.6	21.6		23.0	7.8	63.4
Change Period (Y+Rc), s	4.5	5.5		4.5	4.5	5.5
Max Green Setting (Gmax), s	55.5	16.5		33.5	9.5	62.5
Max Q Clear Time (g_c+I1), s	42.5	15.9		16.1	4.2	13.9
Green Ext Time (p_c), s	2.6	0.2		2.4	0.0	7.7

Intersection Summary	
HCM 6th Ctrl Delay	31.0
HCM 6th LOS	C

Notes
User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	21

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	5	170	5	5	20	30	370	10	50	720	20
Future Vol, veh/h	60	5	170	5	5	20	30	370	10	50	720	20
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	225	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	6	6	0	0	0	9	9	9	7	7	7
Mvmt Flow	63	5	179	5	5	21	32	389	11	53	758	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1351	1343	773	1430	1348	399	781	0	0	402	0	0
Stage 1	877	877	-	461	461	-	-	-	-	-	-	-
Stage 2	474	466	-	969	887	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.1	6.5	6.2	4.19	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.5	4	3.3	2.281	-	-	2.263	-	-
Pot Cap-1 Maneuver	125	149	393	113	152	655	806	-	-	1130	-	-
Stage 1	338	361	-	584	569	-	-	-	-	-	-	-
Stage 2	564	556	-	307	365	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	110	136	392	56	138	653	804	-	-	1128	-	-
Mov Cap-2 Maneuver	110	136	-	56	138	-	-	-	-	-	-	-
Stage 1	324	343	-	559	545	-	-	-	-	-	-	-
Stage 2	518	533	-	156	347	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	124.6	27.4	0.7	0.5
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	804	-	-	231	192	1128	-	-
HCM Lane V/C Ratio	0.039	-	-	1.071	0.164	0.047	-	-
HCM Control Delay (s)	9.7	-	-	124.6	27.4	8.3	-	-
HCM Lane LOS	A	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	10.7	0.6	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	440	50	710	60	90	1350
Future Volume (veh/h)	440	50	710	60	90	1350
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	463	50	747	58	95	1421
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	523	56	1344	104	361	1887
Arrive On Green	0.33	0.33	0.40	0.40	0.06	0.53
Sat Flow, veh/h	1586	171	3435	259	1781	3647
Grp Volume(v), veh/h	514	0	397	408	95	1421
Grp Sat Flow(s),veh/h/ln	1760	0	1777	1824	1781	1777
Q Serve(g_s), s	19.8	0.0	12.3	12.4	2.1	22.4
Cycle Q Clear(g_c), s	19.8	0.0	12.3	12.4	2.1	22.4
Prop In Lane	0.90	0.10		0.14	1.00	
Lane Grp Cap(c), veh/h	580	0	715	733	361	1887
V/C Ratio(X)	0.89	0.00	0.56	0.56	0.26	0.75
Avail Cap(c_a), veh/h	1275	0	1411	1448	405	3367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	16.5	16.5	11.6	13.2
Incr Delay (d2), s/veh	4.8	0.0	0.7	0.7	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	0.0	4.4	4.5	0.7	7.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.5	0.0	17.2	17.2	11.8	13.8
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h	514		805			1516
Approach Delay, s/veh	27.5		17.2			13.7
Approach LOS	C		B			B

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	9.2	33.9	43.1	28.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	57.0	68.0	52.0
Max Q Clear Time (g_c+I1), s	4.1	14.4	24.4	21.8
Green Ext Time (p_c), s	0.0	5.1	13.7	1.8

Intersection Summary	
HCM 6th Ctrl Delay	17.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Intersection Delay, s/veh	18.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	30	120	90	80	140	10	160	60	80	20	290	80
Future Vol, veh/h	30	120	90	80	140	10	160	60	80	20	290	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	1	1	0	0	0	2	2	2	1	1	1
Mvmt Flow	32	126	95	84	147	11	168	63	84	21	305	84
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.6	16	18	23.3
HCM LOS	C	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	53%	12%	35%	5%
Vol Thru, %	20%	50%	61%	74%
Vol Right, %	27%	38%	4%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	300	240	230	390
LT Vol	160	30	80	20
Through Vol	60	120	140	290
RT Vol	80	90	10	80
Lane Flow Rate	316	253	242	411
Geometry Grp	1	1	1	1
Degree of Util (X)	0.57	0.468	0.465	0.71
Departure Headway (Hd)	6.501	6.676	6.913	6.228
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	553	536	518	579
Service Time	4.587	4.768	5.007	4.306
HCM Lane V/C Ratio	0.571	0.472	0.467	0.71
HCM Control Delay	18	15.6	16	23.3
HCM Lane LOS	C	C	C	C
HCM 95th-tile Q	3.5	2.5	2.4	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	220	30	230	250	10	70	130	310	40	330	100
Future Volume (veh/h)	50	220	30	230	250	10	70	130	310	40	330	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1811	1811	1811	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	53	232	0	242	263	0	74	137	304	42	347	104
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	6	6	6	4	4	4	2	2	2
Cap, veh/h	529	555		255	278		124	558	471	295	418	125
Arrive On Green	0.29	0.29	0.00	0.30	0.30	0.00	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1795	1885	1598	848	921	1535	925	1841	1555	947	1381	414
Grp Volume(v), veh/h	53	232	0	505	0	0	74	137	304	42	0	451
Grp Sat Flow(s),veh/h/ln	1795	1885	1598	1769	0	1535	925	1841	1555	947	0	1794
Q Serve(g_s), s	2.5	11.8	0.0	33.2	0.0	0.0	8.2	6.7	20.1	4.2	0.0	27.8
Cycle Q Clear(g_c), s	2.5	11.8	0.0	33.2	0.0	0.0	36.0	6.7	20.1	10.8	0.0	27.8
Prop In Lane	1.00		1.00	0.48		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	529	555		533	0		124	558	471	295	0	544
V/C Ratio(X)	0.10	0.42		0.95	0.00		0.59	0.25	0.65	0.14	0.00	0.83
Avail Cap(c_a), veh/h	529	555		551	0		124	558	471	295	0	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.5	33.7	0.0	40.6	0.0	0.0	55.9	31.2	35.9	35.2	0.0	38.5
Incr Delay (d2), s/veh	0.4	2.3	0.0	25.5	0.0	0.0	7.4	0.2	3.0	0.2	0.0	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.8	0.0	18.2	0.0	0.0	2.5	3.0	7.9	1.0	0.0	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	36.0	0.0	66.1	0.0	0.0	63.3	31.4	38.9	35.5	0.0	48.9
LnGrp LOS	C	D		E	A		E	C	D	D	A	D
Approach Vol, veh/h		285	A		505	A		515			493	
Approach Delay, s/veh		35.0			66.1			40.4			47.8	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	39.0	40.0	39.8	40.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	35.0	36.0	37.0	36.0
Max Q Clear Time (g_c+I1), s	13.8	29.8	35.2	38.0
Green Ext Time (p_c), s	1.5	1.6	0.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	48.8
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	38.5
Intersection LOS	E

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	480	20	80	370	160	140
Future Vol, veh/h	480	20	80	370	160	140
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	11	11	6	6	2	2
Mvmt Flow	505	21	84	389	168	147
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	57.4	29.7	20
HCM LOS	F	D	C

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	96%	53%
Vol Thru, %	18%	0%	47%
Vol Right, %	82%	4%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	450	500	300
LT Vol	0	480	160
Through Vol	80	0	140
RT Vol	370	20	0
Lane Flow Rate	474	526	316
Geometry Grp	1	1	1
Degree of Util (X)	0.804	0.97	0.605
Departure Headway (Hd)	6.113	6.633	6.9
Convergence, Y/N	Yes	Yes	Yes
Cap	592	547	521
Service Time	4.165	4.682	4.96
HCM Lane V/C Ratio	0.801	0.962	0.607
HCM Control Delay	29.7	57.4	20
HCM Lane LOS	D	F	C
HCM 95th-tile Q	7.9	13	4

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	30	190	10	10	170	10
Future Vol, veh/h	30	190	10	10	170	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	200	11	11	179	11
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.3	8	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	94%	0%	0%	50%
Vol Thru, %	0%	100%	0%	50%
Vol Right, %	6%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	30	190	20
LT Vol	170	0	0	10
Through Vol	0	30	0	10
RT Vol	10	0	190	0
Lane Flow Rate	189	32	200	21
Geometry Grp	2	7	7	5
Degree of Util (X)	0.245	0.044	0.24	0.028
Departure Headway (Hd)	4.649	5.023	4.32	4.852
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	775	715	834	739
Service Time	2.667	2.74	2.037	2.876
HCM Lane V/C Ratio	0.244	0.045	0.24	0.028
HCM Control Delay	9.2	8	8.4	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.1	0.9	0.1

Intersection	
Int Delay, s/veh	60.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	130	130	10	80	270	670	10	40	60	190	30	20
Future Vol, veh/h	130	130	10	80	270	670	10	40	60	190	30	20
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	90	-	-	75	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	10	10	10
Mvmt Flow	137	137	11	84	284	705	11	42	63	200	32	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	284	0	0	150	0	0	899	871	145	921	876	285
Stage 1	-	-	-	-	-	-	419	419	-	452	452	-
Stage 2	-	-	-	-	-	-	480	452	-	469	424	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.2	6.6	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.2	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.2	5.6	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.59	4.09	3.39
Pot Cap-1 Maneuver	1273	-	-	1419	-	0	258	287	897	243	279	735
Stage 1	-	-	-	-	-	0	608	587	-	572	557	-
Stage 2	-	-	-	-	-	0	563	567	-	560	574	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	1273	-	-	1416	-	-	197	241	895	~ 172	234	734
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	241	-	~ 172	234	-
Stage 1	-	-	-	-	-	-	542	522	-	510	524	-
Stage 2	-	-	-	-	-	-	483	534	-	427	511	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.9	1.8	18.2	227.9
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	388	1273	-	-	1416	-	190
HCM Lane V/C Ratio	0.298	0.107	-	-	0.059	-	1.33
HCM Control Delay (s)	18.2	8.2	-	-	7.7	-	227.9
HCM Lane LOS	C	A	-	-	A	-	F
HCM 95th %tile Q(veh)	1.2	0.4	-	-	0.2	-	14.4

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	10	40	10	10	20	40	1130	20	20	1010	80
Future Volume (veh/h)	60	10	40	10	10	20	40	1130	20	20	1010	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.95	0.96		0.95	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1841	1841	1841	1826	1826	1826
Adj Flow Rate, veh/h	63	11	8	11	11	4	42	1189	20	21	1063	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	0	0	0	4	4	4	5	5	5
Cap, veh/h	348	49	260	196	164	44	64	1871	31	36	1789	788
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.04	0.53	0.53	0.02	0.52	0.52
Sat Flow, veh/h	1131	283	1499	457	946	255	1753	3519	59	1739	3469	1528
Grp Volume(v), veh/h	74	0	8	26	0	0	42	591	618	21	1063	48
Grp Sat Flow(s),veh/h/ln	1414	0	1499	1658	0	0	1753	1749	1829	1739	1735	1528
Q Serve(g_s), s	1.4	0.0	0.2	0.0	0.0	0.0	1.0	10.4	10.5	0.5	9.4	0.7
Cycle Q Clear(g_c), s	1.9	0.0	0.2	0.5	0.0	0.0	1.0	10.4	10.5	0.5	9.4	0.7
Prop In Lane	0.85		1.00	0.42		0.15	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	397	0	260	404	0	0	64	930	972	36	1789	788
V/C Ratio(X)	0.19	0.00	0.03	0.06	0.00	0.00	0.66	0.64	0.64	0.59	0.59	0.06
Avail Cap(c_a), veh/h	950	0	857	1033	0	0	441	3041	3181	279	5715	2517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	15.0	15.2	0.0	0.0	20.8	7.2	7.2	21.2	7.4	5.3
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	0.0	0.0	10.8	0.7	0.7	14.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.1	0.2	0.0	0.0	0.6	2.5	2.6	0.3	2.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	0.0	15.1	15.2	0.0	0.0	31.6	8.0	7.9	35.5	7.7	5.3
LnGrp LOS	B	A	B	B	A	A	C	A	A	D	A	A
Approach Vol, veh/h		82			26			1251			1132	
Approach Delay, s/veh		15.8			15.2			8.7			8.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.6	5.6	26.5		11.6	4.9	27.2				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		25.0	11.0	72.0		25.0	7.0	76.0				
Max Q Clear Time (g_c+I1), s		3.9	3.0	11.4		2.5	2.5	12.5				
Green Ext Time (p_c), s		0.4	0.0	10.2		0.1	0.0	10.8				

Intersection Summary			
HCM 6th Ctrl Delay			8.8
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	220	130	120	340	60	150	590	80	70	990	90
Future Volume (veh/h)	120	220	130	120	340	60	150	590	80	70	990	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1841	1841	1841	1870	1870	1870
Adj Flow Rate, veh/h	126	232	119	126	358	59	158	621	33	74	1042	28
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	4	4	4	2	2	2
Cap, veh/h	156	323	166	157	440	73	190	1330	581	96	1156	504
Arrive On Green	0.09	0.28	0.28	0.09	0.28	0.28	0.11	0.38	0.38	0.05	0.33	0.33
Sat Flow, veh/h	1781	1148	589	1795	1568	258	1753	3497	1529	1781	3554	1548
Grp Volume(v), veh/h	126	0	351	126	0	417	158	621	33	74	1042	28
Grp Sat Flow(s),veh/h/ln	1781	0	1737	1795	0	1827	1753	1749	1529	1781	1777	1548
Q Serve(g_s), s	7.0	0.0	18.4	7.0	0.0	21.5	8.9	13.5	1.4	4.1	28.3	1.3
Cycle Q Clear(g_c), s	7.0	0.0	18.4	7.0	0.0	21.5	8.9	13.5	1.4	4.1	28.3	1.3
Prop In Lane	1.00		0.34	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	156	0	489	157	0	513	190	1330	581	96	1156	504
V/C Ratio(X)	0.81	0.00	0.72	0.80	0.00	0.81	0.83	0.47	0.06	0.77	0.90	0.06
Avail Cap(c_a), veh/h	247	0	601	248	0	632	295	1383	605	194	1194	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	32.8	45.3	0.0	33.9	44.2	23.6	19.9	47.3	32.6	23.5
Incr Delay (d2), s/veh	10.0	0.0	3.2	9.7	0.0	6.6	11.0	0.4	0.1	12.5	9.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	8.0	3.5	0.0	10.4	4.4	5.4	0.5	2.1	13.1	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.3	0.0	35.9	55.0	0.0	40.5	55.2	24.0	19.9	59.7	42.2	23.5
LnGrp LOS	E	A	D	D	A	D	E	C	B	E	D	C
Approach Vol, veh/h		477			543			812			1144	
Approach Delay, s/veh		41.1			43.9			29.9			42.9	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	43.5	13.8	33.4	16.0	37.9	13.9	33.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	11.0	40.0	14.0	35.0	17.0	34.0	14.0	35.0
Max Q Clear Time (g_c+I1), s	6.1	15.5	9.0	20.4	10.9	30.3	9.0	23.5
Green Ext Time (p_c), s	0.0	6.0	0.1	1.9	0.2	2.6	0.1	2.1

