GENERAL GOVERNMENT COMMITTEE MEETING AGENDA

Online via Zoom and In Person at Tumwater City Hall, Council Conference Room, 555 Israel Rd. SW, Tumwater, WA 98501

Wednesday, January 10, 2024
8:00 AM

1. Call to Order
2. Roll Call
3. Approval of Minutes: General Government Committee, November 8, 2023 & December 13, 2023
4. 2025 Comprehensive Plan Periodic Update – Transportation (Mary Heather Ames)
5. 2024 Long Range Planning Work Program (Brad Medrud)
6. Contract with the State Department of Commerce for the 2025 Comprehensive Plan Periodic Update Middle Housing Planning Grant (Brad Medrud)
7. Contract with the State Department of Commerce for the 2025 Comprehensive Plan Periodic Update Planning Grant (Brad Medrud)
8. Additional Items
9. Adjourn

Meeting Information
All committee members will be attending remotely. The public are welcome to attend in person, by telephone or online via Zoom.

Watch Online
https://us02web.zoom.us/j/82822297182?pwd=akRkWVNRbWR4cXNmK1laWjV6dStiZz09

Listen by Telephone
Call (253) 215-8782, listen for the prompts and enter the Webinar ID 828 2229 7182 and Passcode 564414.

Public Comment
The public may submit comments by sending an email to council@ci.tumwater.wa.us, no later than 5:00 p.m. the day before the meeting. Comments are submitted directly to the Committee members and will not be read individually into the record of the meeting.

Post Meeting
Audio of the meeting will be recorded and later available by request, please email CityClerk@ci.tumwater.wa.us

Accommodations
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TUMWATER GENERAL GOVERNMENT COMMITTEE
MINUTES OF VIRTUAL MEETING
November 8, 2023 Page 1

CONVENE: 8:00 a.m.

PRESENT: Chair Michael Althauser and Councilmembers Joan Cathey and Leatta Dahlhoff.

Staff: City Administrator Lisa Parks, Community Development Director Michael Matlock, Finance Director Troy Niemeyer, Parks and Recreation Director Chuck Denney, Water Resources and Sustainability Director Dan Smith, Planning Manager Brad Medrud, Communications Manager Ann Cook, Economic Development Manager Austin Ramirez, and Housing and Land Use Planner Erika Smith-Erickson.

INTERLOCAL AGREEMENT BETWEEN THE CITY OF TUMWATER AND THE PORT OF OLYMPIA FOR THE BUSH PRAIRIE HABITAT CONSERVATION PLAN (HCP) AMENDMENT NO. 3:

Manager Medrud reported the request is a recommendation to the City Council to add the Interlocal Agreement between the City of Tumwater and the Port of Olympia for the Bush Prairie Habitat Conservation Plan (HCP) Amendment No. 3 to the Council's consent calendar. Amendment No. 3 extends the expiration date of the agreement from December 31, 2023 to December 31, 2025 to accommodate the necessary work to complete the plan. No other changes are included in the interlocal agreement.

Councilmember Cathey asked whether the request affects previous conversations regarding a meeting of the attorneys. Manager Medrud advised that the interlocal agreement is a fundamental agreement between the parties for joint efforts on the HCP. The interlocal agreement outlines the responsibilities for working together on the HCP. The Council signed the interlocal agreement in 2016 to serve as the basis to complete the HCP.

MOTION: **Councilmember Dahlhoff moved, seconded by Councilmember Cathey, to recommend the City Council add the Interlocal Agreement between the City of Tumwater and the Port of Olympia for the Bush Prairie Habitat Conservation Plan to the consent agenda for consideration at its November 21, 2023 meeting. A voice vote approved the motion unanimously.**

ORDINANCE NO. O2023-014, AMENDING TUMWATER MUNICIPAL CODE SECTION 12.32, PUBLIC PARKS:

Director Denney briefed the committee on the request for a recommendation for approval of Ordinance No. O2023-014, amending the Tumwater Municipal Code 12.32; Public Parks. The proposal is based on a review of parks rules to ensure the rules are current and meet current conditions in the use of parks. The Parks and Recreation Department manages all City property and maintains the grounds for all buildings and parks, as well as monitoring public use. The proposal adds all City-owned properties to the ordinance. Some rules and regulations for parks cover banning of fires, horseback riding, loitering at night,

vandalism, overnight camping, open park hours, overnight parking, use of drones or other aerial devices, endangering wildlife, advertising in parks or using parks for private business, noise ordinance, leased dog requirements, use of alcohol, planning or administration of public events, being banned from using property, appeal rights, and an enforcement suspension clause if a person is houseless or indigent and cannot find shelter. The provision enables the City to allow the activity to continue if legal.

Councilmember Cathey asked whether the proposed ordinance affects any rules or regulations pertinent to the Tumwater Metropolitan Park District (TMD). She asked for additional clarification of the provision addressing houseless individuals. Director Denney responded that the proposal does not affect the TMD. He explained that the City cannot legally remove a houseless individual(s) from any City property without first securing another shelter or livable space to relocate the individual(s).

Chair Althauser noted that the golf course is City property and there are specific activities allowed at the golf course. He asked whether the proposal would affect those activities at the golf course. Director Denney said the golf course operates under the parks ordinance, which was updated to include the golf course specific to golf-related activity. Alcohol and smoking are allowed on the golf course as the golf course property is handled differently. The proposal does not affect the golf course. Chair Althauser noted the provision in the second section of the ordinance speaks to no person shall practice or play golf, archery, or other games with no exemption cited for the golf course. Within another section of the ordinance, an exception is cited for the golf course regarding smoking. He suggested revising the ordinance to ensure clarity in the language that the provision does not apply to the golf course. Director Denney acknowledged the request to include an exemption within the second section of the ordinance.

Councilmember Dahlhoff cited recent efforts in the City on the Equity Toolbox for equality and equity. She asked whether those efforts were considered during the review of the proposed ordinance. The Council has often discussed smoking in the parks through labeling and messaging for no smoking in parks. The proposal exempts the golf course with respect to smoking cigarettes, cigars, vaping, and marijuana. Director Denney said it is possible to extend the prohibition of smoking and vaping to the golf course with the understanding that the City lacks the ability to enforce any smoking prohibition. It is possible to state the City's values for uses of substances while on City property. He added that

the ban would be the first in state for any golf course. Additionally the use of tobacco products has decreased substantially. Vaping is difficult to enforce because of the ability to hide the device. Councilmember Dahlhoff suggested pursuing a future discussion in conjunction with efforts on the Equity Toolbox rather than banning smoking at this time.

MOTION: **Councilmember Cathey moved, seconded by Councilmember Dahlhoff, to recommend approval of Ordinance No. O2023-014, Amending Tumwater Municipal Code 12.32, Parks to the City Council for consideration at its November 21, 2023 meeting. A voice vote approved the motion unanimously.**

THURSTON EDC RENEWAL DISCUSSION: Manager Ramirez said the briefing covers some proposed future projects in collaboration with Thurston Economic Development Council (EDC) and to receive input on the scope of work for renewal of the two-year agreement with the EDC.

The City has contracted with the EDC for economic development services for many years providing services such as business retention, recruitment, marketing activities; business support programs for entrepreneurs, new and established businesses; economic analysis and market research, and support on redevelopment efforts within the Brewery District. The current contract with EDC is due for renewal. In addition to those ongoing services, staff proposes adding the following services to the scope of work within the contract:

- Convening and co-hosting business roundtables to provide input on the upcoming Economic Development Plan update
- Convening leaders from the business and development sectors to provide input on redevelopment opportunities in the Brewery District and Capitol Boulevard Corridor. *Two grants received by the City for brewery redevelopment include the EPA federal grant and the Department of Ecology grant, which require a significant amount of outreach to the private sector. The grants are intended to support redevelopment.*
- Coordination of the Thurston Innovation Cluster Accelerator Program (ICAP), an effort to support creative/maker entrepreneurs anchored by the Tumwater Craft District, Olympia Armory, Lacey MakerSpace, and Tenino Agricultural Park
- An annual $5,000 investment in the Lacey MakerSpace, a valuable and regional asset for Tumwater businesses
- An Economic Impact Analysis and Report of the Tumwater Artesian Brewfest, measuring the economic benefits

provided by the annual event to the City and region

Manager Ramirez invited comments and questions on the proposed additions to the scope of work.

Councilmember Dahlhoff asked about any measurable or follow through for those businesses unable to remain in the City because of the lack of space for expansion or to meet needs. Manager Ramirez explained that his position has the responsibility as well as in partnership with the EDC. At this time, the City of Tumwater is an expensive place to start a business despite the City growing very rapidly, which is creating higher market rates for business space. Many existing businesses are typically paying below market rates for space. Cost is one factor for business retention. The City has many residential and distribution uses but fewer smaller manufacturing and retail uses. He works closely with EDC to ensure Tumwater is promoted for all business options. The EDC provides support on different types of projects but does not serve in a role dictating what the market will support or the type of projects developers pursue.

Councilmember Cathey asked whether any City codes or provisions factor in a business decision to leave or prevent the business from expanding. Manager Ramirez said none of those scenarios have occurred since he joined the City. However, many of those decisions can be impacted by the City's development process. Most businesses accept costs associated with the development process but not unpredictability or unknown timelines because it can result in costs that are not predictable which leads to instability and often forces some businesses to relocate to another location. Over the last several years, the City has improved the development process substantially; however, some businesses will relocate elsewhere regardless of the reason.

Councilmember Cathey asked for clarification as to the purpose of the third addition of Coordination of the Thurston Innovation Cluster Accelerator Program (ICAP). Manager Ramirez explained that the ICAP is a regional effort to support and accelerate the creative and maker sector. Councilmember Cathey questioned whether ICAP resembles the prior Innovation Partnership Zone (IPZ) program. Manager Ramirez said the IPZ program was a location specific designation whereby the ICAP is a countywide designation. The City's Craft District is identified as one of the pillars of the ICAP.

The committee supported referring the proposal as a Council Consideration item for review by the Council with a presentation of

the proposal and how it ties to regional efforts.

2025 COMPREHENSIVE PLAN PERIODIC UPDATE – GROWTH MANAGEMENT ACT HOUSING NEEDS ALLOCATION PROCESS:

Manager Medrud introduced the housing needs allocation process as part of the larger discussion by the Council at its November 28, 2023 worksession. The briefing is intended to prompt some questions for staff to address prior to that meeting.

In 2021, the Legislature passed House Bill 1220 requiring cities, towns, and counties to plan for and accommodate future housing affordable to a range of incomes and to document protected housing needs for each jurisdiction that plans under the Comprehensive Plan Periodic Update process. The State Department of Commerce was directed to identify countywide housing needs for all counties planning under the Growth Management Act (GMA) by income range. The Department of Commerce is providing guidance on how cities and counties can work together to allocate countywide numbers to each jurisdiction within a county. As part of the City's process, staff worked with Thurston County and the cities of Lacey, Olympia, and Yelm to contract with Thurston Regional Planning Council (TRPC) to convene a workgroup of local planning directors and staff with staff invited from the cities of Rainer, Tenino, and the Town of Bucoda.

The workgroup identified values to consider as members worked through the technical exercise of allocating countywide numbers. The workgroup identified three values of importance:

- The process must be fair-in terms of the distribution of new low-income units across all jurisdictions while recognizing differences among jurisdictions and existing housing distribution with recognition that the City of Olympia has assumed the bulk of permanently low-income and emergency housing in the region
- The process is clear by ensuring communication is easy to the public and officials and that it is tailored to the jurisdictions and includes all urban growth areas, while establishing methods that would limit the risk for potential legal challenges and liability
- The process is cooperative by building on existing structures and processes including the Regional Housing Council, Countywide Planning Policies, and mutual cooperation amongst jurisdictions in other areas. It was also important that the outcome of the process was a result of consensus among the members of the workgroup.

The Department of Commerce had established two methods for the process and the workgroup selected a hybrid between the two

because neither method captured the goals and values of the region.

During the Council's worksession on November 28, 2023, TRPC staff is scheduled to present the work of the workgroup, the process for adoption, and how the allocation will be incorporated within the City's Comprehensive Plan Periodic Update process for housing and how it affects other elements in the Comprehensive Plan.

2025 COMPREHENSIVE PLAN PERIODIC UPDATE – CLIMATE:

Planner Smith-Erickson updated members on the new Climate Element as part of the 2025 Comprehensive Plan Periodic Update process.

In 2023, the Governor signed House Bill 1181 adding a new climate change and resiliency goal to the Growth Management Act (GMA) to ensure comprehensive plans, development regulations, policies, and plans adapt and mitigate the effects of climate change, reduce greenhouse gas emissions, reduce per capita vehicle miles traveled, prepare for natural climate impacts and hazards, and advance environmental justice. The bill requires the City to develop a new Climate Element by June 25, 2025 to meet the state deadline.

Not only does the climate change and resiliency goal need to be addressed in the Climate Element, it also needs to be addressed in the Conservation Element, Land Use Element, and the Transportation Plan.

The legislation includes the following requirements:

- A climate mitigation sub-element to address actions to reduce overall greenhouse gas emissions and vehicle miles traveled
- A climate resilience sub-element, which could be adoption by reference of the updated Thurston Hazard Mitigation Plan
- Consideration of environmental justice to avoid worsening environmental health disparities

Climate mitigation addresses greenhouse gas emission reductions involving actions to reduce or eliminate emissions of greenhouse gases to reduce the rate and extent of climate change damage. Greenhouse gases include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and any other gas or gases designated by the state. Increasing emissions of carbon dioxide and other greenhouse gases are changing the City's climate in ways that will impact both human and natural systems. To ensure that the City significantly reduces local contributions to climate change, the City adopted the following greenhouse gas

emissions reduction targets in 2021 as part of the Thurston Climate Mitigation Plan: 45% reduction below 2015 levels by 2030; and 85% below 2015 levels by 2050.

Planner Smith-Erickson presented a graph depicting 2021 Greenhouse Gas Emissions (GHG) Inventory for Thurston County with a breakdown of emissions by each sector.

The City adopted the Thurston Climate Mitigation Plan in 2021 with 72 actions projected to reduce emissions. Staff is examining ways to incorporate the actions in the climate mitigation sub-element.

Four pathways were identified to meet the new state requirement for a climate mitigation sub-element. Staff is exploring which pathways or parts of individual pathways taken together would be the best approach for the City to meet the state requirements. The four pathways require the following:

- **Pathway 1:** Select GHG reduction measures by developing GHG reduction goals and policies based directly on a menu of measures.
- **Pathway 2:** GHG Emissions estimates by developing GHG reduction goals and policies using Department of Ecology framework and sample measures in Section 5 (Climate Element Planning Guidance from the Department of Commerce).
- **Pathway 3:** Vehicle miles traveled (VMT) study/evaluation by developing specific, VMT/GHG reduction goals and policies. Only transportation emission sources would be evaluated.
- **Pathway 4:** Emission inventories by developing GHG reduction goals and policies based on emission inventory modeling results.

The pathways enable jurisdictions to establish a baseline to develop greenhouse gas emission reduction targets and select goals and policies to reduce or eliminate emissions.

Councilmember Dahlhoff inquired as to whether the pathways and ongoing work speak to a life cycle analysis of emissions resulting from the production of goods and services. Manager Medrud responded that the topic is an ongoing discussion with the Thurston Regional Climate Workgroup as any study of emissions from the production of goods and services would be detailed. The City's Sustainability Coordinator has been working with other jurisdictions to identify reasonable estimates for the region. The

work would likely not be included within the current update because of timing.

Councilmember Dahlhoff commented on the numerous sources of GHG other than from vehicles. The biggest generator of GHG is from households. She stressed the importance of considering the other elements that create GHG. Manager Medrud noted that 90% of GHG in the county is from buildings, construction, and transportation. The intent is accounting for the larger sectors that have the most impact.

Councilmember Cathey asked whether emissions speak to only air. Manager Medrud explained that the reference to GHG is defined by state law under a range of elements that are part of GHG within the RCWs.

Councilmember Cathey spoke to her frustration of constant references to GHG as part of climate mitigation, as well as references to environmental justice. Her concern is making some progress on mitigating climate impacts by accounting for other sources of emitters that impact the environment. Manager Medrud responded that the City has established much of the ground work through the Thurston Climate Mitigation Action Plan and actual actions that can make a difference. The proposal is in response to a new state requirement that will be memorialized within the Comprehensive Plan. He acknowledged the frustration of reviewing similar information. The City is required by the state to complete a number of tasks as part of the 2025 Comprehensive Plan Periodic Update to include developing the new Climate Element. Staff is utilizing much data from existing work.

Planner Smith-Erickson reviewed the climate resiliency sub-element of the Climate Element to develop comprehensive goals and policies that support countywide climate resilience, environmental justice, and equity. The resilience guidance helps jurisdictions identify and address natural hazards by climate change including landslides, droughts, floods, wildfires, and other impacts caused by changes in temperature and weather patterns.

Five steps to integrate the goals and policies will help develop Comprehensive Plan goals and policies that support countywide climate resilience, environmental justice, and equity. Staff has completed steps 1 through 3 by working on the Tumwater Hazard Mitigation Plan. The Hazard Mitigation Plan will be in substantial conformance with state guidance. The City plans to adopt the plan by reference to satisfy the state climate resilience sub-element requirements. The Draft Hazard Mitigation Plan has been released

for public comment until November 17, 2023.

New state legislation requires the Climate Element to prioritize greenhouse gas reductions in overburdened communities and prioritize climate resilience in communities that disproportionally suffer from compounding environmental impacts.

In response to comments and concerns surrounding the importance of reducing all environmental impacts in addition to emissions, Manager Medrud described the intricacies of planning goals and policies to ensure the population has access to goods and services while planning for the effects of developing those sources of goods and services and their associated impacts in proximity to residents. He added that addressing environmental justice to either correct existing issues or preventing new issues is a policy decision as well as existing regulations that address various environmental impacts, such as light pollution regulations and noise.

Planner Smith-Erickson added that the Hazard Mitigation Plan also addresses issues associated with over-burdened communities and vulnerable populations.

Planner Smith-Erickson reported House Bill 1181 requires the Land Use Element update avoid worsening environmental health disparities and that the Transportation Plan ensures multimodal levels of environmental justice goals. Other transportation and land use changes require the state to maintain a summary of the per capita vehicle miles traveled to support the required updates to the Transportation Plan and the new Climate Element.

Next steps include a Planning Commission worksession with the City Council in February. In June, the committee will receive an update followed by another joint worksession on June 24, 2024. In December 2023, a joint worksession with the Council and the Planning Commission is scheduled to discuss the Long Range Planning Work Program for 2024. The committee is scheduled to receive a briefing on the Economic Development Plan and Lands for Public Purposes and Utilities Element on December 13, 2023. The committee will receive a briefing on the Transportation Plan at its January 10, 2024 meeting.

2025 COMPREHENSIVE PLAN PERIODIC UPDATE – CONSERVATION:

Manager Medrud briefed members on the update of the Conservation Element of the Comprehensive Plan.

The Conservation Element addresses protecting natural resource industries. The City has forest land registered with the state and mineral lands. No registered agricultural lands are located in the

City other than policies and regulations that support small-scale agricultural uses.

The Conservation Element also includes protections for the environment. The City must also account for how it plans to enhance the environment.

Councilmember Cathey spoke to the importance of focusing attention on groundwater and aquifers to ensure future water availability. Aquifers are also impacted by climate change. Many studies have been published about the importance of protecting sources of water. Manager Medrud agreed on the importance of water resources as the City is required to ensure sufficient water is available to accommodate future growth, as well as protecting water resources.

Manager Medrud reported the element also addresses critical areas such as wetlands, aquifer recharge areas, floodplains, any geologically hazardous areas such as landslides and areas where liquefaction has occurred, and wildlife habitat conservation areas. Specific state guidelines require incorporating best available science. A number of maps in the element require updating. A discussion on the Habitat Conservation Plan (HCP) used for managing listed federal and state species will be incorporated within the plan, as well as a number of private HCPs approved by the federal government. Policies will be updated for protecting critical areas, which overlaps with the Climate Element to update greenhouse gas emission targets, which may be moved entirely to the Climate Element. References must also be included to the Shoreline Management Plan, Climate Mitigation Plan, and Urban Forestry Management Plan. Environmental justice will also be addressed.

Manager Medrud reviewed the structure of the element, which is similar to other elements of the Comprehensive Plan. Chapter 10 of the element includes goals, policies, and actions. Manager Medrud encouraged members to review Chapter 10.

The Department of Commerce has provided some guidance materials for the update of the element. One is a checklist for critical areas the City is required to address and a Riparian Management Zone Checklist published by the Department of Ecology that will be applicable primarily in the Deschutes Valley and Percival Creek areas. A Critical Areas Handbook is available to provide guidance. The Priority Habitat and Species List is provided by the Washington State Department of Fish and Wildlife to acknowledge and account for any new and listed species.

Wetland guidance has also been updated.

Next steps include a joint City Council and Planning Commission worksession in February to review the draft followed by a briefing to the committee on the changes to the element at its March 2024 meeting.

Manager Medrud reported on the release of the community survey for the Comprehensive Plan update. To date, the City has received 57 responses. The community survey will provide an initial snapshot of the community's interest in the update and particular topics of interest and areas of concern.

Councilmember Cathey commented on the importance of highlighting wetlands. Many more community members are interested in protecting wetlands and understand the relationship between wetlands and climate change.

ADJOURNMENT: **With there being no further business, Chair Althauser adjourned the meeting at 9:22 a.m.**

Prepared by Valerie L. Gow, Recording Secretary/President
Puget Sound Meeting Services, psmsoly@earthlink.net

TUMWATER GENERAL GOVERNMENT COMMITTEE
MINUTES OF VIRTUAL MEETING
December 13, 2023 Page 1

CONVENE: 8:01 a.m.

PRESENT: Chair Michael Althauser and Councilmembers Joan Cathey and Leatta Dahlhoff.

Staff: City Attorney Karen Kirkpatrick, Community Development Director Michael Matlock, Finance Director Troy Niemeyer, Planning Manager Brad Medrud, Communications Manager Ann Cook, Economic Development Manager Austin Ramirez, and Housing and Land Use Planner Erika Smith-Erickson.

APPROVAL OF MINUTES: GENERAL GOVERNMENT COMMITTEE, OCTOBER 11, 2023:

MOTION: **Councilmember Dahlhoff moved, seconded by Chair Althauser, to approve the minutes of October 11, 2023 as published. A voice vote approved the motion unanimously.**

Councilmember Cathey joined the meeting.

2025 COMPREHENSIVE PLAN PERIODIC UPDATE - LANDS FOR PUBLIC PURPOSES & UTILITIES: Planner Smith-Erickson briefed members on two elements of the Comprehensive Plan Periodic Update - Lands for Public Purposes Element and Utilities Element.

The State Growth Management Act (GMA) requires cities to demonstrate each element in the Comprehensive Plan meets the relevant 15 planning goals in the GMA. For both elements, the update focuses on urban growth goals to encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner, and ensuring public facilities and services necessary to support development are adequate for the next 20 years.

The Lands for Public Purposes Element includes: (1) Inventory of existing capital facilities owned by public entities; (2) Forecast of the future needs for such capital facilities; (3) Proposed locations and capacities of expanded or new capital facilities; (4) Lands for Public Facilities Element Maps showing the locations of the existing capital facilities owned by public entities; and (5) Essential Public Facilities and siting.

Capital facilities include:

- Transportation Systems
- Solid Waste Management

- Sewage Treatment Facilities and Sanitary Sewer Systems
- Stormwater Systems and Facilities
- Water Systems and Facilities
- Parks, Recreation, and Open Space
- Fire Protection and Emergency Medical Services
- Police Protection
- School Facilities
- Library Services
- City Facilities

2016 Capital facilities maps in the element include:

- Sewage Treatment Facilities and Sanitary Sewer System
- Stormwater Systems and Facilities
- Water Systems and Facilities
- School Facilities, Library Services , City Facilities

The Lands for Public Purposes Element includes Essential Public Facilities that are difficult to site such as:

- Airports
- State Education Facilities
- Large Scale State or Regional Transportation Facilities
- Correctional Facilities
- Solid Waste Handling Facilities
- Inpatient Facilities
- Mental Health Facilities
- Sewage Treatment Facilities
- Emergency Communication Towers and Antennas

The City is required to establish a process or amend its existing process for identifying essential public facilities and the sites for those facilities. The current code includes the uses and zoning codes. The City must identify and site the expansion of essential public facilities. A process was created by Thurston Regional Planning Council to provide guidance for the implementation of the Countywide Planning Policies that recommends a regional process for the siting of essential public facilities. Tumwater Municipal Code 18.56.140 directs the siting essential public facilities and identifies requirements, minimum conditions, and standards for siting those facilities.

The Utilities Element addresses the general location, proposed location, and capacity of all existing and proposed private utilities, such as natural gas, electricity, telephone, utility pipelines, cable television, cellular, and broadband internet. A utilities map of

existing facilities is included in the element.

Some of the 2025 topics to address as part of the update for Lands for Public Purposes Element include:

- Address Organics Management Facility Siting (ESSHB 1799)
- Update inventory and projected needs for public buildings, facilities, and services over the 20-year planning period
- Use the updated City and urban growth area 20-Year population forecasts
- Update provisions for protection of the quality and quantity of groundwater used for public water supplies

Chair Althauser asked how the update of the element addresses the shift away from installing natural gas in new development, the installation of more electric vehicle charging stations, and shifting more to electrical uses to address climate change. Manager Medrud advised that the state requirement for the update of the element is to identify the facilities to accommodate particular uses and not necessarily how the facilities are operated or managed. Climate change as it relates to existing and future uses will be addressed as part of the new Climate Change Element required as part of the periodic update in terms of addressing City services.

Chair Althauser cited the example of a hypothetical situation where more residents decide to switch from natural gas to heat pumps to obtain federal incentives or help reduce emissions. He asked whether the element would account for those types of situations in terms of the capacity of the electric grid to accommodate an increase in usage. Manager Medrud said it is likely the element would include references to situations occurring both at the state and federal level, as well staff attempting to obtain information from private utilities as to how the companies are addressing growth in electric service caused by climate change.

Chair Althauser asked whether the new element would address the source of electricity, as the City pays extra to obtain green electricity for City facilities versus electricity produced from coal. Manager Medrud said staff would likely account for the different circumstances but was unclear as to whether the City's policies address that situation. Recent efforts by the City however, have likely laid the groundwork since the last update.

Councilmember Dahlhoff shared that she forwarded questions to Director Smith and Sustainability Coordinator Wood inquiring about net zero energy buildings. She is hopeful the update could include another step by including net zero policies with the ultimate

goal of developing net zero buildings in the City. Manager Medrud said the suggestion is reasonable to include as part of the update. Many other programs also require net zero energy for the public sector. It is also important to be somewhat cautious as it may affect affordable housing goals. Some analysis would be necessary to ensure net zero energy policies do not affect affordable housing goals.

Councilmember Dahlhoff offered that based on emerging technologies and change in policies, some space could be afforded for some pilot programs with either private business or state agencies. Manager Medrud replied that policy language could be included to support the suggestion. It would also be important to include flexibility within policies as the plan covers a 20-year horizon. Technology changes may occur that were never anticipated and it would be important the plan could account for those types of changes.

Planner Smith-Erickson reported the 2025 update for Lands for Public Purposes Element also includes addressing the following:

- Allow expansion of the area in the City that would allow for essential public facilities such as inpatient facilities as part of Planning Commission's 2022 Comprehensive Plan amendment cycle recommendations
- Group A water system plans must include climate resilience element if initiated after June 30, 2024

Topics to address as part of the update of the Utilities Element include:

- Include all electrical, telecommunication, and natural gas systems and make a good faith effort to gather information from them (E2SHB 1181)
- Update general location, proposed location, and capacity of all existing and proposed gas, electric, cable television, and telecommunications to year 2045
- Update wireless telecommunication facilities information as needed
- Update the general location, proposed location, and capacity of all existing and proposed utilities
- Incorporate provisions of the updated 2023 Hazard Mitigation Plan as appropriate
- Update Map

New requirements to address include:

- Special consideration for environmental justice in goals and

policies (E2SHB 1181)
- Address Organics Management Facility Siting (ESSHB 1799)

Planner Smith-Erickson reviewed the structure of the Lands for Public Purposes Element and the Utilities Element. The internet link for both elements is located at Tumwater Comprehensive Plan | City of Tumwater, Washington on the City's website. Department of Commerce guidance materials to aid in the update include:

- Periodic Update Checklist for Fully Planning Cities (Commerce, March 2023)
- A Guide to the Periodic Update Process Under the Growth Management Act – Fully-Planning Counties & Cities (Commerce, 2022)
  - Commerce Periodic Update Materials:
    - Capital Facilities Planning - *Capital Facilities Planning Guidebook (Commerce, October 2014)*
    - Stormwater - *Building Cities in the Rain: Watershed Prioritization for Stormwater Retrofits (September 2016)*

Next steps are completion of the gap analysis and a briefing to the Public Works Committee on January 18, 2024.

2025 COMPREHENSIVE PLAN PERIODIC UPDATE – ECONOMIC DEVELOPMENT:

Manager Ramirez briefed the committee on the update of the Economic Development Plan (EDP), an element in the Comprehensive Plan. The update will be a refocused and refreshed Economic Development Plan.

The current 2019 EDP includes 9 main goals with sub goals and prioritized goals. Following the pandemic, some goals have shifted and some are less relevant or more relevant. The updated plan will refocus on priorities given limited resources and acknowledgment of opportunities that are more time sensitive, as well as removing some completed goals. Several goals encompass ongoing activities within any economic development program. The plan includes many assumptions based on data in the plan. Data in the plan are outdated. Staff plans to work with a consultant to help refresh the data workbook to ensure the assumptions are evidence-based in alignment with feedback from the community and from the organization.

Councilmember Cathey asked whether the fourth goal: *Make strategic use of the brewery properties and surrounding Brewery District to strengthen the City's economic base,* includes privately owned land. Manager Ramirez said the goal refers to the entirety of

the Brewery District and continued efforts to work as partners with privately owned sites. The Brewery District is much broader than just the site of the brewery properties. The Craft District was developed because of the lack of activity occurring in the Brewery District; however, the City continues to experience more investment in sites located adjacent to brewery properties along with more interest in redevelopment of those sites. Staff continues to work with the owners of the brewery properties to the extent possible to maintain a productive relationship.

Chair Althauser pointed out that the goal related to the Brewery District also mirrors a strategy for achieving redevelopment of the old brewery because as more redevelopment and investment occurs to properties surrounding the old brewery, the area becomes more attractive for potential developers to consider the old brewery site for a redevelopment opportunity.

Councilmember Dahlhoff offered that the update of the goals should include more efforts on the third goal of *Grow the City's light industrial and manufacturing sectors* by updating the goal to reflect that the intent is attracting modern manufacturing and adding elements of clean and green rather than expanding zoning for light industrial and manufacturing uses. Manager Ramirez affirmed that the phrasing of the goal would be reviewed to ensure accuracy of the intent.

Councilmember Dahlhoff added that the goals should also reflect that the types of jobs available in the City should be inclusive for all demographics of the population.

Councilmember Cathey noted that another factor to consider for attracting light industrial and manufacturing sectors is the increase in water usage. She asked whether environmental factors are acknowledged in the plan, as water will continue to be an important issue for types of development. Manager Ramirez shared that he often discusses anticipated development with Director Smith as any new business seeks information from the City as to the availability of resources the business will need. During those conversations, there has been no indication that the City is not able to meet the needs of existing or anticipated users. However, new and redevelopment proposals are continually monitored to ensure adequate resources are available.

Councilmember Cathey stressed the important of including water resources as part of any economic development plan.

Manager Medrud noted that the adequacy of water availability is

also addressed in the City's Water System Plan, which is updated by Water Resources and approved by the state as a purveyor of water. The information from the Water System Plan informs other elements of the Comprehensive Plan. Following the completion of the 2025 Comprehensive Plan Periodic Update, the City is scheduled to update the Water System Plan.

Manager Ramirez reviewed the timeline for the update of the plan. By spring, the first phase of the update includes completion of the data workbook, addition of new initiatives, and removal of completed initiatives or those no longer relevant. Some assumptions may change as the community and the market continue to deal with the consequences of the pandemic. Staff will solicit feedback on the draft Plan from stakeholders and partners with special consideration for environmental justice in goals, strategies, and actions. The second phase of the update from winter 2023/24 through fall 2024 incorporates feedback from the community outreach process into the draft plan. The draft plan will be presented to the Planning Commission and General Government Committee, as well as external/internal stakeholders. The third phase from fall 2024 through June 30, 2025 will culminate in the adoption of an updated Economic Development Plan and Comprehensive Plan by the Growth Management Act deadline of June 30, 2025.

Councilmember Cathey asked for some examples for factoring special consideration for environmental justice in goals, strategies, and actions as part of the update. Manager Ramirez cited the use of the Environmental Protection Agency's (EPA) standard definition for environmental justice, which is the department's fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. With any decision, policy, and regulation that affect people, it is an important principle to consider any action that could impact people in different ways whether intended or unintended. A specific example surrounds brownfield redevelopment and conducting town hall meetings, as well as reaching out to others who may not participate in town hall meetings or who have trouble attending meetings by tailoring outreach to meet them where they reside. Additionally, the City is committed and is working to meet the needs of all individuals, families, students, and visitors in safe, respectful, welcoming, and inclusive ways. Those efforts will be factored within all elements of the Comprehensive Plan.

