City of Duvall
2024

Transportation Plan

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City of Duvall

2024 Transportation Plan

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Chapter 1: Introduction

The City of Duvall's transportation system is essential to nearly every function of the community, from land use, housing, and employment to recreation and daily activities like shopping and attending school. The Transportation Plan (Plan) serves as a foundational document and companion to the Transportation Element of the City's Comprehensive Plan. This Plan will guide the City in advancing its multimodal transportation goals, addressing current needs, and supporting land use plans while aligning with the broader community vision.

Purpose & Intent

This Plan provides a strategic framework to guide the growth and development of the City's transportation infrastructure. It integrates land use planning with the transportation network to address current needs while ensuring that future developments are adequately served. The Plan also emphasizes creating a balanced, multimodal transportation system for both the City and its surrounding Urban Growth Area (UGA). Recognizing the regional nature of transportation, the Plan underscores the importance for ongoing interagency collaboration.

This Plan is based on a 2023 study of Duvall's existing transportation network, combined with a 20-year projection (to 2044) of future growth and transportation needs. This document is organized into the following chapters:

- Goals and Policies
- Existing Transportation Services and Facilities
- Forecast Transportation Conditions
- Transportation Systems Plan
- Transportation Finance and Implementation Program
- Consistency with Other Agencies

As a companion document, the Transportation Plan implements the Transportation Element of the Comprehensive Plan. The Transportation Element sets the goal and policy framework for aligning transportation decisions with the City's long-term vision over the 20-year planning horizon. Building on these goals and policies, the Transportation Plan guides decisions to address both short- and long-term needs. It identifies existing system characteristics, sets level of service (LOS) standards, and highlights existing and future deficiencies based on land use projections to meet Growth Management Act (GMA) requirements. The Plan also addresses roadway mobility, accessibility, and improvements needed to enhance safety, bicycle and pedestrian travel, and public transit.

The purpose of the Transportation Plan is to identify infrastructure needs for both motorized and non-motorized transportation to support the land use goals selected for the City; and to compile this information in one document in a comprehensive manner. The goal is to provide a safe, efficient, economical, and environmentally responsible transportation system for future growth and development. This plan and the policies and goals that are developed as a result will work in concert with the City's Comprehensive Plan. The Transportation Plan reflects the policy direction from the Planning Commission and City Council on how to plan for transportation.

Regulatory Setting

In 2023 the City Council commissioned an update of the Transportation Plan to replace the 2017 Transportation Plan (City of Duvall, 2016). This updated Plan addresses transportation needs, improvement projects, and funding sources to support the projected population and employment growth through the year 2044 in accordance with the City's Comprehensive Plan, anticipated to be adopted June 2025 by resolution, predating the comprehensive plan.

The following summarizes the regulatory setting and regional planning efforts that guided the development of the Transportation Plan.

Growth Management Act

The Transportation Plan satisfies the GMA requirements for long-range planning and to supplement information and implement goals and policies within the Transportation Element of the Comprehensive Plan. Under the GMA (RCW 36.70A.070), the Transportation Element is required to assess the needs of a community and determine how to provide appropriate transportation facilities for current and future residents, workers, and the traveling public. The Transportation Element, and this supplemental Transportation Plan, contain:

- Existing travel conditions and land use assumptions used in estimating future travel conditions
- Estimated travel impacts on state-owned transportation facilities
- Inventory of existing facilities
- Assessment of future facility needs to meet current and future demands
- Multi-year plan for financing proposed transportation improvements
- Forecasts of traffic for at least 10 years based on adopted land use plan
- Level of Service (LOS) standards for arterials, non-motorized facilities, and public transportation, including actions to bring deficient facilities into compliance
- Transportation Demand Management (TDM) strategies
- Identification of intergovernmental coordination efforts
- A pedestrian and bicycle component that includes collaborative efforts to identify and designate planned improvements for pedestrian and bicycle facilities and corridors that address and encourage enhanced community access and promote active transportation

Under the City's concurrency management policy, development may not occur if it will cause the performance of a transportation facility to decline below the City's adopted LOS standard unless existing infrastructure is in place or strategies to accommodate the impacts of the development are made within six years of its completion. Finally, the Plan must include a reassessment strategy to address how the Plan will respond to potential funding shortfalls.

> *The Washington State GMA requires that transportation improvements or strategies to accommodate development be available when the impacts of development occur. "Concurrency" for transportation facilities is defined in the GMA and the Washington Administrative Code (WAC) to mean that any needed transportation improvements or programs be in place at the time of development or that a financial commitment exists to complete the improvements or strategies within six years.*[1]

Puget Sound Regional Council

The Puget Sound Regional Council's (PSRC) *VISION 2050* was adopted in 2020 as the central Puget Sound region's long-range strategy for growth management, the environment, economic development, and transportation. *VISION 2050* replaces the previous *VISION 2040* document and includes Regional Growth Strategies to address congestion, ensure mobility, limit or mitigate environmental impacts, and direct funding. While *VISION 2050* builds on previous regional plans for King, Kitsap, Pierce, and Snohomish counties, it also introduces new

[1] https://www.psrc.org/our-work/adopted-level-service-standards-regionally-significant-state-highways

provisions to guide and coordinate regional and local planning. Successful implementation of *VISION 2050* relies on successful implementation of local comprehensive plans.

Countywide Planning Policies

The King County Countywide Planning Policies (CPPs) are a series of policies that address growth management issues in King County. Adopted in 2021 and updated in 2024, the CPPs provide a countywide vision to serve as a framework for local Comprehensive Plans. The CPPs require that local jurisdictions develop a balanced transportation plan consistent with *VISION 2050.* An essential component of the *Vision 2050* is an efficient transportation system that provides multiple options for moving people and goods into and among various centers. The CPPs promote a multimodal approach to serve existing and new development, with particular emphasis on transit and non-motorized modes to support land use plans. The overarching transportation goal is, "*the region is well served by an integrated, multimodal transportation system that supports the regional vision for growth, efficiently moves people and goods, and is environmentally and functionally sustainable over the long term*."

Clean Air Act

The Transportation Element is also intended to foster compliance with the Washington State Clean Air Act and specific "conformity" requirements that implement the directives of the Federal Clean Air Act. Because air quality is a region wide issue, the City of Duvall's Comprehensive Plan must support the efforts of state, regional, and local agencies as guided by WAC 173-420-080.[2]

Other City Policies and Plans

The projects and programs outlined in the Transportation Plan are guided by other City plans and requirements. Transportation infrastructure planning considers economic vitality, social interaction, and Duvall's unique character, as highlighted in the Economic Development Element of the City's Comprehensive Plan. Land Use goals, policies, and assumptions from the Comprehensive Plan, Duvall Municipal Code Unified Development Regulations (DMC Title 14), also play a key role in the planning process.

While aesthetics are sometimes seen as a relatively minor aspect of transportation projects, the City of Duvall emphasizes the importance of the natural and built environment, and the incorporation of arts and culture within its projects. Combined with sound engineering, these elements contribute to livable streets that are functional and accessible to all users. Features such as landscaping, street trees, streetscape materials, parks, trails, wayfinding signage, effective lighting, safety features, parking, and street furniture – all installed in accordance with DMC Title 14, Public Works Development Design Standards (DDS), and other City guidelines – help create complete streets for everyone.

[2] https://app.leg.wa.gov/WAC/default.aspx/default.aspx?cite=173-420-080

Chapter 2: Goals & Policies

The City has identified a range of goals and policies to implement the Transportation Plan efficiently and effectively. Detailed goals and policies are outlined in the Transportation Element of the Comprehensive Plan. The transportation goals and policies are organized around the foundational principles of the Duvall Comprehensive Plan including:

- Equity: Enable quality, diverse, and efficient residential growth, with an emphasis on homeownership and affordability.
- Economic Stability and Vibrancy: Create opportunities for economic stability, vibrancy, sustainability, and resilience.
- Climate Adaptation and Resiliency: Develop achievable plans to address climate adaptation and community resilience.
- Neighborhoods and Connectivity: Prioritize place-making and neighborhood connectivity.
- Healthy Active Lifestyles: Develop recreational and park opportunities for the protection of the quality of life for our residents.

The Transportation Element emphasizes the importance of pedestrians and bicycles, prioritizing the development of multimodal transportation-related improvements and policies. The goal is to balance vehicle traffic needs with the community's need for a safe and comfortable active transportation environment. To achieve this the City must collaborate with other transportation service providers to plan, design, fund, and implement transportation projects and programs that serve the community. The goals and policies outlined in the Transportation Element provide a framework for decision making, guiding City leaders in securing and allocating funding, evaluating new land use development applications, and aligning transportation efforts with other City planning objectives.

Chapter 3: Existing Transportation Services and Facilities

Assessing existing transportation services and facilities is important to identify transportation issues and needs. An updated inventory of these facilities serves as a reference point for evaluating operations and highlights areas where needs exist. This inventory covers the following topics:

- Roadway System
- Complete Streets
- Active Transportation
- Transit Service
- Freight Mobility
- Air Services

Roadway System

The roadway system provides the backbone for travel in and around the City of Duvall. The roadways serve travelers in automobiles, people moving freight, pedestrians, bicyclists, and transit users. The study area is shown in Figure 3-1.

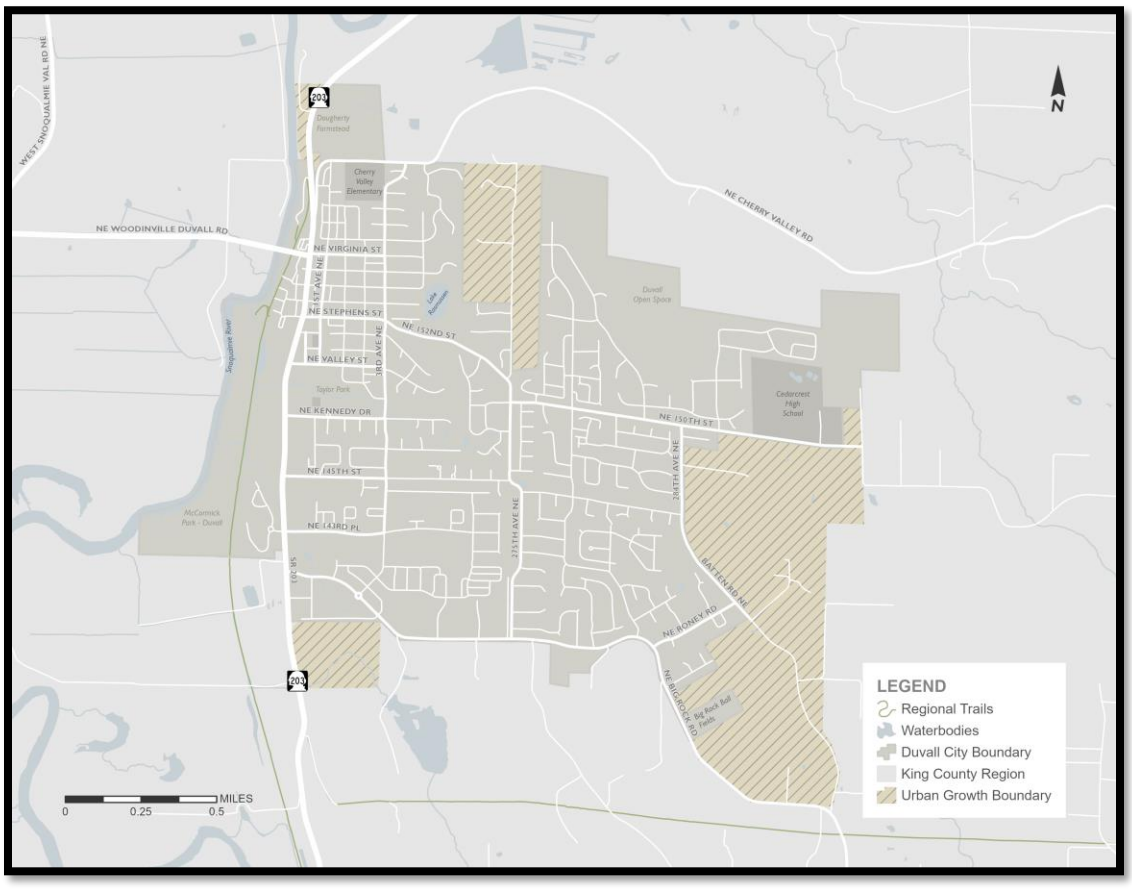


Figure 3-1 Study Area

Level of Service Standards

Level of Service (LOS) is a key metric used to evaluate the performance of transportation facilities, particularly intersections. It reflects the quality of traffic flow and user experience, with categories ranging from “A” (optimal conditions) to “F” (severe congestion).

The City of Duvall has established minimum LOS standards for various types of roadways, applying to both signalized and unsignalized intersections. While the City typically assesses LOS during PM peak traffic hours, it may also consider other time periods as needed.

Further details on LOS standards and related criteria can be found in Chapter 5. LOS definitions are provided in Appendix A.

Existing Conditions

The performance of twenty-nine (29) key intersections within the City were evaluated in November of 2023 to determine existing traffic operations during typical peak hours. LOS results are summarized in Table 3-1.

Overall, the findings indicated that all intersections met or exceeded the established LOS standards. Most intersections maintained a similar performance compared to previous evaluations. Notable changes included adjustments to signal timing to enhance pedestrian safety, which affected vehicle delays at certain intersections. Additionally, some intersections experience improved performance due to shifts in traffic patterns. LOS worksheets are provided in Appendix B.

Table 3-1 Existing Conditions Summary

Intersection	Control Type	LOS	2015 PM Peak Hour		2023 PM Peak Hour	
			LOS[1]	Delay[2]	LOS	Delay
3rd Avenue NE & NE Cherry Valley Road	TWSC	C	N/A	N/A	A	10
Main Street (SR 203) & NE Cherry Valley Road	TWSC	D	C	20	C	24
Main Street (SR 203) & NE Woodinville-Duvall Road	Signal	D	C	29	D	52
Main Street (SR 203) & NE Stewart St	TWSC	D	N/A	N/A	C	23
Main Street (SR 203) & NE Stella Street	TWSC	D	C	19	C	20
1st Avenue NE & NE Stella Street	TWSC	C	N/A	N/A	A	10
Main Street (SR 203) & NE Stephens Street	Signal	D	B	10	B	16
1st Avenue NE & NE Stephens Street	TWSC	C	N/A	N/A	B	12
3rd Avenue NE & NE Stephens Street	AWSC	C	B	12	A	9
275th Avenue NE & Bruett Road	TWSC	C	N/A	N/A	B	11
275th Avenue NE & NE 150th Street	TWSC	C	C	18	C	18
278th Avenue NE & NE 150th Street	TWSC	C	B	12	B	13
284th Avenue NE & NE 150th Street	TWSC	C	N/A	N/A	A	8
286th Avenue NE & NE 150th Street	TWSC	C	A	9	A	9
Main Street (SR 203) & NE Kennedy Drive	TWSC	D	C	23	C	16
3rd Avenue NE & NE Kennedy Drive	AWSC	C	A	7	A	8
Main Street (SR 203) & NE 145th Street	TWSC	D	D	33	C	25
3rd Avenue NE & NE 145th Street	TWSC	C	N/A	N/A	B	11
275th Avenue NE & NE 145th Street	TWSC	C	B	12	B	11
278th Avenue NE & NE 144th Street	AWSC	C	A	7	A	7
284th Avenue NE & NE 144th Street	TWSC	C	N/A	N/A	A	9
Main Street (SR 203) & NE 143rd Place	TWSC	D	E	40	D	31
3rd Avenue NE & NE 143rd Place	AWSC	C	A	9	A	8
Main Street (SR 203) & NE Big Rock Road	Signal	D	B	14	B	16
3rd Avenue NE & NE Big Rock Road	RAB	C	N/A	N/A	A	5
271st Avenue NE & NE Big Rock Road	TWSC	C	N/A	N/A	B	10
275th Avenue NE & NE Big Rock Road	TWSC	C	B	11	B	11
282nd Place NE & NE Big Rock Road	TWSC	C	N/A	N/A	B	11
Batten Road NE & NE Roney Road	TWSC	C	N/A	N/A	A	9

Note: Signal = Signalized intersection; AWSC = All-Way Stop Controlled intersection; TWSC = Two-Way Stop Controlled intersection; RAB = roundabout.
1. Level of Service (A – F) as defined by the 7th Edition *Highway Capacity Manual* (HCM), Transportation Research Board.
2. Average delay in seconds per vehicle.

Traffic Volumes

Traffic counts were also collected at several intersections on State Highways, County facilities, and City roadways in November 2023 with some data collected in September 2022. Midweek

daily traffic volumes were collected along Main Street (SR 203), 3rd Avenue NE, NE 150th Street, and NE Big Rock Road in November 2023. Approximately 11,500 vehicles per day (VPD) travel on Main Street (SR 203) which is a decrease from the previous 2014 volumes of 14,000 VPD and 12,000 VPD collected in 2008. Data collected in 2024 from the WSDOT showed an average weekday daily traffic volume of 13,700 VPD, an increase over 2023 but still lower than the 2014 volumes. Historic daily vehicle volumes along Main Street (SR 203) are summarized on Figure 3-2. Intersection turning movement count data are provided in Appendix C.

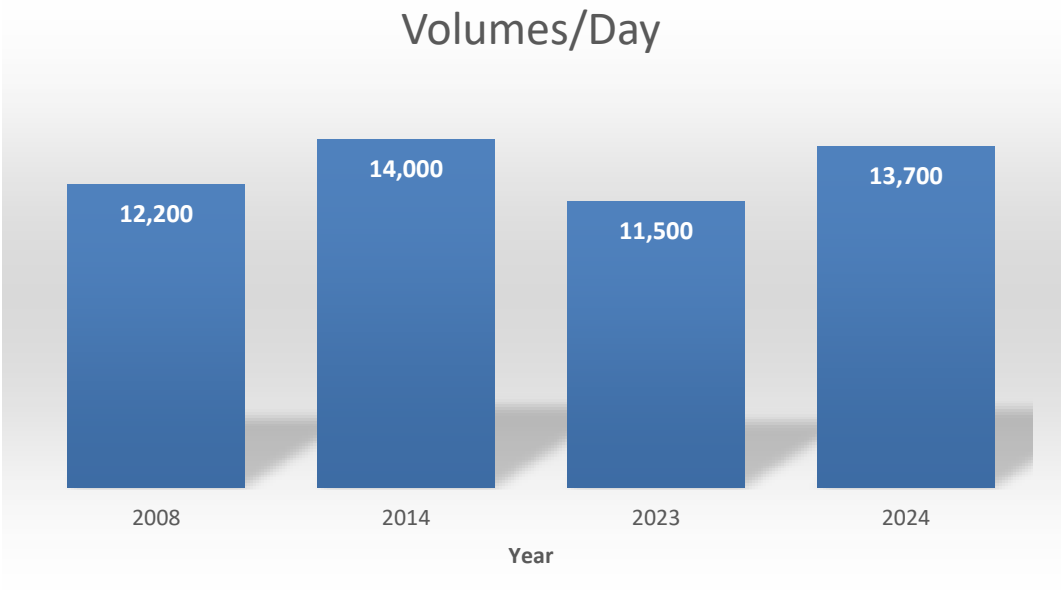


Figure 3-2 Historic Daily Vehicle Volumes Along Main Street (SR 203)

Daily truck classification counts show truck traffic represents approximately 7% (percent) of daily traffic on Main Street (SR 203), 3rd Avenue NE, NE 150th Street, and NE Big Rock Road. Figure 3-3 depicts existing average daily traffic volumes.

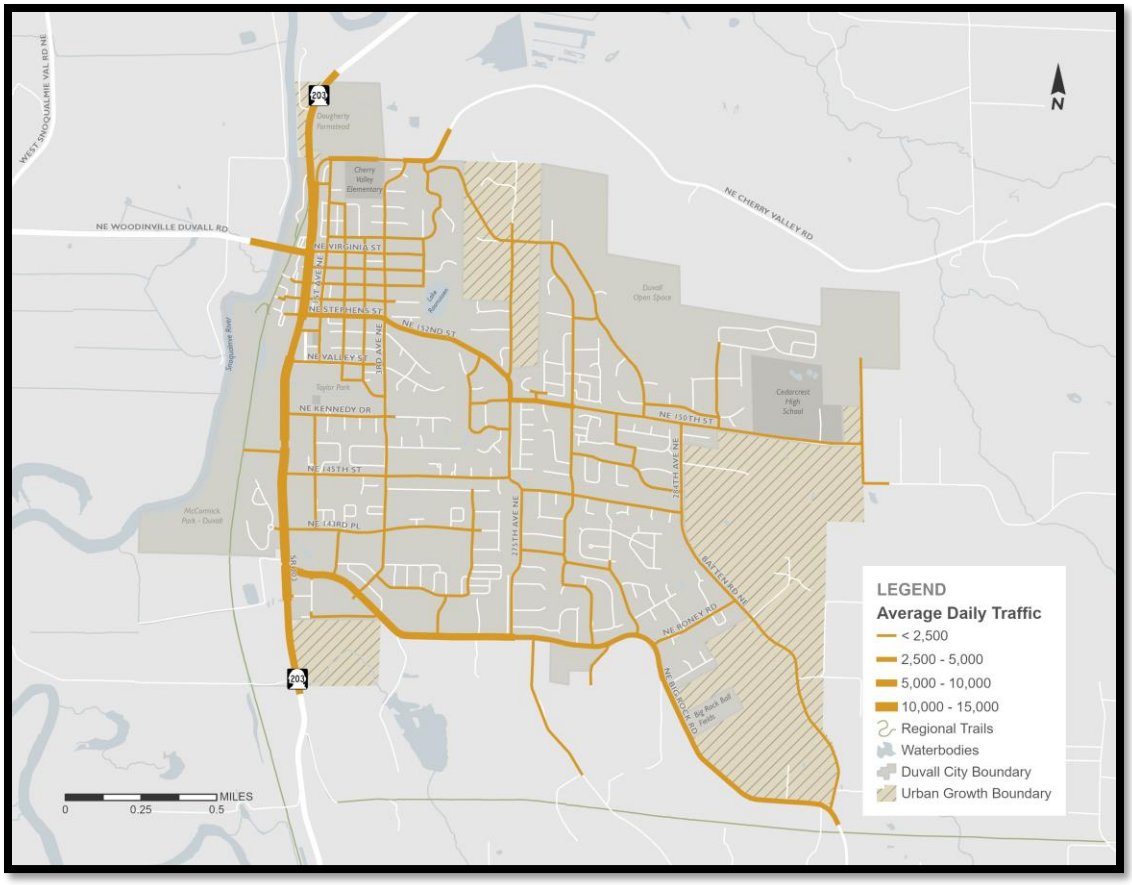


Figure 3-3 Existing Average Daily Roadway Traffic Volumes

Traffic Safety

Collision records for the five-year period between 2018 and 2022 as reported throughout the City provide an indicator of traffic safety. Historical safety data were obtained from WSDOT for the period of January 1, 2018, to December 31, 2022. Reviewing collision history provides an opportunity to identify if there are any potential safety issues for vehicles, pedestrians, and cyclists. Figure 3-4 illustrates that the number of collisions remained steady over most of the five-year period with drops in 2020 and 2021. Additionally, the number of fatal or serious collisions has decreased, remaining at zero reported fatal or serious collisions in 2020, 2021, and 2022.

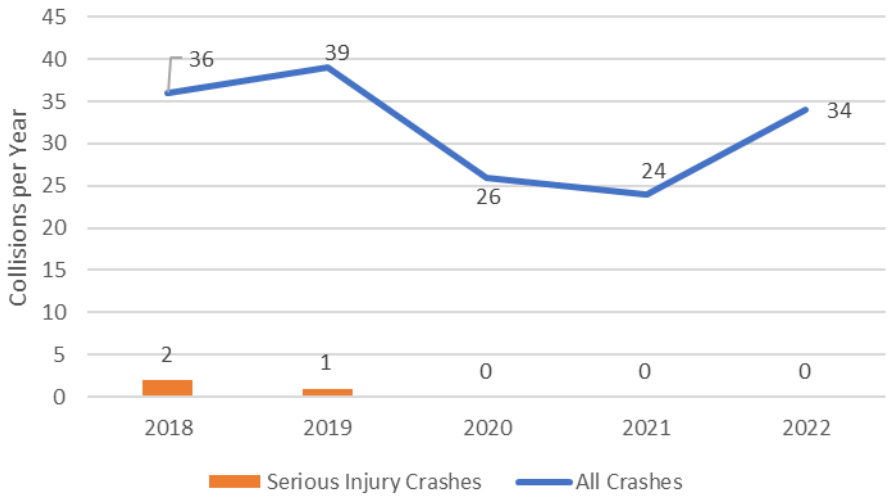


Figure 3-4 Five-Year Summary of Duvall Collisions

Over the five-year period, there were no reported fatalities and three collisions resulting in serious injury. Of these serious injury crashes, one involved a speeding motorcycle, another occurred when a bicyclist collided with a vehicle due to inattention, and the third involved a vehicle making a left-turn at a side-street stop-controlled intersection.

Crash rates were analyzed to identify the average frequency of collisions based on the number of vehicles passing through the study intersections. The standard measure used is the number of crashes per million entering vehicles (MEV). Intersections with fewer than one collision per year or an MEV below 1.0 were excluded from the summary tables due to the limited data available to identify crash patterns. Table 3-2 summarizes the collisions at the five intersections that averaged one or more collisions per year; none of these intersections had an MEV exceeding 1.0.

Table 3-2 Five-Year Collision Summary – 2018 to 2022

Intersection	Existing Traffic Control	Number of Collisions					Total	Annual Average	Collisions per MEV[1]
		2018	2019	2020	2021	2022			
Main Street (SR 203) & NE Cherry Valley Road	TWSC	2	2	2	3	0	9	1.8	0.45
Main Street (SR 203) & NE Woodinville-Duvall Road	Signal	4	2	3	0	2	11	2.2	0.38
Main Street (SR 203) & NE Stephens Street	Signal	2	0	3	1	0	6	1.2	0.26
275th Avenue NE & NE 150th Street	TWSC	0	2	1	2	1	6	1.2	0.53
Main Street (SR 203) & NE Big Rock Road	Signal	2	0	1	1	1	5	1.0	0.19

Source: WSDOT (2023)
Note: TWSC = two-way stop-controlled, AWSC = all-way stop-controlled, RAB = roundabout
1. Observed crash rate per MEV is the average number of crashes in the 5-year period divided by total number of million entering vehicles for the intersection. Crashes per Million Entering Vehicles (MEV).

As shown in Table 3-2, none of the intersections had an MEV over 1.0, though five had an annual average of more than one collision. Most collisions occurred along Main Street, between NE Woodinville-Duvall Road and NE Valley Street, with roughly 40 percent being angle type collisions, which typically occur when one vehicle is turning left while the other continues straight. Notably, three pedestrian or bicyclist collisions were reported during the five-year period, two of which took place at intersections along Main Street.

Considering traffic volume, the collision rate per MEV provides a standardized measure for evaluating accident history. Generally, intersections with a rate greater than 1.0 MEV warrant further evaluation. As shown in Table 3-2, all the intersections studied had crash rates within the standards set by the *Highway Safety Manual*[3]. Figure 3-5 provides a summary of citywide collisions over the 2018 to 2022 study period, during which no potential safety issues were identified.