Intersection Summary	
HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	280	60	70	390	80	60	140	80	110	310	40
Future Volume (veh/h)	50	280	60	70	390	80	60	140	80	110	310	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	0.96		0.86	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1870	1856	1856	1885	1885	1885
Adj Flow Rate, veh/h	53	295	52	74	411	73	63	147	65	116	326	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	2	2	2	2	3	3	1	1	1
Cap, veh/h	114	487	80	123	491	83	197	438	175	219	572	59
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	134	1297	214	158	1307	221	273	935	374	319	1222	126
Grp Volume(v), veh/h	400	0	0	558	0	0	275	0	0	478	0	0
Grp Sat Flow(s),veh/h/ln	1644	0	0	1686	0	0	1582	0	0	1667	0	0
Q Serve(g_s), s	0.0	0.0	0.0	7.4	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0
Cycle Q Clear(g_c), s	12.1	0.0	0.0	19.4	0.0	0.0	6.3	0.0	0.0	13.0	0.0	0.0
Prop In Lane	0.13		0.13	0.13		0.13	0.23		0.24	0.24		0.08
Lane Grp Cap(c), veh/h	681	0	0	697	0	0	810	0	0	850	0	0
V/C Ratio(X)	0.59	0.00	0.00	0.80	0.00	0.00	0.34	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	828	0	0	845	0	0	810	0	0	850	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	0.0	0.0	18.3	0.0	0.0	10.7	0.0	0.0	12.4	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.0	4.6	0.0	0.0	1.1	0.0	0.0	2.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	0.0	7.8	0.0	0.0	2.5	0.0	0.0	5.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	0.0	0.0	22.9	0.0	0.0	11.9	0.0	0.0	15.0	0.0	0.0
LnGrp LOS	B	A	A	C	A	A	B	A	A	B	A	A
Approach Vol, veh/h		400			558			275			478	
Approach Delay, s/veh		16.9			22.9			11.9			15.0	
Approach LOS		B			C			B			B	

Timer - Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		35.0		29.1		35.0		29.1
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		30.0		30.0		30.0		30.0
Max Q Clear Time (g_c+I1), s		8.3		14.1		15.0		21.4
Green Ext Time (p_c), s		1.8		2.5		3.0		2.6

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	59.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	130	300	550	60	160	180
Future Vol, veh/h	130	300	550	60	160	180
Conflicting Peds, #/hr	2	0	0	2	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	137	316	579	63	168	189

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	644	0	-	0	1205	615
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	592	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	951	-	-	-	203	491
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	949	-	-	-	~ 167	489
Mov Cap-2 Maneuver	-	-	-	-	~ 167	-
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	552	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	238.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	949	-	-	-	256
HCM Lane V/C Ratio	0.144	-	-	-	1.398
HCM Control Delay (s)	9.4	0	-	-	238.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	19.6

Notes

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

Intersection	
Int Delay, s/veh	15.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	360	30	300	310	10
Future Vol, veh/h	150	360	30	300	310	10
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	0	0	1	1
Mvmt Flow	158	379	32	316	326	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	539	0	732	352
Stage 1	-	-	-	-	350	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	-	-	4.1	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.2	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1040	-	390	694
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	692	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1038	-	374	691
Mov Cap-2 Maneuver	-	-	-	-	374	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	56
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	379	-	-	1038	-
HCM Lane V/C Ratio	0.889	-	-	0.03	-
HCM Control Delay (s)	56	-	-	8.6	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	8.9	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	10	150	30	10	10	190	1110	50	10	1560	90
Future Volume (veh/h)	50	10	150	30	10	10	190	1110	50	10	1560	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1693	1693	1693	1841	1841	1841	1826	1826	1826
Adj Flow Rate, veh/h	53	11	27	32	11	0	200	1168	52	11	1642	92
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	14	14	14	4	4	4	5	5	5
Cap, veh/h	193	28	123	127	30	0	242	2411	107	24	1946	108
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.00	0.14	0.71	0.71	0.01	0.58	0.58
Sat Flow, veh/h	1361	358	1598	555	391	0	1753	3410	152	1739	3341	186
Grp Volume(v), veh/h	64	0	27	43	0	0	200	599	621	11	848	886
Grp Sat Flow(s),veh/h/ln	1720	0	1598	946	0	0	1753	1749	1813	1739	1735	1792
Q Serve(g_s), s	0.0	0.0	1.2	1.5	0.0	0.0	8.2	11.3	11.3	0.5	29.6	30.3
Cycle Q Clear(g_c), s	2.5	0.0	1.2	4.0	0.0	0.0	8.2	11.3	11.3	0.5	29.6	30.3
Prop In Lane	0.83		1.00	0.74		0.00	1.00		0.08	1.00		0.10
Lane Grp Cap(c), veh/h	221	0	123	157	0	0	242	1236	1282	24	1010	1044
V/C Ratio(X)	0.29	0.00	0.22	0.27	0.00	0.00	0.83	0.48	0.48	0.46	0.84	0.85
Avail Cap(c_a), veh/h	667	0	604	556	0	0	473	1236	1282	469	1217	1258
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	32.1	33.6	0.0	0.0	31.1	4.8	4.8	36.3	12.6	12.8
Incr Delay (d2), s/veh	0.3	0.0	0.3	0.3	0.0	0.0	2.7	0.2	0.2	5.1	4.3	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.5	0.8	0.0	0.0	3.5	2.8	2.9	0.2	10.3	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	32.4	33.9	0.0	0.0	33.8	5.1	5.0	41.4	16.9	17.3
LnGrp LOS	C	A	C	C	A	A	C	A	A	D	B	B
Approach Vol, veh/h		91			43			1420			1745	
Approach Delay, s/veh		32.8			33.9			9.1			17.3	
Approach LOS		C			C			A			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	57.4		10.7	15.2	48.2		10.7
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	20.0	52.0		28.0	20.0	52.0		28.0
Max Q Clear Time (g_c+I1), s	2.5	13.3		4.5	10.2	32.3		6.0
Green Ext Time (p_c), s	0.0	8.0		0.2	0.2	10.9		0.1

Intersection Summary		
HCM 6th Ctrl Delay		14.4
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	320	260	360	290	340	300	540	170	200	1180	110
Future Volume (veh/h)	240	320	260	360	290	340	300	540	170	200	1180	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		1.00	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	253	337	179	379	305	349	316	568	-23	211	1242	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	3	3	3
Cap, veh/h	321	388	317	455	438	379	342	1355	604	244	1153	491
Arrive On Green	0.09	0.21	0.21	0.13	0.25	0.25	0.19	0.38	0.00	0.14	0.33	0.33
Sat Flow, veh/h	3456	1870	1528	3456	1777	1537	1781	3554	1585	1767	3526	1500
Grp Volume(v), veh/h	253	337	179	379	305	349	316	568	-23	211	1242	77
Grp Sat Flow(s),veh/h/ln	1728	1870	1528	1728	1777	1537	1781	1777	1585	1767	1763	1500
Q Serve(g_s), s	8.1	19.7	11.9	12.1	17.7	25.1	19.7	13.3	0.0	13.2	37.0	4.1
Cycle Q Clear(g_c), s	8.1	19.7	11.9	12.1	17.7	25.1	19.7	13.3	0.0	13.2	37.0	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	388	317	455	438	379	342	1355	604	244	1153	491
V/C Ratio(X)	0.79	0.87	0.56	0.83	0.70	0.92	0.92	0.42	-0.04	0.87	1.08	0.16
Avail Cap(c_a), veh/h	489	397	324	642	456	394	346	1355	604	406	1153	491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	43.3	40.2	47.9	38.8	41.6	44.9	25.8	0.0	47.7	38.1	27.0
Incr Delay (d2), s/veh	4.8	17.8	2.2	6.5	4.4	26.4	29.4	0.2	0.0	10.1	49.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	10.9	4.6	5.6	8.1	12.1	11.2	5.4	0.0	6.3	23.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.0	61.1	42.4	54.4	43.2	67.9	74.3	26.0	0.0	57.8	87.9	27.1
LnGrp LOS	E	E	D	D	D	E	E	C	A	E	F	C
Approach Vol, veh/h		769			1033			861			1530	
Approach Delay, s/veh		54.8			55.7			44.4			80.7	
Approach LOS		D			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.6	47.1	18.9	27.5	25.7	41.0	14.5	31.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	26.0	33.0	21.0	24.0	22.0	37.0	16.0	29.0
Max Q Clear Time (g_c+I1), s	15.2	15.3	14.1	21.7	21.7	39.0	10.1	27.1
Green Ext Time (p_c), s	0.4	3.2	0.8	0.6	0.0	0.0	0.4	0.8

Intersection Summary	
HCM 6th Ctrl Delay	62.3
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	620	80	350	590	230	50	190	130	170	230	110
Future Volume (veh/h)	60	620	80	350	590	230	50	190	130	170	230	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	63	653	81	368	621	233	53	200	115	179	242	104
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	2	2	2	1	1	1	1	1	1
Cap, veh/h	166	620	77	357	665	249	68	213	123	165	305	131
Arrive On Green	0.04	0.38	0.38	0.17	0.51	0.51	0.04	0.19	0.19	0.09	0.25	0.25
Sat Flow, veh/h	1767	1618	201	1781	1295	486	1795	1112	640	1795	1243	534
Grp Volume(v), veh/h	63	0	734	368	0	854	53	0	315	179	0	346
Grp Sat Flow(s),veh/h/ln	1767	0	1818	1781	0	1781	1795	0	1752	1795	0	1777
Q Serve(g_s), s	2.6	0.0	46.0	20.0	0.0	53.8	3.5	0.0	21.3	11.0	0.0	21.9
Cycle Q Clear(g_c), s	2.6	0.0	46.0	20.0	0.0	53.8	3.5	0.0	21.3	11.0	0.0	21.9
Prop In Lane	1.00		0.11	1.00		0.27	1.00		0.37	1.00		0.30
Lane Grp Cap(c), veh/h	166	0	697	357	0	914	68	0	336	165	0	436
V/C Ratio(X)	0.38	0.00	1.05	1.03	0.00	0.93	0.78	0.00	0.94	1.09	0.00	0.79
Avail Cap(c_a), veh/h	175	0	697	357	0	914	75	0	336	165	0	436
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	37.0	39.6	0.0	27.3	57.2	0.0	47.8	54.5	0.0	42.4
Incr Delay (d2), s/veh	0.5	0.0	48.9	55.9	0.0	16.2	32.0	0.0	33.4	95.5	0.0	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	29.2	11.5	0.0	25.6	2.2	0.0	12.3	9.3	0.0	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	85.9	95.5	0.0	43.5	89.2	0.0	81.2	150.0	0.0	52.2
LnGrp LOS	C	A	F	F	A	D	F	A	F	F	A	D
Approach Vol, veh/h		797			1222			368			525	
Approach Delay, s/veh		81.4			59.1			82.3			85.5	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	28.0	25.0	51.0	9.6	34.4	9.4	66.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	11.0	23.0	20.0	46.0	5.0	29.0	5.0	61.0
Max Q Clear Time (g_c+I1), s	13.0	23.3	22.0	48.0	5.5	23.9	4.6	55.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.9	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	72.9
HCM 6th LOS	E

Intersection	
Int Delay, s/veh	53

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1730	0	0	950	0	200	0	210	0	0	0
Future Vol, veh/h	0	1730	0	0	950	0	200	0	210	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	0	0	0
Mvmt Flow	0	1821	0	0	1000	0	211	0	221	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	-	0	-	-	-	0	2821	-	-
Stage 1	-	-	-	-	-	-	1821	-	-
Stage 2	-	-	-	-	-	-	1000	-	-
Critical Hdwy	-	-	-	-	-	-	6.615	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.815	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.415	-	-
Follow-up Hdwy	-	-	-	-	-	-	3.5095	-	-
Pot Cap-1 Maneuver	0	-	0	0	-	-	~ 17	0	0
Stage 1	0	-	0	0	-	-	~ 116	0	0
Stage 2	0	-	0	0	-	-	357	0	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	-	~ 17	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 86	0	-
Stage 1	-	-	-	-	-	-	~ 116	0	-
Stage 2	-	-	-	-	-	-	357	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	$ 762.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBT	WBR
Capacity (veh/h)	86	-	-	-	-
HCM Lane V/C Ratio	2.448	-	-	-	-
HCM Control Delay (s)	$ 762.9	0	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	19.6	-	-	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1085	110	840	1210	10	330	0	550	5	10	10
Future Volume (vph)	10	1085	110	840	1210	10	330	0	550	5	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.0	5.7			5.0	5.0		5.0	
Lane Util. Factor	1.00	0.95		0.97	1.00			1.00	0.88		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.99	
Satd. Flow (prot)	1736	3419		3433	1859			1770	2659		1779	
Flt Permitted	0.11	1.00		0.95	1.00			0.95	1.00		0.99	
Satd. Flow (perm)	201	3419		3433	1859			1770	2659		1779	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	1142	116	884	1274	11	347	0	579	5	11	11
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	481	0	11	0
Lane Group Flow (vph)	11	1250	0	884	1285	0	0	347	98	0	16	0
Confl. Peds. (#/hr)	15		1	1		15			9	9		
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases		4		3			2	2		1	1	
Permitted Phases	4				8			2	2		1	
Actuated Green, G (s)	36.3	36.3		23.0	64.3			17.0	17.0		3.0	
Effective Green, g (s)	36.3	36.3		23.0	64.3			17.0	17.0		3.0	
Actuated g/C Ratio	0.36	0.36		0.23	0.64			0.17	0.17		0.03	
Clearance Time (s)	5.7	5.7		5.0	5.7			5.0	5.0		5.0	
Vehicle Extension (s)	3.0	3.0		3.0	2.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	72	1241		789	1195			300	452		53	
v/s Ratio Prot		0.37		0.26				c0.20			c0.01	
v/s Ratio Perm	0.05				c0.69				0.04			
v/c Ratio	0.15	1.01		1.12	1.08			1.16	0.22		0.31	
Uniform Delay, d1	21.5	31.9		38.5	17.9			41.5	35.8		47.5	
Progression Factor	1.00	1.00		0.74	0.91			1.00	1.00		1.00	
Incremental Delay, d2	1.0	27.4		56.0	35.6			101.3	0.1		1.2	
Delay (s)	22.5	59.2		84.4	51.8			142.8	35.9		48.7	
Level of Service	C	E		F	D			F	D		D	
Approach Delay (s)		58.9			65.1			75.9			48.7	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	65.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	110	800	260	100	80	900	1050	170	90	930	70
Future Volume (veh/h)	80	110	800	260	100	80	900	1050	170	90	930	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1900	1900	1900	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	84	116	818	274	105	61	947	1105	168	95	979	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	0	0	0	3	3	3	4	4	4
Cap, veh/h	131	180	735	232	143	83	1027	1545	234	118	1001	419
Arrive On Green	0.17	0.17	0.17	0.13	0.13	0.13	0.30	0.50	0.50	0.07	0.27	0.27
Sat Flow, veh/h	757	1046	1555	1810	1119	650	3428	3065	465	1753	3681	1541
Grp Volume(v), veh/h	200	0	818	274	0	166	947	634	639	95	979	21
Grp Sat Flow(s),veh/h/ln	1803	0	1555	1810	0	1768	1714	1763	1767	1753	1841	1541
Q Serve(g_s), s	12.9	0.0	21.6	16.0	0.0	11.3	33.4	34.8	35.1	6.7	33.0	1.3
Cycle Q Clear(g_c), s	12.9	0.0	21.6	16.0	0.0	11.3	33.4	34.8	35.1	6.7	33.0	1.3
Prop In Lane	0.42		1.00	1.00		0.37	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	311	0	735	232	0	226	1027	888	891	118	1001	419
V/C Ratio(X)	0.64	0.00	1.11	1.18	0.00	0.73	0.92	0.71	0.72	0.80	0.98	0.05
Avail Cap(c_a), veh/h	311	0	735	232	0	226	1124	888	891	182	1001	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	0.0	33.0	54.5	0.0	52.4	42.4	24.0	24.1	57.5	45.1	33.6
Incr Delay (d2), s/veh	9.8	0.0	68.5	117.5	0.0	11.6	1.4	0.3	0.3	13.5	23.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.0	35.2	14.8	0.0	5.7	14.1	14.0	14.2	3.4	18.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9	0.0	101.5	172.0	0.0	64.1	43.7	24.3	24.3	71.0	68.2	33.6
LnGrp LOS	E	A	F	F	A	E	D	C	C	E	E	C
Approach Vol, veh/h		1018			440			2220			1095	
Approach Delay, s/veh		92.9			131.3			32.6			67.8	
Approach LOS		F			F			C			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		25.6	41.4	38.0		20.0	12.4	67.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		18.0	41.0	34.0		16.0	13.0	62.0				
Max Q Clear Time (g_c+I1), s		23.6	35.4	35.0		18.0	8.7	37.1				
Green Ext Time (p_c), s		0.0	2.0	0.0		0.0	0.1	9.7				
Intersection Summary												
HCM 6th Ctrl Delay			62.6									
HCM 6th LOS			E									
Notes												

User approved volume balancing among the lanes for turning movement.