Chair Althauser cited an example of environmental justice as the

neighborhoods in south Seattle where communities of color reside because the area was historically redlined because it was the only area many communities of color could own property. The state then built a highway next to those neighborhoods, which has led to statistically verified higher rates of lung cancer and asthma and other ailments caused by the built environment imposed upon specific communities that lacked access to power and the ability to influence policies. For him, environment justice means recognizing those injustices and preventing similar future injustices by ensuring an inclusive and informed process.

Councilmember Cathey cited some environmental justice and equity actions of creating open space, adding parks, and planting trees to afford opportunities for shade and places for residents to recreate and exercise. Any new development should include those types of protections as well.

Manager Ramirez offered that environmental injustice is the concept of doing things with people and not too people. Too often, things happen to people without the opportunity to be part of the process or offer input during a process.

OTHER BUSINESS: Following some questions on the timing of elections for the Chair and Vice Chair of the committee, City Attorney Kirkpatrick advised that elections for officers are scheduled in January/February 2024.

ADJOURNMENT: **With there being no further business, Chair Althauser adjourned the meeting at 8:53 a.m.**

Prepared by Valerie L. Gow, Recording Secretary/President
Puget Sound Meeting Services, psmsoly@earthlink.net

TO: General Government Committee

FROM: Mary Heather Ames, Assistant Transportation & Engineering Director

DATE: January 10, 2024

SUBJECT: 2025 Comprehensive Plan Periodic Update – Transportation

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1) Recommended Action:

This is a discussion item about the Transportation Plan for the 2025 Comprehensive Plan periodic update.

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2) Background:

On a ten-year cycle, the City is required to conduct a Growth Management Act periodic update of its Comprehensive Plan and related development regulations. For the current cycle, the City is required to complete work on the periodic update by June 30, 2025. Work on the periodic update started last fall.

The updated Comprehensive Plan will address diversity, equity, and inclusion throughout the Plan. 2025 Comprehensive Plan Update | City of Tumwater, WA contains links to guidance material and information about the update.

The intent of this work session is to discuss the current version of the Transportation Plan and guidance for its update.

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3) Policy Support:

Strategic Priority: Build a Community Recognized for Quality, Compassion, and Humanity.

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4) Alternatives:

- ❑ None.

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5) Fiscal Notes:

The periodic update is primarily an internally funded annual work program task. The City has filed an application for a Washington State Department of Commerce grant for $125,000 to update the Transportation Plan and Economic Development Plan and is waiting to hear back about edits to our proposed scope and budget. The City has been awarded a Washington State Department of Commerce grant for $75,000 to address the new state middle housing requirements. The City has filed an application for a Washington State Department of Commerce grant application for $500,000 to support the development of a Climate Element and supporting implementation actions and is waiting to hear back about edits to the proposed scope and budget.

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6) Attachments:

A. Staff Report
B. Presentation
C. Transportation Plan, November 2016
D. Transportation Plan Appendices, November 2016

Attachment A

MEMORANDUM

Date: January 10, 2024
To: General Government Committee
From: Mary Heather Ames, Assistant Transportation & Engineering Director

2025 Comprehensive Plan Update – Transportation Plan

On a ten-year cycle, the City is required to conduct a Growth Management Act periodic update of its Comprehensive Plan and related development regulations. For the current cycle, the City is required to complete work on the periodic update by June 30, 2025. Work on the periodic update started last fall.

The updated Comprehensive Plan will address diversity, equity, and inclusion throughout the Plan and incorporate a large number of state required changes addressing housing, climate change, and other topics.

The intent of the General Government Committee on Wednesday, January 10, 2024, is to start the discussion of the Transportation Plan by discussing the state requirements and introducing the current version.

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1 – Growth Management Act – Transportation Goals

The state Growth Management Act (Chapter 36.70A Revised Code of Washington (RCW)) requires that the City demonstrate that each Element in its Comprehensive Plan meets the relevant fifteen planning goals contained within the Act. The fifteen goals guide the development and adoption of the City's Comprehensive Plan and development regulations. They are not listed in order of priority.

The following is a summary of how the updated Transportation Plan will need to meet the goals.

3. ***Transportation.*** *Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.*

   The Transportation goal was updated in 2023 by the state legislature to add reducing greenhouse gas emissions and per capita vehicle miles traveled. Achieving this goal will be done through a combination of goals, policies, and actions in the Land Use Element and Transportation Plan. The Land Use Element will contain goals, policies, and actions that ensure coordination with regional and local transportation plans. The Land Use Element will also propose residential, mixed-use, and neighborhood commercial land use designations that will encourage multi-modal, transit oriented development. Coordination with the new Climate Element will also be required.

2 – Current Transportation Plan

A – Background

The Transportation Master Plan looks at the transportation network within Tumwater and recommends projects to improve the network for forecasted future conditions. The plan considers all modes of travel and looks at system performance while also discussing funding and needs.

The 2016 Transportation Master Plan is consistent with the plans of our neighboring communities and regional partners.

The 2016 Transportation Master Plan covered the 20-year planning period from 2016 to 2036 and provides the functional framework for realizing Tumwater's transportation vision:

> *"Tumwater's transportation system provides for the safe, efficient, cost-effective movement of people and goods in ways that support adopted land use plans, enhance neighborhood and community livability, support a strong and resilient economy, and minimize environmental impacts." – page 6*

The Transportation Master Plan includes maps that show Roadway Functional Classification, Strategy Corridors, Bike Facilities and Pedestrian Facilities. Other maps include Street and Intersection Projects, Bike Projects and Pedestrian Network Project Needs.

B – Structure

The current Transportation Master Plan consists of the following chapters:

1. Introduction
2. Vision
3. Sub-Area Plans
4. Consistency
5. Modes of Travel
6. Managing Demand
7. Future Conditions
8. Goals and Policies
9. System Inventory
10. System Performance
11. Capital Improvements
12. Funding
13. Opportunities & Needs

C – Link to Current Transportation Plan

https://www.ci.tumwater.wa.us/departments/community-development-department/tumwater-comprehensive-plan

D – Link to State Guidance for Updating Transportation Plans

Your Community's Transportation System (2012):

https://www.ci.tumwater.wa.us/departments/community-development-department/tumwater-comprehensive-plan/2025-comprehensive-plan-update

3 – Specific Topics Addressed as Part of the Update

1. General

A. Diversity, equity, inclusion, and environmental justice will be considered throughout the Comprehensive Plan.

B. All elements, plans, and maps will be updated and be internally consistent.

C. The updated Comprehensive Plan will consist of shorter individual Elements and Plans with a focus on simplified and updated goals, policies, and implementation actions with appendices that contain the required technical information.

D. A new Comprehensive Plan Goal and Policy Guide will be created for use by staff and policymakers as well as a new User Guide for community members.

E. Mutually agreeable Memorandum of Agreements between the City and tribes about collaboration and participation in the planning process will be discussed.

2. Transportation

- Update Maps.
- Update existing conditions and operations.
- Update planned improvements and future operations to 2045.
- Update transportation improvement program.
- Update financial analysis.
- Update traffic impact fees.
- Update estimated traffic impacts to state-owned transportation facilities resulting from land use assumptions to assist the State Department of Transportation in monitoring the performance of state facilities, to plan improvements for the facilities, and to assess the impact of land-use decisions on state-owned transportation facilities.
- Update land use assumptions used in estimating travel.
- Update facilities and service needs, including:
  - An inventory of air, water, and ground transportation facilities and services, including transit alignments and general aviation airport facilities, to define existing capital facilities and travel levels as a basis for future planning.
    - This inventory must include state-owned transportation facilities within the city or county's jurisdictional boundaries.
  - Level of service standards for all locally owned arterials and transit routes to serve as a gauge to judge performance of the system.

    - These standards should be regionally coordinated.
  - For state-owned transportation facilities, include the level of service standards for highways to gauge the performance of the system.
  - Identify specific actions and requirements for bringing into compliance locally owned transportation facilities or services that are below an established level of service standard.
  - Update forecasts of traffic for at least ten years based on the adopted Land Use Element to provide information on the location, timing, and capacity needs of future growth.
  - Identify state and local system needs to meet current and future demands.
    - Identified needs on state-owned transportation facilities must be consistent with the statewide multimodal transportation plan.
- Update financial analysis, including:
  - An analysis of funding capability to judge needs against probable funding resources.
  - A multiyear financing plan based on the needs identified in the Comprehensive Plan, the appropriate parts of which shall serve as the basis for the six-year street, road, or transit program required for cities and for public transportation systems.
    - The multiyear financing plan should be coordinated with the ten-year investment program developed by the state Office of Financial Management.
  - If probable funding falls short of meeting identified needs, a discussion of how additional funding will be raised, or how land use assumptions will be reassessed to ensure that level of service standards will be met.
- The Transportation Plan, the six-year Capital Facilities Plans for cities and for public transportation systems, and the ten-year investment program for the state, must be consistent.
- Provide a projection of state and local system needs to meet current and future demand.
- Provide a pedestrian and bicycle component to include collaborative efforts to identify and designate planned improvements for pedestrian and bicycle facilities and corridors that address and encourage enhanced community access and promote healthy lifestyles.
- Consider approaches that increase physical activity.
- Describe any existing and planned transportation demand management strategies, such as high occupancy vehicle lanes or subsidy programs and parking policies.
- Provide an analysis of future funding capability to judge needs against probable funding resources.

- Provide a multi-year financing plan based on needs identified in the Comprehensive Plan, the appropriate parts of which serve as the basis for the six-year street, road, or transit program.
- If probable funding falls short of meeting identified needs, provide a discussion of how additional funds will be raised, or how land use assumptions will be reassessed to ensure that level of service standards will be met.
- Describe intergovernmental coordination efforts, including an assessment of the impacts of the Transportation Plan, land use assumptions on the transportation systems of adjacent jurisdictions, and how the Plan is consistent with the regional transportation plan.
- Identify lands useful for public purposes such as utility corridors, transportation corridors, landfills, sewage treatment facilities, stormwater management facilities, recreation, schools, and other public uses.
- Identify open space corridors within and between urban growth areas, including lands useful for trails.
- Update, as needed, the process or criteria for identifying and locating essential public facilities in coordination with the update of the Lands for Public Purposes Element.
- Update demand-management strategies.
- Update information on pedestrian and bicycle component to include collaborative efforts to identify and designate planned improvements for pedestrian and bicycle facilities and corridors that address and encourage enhanced community access and promote healthy lifestyles.
- Revisions to allow for some form of Intercity Transit turnarounds on Littlerock Road and Old Highway 99 to allow for future transit services.
- Update to include work done on the Thurston Thrives walkability study, Intercity Transit studies, and the Old Highway 99 Corridor Study.
- Allow active transportation facilities, transportation demand management, or public transportation services to meet concurrency.
- Incorporate equitable implementation.
- Estimate multimodal level of service impacts to state transportation facilities.
- Add impact fee revenue for bike and pedestrian facilities.
- Provide multimodal level of service and needs forecasts for arterials, transit routes, and active transportation facilities.
- Give priority to the greatest multimodal safety benefit to each category of roadway users.
- Include Americans with Disabilities Act transition plan.
- Provide funding analysis that includes state transportation facilities.

4 – Schedule

Phase 2 – Plan Development (Winter 2024 – Fall 2024)

Feedback gathered through the community outreach process will be incorporated into the draft Transportation Plan. Staff will present the drafts to the Planning Commission and General Government Committee as well as external and internal stakeholders and focus groups comprised of subject-area experts for review.

- Continuing Community Outreach – January 2024 –June 2024
- Transportation Plan Development Meetings
  1. Includes Appendices and Maps
  2. Planning Commission Work Sessions
     - June 11, 2024
     - August 27, 2024
  3. General Government Committee Briefing
     - August 14, 2024
- Commerce Preliminary Review
  - Review of Comprehensive Plan Format
    - March 2024
- Complete Draft of Comprehensive Plan
  - All Elements, Maps, and Appendices
  - July 2024 – October 2024

Phase 3 – Legislative Process (Fall 2024 – June 30, 2025)

Staff will complete a draft version of the Comprehensive Plan during Phase III. Staff will present the draft to the Planning Commission and General Government Committee as well as external and internal stakeholders for review.

The Planning Commission will hold a number of work sessions to discuss the Comprehensive Plan and then conduct a public hearing to gather formal public comment on the draft Comprehensive Plan before developing findings of fact, conclusions, and recommendations that will be forwarded to City Council.

The City Council will hold a number of work sessions to discuss the Comprehensive Plan. The City Council will consider the recommendation forwarded by the Planning Commission.

The process will culminate in the adoption of an updated Comprehensive Plan by the Growth Management Act deadline of June 30, 2025.

1) Community Outreach

- Final Actions:
  - To be determined based on the results of Phase 2 and the Community Outreach Plan.

2) Schedule

- Commerce Review
  - Fall 2024 – Winter 2025
- Prepare Comprehensive Plan Update Ordinance
  - October 2024
- SEPA Review
  - November 2024 – December 2024
- Commerce Notice of Intent
  - November 2024 - December 2024
- Public Adoption Meetings

1. Planning Commission
   - Briefing
     - November 26, 2024
   - Work Session
     - December 10, 2024 (Joint with City Council)
     - January 14, 2025
     - February 11, 2025
   - Public Hearing
     - February 25, 2025
2. General Government Committee
   - Briefing for Comprehensive Plan Update Ordinance
     - March 12, 2025
3. City Council Work Session
   - December 10, 2024 (Joint with Planning Commission)

- April 15, 2025
- May 27, 2025

4. City Council
    - June 17, 2025

- Notice of Adoption
    1. Submit Notice of Adoption to Commerce
    2. June 30, 2025

Appendix A – Guidance

The State Department of Commerce has provided guidance specific to the periodic update on their Periodic Update webpage

https://www.commerce.wa.gov/serving-communities/growth-management/periodic-update/

www.commerce.wa.gov/serving-communities/growth-management/growth-management-topics

In addition, the Puget Sound Regional Council is conducting a series of workshops on a variety of topics related to the periodic update.

www.psrc.org/our-work/passport-2044-comprehensive-plan-workshop-series)

The Municipal Research Services Center has a Comprehensive Planning webpage.

https://mrsc.org/getdoc/d7964de5-4821-4c4d-8284-488ec30f8605/Comprehensive-Planning.aspx

Appendix B – Current Transportation Plan Goals and Policies

Transportation goals and policies provide a framework for transportation decision-making. The policy elements in this Plan derive from a regionally-coordinated process and are consistent with the Regional Transportation Plan and Sustainable Thurston, both of which are regional policy initiatives supported by Tumwater. The goals and policies in this Transportation Master Plan support localized efforts while maintaining consistency with established regional objectives and the policy frameworks of adjacent communities.

1. Transportation and Land Use Consistency

Goal: Ensure the design and function of transportation facilities are consistent with and support sustainable, healthy urban, suburban, and rural communities.

Policies:

a. Commit to the development and implementation of land use plans, development patterns, parking requirements, and design standards that encourage walking, bicycling, transit use, and other alternatives to driving alone.

b. Provide transportation facilities that support the location of jobs, housing, industry, and other activities as called for in Tumwater's adopted land use plan.

c. Support policies, programs, and procedures that promote urban infill, and make transportation investments that support increased urban densities and mix of uses consistent with Tumwater's plans for the Brewery District and Capitol Boulevard.

d. Create vibrant city centers and activity nodes that support active transportation and housing, jobs, and services as called for in Tumwater's Comprehensive Plan.

e. Create safe and vibrant neighborhoods with places that build community and encourage active travel.

f. Create urban parks and places that reduce pressure on the region's farms, forests, prairies, and open spaces.

g. Meet mobility, access, and economic goals in designated Strategy Corridors with an appropriate combination of investments, policies, and land use measures.

h. Design and invest in transportation projects that have a lasting positive impact, reflect the goals of the people who live and work in Tumwater, and contribute to a sense of place and community.

i. Ensure adequate transportation capacity to address growth consistent with this Comprehensive Plan.

j. Preserve and promote awareness of Tumwater's historic, cultural, and natural heritages.

2. Multimodal Transportation System

Goal: Work toward an integrated, multimodal transportation system that supports adopted land use plans, reduces overall need to drive, and provides alternative travel choices.

Policies:

a. Provide quality travel choices appropriate to existing and future land uses, including walking, bicycling, transit, motor vehicles including freight, and rail.

b. Ensure that development of transit transfer centers, activity centers, employment centers, schools, and the airport accommodate multiple modes of travel and safe, efficient connections among those modes of travel.

c. Invest in mode-specific strategies that contribute to overall development of an integrated, multimodal transportation system.

d. Promote public awareness on the rights and responsibilities of drivers, bicyclists, and walkers, and ways these modes can travel together safely and efficiently.

e. Incorporate practical design considerations where appropriate, designing to solve mobility problems more so than to meet design standards if doing so increases functional mobility of the transportation system.

3. Barrier-free Transportation

Goal: Ensure transportation system investments support the special travel needs of youth, elders, people with disabilities, people with literacy or language barriers, those with low incomes, and other affected groups.

Policies:

a. Work over time to ensure that transportation facilities comply with the Americans with Disabilities Act.

b. Construct transit stops and walkway approaches that are accessible for those with differing capabilities.

c. Provide appropriate transportation services, facilities, programs, and on-line resources that reduce barriers to people who do not speak or read English.

d. Present information and provide public participation opportunities for everyone, including people with physical disabilities and/or people with limited literacy skills.

e. Implement land use policies that provide a variety of housing types on corridors with excellent transit service connecting to employment centers, services, retail, health care, and other essential services to support the lifestyles of people who cannot drive.

4. System Safety and Security

Goal: Enhance the safety and security of those who use, operate, and maintain the transportation system.

Policies:

a. Combine education, enforcement, engineering, and evaluation to maintain and enhance system safety.

b. Design transportation infrastructure to encourage safe user behavior.

c. Support projects that improve passenger safety and security at facilities like park-and-ride lots and transit transfer centers.

d. Provide safe walking routes to schools.

e. Retrofit essential transportation facilities where possible to improve their ability to withstand a major earthquake or other natural disaster.

f. Build in system redundancy through a well-connected street grid to support emergency response and reduce community disruption during natural or man-made disasters.

g. Encourage coordination between transportation system providers and emergency response providers who rely on that system.

5. System Maintenance and Repair

Goal: Protect investments that have already been made in the transportation system and keep life-cycle costs as low as possible.

Policies:

a. Prioritize maintenance, preservation, operation, and repair of the existing transportation system.

b. Use preventive maintenance programs to ensure lowest life-cycle costs.

c. Use street restoration standards and coordinate utility and street projects to minimize destructive impacts of utility projects on streets, leveraging where possible investments for both project types to deliver more cost-effective public facilities.

d. Explore innovative programs that reduce infrastructure life-cycle costs or increase efficiency of service delivery, including use of new materials, technologies, and resource partnerships.

6. Travel Demand Management

Goal: Increase overall operating efficiency of the transportation system through the effective use of measures that reduce the need to drive alone.

Policies:

a. Promote transportation-efficient development and redevelopment, and site public services and facilities where transit, walking, and biking are now or will be viable alternatives to driving alone.

b. Encourage use of public transportation, ridesharing, biking, and walking by improving access, convenience, and reliability of those options.

c. Sustain and expand private and public sector programs and services that encourage employees to commute to work by means other than driving alone, or to change commuting patterns through teleworking, flex-time, or compressed work weeks.

d. Manage parking to improve consistency with transportation demand management objectives.

e. Promote technologies that enable people to meet their needs without having to travel.

f. Use travel demand management techniques to provide alternatives during temporary congestion, such as during major construction.

g. Work to mainstream telework as a primary transportation demand management strategy among public and private employers.

h. Strive to meet State Commute Trip Reduction targets for the City.

7. Transportation Technologies

Goal: Use technology-based approaches to address transportation congestion, safety, efficiency, and operations.

Policies:

a. Use transportation technologies to improve the operating efficiency and safety of the existing transportation system.

b. Use transportation technologies to better integrate transportation modes.

c. Make short-range technology investments that support future technology implementation strategies.

d. Look for opportunity to integrate transportation technology considerations in all projects.

e. Recognize that transmittal of electronic information is an important function of a transportation system, and integrate this into transportation system evaluation, policies, and implementation strategies.

8. Freight Mobility

Goal: Promote efficient, cost-effective, timely, and safe movement of the freight within and through the region.

Policies:

a. Plan for freight access to and from highways and other major freight corridors, and between intermodal facilities and industrial areas.

b. Support efforts to increase the amount of freight that is moved by rail to enhance efficiency, productivity, safety, and mobility.

c. Explore strategies to reduce conflict and optimize safety for all transportation system users where industrial or commercial land uses are adjacent to highly urbanized areas.

d. Implement policies and design standards that support local economic vitality by accommodating delivery trucks serving businesses and services while minimizing impacts on local streets.

9. Streets, Roads, and Bridges

Goal: Establish a street and road network that provides for the safe and efficient movement of people and goods while supporting adopted land use goals.

Policies:

a. Design and construct multimodal, context-sensitive, complete streets and roads.

b. Coordinate regionally to identify new connections that provide more direct routes and reduce vehicle miles traveled.

c. Avoid widening any local arterial or collector more than two through-lanes in each direction with auxiliary turn lanes where warranted (maximum five lanes mid-block width) to preserve an acceptable community scale and minimize transportation impacts on non-motorized travelers and adjacent land uses.

d. Develop an interconnected grid of local streets and roads to increase individual travel options and neighborhood connectivity, while improving efficient use of the overall transportation system.

e. Use new technologies or alternative designs to safely and efficiently manage the flow of traffic, such as roundabouts where appropriate as alternatives to traffic signals or stop signs.

f. Use access management techniques to improve roadway capacity and operating efficiency, and increase overall system safety.

g. Ensure that street, road, and bridge projects are integrated with pedestrian amenities in districts and neighborhoods, and add lasting value to the community.

h. Incorporate alternative strategies to address congestion where road widening and traffic control devices are not suitable, particularly along Strategy Corridors.

m. Strategy Corridors are places where street widening is not a preferred option to address congestion problems. This may be because the street is already at the maximum number of lanes (5), or that adjacent land uses are either fully built out or are environmentally sensitive. In strategy corridors, level of service (LOS) may not meet adopted standards, suggesting instead that a different approach is needed for maintaining access and mobility in these areas such as increased transit service, more sidewalks or bike facilities, a complete and connected street grid, transportation technology measures that improve system operating efficiency, access management, parking management, incentives for employees

to telework or carpool, or land use measures that increase the density of land use activities in these corridors that support the best alternatives to driving.

i. Design and build streets that are important freight or bus routes to reduce weather-induced weight restrictions.

j. Meet pm peak Level of Service (LOS) standards:

- LOS E or better in Urban Core Areas [where these areas overlap with Strategy Corridors the LOS may exceed adopted standards]
- LOS D or better elsewhere inside the City limits

10. Public Transportation

Goal: Provide an appropriate level of reliable, effective public transportation options commensurate with the region's evolving needs.

Policies:

a. Support Intercity Transit's long-range plan emphasizing trunk and primary routes servicing core areas along designated Urban Corridors and other strategy corridors with supportive land use and appropriate design standards.

b. Increase the share of trips made by public transportation.

c. Support regional commuter vanpool programs to provide cost-effective, flexible alternatives to commuting in single-occupancy vehicles.

d. Support safe, convenient, and cost-effective transportation services for youth, elders, people with disabilities, and low-income populations by increasing the supply of housing on high-quality transit corridors.

e. Schedule public meetings where possible in locations served conveniently by transit; include transit route information on meeting notices.

f. Integrate public transportation considerations into the planning for newly emerging urban centers and locations such as those south and east of the airport, including innovative partnerships or programs where fixed-route service is not feasible in the near-term.

11. Bicycling

Goal: Increase the share of all trips made safely and conveniently by bicycle.

Policies:

n. Develop a continuous, safe, and convenient bicycle network that functions as an integral part of the whole transportation system.

o. Provide safe and convenient bicycle routes to all schools in the city, and encourage their use.

p. Participate with regional partners in developing a network of contiguous and interconnected

north-south and east-west dedicated shareduse corridors to serve as the backbone for the region's non-motorized transportation system.

q. Provide bicycle parking facilities at transit centers, park-and-ride locations, and other multimodal locations.

r. Provide short- and long-term bicycle parking and other supporting facilities at locations like schools, employment sites, and activity centers.

s. Support education programs for motorists and bicyclists to increase understanding and awareness of bicycling laws, and encourage safe and lawful sharing of the streets.

t. Participate with regional partners in exploring longterm strategies for funding bicycle facilities and services.

12. Walking

Goal: Increase the share of all trips made safely and conveniently by walking.

Policies:

a. Provide a convenient, interconnected, safe pedestrian network that supports existing and desired land uses.

b. Construct and maintain safe and accessible sidewalks and effective crossing opportunities within an appropriate distance of every school in the city, and encourage their use.

c. Provide frequent pedestrian crossings, especially in urban areas and on urban corridors, along transit routes, and near activity centers.

d. Develop and promote non-motorized connections for pedestrian and bike travel to shorten the length of trips to destinations where walking and biking are viable travel options.

e. Require pedestrian-friendly site design and building standards in activity centers, along urban corridors and other key transit routes, and in high density mixed-use zoning districts.

f. Provide street lighting, pedestrian buffers, trees, benches, and other street elements that make walking safe and pleasant.

g. Encourage neighborhood-scale planning efforts to identify and refine important pedestrian routes that increase connectivity and improve walkability.

h. Consider asphalt walkways as appropriate practical solutions for sidewalks when functional pedestrian mobility needs to be improved prior to the availability of adequate funds for construction as called for in adopted sidewalk and street design standards.

13. Rail

Goal: Ensure the continued long term viability of existing and rail-banked rail lines for future freight and passenger rail travel.

Policies:

a. Support appropriate regional opportunities for the potential shared use of freight rail lines for passenger rail travel.

b. Advocate for regional acquisition and continued operation of short-line railroads where needed to support current and future economic development needs.

c. Use design techniques, technology, and operations coordination to minimize potential conflicts between trains and other modes of travel, and between trains and adjacent land uses.

d. Work with regional partners to acquire railroad rights-of-way threatened with abandonment in order to preserve these corridors for future transportation uses.

e. Participate as appropriate in the partnerships necessary to foster efficient, high-speed passenger rail service in the Pacific Northwest.

f. Coordinate with regional partners to position the Thurston Region for a commuter rail connection in the future.

14. Aviation

Goal: Provide an appropriate level of facilities and services to meet the general aviation needs of residents and businesses in the region.

Policies:

a. Coordinate with the Port of Olympia and Thurston County to maintain consistency between adopted land use plans and long-range airport development strategies, and ensure land use compatibility in areas adjacent to the airport.

b. Support multimodal access to the Port of Olympia's airport terminal.

15. Public Involvement

Goal: Build a community of engaged and informed constituents that contributes ideas and supports actions to create a highly functional multimodal transportation system consistent with the goals and policies of this transportation element.

Policies:

a. Provide broad-based, early, and continuing public involvement opportunities in all aspects of the transportation planning process.

b. Ensure equal access to participation for all users of the transportation system.

c. Promote increased public understanding of the relationships between land use patterns and transportation choices facing Tumwater.

d. Explore innovative participation techniques to increase public involvement in transportation issues, and maximize use of "plain English" and other communication techniques to translate complex issues or decisions so they can be widely understood.

16. Intergovernmental Coordination

Goal: Ensure transportation facilities and programs function seamlessly across community borders.

Policies:

a. Participate in coordination activities at the local, regional, state, tribal, and federal level that address the condition or operations of the transportation system.

b. Work with other agencies to coordinate land use and public facility siting decisions, implement countywide planning policies, and refine the tools needed to achieve transportation-efficient community development patterns.

c. Coordinate street projects with Olympia, Thurston County, WSDOT, and Intercity Transit as appropriate.

d. Coordinate development of local plan updates with regional efforts when possible to ensure consistency.

e. Collaborate with other local jurisdictions, TRPC, Intercity Transit, the Port of Olympia, the Thurston EDC, and other entities to facilitate informed, reasoned decision-making processes that advance shared transportation and land use objectives.

17. Environmental and Human Health

Goal: Minimize transportation impacts on the natural environment and the people who live and work in Tumwater.

Policies:

a. Protect water quality from the impacts of stormwater runoff by minimizing impervious surface area and by using low impact development methods where feasible to effectively treat and manage unavoidable runoff.

b. Use transportation planning, design, and construction measures that minimize negative impacts on priority fish-bearing streams and other environmentally sensitive areas.

c. Develop a transportation system that supports compact, mixed-use development and related nonmotorized travel to curb growth in miles of motor vehicle travel, increase energy efficiency, reduce environmental impacts, and encourage physical activity and community health.

d. Support state and national efforts to promote the use of alternative fuels and technologies that reduce pollution and other environmental impacts from motorized vehicles.

e. Ensure federal Title VI requirements for environmental justice are met so that minority populations and people with low incomes do not incur disproportionately high and adverse human health or environmental impacts from transportation policies, programs, and investments.

f. Comply with federal Clean Air Act transportation requirements.

g. Support policies and programs that reduce greenhouse gas emissions associated with travel.

h. Reduce the impacts of transportation on the natural environment during construction, retrofit, and maintenance.

i. Plan and design for impacts associated with changing weather and climate patterns, such as increased flooding and extreme weather events.

j. Support regional efforts to decrease annual per capita vehicle miles traveled within the Thurston region to:

- 1990 levels by 2020
- 30 percent below 1990 levels by 2035
- 50 percent below 1990 levels by 2050.

18. Performance Measures

Goal: Develop performance measures that are realistic, efficient to administer, effective in assessing performance, and meaningful to the public.

Policies:

a. Use transportation performance measures to evaluate, monitor, and respond to the performance of Tumwater policies and investments.

b. Use transportation performance measures that reflect priority city and regional objectives such as consistency of transportation and land use decision-making, improved mobility and access, adequate maintenance and repair of the system, environmental health, and safety.

c. Develop performance measures that reflect the needs and contributions of all modes of travel.

d. Where feasible, use performance measures consistent with those used by other agencies and organizations to enable compatible comparisons.

19. Transportation Funding

Goal: Secure adequate funding from all sources to implement the goals and policies in this plan.

Policies:

a. Provide timely and comprehensive public information about transportation funding issues and opportunities to better enable citizens to participate and make informed decisions on complex funding issues.

b. Prioritize the maintenance and preservation of the existing transportation system to minimize lifecycle costs.

c. Consider the full array of costs and benefits in the selection of transportation projects to ensure the best long-term investment decisions.

d. Make strategic transportation investments that reinforce land use and transportation decisions consistent with the goals and policies of this transportation element.

e. Ensure that transportation investments are equitable to all segments of the community in terms of costs associated with relocations, health impacts, and land use disruptions, as well as the benefits derived from system performance and travel choices.

f. Support regional efforts to improve the availability, reliability, and flexibility of transportation revenues.

g. Use transportation funding policies and investments to make development decisions predictable, fair, and cost-effective.

h. Continue policies that require new development to pay for its share of impacts on the transportation system; where appropriate support multimodal mitigations and not just street capacity.

Attachment B

Transportation Plan Review for the City of Tumwater's 2025 Comprehensive Plan Update

Balancing Nature and Community: Tumwater's Path to Sustainable Growth

General Government Committee – January 10, 2024

Intent

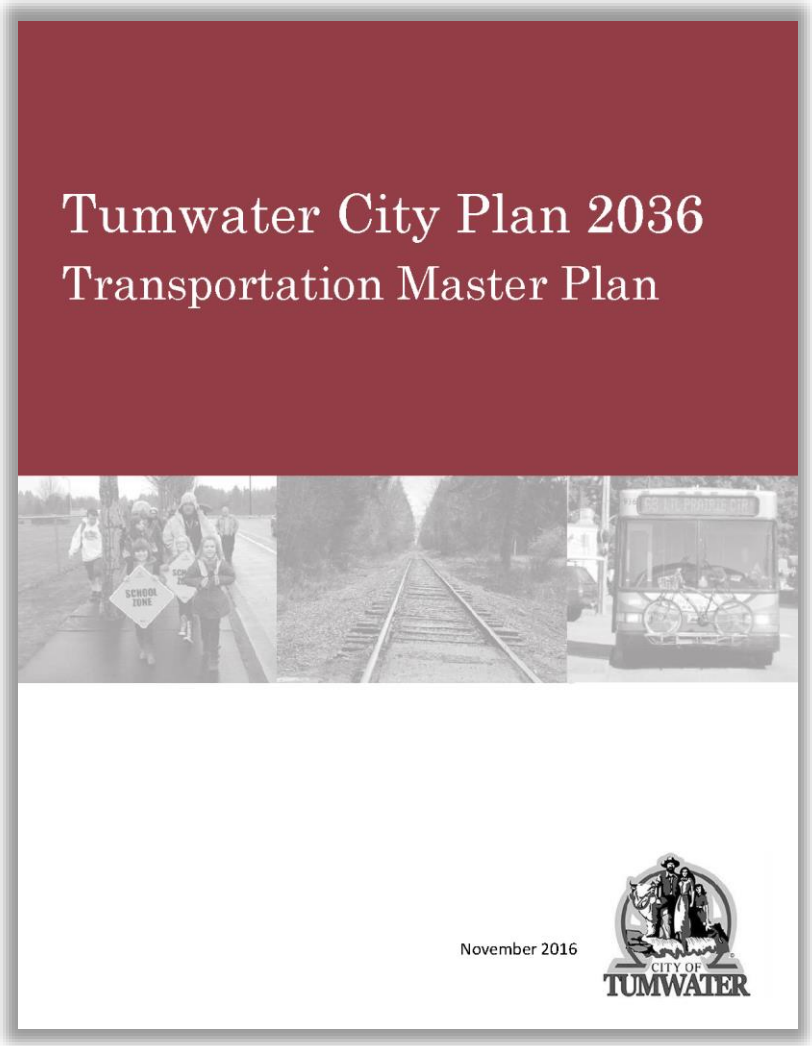
- Discuss Growth Management Act Transportation Plan Goals
- Present the current version of the Plan
- Consider specific issues for the Plan
- Consider how to incorporate diversity, equity, and inclusion throughout
- Discuss guidance materials

Growth Management Act Transportation Goal

3. ***Transportation***. *Encourage efficient multimodal transportation systems that will reduce greenhouse gas emissions and per capita vehicle miles traveled, and are based on regional priorities and coordinated with county and city comprehensive plans.*

2016 Transportation Master Plan

Tumwater's transportation system provides for the safe, efficient, cost-effective movement of people and goods in ways that support adopted land use plans, enhance neighborhood and community livability, support a strong and resilient economy, and minimize environmental impacts.