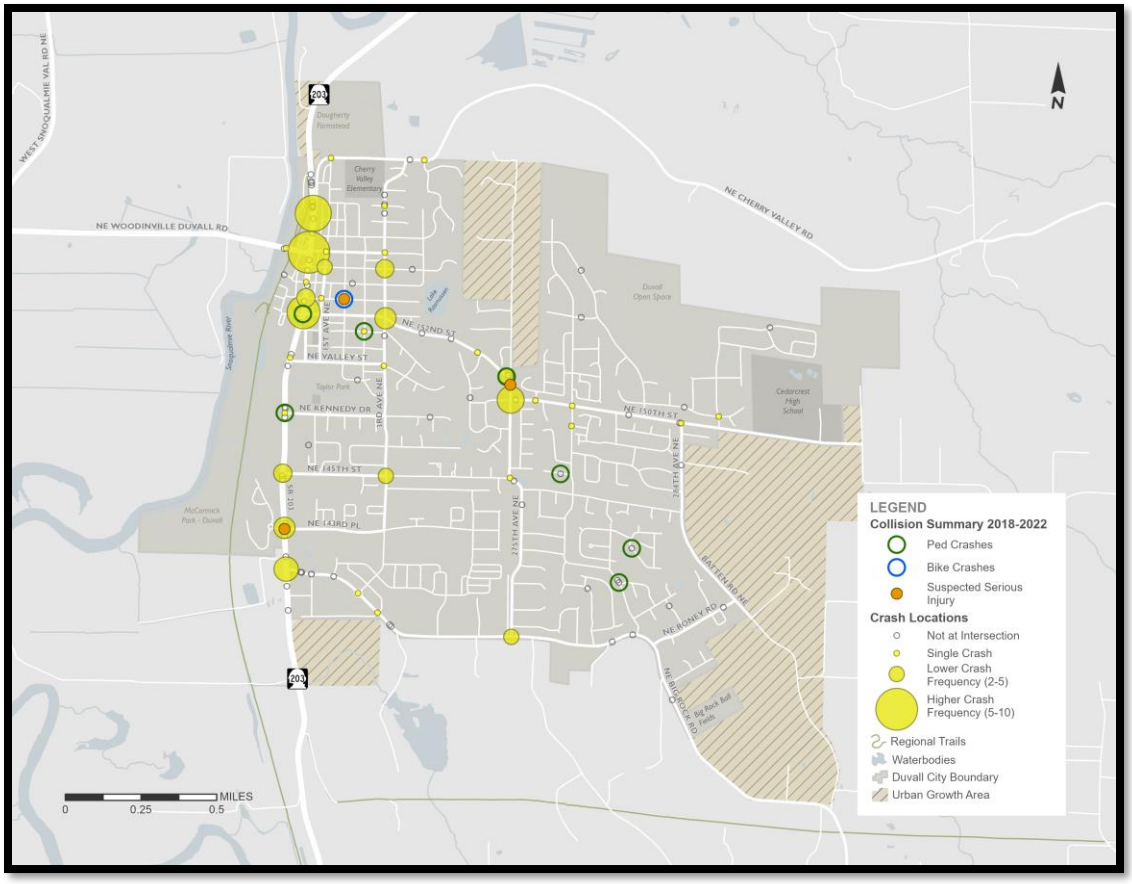


Figure 3-5 Collision Summary 2018-2022

Complete Streets

The City's Complete Streets Policy (Ordinance 1200, adopted September 20, 2016)[4] establishes goals, principles, and practices to create a transportation system that enhances access, mobility, and health for all users. The policy: 1) applies to transportation planning and projects; 2) encourages collaboration between public, private, non-profit organizations; 3) supports various enhancements, including non-motorized improvements and aesthetic features; and 4) must be considered in the development of plans, policies, codes, and standards. Projects may only exclude components of the Complete Streets Policy with approval from the Public Works Director and City Administration.

[3] https://highways.dot.gov/safety/data-analysis-tools/highway-safety-manual

[4] https://www.duvallwa.gov/DocumentCenter/View/3345/Ord-1200-Complete-Streets

Active Transportation

The “active,” non-motorized or multimodal, transportation network consists of facilities that enable residents and visitors to engage in active modes of transportation and recreational activities in Duvall. The City’s active transportation facilities include bike lanes, multi-use trails, sidewalks, crosswalks, and equestrian trails, as shown in Figure 3-6. A well-developed active transportation system promotes healthy recreation, can potentially reduce vehicle demand on City roads, enhances safety, and can provide convenient access to and from transit stops via pedestrian and bicycle facilities.

The City’s non-motorized facilities are primarily located along arterials with sidewalks existing on one or both sides of the roadways. Currently, bicycle lanes are primarily provided along Main Street, 275th Avenue NE south of NE 152nd Street, NE Stephens Street between Main Street and 3rd Place NE, and portions of NE Big Rock Road.

The City of Duvall DDS and Unified Development Regulations (UDR) set specific standards for the development of pedestrian and bicycle facilities. These standards specify that concrete sidewalks are required on both sides of most roadways with a minimum width of 5-feet in residential areas, and 8-12 feet in commercial districts. The City also promotes roadway connectivity by limiting cul-de-sacs and encouraging commercial developers to design new facilities that are pedestrian and bicyclist-friendly.

Duvall’s trail network continues to be developed, providing local and regional connections for recreation, commuting, and general travel. The City’s trail classification is designed around a tiered network comprising four primary trail categories: Regional, Connector, Park/Local, and Water trails.

- Regional trails are designed for high-intensity use and typically feature wider paths, durable surfaces, and incorporate support facilities (restrooms, seating areas, etc.)
- Connector trails are designed for moderate to high usage and typically feature moderate widths, varied surfaces, and incorporate basic facilities (benches, directional signage, etc.)
- Park/Local trails are designed for lower intensity use within parks, neighborhoods, and community areas, featuring narrower widths, soft or natural surfaces, and minimal facilities (benches, waste disposal stations, etc.)
- Water trails are designated routes on navigable water bodies such as rivers, lakes, and coastal areas typically featuring launch sites, safety & navigations, and access to support facilities (picnic spots, campsite access, etc.)

Regional trails include the Snoqualmie Valley Trail and the Tolt Pipeline Trail. Additional information on the City’s trail networks are provided in the parks, trails, and open space plan (PTOS).[5]

The Americans with Disabilities Act (ADA) mandates that all new public, commercial, and institutional facilities meet specific standards for physical accessibility. Accessible routes are designed to accommodate a wide range of users including those who are blind, use wheelchairs, push strollers or carts, or have injuries. The City of Duvall has an ADA Transition Plan that identifies barriers within the right-of-way and outlines a schedule for projects to help the City comply with Title II of the ADA. The City plans to maintain and update the ADA Transition Plan periodically and include evaluation and inventories of facilities and parks.

School safety is a top priority for parents, students, the Riverview School District, and the City. The City will encourage the school district to maintain safe walking routes to Cherry Valley Elementary and Cedarcrest High, considering factors such as the presence of sidewalks or walking paths, safety on neighborhood streets, availability of safe street crossings, and local traffic conditions. These routes should be designated as part of the “Safe Routes to School”

[5] https://duvallwa.gov/480/Parks-Trails-Open-Space-Plan

program. The City can then prioritize improvements or fills gaps in sidewalks along these routes to enhance accessibility and ensure safe travel for students.

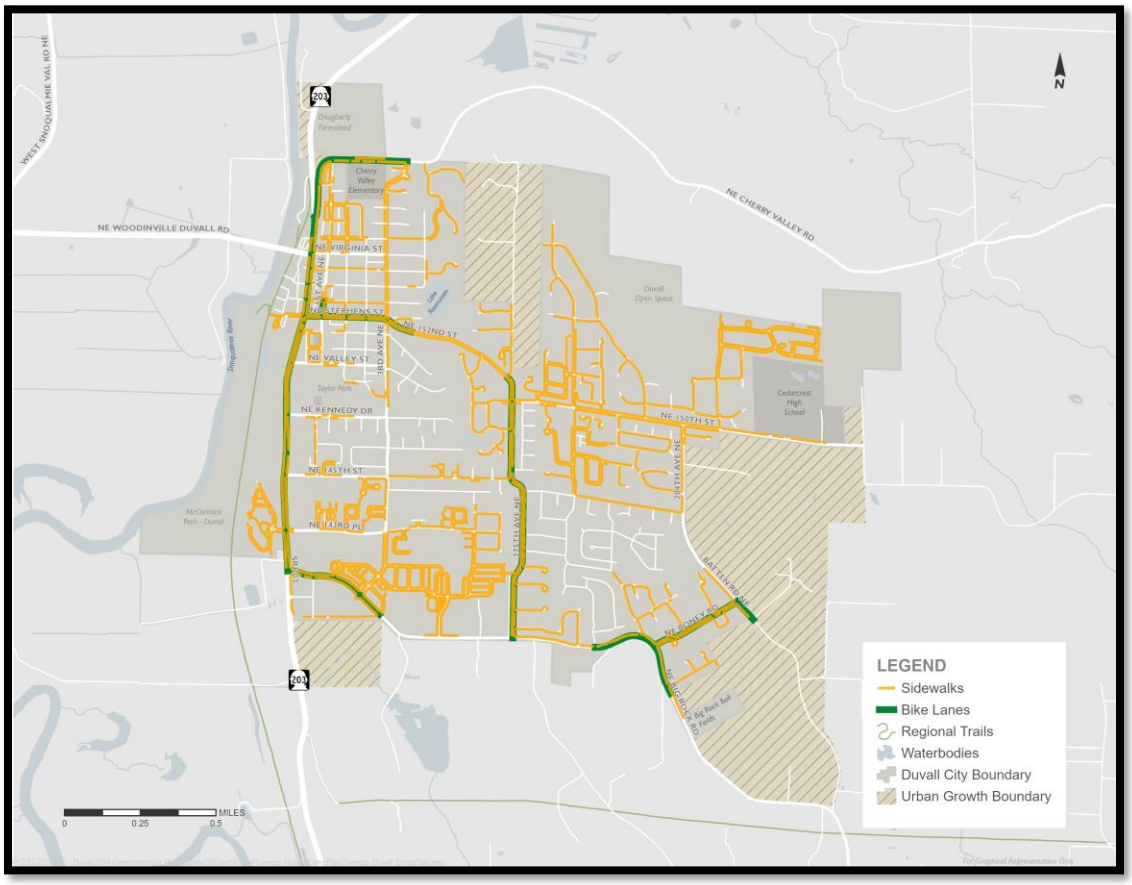


Figure 3-6 Existing Non-Motorized Network

Transit Services

The City of Duvall does not own or operate any transit vehicles or facilities. Public transit services are provided by King County Metro and Snoqualmie Valley Transportation (SVT), with existing service limited to weekdays and primarily oriented toward commuters.

King County Metro operates DART Route 224[6], offering peak-period service between Duvall and the Redmond Transit Center. The 224 also connects to Redmond Ridge and serves the Duvall Park and Ride, which has 49 parking spaces. Route 224 runs with five buses each during the morning and evening peak periods, with headways ranging from 90 to 100 minutes. In addition, Metro offers a Community Van service throughout the Snoqualmie Valley. Vans are available for trips at any time, any day of the week, depending on volunteer driver availability. Of the nine vans in the Snoqualmie Valley, two are in Duvall—one at the library and one at the Police Department.

Snoqualmie Valley Transportation (SVT)[7], a nonprofit partnership between the Mt. Si Senior Center and the Snoqualmie Tribal Nation, offers three primary transit services:

[6] https://kingcounty.gov/en/dept/metro/routes-and-service/schedules-and-maps/224

[7] https://svtbus.org/

- **Regular Shuttle Routes**: Fixed-route service from North Bend to Duvall (via Snoqualmie, Fall City, and Carnation), running every 90 minutes from 5:30 a.m. to 9:15 p.m., Monday through Friday.
    - **SVT's Valley Shuttle**, which runs from 6:20 a.m. to 7:55 p.m. with nine total trips per day and headways of 100–120 minutes.
    - **SVT's Duvall–Monroe Shuttle**, operating from 7:30 a.m. to 8:00 p.m. with six daily trips and headways of 105–115 minutes.
- **Door-to-Door Service**: On-demand transportation available Monday through Friday from 6 a.m. to 7 p.m. for riders aged 10 and over. Rides must be scheduled at least 24 hours in advance.
- **Senior Ride Program**: Volunteer-based transportation for residents aged 60 and over to reach medical appointments.

Additionally, Microsoft Connector provides private commuter service for employees living in Duvall. The Connector runs on weekdays with various pickup and drop-off times along Cherry Valley Road near Holy Innocents Church and plans to add additional on-street pickup and drop-off within the community.

Freight Mobility

Freight movement is a major issue for the City of Duvall. Trucks from as far away as British Columbia, Canada and eastern Washington use Main Street (SR 203) to bypass congestion on I-5, I-405, and SR 522. The Washington State Freight and Goods Transportation System (FGTS)[8] classifies state highways, county roads, and city streets according to average annual gross truck tonnage they carry (per RCW 47.05.021). The FGTS is primarily used to establish funding eligibility for the Freight Mobility Strategic Investment Board (FMSIB) grants. In addition, it also supports HSS designations, pavement upgrades, traffic congestion management, and other State investment decisions.

The FGTS classifies roadways using five freight tonnage classifications, T-1 through T-5. Routes classified as T-1 and T-2 are considered strategic freight corridors and are given priority for receiving FMSIB funding. The classifications are as follows:

- **T-1:** Over 10 million annual gross tonnage
- **T-2:** 4 million to 10 million annual gross tonnage
- **T-3:** 300,000 to 4 million annual gross tonnage
- **T-4:** 100,000 to 300,000 annual gross tonnage
- **T-5:** Over 20,000 gross tonnage in a 60 day period

Within the City of Duvall vicinity, the following roadways are classified as T-2 and T-3 facilities:

- **T-2**
    - Woodinville-Duvall Road (west of the Snoqualmie River)
- **T-3**
    - Main Street (SR 203)
    - NE Cherry Valley Road
    - NE Woodinville-Duvall Road (east of the Snoqualmie River)
    - NE Big Rock Road

[8] https://wsdot.wa.gov/sites/default/files/2024-01/fgts-appendices-2024.pdf

Of these facilities, Main Street (SR 203) carries the most tonnage. WSDOT reports an average of approximately 840 trucks per day and an annual truck tonnage of 3.17 million.[9] While Main Street (SR 203) may carry more than the designated tonnage, these designations are determined by the FHWA and WSDOT and the City of Duvall has no control over the designation of these facilities. Within Duvall, Main Street, NE Big Rock Road, NE Stephens Street, Bruett Road (NE 152nd Street), portions of 3rd Avenue NE, and NE Cherry Valley Road see the highest truck volumes. The existing freight network is shown on Figure 3-7.

Primary issues related to truck traffic include (1) pedestrian safety concerns; (2) noise and vibrations; (3) the configuration of the Woodinville-Duvall Bridge at Main Street; and (4) the alignment of the intersection of NE Cherry Valley Road/Main Street. The geometry of these intersections, along with truck turning characteristics, often result in trucks avoiding Cherry Valley Road and utilizing alternate routes like 3rd Avenue NE, NE Virginia Street, and NE Stephens Street.

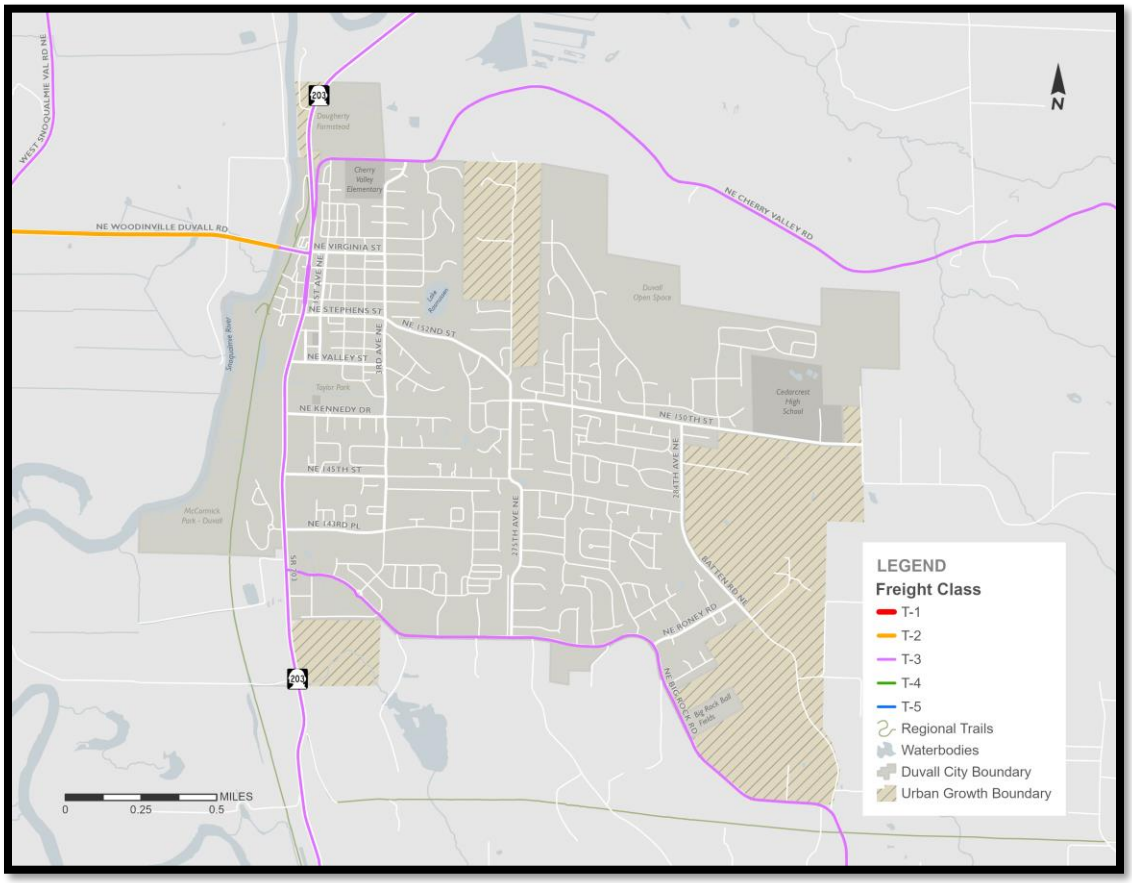


Figure 3-7 Existing Freight Network

Air Services

The City of Duvall does not have freight or passenger airplane facilities within or adjacent to the City limits. The nearest airport facility is a general aviation facility in Monroe, located approximately 15 miles north of Duvall. King County International Airport (Boeing Field) located approximately 25 miles southwest of Duvall and is the closest facility providing national and

[9]https://www.arcgis.com/apps/webappviewer/index.html?id=0e37044a459244d9b6414826b46e8c46 – Reviewed April 1, 2025

international airfreight services. Paine Field Airport, located 25 miles to the northwest, is the closest facility providing regional passenger service while Seattle-Tacoma (SeaTac) International Airport (approximately 35 miles to the southwest) is the closest facility with regional, national, and international passenger services.

Chapter 4: Forecast Transportation Conditions

This Plan is developed based on the evaluation of the existing transportation system and future transportation system needs based on planned future growth. Planned future growth uses the horizon year 2044, consistent with the GMA requirement of at least ten years and aligning with growth targets addressed in the City's Comprehensive Plan. The year 2044 provides a long-range look at the transportation system needed to support anticipated growth in the City. Travel forecasts and analyses have been conducted for average weekday conditions during the PM peak hour, which typically experiences the highest overall traffic volumes in the community. This data serves as a foundation for identifying capacity-related improvement needs.

Travel Forecast Model

Primary analyses of the 2044 traffic forecasts were initially based on the following travel forecasting assumptions:

- Improvement projects identified in Duvall's current six-year Transportation Improvement Program (TIP)
- Improvement projects in available transportation plans from adjacent jurisdictions
- PSRC's Transportation VISION 2050 Update Regional Capacity Projects List (as of May 2022)
- WSDOT's 2024-2027 Statewide Transportation Improvement Program (STIP)
- Duvall's forecast land use data (employment and housing)
- PSRC 2050 Land Use Targets forecasts and regional trip end data from the 2050 regional travel demand model

Travel forecasts were developed using Duvall's travel demand model, which projects future traffic based on land use assumptions and planned improvements. These forecasts form the technical basis for identifying transportation improvement projects.

The Plan evaluates the current transportation system and identifies operational, safety, and alternative transportation mode (active transportation) deficiencies. The future conditions analysis assesses long-term transportation needs based on projected traffic in Duvall and the surrounding communities.

The travel demand model, updated to reflect 2023 conditions, was used to prepare forecasts for 2044, incorporating both local and regional traffic growth assumptions.

Land Use

The 2044 household and employment data represent the growth forecast for the City. For Duvall, the household and employment growth totals reflect the land-use forecast described in the Comprehensive Plan. The projected growth allocated to Duvall is summarized in Table 4-1.

Table 4-1 City of Duvall Land Use

Land Use Type	2018 Estimate[1]	2023 Estimate[2]	Future Growth Allocation ("Target") for 2044	2044 Model Forecast
Housing Units	2,702	3,189	+890	3,795
Jobs	1,483	1,752	+990	2,361

1. King County Urban Growth Capacity Report, June 2018.
2. Updated 2018 to account for growth between 2020 and 2023 (model existing conditions).
3. Jobs and Household Targets, 2021 King County Countywide Planning Policies (See also Table LU-6 in this Plan)

Future Baseline Transportation Network

As a part of forecasting 2044 conditions, transportation improvements that are anticipated to be completed before 2044 that could impact capacity and/or travel patterns are included in this analysis. In addition to these improvements, it was assumed that agencies perform regular traffic signal maintenance and timing updates. Improvements assumed for the 2044 analysis are summarized below.

- **1st Avenue NE from NE 145th Street to NE 143rd Place** – Construct new collector arterial segment including acquisition of right-of-way, road, parking, curb, gutter, sidewalk, and storm drainage system.
- **2nd Avenue NE from NE 143rd Place to NE Big Rock Road** – Construct new collector arterial segment including acquisition of right-of-way, road, parking, curb, gutter, and sidewalk.
- **1st Avenue NE from Valley Street to Virginia Street** – Reconstruct to collector arterial standards including two travel lanes, on-street parking, sidewalks, and curb bulbs.

Forecast Traffic Volumes

The weekday PM peak hour traffic forecasts and average annual growth rate under forecast 2044 conditions are summarized in Table 4-2.

Table 4-2 Weekday PM Peak Hour Traffic Volumes

Intersection	2023 Existing PM Peak Volumes	Forecast 2044 Baseline	
		PM Peak Volumes	Average Annual Growth
3rd Avenue NE & NE Cherry Valley Road	380	420	0.5%
Main Street (SR 203) & NE Cherry Valley Road	1,105	1,490	1.4%
Main Street (SR 203) & NE Woodinville-Duvall Road	1,585	2,195	1.5%
Main Street (SR 203) & NE Stewart St	1,135	1,490	1.2%
Main Street (SR 203) & NE Stella Street	1,155	1,405	0.9%
1st Avenue NE & NE Stella Street	155	305	3.1%
Main Street (SR 203) & NE Stephens Street	1,260	1,525	0.9%
1st Avenue NE & NE Stephens Street	485	685	1.6%
3rd Avenue NE & NE Stephens Street	605	725	0.8%
275th Avenue NE & Bruett Road	450	565	1.0%
275th Avenue NE & NE 150th Street	625	720	0.6%
278th Avenue NE & NE 150th Street	460	495	0.3%
284th Avenue NE & NE 150th Street	325	395	0.9%
286th Avenue NE & NE 150th Street	295	355	0.8%
Main Street (SR 203) & NE Kennedy Drive	1,100	1,330	0.9%
3rd Avenue NE & NE Kennedy Drive	240	345	1.7%
Main Street (SR 203) & NE 145th Street	1,165	1,320	0.6%
3rd Avenue NE & NE 145th Street	360	485	1.4%
275th Avenue NE & NE 145th Street	400	470	0.7%
278th Avenue NE & NE 144th Street	145	200	1.5%
284th Avenue NE & NE 144th Street	150	230	2.0%
Main Street (SR 203) & NE 143rd Place	1,145	1,355	0.8%
3rd Avenue NE & NE 143rd Place	250	380	1.9%
Main Street (SR 203) & NE Big Rock Road	1,405	1,840	1.2%
3rd Avenue NE & NE Big Rock Road	640	820	1.1%
271st Avenue NE & NE Big Rock Road	600	750	1.0%
275th Avenue NE & NE Big Rock Road	635	730	0.6%
282nd Place NE & NE Big Rock Road	445	570	1.1%
Batten Road NE & NE Roney Road	160	265	2.3%

Source: Transpo Group, 2024

As shown in Table 4-2, average annual growth is anticipated to range between approximately 0.3 percent and 3.1 percent. The growth overall represents an increase over existing traffic volumes at key study intersections of between 35 to 610 weekday PM peak hour volumes.

The growth in traffic volumes will result in additional traffic congestion and the number of hours congestion is experienced along city streets assuming similar driving behaviors as today. A review of the roadway system capacity for the City of Duvall shows that additional roadway connections or widening of streets will be required to handle this increase in traffic volumes and maintain adopted LOS. Additional analysis is completed in the following section to determine if specific intersection improvements are required with the projected growth in vehicle traffic.

Forecast Traffic Operations

Weekday PM peak hour traffic operations were evaluated at 29 intersections to forecast 2044 conditions, consistent with existing conditions. The LOS analysis followed procedures from the

Highway Capacity Manual (HCM) using Synchro 12 software for signalized and stop controlled intersections, and Sidra 9.1 for the roundabout, in line with WSDOT guidelines. Table 4-3 summarizes the forecast 2044 weekday PM peak hour intersection operations for evaluated intersections.

Table 4-3 Forecast 2044 Weekday PM Peak Hour Level of Service Summary

Intersections	Future Traffic Control	Current LOS Standard	Future 2044 Baseline		
			LOS[1]	Delay[2]	WM[3] or V/C[4]
3rd Avenue NE & NE Cherry Valley Road	TWSC	C	A	10	NB
Main Street (SR 203) & NE Cherry Valley Road	TWSC	D	**F**	**63**	**WB**
Main Street (SR 203) & NE Woodinville-Duvall Road	Signal	D	**F**	**127**	**-**
Main Street (SR 203) & NE Stewart St	TWSC	D	D	32	EB
Main Street (SR 203) & NE Stella Street	TWSC	D	D	27	EB
1st Avenue NE & NE Stella Street	TWSC	C	B	11	NB
Main Street (SR 203) & NE Stephens Street	Signal	D	C	25	-
1st Avenue NE & NE Stephens Street	TWSC	C	C	17	NB
3rd Avenue NE & NE Stephens Street	AWSC	C	B	10	-
275th Avenue NE & Bruett Road	TWSC	C	B	12	SB
275th Avenue NE & NE 150th Street	TWSC	C	C	20	WBTL
278th Avenue NE & NE 150th Street	TWSC	C	B	13	NB
284th Avenue NE & Legacy Ridge & NE 150th Street	TWSC	C	A	9	-
286th Avenue NE & Legacy Ridge & NE 150th Street	TWSC	C	A	10	SB
Main Street (SR 203) & NE Kennedy Drive	TWSC	D	C	19	WB
3rd Avenue NE & NE Kennedy Drive	AWSC	C	A	8	-
Main Street (SR 203) & NE 145th Street	TWSC	D	D	26	WBL
3rd Avenue NE & NE 145th Street	TWSC	C	B	13	EB
275th Avenue NE & NE 145th Street	TWSC	C	B	12	EB
278th Avenue NE & NE 144th Street	AWSC	C	A	8	-
284th Avenue NE & NE 144th Street	TWSC	C	A	9	EB
Main Street (SR 203) & NE 143rd Place	TWSC	D	**F**	**69**	**WBL**
3rd Avenue NE & NE 143rd Place	AWSC	C	A	8	-
Main Street (SR 203) & NE Big Rock Road	Signal	D	B	20	-
3rd Avenue NE & NE Big Rock Road	RAB	C	A	5	0.314
271st Avenue NE & NE Big Rock Road	TWSC	C	B	11	SB
275th Avenue NE & NE Big Rock Road	TWSC	C	B	11	SB
282nd Place NE & NE Big Rock Road	TWSC	C	B	12	SB
Batten Road NE & NE Roney Road	TWSC	C	B	10	EBL

Source: *Highway Capacity Manual (HCM)*, 2022 and Transpo Group, 2024.
Notes: **Bold** indicates LOS standard is not met. NB = northbound; SB = southbound; EB = eastbound; WB = westbound; WBTL = westbound through/left-turn; WBL = westbound left-turn.
1. Level of service (LOS), based on *Highway Capacity Manual* 7th Edition methodology unless otherwise noted.
2. Average delay in seconds per vehicle.
3. Worst movement reported for unsignalized intersections where NB = northbound, EB = eastbound, WB = westbound, SB = southbound, and EBL = eastbound left.
4. Volume to capacity (V/C) ratio for roundabout controlled intersections.