Intersection	
Intersection Delay, s/veh	21.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	60	40	20	40	50	30	10	260	30	60	410	80
Future Vol, veh/h	60	40	20	40	50	30	10	260	30	60	410	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	3	3	5	5	5	1	1	1	3	3	3
Mvmt Flow	63	42	21	42	53	32	11	274	32	63	432	84
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.7	11.6	13.9	29.7
HCM LOS	B	B	B	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	50%	33%	11%
Vol Thru, %	87%	33%	42%	75%
Vol Right, %	10%	17%	25%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	300	120	120	550
LT Vol	10	60	40	60
Through Vol	260	40	50	410
RT Vol	30	20	30	80
Lane Flow Rate	316	126	126	579
Geometry Grp	1	1	1	1
Degree of Util (X)	0.488	0.231	0.23	0.84
Departure Headway (Hd)	5.568	6.59	6.543	5.222
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	644	541	544	689
Service Time	3.641	4.687	4.639	3.282
HCM Lane V/C Ratio	0.491	0.233	0.232	0.84
HCM Control Delay	13.9	11.7	11.6	29.7
HCM Lane LOS	B	B	B	D
HCM 95th-tile Q	2.7	0.9	0.9	9.3

Intersection						
Int Delay, s/veh	3.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	460	0	0	920	80	900
Future Vol, veh/h	460	0	0	920	80	900
Conflicting Peds, #/hr	0	2	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	1	1	1	1
Mvmt Flow	484	0	0	968	84	947

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	1454	-
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	970	-
Critical Hdwy	-	-	-	-	6.41	-
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	-	-	3.509	-
Pot Cap-1 Maneuver	-	0	0	-	144	0
Stage 1	-	0	0	-	622	0
Stage 2	-	0	0	-	369	0
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	144	-
Mov Cap-2 Maneuver	-	-	-	-	144	-
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	368	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	60.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	WBT
Capacity (veh/h)	144	-	-	-
HCM Lane V/C Ratio	0.585	-	-	-
HCM Control Delay (s)	60.3	0	-	-
HCM Lane LOS	F	A	-	-
HCM 95th %tile Q(veh)	3	-	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1220	140	210	830	90	140
Future Volume (vph)	1220	140	210	830	90	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	1837		1770	1863	1677	
Flt Permitted	1.00		0.04	1.00	0.98	
Satd. Flow (perm)	1837		83	1863	1677	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1284	147	221	874	95	147
RTOR Reduction (vph)	3	0	0	0	44	0
Lane Group Flow (vph)	1428	0	221	874	198	0
Turn Type	NA		pm+pt	NA	Perm	
Protected Phases	4		3	8		
Permitted Phases			8		2	
Actuated Green, G (s)	85.0		101.0	101.0	14.0	
Effective Green, g (s)	85.0		101.0	101.0	14.0	
Actuated g/C Ratio	0.68		0.81	0.81	0.11	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	2.5	
Lane Grp Cap (vph)	1249		215	1505	187	
v/s Ratio Prot	c0.78		c0.09	0.47		
v/s Ratio Perm			0.74		c0.12	
v/c Ratio	1.14		1.03	0.58	1.06	
Uniform Delay, d1	20.0		48.3	4.3	55.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	74.4		68.8	0.6	81.6	
Delay (s)	94.4		117.1	4.9	137.1	
Level of Service	F		F	A	F	
Approach Delay (s)	94.4			27.6	137.1	
Approach LOS	F			C	F	

Intersection Summary			
HCM 2000 Control Delay	71.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	110.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	470	30	310	70	140	20	180	460	10	20	740	780
Future Volume (veh/h)	470	30	310	70	140	20	180	460	10	20	740	780
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	495	32	161	74	147	3	189	484	-1	21	779	499
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	601	66	334	96	236	200	327	1506	672	436	1272	567
Arrive On Green	0.17	0.25	0.25	0.05	0.13	0.13	0.09	0.42	0.00	0.02	0.36	0.36
Sat Flow, veh/h	3456	270	1357	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	495	0	193	74	147	3	189	484	-1	21	779	499
Grp Sat Flow(s),veh/h/ln	1728	0	1626	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.9	0.0	8.0	3.2	5.9	0.1	5.0	7.2	0.0	0.6	14.3	23.4
Cycle Q Clear(g_c), s	10.9	0.0	8.0	3.2	5.9	0.1	5.0	7.2	0.0	0.6	14.3	23.4
Prop In Lane	1.00		0.83	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	601	0	400	96	236	200	327	1506	672	436	1272	567
V/C Ratio(X)	0.82	0.00	0.48	0.77	0.62	0.01	0.58	0.32	0.00	0.05	0.61	0.88
Avail Cap(c_a), veh/h	1091	0	1027	562	1181	1001	775	1506	672	1070	1481	660
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	0.0	25.5	37.0	32.8	30.3	15.3	15.2	0.0	15.4	20.9	23.8
Incr Delay (d2), s/veh	1.1	0.0	0.9	4.8	2.7	0.0	0.6	0.6	0.0	0.0	0.3	10.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	3.1	1.5	2.8	0.0	1.8	2.8	0.0	0.2	5.5	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.6	0.0	26.4	41.8	35.5	30.3	15.9	15.8	0.0	15.4	21.2	34.5
LnGrp LOS	C	A	C	D	D	C	B	B	A	B	C	C
Approach Vol, veh/h		688			224			672			1299	
Approach Delay, s/veh		30.9			37.5			15.8			26.2	
Approach LOS		C			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	24.5	12.1	33.3	18.8	15.0	6.8	38.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	50.0	27.0	33.0	25.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	5.2	10.0	7.0	25.4	12.9	7.9	2.6	9.2
Green Ext Time (p_c), s	0.1	1.3	0.2	3.0	0.8	0.9	0.0	2.0

Intersection Summary		
HCM 6th Ctrl Delay		25.8
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	0	0	940	0	1120	10	910	410	430	820	0
Future Volume (vph)	10	0	0	940	0	1120	10	910	410	430	820	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		5.0		5.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00		0.97		0.88	1.00	0.95		0.97	0.95	
Frt		1.00		1.00		0.85	1.00	0.95		1.00	1.00	
Flt Protected		0.95		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1805		3400		2760	1736	3309		3155	3252	
Flt Permitted		0.95		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1805		3400		2760	1736	3309		3155	3252	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	0	0	989	0	1179	11	958	432	453	863	0
RTOR Reduction (vph)	0	0	0	0	0	339	0	32	0	0	0	0
Lane Group Flow (vph)	0	11	0	989	0	840	11	1358	0	453	863	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	11%	11%	11%
Turn Type	Split	NA		Prot		pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3		4		4 1	5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		5.6		38.3		62.5	5.0	45.4		19.2	59.6	
Effective Green, g (s)		5.6		38.3		62.5	5.0	45.4		19.2	59.6	
Actuated g/C Ratio		0.04		0.29		0.48	0.04	0.35		0.15	0.45	
Clearance Time (s)		6.0		5.0			6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		2.0			2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		76		990		1311	66	1142		460	1473	
v/s Ratio Prot		c0.01		c0.29		0.30	0.01	c0.41		c0.14	0.27	
v/s Ratio Perm												
v/c Ratio		0.14		1.00		0.64	0.17	1.19		0.98	0.59	
Uniform Delay, d1		60.6		46.6		26.0	61.2	43.0		56.0	26.8	
Progression Factor		1.00		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9		28.1		0.8	0.4	94.0		37.6	0.4	
Delay (s)		61.5		74.7		26.8	61.7	137.1		93.6	27.1	
Level of Service		E		E		C	E	F		F	C	
Approach Delay (s)		61.5			48.7			136.5			50.0	
Approach LOS		E			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	74.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	131.5	Sum of lost time (s)	23.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	370	480	1310	510	490	760
Future Volume (vph)	370	480	1310	510	490	760
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1597	3195	3471	1553	3433	1583
Flt Permitted	0.05	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	91	3195	3471	1553	3433	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	389	505	1379	537	516	800
RTOR Reduction (vph)	0	0	0	55	0	354
Lane Group Flow (vph)	389	505	1379	482	516	446
Heavy Vehicles (%)	13%	13%	4%	4%	2%	2%
Turn Type	pm+pt	NA	NA	Perm	Prot	Prot
Protected Phases	7	4	8		6	6
Permitted Phases	4			8		
Actuated Green, G (s)	105.3	105.3	69.2	69.2	41.1	41.1
Effective Green, g (s)	105.3	105.3	69.2	69.2	41.1	41.1
Actuated g/C Ratio	0.65	0.65	0.42	0.42	0.25	0.25
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	345	2061	1471	658	864	398
v/s Ratio Prot	c0.21	0.16	0.40		0.15	c0.28
v/s Ratio Perm	c0.51			0.31		
v/c Ratio	1.13	0.25	0.94	0.73	0.60	1.12
Uniform Delay, d1	56.6	12.2	44.9	39.3	53.8	61.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	87.6	0.0	11.4	3.6	0.7	82.2
Delay (s)	144.2	12.2	56.3	42.9	54.5	143.2
Level of Service	F	B	E	D	D	F
Approach Delay (s)		69.7	52.6		108.4	
Approach LOS		E	D		F	

Intersection Summary			
HCM 2000 Control Delay	74.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	163.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	1125	1390	160	80	50
Future Volume (veh/h)	80	1125	1390	160	80	50
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	1184	1463	165	84	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	299	3107	1155	130	105	94
Arrive On Green	0.14	0.87	0.70	0.70	0.06	0.06
Sat Flow, veh/h	1781	3647	1651	186	1781	1585
Grp Volume(v), veh/h	84	1184	0	1628	84	6
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1837	1781	1585
Q Serve(g_s), s	2.1	9.4	0.0	105.0	7.0	0.5
Cycle Q Clear(g_c), s	2.1	9.4	0.0	105.0	7.0	0.5
Prop In Lane	1.00			0.10	1.00	1.00
Lane Grp Cap(c), veh/h	299	3107	0	1286	105	94
V/C Ratio(X)	0.28	0.38	0.00	1.27	0.80	0.06
Avail Cap(c_a), veh/h	299	3107	0	1286	297	264
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.09	1.00	1.00
Uniform Delay (d), s/veh	55.7	1.8	0.0	22.5	69.7	66.7
Incr Delay (d2), s/veh	0.2	0.4	0.0	120.4	5.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.0	0.0	83.2	3.4	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.8	2.1	0.0	142.9	74.8	66.8
LnGrp LOS	E	A	A	F	E	E
Approach Vol, veh/h		1268	1628		90	
Approach Delay, s/veh		5.7	142.9		74.3	
Approach LOS		A	F		E	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	136.1	13.9	26.1	110.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	115.0	25.0	5.0	105.0
Max Q Clear Time (g_c+I1), s	11.4	9.0	4.1	107.0
Green Ext Time (p_c), s	12.0	0.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	82.5
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Appendix D: Existing Transit Service in Tukwila

MEMORANDUM

To: Emily Alice Allhart, Fehr & Peers

Tino Jonga, Fehr & Peers

From: Peter Soderberg, Nelson\Nygaard

Lela Cooper, Nelson\Nygaard

Date: July 30, 2024

Subject: Tukwila Transit Element Strategies Memorandum

BACKGROUND

This memorandum provides an overview of Tukwila's existing transit network, opportunities and challenges, and specific recommendations and strategies the City of Tukwila can use to further improve the transit network and foster a more accessible transportation system. By focusing on the transit services currently providing service to and from Tukwila, and how these services are utilized, recommendations are discussed based on expected growth scenarios and community goals, as well as recommendations related to programmatic needs, and large capital investment priorities for advocacy efforts.