2025 Topics to Address as Part of the Update

General

- Diversity, equity, inclusion, and environmental justice will be considered throughout the Comprehensive Plan
- All elements, plans, and maps will be updated and be internally consistent
- The updated Comprehensive Plan will consist of shorter individual Elements and Plans with a focus on simplified and updated goals, policies, and implementation actions with appendices that contain the required technical information
- A new Comprehensive Plan Goal and Policy Guide will be created for use by staff and policymakers as well as a new User Guide for community members
- Mutually agreeable Memorandum of Agreements between the City and tribes about collaboration and participation in the planning process will be discussed

2025 Topics to Address as Part of the Update

Transportation

- Update Maps
- Update existing conditions and operations
- Update planned improvements and future operations to 2045
- Update transportation improvement program
- Update financial analysis
- Update traffic impact fees
- Update estimated traffic impacts to state-owned transportation facilities resulting from land use assumptions to assist the State Department of Transportation in monitoring the performance of state facilities, to plan improvements for the facilities, and to assess the impact of land-use decisions on state-owned transportation facilities
- Update land use assumptions used in estimating travel

2025 Topics to Address as Part of the Update

- Update facilities and service needs, including:
  - An inventory of air, water, and ground transportation facilities and services, including transit alignments and general aviation airport facilities, to define existing capital facilities and travel levels as a basis for future planning
  - Level of service standards for all locally owned arterials and transit routes to serve as a gauge to judge performance of the system
  - For state-owned transportation facilities, include the level of service standards for highways to gauge the performance of the system
  - Identify specific actions and requirements for bringing into compliance locally owned transportation facilities or services that are below an established level of service standard
  - Update forecasts of traffic for at least ten years based on the adopted Land Use Element to provide information on the location, timing, and capacity needs of future growth
  - Identify state and local system needs to meet current and future demands

2025 Topics to Address as Part of the Update

- Update financial analysis, including:
  - An analysis of funding capability to judge needs against probable funding resources
  - A multiyear financing plan based on the needs identified in the Comprehensive Plan, the appropriate parts of which shall serve as the basis for the six-year street, road, or transit program required for cities and for public transportation systems
  - If probable funding falls short of meeting identified needs, a discussion of how additional funding will be raised, or how land use assumptions will be reassessed to ensure that level of service standards will be met
- The Transportation Plan, the six-year Capital Facilities Plans for cities and for public transportation systems, and the ten-year investment program for the state, must be consistent
- Provide a projection of state and local system needs to meet current and future demand

2025 Topics to Address as Part of the Update

- Provide a pedestrian and bicycle component to include collaborative efforts to identify and designate planned improvements for pedestrian and bicycle facilities and corridors that address and encourage enhanced community access and promote healthy lifestyles
- Consider approaches that increase physical activity
- Describe any existing and planned transportation demand management strategies, such as high occupancy vehicle lanes or subsidy programs and parking policies
- Provide an analysis of future funding capability to judge needs against probable funding resources
- Provide a multi-year financing plan based on needs identified in the Comprehensive Plan, the appropriate parts of which serve as the basis for the six-year street, road, or transit program
- If probable funding falls short of meeting identified needs, provide a discussion of how additional funds will be raised, or how land use assumptions will be reassessed to ensure that level of service standards will be met

2025 Topics to Address as Part of the Update

- Describe intergovernmental coordination efforts, including an assessment of the impacts of the Transportation Plan, land use assumptions on the transportation systems of adjacent jurisdictions, and how the Plan is consistent with the regional transportation plan
- Identify lands useful for public purposes such as utility corridors, transportation corridors, landfills, sewage treatment facilities, stormwater management facilities, recreation, schools, and other public uses
- Identify open space corridors within and between urban growth areas, including lands useful for trails
- Update, as needed, the process or criteria for identifying and locating essential public facilities in coordination with the update of the Lands for Public Purposes Element
- Update demand-management strategies
- Update information on pedestrian and bicycle component to include collaborative efforts to identify and designate planned improvements for pedestrian and bicycle facilities and corridors that address and encourage enhanced community access and promote healthy lifestyles

2025 Topics to Address as Part of the Update

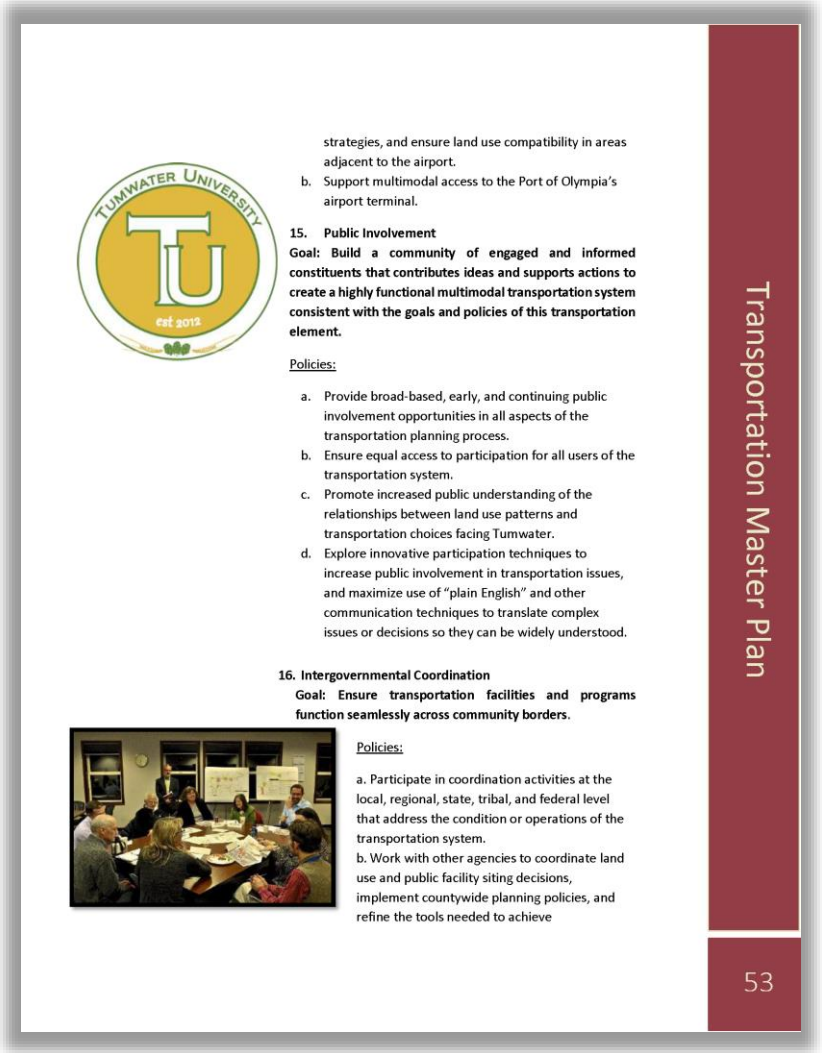
- Revisions to allow for some form of Intercity Transit turnarounds on Littlerock Road and Old Highway 99 to allow for future transit services
- Update to include work done on the Thurston Thrives walkability study, Intercity Transit studies, and the Old Highway 99 Corridor Study
- Allow active transportation facilities, transportation demand management, or public transportation services to meet concurrency
- Incorporate equitable implementation
- Estimate multimodal level of service impacts to state transportation facilities
- Add impact fee revenue for bike and pedestrian facilities
- Provide multimodal level of service and needs forecasts for arterials, transit routes, and active transportation facilities
- Give priority to the greatest multimodal safety benefit to each category of roadway users
- Include Americans with Disabilities Act transition plan
- Provide funding analysis that includes state transportation facilities

New Requirement: Incorporate Environmental Justice

Special consideration for environmental justice in goals and policies (E2SHB 1181)

Structure of Current Transportation Master Plan

1. Introduction
2. Vision
3. Sub-Area Plans
4. Consistency
5. Modes of Travel
6. Managing Demand
7. Future Conditions
8. Goals and Policies
9. System Inventory
10. System Performance
11. Capital Improvements
12. Funding
13. Opportunities & Needs


strategies, and ensure land use compatibility in areas adjacent to the airport.

b. Support multimodal access to the Port of Olympia's airport terminal.

15. Public Involvement

Goal: Build a community of engaged and informed constituents that contributes ideas and supports actions to create a highly functional multimodal transportation system consistent with the goals and policies of this transportation element.

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Policies:

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b. Work with other agencies to coordinate land use and public facility siting decisions, implement countywide planning policies, and refine the tools needed to achieve

Current Transportation Master Plan

Link to current Transportation Master Plan:

https://www.ci.tumwater.wa.us/home/showpublisheddocument/12124/637225343085330000

Commerce Transportation Guidance Materials

- Your Community's Transportation System (2012)

Next Steps

- Advertise RFQ to bring a consultant on board
- General Government Committee briefing January 10, 2024

Comments and Contact information

Written comments are welcome at any time during the periodic update process and staff will address and publish all formal comments

City of Tumwater Contact:

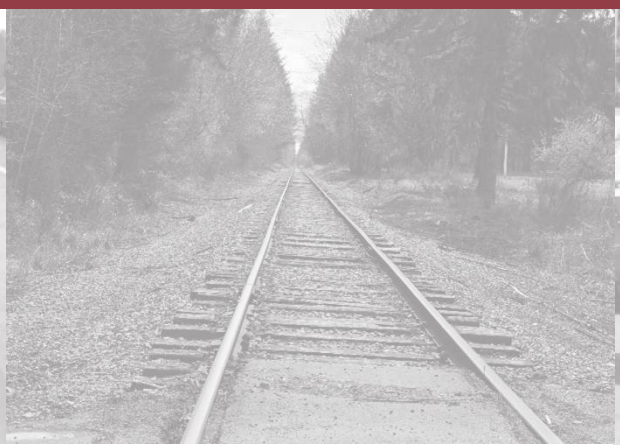
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- The periodic update email is compplan@ci.tumwater.wa.us
- All documents related to the periodic update will be located on the City's periodic update webpage

Atttachment C

Tumwater City Plan 2036
Transportation Master Plan







November 2016

CITY OF TUMWATER

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ACKNOWLEDGEMENTS

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The City wishes to thank all of the members of the Tumwater community City Council, Planning Commission and City staff who took the time to review and comment on drafts of the Transportation Master Plan.

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Transportation Master Plan

CHAPTER 1

INTRODUCTION

INTRODUCTION

Long-range plans result from a civic discussion about the kind of place a community wants to be in the future; they offer a roadmap for how to get from “here” to “there.” By their very nature, long-range plans take time to mature. Much like a tree, it can take many years for things described in long-range plans to come to fruition.

That is true with Tumwater’s long-range planning efforts and it influences the shape of this Transportation Plan. The seeds of ideas planted in Tumwater’s Comprehensive Plan in the 1990s are bearing fruit.

There are many more miles of sidewalks and bike lanes today than ever before, and Tumwater elements of the regional trail system are taking shape. Much of the city is served by transit, including premier 15-minute service on Tumwater’s urban corridors. Coordination of land use and transportation decisions is resulting in more people living where real travel choices exist, where people can easily keep household travel costs down by not having to drive so much. Street and intersection design is making it safer and more reliable to travel by car, bike, and foot. Technology upgrades have brought the city’s signal system into the 21st century while demand management programs are taking vehicles off our streets during the busiest times of the day. Kids are walking to school in larger numbers than we’ve seen in decades.



Tumwater is a different place in 2016 than it would have been without the policy directions established in that first Comprehensive Plan. We've been slowly but steadily changing course from the purely car-dependent city patterns that dominated our 20th century development to patterns that better support our 21st century needs and values. We've made some gains, and we better understand some challenges we face than we did back then. We have a lot of work to do but we're certainly not starting from scratch.



This Transportation Plan, Tumwater's fourth since passage of the Growth Management Act (GMA) in 1990, picks up where the planning horizon of that very first plan left off. It continues the fundamental policy framework set into place with that first Comp Plan, and is consistent with that of our neighboring communities and regional partners. What do the next 20 years hold? That is what this Plan will shape.

"…establish more walkable, people oriented neighborhoods…"

- This plan continues long-term efforts to establish more walkable, people-oriented neighborhoods that expand upon the array of lifestyle options and travel choices available in the City while reducing impacts on existing neighborhoods and rural lands.
- It takes as an integral assumption that our local transportation system is made up of a network of streets and roads, transit, sidewalks, bike lanes, and trails that all work together as part of one system. It is built on the assumption that investments should make the system safer for all users and more efficient for all modes of travel, and that we should keep life cycle and operating costs as low as possible.
- It continues to support the critical role that transportation plays in fostering and maintaining a strong and resilient economy in Tumwater, promoting the cost-effective and reliable transport of employees to jobs, customers to services and retail, and goods into and out of our city and onto store shelves.

- This plan advances policy direction regarding the role of transportation in public health, community character, and environmental stability, as well as overall quality of life.

Transportation policies derived from regionally-coordinated goals and policies underscore the relationship between efforts underway today in the city and broader, longer-term objectives. This provides good context for ensuing sections that describe the existing transportation system, the likely impacts on that system as the city grows, and measures to maintain adequate levels of service. This Plan introduces multimodal levels of service for non-motorized facilities in addition to traditional vehicle-based service standards. Projects are identified that will help the city achieve and maintain its level of service standards over the next 20 years. A financial summary demonstrates that recommendations in this plan are achievable. Finally, it concludes with some strategic initiatives to help further the vision and values embodied in this plan. The initiatives introduced at the end of this plan can be accomplished through annual work program activities, infrastructure investments and coordinated transportation and land use decision-making.

Throughout this plan readers will find examples of the linkage between Tumwater's transportation vision embodied in this Master Plan and associated goals and coordinated strategies. Look for the connection symbol to highlight these examples.

The Appendices include technical analyses supporting the forecast and project recommendations, as well as a briefing paper on multimodal levels of service, and relevant highlights from the Capitol Boulevard Corridor plan and the Brewery District plan that help shape the direction of this Transportation Master Plan.



Transportation Master Plan

CHAPTER 2

VISION

TUMWATER'S TRANSPORTATION VISION

This Transportation Master Plan provides the functional framework for realizing Tumwater's transportation vision:

Tumwater's transportation system provides for the safe, efficient, cost-effective movement of people and goods in ways that support adopted land use plans, enhance neighborhood and community livability, support a strong and resilient economy, and minimize environmental impacts.



Tumwater is employing new Low Impact Development techniques – such as this infiltration baffle shown under construction on Linderson Way – to reduce the effects on the environment of stormwater runoff.

Tumwater's Transportation Master Plan supports many of the City's Strategic Priorities, especially those related to transportation:

Create and Maintain a Transportation System for All Modes of Travel *¬ Construct an inter-connected bicycle and pedestrian system, including developing improved neighborhood connections and enhancing overall bicycle and pedestrian safety – Design and build the E Street Connection – Improve street and sidewalk maintenance – Complete the Tumwater Valley Trail – Explore and utilize lower cost pedestrian facilities (e.g., asphalt paths) as a transition to permanent and long-term facilities (City of Tumwater Strategic Priorities 2017-2022).*

"Create and Maintain a Transportation System for All Modes of Travel …"

This Plan provides the implementation framework for City priorities such as redevelopment of the Olympia Brewery and revitalization of the Brewery District, transformation of Capitol Boulevard from an old highway corridor to a vibrant, people-oriented, walkable district of interconnected neighborhoods and neighborhood-serving businesses, and continuing evolution of the Littlerock sub-area into a regionally-significant center of commerce. It supports the City's commitment to increased "active travel" options that ensure walking and biking are viable choices for more people for more of their trip purposes. It builds on earlier work to enhance and maintain a transportation system that meets the needs of the City today and into the future.

















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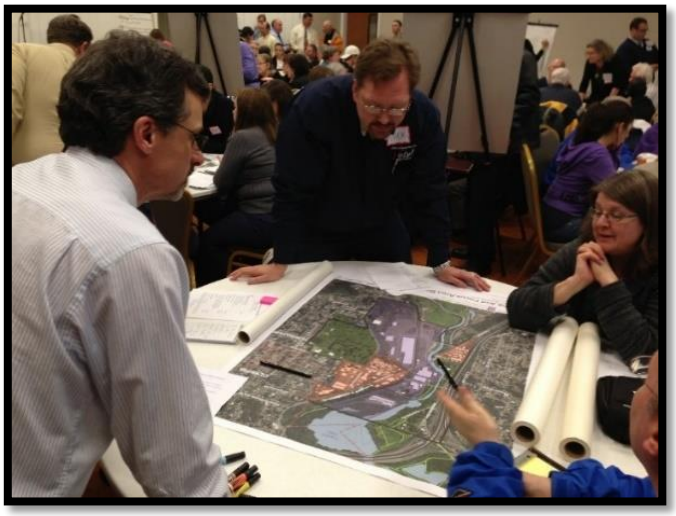
Transportation Master Plan

CHAPTER 3

SUB-AREA PLANS

Sub-Area Plans Incorporated into the Transportation Master Plan

Tumwater's Transportation Master Plan serves as the transportation element of the Comprehensive Plan. It includes the required traffic analyses and discussions that inform the Plan's policies and recommendations. It serves an important function beyond that plan, though. It incorporates the important policies and recommendations generated by on-going studies and sub-area plans. Several older plans – such as the Black Hills Sub-area Plan and the Littlerock Road Sub-area Plan – have shaped the City's development over the last ten years or longer. Since completion of the last Comprehensive Plan update, additional sub-area plans have been completed that are shaping the content of this Master Plan.



For over two decades, Tumwater has built on its accomplishments to achieve better alignment between its vision and on-the-ground realities. Its success is attributed in large measure to consistency and coordination between the long-range Transportation Plan and other city planning products.

Tumwater works to translate the community's vision into area-specific implementation and strategic plans; these plans evolve as conditions mature in these areas and as implementation moves to the next stages. Steady progress in implementing recommendations from these sub-area plans means that they are not static like the Comprehensive Plan. They are modified and revised as needed to support the implementation process, evolving much more frequently than the Comprehensive Plan itself.

Each sub-area plan is consistent with the overall land use vision put forward in the Comprehensive Plan; the Transportation Master Plan identifies transportation policies and investments that support those sub-area plans. Adopting those plans by

reference into the Comprehensive Plan enables them to provide nimble, adaptive guidance to the overall planning process, ensuring that the City's transportation policies and investments fully support the needs of these more detailed implementation plans while maintaining consistency with this Master Plan.

Brewery District Plan

The Brewery District Plan is intended to transform the Brewery District into a vibrant, mixed use, walkable area supporting a mix of local businesses and residential neighborhoods. The work built on analysis conducted by Tumwater in 2011 on revitalizing the former Olympia Brewery.

The Brewery District includes the former Olympia Brewery and the triangle of streets formed by Custer Way, Cleveland Avenue, and Capitol Boulevard. The district extends north to the Sunset Life property and south to E Street. Implementing the Brewery District action plan is a priority in the City's Strategic Plan.

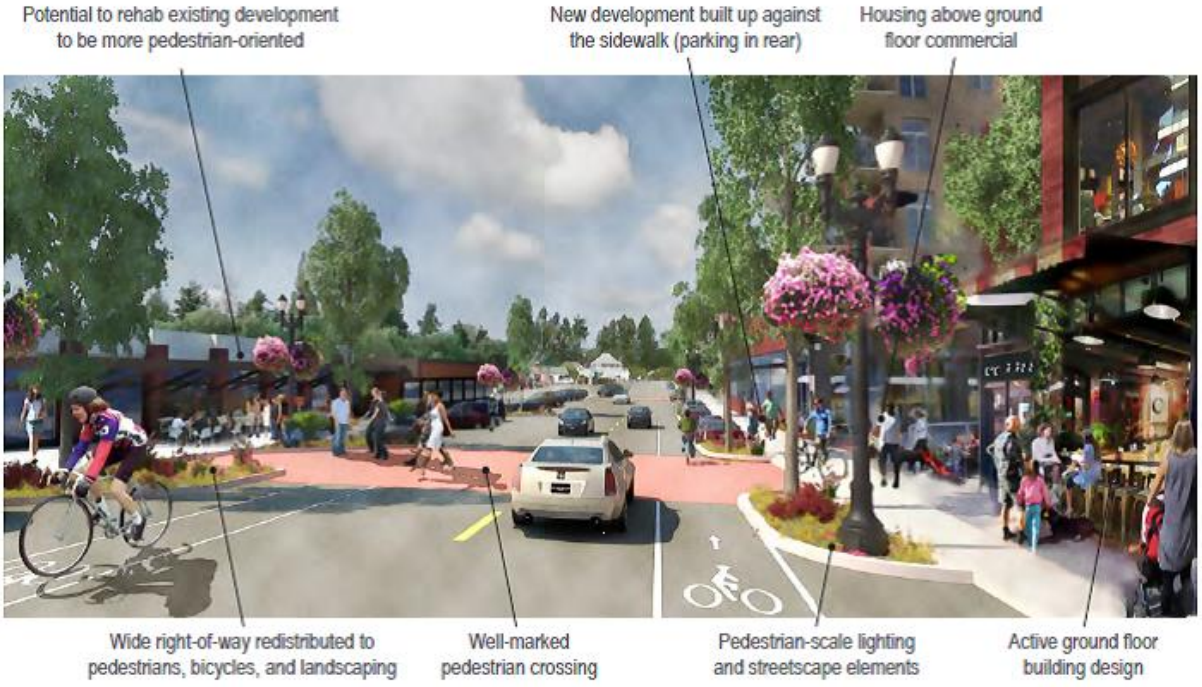
The Brewery District study identified the tools and opportunities needed to revive this historic part of Tumwater. Recommendations from the action plan are included in this Master Plan; they are informing the City as we implement design standards and development regulations. Highlights of



the plan that are relevant to this Transportation Master Plan can be found in Appendix D. The complete report as well as the implementing regulations resulting from the plan can be found at http://www.ci.tumwater.wa.us/departments/community-development/long-range-planning/brewery-district

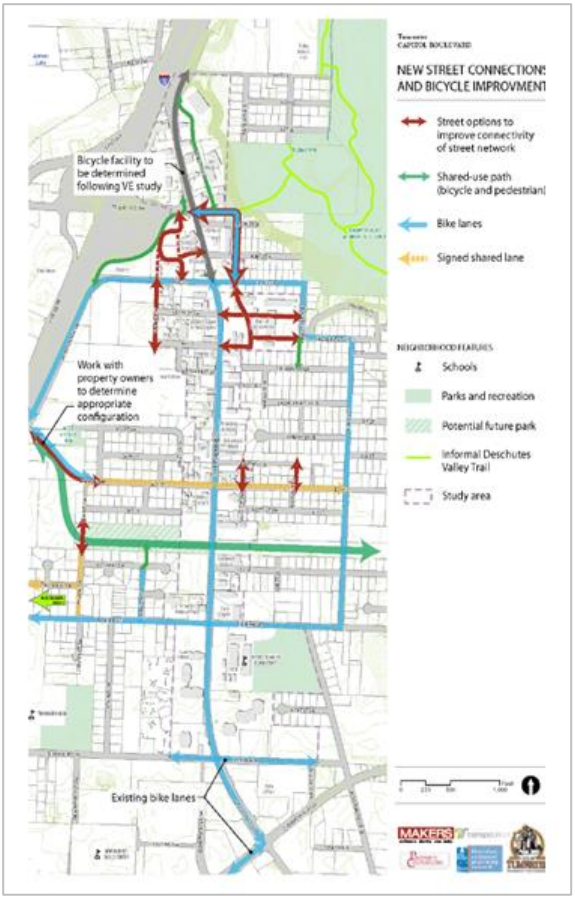


Figure 3.4: A road diet on Cleveland Avenue will include adding bicycle facilities, widening sidewalks, and installing street trees and stormwater facilities. The calmed streetscape allows easier pedestrian crossings and creates a more welcoming environment for mixed-use (re)development along the "main street".



CAPITOL BOULEVARD CORRIDOR PLAN

The Capitol Boulevard Corridor Plan will stimulate the transformation of Capitol Boulevard between Southgate and Israel Road from an old federal highway route to a lively, mixed-use corridor. The goal of the effort is to improve the economic climate in the area and promote redevelopment along the corridor, improve the aesthetic appeal of the corridor, and improve safe and efficient travel choices for walkers, cyclists, transit riders, and motorists. Neighborhoods along the corridor engaged in the work by completing surveys, participating in workshops and meetings, and offering ideas and comments. Transformation of the corridor was identified as a priority item in the City's Economic Development Plan and the City's Strategic Plan.



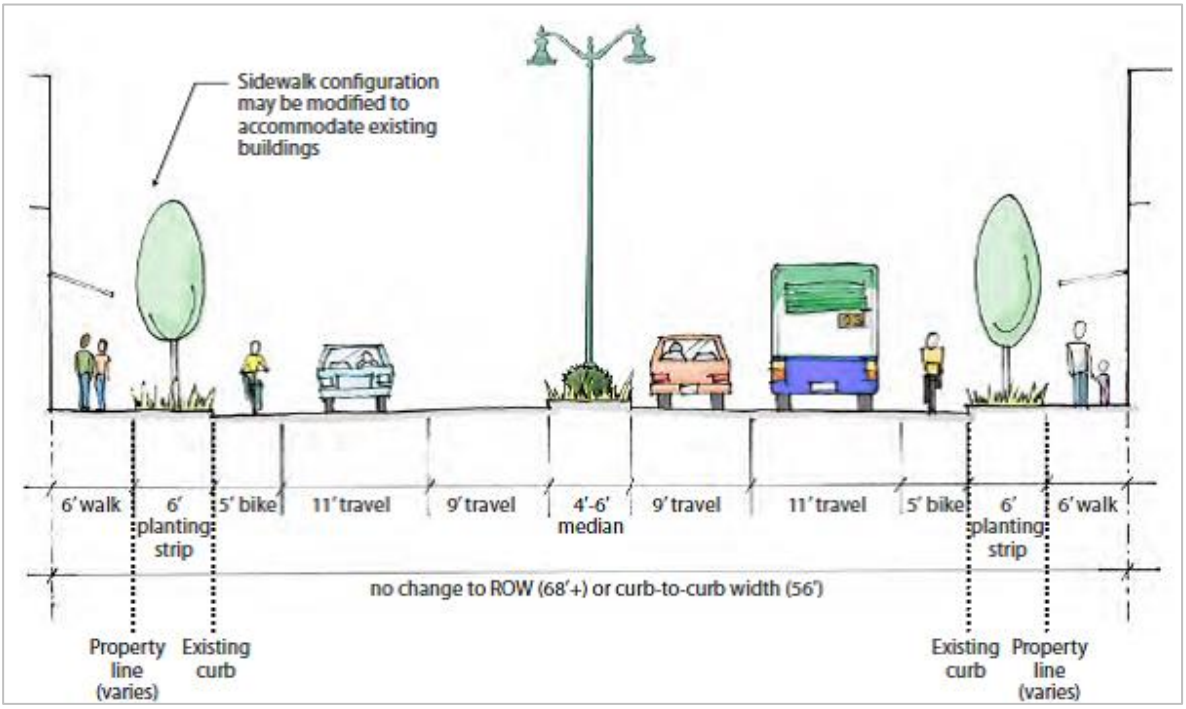
Transportation directives for this corridor provided parameters for the planning work. They included:

a. Reduce congestion growth
b. Provide for pedestrian and bicycle connectivity
c. Improve neighborhoods
d. Beautify the corridor
e. Mitigate new development impacts

These directives were accompanied by seven principles that informed the range of strategies considered and the resulting recommendations:

f. Added travel lanes to quell congestion is neither feasible or desired
g. A parallel street system should be pursued
h. Ensure traffic operations help prioritize premium transit
i. Enhance streetscape at major intersections and crossings
j. Integrate and enhance bus stop facilities
k. Establish parallel and intersecting bike network
l. Establish parallel and intersecting walking routes

Recommendations for transformation include access management that restricts left turn movements, roundabouts to facilitate u-turns, enhanced pedestrian crossings, wider sidewalks and buffers, and the repurposing of existing right-of-way to add bike lanes in each direction without having to reconstruct the street. Resulting traffic will be safer and flow smoother, access to corridor businesses will be enhanced, and the corridor will be more conducive to cycling, walking and transit as the plan is implemented.



Implementing regulations including the design guidelines and zoning have already been adopted. Work is underway now on the preliminary design and engineering work. Recommendations from the Capitol Boulevard Corridor plan are included in Appendix C of this Master Plan and are incorporated as appropriate in the project list. The full plan and its implementing regulations can be found at http://www.ci.tumwater.wa.us/departments/community-development/long-range-planning/capitol-boulevard-corridor-plan

Transportation Master Plan

CHAPTER 4

CONSISTENCY

Consistency with Countywide Planning Policies

Tumwater is required under GMA to ensure its planning process is consistent with adopted Countywide Planning Policies. Countywide Planning Policies (CWPP) are developed collaboratively between Tumwater and all the other jurisdictions in Thurston County to govern development of local comprehensive plans. The primary purpose of the CWPP is to ensure consistency between the comprehensive plans of jurisdictions sharing a common border or related regional issues. They also play an important role in facilitating the transformation of local governance in the unincorporated urban growth area as it is annexed or incorporated into a city, so that urban services are provided by cities and rural and regional services are provided by the county.

The first CWPP in the Thurston Region were adopted in 1992 and most recently amended in November 2015. Most of the CWPP pertain to other aspects of long-range planning but there are policies specific to transportation. This Transportation Master Plan is consistent with and works to implement these policies.

IX. TRANSPORTATION (Countywide Planning Policies, adopted November 2015)

9.1 Increase transportation choices to support all ranges of lifestyles, household incomes, abilities, and ages.

9.2 Increase opportunities for riding transit, biking, walking, ridesharing, allowing and encouraging flexible work schedules, and teleworking.

9.3 Encourage efficient multi-modal transportation systems that are based on regional priorities and are coordinated with county and city comprehensive plans.

a. Local comprehensive plans will consider the relationship between transportation and land use density and development standards.

b. Local comprehensive plans and development standards should provide for local and regional pedestrian and bicycle circulation.

c. Improved transit service will be based on Intercity Transit's plans, informed by and consistent with the regional transportation plan and local comprehensive plans.

d. Transportation Demand Management plans and programs required by State law will be implemented as a key part of the region's transportation program.

e. Improvements to the regional road network will be consistent with local and regional transportation plans.

f. The regional transportation planning process is the primary forum for setting countywide transportation policy.

9.4 The transportation element of each jurisdiction's comprehensive plan will be consistent with the land use element of that jurisdiction's comprehensive plan.

9.5 The transportation element of each jurisdiction's comprehensive plan will include level of service standards for all arterials and transit routes and services. Each jurisdiction will coordinate these level of service standards with all adjacent jurisdictions. Transit level of service standards will be consistent with Intercity Transit policies.

9.6 Each jurisdiction's transportation element will include an assessment of the impacts of the transportation plan and land use assumptions on the transportation systems of adjacent jurisdictions.

9.7 The transportation elements of comprehensive plans adopted by Thurston County and each city and town in the county will be consistent with the Regional Transportation Plan adopted by Thurston Regional Planning Council, in accordance with the provisions of the Washington State Growth Management Act.

9.8 The Regional Transportation Plan adopted by Thurston Regional Planning Council will be consistent with the land use elements of comprehensive plans adopted by Thurston County and the cities and towns within Thurston County and with state transportation plans. To ensure this, the Regional

Transportation Plan will be reviewed and updated, if necessary, at least every two years for consistency with these plans.

9.9 All transportation projects within Thurston County that have an impact upon facilities or services identified as regional in the Regional Transportation Plan will be consistent with the Regional Transportation Plan.

9.10 Local and regional transportation plans will consider maritime, aviation, and rail transportation as an integral link to the area's regional transportation needs.

Regional Consistency and Coordination

Tumwater's long-range transportation planning must be consistent with the Regional Transportation Plan, or RTP. The RTP is developed and maintained by Thurston Regional Planning Council (TRPC). It provides the primary policy framework for overall transportation system considerations at the local, regional, and state levels. All jurisdictions and other service partners in Thurston County work closely with TRPC at various stages throughout the long-range planning and forecasting process to ensure consistency with the RTP. This includes collaboration and agreement on:



- long-range growth and land use assumptions used to estimate future travel demand, among other things;
- level of service standards and times of "peak period" analysis;
- constraints such as limits to street widening; and
- overarching transportation system goals.

Consistency with the Regional Transportation Plan ensures consistency with applicable state and federal transportation planning requirements.