As shown in Table 4-3, three intersections along Main Street (SR 203) operate at LOS F under future 2044 baseline conditions, failing to meet the current adopted LOS standards during the weekday PM peak hour. The intersections not meeting current LOS standards include:

- Main Street (SR 203) & NE Cherry Valley Road (two-way stop-controlled)
- Main Street (SR 203) & NE Woodinville-Duvall Road (signal)

- Main Street (SR 203) & NE 143rd Place (two-way stop-controlled)

All poorly operating intersections will be further reviewed as part of this transportation plan in the next chapter.

Non-Motorized Systems

Bicycle, pedestrian, and trail facilities play a vital role in the City's transportation system. The Duvall non-motorized transportation system is comprised of facilities that promote mobility without the aid of motorized vehicles. A well-established system encourages healthy recreational activities, potentially reduces vehicle demand on roadways, and enhances safety within the community.

Healthy Communities

This Plan promotes facilities for bicyclists, pedestrians, and public transit riders to support a physically active population. Street design considerations include connectivity, traffic calming measures, parking, and a grid system to offer multiple options for non-motorized transport. These designs align with DMC, Duvall's Complete Streets Policy, 2024 Comprehensive Plan, and development standards. Parking availability, both in private development and public rights-of-way, influence the decision to walk, bicycle, or drive.

Additional amenities to foster healthy communities include bike racks, public art, educational signage (interpretive and way finding), and rest areas with benches. The Plan also emphasizes educational efforts on pedestrian and bicycle safety, alongside consistent enforcement of traffic laws for all users, to further support Healthy Communities initiatives.

The key policy areas in the Healthy Communities portion of this Plan are:

- Plan for all users
- Plan complete streets
- Require connectivity
- Create a safe pedestrian network
- Consider multimodal concurrency
- Identify and develop safe routes to school
- Use parking management strategies to enhance bicycling and walking
- Provide facilities to support bicyclists and pedestrians
- Provide encouragement, education, and law enforcement to support bicyclists and pedestrians

Active Transportation System Evaluation

As outlined in Chapter 5, the multimodal LOS standard is based on the presence of facilities along designated routes. Primary corridors extend through the community, while secondary corridors connect neighborhoods, destinations, or form loops. These classifications guide planning but do not imply an implementation strategy. The sidewalk and bicycle networks are detailed in Chapter 5 (see Figure 5-3 and Figure 5-5).

As shown in Figure 4-1, the pedestrian network meets LOS standards in central Duvall, but gaps exist in the northern, southeastern, and downtown areas, including portions of Batten Road NE, NE Big Rock Road, and NE Cherry Street. Many of the residential neighborhoods have sidewalks on at least one side of the roadway. Projects to improve these gaps are included in the long-term project list to ensure the City meets its LOS goals.

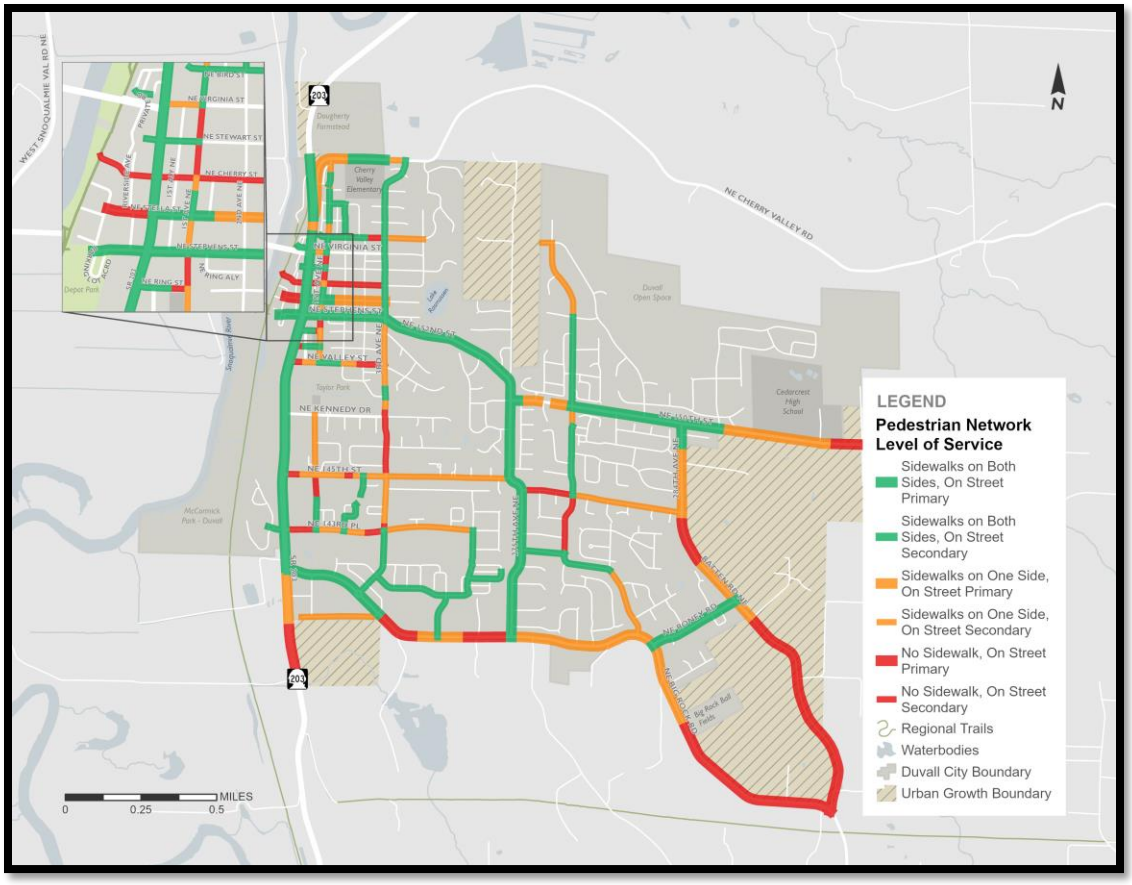


Figure 4-1 Baseline Pedestrian Level of Service

As shown in Figure 4-2, the bicycle system does not meet LOS standards in much of the City. Key gaps include 3rd Avenue NE, NE Big Rock Road, NE 152nd Street/NE 150th Street, NE 145th Street, and NE 143rd Place. The long-term project list outline improvements needed to achieve the green LOS for the bicycle network.

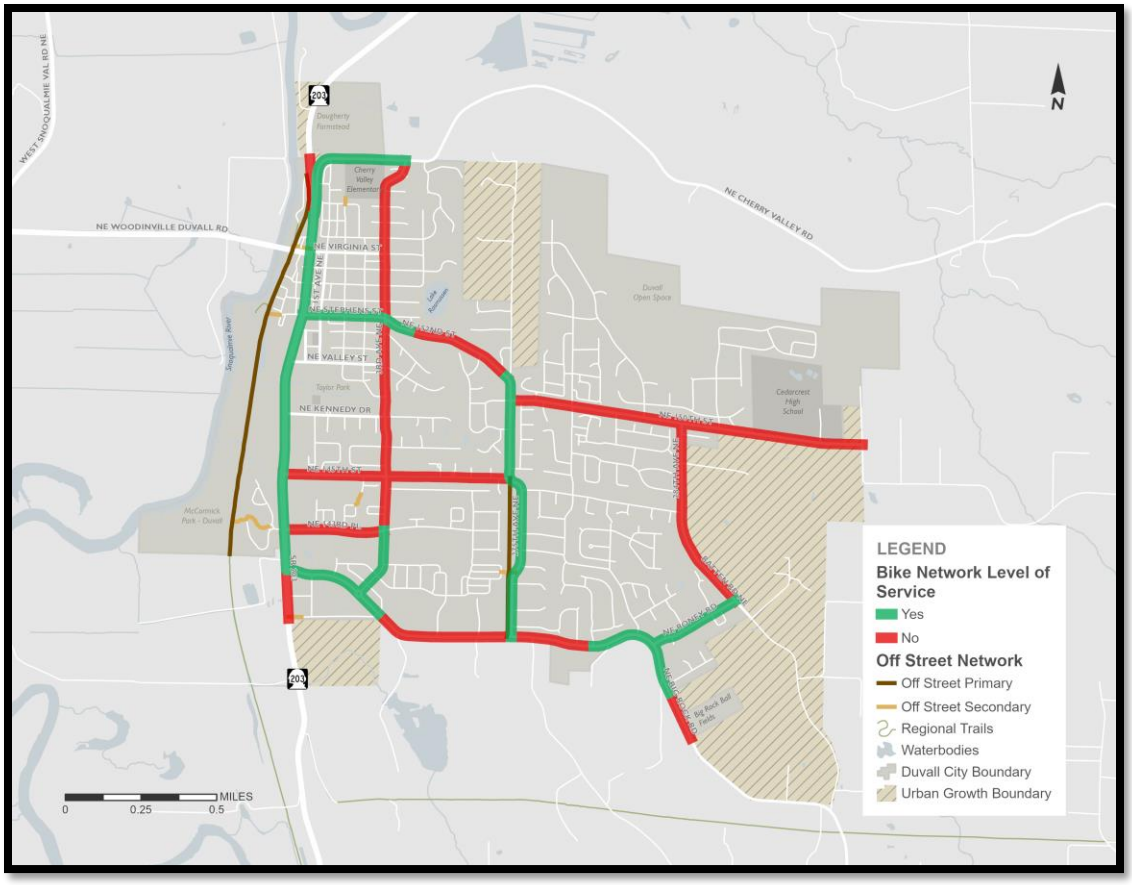


Figure 4-2 Baseline Bicycle Level of Service

Technology Considerations

Advances in technology impact the short and long-term use of the transportation system and its users. The following sections describe technologies emerging or being considered in Duvall and the surrounding region.

Transportation System Management and Operations (TSMO)

Transportation System Management and Operations (TSMO) is an integrated approach to optimize the performance of existing infrastructure by implementing multimodal, intermodal, and often cross-jurisdictional systems, services, and projects. TSMO seeks to operate the existing transportation system as safely and efficiently as possible, often maintaining or even regaining previous capacity levels and improving safety performance levels. In practice, TSMO is applied on a corridor or in a region as a series of potential intersection improvements instead of just intersection level improvements.

Electric Vehicles

As the use of electric vehicles (EVs) continues to grow within transportation systems, it becomes essential to establish accessible EV charging infrastructure. Currently, there are three City-provided charging stalls in the right-of-way or on City-owned properties (e.g., public parking lots). The stalls are located at the City permit center.

E-Bikes

The sales of electric bicycles, or e-bikes, are on the rise, with more people embracing them for both recreation and transportation. This surge in popularity can largely be attributed to the motorized pedal-assist feature, which reduces the physical effort needed to ride and allows users to travel further with ease.

E-bikes also provide greater accessibility for individuals with mobility challenges. As more riders take to the roads and trails, it's essential for cities to evaluate the capacity of existing paved pathways, identify suitable locations for new trails, and consider the development of closed-loop trail systems to accommodate this growing demand.

Puget Sound Energy Pole Charging Program

Puget Sound Energy (PSE) has started the Up & Go for Public – Pole Charging Program where PSE is partnering with local communities to ensure residents have access to EV charging near where they live, work, and play. The City is working with PSE to determine locations for EV pole charging.

Chapter 5: Transportation Systems Plan

The transportation system improvements provide a long-range strategy for the City of Duvall to address current and forecast transportation network needs. The planned improvements contained in this chapter are recommended to safely and efficiently accommodate the projected growth in population and employment within the City and its UGA. The recommended improvements are based on the analysis of existing conditions, forecasts of future demand, anticipated availability of funding resources, and the desire of the community to create a transportation system that prioritizes community livability.

Duvall's 20-year improvement program includes projects that enhance existing intersections, roadways, and non-motorized facilities such as sidewalks and bike paths. As development proposals arise, the City will evaluate their impacts and determine if additional improvements are necessary.

The improvement list is organized by travel mode, though many projects and programs may overlap between modes (e.g., sidewalks are included as part of a roadway widening project). The Transportation System Plan focuses on recommendations for four components of the transportation system:

- Street and Highway System Plan
- Pedestrian System Plan
- Bicycle System Plan
- Other Transportation Services

Multimodal LOS (MMLOS) standards are required for non-motorized facilities, local arterials, and transit routes that serve the City and urban growth areas, to assess system performance and guide planned improvements. Based on these components, a comprehensive long-range list of transportation projects is recommended to meet Duvall's standards over the next 20-years.

Street and Highway System Plan

The existing and future transportation needs analysis and the proposed modal plans for the components described above were utilized to develop a list of multimodal transportation improvement projects to support growth in the City of Duvall.

Roadway Classifications

Roadways are classified based on their intended function and traffic volumes to create a hierarchy. Duvall's Functional Classification system defines the characteristics of each roadway to meet the needs of all users. The design of roadways, both existing and planned, is linked to this classification. Table 5-1 outlines the classifications, and Figure 5-1 illustrates the City's Functional Classification Plan.

Table 5-1 Duvall Roadway Functional Classification

Roadway Type	Description/Purpose	Examples	Speed
Principal Arterials	The highway system serves as the primary arterial roadway system within the City. Highways connect major regions with one another, and WSDOT classifies certain State highways.	Main Street (SR 203) NE Woodinville-Duvall Road	30 mph
Minor Arterial	Roads and highways that connect centers and facilities within the community, provide connections to outlying areas of the community, and distribute traffic to/from principal arterials.	Cherry Valley Road Big Rock Road	25 mph
Collector Arterial	Connect two or more neighborhoods, carry traffic within neighborhoods and provide connections to principal and minor arterials.	3rd Avenue NE 152nd Street Batten Road	25 mph
Local Street	Streets that provide direct access to adjoining properties, commercial businesses, and similar traffic destinations. These roadways also provide traffic circulation within or through neighborhoods.		20 to 25 mph

1. Note: WSDOT = Washington State Department of Transportation

The functional classification and characteristics of key roadways within the City are summarized in Table 5-2.

Table 5-2 City of Duvall Key Roadway Functional Classification & Description

Roadway	Arterial Classification	Jurisdiction	Primary Direction	Posted Speed Limit
Main St (SR 203)	Principal	WSDOT	North/South	30 mph
NE Woodinville-Duvall Rd	Principal	Duvall/King County	East/West	40 mph
NE Cherry Valley Rd	Minor[1]	Duvall/King County	East/West	25 mph
NE Big Rock Rd	Minor[1]	Duvall/King County	East/West	25 mph
NE 143rd Pl	Collector	Duvall	East/West	25 mph
NE 145th St	Collector	Duvall	East/West	25 mph
NE Stephens St	Collector	Duvall	East/West	25 mph
NE Bruett Rd (NE 152nd St)	Collector	Duvall	East/West	25 mph
NE 150th St	Collector	Duvall	East/West	25 mph
275th Ave NE	Collector	Duvall	North/South	25 mph
Batten Rd NE (284th Ave NE)	Collector	Duvall	North/South	25 mph
1st Ave NE	Collector	Duvall	North/South	25 mph
3rd Ave NE (268th Ave NE)	Collector	Duvall	North/South	25 mph
NE Kennedy Dr	Collector	Duvall	East/West	25 mph
NE Roney Rd	Collector	Duvall	East/West	25 mph
NE Valley St	Collector	Duvall	East/West	25 mph
NE Virginia St	Collector	Duvall	East/West	25 mph

Note: WSDOT = Washington State Department of Transportation; mph = miles per hour
1. Cherry Valley Road and Big Rock Road are classified as minor arterials within the City limits. East of the City, these two roads are classified as collectors by King County.

In addition to the Functional Classification system adopted by the City of Duvall, there are federal and state roadway designations. Federal and state grant programs provide funding for improvement projects that are on streets that have been classified with the federal or state roadway designations.

The **National Highway System (NHS)** includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility as defined by the Federal Highway Administration (FHWA). There are no NHS facilities within the City.

The **Federal Functional Classification** system provides a hierarchy of roadways as defined by the Federal Highway Administration (FHWA). This classification system defines the role of travel through a network of roadways, rather than focusing on individual roadways. As a result, the Federal Functional Classification differs in several ways from the City's Functional Classification. Changes to the Federal Functional Classification may be submitted through the Washington State Department of Transportation (WSDOT).

Federally Classified (Urban Minor Arterial) Roads in Duvall:

- NE Stephens Street/NE 152nd Street/275th Avenue NE
- NE 150th Street
- 275th Street NE
- 284th Avenue NE/Batten Road NE
- NE Roney Road
- 3rd Avenue NE

Highways of Statewide Significance WSDOT designates Interstate Highways and other principal arterials that are needed to connect major communities in the state as Highways of Statewide Significance (HSS). This designation assists with the allocation of some state and federal funding. These roadways typically serve corridor movements having travel characteristics indicative of substantial statewide and interstate travel. Concurrency requirements of GMA do not apply to HSS. Main Street (SR 203) is not an HSS, nor are there any HSS designated facilities in the City. In 2005, the Growth Management Hearings Board concluded that the capital facilities element requirements of the GMA do not apply to highways of statewide or regional significance.[10] LOS standards for state-owned (regionally significant) facilities are jointly set by WSDOT and the Regional Transportation Planning Organization (RTPOs).

The **Region's Metropolitan Planning Organization** (MPO) Puget Sound Regional Council (PSRC) also establishes Highways of Statewide Regional Significance (HSRS). Main Street (SR 203) is classified as a Tier 2 HSRS. Tier 2 routes serve the outer urban area outside of a three-mile buffer around the most heavily traveled freeways.

[10] The Building Association of Clark County et al. v. Clark County and State of Washington, Office of Financial Management. 04-2-0038c, WWGMHB (November 23, 2005).

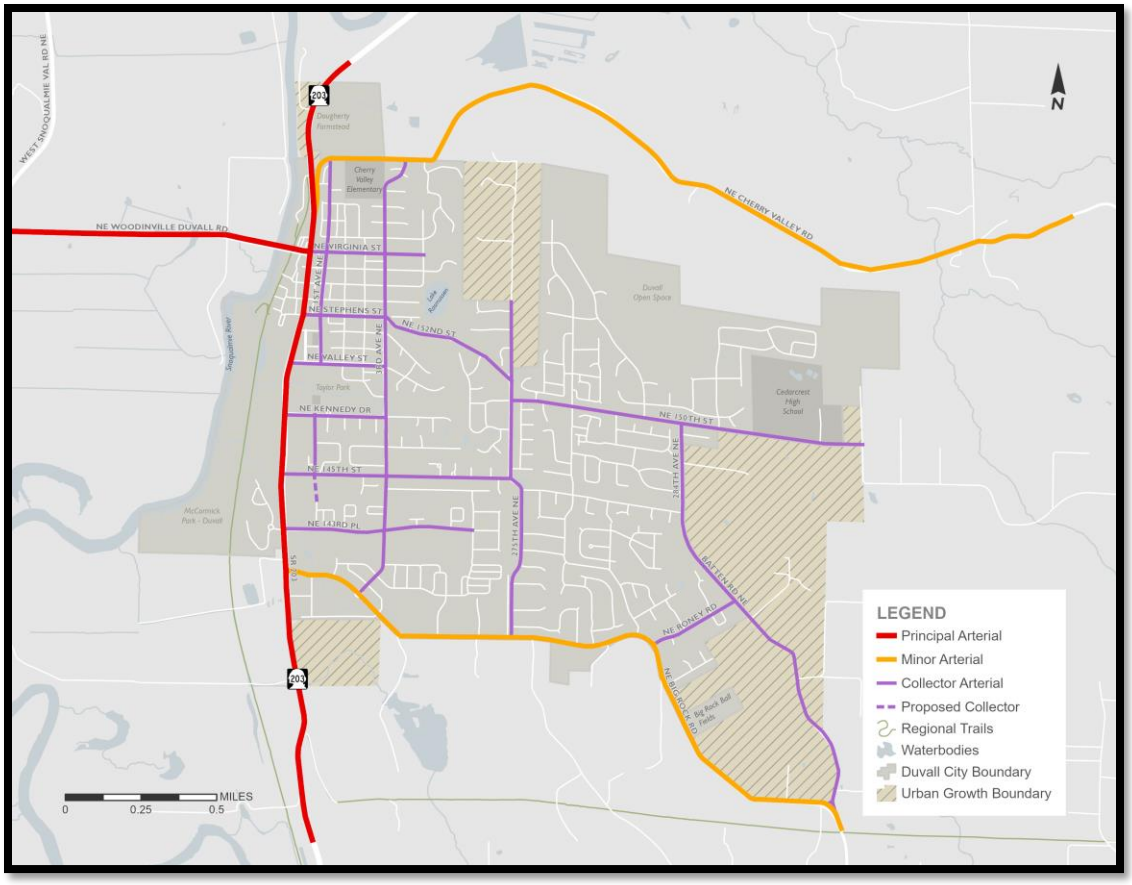


Figure 5-1 Functional Classification Plan

Concurrency and Vehicle Level of Service Standards

One of the 15 goals of the Growth Management Act (GMA) is concurrency when considering land use planning. The purpose of concurrency is to assure that those public facilities and services necessary to support development are adequate to serve that development at the time it is available for occupancy and use, without decreasing service levels below locally established minimum standards (WAC 365-196-840). Therefore, setting a LOS standard is a required component of regulating growth and development while identifying planned improvements (RCW 36.70A.070).

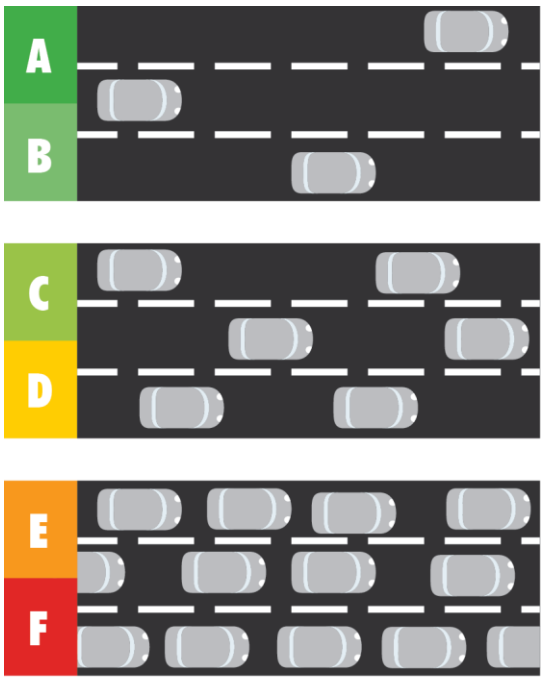
The City also uses the State Environmental Policy Act (SEPA) processes for environmental review and impact evaluation at the project level for consistency with concurrency and LOS standard management. LOS is a measure of the quality of traffic flow and operations. It can be described in terms of speeds, travel times, delays, convenience, interruptions, and comfort. The Highway Capacity Manual (HCM) (Transportation Research Board, 2022) provides methodologies for evaluation of LOS for transportation facilities and services. The HCM criteria range from LOS A indicating free-flow conditions with minimal delays, to LOS F indicating extreme congestion and long vehicle delays.

The City typically applies the intersection LOS standard to the weekday PM peak hour. However, the City may define additional evaluation periods to identify if potential impacts would occur based on land uses other than residential. These could include weekday AM peak hour, weekends, or other time periods depending on the type and location of the proposed development. No changes to the LOS standards are proposed as part of this Plan.

Vehicle level of service is both a qualitative and quantitative measure of roadway and intersection operations. Vehicle level of service uses an “A” to “F” scale to define the operation of roadways and intersections depicted on Figure 5-2 and described as follows:

City of Duvall. The City of Duvall has adopted a LOS C or better for all roadways within jurisdictional control. This applies to signalized, roundabout, and unsignalized intersections. On a case-by-case basis, the City may allow traffic movements from minor streets at two-way stop-controlled intersections to operate below the adopted LOS standard, provided no significant safety or operational issues will result. The flexibility in LOS standards aims to minimize delays on major streets while maintaining safe and efficient operations from the minor streets.

WSDOT. Main Street (SR 203) is classified by PSRC as a Tier 2 HSRS and carries a LOS D or better standard for intersections along that roadway. PSRC definition for Tier 2: These routes serve the "outer" urban area - those outside the 3-mile buffer - and connect the "main" urban growth area (UGA) to the first set of "satellite" UGA's. These urban and rural areas are generally farther from transit alternatives, have fewer alternative roadway routes, and locally adopted LOS standards in these areas are generally LOS "D" or better. The standard for Tier 2 routes is LOS "D."[11]



LOS	CONTROL DELAY (per Vehicle)	DESCRIPTION
A	10	Free flow
B	>10-20	Stable flow (slight delays)
C	>20-25	Stable flow (acceptable delay)
D	>35-55	Approaching unstable flow (tolerable delay, occasional wait through more than one signal)
E	>55-80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Figure 5-2 Illustration of Vehicle LOS

Freight Routes

Trucks have a significant impact on traffic operations, safety, and roadway maintenance. They also impact air quality and noise levels in the City. The freight routes are the same as the 2017 Transportation Plan and would continue to support future transportation needs. Truck routes within the City limits include:

- Main Street (SR 203)
- NE Woodinville-Duvall Road
- NE Cherry Valley Road
- NE Big Rock Road

Active Transportation System Plan

As noted previously in Chapter 3, non-motorized facilities play a vital role in the City’s transportation environment. The Duvall active transportation system plan is comprised of facilities that promote mobility without the aid of motorized vehicles. The active transportation system plan is comprised of pedestrian and bicycle facilities. A well-established system

[11] https://www.psrc.org/sites/default/files/2022-03/los_hss_king.pdf

encourages healthy recreational activities, reduces vehicle demand on roadways, and enhances safety within the community.

Pedestrian System Classifications

The pedestrian system plan contains a series of primary or secondary sidewalk routes. As discussed previously, corridors identified as primary or secondary routes are used to make a distinction between routes that extend completely through the community (primary), and those that connect to destinations, neighborhoods, or complete a loop (secondary). The future pedestrian system plan, shown on Figure 5-3, provides a comprehensive network of sidewalks, pathways, and shared-use trails. This system is designed to facilitate pedestrian travel to key destinations, such as recreational facilities, schools, and places of employment, where higher pedestrian demand is expected.

The City's ADA Transition Plan, established in September 2018, focuses on enhancing the existing sidewalk system by upgrading curb ramps and improving accessibility. The City collaborates with neighboring property owners on sidewalk construction and maintenance efforts. Additionally, funding programs help maintain and improve existing sidewalks throughout the City.