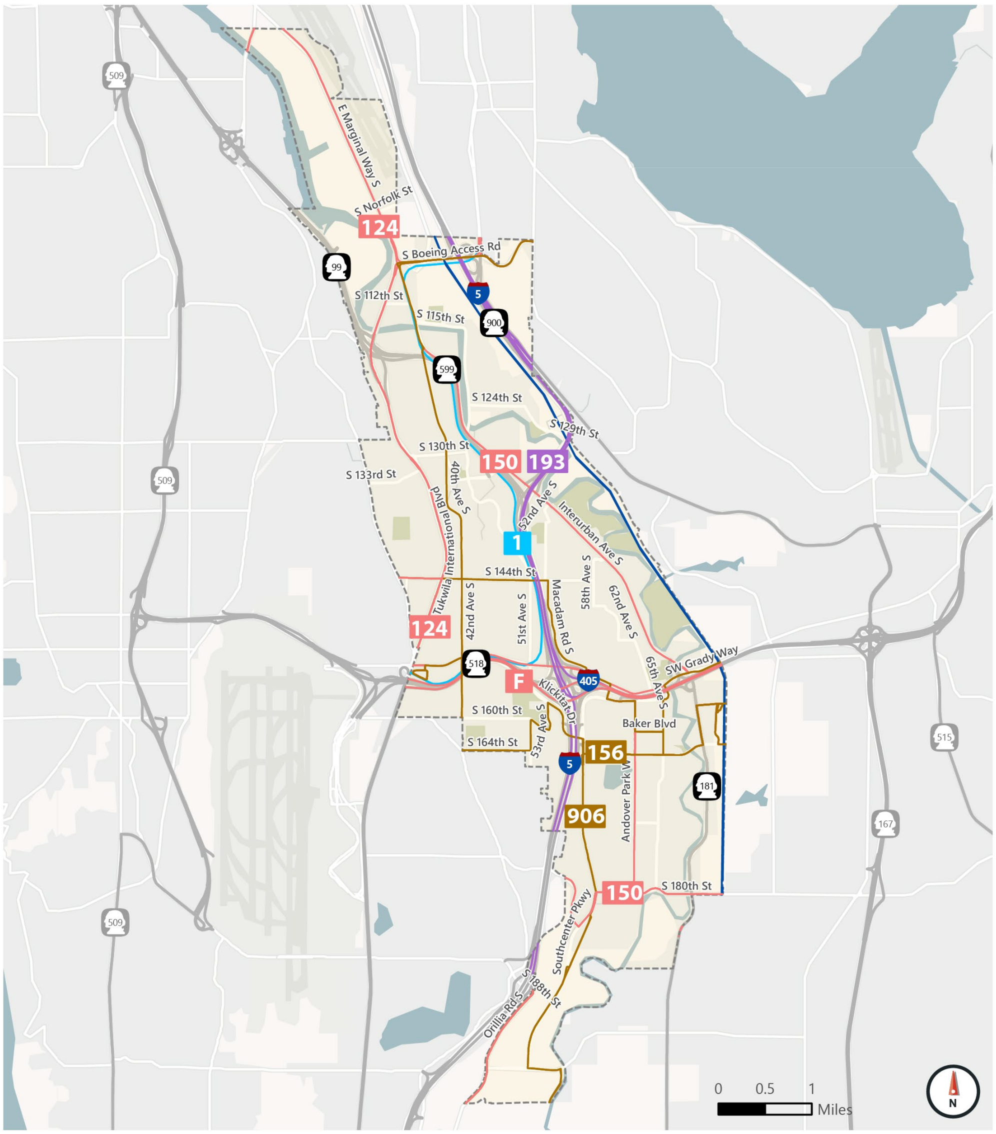
Existing Conditions and System Overview

King County Metro (Metro) offers five traditional fixed-route services, two RapidRide routes, one Demand Area Response (DART) route, and Metro Flex on-demand service within the City of Tukwila. Sound Transit provides light rail service on the 1 Line to Tukwila International Boulevard Station and Sounder commuter rail service to Tukwila Station.

The highest ridership activity occurs at two locations that are served by multiple lines and modes:

- **Tukwila International Boulevard Station**, served by local bus, RapidRide, and the 1 Line. Average daily boardings in October 2021 for Link light rail were 1,960 and bus boardings were 5,337 for a total of 7,338 at the station.
- **Andover Park West/Southcenter Mall**, served by local bus and RapidRide F Line. Passengers can connect to the Tukwila Sounder station to the east using the RapidRide F Line. Average daily boardings in this location during October 2021 were 3,325.

Figure D1. Tukwila Existing Transit Service



City Boundary
Tukwila Parks

Route Type

- KCM Express Route
- KCM Frequent Route
- Link Light Rail
- KCM Local Route
- Sounder Line

Figure 8

Future Transit Options

During peak travel times on weekdays, there are four services that provide 15-minute or better frequency:

- Metro Route 150
- Metro RapidRide A Line
- Metro RapidRide F Line
- Sound Transit 1 Line

Local Route Frequency

During peak travel times on weekdays, Routes 124, 128, and 156 provide service at 30-minute frequencies or better. These routes serve local stops in Tukwila in addition to serving surrounding communities and Downtown Seattle.

- Metro Route 124
- Metro Route 128
- Metro Route 156

On-Demand Services

Two different on-demand services are available within the City of Tukwila to transport riders directly to some destinations within the City or to transit stops with more service and higher frequencies.

Dial-A-Ride Transit (DART) is a service operated by King County Metro that operates within communities that have a need for more flexible service due to lower population density, greater distances, and fewer available fixed route options. DART Route 906 serves Tukwila every hour or better and can deviate from its route by request to allow for residents to make connections to other transit options or their home.

Metro Flex is an on-demand service that is also available within a defined boundary of Tukwila. Metro Flex allows anyone within the defined service area to hail a ride using a mobile app or phone call for transportation to a transit stop with frequent service. In Tukwila, Metro Flex can be used within the defined area to provide transportation to Tukwila International Boulevard Station and the Tukwila Community Center.

OPPORTUNITIES AND CHALLENGES

Community and Stakeholder Priorities

Based on the existing transit network serving the City of Tukwila, there are opportunities to improve transit reliability and viability in coordination with identified community priorities. Through surveying and outreach efforts conducted in Spring 2024, community members had the opportunity to provide feedback on their goals for the City of Tukwila's transit system, including:

- **Access to new destinations -** Community members highlighted a desire for the transit system to expand service to new destinations more effectively within the City. In particular, the Tukwila Library (located on Tukwila International Boulevard and S 144th St), as well as the Tukwila Community Center and surrounding Allentown neighborhood.
- **Safety –** Residents emphasized a goal for improved safety conditions for riders. This included improved bus stop lighting conditions, and further on-board security measures, and safety measures at bus stops and Sounder/Link Light Rail stations, especially during times with lower ridership.
- **Improved Amenities –** Community members underscored the need for improved amenities at bus stops and rail stations, with particular emphasis on bus stop amenities. Increased availability of benches at stops and stations, as well as improved access to bus shelters were identified as community amenity priorities.

  In addition to stop amenities improvements, improved parking access and availability at stations and park-and-rides were also identified as an opportunity to ensure that transit users can find adequate parking availability at facilities on high commute days.

Community members also indicated several service priorities to improve the existing transit network.

- **Improved Frequency –** Community members highlighted the desire for improved frequencies allowing for more consistent use of transit. During peak travel times on weekdays, there are currently four services that provide 15-minute or better frequency, and three routes providing 30-minute or better frequency.
- **Southcenter Circulator Service –** Residents emphasized a desire to implement a potential circulator service connecting Southcenter with other areas in the city.
- **Improved Regional Bus Service –** Riders indicated a desire for improved regional bus connectivity to supplement existing transit service. This includes frustration that other regional express bus lines pass by Tukwila without making a stop for riders and presents an opportunity for increased connectivity. Residents indicated a desire for improved Eastside connectivity with the only existing connection existing via the F RapidRide Line.
- **First- Last-Mile Connectivity –** Community and stakeholder engagement also emphasized the importance of first- last-mile connections in ensuring a reliable and effective transit network in Tukwila. This includes connecting existing sidewalk and bicycle network gaps and ensuring higher rider familiarity with Metro Flex on-demand service from King County Metro.

Challenges and Considerations

In addition to the opportunities and identified community priorities, there are also several challenges and considerations for transit service and accessibility in Tukwila. These challenges include:

- **Land Use, Density, and Barriers –** In Tukwila the highest density areas and employment centers are generally served by the existing transit network, but areas outside these major destinations face gaps in service that limit connectivity for many residents. Additionally, the City has physical challenges that create barriers to access, with freeways, rail lines, and the Green/Duwamish River impeding some options for fixed-route service. While a challenge, this also lends to the potential for more flexible transit service to be implemented in key areas of the City.
- **Infrastructure Availability** – In order to support transit, some infrastructural investments are needed. Particularly, in North Tukwila, there are limited transit facilities and several gaps in the sidewalk network compared to the Tukwila core area.
- **42nd Ave S Bridge Replacement** – The 42nd Ave S Bridge is an important arterial and nearing its lifespan. The City is currently evaluating plans for the bridge, with construction expected to begin after 2026.
- **Boeing Access Road Station Project** – Another consideration for transit investment in Tukwila is the building of a proposed Sound Transit infill station at Boeing Access Road (BAR) in Tukwila. This project would add a new station to the existing 1 Line network and was approved in the ST3 system plan. The location of the station has yet to be finalized, but is open at this time (2024) for public opinion based on two options: adjacent to the Sounder tracks on Boeing Access Road, or further south along E Marginal Way S near S 112th Street.
- **Pedestrian Access to Transit** – Within Tukwila, sidewalk network gaps were identified throughout the area, including key connection points for the existing transit network. These gaps in pedestrian infrastructure make transit usage and connectivity more difficult and less safe for riders. Northwest Tukwila has the greatest need for improved sidewalk conditions.

RECOMMENDATIONS AND STRATEGIES

Based on the existing transit network, community priorities, and identified challenges and opportunities, recommendations and strategies to improve transit service and access to transit were determined in coordination with stakeholders. Recommendations for Tukwila can be broken down into the following main categories:

- Transit Service Improvements
- Transit Amenities and Facilities
- Access to Transit

Transit Service Improvements

Service Enhancements and Expansion Opportunities

The Metro Connects Long Range Plan identifies prioritized service improvements through the year 2050 based on projected growth patterns and demand for service. Within this plan, Route 150 (frequent service between Kent and Downtown Seattle), was identified as a potential future RapidRide corridor. The City of Tukwila should continue to work with Metro to develop this service and continue to incentivize and encourage growth and new development around planned high-capacity transit improvements.

The finalization of Sound Transit's Boeing Access Road infill Line 1 station is of importance for the City of Tukwila and Metro to consider in planning future service and connectivity, when coordinating local service. The City of Tukwila should continue working with Sound Transit and other regional partners to advocate for the development of this station as well as supporting bus-rail transfer infrastructure to ensure seamless connectivity between transit modes in the northern area of the City.

Community members also expressed interest in improved transit service in the Southcenter area, which could be addressed through a potential Southcenter circulator service or on-demand service, similar to Metro Flex. Such a service would provide circulation service within the Southcenter neighborhood and provide connections to existing neighborhood amenities such as connecting transit, shopping, employment, and amenities. The City should explore opportunities internally and with other regional partners to identify potential service options to improve mobility within the Southcenter area, either through expanded services or new programmatic options.

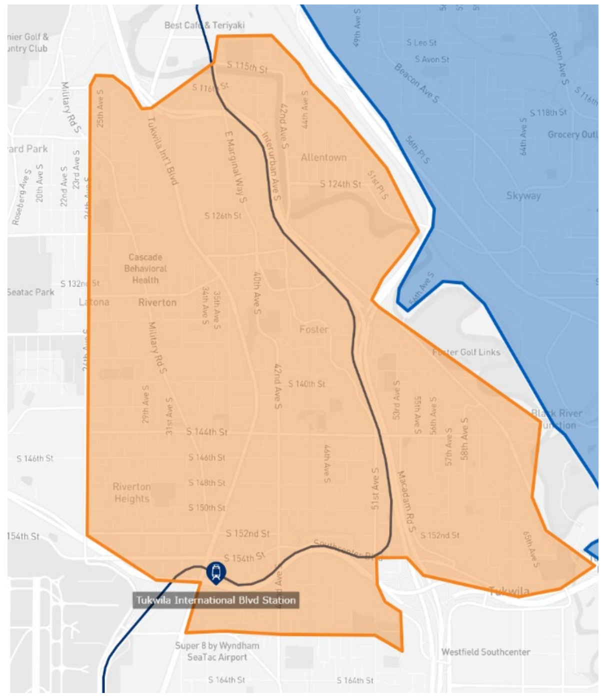
In addition to exploration of a circulator or on-demand circulator service at Southcenter, residents indicated a need for improved transit connections at Southcenter as a whole, including Eastside connections. The City of Tukwila should further work with Sound Transit to support Southcenter's growth as the regional center of Tukwila and ensure it has the needed transit network and last-mile connections.

Metro Flex Service

Community feedback and stakeholder engagement also identified enhanced first and last mile connections and improved ease of access for local trips from the City's transit network as an opportunity for improvement. King County Metro's on-demand transit service Metro Flex provides an opportunity to conveniently address these needs by providing service in areas with lower densities or barriers that inhibit fixed-route service.

To improve the Metro Flex service, Tukwila should consider advocating with King County Metro for an expanded Metro Flex zone, specifically to provide enhanced connections to the south to serve Southcenter, as well as further east to Tukwila Station (**Figure D2**). These recommendations for expanded service are based on both anticipated future growth, as well as rider needs and the opportunity to connect to Sounder and additional transit service.

Figure D2. Existing Tukwila Metro Flex Service Area



Paramount to the success of Metro Flex service and the suggested service enhancements is effective marketing and rider familiarity. Tukwila should prioritize working further with Metro to market the service throughout the City to enhance rider familiarity and usage. These efforts should be concentrated in areas with high need, such as low vehicle ownership or limited existing transit connections. Marketing efforts should also provide further clarity about the service and how it can be used to further reduce barriers to rider usage.

Rider Safety

To address rider safety and experience concerns, Tukwila can encourage improved on-board safety amenities by partnering with Metro and Sound Transit to ensure on-board safety measures in addition to stop amenities/safety improvements. In addition, efforts can be made to explore safety concerns at transit center and Link Light Rail stations, by coordinating with Metro and Sound Transit for improved platform and entrance conditions.

Transit Amenities and Facilities

Community feedback indicated that improved bus amenities were an identified priority, particularly, additional shelters at bus stops. While many stops in the City have shelters either provided by Metro or the City of Tukwila, there remain stops with high ridership activity without shelters, resulting in a less satisfying user experience. This section highlights the highest priority bus stops for investment in improved amenities based on average daily boardings.

Boeing Access Road Station

Members of the community commonly identified a lack of transit facilities in the northern portion of the City of Tukwila. The proposed Boeing Access Road Station would ameliorate this concern and create a key regional link for the City of Tukwila. The City should continue to work with Sound Transit to advance the planning for this rail station and incentivize the necessary surrounding development activity to support station area activity and encourage seamless bus-rail transfer integrations in the immediate station area.

Transit Stop Amenities and Rider Experience

King County Metro classifies stops outside of the City of Seattle with 25 or more average boardings per day as eligible for bus shelters. RapidRide stops with less than 50 average riders are eligible for standard RapidRide stops, and those with over 50 riders are eligible for enhanced stop amenities which include larger shelters, real-time arrival information, and other amenities.

Tukwila currently has 16 bus stops with no bus shelters and more than 25 average boardings per day as shown in **Table D1**. Of these stops, 5 stops have over 50 boardings per day, shown in bold text. Prioritizing improved amenities at these stops will help to improve the rider experience and align with King County Metro's guidelines for stop amenities.

The highest priority stops are along Tukwila International Boulevard at 148th and 152nd Street. These stops have the highest ridership and no shelters available. Additional priority stops include Southcenter Boulevard & Park Place, Strander Boulevard & Andover Park E, and Andover Park W & S 180th Street. These stops represent an opportunity to pursue the addition of bus shelter amenities while meeting King County Metro's defined ridership guidelines and improve rider experience. These stops fall along some of the area's most utilized transit lines, including Routes 150, 128, and F Line shown in **Figure D3**.