Starting in the late 1990s, regional collaboration and coordination resulted in a single coordinated growth forecast and travel demand model for use by all jurisdictions in the Thurston Region to evaluate the aggregate effects of growth and system improvements on future transportation needs. Previously, each jurisdiction developed its own growth and travel demand forecasts which were evaluated independently for regional consistency. Since 2000, consistency between local and regional analysis has been built right into the planning process.

Several significant regional initiatives are incorporated into the RTP and reflected in this plan, including:

- **Urban Corridors Task Force Recommendations** – The Urban Corridors Task Force worked to establish an objective understanding of background conditions along the region's key urban corridors including Capitol Boulevard, identified barriers to achieving adopted land use visions, and identified potential opportunities for addressing those barriers. Task Force members looked at the relationship between transportation and land use in these corridors, and worked to understand the market factors that influence the viability of infill and redevelopment projects in the region. That work helped inform Tumwater's focus on Capitol Boulevard and the Brewery District. For information on the Urban Corridors Task Force work and the resulting activities of the Corridor Communities Partnership, visit: http://www.trpc.org/173/Urban-Corridor-Communities

Tumwater's vision for the Brewery District and Capitol Boulevard are tangible applications of the principles and values inherent in the Urban Corridors Task Force recommendations. Reclaiming the old Capitol Way / Capitol Boulevard highway corridor and repurposing it as the transit-rich backbone of a 21st century urban community offering an array of car-lite lifestyle options supported by vibrant local businesses is at the heart of the two active subarea plans shaping the Brewery District and the Boulevard today.



- **Sustainable Thurston (Regional Sustainability Plan) –** This community-wide conversation was the first region-wide discussion since passage of the Growth Management Act about how to create a vibrant, healthy and resilient future for the Thurston region. It resulted in a vision endorsed by Tumwater and other communities across the region as well as the actions and responsibilities necessary to achieve it. For more information on Sustainable Thurston, see: http://www.trpc.org/259/Sustainable-Thurston



Tumwater's vision for future growth links directly back to key tenets of Sustainable Thurston's livability principles. This includes:

Providing more transportation choices that decrease household travel costs, promote active lifestyles and public health, reduce greenhouse gas emissions, improve air quality, and reduce dependence on foreign oil

Promoting equitable, affordable housing by expanding the availability of location-efficient housing on transit-rich corridors

Enhancing economic competitiveness with reliable and efficient access to jobs and good mobility for goods and services

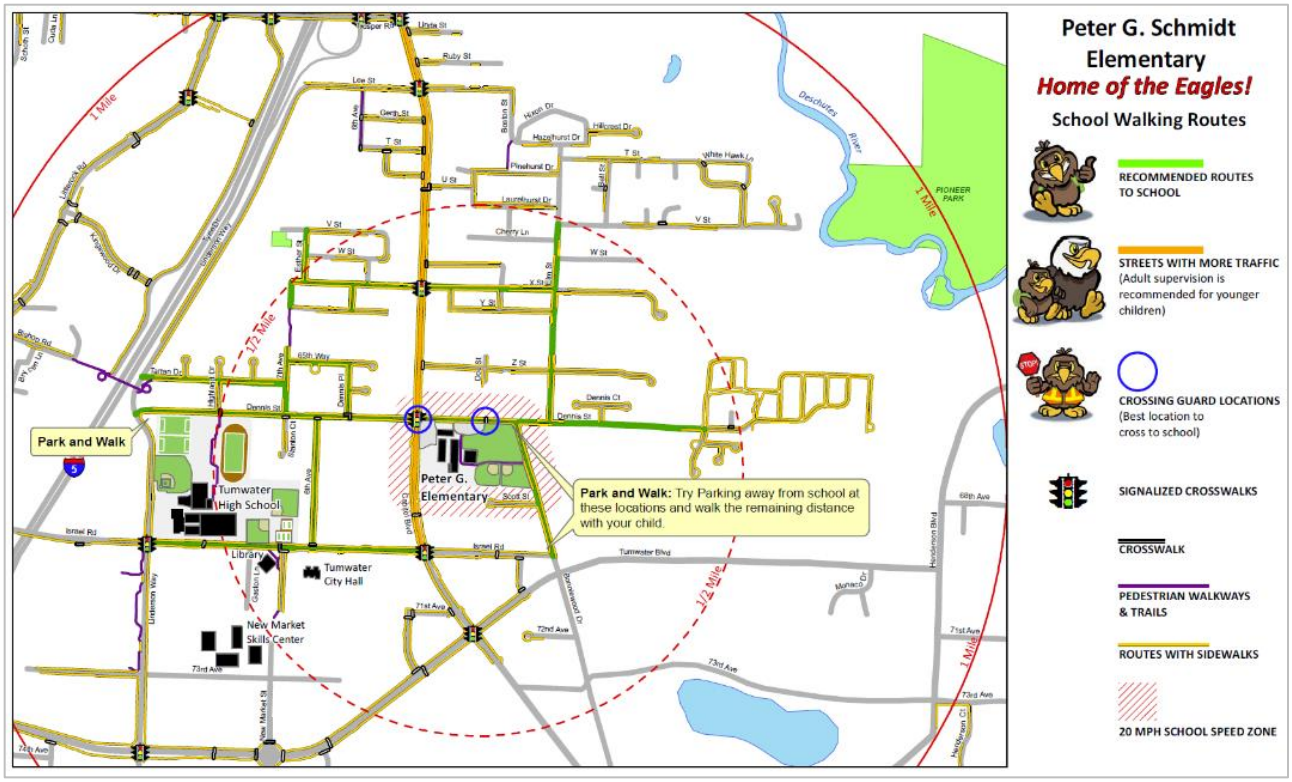
Supporting existing communities with strategies for infill and redevelopment that increase car-lite lifestyle opportunities while reducing pressure on existing neighborhoods and rural and resource lands

Coordinating policies and investments to better align the community's vision with day-to-day implementation activities and leverage available funding resources to get maximum value for the investments

Valuing neighborhoods and communities by investing in healthy, safe, walkable places supporting a variety of lifestyle choices

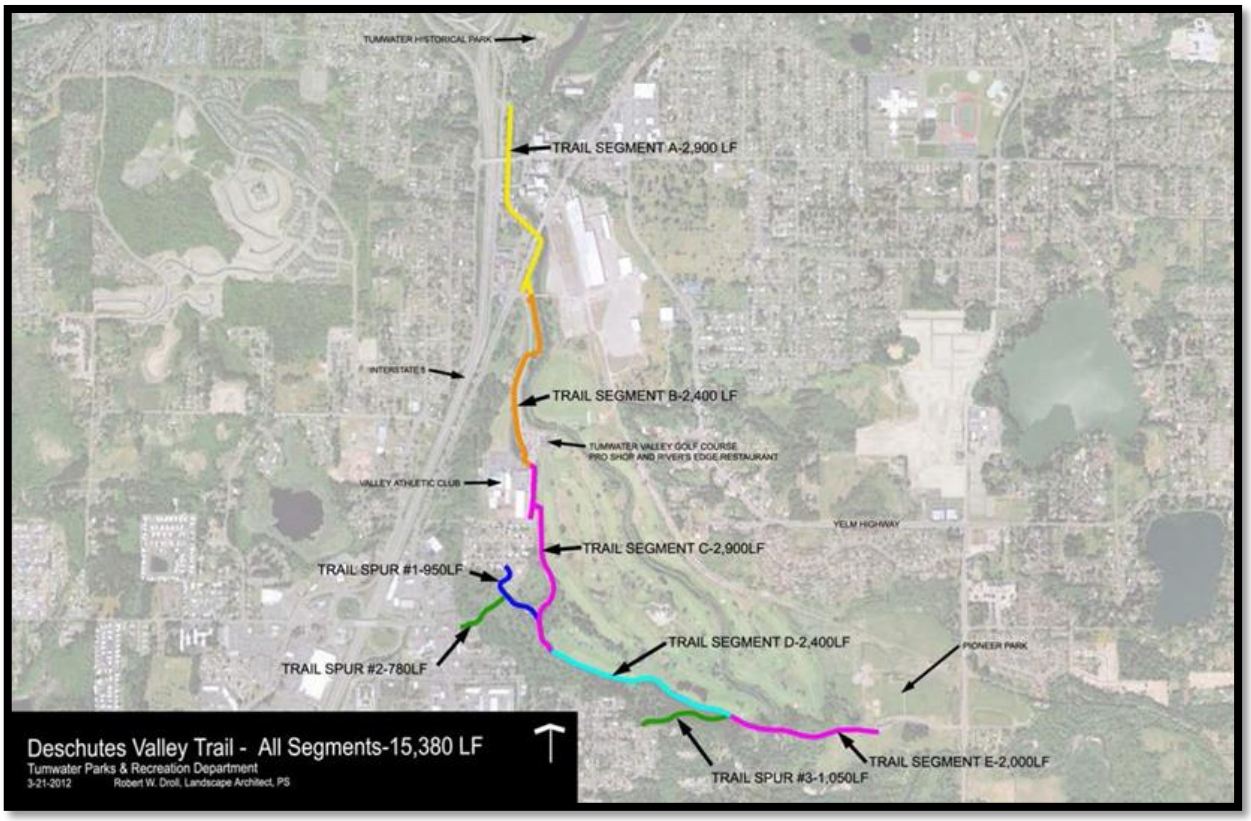
Tumwater is a founding signatory of the Healthy Kids – Safe Streets Action Plan. Two of the region's most active schools participating in the Walk and Roll Program, the centerpiece of the Action Plan, are Michael T. Simmons and Peter G. Schmidt elementary schools in Tumwater. Tumwater's new multimodal level of service approach puts a priority on completing sidewalk networks in the vicinity of schools to create a safe walking environment for school children

- **The Healthy Kids-Safe Streets Action Plan –** This initiative encourages kids to walk, bike, and bus to school by promoting physical activity and safety through education and encouragement programs, development and implementation of school siting criteria, and coordination of infrastructure improvements around schools. Tumwater embraced this plan with its support of Walk and Roll programs at Peter G. Schmidt and Michael T. Simmons schools. For more information on the Healthy Kids-Safe Streets Action Plan and the Walk-and-Roll Program, see: http://www.trpc.org/337/Walk-and-Roll-Program



- **Regional Trails Plan –** Establishing a comprehensive, well-connected non-motorized trail network that links all corners and communities in the region is a regional priority that is strongly supported by Tumwater. Efforts underway now on the Deschutes Valley Trail and the Black Lake-Belmore Trail are moving Tumwater's segments of this trail system to reality. A copy of the complete Regional Trails Plan can be found at http://www.trpc.org/DocumentCenter/View/928

Tumwater's vision of connecting Pioneer Park to Capitol Lake via the Deschutes Valley Trail is consistent with the Regional Trails Plan. This important linkage in the regional system will enhance connectivity to the regional trail system for Tumwater residents. Another important link in the regional trail system is located in Tumwater's urban growth area. The Gate-Belmore trail, currently being developed by Thurston County, will extend from the vicinity of the Black Lake Elementary School to the southwest corner of Thurston County near the Chehalis Reservation via an abandoned rail corridor



- **Intercity Transit -** The future role of transit in serving the transportation needs of the City and surrounding area is a regional priority. Tumwater supports Intercity Transit's strategic plans and continues to coordinate with the agency to identify how transit needs should be addressed, particularly as infill and redevelopment occurs along the urban corridors and within the City's planning sub-areas. Tumwater involves Intercity Transit in the development review process and future planning efforts to ensure that the goals of the City and Intercity Transit related to transit are being met.

Tumwater's vision for the Brewery District and Capitol Boulevard is dependent on robust, high-frequency transit service. Tumwater and Intercity Transit are partnering on a redesign of the Tumwater Transit Station on Cleveland Avenue with a long-term goal of relocating the existing station to a more efficient location on Capitol Boulevard. IT service to the state office buildings provides a critical component of the City's commute trip reduction strategy



CONSISTENCY WITH STATE TRANSPORTATION PLANS

The Washington State Department of Transportation (WSDOT) establishes planning priorities through its statewide and modal plans. As the Regional Transportation Planning Organization for the region, TRPC carefully monitors those planning priorities and works to ensure they are appropriately considered in the region's long-range plan and policies. Tumwater's close coordination and consistency with TRPC plans and policies ensures the City's Transportation Master Plan is also in line with those state guidelines.

The following transportation policy goals of the Washington Transportation Plan are addressed throughout the goals and policies in this plan, and its recommendations.

Preservation. Maintain, preserve, and extend the life and utility of prior investments in transportation systems and services.

Safety. Provide for and improve the safety and security of transportation customers and the transportation system.

Mobility. Improve the predictable movement of goods and people throughout Washington State.

Tumwater policies and investments support statewide transportation planning priorities. One of the most difficult challenges – ensuring adequate preservation of the existing system – was directly addressed through the 2015 Transportation Benefit District package approved by Tumwater voters. This new locally-determined funding source will enable the City to optimize its pavement preservation program over time and keep lifecycle costs as low as possible

Environment. Enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment.

Stewardship. Continuously improve the quality, effectiveness, and efficiency of the transportation system.

Economic Vitality. Promote and develop transportation systems that stimulate, support and enhance the movement of people and goods to ensure a prosperous economy.

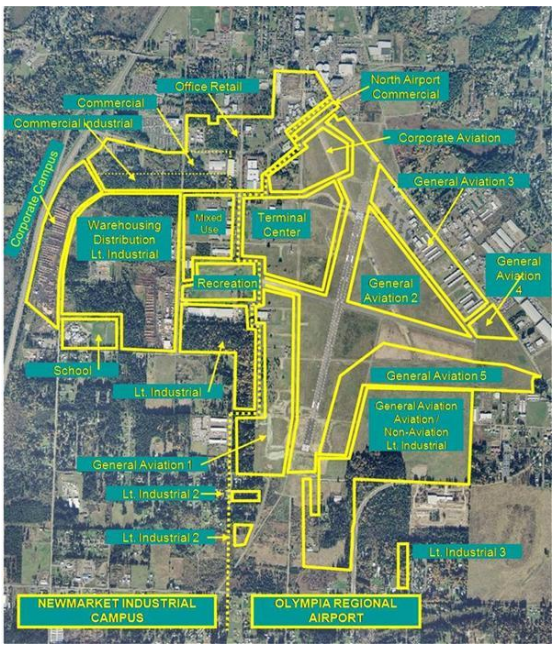
<u>Results WSDOT</u> is a recent initiative that promotes:

- *Strategic Investments*
- *Modal Integration*
- *Environmental Stewardship*
- *Organizational Strength*
- *Community Engagement*
- *Smart Technology*

Tumwater's Transportation Master Plan is consistent with and supportive of WSDOT

INTERGOVERNMENTAL COORDINATION

Coordination between government agencies is a key tenet of the Growth Management Act. The transportation element must describe ***"intergovernmental coordination efforts, including an assessment of the impacts of the transportation plan and land use assumptions on the transportation systems of adjacent jurisdictions."*** This requirement makes good sense; Tumwater cannot develop a realistic plan for its growth without considering its impacts on adjacent communities and their impacts on Tumwater. Much of that coordination occurs at the regional level through TRPC, of which Tumwater is an active member. This Transportation Master Plan is the product of regional coordination, from population and employment forecasts to a unified regional modeling platform to coordinated corridor studies and development reviews. Tumwater's plan reflects the growth and investments anticipated in Olympia and Thurston County; in turn, its own growth and investments are reflected in their plans and strategies.



As a part of its intergovernmental coordination, Tumwater works closely with the Port of Olympia. The Port owns a significant amount of land in the city, where its airport is located alongside hundreds of acres of industrial property. The Port completed in 2016 its New Market Industrial Campus Real Estate Master Plan which provides a blueprint for how these industrial properties will develop over time. Tumwater participated in that planning process and will be active in the plan's implementation.

Another example of Tumwater's intergovernmental coordination related to transportation is its close working relationship with Intercity Transit. From including IT in its development review process and planning activities to its partnership with IT in redesigning the Tumwater Transit Station on Cleveland Avenue and identifying a location for a new park-and-ride facility, Tumwater works to maintain a close working relationship with its transit partner.

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Transportation Master Plan

CHAPTER 5

MODES OF TRAVEL

PLANNING FOR ALL MODES OF TRAVEL

Tumwater understands that the transportation system is more than just streets; its transportation system is made up of streets as well as transit, sidewalks, walkways, bike lanes, trails, highways, rail corridors, and the airport. It accommodates not just car drivers, but transit riders, walkers, cyclists, and freight. The transportation system is made up of a series of intersecting networks that ensure people and goods get to where they need to be. This is what is meant by a "multimodal" transportation system – it is one that accommodates the various modes of travel needed to support existing and future land use patterns.

Tumwater has long promoted biking and walking through its plans, policies, and investments. It is reflected in adopted street standards that require bike lanes and sidewalks with new construction. Long before the term "complete streets" became planning jargon Tumwater was committed to providing safe and convenient facilities enabling more people to bike and walk for more of their trips. Tumwater's street standards incorporate many recommendations found in the National Association of City Transportation Officials (NACTO) Urban Street Design Guidelines. Tumwater has applied for and received grants that help complete the bike and sidewalk networks, making them safer and more convenient for travelers.

In the City's 2015 Community Survey, over half the respondents identified the need for more transportation choices - connected, walkable, bike-able streets and transit that offer reliable, economical travel options that decrease household transportation costs, reduce dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health. Tumwater policies and standards are working to meet that need.

Tumwater works to leverage those complete streets with "complete neighborhoods" offering a mix of different activities close to each other, the kinds of neighborhoods that generate more walking and biking than occurs with traditional residential neighborhood or commercial development. This is a goal of the Brewery District and Capitol Boulevard Corridor strategies – to create the kind of places where driving is but one good option for getting between Point A and Point B.

These sub-area plans enable Tumwater to further align its commitment to a multimodal transportation system by expanding its approach to evaluating system performance. This Master Plan introduces the concept of multimodal system performance to explicitly consider how the sidewalk and bike

networks function in different parts of the city. In those areas intended to generate a greater share of walk and bike trips – where land use patterns are resulting in more complete neighborhoods offering a mix of activities in close proximity – this new performance measure will allow the City to more effectively evaluate development impacts and opportunities to determine the right mix of facilities to support that development. The chapter on System Performance describes this new approach to evaluating system performance.

Tumwater's policies are translated into guidelines and standards that define the design and relationship of streets and buildings. They are tailored for different parts of the City, and reflect underlying values and priorities in this transportation plan as well as the City's adopted land use strategies. In this way they help implement the Comprehensive Plan vision, providing clear direction to developers about City expectations for pedestrian oriented streets, signature roads, and other types of streets to achieve attractive, walkable, sustainable development that enhances the City's identity. For more details about the considerations and standards governing the design of streets and buildings, please see the Citywide Design Guidelines

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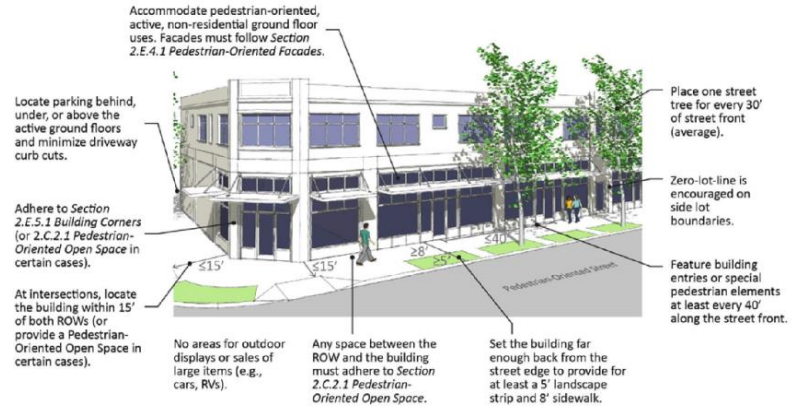


Figure 2.B.1-1. Pedestrian-Oriented Street requirements summary

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Transportation Master Plan

CHAPTER 6

MANAGING DEMAND

MANAGING DEMAND

Managing travel demand is one way to maximize operational efficiency and create more capacity within the existing transportation system. Demand management strategies, as the term implies, are strategies that change the demand for travel – typically lowering the demand for travel during peak congestion periods. Compared to most transportation strategies, demand management involves typically low-cost strategies that take many different forms.

DEMAND MANAGEMENT PROGRAMS

Commute Trip Reduction, implemented at the state level in 1993, requires large employers with 100 or more employees commuting during peak periods and all state agencies regardless of size to reduce the share of trips being made in single-occupant vehicles. This can be done via a myriad of strategies that encourage more commute trips by carpool or vanpool, transit, walking, or biking. Programs like the annual Bicycle Commuter Contest, administered by Intercity Transit since 2005, create awareness about travel alternatives in a fun way that also promotes broader CTR objectives.

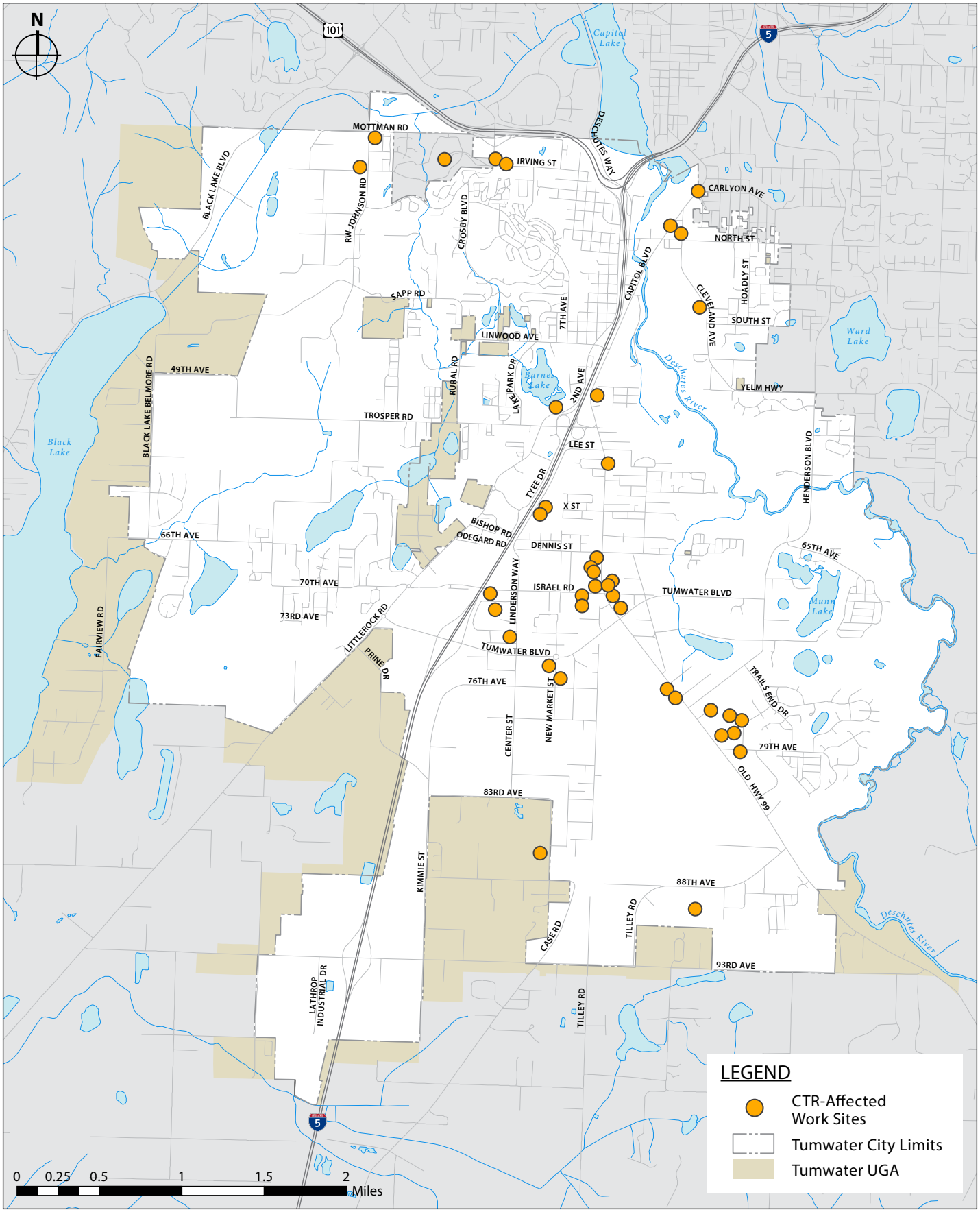
CTR can also include strategies that reduce the number of days an employee has to commute to work, like compressed work weeks that "compress" a five day week into a four day work week, or telework that allows some employees to work from home. It also includes parking pricing that eliminates the financial incentives to drive.

Since 2005, the region's CTR program is administered by TRPC in partnership with Intercity Transit. The CTR program includes 197 active worksites across the region of which 191 must participate and six do so voluntarily. TRPC and IT actively work with local jurisdictions and the State of Washington to improve the program.

Figure 1 shows the location of CTR-affected worksites in Tumwater. Many are located in areas with good transit service.

Details on the CTR program and its implementation in the Thurston Region can be found at: http://www.trpc.org/609/Commute-Trip-Reduction-CTR-101

Tumwater's 2008 Commute Trip Reduction Plan includes goals and strategies that help support regional CTR objectives.



CITY OF TUMWATER
Transportation Master Plan

Figure 1
Location of Tumwater's CTR-Affected Work Sites

School-based programs, like the "Walk & Roll" programs at Peter G. Schmidt and Michael T. Simmons elementary schools help reduce traffic congestion in the vicinity of schools created by parents dropping off or picking up their children. Intercity Transit leads these programs with federal funding from TRPC for this purpose. These innovative programs encourage kids to walk or bike to school more often, which also has health and learning benefits. Program components include field trips, school assemblies and special events, and school-wide "Bike and Walk to School" days. The intent of this award winning program is to build the next generation of safe and healthy bikers, walkers, and transit riders.

Parking management is another tool that Tumwater and many of its employment sites use to manage travel demand. Limiting the amount of parking that can be built, restricting the location of that parking on a building site, and even charging for the use of that parking can influence whether people decide to drive alone or travel differently. Details like locating carpool parking or bike parking closer to building entrances than general parking can help influence how some people travel.



IT's Vanpool Program is celebrating its 34th year of service in 2016. IT's 214 vanpools are carrying over 1,500 people to and from work on any given weekday. This helps free up street and highway capacity and makes the entire transportation system operate more efficiently.

Land use is an important demand management consideration. How communities are built – the proximity of uses within a neighborhood, residential and employment densities, the design of streets and buildings, street connections and infrastructure to support alternatives to driving – all of these are essential determinants in how much traveling people have to do and the choices they have in how they travel.

Traveler Information and Trip Planning Resources

Thurston Here to There is a one-stop resource for information on all different modes of travel and travel needs. Getting from Tumwater to Seattle by transit, planning a bicycle tour of South Thurston County's Bountiful Byways, locating a do-it-yourself bike repair shop, scheduling paratransit services, and figuring out how to take the bus to SeaTac airport – these are just a tiny sampling of the point-and-click resources available on this site, which can be found at http://thurstonheretothere.org/

Rideshare Online is a multi-county effort led by WSDOT and King County Metro. This on-line system, combined with a local database and personal assistance, helps customers identify carpool partners or get into a vanpool as well as evaluate alternate commuting opportunities, primarily in the central Puget Sound area or getting to and from that area. It can be found at www.rideshareonline.com

One Bus Away is an app that provides real-time individual bus arrival schedules so that users can know exactly when the next bus will arrive, thereby minimizing wait times for riders and enhancing the attractiveness of transit as an alternative to driving. It's supported by a consortium of public sector transit agencies and others with the goal of providing robust and real-time transit vehicle location data in combination with transit schedules and other related data. Intercity Transit has been a member of the One Bus Away consortium for several years. A link to the One Bus Away app can be found in the top right corner of Intercity Transit's home page, www.intercitytransit.com

On-Line Bike Maps maintained by Thurston Regional Planning Council allows users to customize their routes, perhaps avoiding certain intersections during the morning commute or maximizing distance traveled on dedicated trails instead of on-street facilities. On-line bike maps can be found at http://www.trpc.org/181/Online-Bike-Maps

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Transportation Master Plan

CHAPTER 7

FUTURE CONDITIONS

PLANNING FOR THE FUTURE

One of the great values of a long-range plan is in setting a course for how the City will grow over time. Many issues Tumwater grapples with today result from decisions made in the first half of the 20th century that differ from the values, needs, and priorities of the City's 21st century residents and businesses. Instead of simply settling for outdated land use patterns that don't afford the kind of lifestyles and travel choices envisioned today, the City is proactively working to change some of the patterns through its sub-area plans and land use policies.

"The vision includes transformation of the Brewery District, Capitol Boulevard Corridor and Tumwater Town Center…"

The City's vision is for the creation of a number of appropriately scaled and well-designed centers that accommodate increased densities and mix of activities. Work underway will result in a small number of truly urban neighborhoods offering a different range of lifestyles than is found in most parts of Tumwater and the Thurston metropolitan area today. The vision includes transformation of the Brewery District, Capitol Boulevard Corridor, and Tumwater Town Center near the airport. In addition, a number of small neighborhood centers are envisioned that will provide basic day-to-day services within walking distance to outlying residential neighborhoods.

Tumwater's land use vision is dependent on a supporting transportation system if it is to succeed. That is why this transportation plan must be consistent with and support the City's vision for how it will grow over time. Growth assumptions associated with the City's long-range vision for its future are the same as those used to estimate future travel needs identified in this Master Plan.

Established community visions combined with zoning, on-the-ground development patterns, and myriad other factors result in a forecast of how the city will grow over the next 25 years. The long-range land use forecast estimates how many people

and jobs Tumwater will have in 2040 and where they will be. The forecast depicts the densities likely to be built over time and the mix of land use activities envisioned in adopted planning policies.

Tumwater's land use forecast is developed and periodically updated in coordination with other jurisdictions in the Thurston region as part of a regional population and employment forecasting process conducted by Thurston Regional Planning Council (TRPC); it takes into consideration growth happening elsewhere in the region and state as well as in the City. Combined with the City's vision for the future, the forecast becomes the basis for the land use element of Tumwater's Comp Plan. The land use element and the forecast on which it is based sets the direction for the Transportation Master Plan.



The table below provides a summary of population and employment projections used to estimate travel demand in Tumwater over time based on its adopted land use policies and regional forecasting assumptions. The land use element of the Comprehensive Plan provides more detail on the geographic distribution of existing patterns and how that is envisioned to change over time.

Table 1: Forecasted 2040 Population and Employment for Tumwater

Forecasts	**2010 (actual)**	2020	2030	2040
Population	**23,720**	30,840	40,150	46,300
City	***17,370***	*22,930*	*28,440*	*32,550*
Urban Growth Area	***6,350***	*7,910*	*11,710*	*13,750*
Jobs	**29,655**	30,325	30,995	31,665

Source:
Thurston Regional Planning Council Population and Employment Forecasts (2013 update). Comprehensive documentation of the entire regional population and employment forecasting process can be found on the TRPC website: http://www.trpc.org/236/Population-Employment-Forecasting. Note that figures do not reflect the annexations completed in 2015, which will shift some share of the population and jobs in the Urban Growth Area into the City, earlier than shown



CHAPTER 8

GOALS AND POLICIES

TRANSPORTATION GOALS AND POLICIES

Transportation goals and policies provide a framework for transportation decision-making. The policy elements in this Plan derive from a regionally-coordinated process and are consistent with the Regional Transportation Plan and Sustainable Thurston, both of which are regional policy initiatives supported by Tumwater. The goals and policies in this Transportation Master Plan support localized efforts while maintaining consistency with established regional objectives and the policy frameworks of adjacent communities.

In 1998, Tumwater and other members of Thurston Regional Planning Council adopted policies recognizing "strategy corridors" where street widening is no longer a suitable option for improving mobility. This may be because the streets are already at a maximum five-lane cross-section, or because they are built out and cannot be widened without significant community disruption, or simply because the facility is at the maximum appropriate width for the adjacent land uses. The preferred solutions for strategy corridors instead will be some combination of non-motorized or transit strategies, signal timing or other operational improvements, completing a street grid that offers a variety of travel routes and land use measures that attract more mixed-use, walkable, high density development where alternatives to driving are most feasible. A map of Tumwater's Strategy Corridors can be found in Figure 3 on page 71.

1. Transportation and Land Use Consistency

Goal: Ensure the design and function of transportation facilities are consistent with and support sustainable, healthy urban, suburban, and rural communities.

Policies:

a. Commit to the development and implementation of land use plans, development patterns, parking requirements, and design standards that encourage walking, bicycling, transit use, and other alternatives to driving alone.
b. Provide transportation facilities that support the location of jobs, housing, industry, and other activities as called for in Tumwater's adopted land use plan.
c. Support policies, programs, and procedures that promote urban infill, and make transportation investments that support increased urban densities and mix of uses consistent with Tumwater's plans for the Brewery District and Capitol Boulevard.
d. Create vibrant city centers and activity nodes that support active transportation and housing, jobs, and services as called for in Tumwater's Comprehensive Plan.
e. Create safe and vibrant neighborhoods with places that build community and encourage active travel.

f. Create urban parks and places that reduce pressure on the region's farms, forests, prairies, and open spaces.
g. Meet mobility, access, and economic goals in designated Strategy Corridors with an appropriate combination of investments, policies, and land use measures.
h. Design and invest in transportation projects that have a lasting positive impact, reflect the goals of the people who live and work in Tumwater, and contribute to a sense of place and community.
i. Ensure adequate transportation capacity to address growth consistent with this Comprehensive Plan.
j. Preserve and promote awareness of Tumwater's historic, cultural, and natural heritages.