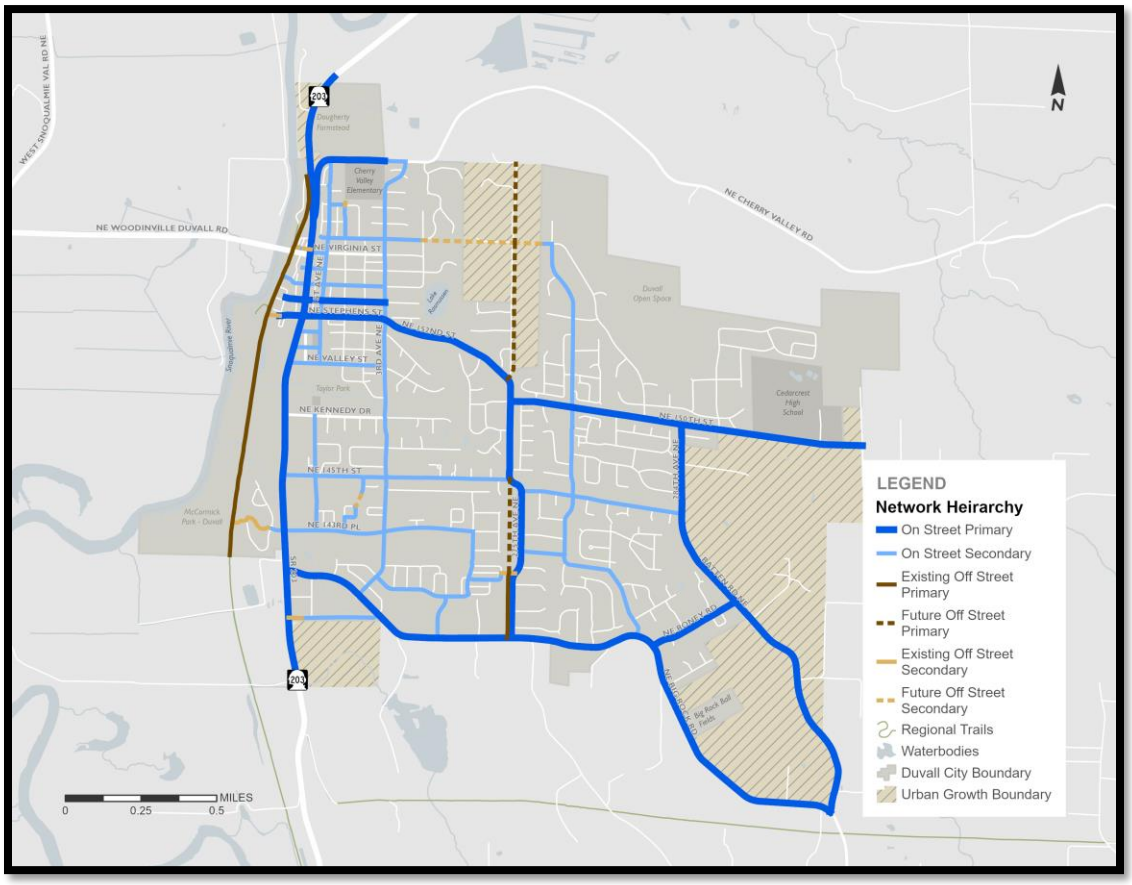


Figure 5-3 Pedestrian System Plan

Pedestrian Level of Service Standard

The City has established LOS standards for its active transportation network, referred to as non-motorized LOS. These standards are based on the future primary and secondary sidewalk,

pathway, and trail system shown in Figure 5-3. The non-motorized system was developed in coordination with City staff and aligns with the Complete Streets Program.

The LOS standards are shown in Figure 5-4, focus on completing sidewalks, pathways, or multi-use trails along arterial roadways. These are categorized into three designations: Green, Orange, and Red.

LOS	Primary Route	Secondary Route
	Meets City standards, facilities on both sides	Meets City standards, facilities on one or both sides
	Facilities exist, but only on one side	N/A
	No facilities exist, does not meet standards	No facilities exist, does not meet standards

Figure 5-4 Pedestrian Levels of Service Overview

The pedestrian LOS analysis indicates that most of the existing non-motorized transportation network meets the City's standard. Many residential neighborhoods have sidewalks on at least one side of the road. The long-term project list outlines improvements to enhance the network, aiming to ensure that the City's standard of Green or Orange LOS are consistently met throughout the City.

Bicycle System Classifications

The bicycle system plan outlines a network of primary or secondary bicycle facilities. As shown in Figure 5-5, the future bicycle system plan provides a comprehensive, interconnected system of both on-road and off-road facilities, including dedicated bike lanes, shared bike facilities, and multi-use trails. Like the pedestrian system, the bicycle network is designed to support bicycle travel to key destinations within Duvall where higher non-motorized demand is anticipated. Trails are also integrated into the bicycle network to ensure a complete and accessible system for cyclists.

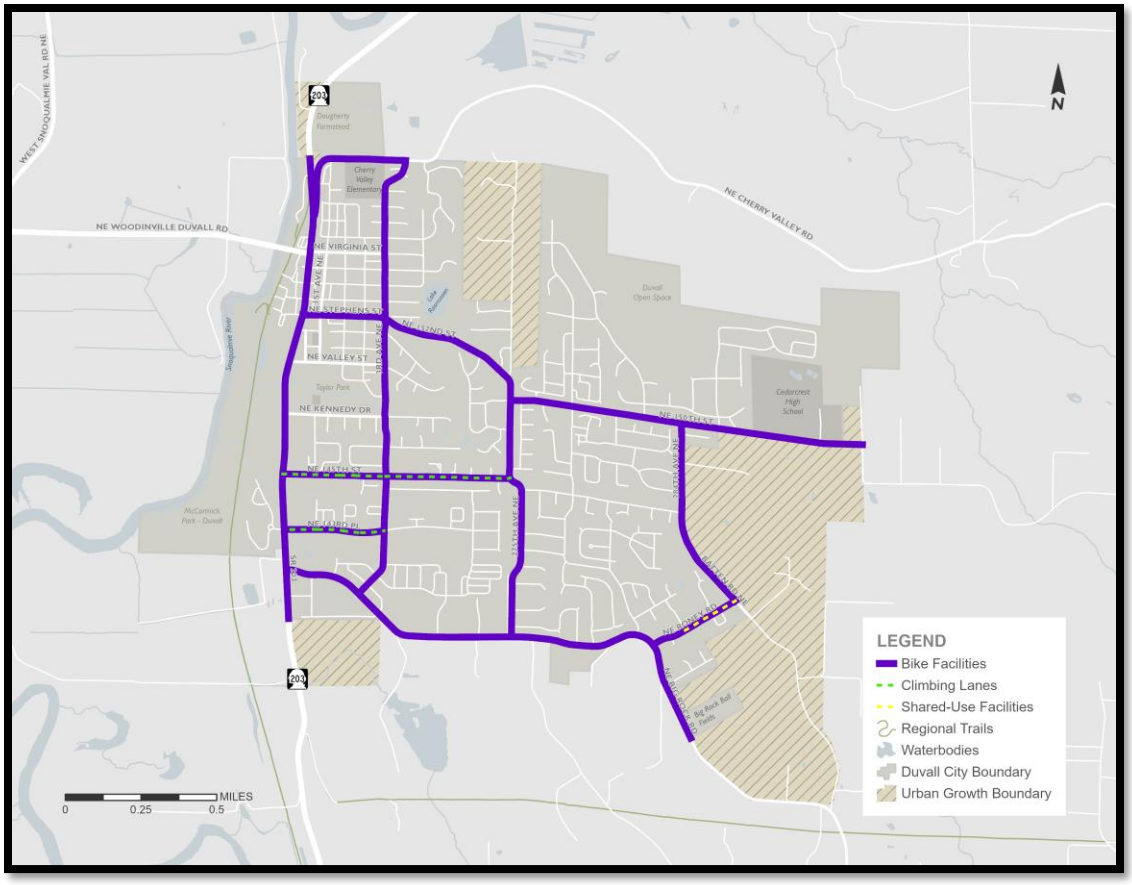


Figure 5-5 Bicycle System Plan

Bicycle Level of Service Standard

The bicycle LOS standards are based on the presence of bike facilities in key corridors within the City as depicted in Figure 5-5. Bike facilities could include sharrows, climbing lanes, dedicated bike lanes, or protected bike lanes. A sharrow is a designated part of the City's bike routes where cars and bikes share the roadway. A climbing lane is typically provided as a separate bike facility along one side of the roadway in the up-hill direction to provide space for bicyclists to climb hills.

A Green LOS (the standard) means that bike facilities are present and a Red LOS means that bike facilities are not present, the bicycle system LOS is shown on Figure 4-2. Duvall utilizes these bike LOS standards to prioritize investments in the bicycle transportation network and identify where significant gaps in the system need to be addressed to serve the City's plans.

Other Transportation Services

Several other transportation services are also included within the City. Those services include transit, transportation demand management program, air transportation, and freight rail services. Those components are described in the following sections.

Transit

The City's transit service is provided by King County Metro and Snoqualmie Valley Transportation (SVT), which play key roles in the overall transportation system. The City supports the transit LOS standards set by King County Metro.

King County Metro's 2023-2028 Transit Development Plan (TDP) focuses on creating an integrated network by coordinating with other agencies, including connecting service with Link light rail expansion. While the TDP does not identify specific transit improvements in Duvall, the Metro Connects Long-Range Plan (2021) proposes extending express service to Duvall by 2050, with connects between Bothell/Woodinville and Redmond, and maintaining local service between Duvall and Carnation. The City will continue to coordinate with King County Metro to enhance connectivity to transit facilities. Projects are incorporated to support connectivity and access to transit facilities by supporting projects that improve access, including park and ride facilities and multi-use paths.

SVT is another important transit option for the area, providing regular-line and door-to-door route service residents between Duvall and North Bend. Supported by King County Metro, WSDOT, The Snoqualmie Tribe, and other partners, SVT operates Monday – Friday (except holidays), offering affordable and accessible transportation to help people stay connected, support local businesses, and foster a strong community.

Transportation Demand Management Program

Transportation Demand Management (TDM) consists of strategies that seek to maximize the efficiency of the transportation system by reducing the number, length and need of private automobile trips. Typically, TDM measures include provision of park and ride lots, improvements to pedestrian and bicycle facilities, and promotion of ridesharing activities. This includes the Duvall Community Car Park, on the northeast corner of the intersection of Woodinville-Duvall Road and Main Street.

Within the State of Washington, alternative transportation solutions are necessitated by the objective of the Commute Trip Reduction (CTR) Law, which applies to employers with 100 or more employees. The purpose of CTR is to help maintain air quality in metropolitan areas by reducing congestion and air pollution. Currently, the City does not have any employer with 100 or more employees working during a shift between 6 am and 9 am. When such an employer does exist, the City would develop a Commute Trip Reduction Ordinance consistent with the Commute Trip Reduction Act (WAC 468-63-010/RCW 70.94.521-551). The ordinance should include TDM actions for employers, such as carpool matching, transit pass subsidies, and bicycle parking to discourage employees from commuting alone.

Duvall is a growing community in a rural area. TDM strategies are typically most effective in denser and larger urban areas. However, strategies coordinated with King County, WSDOT and PSRC can provide alternatives for residents and employees in Duvall. Potential TDM strategies the City could promote through policy or investment include, but are not limited to:

- Transit-oriented and pedestrian friendly street design
- Telecommuting
- Flexible/Alternative work schedules
- Additional Park & Ride facilities
- Ridesharing/Carpooling

Air Transportation & Freight Rail Services

The City of Duvall does not have either freight nor passenger airplane facilities within or adjacent to the City limits.

Transportation Improvement Projects & Programs

The improvements address safety, capacity, network connections, and expanded non-motorized transportation facilities. Improvements also cover upgrades to existing roads and construction of new roadways to support predicted economic development and growth in the City. The roadway and intersection projects incorporate needs for pedestrians, bicyclists, and

transit riders that will use the same corridors. With implementation of the proposed projects, it is anticipated that facilities would meet the intersection and active transportation LOS standards. The projects were categorized into three primary types:

- Spot or intersection improvements
- Corridor or roadway improvements
- Non-motorized improvements
- City-Wide Programs

Intersection Improvements

Intersection improvements have been identified where existing or forecast operational deficiencies are anticipated with growth in and around the City of Duvall. The projects are intended to improve operations at the identified intersections to meet the City's LOS standard. The new intersection improvements are identified to support the Duvall land use plan and summarized in Table 5-3 below.

Table 5-3 2044 Transportation Improvement Project List: Spot/Intersections

Project ID	Intersection	Project Description	TIF Eligible Yes/No?	Estimated Project Cost[1]
SP1	Main St (SR 203)/Woodinville-Duvall Rd/NE Virginia St	Reconstruct intersection to align Virginia St and Woodinville-Duvall Rd at Main St to accommodate growth. Construct south-to-east left-turn lane, improve turning radius and modify the traffic signal or construct roundabout.	Yes	$4,000,000
SP2	Main St (SR 203)/NE 143rd Pl	Install traffic signal.	Yes	$1,500,000
SP3	Main St (SR 203)/NE 145th St	Install traffic signal and channelization improvements when warranted.	Yes	$2,300,000
SP4	Main St (SR 203)/NE Cherry Valley Road	Construct new traffic signal or new roadway extension.	Yes	$7,900,000

1. Planning level cost estimate in 2024 dollars. Source: Transpo Group, 2025

Corridors/Roadway Improvements

Some of the roadway improvements were previously identified as a need in the 6-year transportation improvement program (TIP) and/or the 2017 Transportation Plan and evaluation of the alternatives indicated continued need for the projects based on operations, safety, and completion of motorized and non-motorized networks. Additionally, new roadway connections were identified to support growth. No new roadway connection projects are proposed beyond what was previously identified. Table 5-4 summarizes the corridor/roadway improvements.

Table 5-4 2044 Transportation Improvement Project List: Corridor/Roadway

Project ID	Roadway	Extents	Project Description	TIF Eligible Yes/No?	Estimated Project Cost[1]
RW1	1st Ave NE Extension	NE 145th St to 400 feet south	Construct new collector arterial segment including acquisition of right-of-way, road, parking, curb, gutter, sidewalk, and storm drainage system.	Yes	$1,700,000
RW2	NE 145th St	3rd Ave NE to 275th Ave NE	Major travel-lane widening to collector arterial standards, including bike climbing lane.	Yes	$4,600,000
RW3	NE 160th St	275th Ave to Manion Way	Construct new neighborhood collector including two travel lanes, curbs, gutter, and sidewalk.	No	$2,600,000
RW4	1st Ave NE	Valley St to NE Virginia St	Reconstruct to collector arterial standards including two travel lanes, on-street parking, sidewalks, and curb bulbs.	Yes	$4,900,000
RW5	NE 145th St	Main St to 3rd Ave NE	Reconstruct to collector arterial standards including two travel lanes, curb, gutter, sidewalks, bike climbing lane.	Yes	$5,700,000
RW6	3rd Ave NE	Stephens St to NE 143rd Pl	Reconstruct to collector arterial including two travel lanes, curb, gutter, sidewalks, bike lanes.	Yes	$10,000,000
RW7A	NE 143rd Pl	Main St NE to 3rd Ave NE	Reconstruct to collector arterial standards including two travel lanes, curb, gutter, sidewalks, and bike facilities.	Yes	$3,900,000
RW7B	NE 143rd Pl	3rd Ave NE to 272nd Pl NE	Reconstruct to collector arterial standards including curbs, gutters, sidewalks, and drainage.	Yes	$3,400,000
RW8	NE Big Rock Rd	3rd to 275th Ave NE	Reconstruct to minor arterial standards to include curb, gutter, sidewalk, curb-bulbs, bike lanes, and on-street parking/turn lanes/medians within commercial or residential areas as required.	Yes	$10,400,000
RW9	Batten Rd NE	NE 150th St to NE Roney Rd	Reconstruct to collector arterial standards including curb, gutter, sidewalks, and drainage.	Yes	$8,600,000
RW10	NE 150th St/NE 152nd Street Intersections	275th Ave NE to E City Limits	Reconstruct to improve channelization and capacity including traffic calming elements (traffic circles, chicanes, median) with bike lanes, dedicated parking, and improved pedestrian crossings.	No	$9,100,000
RW11	275th Ave NE	NE 155th Pl to NE Manion Way	Construct new roadway to collector arterial standards including bike lanes, curb, gutter, sidewalk.	No	$2,400,000
RW12	NE Virginia St	Main St NE to 4th Ave NE	Reconstruct to collector arterial standards including two-travel lanes, curb, gutter, sidewalk, curb-bulbs, bike climbing lane, and on-street parking.	No	$4,200,000
RW13	Riverside Ave NE	NE Stephens St to NE Stewart St	Reconstruct to improve channelization and capacity to accommodate growth including two-travel lanes, on street parking, and sidewalks.	No	$2,100,000
RW14	NE Stella St	1st Ave NE to Railroad Ave NE	Reconstruct to improve channelization and capacity to accommodate growth including two-travel lanes, on street parking, and sidewalks.	No	$1,600,000
RW15	NE Cherry St	1st Ave NE to Railroad Ave	Reconstruct to improve channelization and capacity to accommodate growth including two-travel lanes, on street parking, and sidewalks.	No	$1,400,000
RW16	NE Cherry Valley Rd	Main St NE to 3rd Ave NE	Reconstruct to minor arterial standards including two-travel lanes, on street parking, and sidewalks.	No	$2,800,000
RW17	NE Kennedy Dr	Main St NE to 3rd Ave NE	Reconstruct to collector arterial standards including two travel lanes, curb, gutter, sidewalks, and drainage system improvements.	Yes	$3,700,000
RW18	NE Park St	2nd Ave NE to 3rd Ave NE	Reconstruct to improve channelization and capacity to accommodate two-travel lanes and sidewalks.	No	$1,100,000
RW19	NE Valley St	Main St NE to 3rd Ave NE	Reconstruct to collector arterial standards including two-travel lanes, curb, gutter, sidewalk, curb-bulbs, and on-street parking.	Yes	$4,100,000

1. Planning level cost estimate in 2024 dollars. Source: Transpo Group, 2025

Non-Motorized Improvements

While non-motorized improvements will be incorporated into both the intersection and roadway improvement projects, separate non-motorized improvements have been identified. Non-motorized projects have been identified to increase accessibility and connectivity by completing missing links in the current trail, pedestrian, and bike systems and to increase opportunities for alternative modes of transportation such as walking and biking and reducing reliance on Single Occupancy Vehicles (SOVs). The non-motorized improvements include both projects that are already on the TIP as well as new improvements to support the City's Comprehensive Plan and are summarized in Table 5-5.

Table 5-5 2044 Transportation Improvement Project List: Non-Motorized

Project ID	Roadway	Extents	Project Description	TIF Eligible Yes/No?	Estimated Project Cost[1]
NM1	275th Ave NE	NE 152nd St to City Limits	Construct sidewalk or pedestrian pathway on east side of roadway.	Yes	$1,100,000
NM2	NE 144th St	275th Ave NE to 284th Ave NE	Construct sidewalk or pedestrian pathway on both sides of roadway, and bike lane.	Yes	$4,500,000
NM3	3rd Ave NE	NE Stephens Street to Cherry Valley Road	Extend the 3rd Ave Plan to Cherry Valley Road including traffic calming, add shared use, improve storm by re-channelizing and expanding what is there.	Yes	$7,000,000
NM4	Main St (SR 203)	NE Big Rock Road to NE 140th St	Widen to construct bike lanes and sidewalks and intersection re-channelization.	Yes	$1,800,000
NM5	NE Big Rock Road	NE 138th Pl to the south side of Big Rock Sports Field	Widen to construct bike lanes on northeast side of roadway.	Yes	$900,000
NM6	NE Cherry St	1st Ave NE to 3rd Ave NE	Construct sidewalks on north side of roadway.	Yes	$1,800,000
NM7	NE Bird St	Broadway Ave NE to 3rd Ave NE	Construct missing sidewalks along north side of roadway.	Yes	$500,000
NM8	NE Stella St	NE Ring Alley to 3rd Ave NE	Construct sidewalks on both sides of roadway.	Yes	$2,300,000
NM9	278th Ave NE	NE 144th St to NE 142nd PL	Construct sidewalks on one side of roadway.	Yes	$1,600,000
NM10	Batten Rd NE	NE Roney Rd to 290th Ave NE	Construct missing sidewalk on southwest side of roadway.	No	$600,000
NM11	Batten Rd NE	290th Ave NE to NM Big Rock Road	Construct sidewalks on both sides of roadway.	No	$10,500,000
NM12	NE Big Rock Road	South side of Big Rock Sports Field to Batton Road NE	Construct sidewalks on both sides of roadway.	No	$6,600,000
NM13	Main St (SR 203)	NE 140th St to 138th St	Construct sidewalks on both sides of roadway.	No	$3,700,000

1. Planning level cost estimate in 2024 dollars. Source: Transpo Group, 2025

City Programs

In addition to the previously identified programs and improvement projects, the Transportation Plan includes four citywide programs aimed at creating a well-rounded transportation system for all users: Safe Routes to School, Complete Streets, Traffic Calming, and the ADA Transition Plan.

1. **Safe Routes to School** focuses on high-priority pedestrian, bicycle, and safety improvements to promote accessibility and safety for students traveling to and from school.
2. **Complete Streets** (established in September 2016) ensures that all users of the transportation system – pedestrians, cyclists, motorists, and public transit riders – are considered as development and redevelopment occur. This Program maintains policy documents such as the Bicycle and Pedestrian Plans, which guide citywide direction walking, biking, and connectivity. It also includes project prioritization, plan revisions, stormwater and pavement management, staff coordination, and funding strategies.
3. **Traffic Calming Program** is designed to maintain safe and convenient local streets by ensuring travel speeds remain within posted limits and managing the impact of cut-through traffic. This program includes measures such as reduced road widths, dedicated parking, and pedestrian-friendly intersection designs to reduce traffic speeds. It also addresses the potential for increased neighborhood traffic due to congestion along Main Street.
4. **ADA Transition Plan** ensures compliance with the Americans with Disabilities Act (ADA) by identifying and addressing accessibility barriers in public rights-of-way. The plan, based on the City of Duvall ADA Self-Assessment and Transition Plan (2017), focuses on improving sidewalks, curb ramps, crosswalks, and pedestrian amenities. The City is committed to upgrading ADA facilities through both City and private development projects. Priority is given to areas with higher pedestrian traffic, such as school zones, hospitals, and retail areas, ensuring mobility improvements for people with disabilities.

These programs collectively support Duvall’s vision of a connected, accessible, and safe transportation network for all.

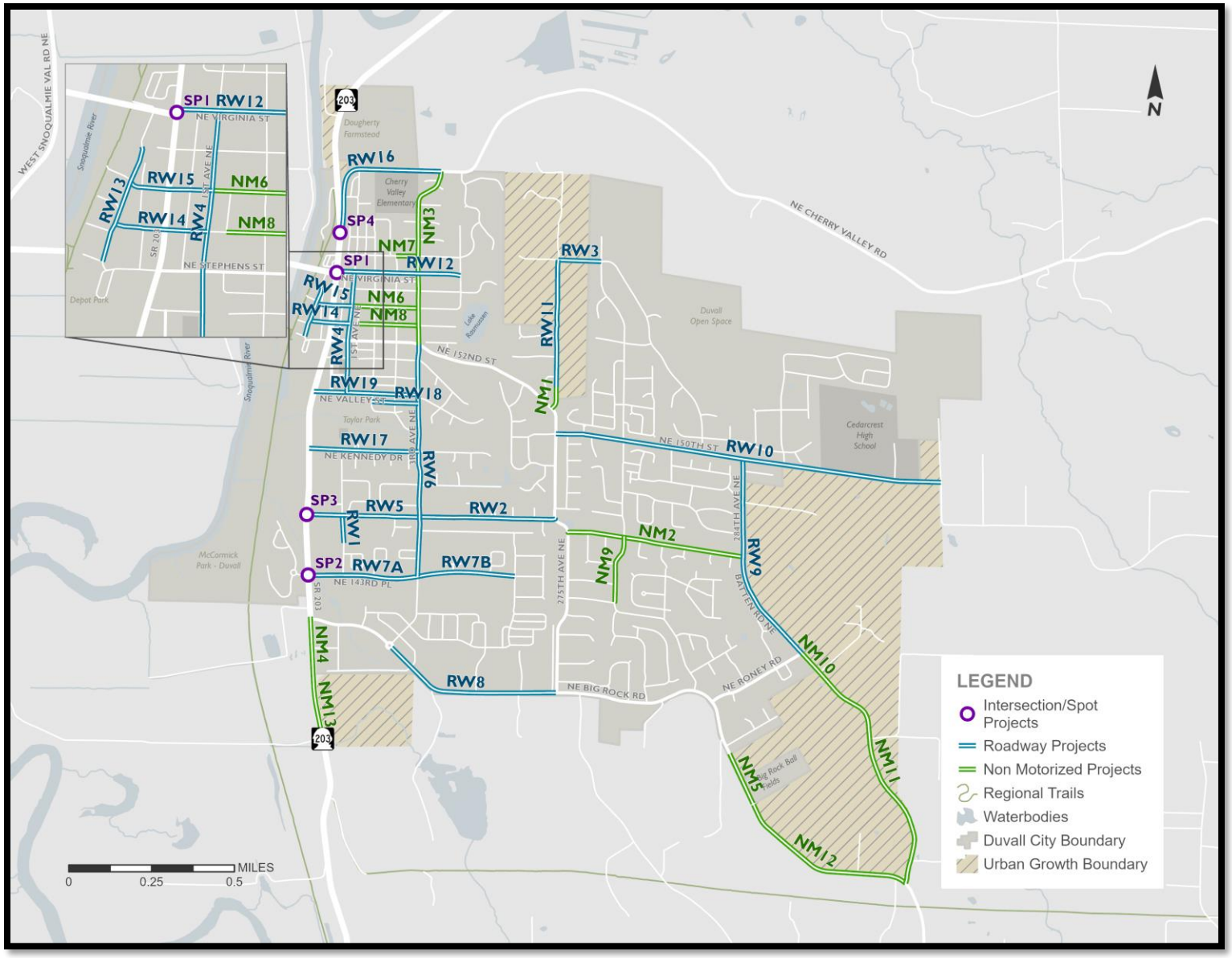


Figure 5-6 20-Year Improvement Projects

Chapter 6: Transportation Finance and Implementation Program

To address current and future travel demands in the City of Duvall, the identified transportation improvement projects must be funded and implemented. This chapter provides an overview of estimated project costs, projected revenues, and potential funding strategies to support these projects. Implementation strategies include coordination with WSDOT, King County, and Puget Sound Regional Council (PSRC) to prioritize and secure funding for regional improvements. The implementation plan establishes a framework for the City to prioritize and finance the projects identified in the Transportation Plan.

The GMA mandates that the Transportation Element of the Comprehensive Plan includes a multi-year financing plan aligned with the transportation plan's identified improvement needs. The financing plan serves as the foundation for the annual Six-Year Transportation Improvement Program (TIP). If projected funding falls short of identified needs, the financing plan must outline strategies for raising additional funds or reassessing land use assumptions to ensure the City meets its level-of-service (LOS) standards. Alternatively, the City may consider adjusting its LOS standards.

This chapter summarizes the costs associated with capital improvement projects and citywide maintenance and operation programs, comparing them to projected revenues from the City's existing funding sources. Additional potential funding mechanisms to address any projected shortfalls are also discussed. Lastly, the chapter includes a reassessment strategy to guide the City in evaluating transportation funding in the broader context of the Comprehensive Plan.

Project and Programs Costs

Table 6-1 summarizes the costs of capital improvement projects and ongoing citywide programs, including the City of Duvall's capital improvements as well as maintenance and operations expenses. These costs are summarized for the duration of the 20-year Plan. The summary does not include improvements under the jurisdiction of WSDOT or King County. However, the City may opt to allocate a portion of WSDOT improvement costs to its transportation impact fee or other funding mechanisms.