Table D1. Tukwila bus stops with no bus shelters and more than 25 average daily boardings

Stop ID	Stop Location	Average Daily Boardings
40813	S 144th St & 42nd Ave S	37.3
41119	42nd Ave S & S 144th St	47
41128	S 144th St & Pacific Hwy S	39.2
54202	Southcenter Blvd & 52nd Ave S	37.5
54203	Southcenter Blvd & Park Place*	32.2
54204	Southcenter Blvd & Park Place*	52.3
54205	Southcenter Blvd & 53rd Ave S*	26.5
54206	Southcenter Blvd & 42nd Ave S*	47.4
58111	Strander Blvd & Andover Park E*	37
58113	Strander Blvd & W Valley Hwy	45.4
59833	Strander Blvd & Andover Park E*	59.3
60380	Andover Park W & S 180th St	54.2
60920	Tukwila Intl Blvd & S 152nd St	188.5
60930	Tukwila Intl Blvd & S 148th St	76.2
61000	Tukwila Intl Blvd & S 133rd St	26.4
61040	Tukwila Intl Blvd & S 148th St	41.9

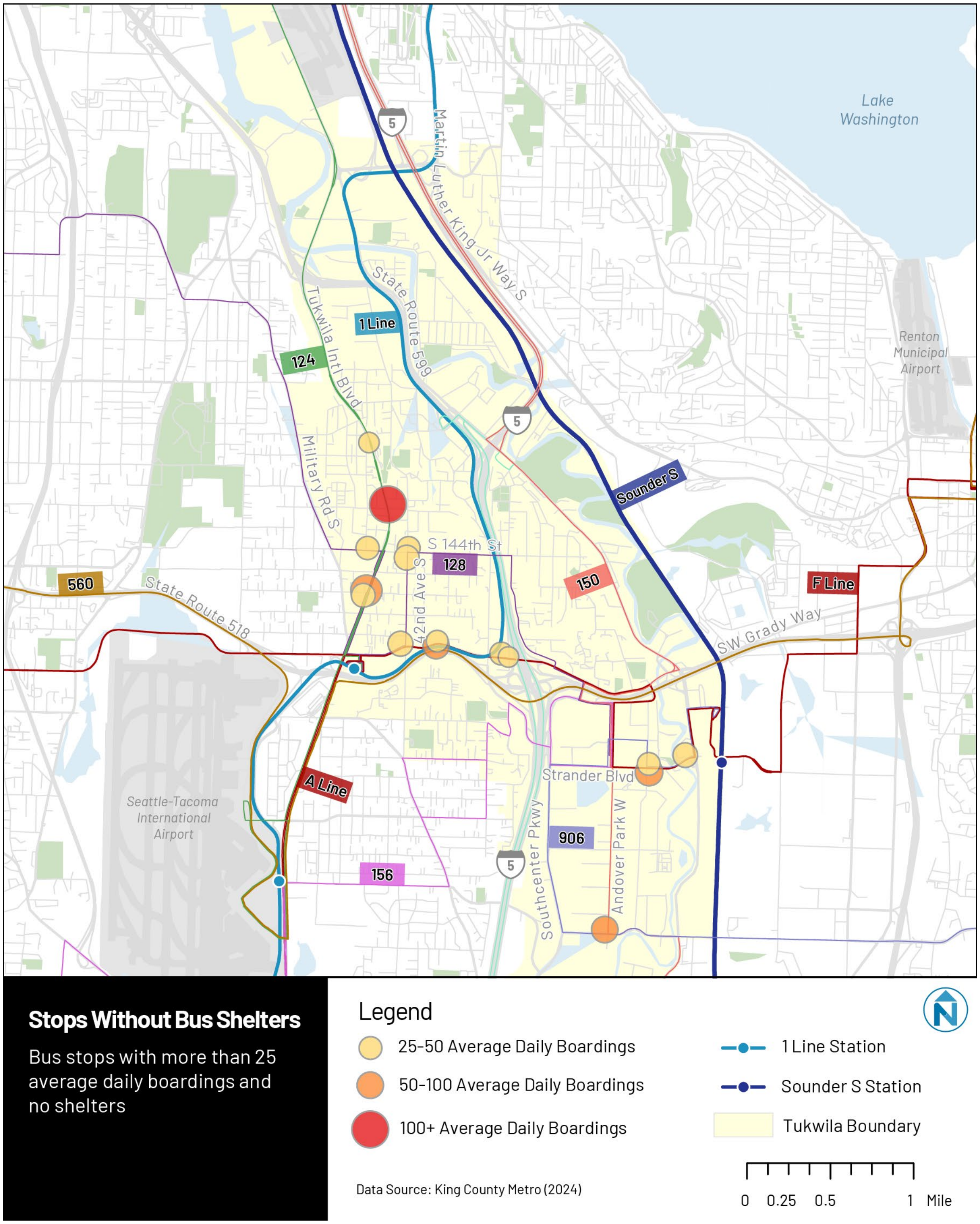
*RapidRide service stops with only bench amenities.

Data Source: King County Metro Boarding Data (2021), King County Metro Bus Shelter Data (2024).

Within the identified stops with over 25 average daily boardings and no bus shelters, five provide RapidRide service to the F Line, as shown asterisked in **Table D1**. While these stops had benches available, other amenities were limited and provide a potential exploration for improved amenities. Ridership at these stops should continue to be monitored as they may be eligible for increased amenities or enhanced stop features from Metro.

Additionally, while some bus stops did have shelters available, they lacked benches or seating for riders. Many of these stops were identified as City of Tukwila-managed bus shelter facilities along Tukwila International Boulevard. This represents another opportunity for the City to explore when evaluating additional amenity improvements such as bike racks, improved lighting, trash receptacles, and well-kept signage.

Figure D3. Tukwila Bus Stops without Shelters



Access to Transit

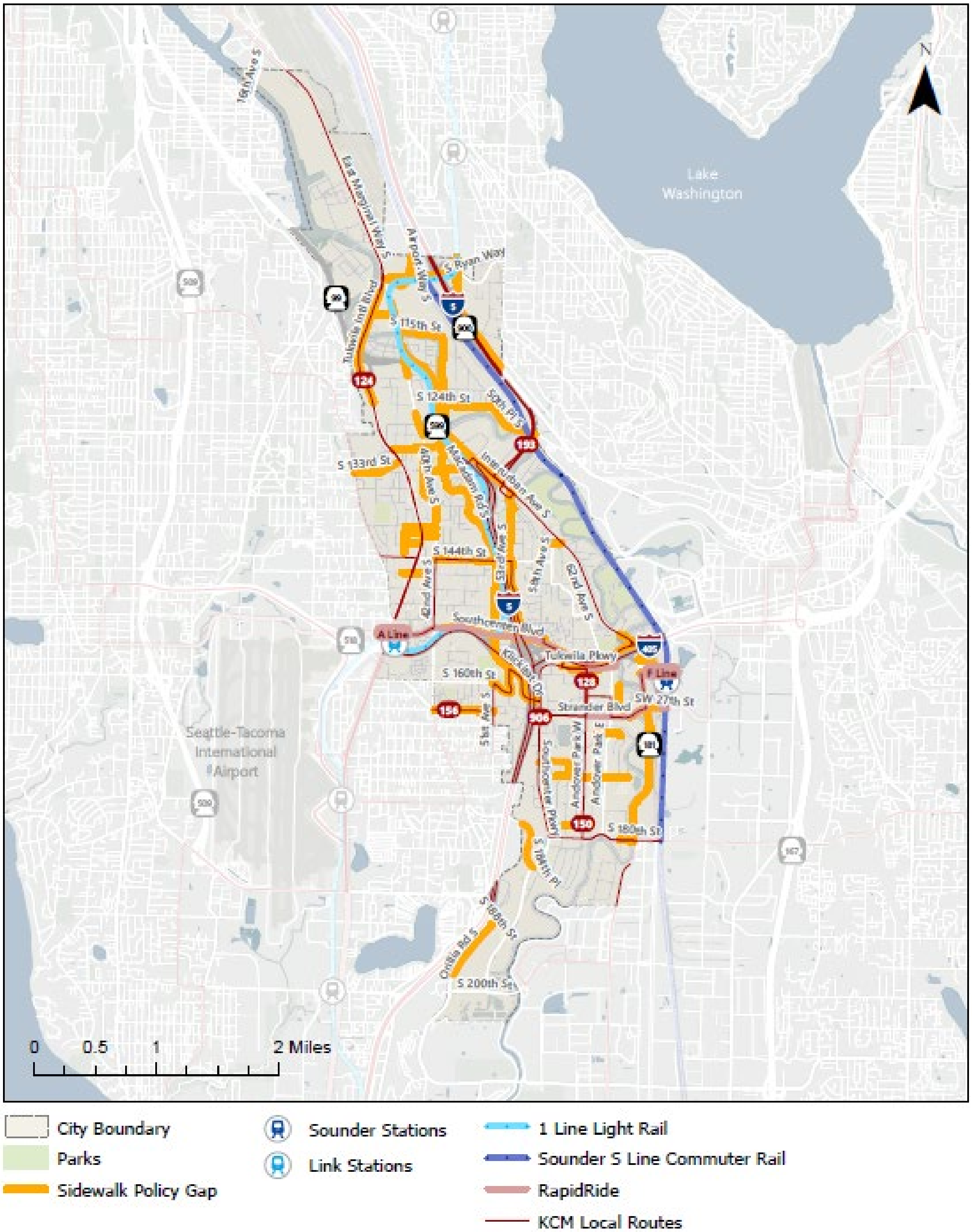
Tukwila also has opportunities to improve accessibility and ensure folks are able to physically access the existing and planned future transit network.

Pedestrian Accessibility to Transit

A key strategy to improve accessibility to transit is through addressing ease of access and safety of riders to physically reach transit service. Specifically, this includes addressing pedestrian conditions and safety, through systematic improvements to existing sidewalk network gaps. These efforts should be first prioritized based on improving pedestrian facilities nearest to frequent transit service, while considering broader pedestrian connectivity as shown in **Figure D4**. Sidewalk network gaps are most prevalent in Northwest Tukwila, including areas currently serving the transit network. Main areas of potential sidewalk network improvements valuable to pedestrian access to transit include:

- **Tukwila International Boulevard** - Tukwila International Boulevard has gaps in the sidewalk network particularly at the northern end of the boulevard before East Marginal Way, near SR 599. This area serves the local 124 Route.
- **40th Avenue, 42nd Avenue S, and Macadam Road** – Continuing east of Tukwila International Boulevard, 40th Avenue, 42nd Avenue S, and Macadam Road also have gaps in the sidewalk network. These streets serve and are near local route 128, as well as the Link Light Rail 1 Line which runs along Macadam Road S, as well as nearby I-5.
- **53rd Avenue SW** - 53rd Avenue SW is also an area needing improved sidewalk facilities, as the area helps to support both local Route 150 as well as Route 128.
- **Allentown** – Additional further improvements in the Allentown area of Tukwila would also help to support better pedestrian accessibility to transit. 50th Place S and S 124th Street are additional areas of priority for pedestrian infrastructure improvements.

Figure D4. Tukwila Sidewalk Network Gaps



Appendix E: Public Outreach (Overview, Fact Sheet, Flyer, Poster, Engagement Boards)

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 51. 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 percent specified a concern regarding cost or access. Lastly, approximately 15 percent 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.

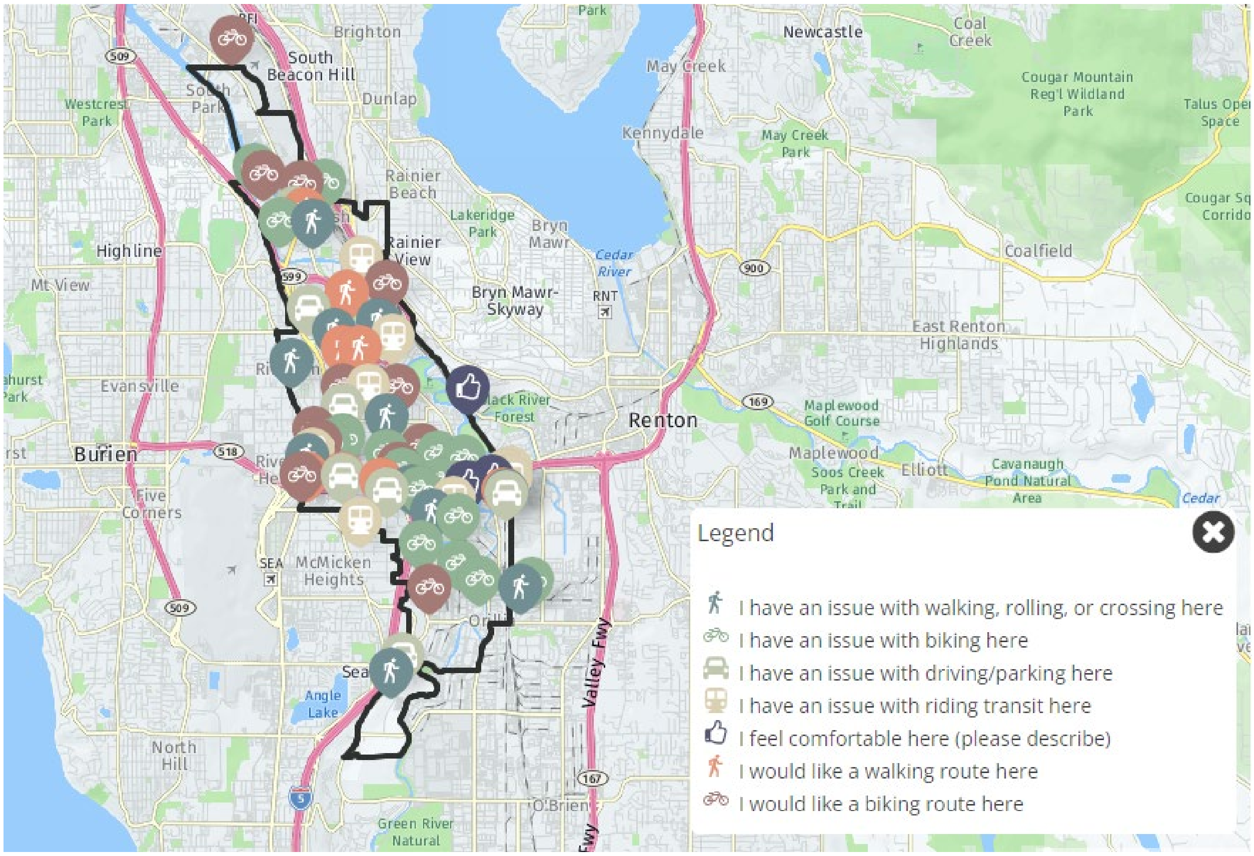
Online Input

The City of Tukwila website[18] hosted project information related to the TE, including an incentivized[19] online survey and an interactive webmap (**Figure 52**) to solicit feedback from the Tukwila residents and visitors. 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.

[18] City of Tukwila. Transportation Element Update. https://www.tukwilawa.gov/departments/public-works/transportation/transportation-element-update/

[19] Survey participation was incentivized with the chance to win a $150 Visa gift card.