2. Multimodal Transportation System

Goal: Work toward an integrated, multimodal transportation system that supports adopted land use plans, reduces overall need to drive, and provides alternative travel choices.

Policies:

a. Provide quality travel choices appropriate to existing and future land uses, including walking, bicycling, transit, motor vehicles including freight, and rail.



b. Ensure that development of transit transfer centers, activity centers, employment centers, schools, and the airport accommodate multiple modes of travel and safe, efficient connections among those modes of travel.
c. Invest in mode-specific strategies that contribute to overall development of an integrated, multimodal transportation system.
d. Promote public awareness on the rights and responsibilities of drivers, bicyclists, and walkers, and ways these modes can travel together safely and efficiently.
e. Incorporate practical design considerations where appropriate, designing to solve mobility problems more so than to meet design standards if doing so

increases functional mobility of the transportation system.

3. Barrier-free Transportation

Goal: Ensure transportation system investments support the special travel needs of youth, elders, people with disabilities, people with literacy or language barriers, those with low incomes, and other affected groups.

Policies:

a. Work over time to ensure that transportation facilities comply with the Americans with Disabilities Act.
b. Construct transit stops and walkway approaches that are accessible for those with differing capabilities.
c. Provide appropriate transportation services, facilities, programs, and on-line resources that reduce barriers to people who do not speak or read English.
d. Present information and provide public participation opportunities for everyone, including people with physical disabilities and/or people with limited literacy skills.
e. Implement land use policies that provide a variety of housing types on corridors with excellent transit service connecting to employment centers, services, retail, health care, and other essential services to support the lifestyles of people who cannot drive.

4. System Safety and Security

Goal: Enhance the safety and security of those who use, operate, and maintain the transportation system.



Policies:

a. Combine education, enforcement, engineering, and evaluation to maintain and enhance system safety.
b. Design transportation infrastructure to encourage safe user behavior.
c. Support projects that improve passenger safety and security at facilities like park-and-ride lots and transit transfer centers.

d. Provide safe walking routes to schools.
e. Retrofit essential transportation facilities where possible to improve their ability to withstand a major earthquake or other natural disaster.
f. Build in system redundancy through a well-connected street grid to support emergency response and reduce community disruption during natural or man-made disasters.
g. Encourage coordination between transportation system providers and emergency response providers who rely on that system.

5. System Maintenance and Repair

Goal: Protect investments that have already been made in the transportation system and keep life-cycle costs as low as possible.

Policies:

a. Prioritize maintenance, preservation, operation, and repair of the existing transportation system.
b. Use preventive maintenance programs to ensure lowest life-cycle costs.
c. Use street restoration standards and coordinate utility and street projects to minimize destructive impacts of utility projects on streets, leveraging where possible investments for both project types to deliver more cost-effective public facilities.
d. Explore innovative programs that reduce infrastructure life-cycle costs or increase efficiency of service delivery, including use of new materials, technologies, and resource partnerships.

In April 2015, Tumwater voters approved a two-tenths of one percent retail sales tax to be devoted to street and sidewalk maintenance. Transportation infrastructure is one of the City's most valuable investments. Inadequate local, state and federal funding had resulted in deferred maintenance which drives repair costs higher. Establishing a Transportation Benefit District with this funding authority helps ensure that over time Tumwater will be able to better preserve and maintain its city streets and sidewalks.

6. Travel Demand Management

Goal: Increase overall operating efficiency of the transportation system through the effective use of measures that reduce the need to drive alone.

Policies:

a. Promote transportation-efficient development and redevelopment, and site public services and facilities where transit, walking, and biking are now or will be viable alternatives to driving alone.
b. Encourage use of public transportation, ridesharing, biking, and walking by improving access, convenience, and reliability of those options.
c. Sustain and expand private and public sector programs and services that encourage employees to commute to work by means other than driving alone, or to change commuting patterns through teleworking, flex-time, or compressed work weeks.
d. Manage parking to improve consistency with transportation demand management objectives.
e. Promote technologies that enable people to meet their needs without having to travel.
f. Use travel demand management techniques to provide alternatives during temporary congestion, such as during major construction.
g. Work to mainstream telework as a primary transportation demand management strategy among public and private employers.
h. Strive to meet State Commute Trip Reduction targets for the City.

As a partner in the regional 'Smart Corridors' project, Tumwater is bringing its traffic signal system into the 21st century with modern technology and protocols that allow coordination with Intercity Transit buses.

7. Transportation Technologies

Goal: Use technology-based approaches to address transportation congestion, safety, efficiency, and operations.

Policies:

a. Use transportation technologies to improve the operating efficiency and safety of the existing transportation system.

b. Use transportation technologies to better integrate transportation modes.
c. Make short-range technology investments that support future technology implementation strategies.
d. Look for opportunity to integrate transportation technology considerations in all projects.
e. Recognize that transmittal of electronic information is an important function of a transportation system, and integrate this into transportation system evaluation, policies, and implementation strategies.

8. Freight Mobility

Goal: Promote efficient, cost-effective, timely, and safe movement of the freight within and through the region.

Policies:

a. Plan for freight access to and from highways and other major freight corridors, and between intermodal facilities and industrial areas.
b. Support efforts to increase the amount of freight that is moved by rail to enhance efficiency, productivity, safety, and mobility.
c. Explore strategies to reduce conflict and optimize safety for all transportation system users where industrial or commercial land uses are adjacent to highly urbanized areas.
d. Implement policies and design standards that support local economic vitality by accommodating delivery trucks serving businesses and services while minimizing impacts on local streets.

9. Streets, Roads, and Bridges

Goal: Establish a street and road network that provides for the safe and efficient movement of people and goods while supporting adopted land use goals.

Policies:

a. Design and construct multimodal, context-sensitive, complete streets and roads.
b. Coordinate regionally to identify new connections that provide more direct routes and reduce vehicle miles traveled.
c. Avoid widening any local arterial or collector more than two through-lanes in each direction with auxiliary turn lanes where warranted (maximum five lanes mid-block width) to preserve an acceptable community scale and minimize transportation impacts on non-motorized travelers and adjacent land uses.
d. Develop an interconnected grid of local streets and roads to increase individual travel options and neighborhood connectivity, while improving efficient use of the overall transportation system.
e. Use new technologies or alternative designs to safely and efficiently manage the flow of traffic, such as roundabouts where appropriate as alternatives to traffic signals or stop signs.
f. Use access management techniques to improve roadway capacity and operating efficiency, and increase overall system safety.
g. Ensure that street, road, and bridge projects are integrated with pedestrian amenities in districts and neighborhoods, and add lasting value to the community.
h. Incorporate alternative strategies to address congestion where road widening and traffic control devices are not suitable, particularly along Strategy Corridors.
m. Strategy Corridors are places where street widening is not a preferred option to address congestion problems. This may be because the street is already at the maximum number of lanes (5), or that adjacent land uses are either fully built out or are environmentally sensitive. In strategy corridors, level of service (LOS) may not meet adopted standards,

Tumwater's plans for the Brewery District and the Capitol Boulevard Corridor incorporate roundabouts as a safe, efficient intersection treatment that reduces impacts associated with signalized intersections on adjacent properties. The Boulevard will integrate roundabout treatments with the use of access management to smooth traffic flow and create safer turning opportunities while improving travel conditions for cyclists and pedestrians.

"Strategy Corridors are places where street widening is not a preferred option to address congestion problems…"

suggesting instead that a different approach is needed for maintaining access and mobility in these areas such as increased transit service, more sidewalks or bike facilities, a complete and connected street grid, transportation technology measures that improve system operating efficiency, access management, parking management, incentives for employees to telework or carpool, or land use measures that increase the density of land use activities in these corridors that support the best alternatives to driving.

i. Design and build streets that are important freight or bus routes to reduce weather-induced weight restrictions.
j. Meet pm peak Level of Service (LOS) standards:
    - LOS E or better in Urban Core Areas [where these areas overlap with Strategy Corridors the LOS may exceed adopted standards]
    - LOS D or better elsewhere inside the City limits

10. Public Transportation

Goal: Provide an appropriate level of reliable, effective public transportation options commensurate with the region's evolving needs.

Policies:

a. Support Intercity Transit's long-range plan emphasizing trunk and primary routes servicing core areas along designated Urban Corridors and other strategy corridors with supportive land use and appropriate design standards.
b. Increase the share of trips made by public transportation.
c. Support regional commuter vanpool programs to provide cost-effective, flexible alternatives to commuting in single-occupancy vehicles.
d. Support safe, convenient, and cost-effective transportation services for youth, elders, people with disabilities, and low-income populations by increasing the supply of housing on high-quality transit corridors.

e. Schedule public meetings where possible in locations served conveniently by transit; include transit route information on meeting notices.
f. Integrate public transportation considerations into the planning for newly emerging urban centers and locations such as those south and east of the airport, including innovative partnerships or programs where fixed-route service is not feasible in the near-term.



11. Bicycling

Goal: Increase the share of all trips made safely and conveniently by bicycle.

Policies:

n. Develop a continuous, safe, and convenient bicycle network that functions as an integral part of the whole transportation system.
o. Provide safe and convenient bicycle routes to all schools in the city, and encourage their use.
p. Participate with regional partners in developing a network of contiguous and interconnected north-south and east-west dedicated shared-use corridors to serve as the backbone for the region's non-motorized transportation system.
q. Provide bicycle parking facilities at transit centers, park-and-ride locations, and other multimodal locations.
r. Provide short- and long-term bicycle parking and other supporting facilities at locations like schools, employment sites, and activity centers.
s. Support education programs for motorists and bicyclists to increase understanding and awareness of bicycling laws, and encourage safe and lawful sharing of the streets.
t. Participate with regional partners in exploring long-term strategies for funding bicycle facilities and services.

While City codes require bike parking facilities with most new construction, some developers are catering to a growing interest in biking by offering even more amenities for resident cyclists. For example, Hearthstone Apartments in the Capitol Boulevard District offers a dedicated bike workshop space for residents. This supports increased bike use within the City's urban core and is an example of market forces aligning with City bike policies.

12. Walking



Goal: Increase the share of all trips made safely and conveniently by walking.

Policies:

a. Provide a convenient, interconnected, safe pedestrian network that supports existing and desired land uses.

b. Construct and maintain safe and accessible sidewalks and effective crossing opportunities within an appropriate distance of every school in the city, and encourage their use.

c. Provide frequent pedestrian crossings, especially in urban areas and on urban corridors, along transit routes, and near activity centers.

d. Develop and promote non-motorized connections for pedestrian and bike travel to shorten the length of trips to destinations where walking and biking are viable travel options.

e. Require pedestrian-friendly site design and building standards in activity centers, along urban corridors and other key transit routes, and in high density mixed-use zoning districts.

f. Provide street lighting, pedestrian buffers, trees, benches, and other street elements that make walking safe and pleasant.

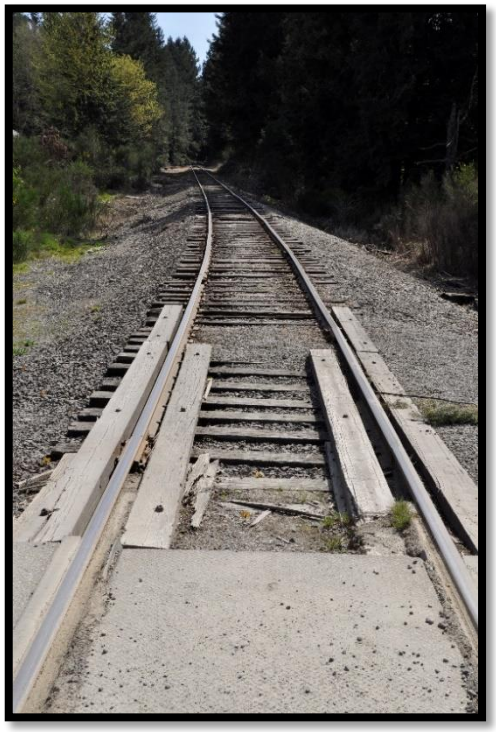
g. Encourage neighborhood-scale planning efforts to identify and refine important pedestrian routes that increase connectivity and improve walkability.

h. Consider asphalt walkways as appropriate practical solutions for sidewalks when functional pedestrian mobility needs to be improved prior to the availability of adequate funds for construction as called for in adopted sidewalk and street design standards.

Tumwater partners with the Tumwater School District and Intercity Transit to support "Walk and Roll" programs at area elementary and middle schools. These programs work with educators and school administrators to encourage children to walk and bike to school. This includes coordinated education and enforcement activities as well as a focused response to infrastructure needs in the vicinity of schools to make it safer and easier for students to walk to school.

13. Rail

Goal: Ensure the continued long term viability of existing and rail-banked rail lines for future freight and passenger rail travel.



Policies:

a. Support appropriate regional opportunities for the potential shared use of freight rail lines for passenger rail travel.
b. Advocate for regional acquisition and continued operation of short-line railroads where needed to support current and future economic development needs.
c. Use design techniques, technology, and operations coordination to minimize potential conflicts between trains and other modes of travel, and between trains and adjacent land uses.
d. Work with regional partners to acquire railroad rights-of-way threatened with abandonment in order to preserve these corridors for future transportation uses.
e. Participate as appropriate in the partnerships necessary to foster efficient, high-speed passenger rail service in the Pacific Northwest.
f. Coordinate with regional partners to position the Thurston Region for a commuter rail connection in the future.

14. Aviation

Goal: Provide an appropriate level of facilities and services to meet the general aviation needs of residents and businesses in the region.

Policies:

a. Coordinate with the Port of Olympia and Thurston County to maintain consistency between adopted land use plans and long-range airport development



strategies, and ensure land use compatibility in areas adjacent to the airport.

b. Support multimodal access to the Port of Olympia's airport terminal.

15. Public Involvement

Goal: Build a community of engaged and informed constituents that contributes ideas and supports actions to create a highly functional multimodal transportation system consistent with the goals and policies of this transportation element.

Policies:

a. Provide broad-based, early, and continuing public involvement opportunities in all aspects of the transportation planning process.
b. Ensure equal access to participation for all users of the transportation system.
c. Promote increased public understanding of the relationships between land use patterns and transportation choices facing Tumwater.
d. Explore innovative participation techniques to increase public involvement in transportation issues, and maximize use of "plain English" and other communication techniques to translate complex issues or decisions so they can be widely understood.

16. Intergovernmental Coordination

Goal: Ensure transportation facilities and programs function seamlessly across community borders.



Policies:

a. Participate in coordination activities at the local, regional, state, tribal, and federal level that address the condition or operations of the transportation system.
b. Work with other agencies to coordinate land use and public facility siting decisions, implement countywide planning policies, and refine the tools needed to achieve

transportation-efficient community development patterns.

c. Coordinate street projects with Olympia, Thurston County, WSDOT, and Intercity Transit as appropriate.
d. Coordinate development of local plan updates with regional efforts when possible to ensure consistency.
e. Collaborate with other local jurisdictions, TRPC, Intercity Transit, the Port of Olympia, the Thurston EDC, and other entities to facilitate informed, reasoned decision-making processes that advance shared transportation and land use objectives.

17. Environmental and Human Health

Goal: Minimize transportation impacts on the natural environment and the people who live and work in Tumwater.

Policies:

a. Protect water quality from the impacts of stormwater runoff by minimizing impervious surface area and by using low impact development methods where feasible to effectively treat and manage unavoidable runoff.
b. Use transportation planning, design, and construction measures that minimize negative impacts on priority fish-bearing streams and other environmentally sensitive areas.
c. Develop a transportation system that supports compact, mixed-use development and related non-motorized travel to curb growth in miles of motor vehicle travel, increase energy efficiency, reduce environmental impacts, and encourage physical activity and community health.
d. Support state and national efforts to promote the use of alternative fuels and technologies that reduce pollution and other environmental impacts from motorized vehicles.

Low Impact Development mimics the natural hydrologic action of watersheds by retaining and infiltrating stormwater runoff on or near the site, and by effectively treating unavoidable runoff, in addition to simply reducing the amount of paved surface area on a site.



e. Ensure federal Title VI requirements for environmental justice are met so that minority populations and people with low incomes do not incur disproportionately high and adverse human health or environmental impacts from transportation policies, programs, and investments.
f. Comply with federal Clean Air Act transportation requirements.
g. Support policies and programs that reduce greenhouse gas emissions associated with travel.
h. Reduce the impacts of transportation on the natural environment during construction, retrofit, and maintenance.
i. Plan and design for impacts associated with changing weather and climate patterns, such as increased flooding and extreme weather events.
j. Support regional efforts to decrease annual per capita vehicle miles traveled within the Thurston region to:
    - 1990 levels by 2020
    - 30 percent below 1990 levels by 2035
    - 50 percent below 1990 levels by 2050.

18. Performance Measures

Goal: Develop performance measures that are realistic, efficient to administer, effective in assessing performance, and meaningful to the public.



Policies:

a.Use transportation performance measures to evaluate, monitor, and respond to the performance of Tumwater policies and investments.

b. Use transportation performance measures that reflect priority city and regional objectives such as consistency of transportation and land use decision-making, improved mobility and access, adequate maintenance and repair of the system, environmental health, and safety.

c. Develop performance measures that reflect the needs and contributions of all modes of travel.
d. Where feasible, use performance measures consistent with those used by other agencies and organizations to enable compatible comparisons.

19. Transportation Funding

Goal: Secure adequate funding from all sources to implement the goals and policies in this plan.

Policies:



a. Provide timely and comprehensive public information about transportation funding issues and opportunities to better enable citizens to participate and make informed decisions on complex funding issues.
b. Prioritize the maintenance and preservation of the existing transportation system to minimize life-cycle costs.
c. Consider the full array of costs and benefits in the selection of transportation projects to ensure the best long-term investment decisions.
d. Make strategic transportation investments that reinforce land use and transportation decisions consistent with the goals and policies of this transportation element.
e. Ensure that transportation investments are equitable to all segments of the community in terms of costs associated with relocations, health impacts, and land use disruptions, as well as the benefits derived from system performance and travel choices.
f. Support regional efforts to improve the availability, reliability, and flexibility of transportation revenues.
g. Use transportation funding policies and investments to make development decisions predictable, fair, and cost-effective.
h. Continue policies that require new development to pay for its share of impacts on the transportation system; where appropriate support multimodal mitigations and not just street capacity.

Transportation Master Plan

CHAPTER 9

SYSTEM INVENTORY

TRANSPORTATION SYSTEM INVENTORY

The transportation system is made up of a number of different networks. Combined, they connect people to the places they need to be and get freight into and out of our city and products to our stores. Following is an inventory of the existing transportation system serving Tumwater's residents and businesses.

CITY STREETS

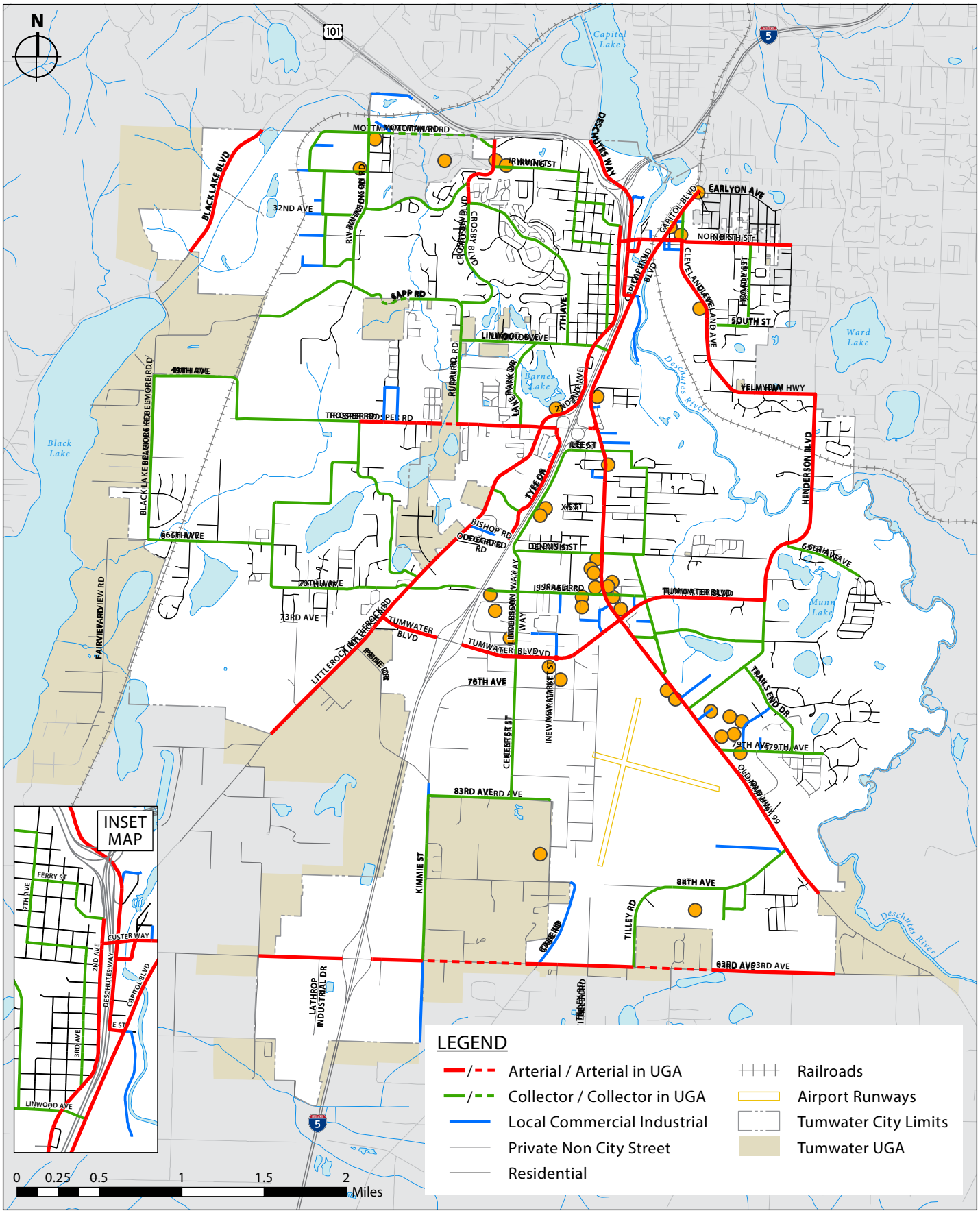
City streets are the most ubiquitous element of our transportation system. The City has about 113 centerline miles of streets it owns and is responsible for maintaining.

Tumwater has defined the functional classification of its streets in accordance with City standards in much the same way that Federal Highway Administration assigns Federal Functional Classification to the nation's streets and highways. While very similar, these are two different street classifications

Some of the intersections where the streets meet need traffic control to enable safe crossing and turning movements. Tumwater has 23 traffic signals and five roundabouts to control traffic at its busiest intersections.

Figure 2 illustrates the City's street system by its functional classification. Functional classification is a way of characterizing the relative importance of a street in terms of the volumes of traffic it carries and its relation to other streets in the network. Some streets are intended to carry more traffic than other streets and serve large commercial or employment centers. Others are intended to connect residential areas with neighborhood centers and schools, carrying lower volumes at slower speeds. Still others provide circulation within a neighborhood and have the lowest volumes and slowest speeds. In this way arterials carry the highest volumes of traffic, followed by collectors, and then local access streets.

A well-connected street grid offering many route choices is the most efficient pattern for carrying and dispersing traffic. The more efficient the street network the less we have to rely on widening to address chronic congestion. We are challenged to complete that grid due to things like I-5 and topographic features that limit our ability to make street connections, but where possible we strive to maximize connectivity.



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Figure 2
Roadway Functional Classification

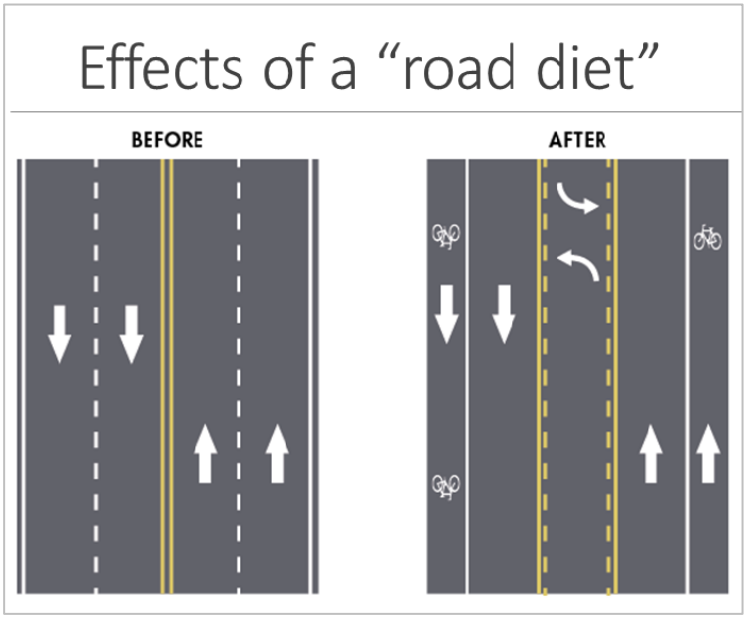
There is a practical limit to how wide we can build our streets and still maintain the character of our community. Regional policies put into place in the late 1990s restrict the width of arterials in our region to five lanes between intersections. This is two lanes in each direction plus a center turn lane, if needed. It was determined that streets wider than this would be inconsistent with the small city character of Tumwater and our neighboring jurisdictions. Our communities realized that traffic congestion cannot be solved by street widening – at best, it alleviates the problem for a while before congestion resumes at an even bigger scale. At worst, it creates bottlenecks elsewhere on the system and degrades the character of the place with facilities that are highway-like in form and function. Excessively wide streets undermine our efforts to create walkable, bike-friendly neighborhoods that are more oriented to people than cars.

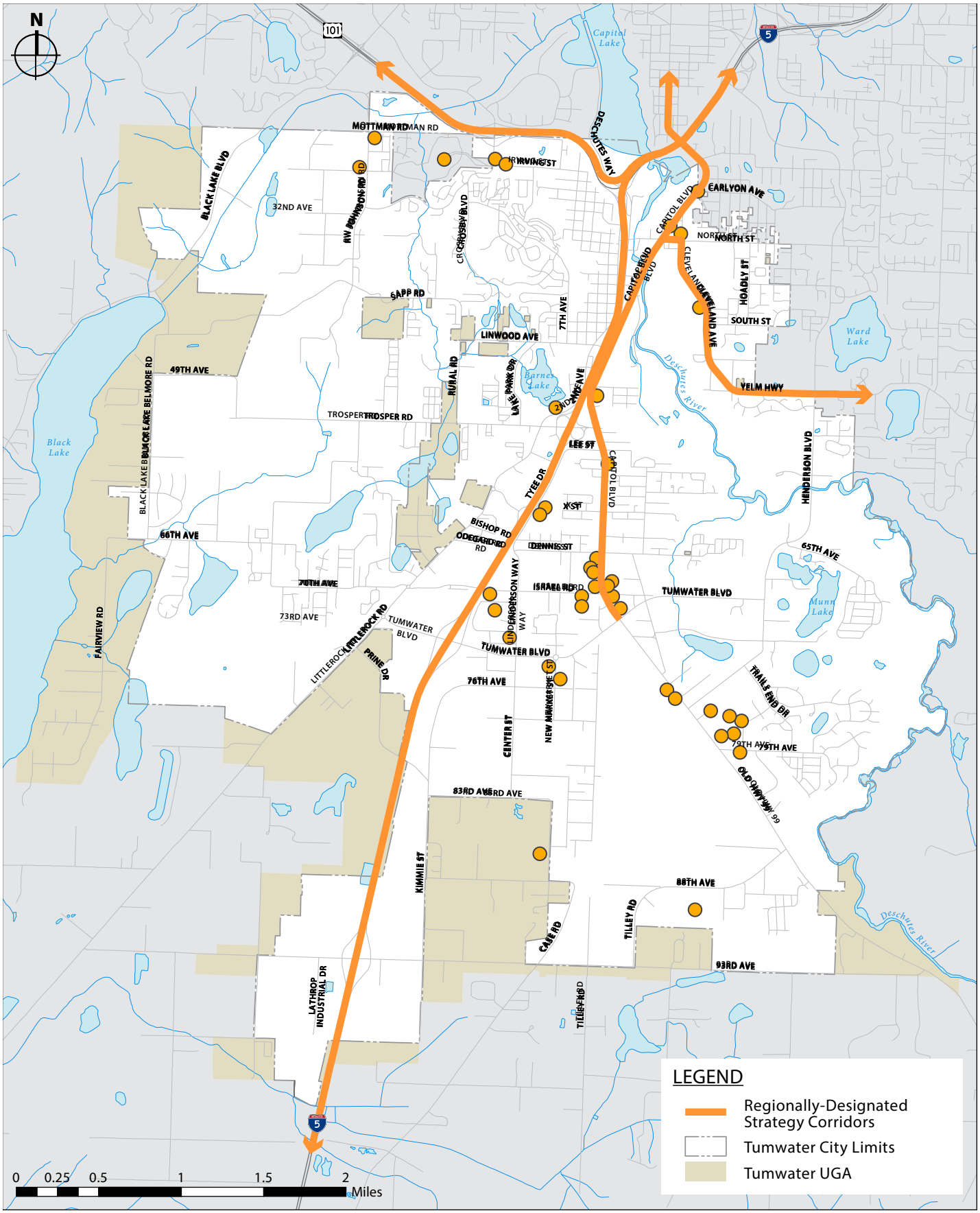
TRPC policies identify 'strategy corridors' where widening is not a viable option due to existing street width or other constraints. Strategy corridors are those places where alternatives to widening are most needed to improve mobility and access. These strategies can include improved signal timing and operational enhancements; they can include improved transit, walking, and biking options; they can include access control that improves safety and efficiency by restricting turn movements.

Interestingly, strategies can also include more urban-style development on these corridors that results in a mix of activities in close proximity and that generates demand for walking, cycling, and transit. If that development were locating on the periphery of the city it would generate car traffic that further clogs these arterials. Locating that same development on our close-in corridors creates opportunities for travel choice that don't exist elsewhere. Figure 3 depicts the regionally-designated strategy corridors in Tumwater. They include Capitol Boulevard, Tumwater Boulevard, Cleveland Avenue and Yelm Highway, and Interstate 5.

Tumwater adheres to some general design principles for its streets, with the goal of creating a safe, convenient street system that supports community identity.

- Design streets to accommodate all travelers, not just drivers.
- Limit the width of streets, ensuring no arterials exceed five lanes mid-block and using “road diets” to repurpose existing rights-of-way where streets are unnecessarily wide.





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Figure 3
Regionally-Designated Strategy Corridors in Tumwater

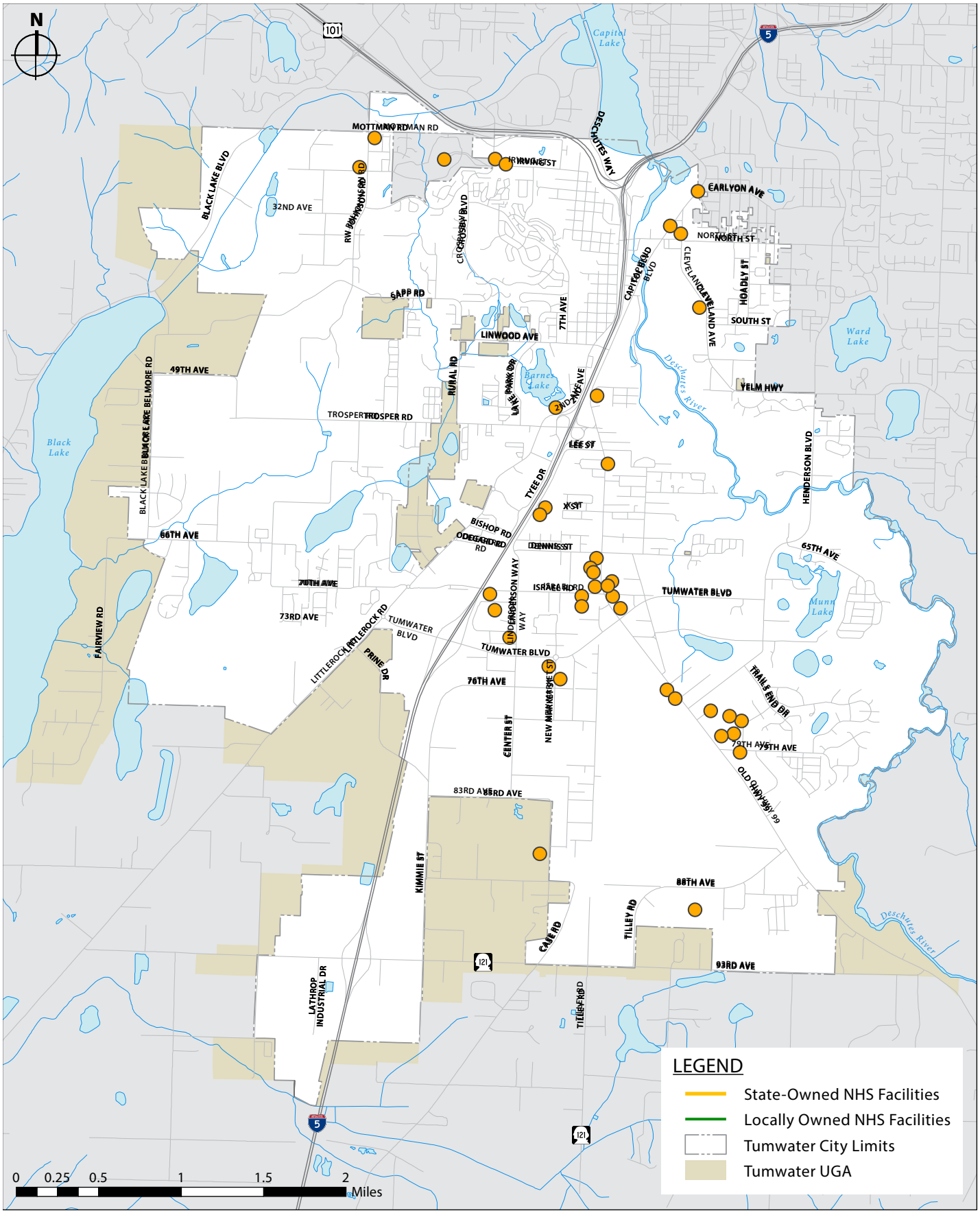
STATE FACILITIES

In addition to the city's streets, Tumwater is also served by two state highways – Interstate 5 and SR 121 – that are owned and managed by the Washington State Department of Transportation (WSDOT). US 101 and its interchanges, which provide access to and from Tumwater, is located in Olympia along Tumwater's northern border. I-5 is a Highway of Statewide Significance that bisects the City from north to south.