Table 6-1 Project and Programs Costs (2024 - 2044)

Improvement Type	2024-2044 Total Costs[1,2]	Percent of Total Costs
Transportation Capital Projects		
Intersections	$15,700,000	11%
New Roadways & Widening/Reconstruction	$88,300,000	60%
Non-Motorized[3]	$42,900,000	29%
Subtotal	**$146,900,000**	**100%**
City-Wide Programs[4]	$12,543,000	-
Total Costs	**$159,443,000**	

1. All costs in 2024 dollars, rounded to $10,000
2. Does not include other agency improvements except for projects along Main Street (SR 203)
3. New project category with pedestrian and bike projects consistent with new MMLOS requirements
4. Includes Maintenance & Operations and ADA Transition Plan Improvements from the City's six-year TIP

Planning-level cost estimates for capital improvement projects were developed and presented in Chapter 5, Transportation Systems Plan. These estimates account for associated stormwater improvement requirements, property acquisition, wetland mitigation, and utility extensions or upgrades, based on historic costs for similar items. As projects progress toward design and construction, more detailed cost estimates will be required. Future design studies

will identify specific property impacts and explore options to reduce costs and impacts on affected properties.

The estimated capital cost of implementing the Transportation Plan is approximately $146.9 million (in 2024 dollars). About 29 percent of these costs are associated to completing the City's active transportation network. These include upgrading roadways to expand pedestrian and bicyclist options, along with constructing urban features such as crosswalks and sidewalks. The remaining 71 percent of capital costs are allocated to intersection and roadway improvement projects.

Maintenance and operations costs were projected based on historic expenditures from 2019 through the 2024 budget. Maintenance and operations costs cover general administration, roadway and storm drainage maintenance, street lighting, traffic signal and street signs, street sweeping, and other safety improvement programs. To reduce the need for extensive capital reconstruction projects, the maintenance and operations program to preserve the existing street system is estimated to be nearly $30 million of the total $122 million Transportation Plan cost.

Funding Analysis with Existing Revenue Sources

The City has historically used tax revenues, developer fees, and grants to construct and maintain their transportation facilities. The financial forecast within this Plan assumes the continued collection of fees over the 20-year plan period (to 2044). The description of this and other available funding sources and projected revenues are listed in Table 6-2.

Table 6-2 Transportation Revenues (2024 – 2044)

Revenue Source	Total Revenues	Percent of Revenues
Transportation Capital Revenues		
Grant Funds	$13,000,000	69%
GMA Fees/(TIF)[1]	$3,000,000	16%
Transportation Benefit District[2]	$2,500,000	13%
Other (interest, interfund transfers, etc.)	$300,000	2%
Subtotal Capital Revenues	**$18,800,000**	**100%**
Transportation M & O Revenues		
State Gas Tax	$3,000,000	24%
Motor Vehicle Fuel Tax	$200,000	2%
Property Tax	$8,000,000	63%
General Funds	$1,000,000	8%
Permits	$340,000	3%
Other (Interest, Miscellaneous Rev)	$210,000	2%
Subtotal M & O Revenues	**$12,750,000**	**40%**
Total Revenues	**$31,550,000**	**100%**

1. Actual TIF collections depend on the level of development that occurs and on credit offered to developers for completion of improvements identified on the 20-year project list. Total revenue calculation used the fee in effect Q1 2025.
2. After 2029 this requires another ballot measure approved by Duvall residents.

Revenue projections were estimated based on the City's 2024 budget, 5-years of historical revenues, and the adopted impact fee program. Based on recent historical data, it is estimated that revenues would be more than $30 million during the 20-year period, of which approximately

60 percent would be dedicated for capital improvements, while the remaining dedicated to maintenance and operations programs.

Developer Transportation Funding

The City uses several programs to help offset the increased traffic impacts of new development or redevelopment. These include construction of frontage improvements such as curb, gutter, and sidewalks, with or without dedication of right-of-way, and new roadways needed to serve the development. The City is also required to review the potential transportation impacts of development and define appropriate mitigation under the State Environmental Policy Act (SEPA) and GMA concurrency requirements. In addition, the City previously adopted a Transportation Impact Fee (TIF) program as allowed by the GMA to help fund growth-related transportation system improvements including completion of connected pedestrian corridors as noted in adopted plans.

Transportation Impact Fees

The GMA allows agencies to develop and implement a TIF program to help fund part of the costs of transportation facilities needed to accommodate growth. State law (RCW 82.02) requires that TIF programs are:

- Related to improvements to serve new growth and not existing deficiencies
- Assessed proportional to the impact of new developments
- Allocated for improvements that reasonably benefit new development
- Spent on facilities identified in the adopted Capital Facilities Plan

TIFs can only be used to help fund improvements that are needed to serve new growth. The cost of projects needed to resolve existing deficiencies cannot be included.

The TIF program must allow developers to receive credits if they are required to construct all or a portion of system improvements to the extent that the required improvements were included in the TIF calculation. The city is in the process of updating its existing program based on this updated Transportation Plan.

Other Developer Mitigation and Requirements

The City has adopted specific development-related requirements which will help fund the identified improvements. These include requirements for frontage improvements, mitigation of transportation impacts under SEPA, and concurrency requirements. The City requires developments to fund and construct certain roadway improvements as part of their projects. These typically include reconstructing abutting streets to meet the City's current design standards. These improvements can include widening of pavement, drainage improvements, and construction of curb, gutter, and sidewalks.

Several of the projects identified in the Transportation Plan could be partially funded and constructed as part of new developments. As noted above, to the extent that costs of a transportation improvement are included in the TIF then credits must be provided. If improvements to an abutting local street are not included in the TIF, then credits against the TIF would not be provided or allowed.

The City also evaluates the impact of development projects under SEPA. The SEPA review may identify adverse transportation impacts that require mitigation beyond payment of the TIF. These could include impacts related to safety, traffic operations, active transportation, or other transportation issues. The needed improvements may or may not be identified as specific projects in the Plan. If the required improvements are included in the TIF program, then the City must provide credits to the extent that the costs are included in the project list and impact fee calculations.

The City also requires an evaluation of transportation concurrency for development projects. The concurrency evaluation is intended to identify project impacts that will cause City facilities to operate below the City's adopted level of service standard. To resolve such a deficiency, the applicant can propose to fund and/or construct improvements to provide an adequate level of service. Alternatively, the applicant can wait for the City, or another agency or developer to fund improvements to resolve the deficiency. According to the GMA, the City must deny any proposal that will cause the level of service for transportation facilities to decline below the adopted standard unless a financial commitment is in place to complete measures to achieve the LOS standard within six years. (RCW 36.70A.070(6)(b).

Grants

Over the past several years the City has had success in securing grants for transportation improvements. Grant funding is typically tied to specific improvement projects and distributed on a competitive basis, often with a local funding match.

Forecast Revenue Shortfall

Table 6-3 summarizes the City's proposed transportation financing strategy for the approximately $145.4 million City portion of the capital improvement costs as well as the $12.4 million in maintenance, operations, and program expenditures. The Plan results in a forecast shortfall of approximately $18.8 million. This assumes that the level of grants and developer commitments will be generated as estimated in the Transportation Plan. The deficit could be greater if the level of development or the level of grant funding is less than forecast. The former would be offset by a reduced need for transportation improvements to accommodate growth. If the City is more successful in obtaining grants or other outside funding for projects, then the potential deficit could be reduced, as discussed in the next section.

Table 6-3 Forecasted Revenues and Costs

Revenue Source[1]	Total (2024–2044)[1, 2]
Transportation Capital Revenues	$18,800,000
Total Capital Project Costs	$146,900,000
Capital Estimated Shortfall	**($128,100,000)**
Transportation M&O Revenues	$12,750,000
Transportation M&O Costs	$12,380,000
M&O Estimated Surplus	**$370,000**
Total Estimated Shortfall	**($126,230,000)**

1. All revenues in 2024 dollars
2. Does not include other agency improvements except for Main Street (SR 203)

Capital Revenue Shortfall

The approximately $128.1 million funding shortfall would significantly affect the City's ability to finance all identified projects during the planning period. However, the formation of the TBD demonstrates the City's commitment to funding essential maintenance and operations programs to preserve the integrity, safety, and efficiency of the existing transportation system. These maintenance and operations costs are expected to increase as transportation system improvements are implemented and as the City annexes its unincorporated Urban Growth Area (UGA).

Maintenance and Operations Revenue Shortfall

The financial forecast projects a $370,000 surplus for the 20-year maintenance and operations program. General maintenance and operations programs balance with forecast revenues over the life of the plan. The City will annually review and adjust these programs to maintain a balance with anticipated dedicated revenues.

Potential Options to Balance the Plan

As noted above, projected existing revenue sources would allow the City to fund the majority of the identified transportation improvement projects and program costs. The City could address this shortfall through delaying lower priority projects or increasing revenue allocations from discretionary sources, primarily the General Fund.

Options for Reducing the Funding Shortfall for Capital Improvement Projects

The City can increase funding for capital street projects using a range of revenue options. These include partnering with other agencies or additional grants as available. Alternatively, the City could delay implementation of projects, especially lower priority improvements. Possible applications of these funding strategies are discussed below.

Delaying Improvement Projects

The City will not likely be able to, or may choose not to, fund lower priority projects within the 20-year horizon without additional funding sources. Some of these projects may be funded through impact fees and/or frontage improvement requirements as development (or re-development) occurs. As developments occur in these areas the City may require project-specific facility improvements including SEPA mitigation measures, as appropriate. The City also may identify other programs or opportunities to partially or fully fund some of these improvements.

Additional Grants and Other Agency Funding

As discussed above, the transportation financing analysis estimates that the City may receive approximately $13 million in grant funding over the life of the Plan. If the City can pursue and receive grants at a higher rate, shortfalls may be less than projected.

Tax Increment Financing

Washington State allows cities to create “increment areas” that allows for the financing of public improvements, including transportation projects within the area by using increased future revenues from local property taxes generated within the area. The specific rules and requirements are noted in the Community Revitalization Financing (CRF) Act.

The Local Infrastructure Financing Tool (LIFT) program is a potential tool for the City to pursue. Under this concept the annual increases in local sales/use taxes and property taxes can be used to fund various public improvements.

The City may choose to further consider these types of funding programs in the future as part of its annual budget and six-year Transportation Improvement Program (TIP) processes.

Voter Approved Bond/Tax Package

Bonds do not result in additional revenue unless coupled with a revenue generating mechanism, such as a voter approved tax. The debt service on the bonds results in increased

costs which can be paid with additional tax revenues. Although the City does not anticipate issuing bonds soon, it remains an option for generating additional transportation revenues to fund some of the higher cost improvement projects.

Local Improvement Districts

A local improvement district (LID) is a special assessment area established by a jurisdiction to help fund specific improvements that would benefit properties within the district. LIDs could be formed to construct sidewalks, upgrade streets, improve drainage or other similar types of projects. A LID may be in residential, commercial, industrial areas, or combinations depending on the needs and benefits. LIDs can be proposed either by the City or by property owners. LIDs must be formed by a specific process which establishes the improvements, their costs, and assessments. The assessments are added to the property tax which helps to spread the costs over time.

Reassessment Strategy

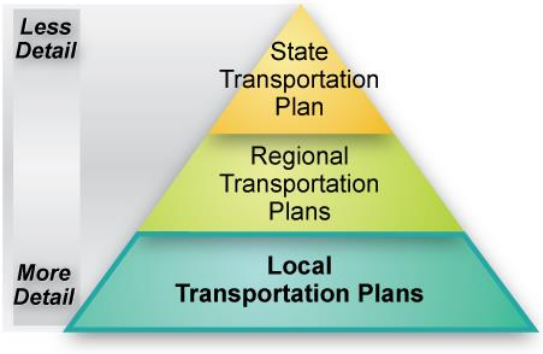
Although the financing summary identifies the potential for a total revenue shortfall of approximately $128.1 million (in 2024 dollars) over the life of the Plan, the City is committed to reassessing transportation needs and funding sources each year as part of its six-year Transportation Improvement Program (TIP). This allows the City to match the financing program with the short-term improvement projects and funding. To implement the Transportation Plan, the City will consider the following principals in its transportation funding program:

- Balance improvement costs with available revenues as part of the annual six-year Transportation Improvement Program (TIP)
- Review project design standards to determine whether costs could be reduced through reasonable changes in scope or deviations from design standards
- Fund improvements or require developer improvements as they become necessary to maintain LOS standards
- Explore ways to obtain more developer contributions to fund improvements
- Coordinate and partner with WSDOT, King County, and others to implement improvements to SR 203 and NE Woodinville Duvall Road
- Vigorously pursue grant funds from state and federal sources
- Work with King & Snohomish Counties, and other neighboring agencies to develop multiagency grant applications for projects that serve growth in and around the City
- Review and update the TIF program regularly to account for the updated capital improvement project list, revised project cost estimates, and annexations

Some lower priority improvements may be deferred or removed from the Transportation Plan. The City will use the annual update of the six-year Transportation Improvement Program (TIP) to re-evaluate priorities and timing of projects and need for alternative funding programs. Throughout the planning period, projects will be completed, and priorities revised. This will be accomplished by annually reviewing traffic growth and the location and intensity of land use growth in the city and its UGA. The City will then be able to direct funding to areas that are most impacted by growth or to roadways that may be falling below the City's LOS standards. The development of the TIP will be an ongoing process over the life of the Plan and will be reviewed and amended annually.

Chapter 7: Consistency with Other Agencies

Duvall's transportation system is part of, and connected to, a broader regional highway and arterial system. The GMA works to increase coordination and compatibility between the various agencies that are responsible for the overall transportation system. Since transportation improvements need to be coordinated across jurisdictional boundaries, the Transportation Plan needs to be consistent with and supportive of the objectives identified in the Washington State Transportation Plan, PSRC's VISION 2050, and King County's Capital Improvement Program. Developing the Transportation Plan is primarily a bottom-up approach to planning, with the City exploring its needs based on the land use plan. Eventually, local projects are incorporated into regional and state plans. A schematic of this approach is shown.



The City of Duvall's Transportation Plan considers the impacts of planned improvements, along with the priorities and policies of WSDOT and King County. The following summarizes how the Plan relates and is consistent to these other state and regional agency plans.

WSDOT

The Washington Transportation Plan (WTP) 2040 and Beyond, and the associated Highway System Plan (HSP), updated in 2024, provide the umbrella for all metropolitan and regional transportation plans. The updated WTP focuses on key policies and strategies for the State, while the HSP maintains the most recent long-term statewide project list.

The Highway System Plan is an element of the WTP. The HSP identifies highway system improvement projects and programs consistent with the WTP priorities. The HSP is constrained by available funding forecast for the next 20 years. Policies and improvement projects listed in the WTP and HSP were reviewed for consistency with the strategies and projects recommended in the Cities Transportation Plan.

As required by the GMA, the Transportation Plan addresses the existing and future conditions of Main Street (SR 203) serving the City. The transportation inventory describes existing traffic volumes, levels of service, and safety along the state route. The Plan also identifies forecast conditions and improvement needs to resolve capacity, operations, safety, complete street, and multimodal transportation needs along the corridor.

The City of Duvall has no authority to alter the level of service on Main Street (SR 203) nor does the City have the responsibility to make ultimate decisions concerning improvements to the State highway system or to raise needed funding. The City of Duvall will not apply concurrency regulations to Main Street (SR 203) in the City.

PSRC

The Puget Sound Regional Council (PSRC) adopted VISION 2050 and Transportation 2040 and Beyond to guide transportation policies, priorities and investments for the Puget Sound region. The update of the Duvall Transportation Plan included a review of the policies and projects that were important to consider and build from to provide regional and local consistency. The appropriate policy and project updates were incorporated into the City's Transportation Plan so that it is consistent and supportive of both VISION 2050 and Transportation 2040 and Beyond (the Region's Metropolitan Transportation Plan). Several policies were added to the City's Transportation Plan to address important regional priorities

such as multimodal connectivity, complete streets, low impact design, equity, sustainability, electric vehicles, alternative fuel, environmental impacts, air quality, and travel demand management.

The City roadway functional classification system is slightly different from the federal functional classification system, particularly for roadways such as Main Street (SR 203), NE Cherry Valley Road, NE Big Rock Road, 275th Avenue NE, and NE Stephens Street/NE 152nd Street/NE 150th Street.

King County

King County's transportation and capital improvement plans were reviewed as part of the City of Duvall's Transportation Plan update. County road classifications were also reviewed and determined to be compatible. The City's functional classification map notes the classification of County roadways. Roadway construction projects were obtained from King County's Transportation Needs Report 2020 (TNR). Several major capital improvements are identified within King County that could impact or influence specific outcomes of the Duvall Transportation Plan including providing complete non-motorized facilities along Woodinville-Duvall Road from the Duvall City limits, west to Avondale Road NE. Overall, the Transportation Element is consistent with and accounts for travel forecasts from the unincorporated areas of King County.

King County Metro

King County Metro Transit provides transit service for the City of Duvall. The Duvall Transportation Plan acknowledges the need for coordination between the City and King County Metro to work together to identify service improvements and strategies to serve Duvall. The City has also developed policies and road standards to provide adequate streets and active mode facilities to support transit service. King County Metro's six-year development plan and long-range Metro Connects Plan were reviewed as part of the Plan, although no service changes are currently planned within the City of Duvall.

Appendix A: Level of Service Definitions

Highway Capacity Manual 7th Edition

Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). Control delay is a complex measure based on many variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Table 1 summarizes the LOS criteria for signalized intersections, as described in the *Highway Capacity Manual* 7th Edition (Transportation Research Board, 2022).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F[1]	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 7th Edition*, Transportation Research Board, 2022, respectively.
1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop and two-way stop controlled. All-way stop controlled intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. Table 2 shows LOS criteria for unsignalized intersections.

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F[1]	>50

Source: *Highway Capacity Manual 7th Edition*, Transportation Research Board, 2022, respectively.
1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

Appendix B: Level of Service Worksheets

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	135	40	70	65	10	60
Future Vol, veh/h	135	40	70	65	10	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	147	43	76	71	11	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	190	0	391	168
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	223	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1390	-	617	881
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	819	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1390	-	582	881
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	772	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	4.01	9.84
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	821	-	-	933	-
HCM Lane V/C Ratio	0.093	-	-	0.055	-
HCM Ctrl Dly (s/v)	9.8	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

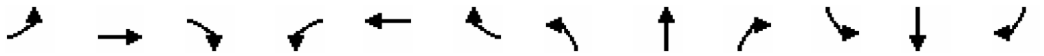
Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	30	605	110	20	280
Future Vol, veh/h	60	30	605	110	20	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	5	5	7	7
Mvmt Flow	64	32	644	117	21	298

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1043	702	0	0	761	0
Stage 1	702	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.263	-
Pot Cap-1 Maneuver	254	438	-	-	829	-
Stage 1	491	-	-	-	-	-
Stage 2	721	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	246	438	-	-	829	-
Mov Cap-2 Maneuver	246	-	-	-	-	-
Stage 1	491	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	23.56	0	0.63
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	288	120	-
HCM Lane V/C Ratio	-	-	0.332	0.026	-
HCM Ctrl Dly (s/v)	-	-	23.6	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.4	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	295	50	210	20	65	45	170	370	5	5	265	85
Future Volume (veh/h)	295	50	210	20	65	45	170	370	5	5	265	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	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	1856	1856	1856	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	311	53	221	21	68	47	179	389	5	5	279	89
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	3	3	3	7	7	7	6	6	6
Cap, veh/h	338	58	240	14	47	51	209	570	7	39	316	843
Arrive On Green	0.41	0.38	0.41	0.06	0.03	0.03	0.06	0.32	0.35	0.21	0.18	0.18
Sat Flow, veh/h	901	154	640	433	1401	1530	1711	1769	23	9	1794	1517
Grp Volume(v), veh/h	585	0	0	89	0	47	179	0	394	284	0	89
Grp Sat Flow(s),veh/h/ln	1695	0	0	1834	0	1530	1711	0	1792	1803	0	1517
Q Serve(g_s), s	31.9	0.0	0.0	3.3	0.0	3.0	5.6	0.0	18.6	0.2	0.0	2.7
Cycle Q Clear(g_c), s	31.9	0.0	0.0	3.3	0.0	3.0	5.6	0.0	18.6	14.5	0.0	2.7
Prop In Lane	0.53		0.38	0.24		1.00	1.00		0.01	0.02		1.00
Lane Grp Cap(c), veh/h	636	0	0	61	0	51	209	0	577	410	0	843
V/C Ratio(X)	0.92	0.00	0.00	1.45	0.00	0.92	0.86	0.00	0.68	0.69	0.00	0.11
Avail Cap(c_a), veh/h	880	0	0	433	0	362	222	0	834	654	0	1050
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	0.0	46.7	0.0	46.9	37.3	0.0	28.6	39.0	0.0	10.4
Incr Delay (d2), s/veh	12.8	0.0	0.0	217.7	0.0	33.5	25.1	0.0	2.0	3.0	0.0	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	14.4	0.0	0.0	5.2	0.0	1.6	3.1	0.0	8.1	6.6	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.5	0.0	0.0	264.4	0.0	80.4	62.3	0.0	30.7	42.0	0.0	10.5
LnGrp LOS	D			F		F	E		C	D		B
Approach Vol, veh/h		585			136			573			373	
Approach Delay, s/veh		40.5			200.8			40.6			34.5	
Approach LOS		D			F			D			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		39.9		45.0	14.2	25.7		12.3				
Change Period (Y+Rc), s		5.6		5.5	5.6	* 5.6		6.1				
Max Green Setting (Gmax), s		48.3		53.5	9.4	* 33		26.0				
Max Q Clear Time (g_c+I1), s		20.6		33.9	8.6	16.5		6.0				
Green Ext Time (p_c), s		3.7		5.6	0.0	2.6		0.4				

Intersection Summary		
HCM 7th Control Delay, s/veh	52.2	
HCM 7th LOS	D	

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	10	5	5	5	20	560	15	5	460	35
Future Vol, veh/h	10	5	10	5	5	5	20	560	15	5	460	35
Conflicting Peds, #/hr	2	0	11	11	0	2	0	0	4	4	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	9	9	9	6	6	6	4	4	4
Mvmt Flow	10	5	10	5	5	5	21	583	16	5	479	36

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1137	1152	508	1140	1163	597	516	0	0	603	0	0
Stage 1	508	508	-	637	637	-	-	-	-	-	-	-
Stage 2	630	645	-	503	526	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.19	6.59	6.29	4.16	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.581	4.081	3.381	2.254	-	-	2.236	-	-
Pot Cap-1 Maneuver	180	199	569	172	189	490	1030	-	-	965	-	-
Stage 1	551	542	-	454	461	-	-	-	-	-	-	-
Stage 2	473	471	-	538	517	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	167	191	563	156	181	487	1030	-	-	961	-	-
Mov Cap-2 Maneuver	167	191	-	156	181	-	-	-	-	-	-	-
Stage 1	547	538	-	439	445	-	-	-	-	-	-	-
Stage 2	448	455	-	513	513	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	21.78	23.08	0.29	0.09
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	60	-	-	240	215	18	-	-
HCM Lane V/C Ratio	0.02	-	-	0.108	0.073	0.005	-	-
HCM Ctrl Dly (s/v)	8.6	0	-	21.8	23.1	8.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	5	5	5	0	10	5	610	25	15	470	5
Future Vol, veh/h	0	5	5	5	0	10	5	610	25	15	470	5
Conflicting Peds, #/hr	4	0	8	8	0	4	27	0	27	27	0	27
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	6	6	6	3	3	3
Mvmt Flow	0	5	5	5	0	10	5	635	26	16	490	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1200	1249	527	1217	1239	679	522	0	0	688	0	0
Stage 1	550	550	-	686	686	-	-	-	-	-	-	-
Stage 2	650	699	-	531	553	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.16	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.254	-	-	2.227	-	-
Pot Cap-1 Maneuver	163	174	555	159	177	455	1024	-	-	901	-	-
Stage 1	523	519	-	441	451	-	-	-	-	-	-	-
Stage 2	461	445	-	535	518	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	150	160	536	143	163	441	998	-	-	878	-	-
Mov Cap-2 Maneuver	150	160	-	143	163	-	-	-	-	-	-	-
Stage 1	497	493	-	426	436	-	-	-	-	-	-	-
Stage 2	445	430	-	508	492	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	20.23	19.73	0.07	0.28
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	14	-	-	247	260	55	-	-
HCM Lane V/C Ratio	0.005	-	-	0.042	0.06	0.018	-	-
HCM Ctrl Dly (s/v)	8.6	0	-	20.2	19.7	9.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	15	5	5	10	5	10	40	5	10	35	5
Future Vol, veh/h	10	15	5	5	10	5	10	40	5	10	35	5
Conflicting Peds, #/hr	0	0	3	3	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	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	11	17	6	6	11	6	11	45	6	11	40	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	17	0	0	26	0	0	89	74	23	88	74	15
Stage 1	-	-	-	-	-	-	46	46	-	26	26	-
Stage 2	-	-	-	-	-	-	44	28	-	63	48	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1613	-	-	1602	-	-	901	820	1060	902	820	1070
Stage 1	-	-	-	-	-	-	973	861	-	997	878	-
Stage 2	-	-	-	-	-	-	976	875	-	954	858	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1613	-	-	1597	-	-	840	809	1057	838	809	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-	840	809	-	838	809	-
Stage 1	-	-	-	-	-	-	964	852	-	994	875	-
Stage 2	-	-	-	-	-	-	922	872	-	891	850	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	2.42	1.82	9.68	9.62
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	832	571	-	-	422	-	-	835
HCM Lane V/C Ratio	0.075	0.007	-	-	0.004	-	-	0.068
HCM Ctrl Dly (s/v)	9.7	7.2	0	-	7.3	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	10	55	10	75	10	560	45	105	370	5
Future Volume (veh/h)	10	5	10	55	10	75	10	560	45	105	370	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	0.98		0.96	0.97		0.96	0.99		0.99	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	1900	1900	1900	1826	1826	1826	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	10	5	10	57	10	78	10	583	47	109	385	5
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	5	5	5	6	6	6	4	4	4
Cap, veh/h	139	51	59	140	21	71	499	656	53	345	809	11
Arrive On Green	0.15	0.09	0.15	0.15	0.09	0.15	0.01	0.40	0.46	0.06	0.45	0.51
Sat Flow, veh/h	430	573	669	447	234	794	1725	1652	133	1753	1812	24
Grp Volume(v), veh/h	25	0	0	145	0	0	10	0	630	109	0	390
Grp Sat Flow(s),veh/h/ln	1673	0	0	1475	0	0	1725	0	1785	1753	0	1836
Q Serve(g_s), s	0.0	0.0	0.0	3.0	0.0	0.0	0.1	0.0	16.5	1.6	0.0	7.5
Cycle Q Clear(g_c), s	0.6	0.0	0.0	4.6	0.0	0.0	0.1	0.0	16.5	1.6	0.0	7.5
Prop In Lane	0.40		0.40	0.39		0.54	1.00		0.07	1.00		0.01
Lane Grp Cap(c), veh/h	349	0	0	319	0	0	499	0	708	345	0	820
V/C Ratio(X)	0.07	0.00	0.00	0.45	0.00	0.00	0.02	0.00	0.89	0.32	0.00	0.48
Avail Cap(c_a), veh/h	571	0	0	510	0	0	812	0	1300	576	0	1336
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	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	0.0	21.4	0.0	0.0	6.5	0.0	14.0	9.5	0.0	9.7
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.0	0.0	0.0	0.0	0.0	4.1	0.4	0.0	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	0.2	0.0	0.0	1.4	0.0	0.0	0.0	0.0	6.1	0.5	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.1	0.0	0.0	22.4	0.0	0.0	6.5	0.0	18.1	9.8	0.0	10.2
LnGrp LOS	C			C			A		B	A		B
Approach Vol, veh/h		25			145			640			499	
Approach Delay, s/veh		20.1			22.4			17.9			10.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	28.4		13.4	5.9	30.9		13.4				
Change Period (Y+Rc), s	5.5	5.5		* 5.9	5.5	5.5		5.9				
Max Green Setting (Gmax), s	9.5	39.5		* 15	9.5	39.5		14.1				
Max Q Clear Time (g_c+I1), s	3.6	18.5		3.0	2.1	9.5		6.6				
Green Ext Time (p_c), s	0.1	4.4		0.0	0.0	2.6		0.4				