Figure 52. Online Webmap



Source: Fehr & Peers. 2023

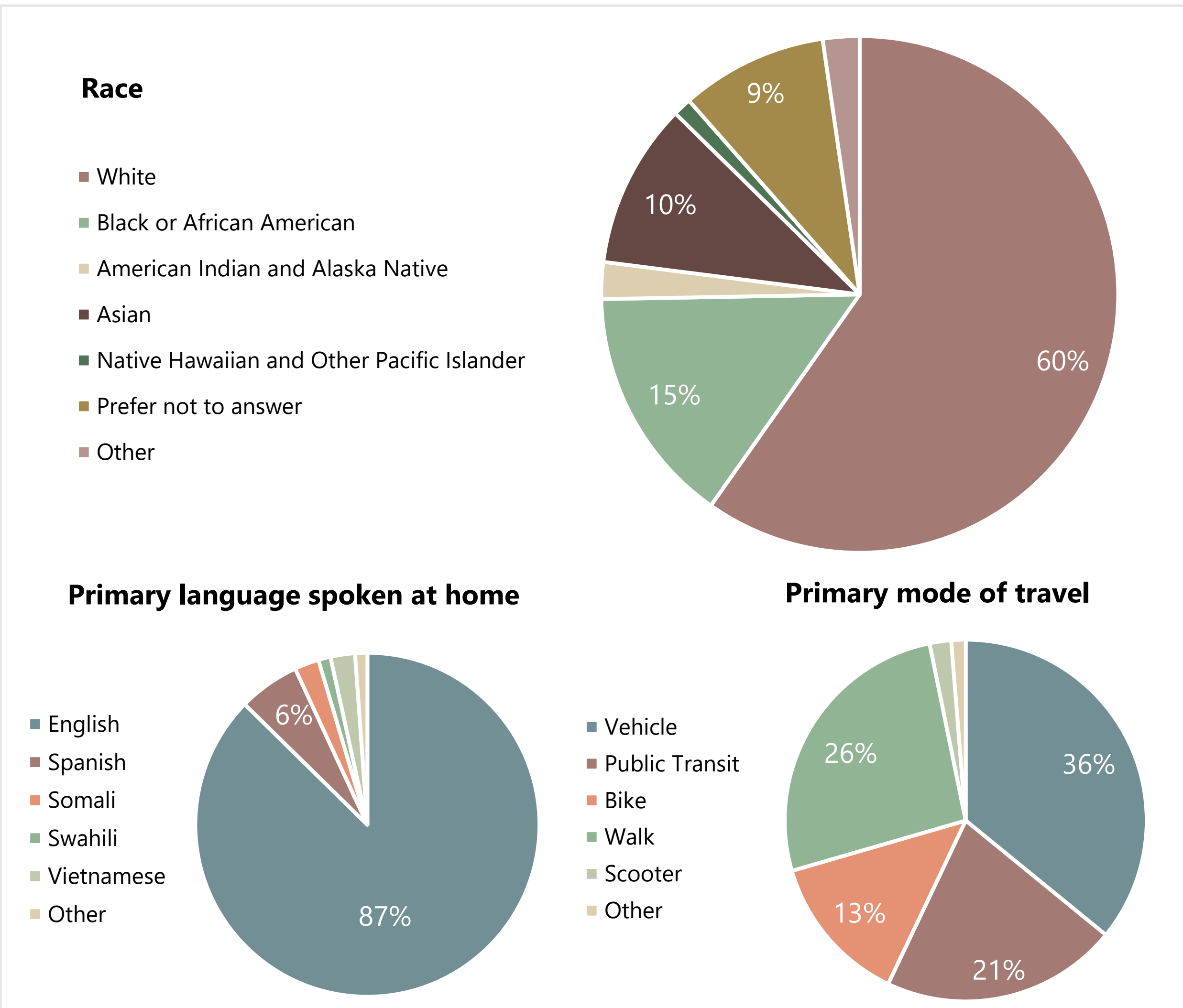
About 80 unique respondents completed the survey and provided feedback on the draft goals in addition to the 67 comments that were added to the interactive webmap. The location-based comments pointed out the lack of bicycle and sidewalk connectivity. Several comments identified abrupt ends of bike lanes 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 53**. 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.

Figure 53. Respondent Demographics

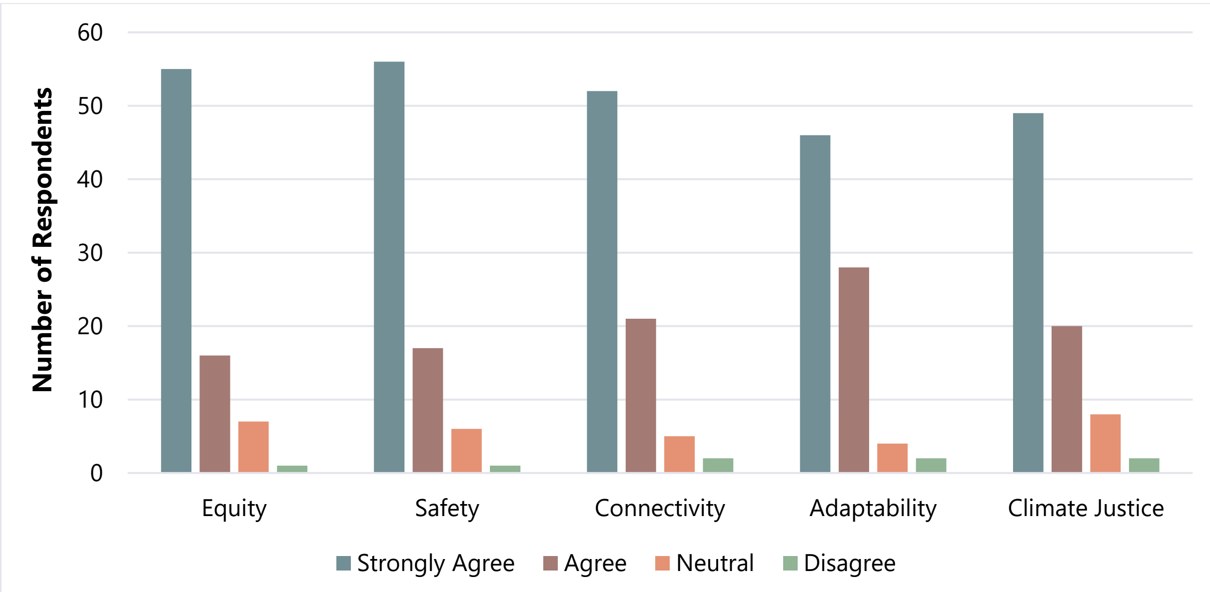


Source: Fehr & Peers. 2023

As shown in **Figure 54**, 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 54. 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 Community Center as a way to improve connectivity and address related safety concerns.

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

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

SEAL OF TUKWILA WASHINGTON 1908

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:

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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 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.

"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."

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.

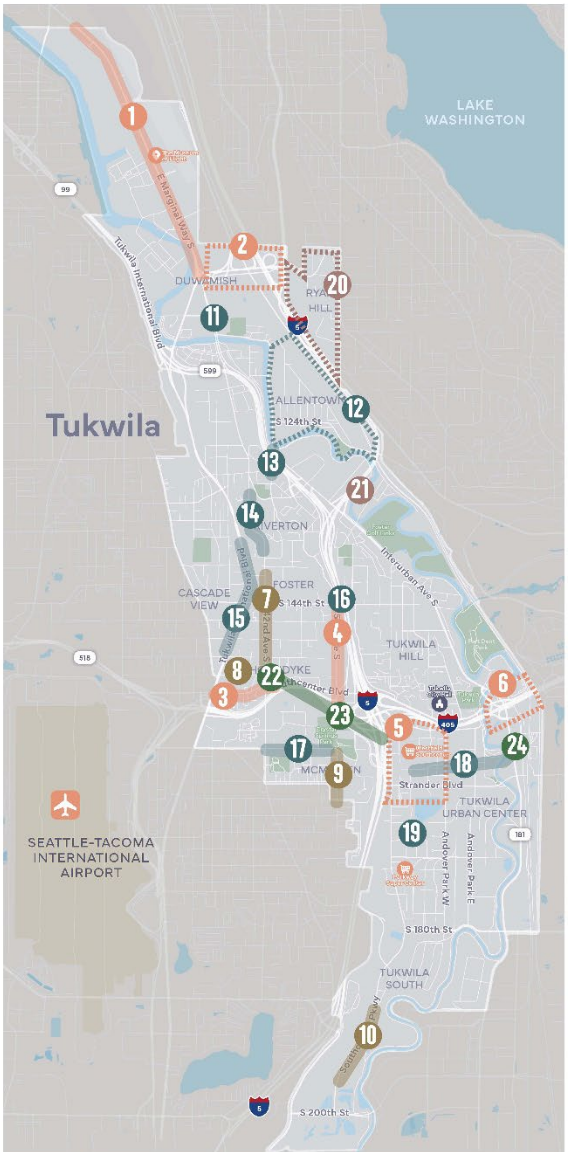
- I like the idea of riding transit but I don't ride as much as I would like to because I'm concerned about my personal safety while riding or waiting for a bus or light rail.
- I really like the transportation connectivity in Tukwila and am happy with our current options.
- I would like to drive more 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?

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

Vote your top 5 ideas!



TRANSIT

	COMMENTS	VOTES
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	

BIKING

	COMMENTS	VOTES
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

	COMMENTS	VOTES
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

	COMMENTS	VOTES
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

	COMMENTS	VOTES
20	More lighting in Ryan Hill.	
21	Clean up Green River Trail / Interurban Trail.	

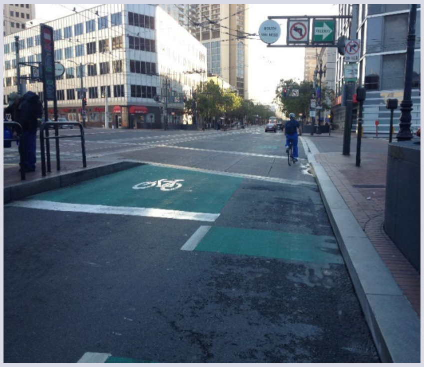
Appendix F: Bike Facility Types and Treatments

Table F1. Bike Facility Types

Facility Type	Description	Image
Off-Corridor Bike Network	Bike boulevards are low-volume and low-speed streets that prioritize bike travel. They incorporate signage, pavement markings, and traffic calming tools to improve the comfort and connectivity of the bike roadway network. Bike boulevards offer an alternative to bicycling on busy streets with high traffic volumes. Many bike boulevards couple speed management strategies with bike route signage to create safer streets.	
Striped Bike Lane	A conventional bike lane is a striped lane on a roadway that is designated for exclusive use by people riding bikes. Conventional bike lanes include pavement markings indicating one-way bike use. These facilities are established along roadways where there is current or anticipated bike demand and where it would be unsafe for bicyclists to ride in the travel lane.	
Buffered Bike Lane (Horizontal)	Buffered bike lanes are conventional bike lanes paired with a designated buffer space separating the bike lane from the adjacent motor vehicle travel lane and/or parking lane. These facilities are established along roadways with high travel speeds, volumes, and/or truck traffic.	

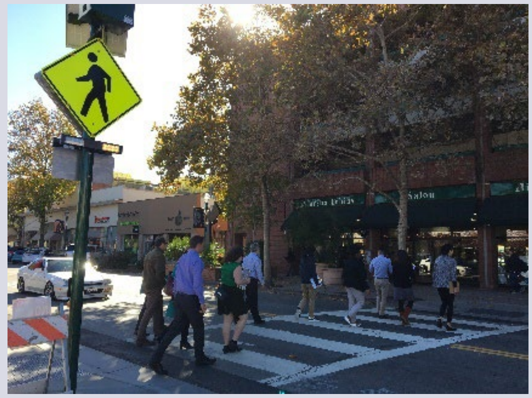
<table>
<tr><th>Facility Type</th><th>Description</th><th>Image</th></tr>
<tr><td>Separated Bike Lane (Vertical)</td><td>Separated bike lanes (vertical) are buffered bike lanes with vertical elements that provide further separation from motor vehicle traffic. Common vertical elements are vertical curbs, a painted buffer with planter boxes, parked cars, or a fixed barrier. These facilities keep motorists from crossing into the bike lane and minimize maintenance costs due to decreased motor vehicle wear. They may be especially appropriate for curvy streets, areas with high drop off/pick up activity, and higher speed streets with few driveways and cross streets.</td><td>
Source: NACTO, 2019. https://nacto.org/2019/11/15/bellevues-downtown-demonstration-bikeway/</td></tr>
<tr><td>Physically Separated Bikeway/ Shared Use Paths</td><td>Physically separated bikeways are paths distinct from the sidewalks. These include shared use paths, which are paved trails for the exclusive use of pedestrians, cyclists, skaters, and other active transportation users. They are wide enough for two-way travel. They are typically separated from motorized vehicular traffic by an open space, barrier, curb, or exist in an independent corridor. They can also be one-way bike facilities separate from – but adjacent to – the sidewalk.</td><td></td></tr>
<tr><td colspan="3">Note: All images are courtesy of Fehr & Peers unless otherwise noted.</td></tr>
</table>

Table F2. Bike Intersection Improvement Treatments

Treatment Type	Description	Image
Bike Signal	Bike signals are dedicated signals, which can be detection or actuation systems, to separate bicyclists and motor vehicle movements at intersections. They give bicyclists priority. These facilities are utilized at high volume intersections with conflicts among motorists, bicyclists, and pedestrians.	
Green solid or skip-stripe	Skip-striping directs cyclists to the bike lane and increases the visibility of cyclists to motorists. These facilities are often used to visually alert users to upcoming bike lanes.	
Bike box	A bike box is dedicated space at the head of a signalized intersection for bicyclists to wait safely and visibly. Bicyclists have priority crossing major streets as they wait in front of vehicle traffic. These facilities are mostly adopted at signalized intersections with high volumes of bicyclists making left-turns and/or motorists making right-turns.	