SR 121 includes 93rd Avenue between I-5 and Tilley Road, Tilley Road south to Maytown Road, and Maytown Road west to I-5.

NATIONAL HIGHWAY SYSTEM ROUTES

The National Highway System (NHS) includes the interstate highway system as well as other streets and highways important to the nation's economy, defense, and mobility. Local arterials are designated as a part of the NHS, as are other local streets that connect intermodal facilities like the airport to the interstate highway system. Figure 4 identifies the NHS routes in Tumwater. Golden colored facilities are state—owned while green colored facilities are local components of the NHS.



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Figure 4
National Highway System Routes in Tumwater

PUBLIC TRANSPORTATION

Transit is an integral part of Tumwater's transportation system. A range of services, from general purpose to commuter to rural connectivity, make up the City's transit network.

INTERCITY TRANSIT

Intercity Transit is an important partner in meeting the City's mobility needs. Intercity Transit (IT) is the region's public transportation service provider, operating a fleet of 71 buses with 20 local routes in the Tumwater, Olympia, Lacey, and Yelm area. IT also operates 5 Express routes to Lakewood and Tacoma offering connections to Pierce Transit and Sound Transit services. All buses are equipped with bike racks and all buses are ADA accessible. In addition, IT operates complementary paratransit service called "Dial-A-Lift", or DAL for short, with 35 vans; this service exceeds requirements of the Americans with Disabilities Act (ADA). IT also maintains an extensive commuter vanpool program with 200 active vans carrying over 1,500 people each workday between work and home efficiently and cost-effectively. IT supports its transit and vanpool program utilizing 7 park-and-ride lots throughout the region, including one in Tumwater located at the corner of Bonniewood Drive and Israel Road, in the Department of Health parking lot. In 2014, IT had 4.5 million boardings on its fixed-route service, over 154,000 boardings on its "Dial-A-Lift" paratransit service, and over 745,000 trips on its Commuter Vanpool service.



IT's commitment to efficiency results in the most frequent service operating along the region's urban corridors, the next most frequent service connecting neighborhoods to significant employment and activity centers, and the sparsest service connecting outlying areas to transit transfer centers. Five local transit routes currently serve the Tumwater area.

u. Route 12 operates between the Olympia Transit Center at the north to Tumwater Square and the

State's Department of Labor and Industries building on Linderson Way SW to the south, providing access to the west side of Tumwater via Littlerock Road, Trosper Road, and Linwood Avenue. Service is provided Monday through Friday between approximately 6:00 a.m. and 11:15 p.m. On the weekends service is provided between approximately 8:15 a.m. and 11:15 p.m.

v. Route 13 also operates between the Olympia Transit Center at the north to the Labor and Industries building on Linderson Way to the south via Capitol Way and Capitol Boulevard; it is a high frequency weekday service route offering 15 minute service frequency. Service is provided Monday through Friday between approximately 6:00 a.m. and 11:00 p.m. On Saturdays service is provided between approximately 8:45 a.m. and 11:00 p.m., and on Sundays from 8:45 a.m. to 8:15 p.m.

w. Route 42, a weekday circulator route, provides service to the Thurston County Family Court and the Accountability and Restitution Center (ARC), both located in Tumwater's Mottman Industrial Park. This route is also within ¼ mile of Quixote Village, the cottage community for previously homeless adults. Route 42 makes connections with the high frequency service corridors served by Routes 43 and 44 on Cooper Point Road and at the South Puget Sound Community College.



x. Route 43 operates between the Olympia Transit Center and the Tumwater Square Transfer Station, traveling along Deschutes Parkway, and serving the County Courthouse, Evergreen Park Drive, the South Puget Sound Community College, Barnes Hill, and back to Capitol Boulevard via the northwest part of Tumwater. Service is provided Monday through Friday between approximately 6:15 a.m. and 7:45 p.m. On

Saturdays, service is provided between approximately 8:45 a.m. and 7:00 p.m.

y. Route 68 travels between the Lacey Transit Center, Tumwater Square Transfer Station, and the Olympia Transit Center via the Yelm highway, providing access to parts of east Tumwater along the way. Service is provided Monday through Friday between approximately 6:00 a.m. and 8:30 p.m. On the weekends service is provided between approximately 8:30 a.m. and 8:30 p.m.

Intercity Transit also offers inter-regional service to and from Lakewood on weekdays with stops near the Labor and Industries and Department of Health buildings. Express Route 609 provides 10 northbound trips departing Tumwater from 5:00 a.m. to 5:20 p.m. and 11 southbound trips arriving in Tumwater from 6:50 a.m. to 7:30 p.m. Transfer points in Lakewood enable connections with Pierce Transit and Sound Transit's Sounder commuter rail and Express bus service to SeaTac airport and Seattle. This is a grant-funded pilot program through June 2017, to demonstrate the demand for express service between Tumwater, Olympia, Lacey, and Lakewood.

IT's service standards and facilities plans are guided by an annual update of both its six-year Transit Development Plan and its Strategic Plan. Together, these two plans help the agency prioritize its service and investments to maximize system performance. Seven essential design principles frame IT's decision-making processes and ensure coordination with Tumwater and other local jurisdictions:

- Operate a range of services, each designed to meet the needs and capabilities of the neighborhoods it serves.
- Strengthen service operating along major corridors.
- Reduce customer travel times with strategies such as:
    - Express services
    - Priority treatment for transit vehicles
    - More direct services linking major points of origin and destination
    - Fare policies that speed boarding times
- Keep pace with development.
- Expand regional express routes.

- Support a range of transportation alternatives.
- Provide fixed facilities and equipment that support the region's public transit infrastructure.

Figure 5 illustrates the extent of IT service within Tumwater, by route and service frequency. Note that all service in Tumwater is directly linked to service elsewhere within the metropolitan area. Thus, transit riders in Tumwater can easily connect in downtown Olympia with inter-regional service offered by Intercity Transit, Grays Harbor Transit, Mason Transit, and Greyhound, as well as to routes operating into Pierce County.

IT maintains the regional Tumwater Square Transfer Station on Cleveland Avenue, near the Safeway. Tumwater engages IT in reviewing land use permitting requests in order to maximize the opportunities for public transportation through effective land use planning and urban design. IT is also a regular stakeholder on the City's advisory committees convened for special studies and sub-area plans. IT and Tumwater are partnering on an upgrade to the Tumwater Square Transit Station to improve accessibility, pedestrian safety and bus alignments in support of Brewery District recommendations.



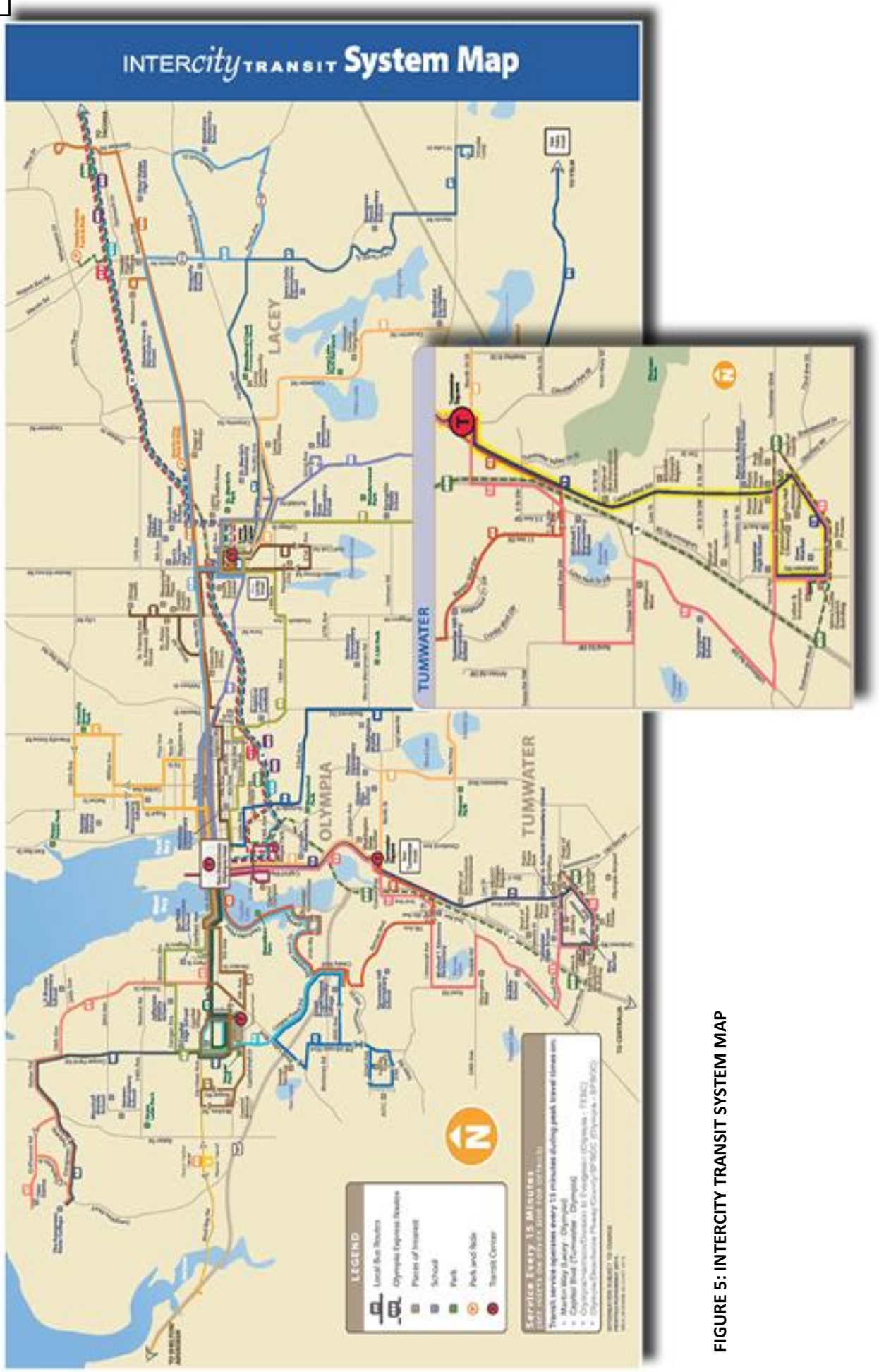


FIGURE 5: INTERCITY TRANSIT SYSTEM MAP

R/T – Rural & Tribal Transportation

R/T – the Rural & Tribal Transportation program – helps connect outlying communities outside of Intercity Transit's service area to the urban transit network. R/T provides accessible, fixed-route public transportation services for the Nisqually Indian Tribe, the Confederated Tribes of the Chehalis Reservation, and the communities of Bucoda, Rainier, Rochester, Tenino, Yelm, and Centralia, connecting those communities to Intercity Transit in Thurston County and Twin Transit in Lewis County. The north urban connection to Intercity Transit is in Tumwater, at the state office buildings located at Capitol Boulevard and Israel Road, and at the Tumwater Square Transfer Station.



- Route 2 makes arrivals in Tumwater from Rainier and Tenino beginning at 6:50 a.m. through about 5:00 p.m., with return trips leaving Tumwater from 7:00 a.m. until 5:00 p.m.
- Route 3 makes arrivals in Tumwater from the Chehalis Reservation, Rochester, and Grand Mound from 7:40 a.m. until 5:40 p.m., with return trips leaving Tumwater from 7:45 a.m. until 5:45 p.m.

Timed transfer points enable people to travel conveniently between rural communities in south Thurston County and north Lewis County and Tumwater.

Non-Motorized Facilities

Tumwater, like other jurisdictions in the Thurston region, places a high priority on "complete streets" that include infrastructure for all modes of travel and not just cars. For almost 20 years, Tumwater has had in place street standards that require sidewalks and bike lanes with street construction or reconstruction projects. Following is a summary description of these systems.

Pedestrian Facilities

Every single trip begins or ends with a walk for most people. Sidewalks and other elements of the pedestrian system are the facilities that make those walks to and from final destinations safe and convenient. Design guidelines specify how sidewalks are to be built – their width, their distance from the street,

whether they are on one side of the street or both sides. Different standards apply to different types of streets depending on the speed and volume of vehicular traffic, number of pedestrian-generating activities, and other factors.



Asphalt walkways, such as this walkway located on 70th Avenue, provide a cost-effective, practical solution for improving pedestrian mobility.

Most streets built or upgraded since the mid-1990s have sidewalks because of policies put into place after GMA that require streets to accommodate all travelers and not just those in cars. However, many older streets do not have sidewalks and adding them will be an expensive undertaking to be accomplished over many years. Tumwater is using asphalt walkways as a functional alternative to sidewalks in some locations that don't have sidewalks and will not for the foreseeable future due to costs, land acquisition, and other factors. Walkways are designed to solve a problem – lack of safe and convenient pedestrian facilities for the people who need to walk there. They provide functional, safe, and convenient connections at a fraction of the cost of full-standard sidewalks.

Crosswalks are what makes it possible for people to safely cross busy streets while giving drivers some predictability about where to expect pedestrians in the street. They come in various configurations and may be located at an intersection or "mid-block", enabling people to safely cross between intersections. Mid-block crossing opportunities are especially important on busy transit corridors because riders typically have to cross either going to or returning from their trips.

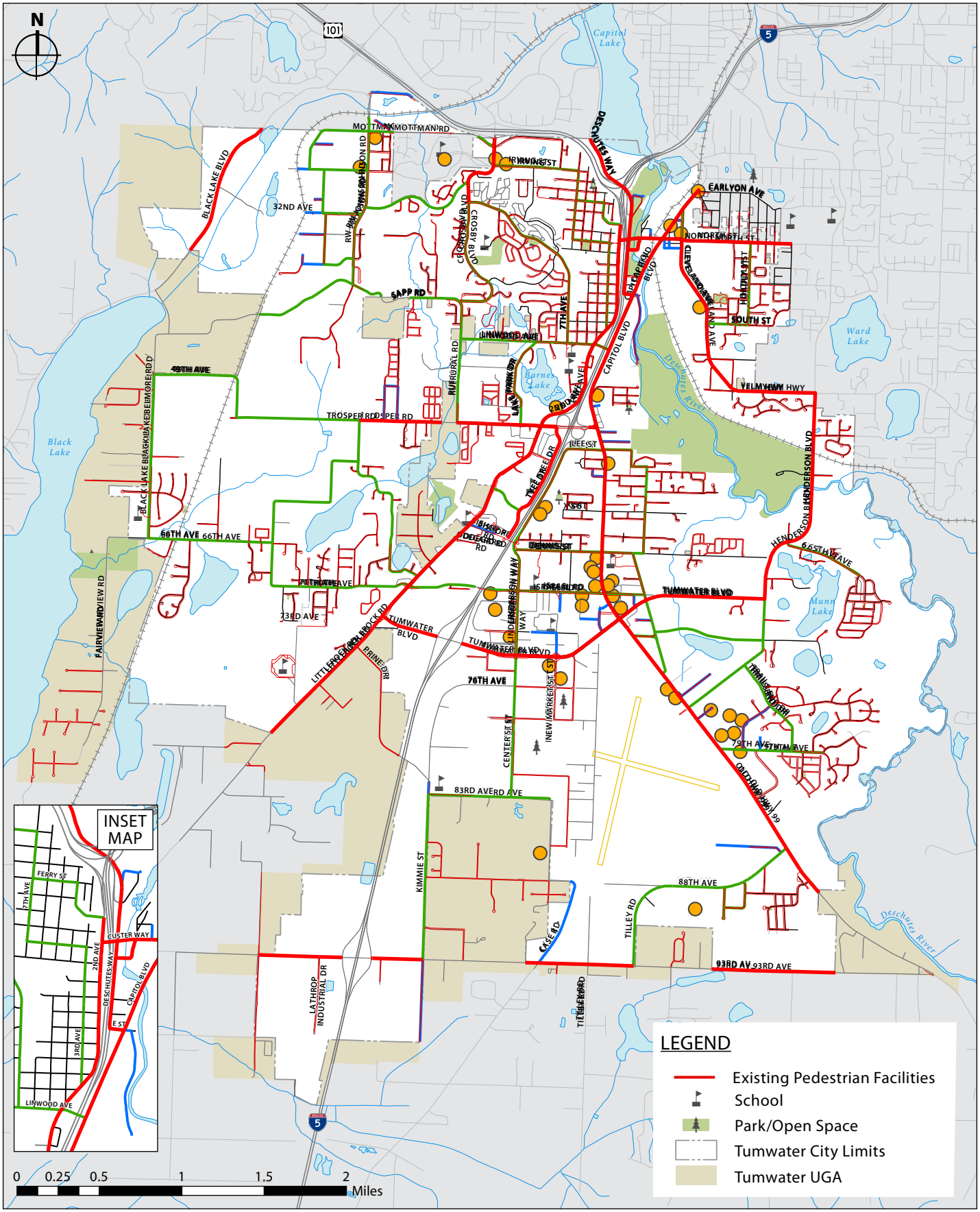
It takes more than sidewalks and crosswalks to make a comfortable and accessible pedestrian environment. Other elements that may be deployed include refuge islands for wide intersections, pedestrian-activated signals, planter strips, colored or textured pavement, street trees, and bulb-outs or

curb extensions. In more urbanized areas, building architecture and site design are also critical considerations that will either enhance or inhibit pedestrian access

Figure 6 delineates the existing pedestrian network, including sidewalks and sidewalks adjacent to planter strips, walkways that provide safe and functional places for people to walk, and multiuse pathways designed to serve pedestrians and cyclists.



A Walkability Audit conducted by Planning Commissioners and staff evaluated the condition and suitability of sidewalks in the Brewery District.



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Figure 6
Existing Pedestrian Facilities 2012

Despite rain, hills, and short winter days, biking is an increasingly popular mode of travel throughout Tumwater and the rest of the region. Designated bike routes include several different types of facilities with different types of treatments. What they have in common is that they are favorable routes for cyclists that connect important destinations or corridors.

Bike lanes are typically on-street facilities with a minimum width of five feet that are designed and signed to accommodate cyclists on existing streets. Bike lanes enable cyclists to travel on streets without having to ride in traffic by dedicating a part of the street for bike travel.

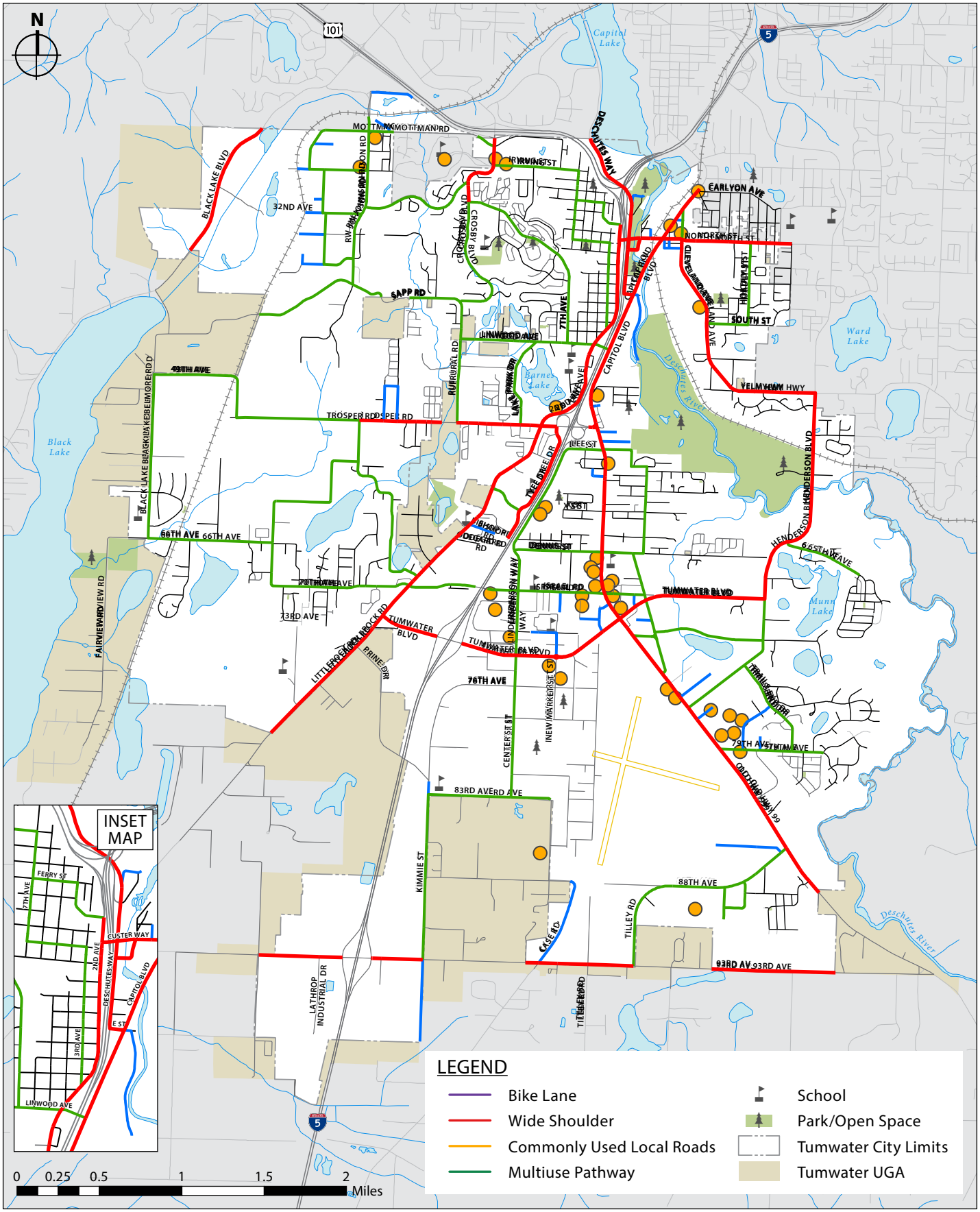


Wide shoulders can serve the function of bike lanes on some roads where a signed bike facility is not appropriate. This might be because additional paved width is not available, or where the space is shared with pedestrians because there are no sidewalks. Four feet of shoulder width can make biking safer and more comfortable for some people, even if it is not designated as a formal bike lane.

Multi-use pathways and trails provide off-street facilities that may be paved or unpaved but smooth, and which are designed to accommodate cyclists as well as pedestrians. Trails are sometimes discounted as being purely recreational in nature but in reality, a well-developed trail system is the backbone of the non-motorized network connecting far-flung activity centers and destinations with a dedicated route that is generally free of motorized traffic.

Finally, quiet parallel streets can offer ideal alternatives for many riders to busy streets with or without bike lanes. Quiet streets are typically low-volume, low-speed routes regularly used by riders due to their proximity to key corridors and destinations. Sometimes these are marked with a “sharrow” indicating the street is to be shared by cars and bikes alike, but just as often they are unmarked except on traveler resources like the Thurston County Bike Map developed and maintained by TRPC.

The availability of bike facilities is complemented by Intercity Transit’s policy of including bike racks on every bus, design standards that require convenient bike parking at buildings, and education and enforcement activities directed to cyclists and motorists alike. Figure 7 illustrates Tumwater’s bike facilities.


N
INSET MAP
LEGEND
Bike Lane
Wide Shoulder
Commonly Used Local Roads
Multiuse Pathway
School
Park/Open Space
Tumwater City Limits
Tumwater UGA
0 0.25 0.5 1 1.5 2 Miles
Capital Lake
Ward Lake
Black Lake
Barnes Lake
Munn Lake
Deschutes River
BLACK LAKE BLVD
32ND AVE
MOTTMAN RD
IRVING ST
DESCHUTES WAY
EARLYON AVE
NORTH ST
CLEVELAND AVE
HOFFMAN CT
SOUTH ST
CROSBY BLVD
SAPP RD
7TH AVE
LINWOOD AVE
CAPITOL BLVD
RURAL RD
LAKE PARK DR
29TH AVE
YELM HWY
HENDERSON BLVD
49TH AVE
TROSPER RD
LEE ST
TREE FREE DR
BLACK LAKE BELMORE RD
66TH AVE
DELPHI RD
DENNIS ST
65TH AVE
FAIRVIEW RD
73RD AVE
TUMWATER BLVD
LITTLEROCK RD
PRINE DR
LINDERSON WAY
76TH AVE
CENTER ST
NEW MARKET ST
TRAILS END DR
79TH AVE
OLD HWY 99
83RD AVE
KIMMIE ST
88TH AVE
TILLEY RD
CASE RD
93RD AVE
LATHROP INDUSTRIAL DR
FERRY ST
CUSTER WAY
2ND AVE
DESCHUTES WAY
3RD AVE
E ST

AIRPORT

The Olympia Regional Airport is owned and operated by the Port of Olympia. It consists of 835 acres within the city limits of Tumwater. Uses at the airport include general aviation facilities as well as industrial, commercial and public uses. The airport accommodates a variety of users, ranging from single engine aircraft to business jets, and includes activity by helicopters, gliders, and ultralights. The airport does not have scheduled passenger flights.

The airport currently operates with two runways. Runway 17/35 is the primary runway at 5,501 feet in length and 150 feet in width. Runway 08/26 is the airport's crosswind runway and is 4,157 feet in length and 150 feet wide.

The airport is well connected to several arterial roadways that serve Tumwater. Vehicle access to the property is provided by Old Highway 99 along the east side of the property, Terminal Street and New Market Street along the northwest side of the property and Center Street and Case Road along the southwest side of the property. Tumwater Boulevard is adjacent to the northern boundary of the airport and provides direct access to I-5.



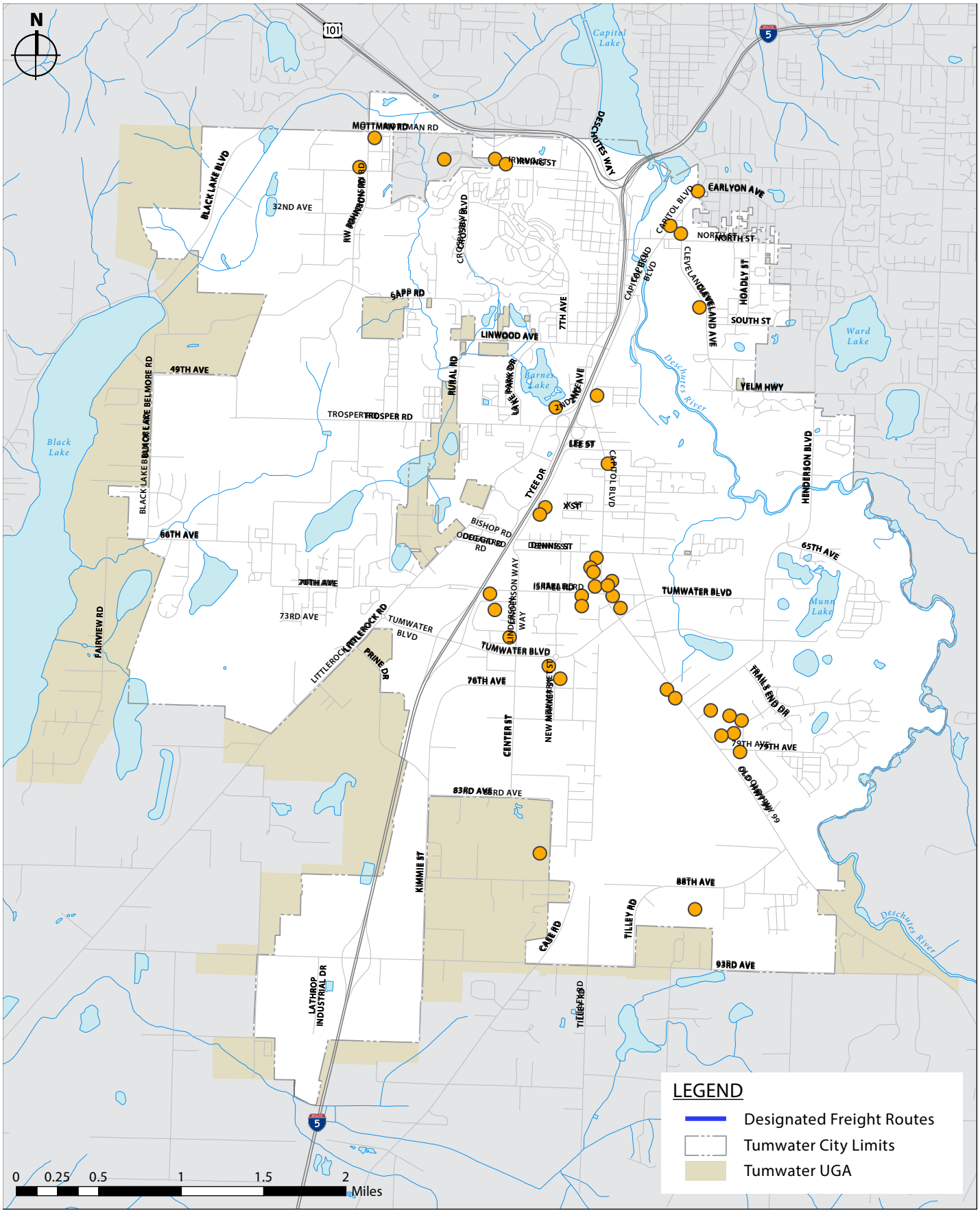
RAIL

Two railroad facilities serve Tumwater, both owned by Union Pacific Railroad Company. One is the line that comes up through the Deschutes Valley from East Olympia, with connections to the former Olympia Brewery warehouses in Tumwater valley. This rail line intersects a spur line owned by Tacoma Municipal Belt line in Olympia at Capitol Lake; it provides service into and out of the Mottman Industrial Complex via Percival Creek Canyon. That second line extends south of 66th Avenue though it is active only to Sapp Road.

There are six at-grade crossings in Tumwater. They are located at R.W. Johnson Road SW, 29th Avenue, Sapp Road, Trosper Road SW at 49th Avenue SW, 66th Avenue, and Henderson Boulevard. Five crossings are active but lightly used, with a regulated low travel speed. The crossing at R.W. Johnson has lights, sound, and cross arms; the crossing at Henderson has lights and sound. The crossings at 29th Avenue, Sapp Road, and Trosper Road/49th Avenue have signs. The crossing at 66th Avenue is inactive. The rail corridor from 66th to 81st went into abandonment proceedings in 2016; Thurston County will acquire the corridor and incorporate it into the future Gate-Belmore Trail.

DESIGNATED FREIGHT ROUTES ON LOCAL STREETS

Freight mobility is an important function of the transportation system. It is how goods get to stores and how local businesses get products to their customers. Freight mobility is an integral part of the City's overall economy. Figure 8 illustrates the City's locally-designated freight routes. The State designates streets as freight routes based on the amount of tonnage carried on those streets.



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Figure 8
Locally-Designated Freight Routes

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CHAPTER 10

SYSTEM PERFORMANCE

System Performance

The way we measure system performance is commonly referred to as its "level of service." Level of service standards, or LOS standards, describe our expectations about what is acceptable and unacceptable in terms of how our transportation system performs.

The GMA does not prescribe to Tumwater how to measure system performance, only that it must do so and that the standards it uses for arterials and collectors must be regionally coordinated. For decades Tumwater has used a traditional approach based on vehicle congestion and delay. With this Transportation Master Plan, Tumwater is advancing its system performance measures – its LOS – to include non-motorized networks in its evaluation process. It is initiating development of multimodal LOS standards.

The new multimodal standards do not replace the old standards. The City is introducing these new LOS standards to augment existing LOS standards for streets. The new standards will incorporate additional factors more appropriate for evaluating bike and sidewalk network performance in different parts of the city. The City is working to align its evaluation of transportation system performance with what it's trying to accomplish with infill and redevelopment in some of its sub-areas and the completion of walking routes around its schools.

Growth will continue to mitigate its impacts through fees, development and street standards, SEPA mitigations, and other mechanisms. The mitigations developers make derive from LOS evaluations and the criteria used to judge system performance. That's why it's important to measure what matters when looking at impacts and mitigations. These multimodal level of service standards give Tumwater a greater range of tools for managing impacts of growth and improving the quality and performance of the City's transportation system.