Intersection Summary		
HCM 7th Control Delay, s/veh		15.5
HCM 7th LOS		B

Notes

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

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	135	5	45	125	5	15	25	65	15	10	20
Future Vol, veh/h	20	135	5	45	125	5	15	25	65	15	10	20
Conflicting Peds, #/hr	1	0	6	6	0	1	1	0	3	3	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	0	0	0
Mvmt Flow	21	141	5	47	130	5	16	26	68	16	10	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	136	0	0	152	0	0	421	421	152	426	421	135
Stage 1	-	-	-	-	-	-	191	191	-	228	228	-
Stage 2	-	-	-	-	-	-	230	230	-	198	194	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	1460	-	-	1441	-	-	545	525	897	542	527	919
Stage 1	-	-	-	-	-	-	813	744	-	780	719	-
Stage 2	-	-	-	-	-	-	775	716	-	808	744	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1459	-	-	1433	-	-	492	496	889	450	497	918
Mov Cap-2 Maneuver	-	-	-	-	-	-	492	496	-	450	497	-
Stage 1	-	-	-	-	-	-	796	728	-	751	693	-
Stage 2	-	-	-	-	-	-	719	690	-	707	728	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.94	1.95	11.29	11.53
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	682	223	-	-	459	-	-	598
HCM Lane V/C Ratio	0.16	0.014	-	-	0.033	-	-	0.078
HCM Ctrl Dly (s/v)	11.3	7.5	0	-	7.6	0	-	11.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.3

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	160	10	5	125	70	10	45	10	65	35	30
Future Vol, veh/h	40	160	10	5	125	70	10	45	10	65	35	30
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	1	1	1
Mvmt Flow	43	170	11	5	133	74	11	48	11	69	37	32
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, s/veh	9.6	9.2	8.6	9.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	19%	3%	50%
Vol Thru, %	69%	76%	63%	27%
Vol Right, %	15%	5%	35%	23%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	210	200	130
LT Vol	10	40	5	65
Through Vol	45	160	125	35
RT Vol	10	10	70	30
Lane Flow Rate	69	223	213	138
Geometry Grp	1	1	1	1
Degree of Util (X)	0.097	0.29	0.266	0.191
Departure Headway (Hd)	5.024	4.67	4.494	4.963
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	708	766	796	718
Service Time	3.094	2.721	2.545	3.026
HCM Lane V/C Ratio	0.097	0.291	0.268	0.192
HCM Control Delay, s/veh	8.6	9.6	9.2	9.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	1.2	1.1	0.7

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	220	170	20	15	10
Future Vol, veh/h	15	220	170	20	15	10
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	16	242	187	22	16	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	209	0	-	0	473	201
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	275	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1374	-	-	-	554	845
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	776	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1374	-	-	-	546	843
Mov Cap-2 Maneuver	-	-	-	-	546	-
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	776	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.49	0	10.92
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	115	-	-	-	636
HCM Lane V/C Ratio	0.012	-	-	-	0.043
HCM Ctrl Dly (s/v)	7.7	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	5	80	5	130	5	55	100	160	70	5
Future Vol, veh/h	5	5	5	80	5	130	5	55	100	160	70	5
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	70	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	5	5	88	5	143	5	60	110	176	77	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	508	620	80	565	567	125	82	0	0	177	0	0
Stage 1	431	431	-	133	133	-	-	-	-	-	-	-
Stage 2	77	188	-	431	434	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	478	407	986	439	436	931	1528	-	-	1411	-	-
Stage 1	606	586	-	875	790	-	-	-	-	-	-	-
Stage 2	937	748	-	606	584	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	344	349	986	370	374	922	1528	-	-	1401	-	-
Mov Cap-2 Maneuver	344	349	-	370	374	-	-	-	-	-	-	-
Stage 1	527	509	-	866	781	-	-	-	-	-	-	-
Stage 2	781	740	-	518	508	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	13.45	12.93	0.23	5.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	50	-	-	442	370	922	1209	-	-
HCM Lane V/C Ratio	0.004	-	-	0.037	0.252	0.155	0.125	-	-
HCM Ctrl Dly (s/v)	7.4	0	-	13.5	18	9.6	7.9	0	-
HCM Lane LOS	A	A	-	B	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0.5	0.4	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	55	160	20	5	150	5	15	0	5	5	5	35
Future Vol, veh/h	55	160	20	5	150	5	15	0	5	5	5	35
Conflicting Peds, #/hr	8	0	0	0	0	8	1	0	6	6	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	60	176	22	5	165	5	16	0	5	5	5	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	178	0	0	198	0	0	487	497	193	489	505	177
Stage 1	-	-	-	-	-	-	308	308	-	187	187	-
Stage 2	-	-	-	-	-	-	180	189	-	303	319	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1410	-	-	1387	-	-	494	477	854	492	472	872
Stage 1	-	-	-	-	-	-	707	664	-	820	749	-
Stage 2	-	-	-	-	-	-	827	747	-	711	657	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1399	-	-	1387	-	-	441	449	849	457	444	864
Mov Cap-2 Maneuver	-	-	-	-	-	-	441	449	-	457	444	-
Stage 1	-	-	-	-	-	-	672	632	-	810	740	-
Stage 2	-	-	-	-	-	-	780	738	-	668	625	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.8	0.24	12.51	10.39
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	502	412	-	-	56	-	-	718
HCM Lane V/C Ratio	0.044	0.043	-	-	0.004	-	-	0.069
HCM Ctrl Dly (s/v)	12.5	7.7	0	-	7.6	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.2

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	25	40	100	20	35
Future Vol, veh/h	105	25	40	100	20	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	114	27	43	109	22	38
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay, s/veh	8.5	8.2	7.9
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	81%	0%	100%
Vol Right, %	0%	100%	19%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	35	130	40	100
LT Vol	20	0	0	40	0
Through Vol	0	0	105	0	100
RT Vol	0	35	25	0	0
Lane Flow Rate	22	38	141	43	109
Geometry Grp	5	5	3b	5	5
Degree of Util (X)	0.035	0.048	0.177	0.063	0.141
Departure Headway (Hd)	5.733	4.528	4.504	5.177	4.676
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	627	794	800	684	757
Service Time	3.441	2.235	2.512	2.968	2.466
HCM Lane V/C Ratio	0.035	0.048	0.176	0.063	0.144
HCM Control Delay, s/veh	8.6	7.5	8.5	8.3	8.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.6	0.2	0.5

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	80	95	10	5	40
Future Vol, veh/h	60	80	95	10	5	40
Conflicting Peds, #/hr	14	0	0	14	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	130	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	66	88	104	11	5	44

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	129	0	-	0	344	126
Stage 1	-	-	-	-	124	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1462	-	-	-	657	930
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1443	-	-	-	610	916
Mov Cap-2 Maneuver	-	-	-	-	718	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	811	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	3.26	0	9.29
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1443	-	-	-	889
HCM Lane V/C Ratio	0.046	-	-	-	0.056
HCM Ctrl Dly (s/v)	7.6	-	-	-	9.3
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	15	615	20	15	430
Future Vol, veh/h	5	15	615	20	15	430
Conflicting Peds, #/hr	0	0	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	4	4	2	2	2	2
Mvmt Flow	5	15	634	21	15	443

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1123	648	0	0	659	0
Stage 1	648	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.12	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.218	-
Pot Cap-1 Maneuver	226	467	-	-	929	-
Stage 1	517	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	220	465	-	-	926	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	515	-	-	-	-	-
Stage 2	608	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	15.5	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	363	61	-
HCM Lane V/C Ratio	-	-	0.057	0.017	-
HCM Ctrl Dly (s/v)	-	-	15.5	9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	5	15	5	5	5	15	75	5	5	80	10
Future Vol, veh/h	15	5	15	5	5	5	15	75	5	5	80	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	2	2	2
Mvmt Flow	17	6	17	6	6	6	17	83	6	6	89	11
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, s/veh	7.4	7.4	7.7	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	43%	33%	5%
Vol Thru, %	79%	14%	33%	84%
Vol Right, %	5%	43%	33%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	35	15	95
LT Vol	15	15	5	5
Through Vol	75	5	5	80
RT Vol	5	15	5	10
Lane Flow Rate	106	39	17	106
Geometry Grp	1	1	1	1
Degree of Util (X)	0.12	0.045	0.02	0.119
Departure Headway (Hd)	4.095	4.205	4.266	4.059
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	870	857	844	877
Service Time	2.146	2.205	2.267	2.111
HCM Lane V/C Ratio	0.122	0.046	0.02	0.121
HCM Control Delay, s/veh	7.7	7.4	7.4	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.1	0.4

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	25	600	65	20	420
Future Vol, veh/h	35	25	600	65	20	420
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	36	26	619	67	21	433

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1127	653	0	0	687	0
Stage 1	653	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.12	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.218	-
Pot Cap-1 Maneuver	225	465	-	-	907	-
Stage 1	516	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	220	465	-	-	906	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	516	-	-	-	-	-
Stage 2	610	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	19.83	0	0.41
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	220	465	906	-
HCM Lane V/C Ratio	-	-	0.164	0.055	0.023	-
HCM Ctrl Dly (s/v)	-	-	24.6	13.2	9.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.2	0.1	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	60	5	20	45	15	5	75	35	25	60	5
Future Vol, veh/h	10	60	5	20	45	15	5	75	35	25	60	5
Conflicting Peds, #/hr	2	0	3	3	0	2	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	1	1	1	1	1	2	2	2
Mvmt Flow	11	65	5	22	48	16	5	81	38	27	65	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	247	258	78	264	242	101	78	0	0	118	0	0
Stage 1	129	129	-	110	110	-	-	-	-	-	-	-
Stage 2	118	129	-	154	132	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.11	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.209	-	-	2.218	-	-
Pot Cap-1 Maneuver	711	650	988	691	661	957	1527	-	-	1470	-	-
Stage 1	880	793	-	897	806	-	-	-	-	-	-	-
Stage 2	892	793	-	851	789	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	627	630	978	603	641	955	1515	-	-	1470	-	-
Mov Cap-2 Maneuver	627	630	-	603	641	-	-	-	-	-	-	-
Stage 1	856	772	-	894	803	-	-	-	-	-	-	-
Stage 2	819	790	-	759	768	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	11.38	11.14	0.32	2.08
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	74	-	-	645	672	492	-	-
HCM Lane V/C Ratio	0.004	-	-	0.125	0.128	0.018	-	-
HCM Ctrl Dly (s/v)	7.4	0	-	11.4	11.1	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	60	40	25	115	105	55
Future Vol, veh/h	60	40	25	115	105	55
Conflicting Peds, #/hr	1	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	63	42	26	120	109	57

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	311	140	167	0	-	0
Stage 1	138	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	686	913	1424	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	672	912	1424	-	-	-
Mov Cap-2 Maneuver	672	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	862	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.56	1.35	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	321	-	751	-	-
HCM Lane V/C Ratio	0.018	-	0.139	-	-
HCM Ctrl Dly (s/v)	7.6	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	25	5	5	10	5	5	10	5	5	10	20
Future Vol, veh/h	40	25	5	5	10	5	5	10	5	5	10	20
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	3	3	3	0	0	0	10	10	10	3	3	3
Mvmt Flow	47	29	6	6	12	6	6	12	6	6	12	23
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, s/veh	7.6	7.1	7.4	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	57%	25%	14%
Vol Thru, %	50%	36%	50%	29%
Vol Right, %	25%	7%	25%	57%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	70	20	35
LT Vol	5	40	5	5
Through Vol	10	25	10	10
RT Vol	5	5	5	20
Lane Flow Rate	23	81	23	41
Geometry Grp	1	1	1	1
Degree of Util (X)	0.027	0.094	0.026	0.043
Departure Headway (Hd)	4.183	4.152	3.973	3.836
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	849	862	897	925
Service Time	2.242	2.181	2.017	1.894
HCM Lane V/C Ratio	0.027	0.094	0.026	0.044
HCM Control Delay, s/veh	7.4	7.6	7.1	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.1	0.1

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	5	60	65	5
Future Vol, veh/h	5	10	5	60	65	5
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	6	12	6	71	77	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	168	84	87	0	-	0
Stage 1	84	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.218	-	-	-
Pot Cap-1 Maneuver	827	980	1509	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	818	977	1503	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9	0.57	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	138	-	917	-	-
HCM Lane V/C Ratio	0.004	-	0.019	-	-
HCM Ctrl Dly (s/v)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	5	10	15	0	15	5	610	40	10	420	5
Future Vol, veh/h	10	5	10	15	0	15	5	610	40	10	420	5
Conflicting Peds, #/hr	2	0	3	3	0	2	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	-	150	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	5	5	5	10	10	10	2	2	2	3	3	3
Mvmt Flow	11	5	11	16	0	16	5	649	43	11	447	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1132	1180	452	1162	1161	679	452	0	0	698	0	0
Stage 1	471	471	-	688	688	-	-	-	-	-	-	-
Stage 2	662	709	-	474	473	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.2	6.6	6.3	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.2	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.2	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.59	4.09	3.39	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	178	188	601	166	189	438	1108	-	-	893	-	-
Stage 1	568	555	-	424	435	-	-	-	-	-	-	-
Stage 2	446	433	-	556	545	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	168	183	599	154	184	434	1108	-	-	887	-	-
Mov Cap-2 Maneuver	168	183	-	154	184	-	-	-	-	-	-	-
Stage 1	561	548	-	419	430	-	-	-	-	-	-	-
Stage 2	427	428	-	533	538	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	20.79	22.32	0.06	0.21
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1108	-	-	168	341	154	434	887	-	-
HCM Lane V/C Ratio	0.005	-	-	0.063	0.047	0.104	0.037	0.012	-	-
HCM Ctrl Dly (s/v)	8.3	-	-	27.9	16.1	31	13.6	9.1	-	-
HCM Lane LOS	A	-	-	D	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0.3	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	10	5	5	10	10	5	85	10	5	80	5
Future Vol, veh/h	20	10	5	5	10	10	5	85	10	5	80	5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	5	5	5	1	1	1	2	2	2
Mvmt Flow	22	11	5	5	11	11	5	93	11	5	88	5
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, s/veh	7.6	7.4	7.7	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	57%	20%	6%
Vol Thru, %	85%	29%	40%	89%
Vol Right, %	10%	14%	40%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	100	35	25	90
LT Vol	5	20	5	5
Through Vol	85	10	10	80
RT Vol	10	5	10	5
Lane Flow Rate	110	38	27	99
Geometry Grp	1	1	1	1
Degree of Util (X)	0.124	0.047	0.033	0.113
Departure Headway (Hd)	4.056	4.414	4.283	4.109
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	875	816	841	863
Service Time	2.121	2.415	2.284	2.175
HCM Lane V/C Ratio	0.126	0.047	0.032	0.115
HCM Control Delay, s/veh	7.7	7.6	7.4	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.1	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	5	150	0	140	5	480	175	160	290	0
Future Volume (veh/h)	0	0	5	150	0	140	5	480	175	160	290	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1900	1900	1900	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	0	0	5	161	0	151	5	516	188	172	312	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	3	3	3	2	2	2	3	3	3
Cap, veh/h	0	0	299	315	0	205	565	674	572	401	927	0
Arrive On Green	0.00	0.00	0.19	0.13	0.00	0.19	0.00	0.36	0.36	0.09	0.50	0.00
Sat Flow, veh/h	0	0	1610	1400	0	1572	1781	1870	1585	1767	1856	0
Grp Volume(v), veh/h	0	0	5	161	0	151	5	516	188	172	312	0
Grp Sat Flow(s),veh/h/ln	0	0	1610	1400	0	1572	1781	1870	1585	1767	1856	0
Q Serve(g_s), s	0.0	0.0	0.1	6.1	0.0	4.9	0.1	13.2	4.7	2.9	5.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.1	6.1	0.0	4.9	0.1	13.2	4.7	2.9	5.5	0.0
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	299	315	0	205	565	674	572	401	927	0
V/C Ratio(X)	0.00	0.00	0.02	0.51	0.00	0.74	0.01	0.77	0.33	0.43	0.34	0.00
Avail Cap(c_a), veh/h	0	0	442	568	0	489	1033	1402	1188	718	1493	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)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	18.1	23.2	0.0	21.2	7.0	15.3	12.6	9.8	8.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.3	0.0	5.1	0.0	2.6	0.5	0.5	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	0.0	0.0	0.0	2.0	0.0	1.9	0.0	5.3	1.5	0.9	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	18.1	24.5	0.0	26.4	7.0	17.9	13.1	10.4	8.5	0.0
LnGrp LOS			B	C		C	A	B	B	B	A	
Approach Vol, veh/h		5			312			709			484	
Approach Delay, s/veh		18.1			25.4			16.6			9.2	
Approach LOS		B			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.3	28.9		15.2	5.7	33.4		15.2				
Change Period (Y+Rc), s	5.5	6.3		5.1	5.5	6.3		5.1				
Max Green Setting (Gmax), s	14.5	43.7		14.9	14.5	43.7		19.9				
Max Q Clear Time (g_c+I1), s	4.9	16.2		2.1	2.1	7.5		9.1				
Green Ext Time (p_c), s	0.2	6.4		0.0	0.0	2.9		1.0				

Intersection Summary	
HCM 7th Control Delay, s/veh	16.0
HCM 7th LOS	B

Notes

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

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	365	215	5	5	5
Future Vol, veh/h	5	365	215	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	5	388	229	5	5	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	234	0	-	0	630	231
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	399	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1345	-	-	-	449	813
Stage 1	-	-	-	-	812	-
Stage 2	-	-	-	-	682	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1345	-	-	-	447	813
Mov Cap-2 Maneuver	-	-	-	-	602	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	682	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.1	0	10.29
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1345	-	-	-	692
HCM Lane V/C Ratio	0.004	-	-	-	0.015
HCM Ctrl Dly (s/v)	7.7	-	-	-	10.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	250	145	30	25	65
Future Vol, veh/h	120	250	145	30	25	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	126	263	153	32	26	68

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	184	0	-	0	684	168
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	516	-
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	1403	-	-	-	416	878
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	601	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1403	-	-	-	378	878
Mov Cap-2 Maneuver	-	-	-	-	536	-
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	601	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	2.54	0	10.53
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1403	-	-	-	746
HCM Lane V/C Ratio	0.09	-	-	-	0.127
HCM Ctrl Dly (s/v)	7.8	-	-	-	10.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	215	150	10	15	20
Future Vol, veh/h	35	215	150	10	15	20
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	180	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	1	1	3	3
Mvmt Flow	38	236	165	11	16	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	182	0	-	0	490	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	313	-
Critical Hdwy	4.12	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1393	-	-	-	536	864
Stage 1	-	-	-	-	852	-
Stage 2	-	-	-	-	739	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1385	-	-	-	515	859
Mov Cap-2 Maneuver	-	-	-	-	515	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	735	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	1.07	0	10.72
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1385	-	-	-	668
HCM Lane V/C Ratio	0.028	-	-	-	0.058
HCM Ctrl Dly (s/v)	7.7	-	-	-	10.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	10	10	45	55	15
Future Vol, veh/h	25	10	10	45	55	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	29	11	11	52	63	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	147	72	80	0	-	0
Stage 1	72	-	-	-	-	-
Stage 2	75	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.218	-	-	-
Pot Cap-1 Maneuver	850	996	1517	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	953	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	844	996	1517	-	-	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	953	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.2	1.34	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1517	-	844	996	-	-
HCM Lane V/C Ratio	0.008	-	0.034	0.012	-	-
HCM Ctrl Dly (s/v)	7.4	-	9.4	8.7	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	95	50	80	70	10	115
Future Vol, veh/h	95	50	80	70	10	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	103	54	87	76	11	125

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	158	0	380	130
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	250	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1428	-	626	925
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1428	-	586	925
Mov Cap-2 Maneuver	-	-	-	-	586	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	4.1	9.81
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	884	-	-	960	-
HCM Lane V/C Ratio	0.154	-	-	0.061	-
HCM Ctrl Dly (s/v)	9.8	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	70	55	870	60	20	415
Future Vol, veh/h	70	55	870	60	20	415
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	5	5	7	7
Mvmt Flow	74	59	926	64	21	441

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1441	957	0	0	989	0
Stage 1	957	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.263	-
Pot Cap-1 Maneuver	146	312	-	-	679	-
Stage 1	373	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	140	312	-	-	679	-
Mov Cap-2 Maneuver	140	-	-	-	-	-
Stage 1	373	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	62.85	0	0.48
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	185	83	-
HCM Lane V/C Ratio	-	-	0.72	0.031	-
HCM Ctrl Dly (s/v)	-	-	62.9	10.5	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	4.5	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	405	75	325	15	90	50	235	485	5	5	360	145
Future Volume (veh/h)	405	75	325	15	90	50	235	485	5	5	360	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	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	1856	1856	1856	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	426	79	342	16	95	53	247	511	5	5	379	153
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	3	3	3	7	7	7	6	6	6
Cap, veh/h	329	61	264	10	61	59	196	644	6	169	395	926
Arrive On Green	0.41	0.39	0.41	0.06	0.04	0.04	0.08	0.36	0.39	0.24	0.22	0.22
Sat Flow, veh/h	850	158	682	266	1577	1527	1711	1776	17	855	1811	1521
Grp Volume(v), veh/h	847	0	0	111	0	53	247	0	516	5	379	153
Grp Sat Flow(s),veh/h/ln	1690	0	0	1842	0	1527	1711	0	1793	855	1811	1521
Q Serve(g_s), s	48.1	0.0	0.0	4.8	0.0	4.3	9.4	0.0	31.9	0.6	25.7	5.5
Cycle Q Clear(g_c), s	48.1	0.0	0.0	4.8	0.0	4.3	9.4	0.0	31.9	14.6	25.7	5.5
Prop In Lane	0.50		0.40	0.14		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	655	0	0	71	0	59	196	0	650	169	395	926
V/C Ratio(X)	1.29	0.00	0.00	1.56	0.00	0.90	1.26	0.00	0.79	0.03	0.96	0.17
Avail Cap(c_a), veh/h	661	0	0	341	0	283	197	0	684	185	429	955
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	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	0.0	0.0	59.4	0.0	59.4	41.1	0.0	35.4	47.3	48.0	10.7
Incr Delay (d2), s/veh	143.2	0.0	0.0	262.4	0.0	27.1	150.5	0.0	6.6	0.1	32.8	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	45.3	0.0	0.0	7.4	0.0	2.1	10.0	0.0	15.0	0.1	15.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	179.8	0.0	0.0	321.8	0.0	86.5	191.6	0.0	41.9	47.4	80.7	10.9
LnGrp LOS	F			F		F	F		D	D	F	B
Approach Vol, veh/h		847			164			763			537	
Approach Delay, s/veh		179.8			245.8			90.4			60.5	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	2	4	5	6	8
Phs Duration (G+Y+Rc), s	53.6	56.6	18.0	35.6	13.9
Change Period (Y+Rc), s	5.6	5.5	5.6	* 5.6	6.1
Max Green Setting (Gmax), s	50.3	51.5	12.4	* 32	26.0
Max Q Clear Time (g_c+I1), s	33.9	50.1	12.4	28.7	7.3
Green Ext Time (p_c), s	4.2	1.0	0.0	1.3	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	127.3
HCM 7th LOS	F

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	5	10	5	5	60	20	670	15	20	640	35
Future Vol, veh/h	5	5	10	5	5	60	20	670	15	20	640	35
Conflicting Peds, #/hr	2	0	11	11	0	2	0	0	4	4	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	9	9	9	6	6	6	4	4	4
Mvmt Flow	5	5	10	5	5	63	21	698	16	21	667	36

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1471	1486	696	1473	1496	712	703	0	0	718	0	0
Stage 1	727	727	-	751	751	-	-	-	-	-	-	-
Stage 2	744	759	-	722	745	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.19	6.59	6.29	4.16	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.581	4.081	3.381	2.254	-	-	2.236	-	-
Pot Cap-1 Maneuver	106	126	445	101	118	421	876	-	-	874	-	-
Stage 1	419	432	-	392	408	-	-	-	-	-	-	-
Stage 2	410	418	-	407	411	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	116	440	86	109	419	876	-	-	871	-	-
Mov Cap-2 Maneuver	80	116	-	86	109	-	-	-	-	-	-	-
Stage 1	402	415	-	375	390	-	-	-	-	-	-	-
Stage 2	330	400	-	373	395	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	31.74	22.09	0.26	0.27
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	51	-	-	155	283	51	-	-
HCM Lane V/C Ratio	0.024	-	-	0.134	0.258	0.024	-	-
HCM Ctrl Dly (s/v)	9.2	0	-	31.7	22.1	9.2	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	1	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	5	5	5	0	15	5	705	25	15	620	5
Future Vol, veh/h	0	5	5	5	0	15	5	705	25	15	620	5
Conflicting Peds, #/hr	4	0	8	8	0	4	27	0	27	27	0	27
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	6	6	6	3	3	3
Mvmt Flow	0	5	5	5	0	16	5	734	26	16	646	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1455	1505	683	1473	1494	778	678	0	0	787	0	0
Stage 1	707	707	-	785	785	-	-	-	-	-	-	-
Stage 2	749	798	-	688	709	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.16	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.254	-	-	2.227	-	-
Pot Cap-1 Maneuver	109	122	452	106	124	399	895	-	-	827	-	-
Stage 1	429	441	-	389	407	-	-	-	-	-	-	-
Stage 2	407	401	-	440	440	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	97	112	437	93	113	388	872	-	-	806	-	-
Mov Cap-2 Maneuver	97	112	-	93	113	-	-	-	-	-	-	-
Stage 1	406	417	-	375	392	-	-	-	-	-	-	-
Stage 2	385	387	-	413	416	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	26.51	23.43	0.06	0.22
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	12	-	-	178	216	42	-	-
HCM Lane V/C Ratio	0.006	-	-	0.059	0.096	0.019	-	-
HCM Ctrl Dly (s/v)	9.2	0	-	26.5	23.4	9.6	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0.1	-	-