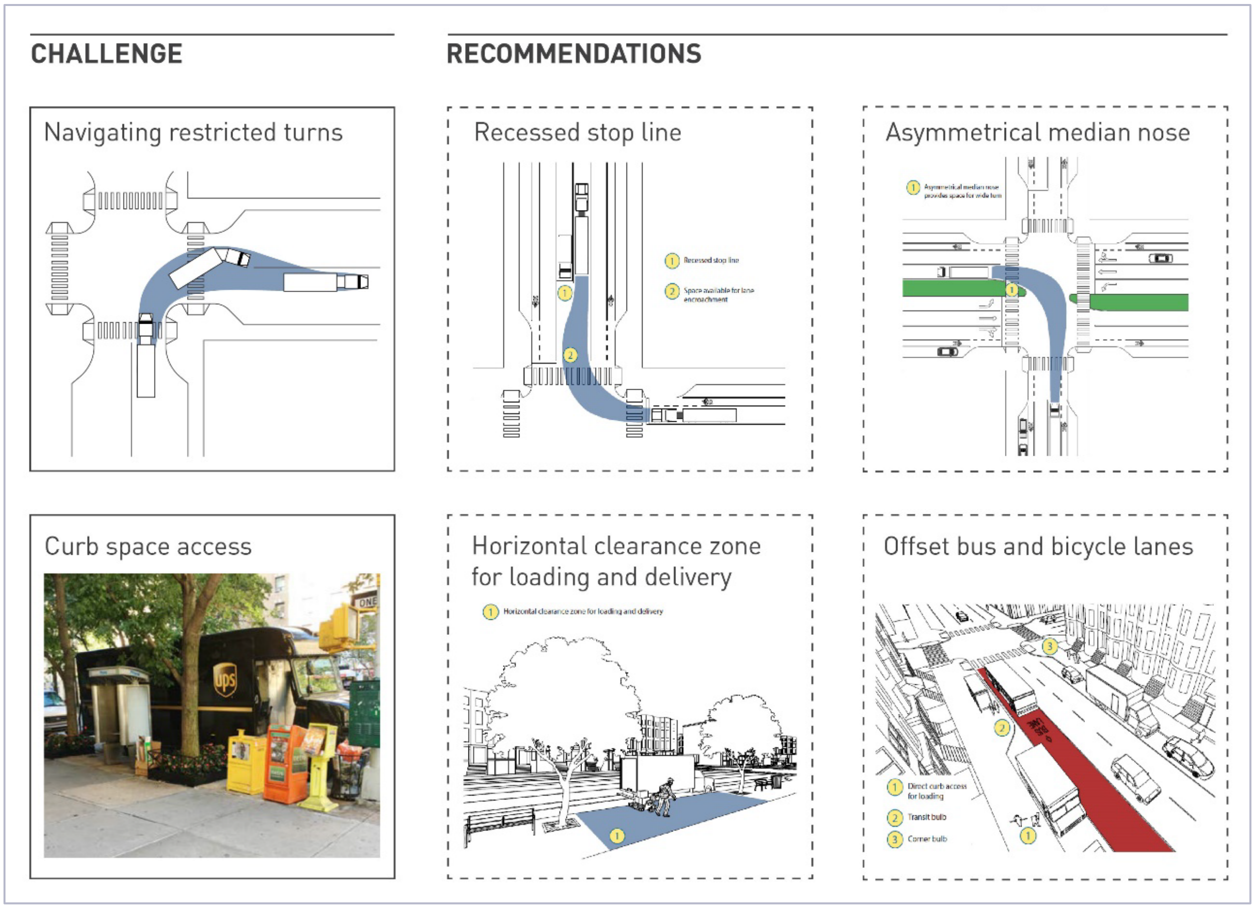
Treatment Type	Description	Image
Protected or Dutch Intersection	A Protected or Dutch Intersection is an intersection that accommodates one-way cycle tracks. Modeled after Dutch intersection design, Dutch Intersections feature corner refuge islands that place stop bars for bicyclists ahead of vehicles, and set back bike crossing approximately one car length from the adjacent travel lane. This allows for two-stage left-turns and free right turns.	
Green Cycle Length	Green cycle length refers to a minimum green signal cycle that is long enough for bicyclists to clear the intersection. In locations where this is implemented, the green cycle length is longer than is typically offered to cars.	
Automatic Signal Actuation	Automatic Signal Actuation are signals which alert motorists of bike crossings and separate motorist and bicyclists traffic signaling. In the case of automatic signals, bike signals are initiated through inductive loop vehicle detection, which is calibrated to the size or metallic mass of a bike. Bicyclists are instructed to wait in detection areas through marked pavement and signage.	 Source: NACTO, 2019. https://nacto.org/publication/urban-bikeway-design-guide/bike-signals/signal-detection-and-actuation/

Treatment Type	Description	Image
Bike Lane to Left	Left-side bike lanes are conventional bike lanes placed on the left side of one-way or two-way median divided streets. They improve visibility as motorists have bike lanes on the driver's side and potentially avoid right-side bike lane conflicts. They also reduce bus and truck conflicts as most bus stops, loading zones, and rush hour parking restrictions are usually on the right side of the street. Consequently, these facilities are often utilized on streets with frequent bus stops or truck loading zones on the right side, high numbers of left-turning bicyclists, high volumes of right turning motor vehicles, and high parking turnover accompanied by rush hour parking restrictions.	 Source: NACTO, 2019. https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/left-side-bike-lanes/
HAWK Signal	Also known as a hybrid beacon, High-intensity Activated Crosswalks are signal-heads with two red over yellow lenses indicating pedestrian and cyclist crossing to motorists. These facilities are mostly installed at unsignalized intersections or mid-block crossing locations. They can be useful along bike boulevards, where intersections are more likely to be unsignalized due to low vehicular traffic volumes, and/or where bike trails intersect streets.	

Treatment Type	Description	Image
Rectangular Rapid Flashing Beacon	Rectangular Rapid Flashing Beacons (RRFB) allow pedestrians to actuate a flashing warning light to indicate pedestrian crossing. When combined with other pedestrian treatments, such as median refuge islands or advance yield marking, they have an even stronger impact on pedestrian and bicyclist visibility.	
Note: All images are courtesy of Fehr & Peers unless otherwise noted.		

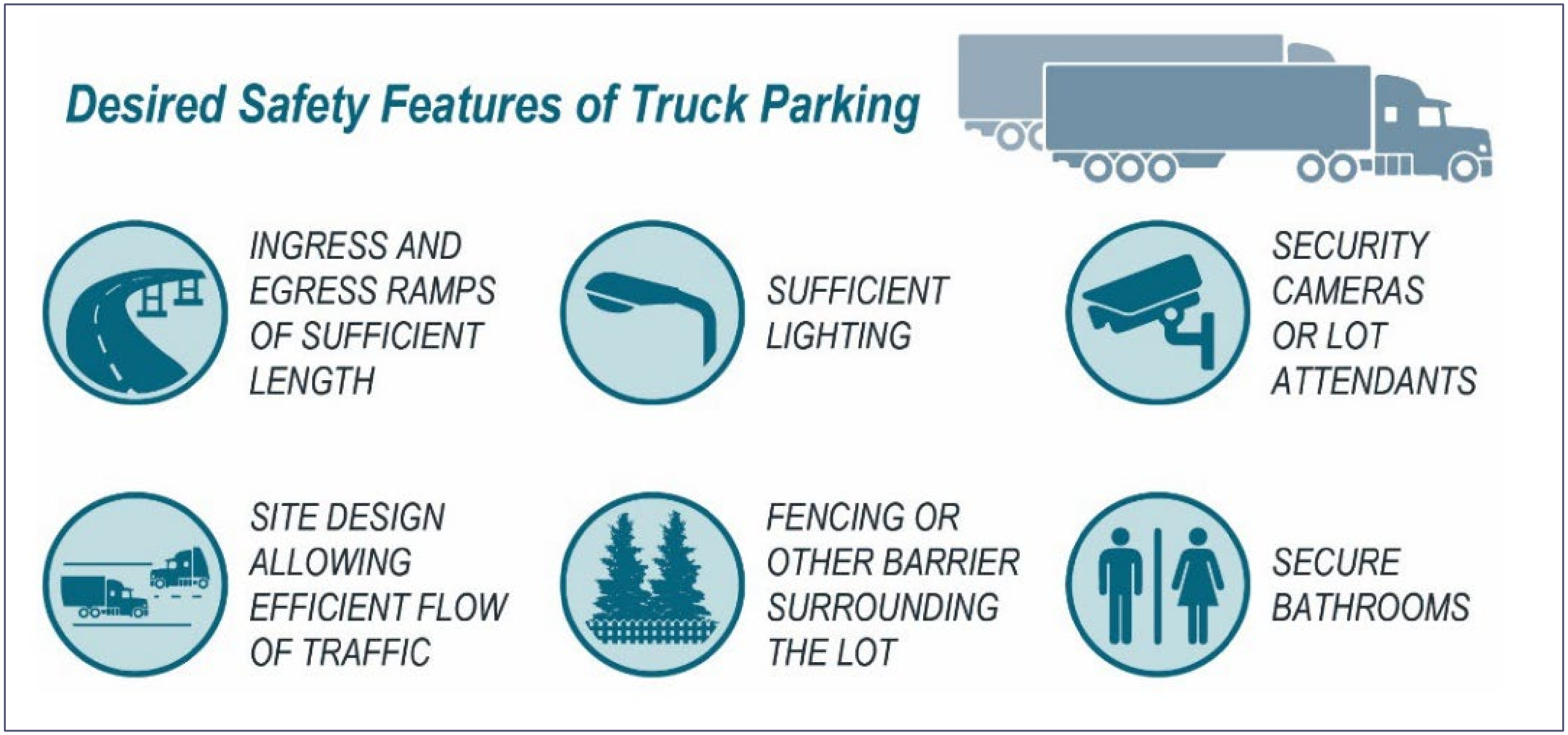
Appendix G: Freight Considerations

Figure G1. Examples of Freight Considerations along Corridors



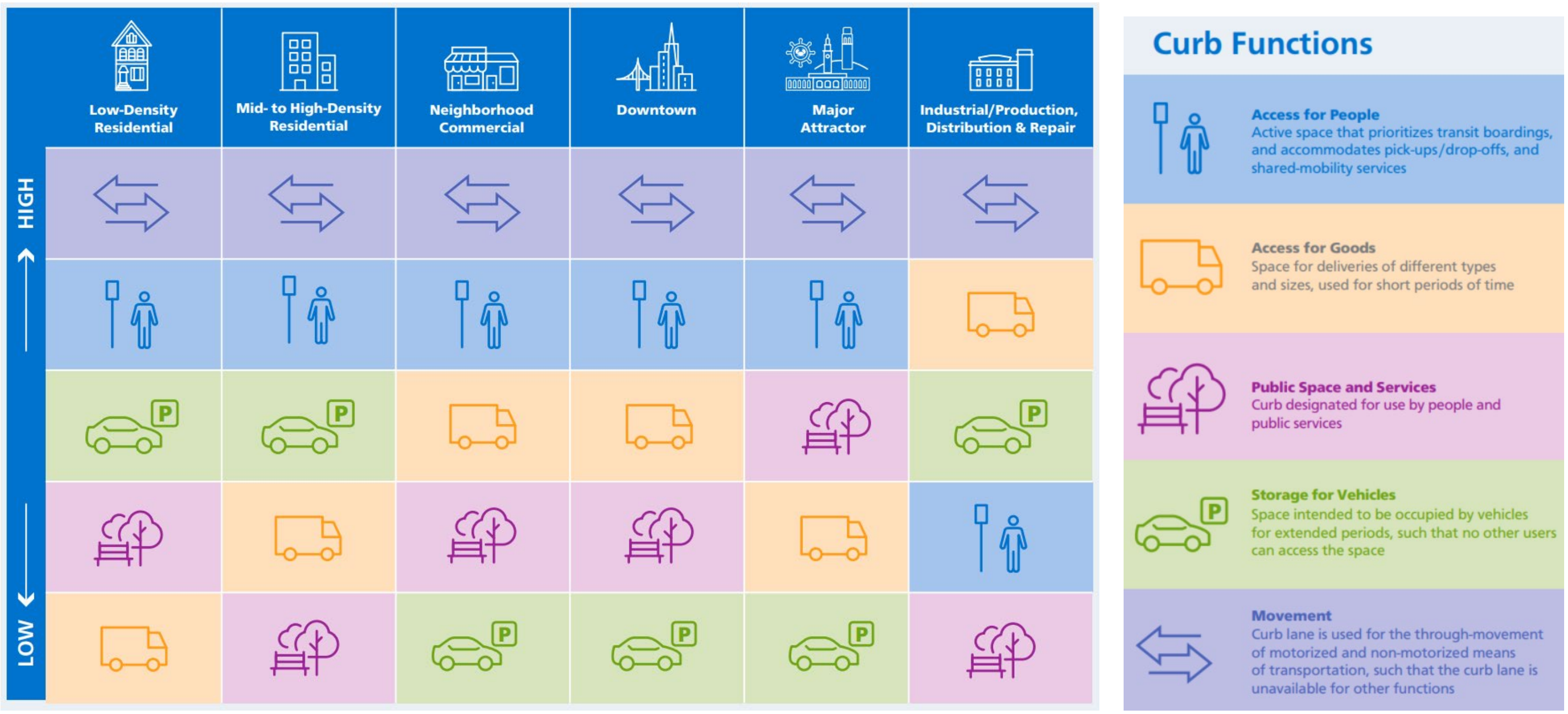
Source: Accommodating Freight in Complete Streets. 2019

Figure G2. Common Features for Safe Truck Parking



Source: FHWA, Truck Parking Development Handbook, 2022

Figure G3. Curb Functions Prioritized by Land Use



Source: San Francisco Municipal Transportation Agency (SFMTA) Curb Management Strategy, 2020

Appendix H: Extended Project List

Table H1. Extended Project List

#	Project Name	Description	Street Name	Start	End	Priority Level
T-37	Striped Bike Lane on Macadam Road	Add buffered bike lanes on both sides of the segment. 2-5ft bike lanes 2-3ft bike buffer 2-12ft lanes.	Macadam Rd S	S 149th Lane	S 144th Street	Low
T-38	Southcenter Blvd Bike Parkway Section 3	Develop shared use path on north side. May need to acquire ROW from 6550 at the intersection or restripe to reduce lanes from path to continue north of 66th and down the hill to tie into the Green River Trail and the proposed Tukwila Pkwy improvements.	Southcenter Blvd	65th Ave S	66th Ave S	High
T-39	Southcenter Blvd Bike Parkway Section 2	Continue shared use path on north side.	Southcenter Blvd	61st Ave S	65th Ave S	High
T-40	Southcenter Blvd Bike Parkway Section 1	Widen sidewalk on north side for shared use path.	Southcenter Blvd	405 Exit Ramp	61st Ave S	High
T-41	S Boeing Access Road	Recent improvements created a 10-12ft buffered path next to the bridge over the tracks. Propose doing similar on other bridges.	S Boeing Access Rd	E Marginal Way S	Airport Way S	Low
T-42	S Boeing Access Road	Recent improvements created a 10-12ft buffered path next to the bridge over the tracks. Propose doing similar on other bridges.	S Boeing Access Rd	Airport Way S	MLK	Low
T-43	S 144th Street Bike Lane Extension Section 3	Remove parking on east side. Widen sidewalk on west side to create a raised bike lane and parking with bulb outs. On east side, remove and relocate sidewalk to ROW line and create buffered bike lane at street level.	58th Ave S	S 144th Street	Interurban Ave S	Low