How Tumwater defines its system performance – its level of service – affects how it evaluates concurrency. Concurrency is the process describing how Tumwater calculates the impacts of future development on the transportation system. Like the Comprehensive Plan, concurrency is a process required by the GMA. It ensures system improvements are made "concurrent with" development so that the transportation system performs

as expected as the city grows. Concurrency is addressed in a different city process; what matters is that it is based on expectations of future system performance that are established in this transportation element. The rest of this section looks at system performance based on today's conditions and an analysis of system performance based on future growth in light of its adopted LOS standards. This includes some projects that resulted from the detailed sub-area plans for the Brewery District and Capitol Boulevard, projects that are needed to realize the community vision embodied in those plans.

Performance of City Streets

LOS standards for streets consider travel conditions perceived by motorists – travel speed, travel time, freedom to maneuver, traffic interruptions and delays, comfort, and convenience. These standards are typically expressed with letter designations ranging from A – completely free flow conditions – to F, or failing, when chronic congestion is predictable and extends well beyond a "peak 15 minutes" at the end of the work day.

Sometimes chronic congestion results not from too many vehicles but from system inefficiency – poorly timed signals, too many left-turning movements, inadequate storage space at intersections. Analysis of traffic operations can help determine whether the problem is one of too many cars or a need for better intersection or roadway design.



Tumwater will continue to evaluate the performance of its arterials and collectors using congestion measures that equate to delay. Since the late 1990s this has included acceptance of a bit more congestion on streets offering a wider range of travel choices, such as Capitol Boulevard. Expectations are that congestion will be less acceptable on more suburban streets like 70th Avenue or R.W. Johnson Boulevard.

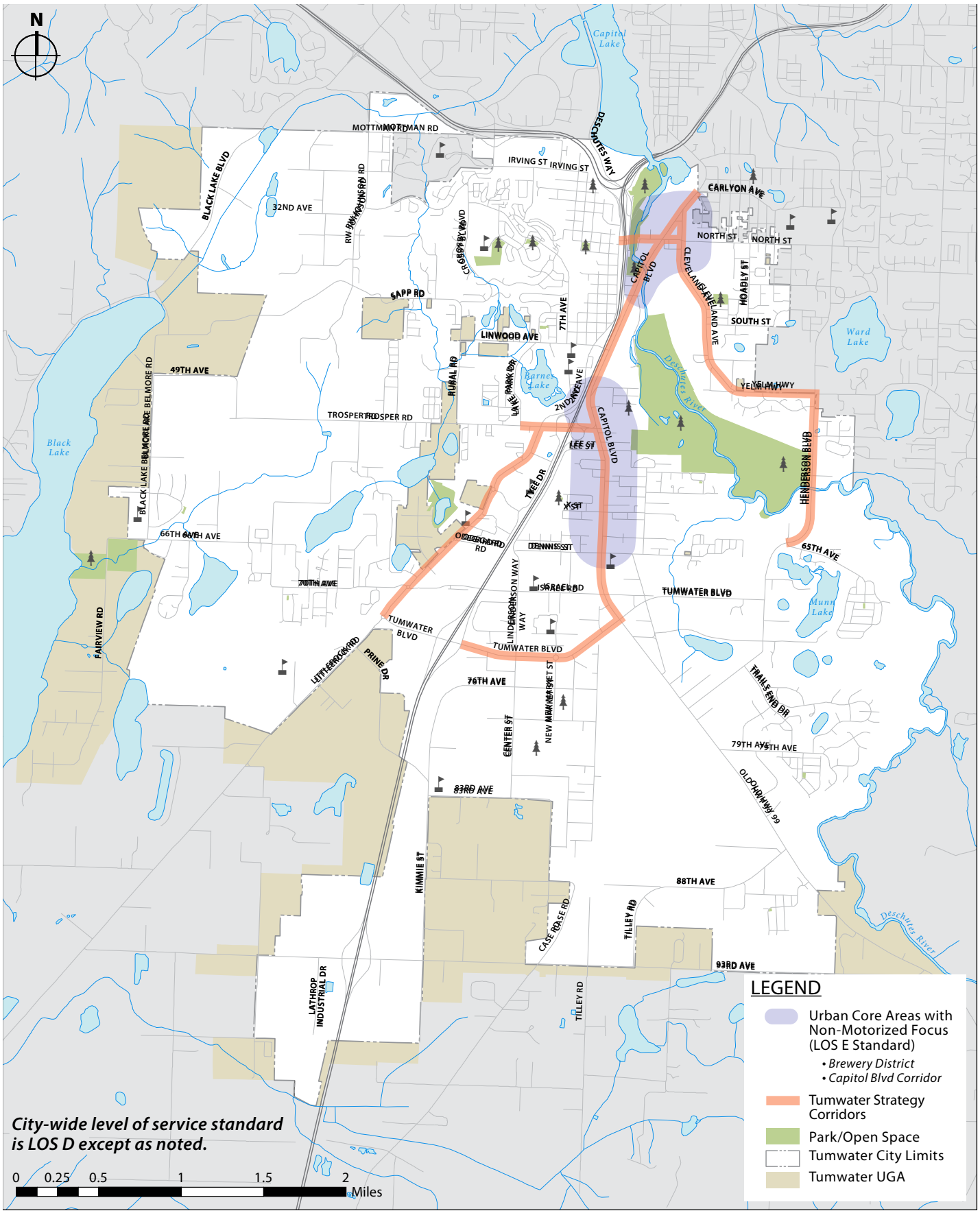
The following LOS designations describe Tumwater's policy in the city and its urban growth area:

- For the designated "Urban Core Areas" LOS E is the acceptable standard of system performance. The Urban Core Areas are shown on Figure 9.
- For the rest of the City and its urban growth area, LOS D will apply.
- The City has established Tumwater Strategy Corridors where the local LOS standard still applies as a goal, but it is acknowledged that some intersections or roadways may experience periodic congestion that exceeds the applicable standard. The Tumwater Strategy Corridors are also shown on Figure 9.

Tumwater's use of regionally coordinated level of service standards for arterials and collectors ensures consistency in evaluation methods between Tumwater and its neighboring jurisdictions.

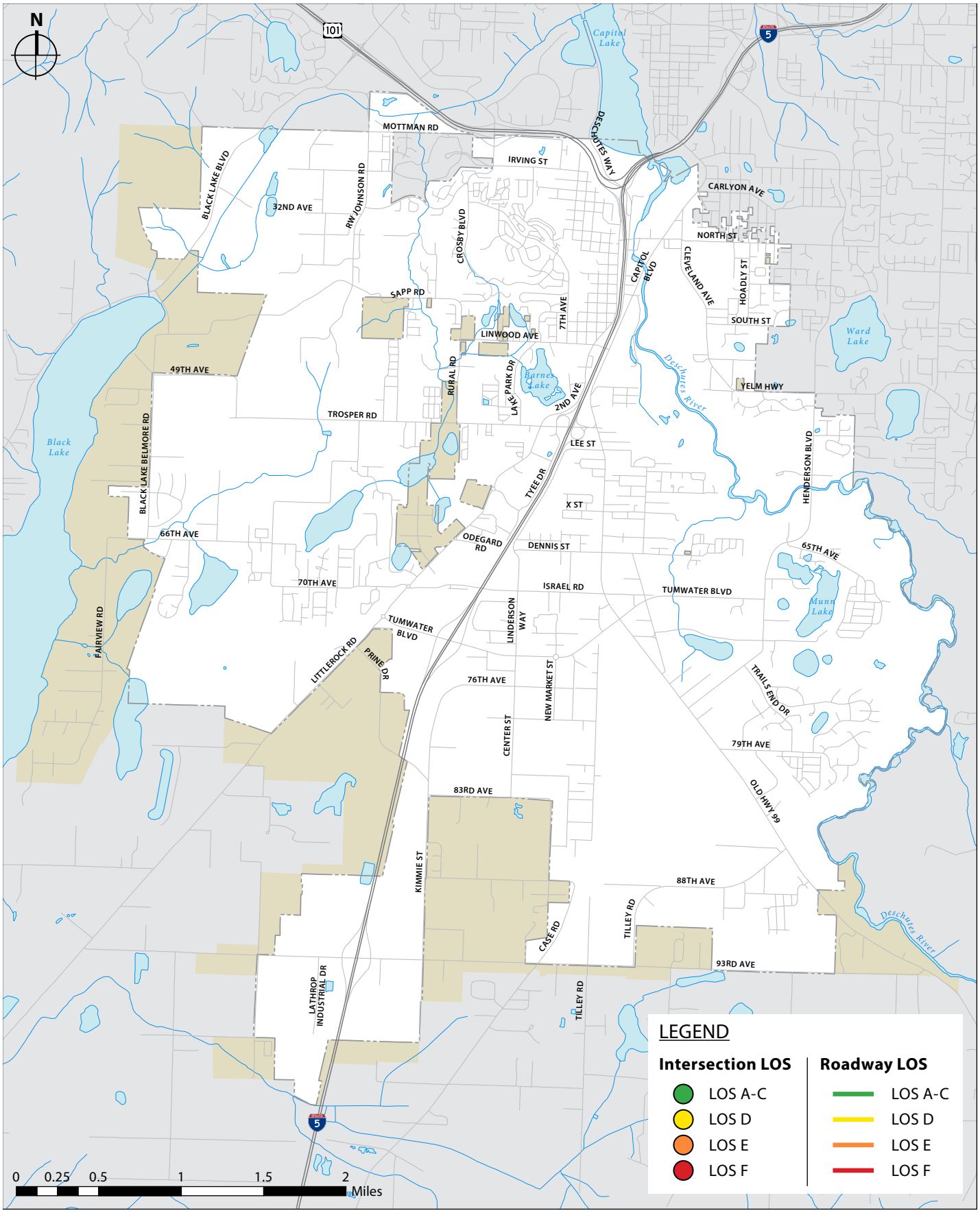
Figure 10 illustrates PM peak period level of service conditions in 2015 for the City's streets and intersections. Figure 11 shows corresponding 2015 traffic volumes in an order-of-magnitude map; Figure 12 shows those same facilities with 2040 traffic volumes. Figure 13 shows the resulting level of service conditions in 2040 if no projects were built between now and then, while Figure 14 demonstrates the improvement to adopted levels of service generated by the projects included in this plan.

Congestion is not the over-riding consideration in Strategy Corridors. In these areas the City will work with developers to mitigate impacts and enhance multimodal mobility to the extent practicable; however, the City may choose to permit development even if it exceeds LOS thresholds because that development supports broader City objectives about growth and urban form. In these areas extra emphasis is placed on operational efficiency and completeness of the multimodal network as this is where development is most likely to generate bike, walk and transit trips.



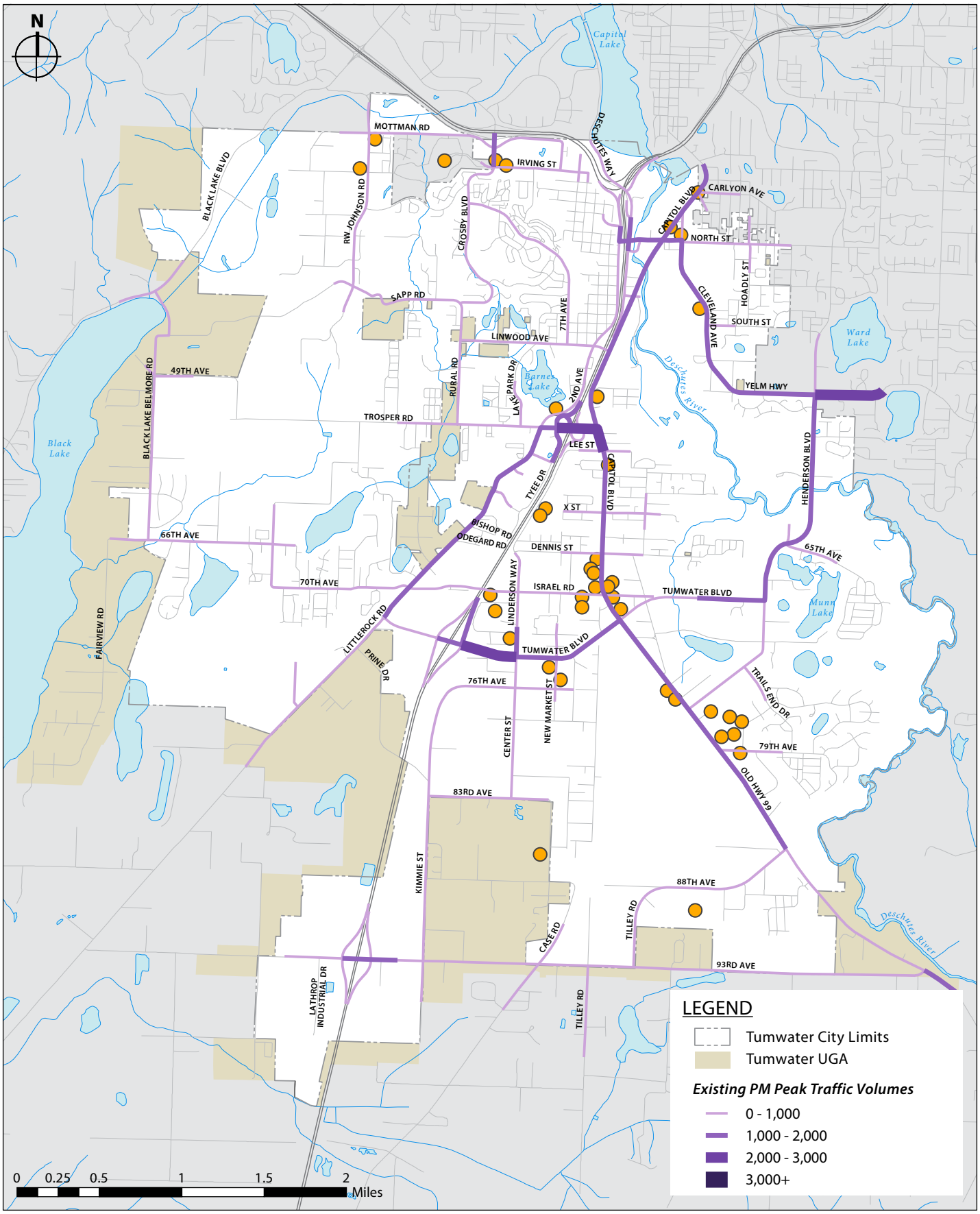
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Figure 9
Motorized Level of Service Standards



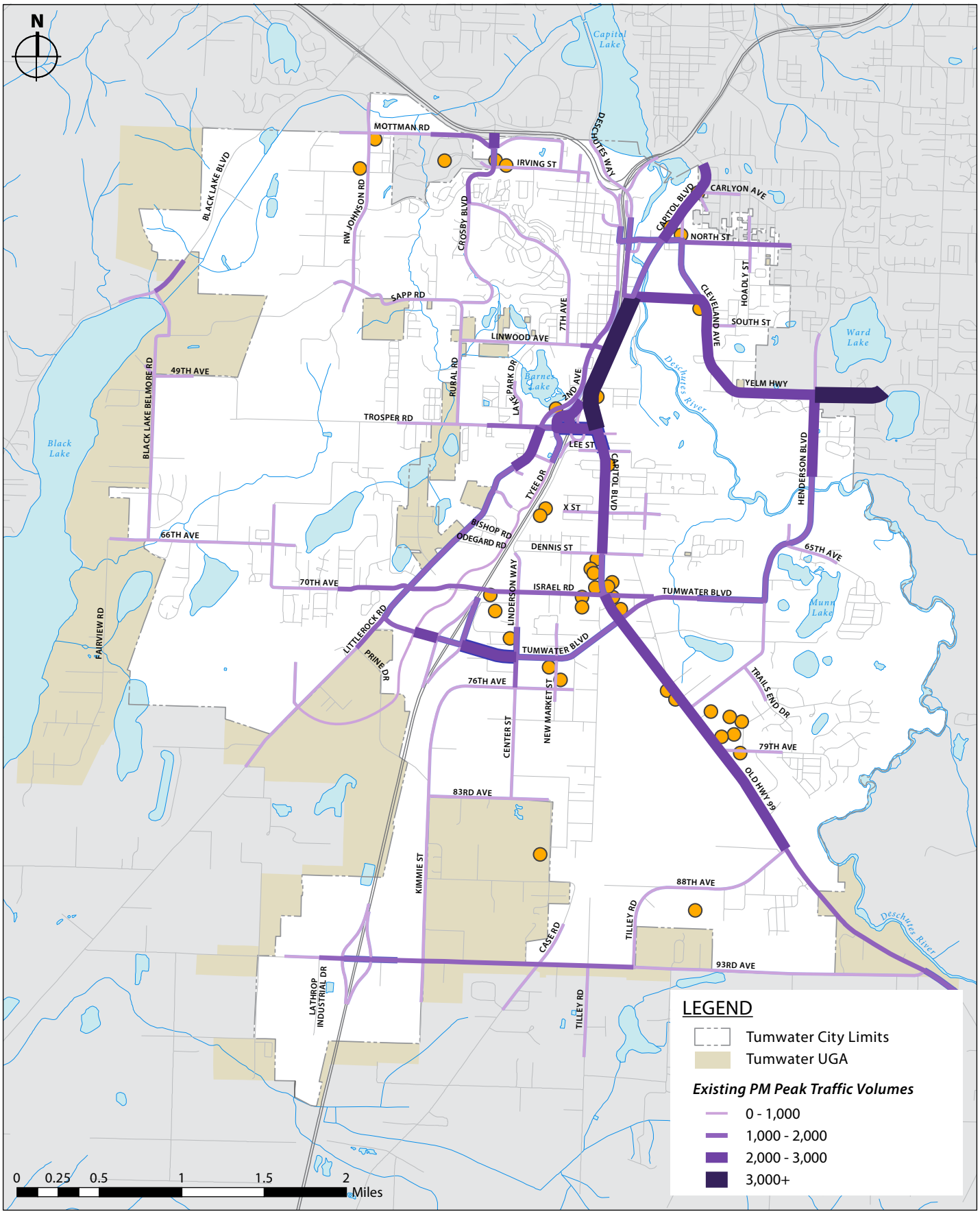
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Figure 10
2015 Intersection and Roadway Level of Service



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Figure 11
2015 PM Peak Traffic Volumes



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Figure 12
2040 PM Peak Traffic Volumes

DETERMINING FUTURE PROJECT NEEDS

In planning for the future, Tumwater establishes base line conditions reflecting today's system performance and then "grows" the demand for future travel based on adopted population and employment forecasts. This gives an estimation of what future conditions are likely to be absent any kind of system investment to improve operating performance. This is sometimes called the "no build" scenario as it illustrates the hypothetical situation of growth with no additional transportation projects between now and 2040. Tumwater then evaluates locations that are under-performing, working to identify what will be needed to restore system performance as the city grows. Sometimes no project is identified and instead, the area is watched for a period of time in order to determine the best strategy to address future needs. That is because occasionally a problem in one location may generate symptoms in another location; evaluating conditions at that site over time will help ensure the right strategy is identified to maintain system performance.

Often evaluation reveals areas that may need an improvement if the City grows as planned over the next 20-25 years, but it may also be a longer-term need. Forecasting growth over two or more decades is imprecise and the City does not want to overbuild its system. In those cases the areas are flagged and monitored, and will be addressed in subsequent plan updates as warranted.

Level of service is the measure of how well the transportation system is performing. As this section makes clear, LOS can be measured in different ways.

For example, LOS evaluation of intersections, such as those in the following table, is typically measured by seconds of delay. The fewer seconds of delay, generally, the better the intersection is said to perform. Long delays such as those experienced at Trosper Road and Capitol Boulevard during rush hour result in people sitting through several signal cycles before they can proceed; this creates long queues that can block driveways and side streets. Even though the problem is at the intersection itself delays can be felt several blocks away.

Another measure of vehicle LOS is known as "V/C ratio". V/C ratio stands for Volume to Capacity ratio. It is calculated by

dividing the number of vehicles to be accommodated on a street by the total capacity of the street. For example, if the street is designed to carry 800 vehicles an hour and during peak periods it is carrying 600 vehicles an hour then it has a V/C ratio of 0.75, which equates to an LOS C. The V/C ratio is a "percent of capacity" measure – what percent of the available capacity is consumed by traffic today and in the future.

The closer the capacity consumed is to 100% - the closer the V/C ratio is to 1.0 – the more friction and congestion drivers on that street will experience. It's even possible for a model to produce a V/C ratio in excess of 100%, which can seem impossible at first glance; no street can carry more vehicles than it was designed to carry. It doesn't, of course. It just means that there is much more demand for travel on that street during that period of time than can be accommodated. In reality it means that congestion will last longer, or that it may be faster to get around by walking or biking than by driving during rush hour.

Tables in the rest of this plan use intersection delay as well as V/C ratio to describe system performance of the motorized system. Table 2 provides the intersection operational results. It shows 2015 conditions for 69 intersections evaluated for this plan, what those conditions are likely to be in 2040 without any improvements, and 2040 conditions with proposed improvements. Details on proposed intersection improvements are in the Capital Improvements Chapter.

TABLE 2: LOS CONDITIONS FOR INTERSECTIONS - 2015 AND 2040

#	Intersection	2015 Conditions		2040 LOS No-Build	2040 Conditions with Improvements	
		Intersection Control	LOS (Delay, in seconds)		Improvement	LOS (Delay, in seconds)
1	RW Johnson Blvd/Mottman Rd	AWSC	B (12)	C (17)		
2	Crosby Blvd/Mottman Rd	Signal	B (16)	B (17)		
3	Crosby Blvd/Irving St	Signal	B (11)	B (12)		
4	7th Ave/Irving St	AWSC	A (9)	B (10)		
5	Crosby Blvd/Barnes Blvd	TWSC	C (22)	F (60)		
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	E (37)	F (200+)	RAB	B (11)
7	RW Johnson Blvd/Sapp Rd	TWSC	B (10)	B (15)		
8	Sapp Rd/Crosby Blvd	TWSC	B (12)	C (21)		
9	49th Ave/Black Lake Belmore Rd	TWSC	A (9)	B (12)		
10	Capitol Blvd/Carlyon Ave/Sunset Way	Signal	B (10)	B (12)*	RAB	B (12)*
11	Deschutes Way/I-5 NB On-Ramp	Yield	A (9)	A (9)		
12	Deschutes Way/US 101 WB On-Ramp	Yield	A (10)	B (11)		
13	I-5/US 101 Off-Ramps/Desoto St/2nd Ave	TWSC	D (32)	F (200+)	Lanes	E (50)
14	2nd Ave/Custer Way	Signal	B (15)	D (40)	Lanes	C (25)
15	Boston St/Custer Way	TWSC	D (30)	B (12)*	RAB	B (12)*
16	Deschutes Way/Boston St	AWSC	D (29)	C (20)*	Signal	C (20)*
17	Cleveland Ave/Capitol Blvd	TWSC	B (11)	B (10)*	RAB	B (10)*
18	Custer Way/Capitol Blvd	Signal	D (39)	D (36)*	RAB	D (36)*
19	Custer Way/North St/Cleveland Ave	Signal	D (48)	B (13)	RAB	B (13)*
20	Hoadly St/North St	TWSC	C (20)	F (54)		
21	Deschutes Way/I-5 NB Off-Ramp	TWSC	B (12)	D (30)*	Lanes	D (30)*
22	Capitol Blvd/E St	Signal	C (23)	D (38)*	RAB	D (38)*
23	Cleveland Ave/South St	TWSC	B (15)	C (21)		
24	7th Ave/Linwood Ave	TWSC	C (18)	D (33)		
25	2nd Ave/Linwood Ave	AWSC	C (25)	F (58)	RAB	B (19)
26	Capitol Blvd/Linwood Ave	Signal	B (17)	D (44)	RAB	B (17)
27	Henderson Blvd/Yelm Hwy	Signal	D (49)	F (82)	Signal	D (55)
28	Rural Rd/Trosper Rd	TWSC	C (16)	F (53)	Lanes	C (18)
29	Lake Park Dr/Trosper Rd	Signal	B (14)	B (14)		
30	Littlerock Rd/Trosper Rd	Signal	D (42)	E (58)	RAB	C (32)
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	Signal	D (45)	D (50)	RAB	C (23)
32	I-5 NB Ramps/Trosper Rd	Signal	A (7)	C (19)*	TWSC	C (19)*
33	Capitol Blvd/Trosper Rd	Signal	F (30)	F (112)	RAB	C (26)
34	Capitol Blvd/Lee St	Signal	C (24)	C (25)		
35	Littlerock Rd/Fred Meyer/Costco Drwy	Signal	A (8)	A (10)		

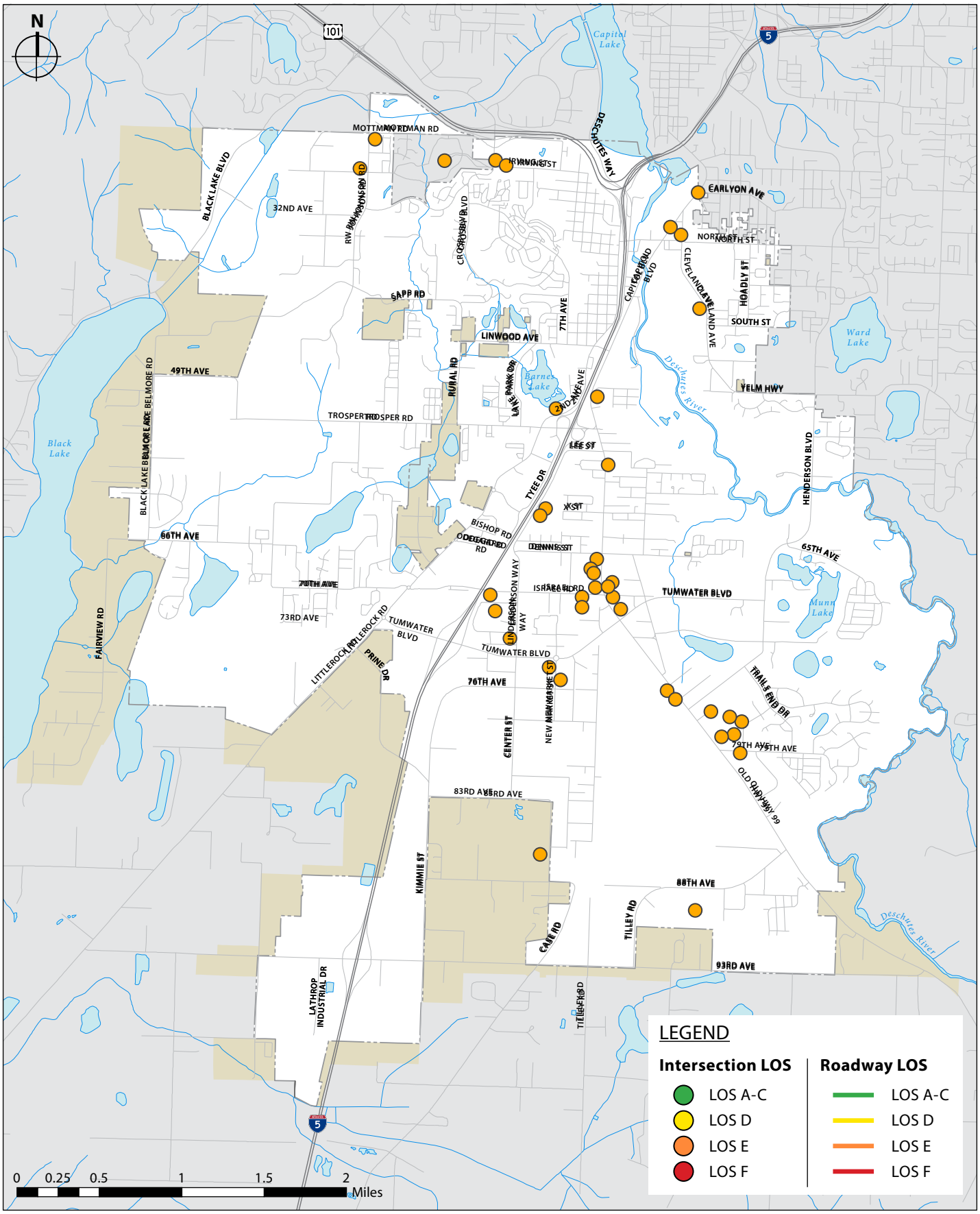
AWSC – All-Way Stop Control | TWSC – Two-Way Stop Control | RAB - Roundabout

* Projects included in Regional Transportation Plan were included in the 2040 No-Build; these projects included associated local intersection improvements.

#	Intersection	2015 Conditions		2040 LOS No-Build	2040 Conditions with Improvements	
		Intersection Control	LOS (Delay, in seconds)		Improvement	LOS (Delay, in seconds)
36	Littlerock Rd/Costco Drwy	Signal	C (21)	C (27)		
37	Littlerock Rd/Kingswood Dr	RAB	A (6)	B (14)		
38	Capitol Blvd/X St	Signal	A (7)	A (10)	RAB	A (8)
39	Elm St/X St	TWSC	A (10)	A (10)		
40	Capitol Blvd/Dennis St	Signal	B (12)	B (16)	RAB	A (9)
41	Capitol Blvd/Israel Rd	Signal	C (22)	D (42)		
42	66th Ave/Black Lake Belmore Rd	TWSC	B (11)	C (16)		
43	Kirsop Rd/66th Ave	TWSC	B (13)	C (19)		
44	Littlerock Rd/Odegard Rd	RAB	A (5)	A (5)		
45	Littlerock Rd/Israel Rd/70th Ave	RAB	A (9)	C (25)		
46	Linderson Way/Israel Rd	Signal	B (17)	D (49)		
47	Littlerock Rd/Tumwater Blvd	RAB	A (8)	A (9)		
48	I-5 SB Ramps/Tumwater Blvd	Signal	B (12)	C (22)*	RAB	C (22)*
49	I-5 NB Ramps/Tumwater Blvd	TWSC	F (106)	A (7)*	RAB	A (7)*
50	Linderson Way/Tumwater Blvd	Signal	C (35)	D (47)		
51	New Market St/Tumwater Blvd	RAB	A (4)	A (6)		
52	Capitol Blvd/Tumwater Blvd	Signal	D (36)	D (55)		
53	65th Ave/Henderson Blvd	Signal	A (7)	B (10)		
54	Tumwater Blvd/Henderson Blvd	Signal	C (34)	D (45)		
55	Trails End Dr/Henderson Blvd	TWSC	B (13)	C (16)		
56	Littlerock Rd/Black Hills School Drwy	Signal	A (3)	A (4)	Lanes	C (27)
57	Center St/76th Ave	TWSC	C (17)	D (33)		
58	Old Hwy 99/Henderson Blvd	Signal	B (13)	B (11)*	RAB	B (11)*
59	Old Hwy 99/79th Ave	TWSC	F (64)	F (177)	RAB	A (8)
60	Kimmie St/83rd Ave	TWSC	A (9)	B (11)		
61	Center St/83rd Ave	TWSC	B (12)	C (15)		
62	Old Hwy 99/88th Ave	Signal	A (9)	A (8)*	RAB	A (8)*
63	I-5 SB Ramps/93rd Ave	Signal	B (20)	D (35)	Lanes	B (15)
64	I-5 NB Ramps/93rd Ave	TWSC	B (12)	F (112)	Signal	A (9)
65	Kimmie St/93rd Ave	TWSC	C (21)	D (34)	Signal	B (14)
66	Case Rd/93rd Ave	AWSC	C (20)	F (53)	RAB	B (16)
67	Tilley Rd (South)/93rd Ave	AWSC	B (15)	F (54)	RAB	B (17)
68	Tilley Rd (North)/93rd Ave	TWSC	B (14)	F (60)	RAB	B (12)
69	Old Hwy 99/93rd Ave	TWSC	C (18)	E (36)	RAB	C (24)

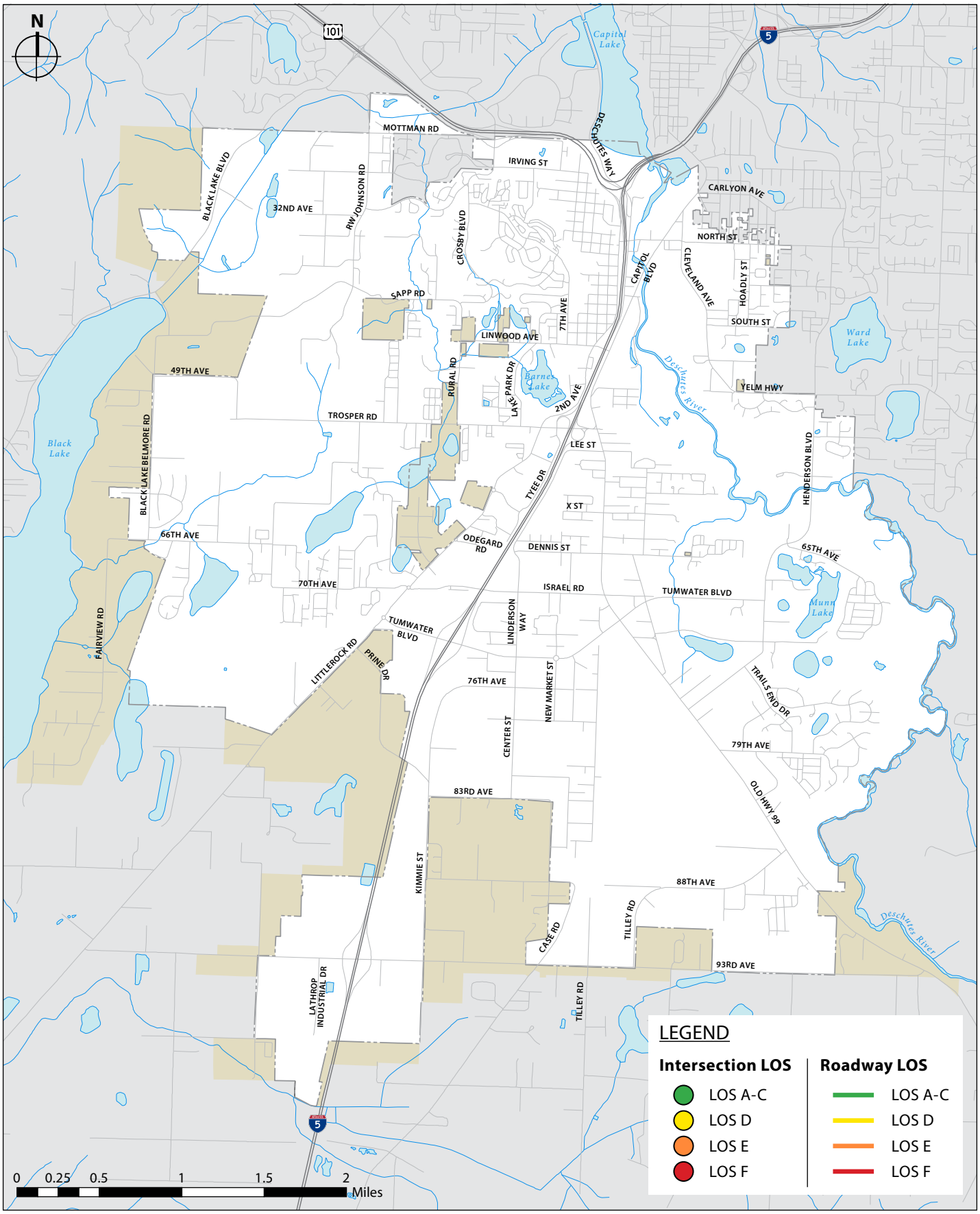
AWSC – All-Way Stop Control | TWSC – Two-Way Stop Control | RAB - Roundabout

* Projects included in Regional Transportation Plan were included in the 2040 No-Build; these projects included associated local intersection improvements.