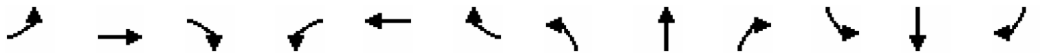
Intersection	
Int Delay, s/veh	9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	15	5	10	10	10	10	140	5	10	75	5
Future Vol, veh/h	10	15	5	10	10	10	10	140	5	10	75	5
Conflicting Peds, #/hr	0	0	3	3	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	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	11	17	6	11	11	11	11	159	6	11	85	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	26	0	0	123	91	23	159	88	18
Stage 1	-	-	-	-	-	-	46	46	-	40	40	-
Stage 2	-	-	-	-	-	-	78	45	-	119	48	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1606	-	-	1602	-	-	856	803	1060	811	806	1066
Stage 1	-	-	-	-	-	-	973	861	-	980	866	-
Stage 2	-	-	-	-	-	-	936	861	-	890	858	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1606	-	-	1597	-	-	747	789	1057	637	792	1065
Mov Cap-2 Maneuver	-	-	-	-	-	-	747	789	-	637	792	-
Stage 1	-	-	-	-	-	-	964	852	-	973	860	-
Stage 2	-	-	-	-	-	-	832	855	-	715	850	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	2.42	2.42	10.83	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	793	571	-	-	545	-	-	782
HCM Lane V/C Ratio	0.222	0.007	-	-	0.007	-	-	0.131
HCM Ctrl Dly (s/v)	10.8	7.3	0	-	7.3	0	-	10.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	10	80	10	110	10	615	45	145	475	10
Future Volume (veh/h)	10	5	10	80	10	110	10	615	45	145	475	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	0.98		0.97	0.98		0.97	1.00		0.99	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	1900	1900	1900	1826	1826	1826	1811	1811	1811	1841	1841	1841
Adj Flow Rate, veh/h	10	5	10	83	10	115	10	641	47	151	495	10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	5	5	5	6	6	6	4	4	4
Cap, veh/h	160	77	105	156	31	132	398	674	49	298	841	17
Arrive On Green	0.21	0.16	0.21	0.21	0.16	0.21	0.01	0.40	0.45	0.07	0.47	0.52
Sat Flow, veh/h	494	477	648	469	192	817	1725	1665	122	1753	1797	36
Grp Volume(v), veh/h	25	0	0	208	0	0	10	0	688	151	0	505
Grp Sat Flow(s),veh/h/ln	1619	0	0	1478	0	0	1725	0	1787	1753	0	1833
Q Serve(g_s), s	0.0	0.0	0.0	5.6	0.0	0.0	0.2	0.0	23.5	2.8	0.0	12.8
Cycle Q Clear(g_c), s	0.7	0.0	0.0	8.0	0.0	0.0	0.2	0.0	23.5	2.8	0.0	12.8
Prop In Lane	0.40		0.40	0.40		0.55	1.00		0.07	1.00		0.02
Lane Grp Cap(c), veh/h	418	0	0	389	0	0	398	0	723	298	0	858
V/C Ratio(X)	0.06	0.00	0.00	0.53	0.00	0.00	0.03	0.00	0.95	0.51	0.00	0.59
Avail Cap(c_a), veh/h	692	0	0	637	0	0	467	0	874	315	0	957
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	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	0.0	0.0	24.1	0.0	0.0	8.5	0.0	18.1	13.3	0.0	12.3
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.1	0.0	0.0	0.0	0.0	17.8	1.0	0.0	0.8
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	0.0	2.6	0.0	0.0	0.1	0.0	12.0	1.0	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	21.6	0.0	0.0	25.3	0.0	0.0	8.5	0.0	35.9	14.3	0.0	13.1
LnGrp LOS	C			C			A		D	B		B
Approach Vol, veh/h		25			208			698			656	
Approach Delay, s/veh		21.6			25.3			35.5			13.4	
Approach LOS		C			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	34.1		19.1	6.0	38.1		19.1				
Change Period (Y+Rc), s	5.5	5.5		* 5.9	5.5	5.5		5.9				
Max Green Setting (Gmax), s	5.1	33.9		* 25	3.0	36.0		24.1				
Max Q Clear Time (g_c+I1), s	4.8	25.5		3.0	2.2	14.8		10.0				
Green Ext Time (p_c), s	0.0	3.0		0.1	0.0	3.3		1.0				

Intersection Summary	
HCM 7th Control Delay, s/veh	24.8
HCM 7th LOS	C

Notes

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

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

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	25	165	5	55	155	10	10	120	55	15	15	55
Future Vol, veh/h	25	165	5	55	155	10	10	120	55	15	15	55
Conflicting Peds, #/hr	1	0	6	6	0	1	1	0	3	3	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	0	0	0
Mvmt Flow	26	172	5	57	161	10	10	125	57	16	16	57

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	183	0	0	517	520	183	572	517	169
Stage 1	-	-	-	-	-	-	233	233	-	282	282	-
Stage 2	-	-	-	-	-	-	285	287	-	289	235	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	1416	-	-	1404	-	-	470	462	862	434	465	881
Stage 1	-	-	-	-	-	-	773	714	-	729	681	-
Stage 2	-	-	-	-	-	-	725	676	-	723	714	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1415	-	-	1396	-	-	394	429	854	273	432	879
Mov Cap-2 Maneuver	-	-	-	-	-	-	394	429	-	273	432	-
Stage 1	-	-	-	-	-	-	753	695	-	695	650	-
Stage 2	-	-	-	-	-	-	630	645	-	540	695	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.97	1.92	16.62	12.67
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	501	229	-	-	445	-	-	558
HCM Lane V/C Ratio	0.385	0.018	-	-	0.041	-	-	0.159
HCM Ctrl Dly (s/v)	16.6	7.6	0	-	7.7	0	-	12.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0.1	-	-	0.6

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	185	10	10	160	100	10	50	15	65	50	30
Future Vol, veh/h	40	185	10	10	160	100	10	50	15	65	50	30
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	1	1	1
Mvmt Flow	43	197	11	11	170	106	11	53	16	69	53	32
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, s/veh	10.4	10.4	9.1	9.9
HCM LOS	B	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	17%	4%	45%
Vol Thru, %	67%	79%	59%	34%
Vol Right, %	20%	4%	37%	21%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	75	235	270	145
LT Vol	10	40	10	65
Through Vol	50	185	160	50
RT Vol	15	10	100	30
Lane Flow Rate	80	250	287	154
Geometry Grp	1	1	1	1
Degree of Util (X)	0.119	0.337	0.368	0.224
Departure Headway (Hd)	5.384	4.854	4.618	5.233
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	670	733	773	679
Service Time	3.384	2.933	2.694	3.328
HCM Lane V/C Ratio	0.119	0.341	0.371	0.227
HCM Control Delay, s/veh	9.1	10.4	10.4	9.9
HCM Lane LOS	A	B	B	A
HCM 95th-tile Q	0.4	1.5	1.7	0.9

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	240	230	30	25	20
Future Vol, veh/h	20	240	230	30	25	20
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	22	264	253	33	27	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	289	0	-	0	580	272
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	308	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1285	-	-	-	480	771
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	750	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	468	769
Mov Cap-2 Maneuver	-	-	-	-	468	-
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.6	0	11.96
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	138	-	-	-	566
HCM Lane V/C Ratio	0.017	-	-	-	0.087
HCM Ctrl Dly (s/v)	7.9	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↗		↕			↕	
Traffic Vol, veh/h	5	5	5	80	5	160	5	95	95	160	100	5
Future Vol, veh/h	5	5	5	80	5	160	5	95	95	160	100	5
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	70	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	5	5	5	88	5	176	5	104	104	176	110	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	585	691	113	639	642	167	115	0	0	216	0	0
Stage 1	464	464	-	175	175	-	-	-	-	-	-	-
Stage 2	121	227	-	464	467	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	425	370	946	392	395	883	1486	-	-	1366	-	-
Stage 1	582	567	-	832	758	-	-	-	-	-	-	-
Stage 2	888	720	-	582	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	286	315	946	327	337	875	1486	-	-	1357	-	-
Mov Cap-2 Maneuver	286	315	-	327	337	-	-	-	-	-	-	-
Stage 1	501	488	-	823	750	-	-	-	-	-	-	-
Stage 2	699	712	-	493	487	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	14.67	13.68	0.19	4.86
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	42	-	-	389	327	875	1077	-	-
HCM Lane V/C Ratio	0.004	-	-	0.042	0.285	0.201	0.13	-	-
HCM Ctrl Dly (s/v)	7.4	0	-	14.7	20.3	10.1	8	0	-
HCM Lane LOS	A	A	-	B	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.2	0.7	0.4	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	55	155	20	10	170	10	20	0	5	5	5	40
Future Vol, veh/h	55	155	20	10	170	10	20	0	5	5	5	40
Conflicting Peds, #/hr	8	0	0	0	0	8	1	0	6	6	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	60	170	22	11	187	11	22	0	5	5	5	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	206	0	0	192	0	0	515	530	187	519	535	201
Stage 1	-	-	-	-	-	-	302	302	-	222	222	-
Stage 2	-	-	-	-	-	-	213	228	-	297	313	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1378	-	-	1393	-	-	474	457	860	470	454	845
Stage 1	-	-	-	-	-	-	711	668	-	785	723	-
Stage 2	-	-	-	-	-	-	794	719	-	716	660	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1367	-	-	1393	-	-	417	428	855	434	424	837
Mov Cap-2 Maneuver	-	-	-	-	-	-	417	428	-	434	424	-
Stage 1	-	-	-	-	-	-	676	635	-	772	711	-
Stage 2	-	-	-	-	-	-	739	707	-	672	628	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.85	0.4	13.23	10.55
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	465	421	-	-	94	-	-	704
HCM Lane V/C Ratio	0.059	0.044	-	-	0.008	-	-	0.078
HCM Ctrl Dly (s/v)	13.2	7.8	0	-	7.6	0	-	10.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.3

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	100	30	65	125	30	45
Future Vol, veh/h	100	30	65	125	30	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	2	2
Mvmt Flow	109	33	71	136	33	49
Number of Lanes	1	0	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay, s/veh	8.6	8.6	8.2
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	100%	0%
Vol Thru, %	0%	0%	77%	0%	100%
Vol Right, %	0%	100%	23%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	45	130	65	125
LT Vol	30	0	0	65	0
Through Vol	0	0	100	0	125
RT Vol	0	45	30	0	0
Lane Flow Rate	33	49	141	71	136
Geometry Grp	5	5	3b	5	5
Degree of Util (X)	0.053	0.063	0.181	0.104	0.182
Departure Headway (Hd)	5.866	4.659	4.602	5.323	4.822
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	612	770	781	675	747
Service Time	3.586	2.38	2.616	3.037	2.535
HCM Lane V/C Ratio	0.054	0.064	0.181	0.105	0.182
HCM Control Delay, s/veh	8.9	7.7	8.6	8.7	8.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.7	0.3	0.7

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	85	145	15	5	45
Future Vol, veh/h	60	85	145	15	5	45
Conflicting Peds, #/hr	14	0	0	14	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	130	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	66	93	159	16	5	49

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	190	0	-	0	407	184
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	225	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1390	-	-	-	604	864
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	817	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1372	-	-	-	560	851
Mov Cap-2 Maneuver	-	-	-	-	686	-
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	806	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	3.21	0	9.64
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1372	-	-	-	831
HCM Lane V/C Ratio	0.048	-	-	-	0.066
HCM Ctrl Dly (s/v)	7.8	-	-	-	9.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	15	735	25	35	515
Future Vol, veh/h	5	15	735	25	35	515
Conflicting Peds, #/hr	0	0	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	4	4	2	2	2	2
Mvmt Flow	5	15	758	26	36	531

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1378	775	0	0	788	0
Stage 1	775	-	-	-	-	-
Stage 2	603	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.12	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.218	-
Pot Cap-1 Maneuver	158	395	-	-	832	-
Stage 1	451	-	-	-	-	-
Stage 2	542	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	148	393	-	-	829	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	509	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	18.99	0	0.61
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	278	115	-
HCM Lane V/C Ratio	-	-	0.074	0.044	-
HCM Ctrl Dly (s/v)	-	-	19	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	5	20	5	5	5	15	130	5	10	120	10
Future Vol, veh/h	15	5	20	5	5	5	15	130	5	10	120	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1	2	2	2
Mvmt Flow	17	6	22	6	6	6	17	144	6	11	133	11
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, s/veh	7.6	7.6	8.2	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	38%	33%	7%
Vol Thru, %	87%	13%	33%	86%
Vol Right, %	3%	50%	33%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	150	40	15	140
LT Vol	15	15	5	10
Through Vol	130	5	5	120
RT Vol	5	20	5	10
Lane Flow Rate	167	44	17	156
Geometry Grp	1	1	1	1
Degree of Util (X)	0.192	0.054	0.021	0.179
Departure Headway (Hd)	4.143	4.397	4.523	4.14
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	857	819	796	856
Service Time	2.218	2.399	2.525	2.218
HCM Lane V/C Ratio	0.195	0.054	0.021	0.182
HCM Control Delay, s/veh	8.2	7.6	7.6	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.2	0.1	0.6

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	35	710	45	5	520
Future Vol, veh/h	5	35	710	45	5	520
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	2	2	2	2
Mvmt Flow	5	36	732	46	5	536

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1303	756	0	0	779	0
Stage 1	756	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.12	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.218	-
Pot Cap-1 Maneuver	176	406	-	-	838	-
Stage 1	462	-	-	-	-	-
Stage 2	578	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	175	406	-	-	837	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	461	-	-	-	-	-
Stage 2	575	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	16.16	0	0.09
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	175	406	837	-
HCM Lane V/C Ratio	-	-	0.029	0.089	0.006	-
HCM Ctrl Dly (s/v)	-	-	26.2	14.7	9.3	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.3	0	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	75	5	40	25	20	5	125	40	35	100	5
Future Vol, veh/h	10	75	5	40	25	20	5	125	40	35	100	5
Conflicting Peds, #/hr	2	0	3	3	0	2	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	1	1	1	1	1	2	2	2
Mvmt Flow	11	81	5	43	27	22	5	134	43	38	108	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	354	382	121	393	363	158	121	0	0	177	0	0
Stage 1	193	193	-	167	167	-	-	-	-	-	-	-
Stage 2	161	188	-	226	196	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.11	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.209	-	-	2.218	-	-
Pot Cap-1 Maneuver	605	554	935	568	566	890	1473	-	-	1399	-	-
Stage 1	813	744	-	838	762	-	-	-	-	-	-	-
Stage 2	846	748	-	779	740	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	538	532	926	465	544	888	1462	-	-	1399	-	-
Mov Cap-2 Maneuver	538	532	-	465	544	-	-	-	-	-	-	-
Stage 1	784	717	-	834	759	-	-	-	-	-	-	-
Stage 2	792	745	-	666	714	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	13.01	12.85	0.22	1.91
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	50	-	-	546	550	446	-	-
HCM Lane V/C Ratio	0.004	-	-	0.177	0.166	0.027	-	-
HCM Ctrl Dly (s/v)	7.5	0	-	13	12.8	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	90	40	30	120	135	55
Future Vol, veh/h	90	40	30	120	135	55
Conflicting Peds, #/hr	1	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	94	42	31	125	141	57

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	358	171	198	0	-	0
Stage 1	169	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	645	878	1387	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	848	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	629	876	1387	-	-	-
Mov Cap-2 Maneuver	629	-	-	-	-	-
Stage 1	844	-	-	-	-	-
Stage 2	848	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	11.5	1.53	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	360	-	689	-	-
HCM Lane V/C Ratio	0.023	-	0.197	-	-
HCM Ctrl Dly (s/v)	7.7	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	40	5	10	35	5	5	15	5	5	10	25
Future Vol, veh/h	40	40	5	10	35	5	5	15	5	5	10	25
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	3	3	3	0	0	0	10	10	10	3	3	3
Mvmt Flow	47	47	6	12	41	6	6	17	6	6	12	29
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, s/veh	7.8	7.4	7.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	47%	20%	13%
Vol Thru, %	60%	47%	70%	25%
Vol Right, %	20%	6%	10%	63%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	85	50	40
LT Vol	5	40	10	5
Through Vol	15	40	35	10
RT Vol	5	5	5	25
Lane Flow Rate	29	99	58	47
Geometry Grp	1	1	1	1
Degree of Util (X)	0.035	0.115	0.066	0.05
Departure Headway (Hd)	4.298	4.185	4.086	3.895
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	821	852	869	905
Service Time	2.386	2.233	2.146	1.982
HCM Lane V/C Ratio	0.035	0.116	0.067	0.052
HCM Control Delay, s/veh	7.5	7.8	7.4	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.2	0.2

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	25	25	75	90	10
Future Vol, veh/h	5	25	25	75	90	10
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	6	30	30	89	107	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	266	117	123	0	-	0
Stage 1	117	-	-	-	-	-
Stage 2	149	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.218	-	-	-
Pot Cap-1 Maneuver	728	940	1464	-	-	-
Stage 1	913	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	707	937	1458	-	-	-
Mov Cap-2 Maneuver	707	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.22	1.88	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	450	-	889	-	-
HCM Lane V/C Ratio	0.02	-	0.04	-	-
HCM Ctrl Dly (s/v)	7.5	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	10	55	0	0	5	720	50	25	475	5
Future Vol, veh/h	10	0	10	55	0	0	5	720	50	25	475	5
Conflicting Peds, #/hr	2	0	3	3	0	2	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	100	-	-	150	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	5	5	5	10	10	10	2	2	2	3	3	3
Mvmt Flow	11	0	11	59	0	0	5	766	53	27	505	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1340	1398	511	1372	1374	802	511	0	0	826	0	0
Stage 1	561	561	-	810	810	-	-	-	-	-	-	-
Stage 2	779	837	-	562	564	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.2	6.6	6.3	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.2	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.2	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.59	4.09	3.39	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	128	139	557	118	140	372	1055	-	-	800	-	-
Stage 1	507	505	-	362	382	-	-	-	-	-	-	-
Stage 2	385	378	-	498	496	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	123	132	555	111	134	369	1055	-	-	795	-	-
Mov Cap-2 Maneuver	123	132	-	111	134	-	-	-	-	-	-	-
Stage 1	490	488	-	358	377	-	-	-	-	-	-	-
Stage 2	382	374	-	471	479	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	24.37	69.3	0.05	0.48
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1055	-	-	123	555	111	-	795	-	-
HCM Lane V/C Ratio	0.005	-	-	0.087	0.019	0.529	-	0.033	-	-
HCM Ctrl Dly (s/v)	8.4	-	-	37.1	11.6	69.3	0	9.7	-	-
HCM Lane LOS	A	-	-	E	B	F	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	2.4	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	35	15	5	10	35	5	100	10	15	100	25
Future Vol, veh/h	25	35	15	5	10	35	5	100	10	15	100	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	5	5	5	1	1	1	2	2	2
Mvmt Flow	27	38	16	5	11	38	5	110	11	16	110	27
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, s/veh	8.1	7.6	8.2	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	33%	10%	11%
Vol Thru, %	87%	47%	20%	71%
Vol Right, %	9%	20%	70%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	115	75	50	140
LT Vol	5	25	5	15
Through Vol	100	35	10	100
RT Vol	10	15	35	25
Lane Flow Rate	126	82	55	154
Geometry Grp	1	1	1	1
Degree of Util (X)	0.153	0.104	0.066	0.184
Departure Headway (Hd)	4.351	4.534	4.307	4.299
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	825	792	832	837
Service Time	2.37	2.554	2.329	2.316
HCM Lane V/C Ratio	0.153	0.104	0.066	0.184
HCM Control Delay, s/veh	8.2	8.1	7.6	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.2	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	5	220	0	140	5	640	290	140	400	0
Future Volume (veh/h)	0	0	5	220	0	140	5	640	290	140	400	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1900	1900	1900	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	0	0	5	237	0	151	5	688	312	151	430	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	3	3	3	2	2	2	3	3	3
Cap, veh/h	0	0	361	354	0	288	492	819	694	294	1005	0
Arrive On Green	0.00	0.00	0.22	0.18	0.00	0.22	0.00	0.44	0.44	0.07	0.54	0.00
Sat Flow, veh/h	0	0	1610	1400	0	1572	1781	1870	1585	1767	1856	0
Grp Volume(v), veh/h	0	0	5	237	0	151	5	688	312	151	430	0
Grp Sat Flow(s),veh/h/ln	0	0	1610	1400	0	1572	1781	1870	1585	1767	1856	0
Q Serve(g_s), s	0.0	0.0	0.2	12.2	0.0	6.2	0.1	24.0	10.1	3.1	10.1	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.2	12.2	0.0	6.2	0.1	24.0	10.1	3.1	10.1	0.0
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	361	354	0	288	492	819	694	294	1005	0
V/C Ratio(X)	0.00	0.00	0.01	0.67	0.00	0.52	0.01	0.84	0.45	0.51	0.43	0.00
Avail Cap(c_a), veh/h	0	0	570	537	0	493	558	1085	920	332	1241	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)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	22.2	29.5	0.0	25.7	8.3	18.3	14.4	14.1	10.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.2	0.0	1.5	0.0	5.3	0.7	1.0	0.4	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	0.0	0.0	0.1	4.1	0.0	2.3	0.0	10.5	3.5	1.1	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	22.2	31.7	0.0	27.2	8.3	23.6	15.1	15.2	10.4	0.0
LnGrp LOS			C	C		C	A	C	B	B	B	
Approach Vol, veh/h		5			388			1005			581	
Approach Delay, s/veh		22.2			29.9			20.9			11.7	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	41.5		21.5	5.8	46.1		21.5
Change Period (Y+Rc), s	5.5	6.3		5.1	5.5	6.3		5.1
Max Green Setting (Gmax), s	5.5	45.6		26.0	3.0	49.1		26.0
Max Q Clear Time (g_c+I1), s	5.1	27.0		2.2	2.1	12.1		15.2
Green Ext Time (p_c), s	0.0	8.1		0.0	0.0	4.4		1.2

Intersection Summary	
HCM 7th Control Delay, s/veh	20.0
HCM 7th LOS	B

Notes

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

MOVEMENT SUMMARY

Site: 25 [BASELINE_3rd Ave NE/NE Big Rock Rd (Site Folder: General)]

Future (2045) Baseline Weekday PM Peak Hour
Site Category: Duvall TE
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: 3rd Ave NE														
3	L2	10	1.0	10	1.0	0.019	11.4	LOS B	0.1	2.3	0.47	0.59	0.47	35.4
8	T1	5	1.0	5	1.0	0.019	5.5	LOS A	0.1	2.3	0.47	0.59	0.47	35.3
18	R2	5	1.0	5	1.0	0.019	5.5	LOS A	0.1	2.3	0.47	0.59	0.47	34.3
Approach		20	1.0	21	1.0	0.019	8.4	LOS A	0.1	2.3	0.47	0.59	0.47	35.1
East: NE Big Rock Rd														
1	L2	5	2.0	5	2.0	0.201	10.3	LOS B	1.0	25.0	0.28	0.43	0.28	37.2
6	T1	235	2.0	245	2.0	0.201	4.3	LOS A	1.0	25.0	0.28	0.43	0.28	37.1
16	R2	15	2.0	16	2.0	0.201	4.4	LOS A	1.0	25.0	0.28	0.43	0.28	36.0
Approach		255	2.0	266	2.0	0.201	4.5	LOS A	1.0	25.0	0.28	0.43	0.28	37.0
North: 3rd Ave NE														
7	L2	35	1.0	36	1.0	0.102	10.7	LOS B	0.5	12.3	0.38	0.57	0.38	36.3
4	T1	5	1.0	5	1.0	0.102	4.8	LOS A	0.5	12.3	0.38	0.57	0.38	36.2
14	R2	80	1.0	83	1.0	0.102	4.8	LOS A	0.5	12.3	0.38	0.57	0.38	35.1
Approach		120	1.0	125	1.0	0.102	6.5	LOS A	0.5	12.3	0.38	0.57	0.38	35.5
West: NE Big Rock Rd														
5	L2	110	1.0	115	1.0	0.314	10.0	LOS A	1.8	46.5	0.19	0.47	0.19	36.8
2	T1	300	1.0	313	1.0	0.314	4.0	LOS A	1.8	46.5	0.19	0.47	0.19	36.7
12	R2	15	1.0	16	1.0	0.314	4.1	LOS A	1.8	46.5	0.19	0.47	0.19	35.6
Approach		425	1.0	443	1.0	0.314	5.6	LOS A	1.8	46.5	0.19	0.47	0.19	36.7
All Vehicles		820	1.3	854	1.3	0.314	5.4	LOS A	1.8	46.5	0.25	0.47	0.25	36.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	405	295	25	15	5
Future Vol, veh/h	5	405	295	25	15	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	5	431	314	27	16	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	340	0	-	0	769	327
Stage 1	-	-	-	-	327	-
Stage 2	-	-	-	-	441	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1230	-	-	-	372	719
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1230	-	-	-	371	719
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	652	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.1	0	11.38
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1230	-	-	-	585
HCM Lane V/C Ratio	0.004	-	-	-	0.036
HCM Ctrl Dly (s/v)	7.9	-	-	-	11.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	95	290	200	35	30	80
Future Vol, veh/h	95	290	200	35	30	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	100	305	211	37	32	84

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	247	0	-	0	734	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	505	-
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	1330	-	-	-	389	813
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	608	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1330	-	-	-	359	813
Mov Cap-2 Maneuver	-	-	-	-	530	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	608	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	1.96	0	11.06
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1330	-	-	-	710
HCM Lane V/C Ratio	0.075	-	-	-	0.163
HCM Ctrl Dly (s/v)	7.9	-	-	-	11.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	255	210	20	20	25
Future Vol, veh/h	40	255	210	20	20	25
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	180	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	1	1	3	3
Mvmt Flow	44	280	231	22	22	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	259	0	-	0	616	248
Stage 1	-	-	-	-	248	-
Stage 2	-	-	-	-	368	-
Critical Hdwy	4.12	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1306	-	-	-	452	789
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	698	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1298	-	-	-	432	784
Mov Cap-2 Maneuver	-	-	-	-	432	-
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	694	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	1.07	0	11.84
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1298	-	-	-	576
HCM Lane V/C Ratio	0.034	-	-	-	0.086
HCM Ctrl Dly (s/v)	7.9	-	-	-	11.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	20	25	60	70	45
Future Vol, veh/h	45	20	25	60	70	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	52	23	29	69	80	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	233	106	132	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.218	-	-	-
Pot Cap-1 Maneuver	760	953	1453	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	745	953	1453	-	-	-
Mov Cap-2 Maneuver	745	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	904	-	-	-	-	-

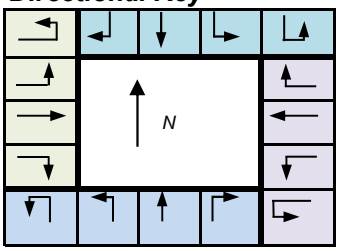
Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.79	2.21	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1453	-	745	953	-	-
HCM Lane V/C Ratio	0.02	-	0.069	0.024	-	-
HCM Ctrl Dly (s/v)	7.5	-	10.2	8.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	0.1	-	-

Appendix C: Turning Movement Volumes

Appendix C - Turning Movement Volumes

Directional Key



Existing

1 3rd Ave NE / NE Cherry Valley Rd

		0		0	
75					
					135
	135	380		65	
175	40			70	
		10		60	195
	110			70	

2 Main St NE / NE Cherry Valley Rd

		300		635	
0			280	20	
				30	90
		1,105			
0				60	
			605	110	130
	340			715	

Forecast 2044

1 3rd Ave NE / NE Cherry Valley Rd

		0		0	
80		0	0	0	
	0			0	150
	95	420		70	
145	50			80	
		10	0	115	210
	130			125	

2 Main St NE / NE Cherry Valley Rd

		435		925	
0		0	415	20	
	0			55	125
	0	1,490		0	
0	0			70	
		0	870	60	80
	485			930	

Appendix C - Turning Movement Volumes

Existing

3 Main St NE / NE Woodinville Duvall Rd

		355		710		
320		85	265	5		
	295		1,585		45	130
	50				65	
555	210				20	
		170	370	5		60
	495		545			

4 Main St NE / SW Stewart St

		500		575		
60		35	460	5		
	10		1,135		5	15
	5				5	
25	10				5	
		20	560	15		25
	475		595			

5 Main St NE / NE Stella St

		490		620		
10		5	470	15		
	0		1,155		10	15
	5				0	
10	5				5	
		5	610	25		45
	480		640			

Forecast 2044

3 Main St NE / NE Woodinville Duvall Rd

		510		940		
470		145	360	5		
	405		2,195		50	155
	75				90	
805	325				15	
		235	485	5		85
	700		725			

4 Main St NE / SW Stewart St

		695		735		
60		35	640	20		
	5		1,490		60	70
	5				5	
20	10				5	
		20	670	15		40
	655		705			

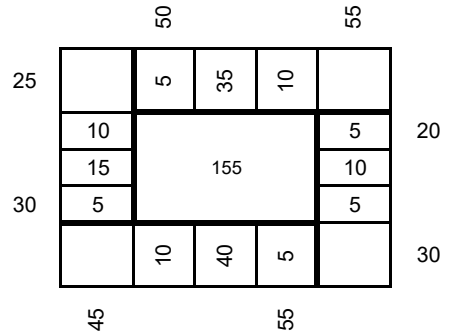
5 Main St NE / NE Stella St

		640		720		
10		5	620	15		
	0		1,405		15	20
	5				0	
10	5				5	
		5	705	25		45
	630		735			