T-44	S 144th Street Bike Lane Extension Section 2	Restripe and remove parking on one side to accommodate 2-10ft lanes 1-8ft parking area 1-2ft buffer and 1-10ft two way cycle track.	S 144th St	56th Ave S	58th Ave S	Low
T-45	S 144th Street Bike Lane Extension Section 1	Restripe and remove parking on one side to accommodate 2-10ft lanes 1-8ft parking area 1-2ft buffer and 1-10ft two way cycle track.	S 144th St	Macadam Rd S	56th Ave S	Low
T-46	Striped Bike Lane on Macadam Road Extension	Replace existing bike lane on west side with separated shared use path. Restripe roadway to provide a bike lane on the east side of the street.	Macadam Rd S	Southcenter Blvd	S 149th Lane	Low
T-47	S 144th Street Bike Lane Extension Section 0	Restripe to accommodate 2-10ft lanes 1-8ft parking area 1-2ft buffer and 1-10ft two-way cycle track.	S 144th St	51st Ave S	Macadam Road S	Low
T-48	Minkler Boulevard Bike Project Section 2	Build a separate shared use path in the ROW south of Minkler in conjunction with a stream mediation or culvert replacement project. Work with City and County owned land to connect the path to the green river trail through the wetalndto the east.	Minkler Blvd	Andover Parkway W	Green River Trail	Low
T-49	Minkler Boulevard Bike Project Section 1	Remove railroad track and construct a shared use path that connects with Minkler Blvd Bike Project Section 2.	Minkler Blvd	243 Minkler Blvd	Andover Park W	Low
T-50	Minkler Boulevard Bike Project Section 0	Widen the sidewalk on the south side to accommodate a shared use path.	Minkler Blvd	Southcenter Pkwy	243 Minkler Blvd	Low
T-51	E Marginal Way Bike Lane Section 2	Add striped bike lanes on both sides of the street.	E Marginal Way S	Interurban Ave S	S 126th Street	Low
T-52	E Marginal Way Bike Lane Section 1	Road width sufficient to incorporate bike lane. Parking is restricted to one side. Lanes to be narrowed to 10'. ADT is low and is not a cause for concern.	E Marginal Way S	S 126th Street	S 128th Street	Medium
T-53	E Marginal Way Bike Lane Section 0	Update cross section to include 2-8ft sidewalks 1-5ft bike lane with a 2ft buffer 2-11ft lanes and 1-5ft parking protected bike lane with 8ft parking and 2ft buffer.	E Marginal Way S	S 128th Street	40th Ave S	Low

T-54	Buffered Lane on 42nd Ave S Section 2	From S 144th to S 142nd, update cross section to include 2-8ft sidewalks 1-5ft bike lane with a 2ft buffer 2-11ft lanes and 1-5ft parking protected bike lane with 8ft parking and 2ft buffer. North to S139 the ROW widens and there is room to adjust cross section to have 2 parking protected bike lanes.	42nd Ave S	S 144 St.	S 139th St	High
T-55	Buffered Lane on 42nd Ave S Section 1	Update cross section to include 2-8ft sidewalks 1-5ft bike lane with a 2ft buffer 2-11ft lanes and 1-5ft parking protected bike lane with 8ft parking and 2ft buffer. North of 137th, remove parking and widen buffers on undeveloped curved section.	42nd Ave S	S 139th St	E Marginal Way	Low
T-56	SouthCenter Parkway Section 3	Reduce lane width by restriping. 3-11ft lanes 2-10ft lanes a 12ft shared use path and 3 feet for utilities all on the west side.	Southcenter Pkwy	Minkler Boulevard	S 180th Street	Low
T-57	51st Ave S Project	Update cross section to include new sidewalk and buffered bike lanes. The ROW between S 151st and where S 147th would be is reduced to 40ft. May need ROW acquisition while it is under development or have any potential developer donate the land.	51st Ave S	S 144th St	Southcenter Blvd	Low
T-58	Andover Park E Section 1	Bike facilities likely here, along with road diet on APE, possible ROW dedication from development	Andover Park E	Tukwila Pkwy	Industry Dr	High
T-59	Andover Park W	Bike facilities could go along one (or both) n/s corridor, need further analysis when appropriate time is presented/decision point is reached	Andover Park W	Treck Dr	S 180th St	High
T-60	Andover Park E Section 2	Bike facilities could go along one (or both) n/s corridor, need further analysis when appropriate time is presented/decision point is reached	Andover Park E	Industry Dr	S 180th St	Low

T-61	S 168th Street/Macy's Parking Lot Connector Road	Bike facility likely here with connector road, if completed	Macy's parking lot and CuliNEX parking lot	Southcenter Pkwy	Andover Park W	Medium
T-62	E Marginal Way S Section 1	Bike facilities may be desired here, pending BAR Infill station and area redevelopment, could connect to bike facilities on Airport Way if Seattle/Tukwila install, connecting via Norfolk to EMWS	E Marginal Way S	S Boeing Access Rd	Interurban Ave S	Medium
T-63	Tukwila International Blvd	Bike facilities may be desired here, pending BAR Infill station and area redevelopment, could connect to bike facilities on Airport Way if Seattle/Tukwila install, connecting via Norfolk to EMWS	Tukwila International Blvd	E Marginal Way S	WA-599	High
T-64	Treck Dr Connection	Bike facilities could go along one (or both) n/s corridor, need further analysis when appropriate time is presented/decision point is reached	Treck Dr	Andover Park W	Andover Park E	Medium
T-65	Southcenter Boulevard Bike Lanes Section 4	Reduce lane with and median buffer to create a shared use path on the south side.	Southcenter Blvd	I - 5 Exit Ramp	I - 405 Exit Ramp	High
T-66	Southcenter Boulevard/SW Grady Way Bike Facilities	Add striped bike lanes east of I-405 Off ramps. If this project moves forward, need to update bike network.	Southcenter Blvd/SW Grady Way	I-405 interchange	Eastern City Limits	High
T-67	S 144th Street / 53rd Avenue S and S 144th Street / Macadam Road S Intersection Improvements	Design and construct a new traffic signal that serves both S 144th Street / 53rd Avenue S and S 144th Street / Macadam Road S. Evaluate eastbound left demand to determine if a turn pocket is required. As part of the intersection improvements include additional pedestrian facilities such as pedestrian push buttons.	S 144th Street	Macadam Road S	53rd Avenue S	Low
T-68	Southcenter Boulevard / I-405 SB Off-ramp	Design and construct intersection improvements, which could include a new half/full traffic signal or a roundabout coupled with geometric realignment, lighting, pedestrian facilities, and drainage.	Southcenter Boulevard	I-405 SB Off-ramp		Low

T-69	Southcenter Blvd/65th Avenue S Signal	Signalize the intersection.	Southcenter Boulevard	65th Avenue S		High
T-70	Ryan Hill Lighting Improvements	Add lighting to S Ryan Way	S Ryan Way	S Boeing Access Rd	51st Ave S	Medium
T-71	Intersection Improvements: E Marginal Way and S 112th St	Add crosswalks and RRFB to the intersection of E Marginal Way and S 112th St	0	E Marginal Way	S 112th St	High
T-72	S 133 St/SR599 Intersection	Design and construct intersection improvements, which could include a new traffic signal or a roundabout, lighting, pedestrian facilities, and drainage.	S 133rd St	SR-599		Low
T-73	Minkler Blvd (APW - S/C Pkwy)	Widen Minkler Blvd from Andover Park West to Southcenter Parkway. Add third lane and curb, gutter, and sidewalk on the south side.	Minkler Blvd	Andover Park W	Southcenter Pkwy	Low
T-74	S 129th St	Construct sidewalk on both sides of road segment	50th Pl S and S 129th St	S 124th St	East boundary of Tukwila city limits	Medium
T-75	Wig Blvd	Construct sidewalk on north side of Wig Blvd from Southcenter Pkwy to Bauch Dr. Construct sidewalk on east side of Bauch Dr from Wig Blvd to Andover Park W	Wig Blvd and Bauch Dr	Southcenter Pkwy	Minkler Blvd	Low
T-76	S Boeing Access Rd	Construct sidewalk on both sides of road segment	S Boeing Access Rd	E Marginal Way S	Martin Luther King Jr Way S	Low
T-77	Minkler Blvd Section 1	Construct sidewalk on south side of Minkler Blvd from end of existing sidewalk to Andover Park W	Minkler Blvd	243 Minkler Blvd	Andover Park W	Low
T-78	W Valley Hwy Section 1	Construct sidewalk on west side of W Valley Hwy	W Valley Hwy	17450 W Valley Hwy	S 180th St	Low
T-79	W Valley Hwy Section 2	Construct sidewalk on both sides of road segment	W Valley Hwy	17000 W Valley Hwy	17450 W Valley Hwy	Medium
T-80	W Valley Hwy Section 3	Construct sidewalk on west side of road from SW 27th St to simpleFLOORS Seattle parking lot entrance. Construct sidewalk on both sides	W Valley Hwy	Strander Boulevard	17000 W Valley Hwy	Medium

		of road from simpleFLOORS Seattle parking lot entrance to Auto Trim Design parking lot entrance				
T-81	Industry Dr Section 2	Construct sidewalk on both sides of Treck Dr. Construct sidewalk on north side of Industry Dr up to railroad crossing	Treck Dr and Industry Dr	West end of Treck Dr	Railroad crossing on Industry Drive	Medium
T-82	Christensen Rd Section 2	Construct sidewalk on west side of Christensen Rd from Baker Blvd to the southern-most Riverview Plaza parking lot entrance. Construct sidewalk on both sides of Christensen Rd from the parking lot entrance to Strander Blvd	Christensen Rd	Baker Blvd	Strander Blvd	High
T-83	Christensen Rd Section 1	Construct sidewalk on west side of 68th Ave S	Christensen Rd	16000 Christensen Rd	Baker Blvd	Medium
T-84	Longacres Way	Construct sidewalk on north side of Longacres Way. This would improve pedestrian connectivity to Tukwila Sounder Station.	Longacres Way	W Valley Hwy	Tukwila Station AcRd	Medium
T-85	Nelson Pl S Section 2	Construct sidewalk on south side of S 156th St segment. Construct sidewalk on both sides of Nelson Pl S segment. This would improve pedestrian connectivity to Tukwila Sounder Station.	S 156th St	W Valley Hwy	Interurban Trail	Medium
T-86	Interurban Ave S Section 3	Construct sidewalk on west side of road segment	Interurban Ave S	Southcenter Blvd	Fort Dent Way	Medium
T-87	S 164th St	Construct sidewalk on both sides of road segment	S 164th St	42nd Ave S	51st Ave S	High
T-88	S 160th St	Construct sidewalk on the north and west side of the segment from 51st Ave S to S 159th St. Construct sidewalk on the east side of the segment from S 159th St to Klickitat Dr	S 160th St and 53rd Ave S	51st Ave S	Klickitat Dr	Low
T-89	Martin Luther King Jr Way S Section 2	Construct sidewalk on both sides of road segment	Martin Luther King Jr Way S	S Boeing Access Rd	HW 5 entrance ramp	Medium
T-90	51st Ave S	Construct sidewalk on both sides of road segment	51st Ave S	S 144th St	51st Ave S Bridge	Medium

T-91	S 144th St Section 1	Construct sidewalk on south side of S 144th St	S 144th St	44th Ave S	51st Ave S	Medium
T-92	S 144th St Section 2	Construct sidewalk on south side of S 144th St	S 144th St	Tukwila International Blvd	44th Ave S	Medium
T-93	Macadam Rd S Section 3	Construct sidewalk on west side of road segment	Macadam Rd S	S 144th St	14449 Macadam Rd S	Low
T-94	S 140th St Section 1	Construct sidewalk on both sides of road segment	S 140th St	37th Ave S	Tukwila International Blvd	High
T-95	S 140th St Section 2	Construct sidewalk on both sides of road segment	S 140th St	Tukwila International Blvd	42nd Ave S	High
T-96	S 141st St Section 2	Construct sidewalk on both sides of road segment	S 141st St	Tukwila International Blvd	42nd Ave S	High
T-97	S 137th St and 53rd Ave S	Construct sidewalks on north side of S 137th St from 53rd Ave S (west) to 53rd Ave S (east) and on west side of 53rd Ave S from S 137th St to 52nd Ave S.	S 137th St, 53rd Ave S	Tukwila Park and Ride (52nd Ave S Entrance)	5204 S 137th St	Medium
T-98	Macadam Rd S Section 4	Construct sidewalk on both sides of road segment	Macadam Rd S	S 137th St	S 144th St	Medium
T-99	E Marginal Way S Section 1	Construct sidewalk on east side of E Marginal Way S	E Marginal Way S	10838 E Marginal Wy S	S 112th St	Medium
T-100	Macadam Rd S Section 5	Construct sidewalk on both sides of Macadam Rd S from S 133rd St to 43rd Ave S, construct sidewalk on east side of Macadam Rd S from 43rd Ave S to end of existing sidewalk on west side, and construct sidewalk on both sides of Macadam Rd S from existing sidewalk to S 137th St	Macadam Rd S	S 133rd St	S 137th St	High
T-101	S 133rd St/S 132nd St	Construct sidewalk on both sides of road segment	S 133rd St and S 132nd St	Military Rd S	Tukwila International Blvd	High

T-102	S 130th St	Construct sidewalk on both sides of road segment	S 130th St	Tukwila International Blvd	Macadam Rd S	High
T-103	E Marginal Way S/S 133rd St	Fill sidewalk gaps along the segment.	East Marginal Way S and S 133rd St	40th Ave S	Interurban Ave S	High
T-104	Macadam Rd S Section 6	Construct sidewalk on west side of Macadam Rd S from S 130th St to S 131st St. Construct sidewalk on both sides of Macadam Rd S from S 131st St to S 133rd St.	Macadam Rd S	S 130th St	S 133rd St	High
T-105	E Marginal Way S Section 3	Construct sidewalk on east side of East Marginal Way S	East Marginal Way S	S 124th St	S 128th St	Medium
T-106	Tukwila International Blvd Section 1	Construct sidewalk on both sides of road segment	Tukwila International Blvd	10825 E Marginal Wy S	S 112th St	Medium
T-107	S 112th St	Construct sidewalk on both sides of road segment	S 112th St	Tukwila International Blvd	E Marginal Way S	Medium
T-108	Tukwila Pond Pedestrian Access Improvements	Improve pedestrian access to Tukwila Pond Park				Medium
T-109	Tukwila International Boulevard Sidewalk Improvement	Add landscape buffers along sidewalks to prevent cars parking in pedestrian space.	Tukwila International Blvd	S 152nd St	S 139th St	High
T-110	S 124th St Sidewalk (West Segment)	Fill sidewalk gaps along the segment.	S 124th St	42nd Ave S	49th Ave S	Medium
T-111	42nd Ave S Traffic Calming Study	Review traffic calming tools that may reduce traffic speeds on 42nd Ave S	42nd Ave S	Southcenter Blvd	S 140th St	Medium
T-112	51st Ave S Traffic Calming Study	Review traffic calming tools that may reduce traffic speeds on 51st Ave S	51st Ave S	S 160th St	Southern City Limits	Low
T-113	Southcenter Parkway Speed Study	Review tools that may reduce traffic speeds on Southcenter Parkway	Southcenter Pkwy	57th Ave S	S 200th St	Low
T-114	Macadam Rd South Complete Street	Construction of a complete street design for Macadam Rd South between South 144th St	Macadam Rd S	S 144th St	S 150th St	Medium

		and S 150th St. The project will require roadway widening and re-channelization to add 5-foot bike lanes and 5-foot sidewalks on both sides of the roadway, and includes illumination, curb, and storm drainage.				
T-115	S 124th Street / 42nd Avenue S Intersection Improvements	Continue to evaluate intersection delays and consider intersection control changes through signalization or a roundabout.	S 124th Street	42nd Avenue S		High
T-116	West Valley Highway Corridor Monitoring	Collaborate with WSDOT to continue to monitor corridor delays and further study	West Valley Highway	Southcenter Blvd	Strander Blvd	Low