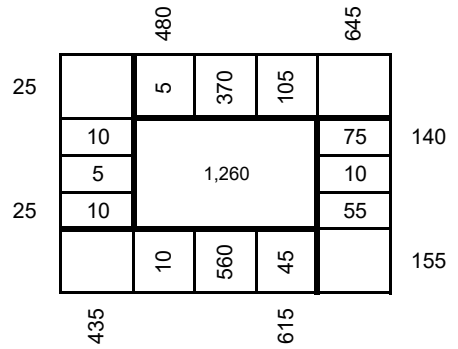
Appendix C - Turning Movement Volumes

Existing

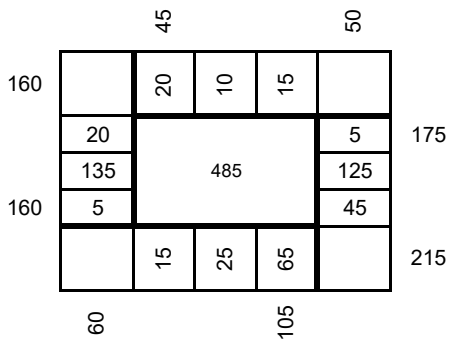
6 1st Ave NE / NE Stella St



7 Main St NE / NE Stephens St

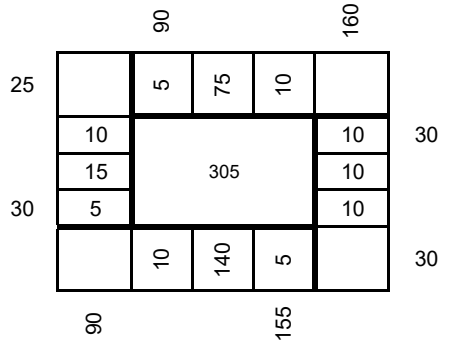


8 1st Ave NE / NE Stephens St

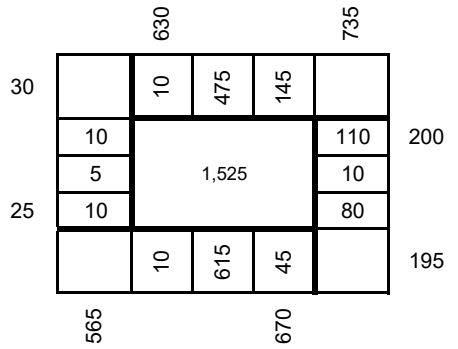


Forecast 2044

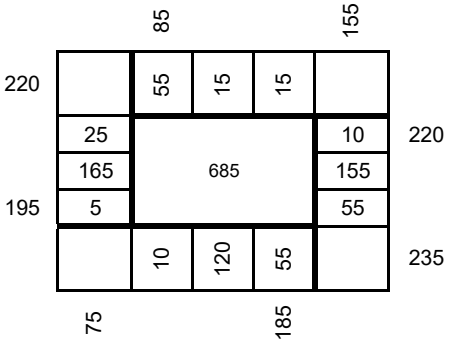
6 1st Ave NE / NE Stella St



7 Main St NE / NE Stephens St



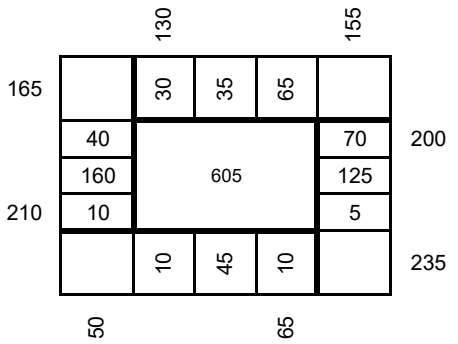
8 1st Ave NE / NE Stephens St



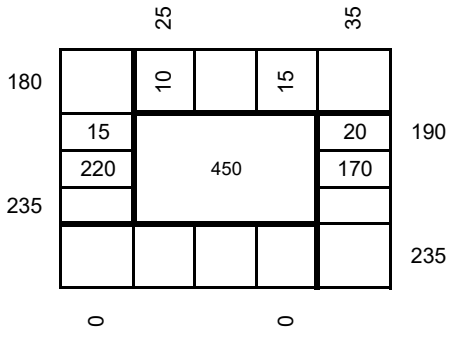
Appendix C - Turning Movement Volumes

Existing

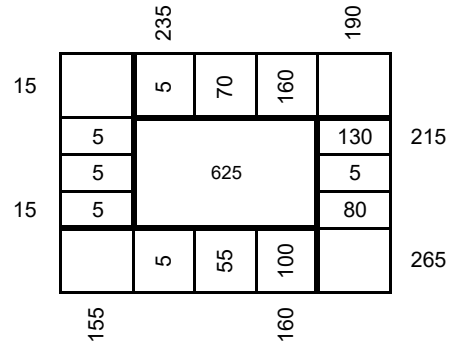
9 — 3rd Ave NE / NE Stephens St



10 — 275th Ave NE / Bruett Rd

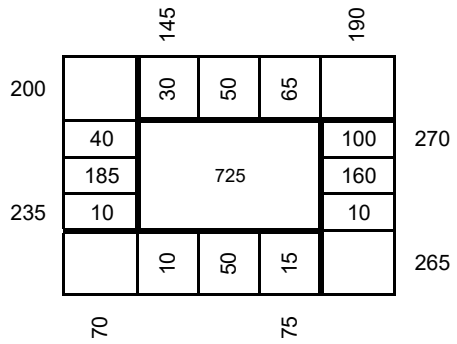


11 — 275th Ave NE / NE 150th St

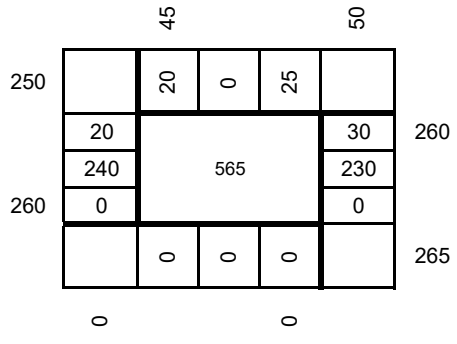


Forecast 2044

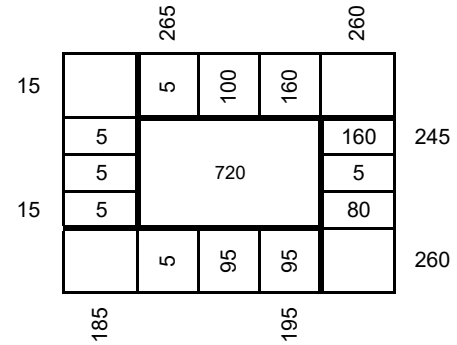
9 — 3rd Ave NE / NE Stephens St



10 — 275th Ave NE / Bruett Rd



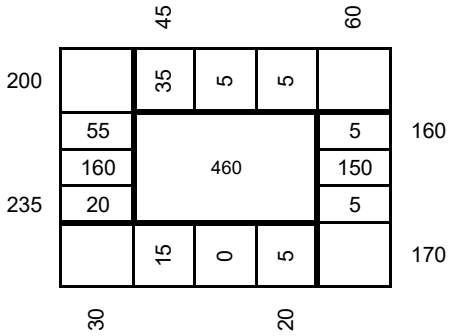
11 — 275th Ave NE / NE 150th St



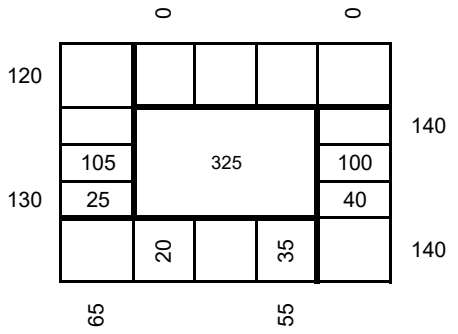
Appendix C - Turning Movement Volumes

Existing

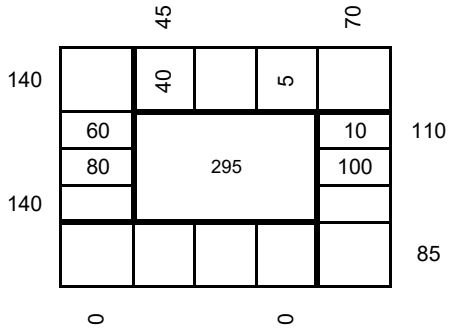
12 — 278th Ave NE & NE 150th St



13 — 284th Ave NE & NE 150th St

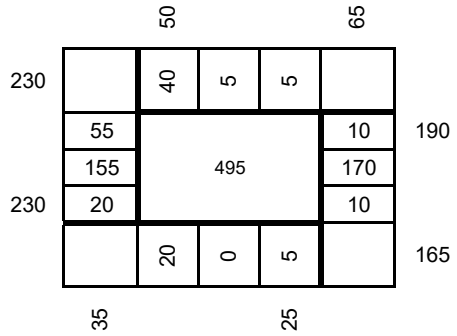


14 — 286th Ave NE & NE 150th St

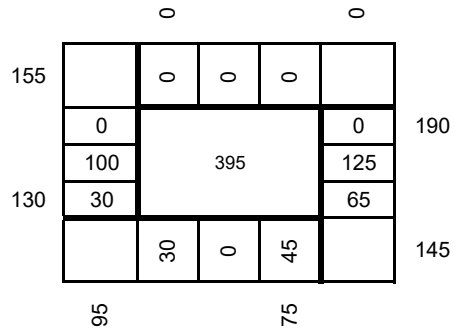


Forecast 2044

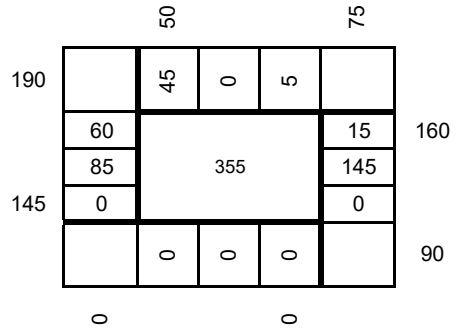
12 — 278th Ave NE & NE 150th St



13 — 284th Ave NE & NE 150th St



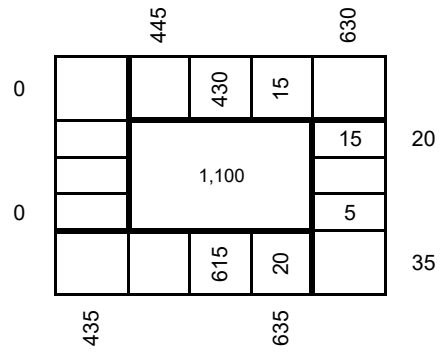
14 — 286th Ave NE & NE 150th St



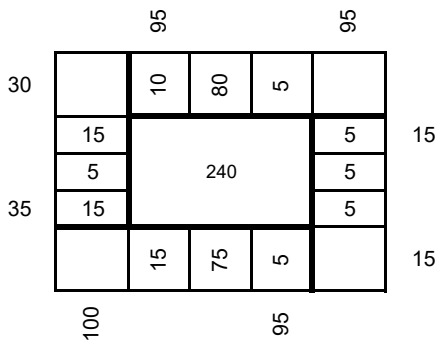
Appendix C - Turning Movement Volumes

Existing

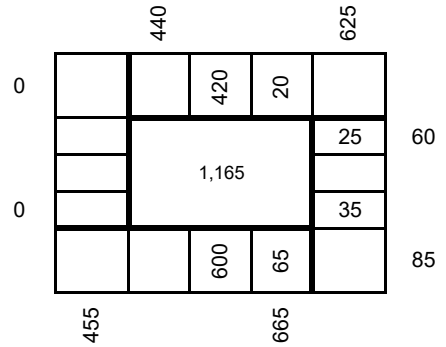
15 SR-203 / NE Kennedy Dr



16 3rd Ave NE / NE Kennedy Dr

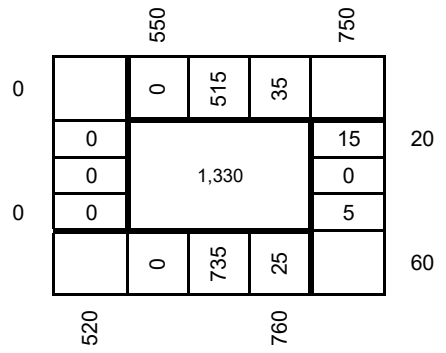


17 SR 203 / NE 145th St

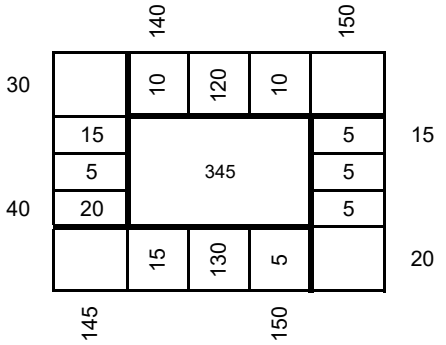


Forecast 2044

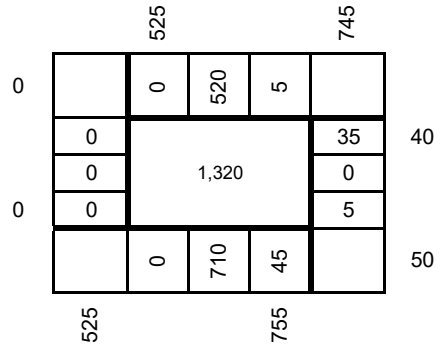
15 SR-203 / NE Kennedy Dr



16 3rd Ave NE / NE Kennedy Dr



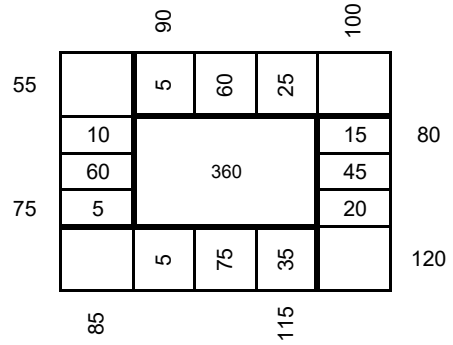
17 SR 203 / NE 145th St



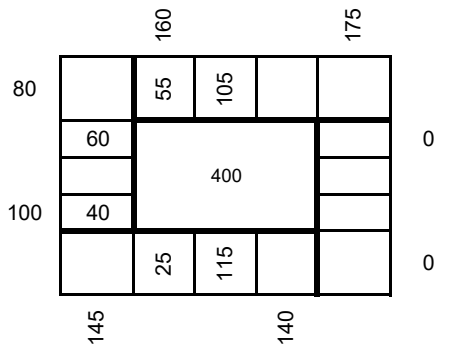
Appendix C - Turning Movement Volumes

Existing

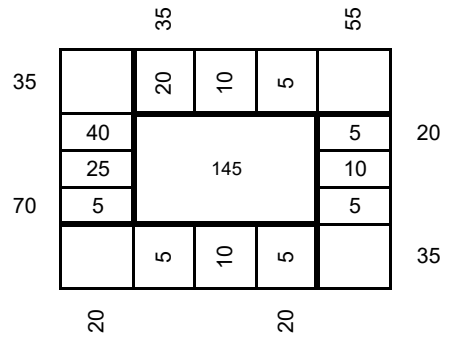
18 — 3rd Ave NE / NE 145th St



19 — 275th Ave NE / NE 145th St

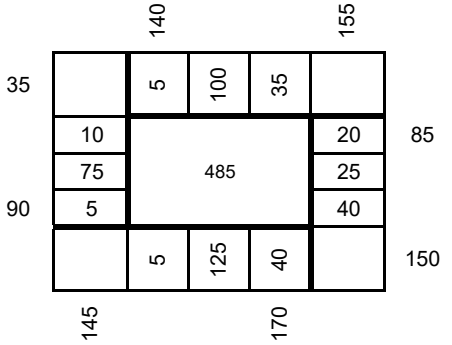


20 — 278th Ave NE / NE 144th St

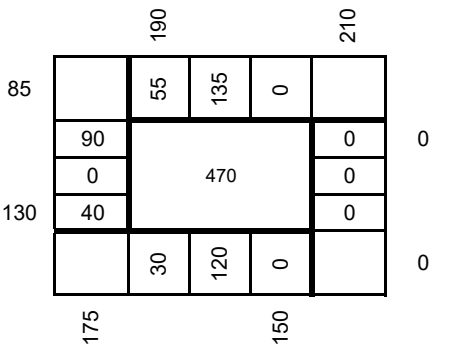


Forecast 2044

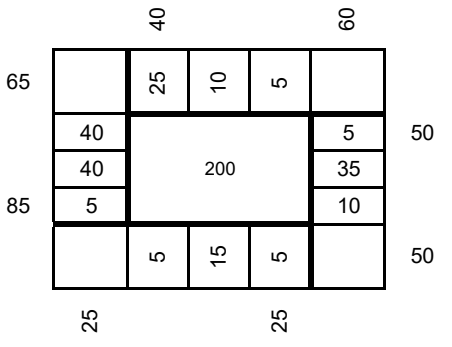
18 — 3rd Ave NE / NE 145th St



19 — 275th Ave NE / NE 145th St



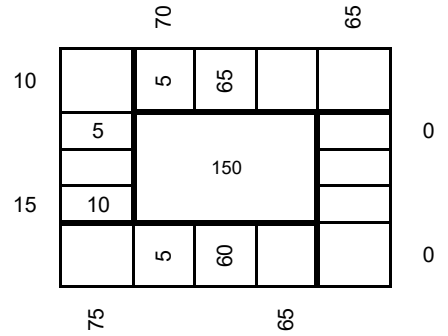
20 — 278th Ave NE / NE 144th St



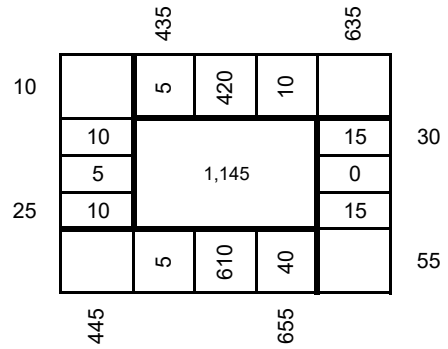
Appendix C - Turning Movement Volumes

Existing

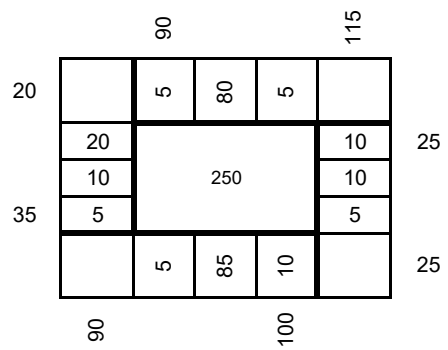
21 284th Ave NE & NE 144th St



22 SR 203 & NE 143rd Pl

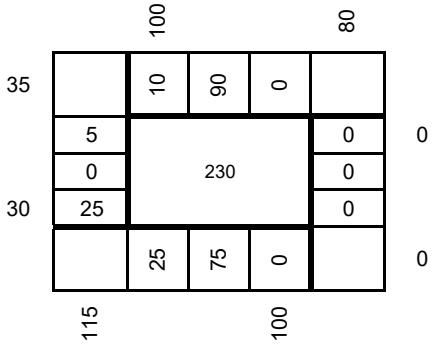


23 3rd Ave NE & NE 143rd Pl

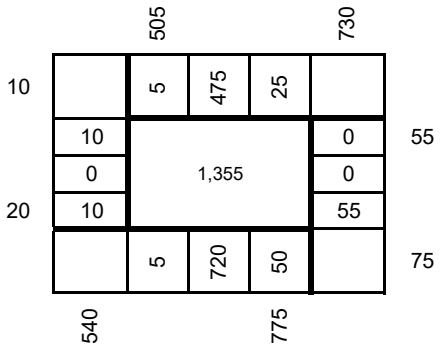


Forecast 2044

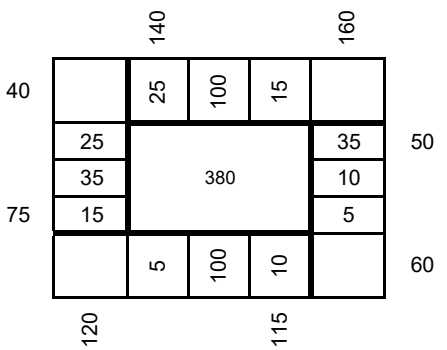
21 284th Ave NE & NE 144th St



22 SR 203 & NE 143rd Pl



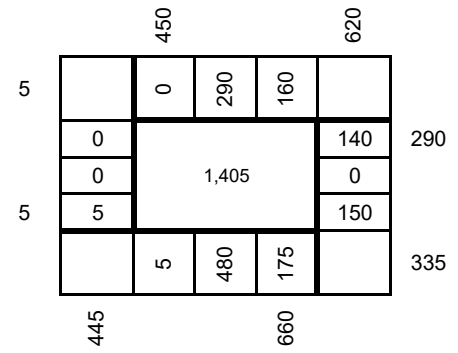
23 3rd Ave NE & NE 143rd Pl



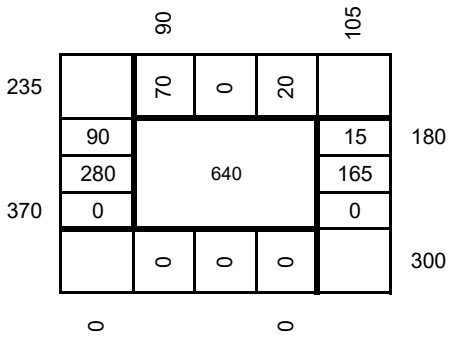
Appendix C - Turning Movement Volumes

Existing

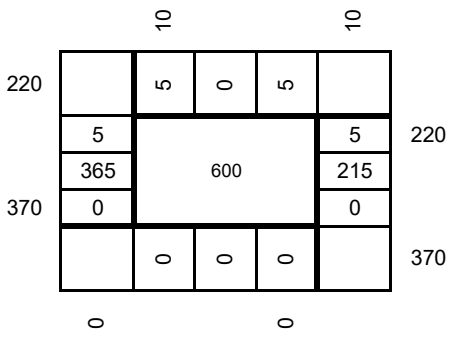
24 SR 203 / NE Big Rock Rd



25 3rd Ave NE / NE Big Rock Rd

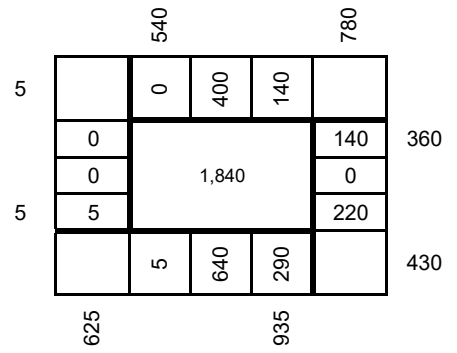


26 271st Ave NE / NE Big Rock Rd

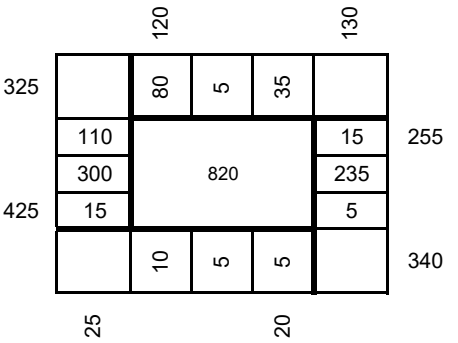


Forecast 2044

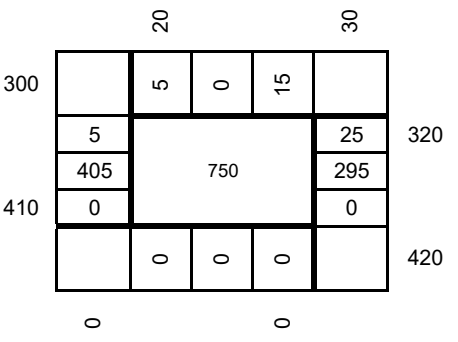
24 SR 203 / NE Big Rock Rd



25 3rd Ave NE / NE Big Rock Rd



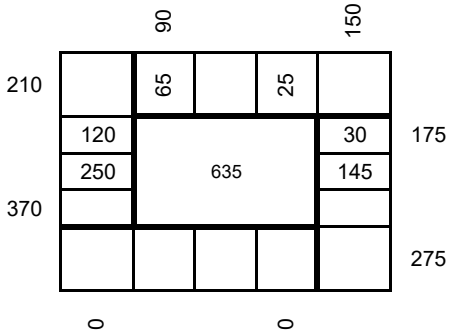
26 271st Ave NE / NE Big Rock Rd



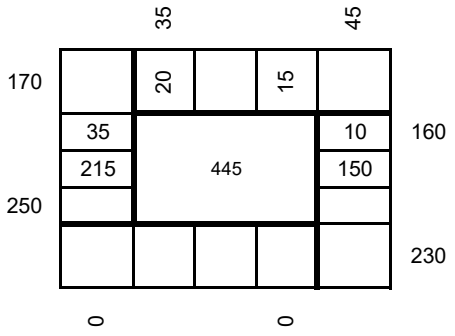
Appendix C - Turning Movement Volumes

Existing

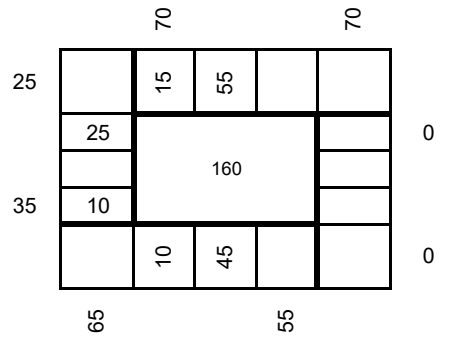
27 275th Ave NE / NE Big Rock Rd



28 282nd Pl NE / NE Big Rock Rd

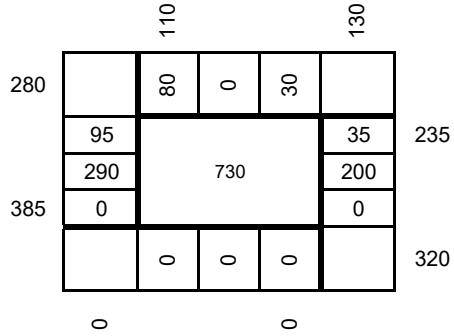


29 Batten Rd NE / NE Roney Rd

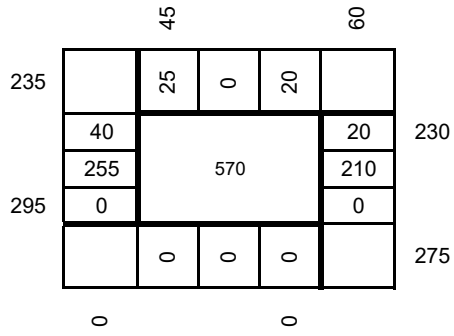


Forecast 2044

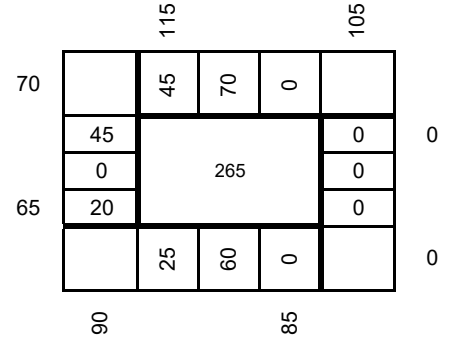
27 275th Ave NE / NE Big Rock Rd



28 282nd Pl NE / NE Big Rock Rd



29 Batten Rd NE / NE Roney Rd



Appendix C - Turning Movement Volumes

Existing

30 Batten Rd NE

NE Big Rock Rd

		50		50	
130		5		45	
	5			45	170
	150		375	125	
155					
					195
	0			0	

Forecast 2044

30 Batten Rd NE

NE Big Rock Rd

		60		55	
145		5	0	55	
	5			50	190
	160		415	140	
165	0			0	
		0	0	0	215
	0			0	