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Figure 13
2040 Intersection and Roadway Levels of Service – No Build



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Figure 14
2040 Intersection and Roadway Level of Service – With Improvements

PERFORMANCE OF PUBLIC TRANSPORTATION

Intercity Transit establishes and maintains its own level of service standards, which Tumwater supports and adopts by reference. These are governed by IT's six-year Transit Development Plan and its Strategic Plan, in which seven different service design principles are articulated.

Following is a summary of each service design principle and its implications for Tumwater.

1. Operate five different types of local service, each designed to meet the needs of the neighborhoods it serves.
   IT operates five types of local service based on street network, residential densities, and levels of commercial activity in the areas being served.

TABLE 3: INTERCITY TRANSIT LOS STANDARDS

Service Type	Roadway Type	Service Frequency (A bus every x minutes)		
		Peak Svc	Midday Svc	Night Svc
Trunk	Major Arterial	15	15	30
Primary	Local	30	30	60
Secondary	Arterial, Local	30 / 60	60	None
Rural	Local	30 / 60	60	None

2. Strengthen service operating along major corridors.
   Services operating along major corridors will be strengthened by operating weekday services more frequently and by extending hours of operation. Major corridors also received new shelters and other stop upgrades in the past several years. Corridors in Tumwater with 15 minute, extended service are highlighted in yellow.



3. Reduce customer travel times.
   This is being accomplished by providing more direct service, increasing travel speeds through the use of transit priority measures, and by increasing service reliability. Tumwater partnered with IT in this effort by participating in the regional Smart Corridors project sponsored by TRPC, upgrading its signal system and adding Transit Signal Priority to assist IT in maintaining its schedules.

4. Keep pace with new high-density development.

This includes Tumwater Town Center, the area bordered by I-5, Tumwater Boulevard, Israel Road, and Capitol Boulevard. The number of state employees in this area continues to increase and plans call for increased residential and retail development. Fifteen minute service was introduced to this area in early 2008. Express service between Tumwater and Lakewood began September 30, 2013, funded by a regional mobility grant.

5. Expand regional express routes.
IT sought and received a regional mobility grant to pilot express inter-regional service between Tumwater, Olympia, Lacey and Lakewood.



6. Support a range of transportation alternatives.
These efforts include:

- On-going, active support of the Commute Trip Reduction program
- Addition of bike racks to all new IT buses
- On-going engagement with Tumwater schools supporting Walk N Roll programs and other Healthy Kids, Safe Streets implementation activities
- Encouraging land use patterns that support public transportation and coordinating with jurisdictions to ensure zoning ordinances and development standards support alternate modes by providing: sidewalks and street lighting; bus shelters and schedule information; convenient and safe pedestrian crossings; convenient pedestrian access to public buildings and businesses.
- Advocating and support for Tumwater's efforts to implement transit-oriented development in the vicinity of transit stations such as that at Tumwater Square, in the Brewery District
- Reviewing all development proposals and commenting on those impacting public transportation.

7. Provide fixed facilities and equipment that support the region's public transit infrastructure.
Intercity Transit is exploring opportunities for a more conveniently-located, permanent park-and-ride facility in

the vicinity of Tumwater Town Center to replace the interim facility at the corner of Bonniewood Drive and Israel Road.

Performance of Non-Motorized Networks

This Transportation Master Plan introduces new ways of looking at system performance. Specifically, this Plan introduces the concept of a multimodal level of service that focuses on how well the non-motorized network supports pedestrians and cyclists. Concepts introduced in this plan will be evaluated and tested with on-going work program activities where it will be refined and adapted to best suit Tumwater's needs.

Tumwater has had in place for many years a multimodal street policy and supportive design standards. What this means is that Tumwater includes sidewalks and bike lanes where feasible with new street construction projects and major reconstructions throughout the city as a standard procedure. Today there are many miles of sidewalks and bike lanes that would not have existed without these policies and design standards.



The multimodal system performance standards introduced with this plan do not replace those requirements. Instead, they will serve as an overlay to guide the retrofit of older infrastructure that was built with inadequate non-motorized infrastructure to satisfy current expectations about system performance. Standards must be responsive to the different place types throughout the city which include increasingly urbanized mixed-use neighborhoods, older established suburban neighborhoods and new suburban communities, regional commercial centers, and older rural areas that will transition over several decades into a more suburban character.

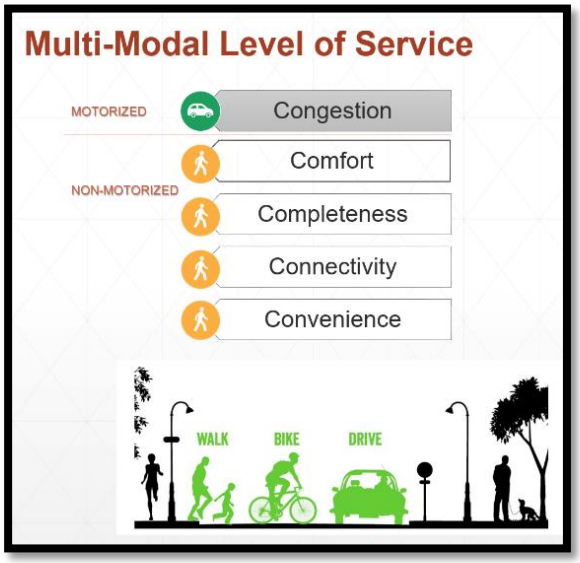
System Performance

As Tumwater expands its analysis of system performance to more explicitly consider non-motorized travel, it's important to expand its definitions of system performance. There are no congested sidewalks in Tumwater – congestion is not an

appropriate way to evaluate performance of these types of facilities in a small, predominately suburban city like Tumwater.

Instead, Tumwater is looking at other factors that influence how well the non-motorized network meets traveler expectations.

- **Comfort** pertains to the traveler's experience. It gets at the sense of safety people might feel when walking or biking along that street, and the effects that traffic volumes and speeds might have on that experience given the available infrastructure and whether it is appropriate for the speed and volume of traffic. It considers the ability of people to find their way easily, without confusion, what is referred to as the "legibility" of the network and signage. It includes things like pavement condition and lighting, which can greatly affect the comfort with which walkers and cyclists travel.
- **Completeness** relates to the area served by infrastructure. It gets at the degree of system continuity and the extent of the area served by the non-motorized system.
- **Connectivity** refers to the ways that infrastructure is considered in development patterns –street connections and non-motorized pathways increase traveler route choices. Connectivity also includes the ability to make modal linkages such as pedestrian connections from residential neighborhoods to high-frequency transit corridors.
- **Convenience** refers to the density and mix of uses within close proximity – walking distance – and the range of travel choices available to reach those destinations. This particular consideration is applicable where land use policies are deliberately working to create high density, mixed-use environments such as those envisioned for the Brewery District and the Capitol Boulevard Corridor.



This plan proposes a performance classification based on these considerations; it describes the non-motorized system in terms

of good, acceptable, and poor conditions. Table 4 on the following page describes these conditions as they might be experienced by travelers.

As with congestion-based performance standards for motor vehicles, the perception of system performance for non-motorized facilities is likely to be very subjective and reflect the individual experience and comfort level of each traveler in a variety of different conditions. Table 5 offers some illustrative examples of good, acceptable, and poor system performance conditions introduced in this plan.

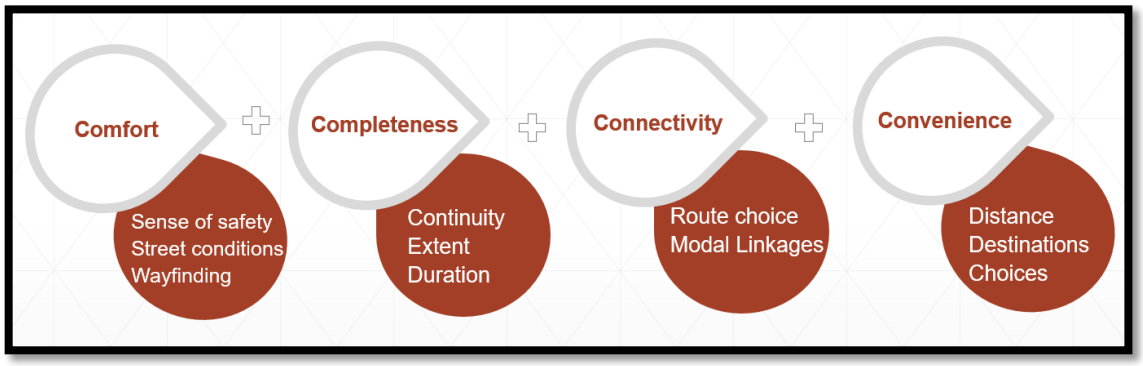


Table 4: Proposed Non-Motorized System Performance Standards - Traveler Experience

System Performance	Traveler Experience
Good	Direct routes. Well-connected network has good signage and is well lit. Non-motorized facilities are continuous, with infrequent gaps, and are the appropriate scale for the type of street. Frequent designated crossing opportunities, actuated signal controls, and design elements make travel comfortable for people of all abilities most of the time.
Acceptable	Routes may be less than direct but they are often quieter and more scenic than direct routes. Network connectivity is satisfactory though the connections may be far apart. Lighting in more rural areas is not oriented to pedestrians. Facilities are present but are discontinuous or only available on one side of the street, or may be somewhat undersized for the street type. Crossing opportunities are present but may lack actuated signal controls. Some travelers may have a less-than-comfortable travel experience some times of the day.
Poor	Routes are indirect and offer no parallel alternate routes on quieter streets. There are no network connections, no practical alternate routes. Lighting and signage are lacking. Facilities are non-existent, or are grossly undersized for the street type, or are in such poor physical condition that they constitute a hazard. Travel is stressful for most people even during off-peak travel times.

Table 5: Proposed Non-Motorized System Performance Standards - Illustrative Examples

System Performance	Illustrative Examples
GOOD Complete facilities with signage, crosswalk, both sides of street	 
ACCEPTABLE Facilities on one side of the street, shared facilities off-street or on shoulder	 
POOR No shoulders, large and busy intersections offer few amenities for non-motorized travel or comfort	 

It's important to note that the quality of non-motorized system performance is an inherently subjective measure; what is considered acceptable, good, or poor performance often varies by person, location, and situation.

Non-motorized system performance in Tumwater is a qualitative measure more than a quantitative measure. The goal of this initial foray into multimodal system performance is not to derive a standardized two decimal-point numeric value to quantify multimodal level of service in a manner similar to congestion. Rather, it is to develop a practical framework for evaluating the quality of non-motorized travel in relation to the built environment. That is because the built environment – where we each live and work and shop and recreate – influences whether walking or biking or transit are viable travel options or whether driving is the only reasonable option. Non-motorized infrastructure is but one factor in determining how we each get from Point A to Point B. Going forward, Tumwater will refine this framework to ensure alignment between its non-motorized investments and its land use policies and objectives.

Primary and Secondary Networks

An efficient, well-functioning street system has a hierarchy of arterials, collectors, and residential streets to support the mobility, circulation, and access needs of drivers. In the same way, a mature non-motorized system will have an increasingly complete network of primary and secondary routes, with other streets and facilities playing a vital role connecting neighborhoods to those networks. Table 6 describes the central function and characteristics of these networks. This plan introduces a network concept for the bike and pedestrian systems that recognizes these distinct system functions.

TABLE 6: DESCRIPTION OF NON-MOTORIZED NETWORK HIERARCHY

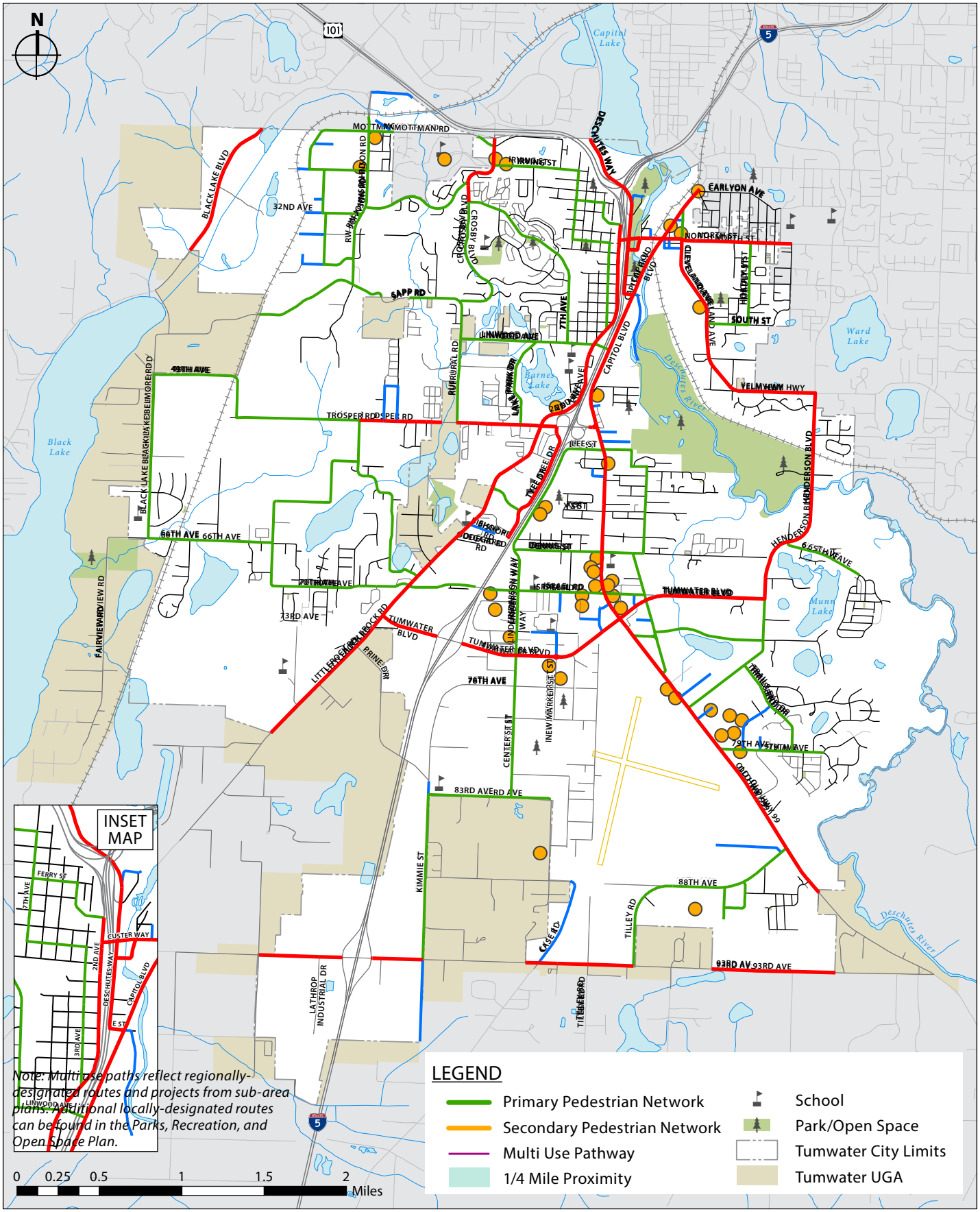
Hierarchy	System Function
Primary Network	Backbone of the system. Offers direct connections to majority of important community destinations, usually on arterials or collectors. Primary Network routes are often the most attractive route in terms of convenience in urban areas. Includes trails.
Secondary Network	Supportive role to Primary Network, often providing system continuity by connecting segments of the primary network with on-street or off-street facilities. Secondary network routes sometimes offers more comfortable routes on quieter streets, throughout route may not be as direct as Primary network.
Other Streets	Majority of streets, including residential neighborhood streets. Many have bicycle and pedestrian facilities and most future streets in this category will as a result of street standards required of all development since the mid-late 1990s. Other Streets provide access to primary and secondary networks.

Due to the different travel characteristics of cyclists and pedestrians, there are differences in the designation of primary and secondary networks serving those two modes of travel.

Pedestrian Network

Designation of the Primary and Secondary pedestrian network is largely a reflection of destinations within walkable distances. The average person is willing to travel about one-quarter mile – roughly a five minute walk – for utilitarian trips such as going to the store or catching a bus to a more distant destination. Outside of the City's most urban corridors, these destinations tend to be schools, parks, trailheads, and other recreational opportunities. Along the City's most urban corridors walkable destinations also include stores, services, restaurants and coffee shops, pubs, entertainment, employment sites, and transit stops. The pedestrian network within one-quarter mile of community destinations is considered to be part of the Primary Network. Pedestrian infrastructure within one-quarter to one mile is considered as part of the Secondary Network.

Figure 15 illustrates the Pedestrian Network introduced in this plan. Based on these designations, Tumwater's Primary Pedestrian Network is 33.2 miles in total length and its Secondary Pedestrian Network is 36.8 miles in length. Of these 70 total miles about 47 percent – roughly 33 miles – are complete with pedestrian facilities on both sides of the street. The remaining network will be built out over the years via multimodal street projects, developer mitigations, and stand-alone projects.



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Figure 15
Primary and Secondary Pedestrian Network

Bike Network

In contrast to the proximity and destination-oriented considerations in designating pedestrian networks, the Primary and Secondary bike network seeks to create a foundation of east-west and north-south routes that offer a mix of direct routes on streets often regarded as busy streets as well as alternate though often less-direct routes on lower volume streets. Trails – which provide a completely non-motorized travel route – are designated as part of the Primary Network.

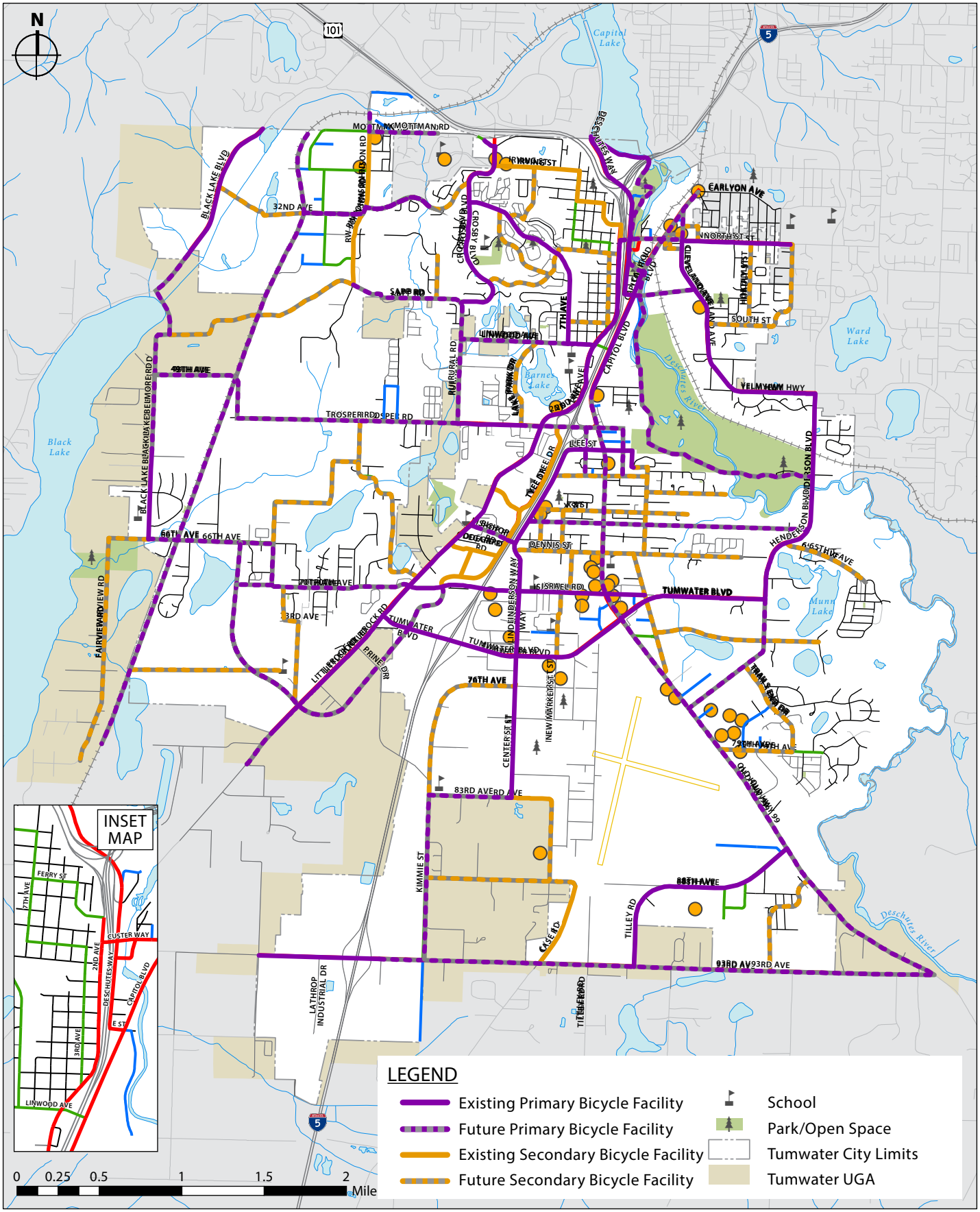
Figure 16 illustrates the Primary and Secondary Bike Network introduced in this plan. Based on these designations, Tumwater's Primary Bike Network is 57 miles in total length and its Secondary Bike Network is 30.3 miles in length. Of these 87 total miles about 31 percent – roughly 27 miles – are complete with bike facilities on both sides of the street. As with the pedestrian network, the remaining bike network will be built out over the years via multimodal street projects, developer mitigations, and stand-alone projects. In some of the more rural parts of the city the future network is likely to include wide, multiuse shoulders that will accommodate cyclists and pedestrians.

Zonal Approach to Evaluating Infrastructure Needs

Not all parts of the city are equally conducive to walking and biking because of how land use patterns have evolved over the decades. The majority of people still prefer to live in residential-only neighborhoods; this is the predominant type of land use across the city. There are expectations that people should be able to walk and ride their bikes safely though it is not assumed that people will be able to reduce many vehicle trips to a significant degree because land use activities are so dispersed.

There are some areas, though, where land use patterns make it possible for more people to meet some of their travel needs by walking or biking or transit instead of driving. City policies are working to increase development activity in these areas, which in turn will generate even more demand for walking, biking and transit.

The multimodal levels of service introduced with this plan includes designation of two zones within which to evaluate and respond to system performance. One of these is referred to as

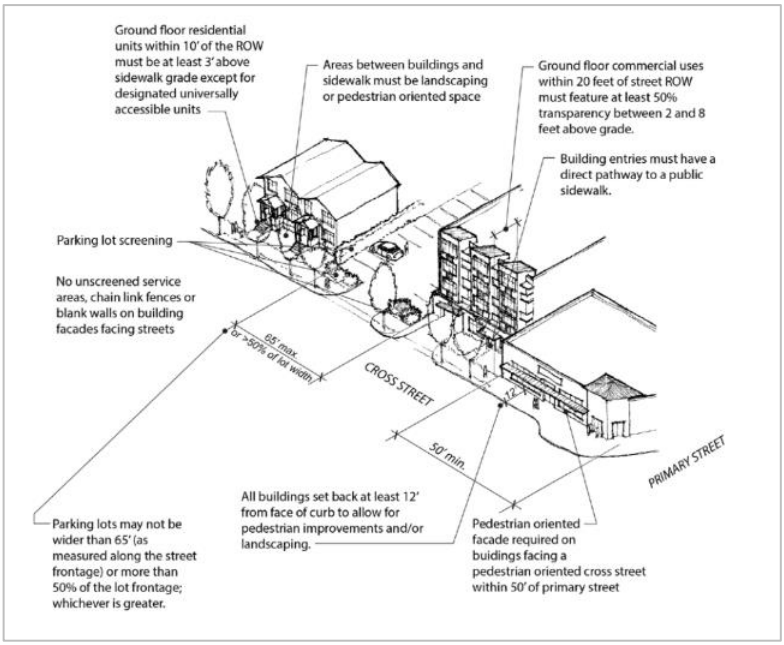

N
INSET MAP
LEGEND
Existing Primary Bicycle Facility
Future Primary Bicycle Facility
Existing Secondary Bicycle Facility
Future Secondary Bicycle Facility
School
Park/Open Space
Tumwater City Limits
Tumwater UGA
0 0.25 0.5 1 1.5 2 Mile
Capital Lake
Black Lake
Ward Lake
Barnes Lake
Munn Lake
Deschutes River
101
5
MOTTMAN RD
32ND AVE
BLACK LAKE BLVD
IRVING ST
EARLYON AVE
NORTH ST
SOUTH ST
CAPITOL BLVD
7TH AVE
SAPP RD
RURAL RD
TROSPER RD
49TH AVE
66TH AVE
BLACK LAKE BELMORE RD
FAIRVIEW RD
LITTLEROCK RD
TUMWATER BLVD
DENNIS ST
LEE ST
TREE FREE DR
HENDERSON BLVD
ISRAEL RD
INDEPENDENCE WAY
CENTER ST
76TH AVE
83RD AVE
KIMMIE ST
LATHROP INDUSTRIAL DR
CASE RD
TILLEY RD
93RD AVE
79TH AVE
TRAMS END DR
OLD HWY 99
YELM HWY
PRINE DR
FERRY ST
CUSTER WAY
DESCHUTES WAY
LINWOOD AVE

the Urban Corridor Zone; the second is referred to as the Practical Design Zone.

Urban Corridor Zone

The Urban Corridor Zone includes the Brewery District, the Capitol Boulevard Corridor, and Tumwater Town Center. These are the areas of focused study and policy development over the last few years on ways to revitalize the region's urban corridors.

Those studies pointed out the important role that non-motorized travel and access to transit play in fostering the kind of built environment people say they want in an urban area. Tumwater simply can't accommodate the kind of mixed-use, compact, walkable development desired in these areas without a robust non-motorized network; walking, biking, and transit are increasingly viable alternatives to driving as the mix and density of land uses increase. In many respects it can be said that Tumwater cannot achieve its land use vision within the Urban Corridor Zone without completing its non-motorized networks. Detailed sub-area studies evaluated access and circulation for all modes of travel, and identified critical connections, upgrades, and additions that will enable the non-motorized system to accommodate future growth.



Capitol Boulevard is an example of a city street with a pronounced pedestrian focus. Updated design standards specific to the Capitol Boulevard Corridor will ensure that future development is compatible with the intended pedestrian orientation of this important street while increasing internal access and circulation between businesses and properties. The Design Guidelines specify "primary" and "secondary" pedestrian cross streets with corresponding site and development standards.

Design standards are rigid in the Urban Corridor Zone. New facilities in these areas will be carefully designed to ensure they are compatible with adjacent land uses and building standards, and contribute to the overall sense of place in the public realm called for in adopted plans. Transportation drives land use development in this zone. In the Urban Corridor Zone, "form" or design is as important as "function" when it comes to the non-motorized system.

Practical Design Zone



This 6 foot wide asphalt pathway on 70th Avenue is a good example of how flexible design can result in critical infrastructure that would not have been achievable otherwise. Responding to area resident concerns about the lack of safe shoulders or sidewalks, the City constructed this pathway for a fraction of the cost of its standard frontage improvements. This means people had safe walking and biking options years before they would have under current standards.

Outside of the Urban Corridor Zone, the City's Comprehensive Plan calls for different types of land uses. The majority of lands are designated for residential-only neighborhoods, regional commercial centers, and industrial areas. While many developments over the last 15-20 year have included sidewalks and bike lanes, many older neighborhoods and streets have few facilities at all for walking or biking.

While there is no expectation that these areas will generate the same share of non-motorized trips as the Urban Corridor Zone, there are still important connections needed for walking and biking. Schools and parks are two of the most important destinations that need to be served by non-motorized infrastructure so that more people can access them safely without having to drive. There are also critical corridors that could accommodate longer bicycle trips if they had better infrastructure.

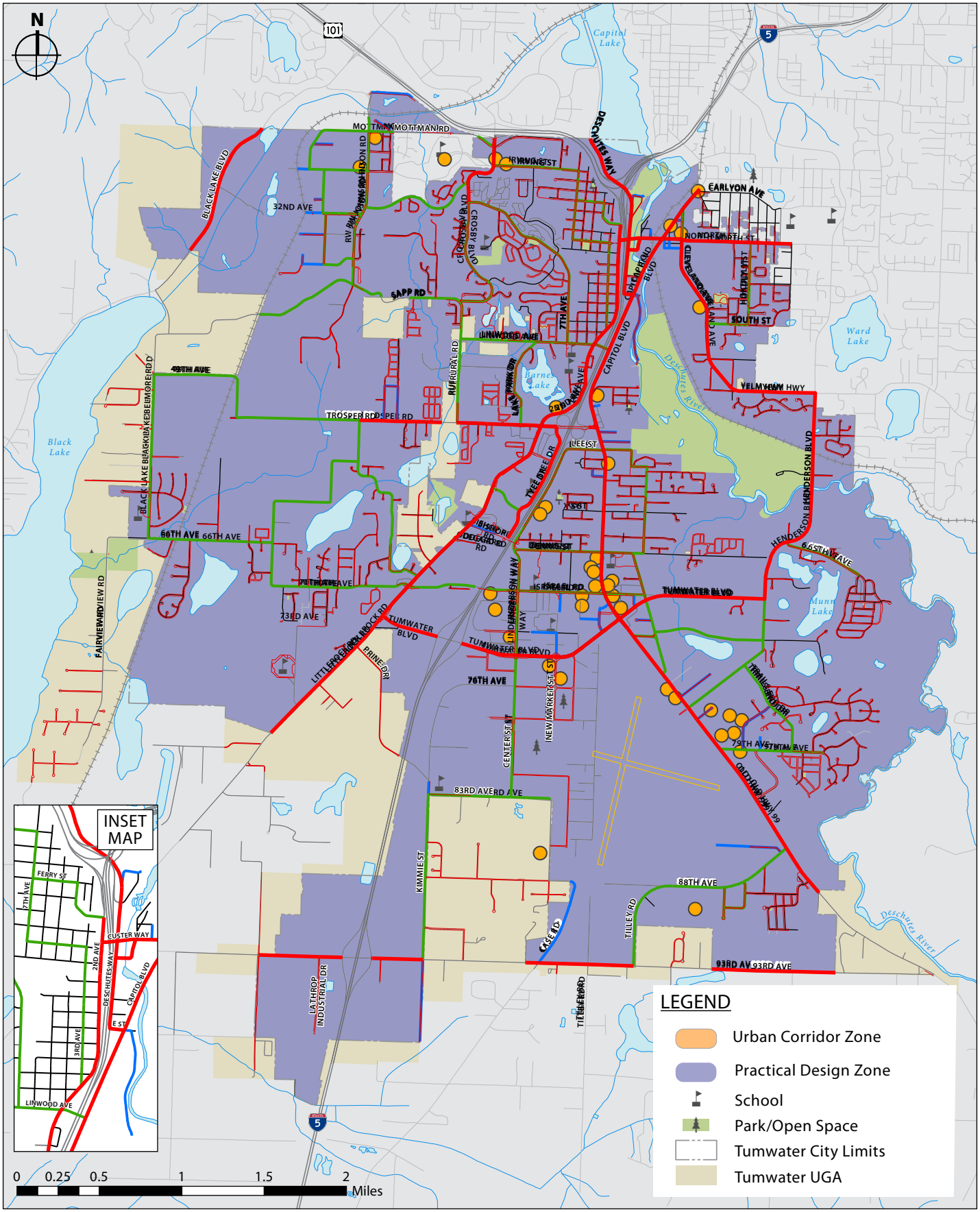
The imperative in these areas is to expand the functionality of the transportation system to accommodate these additional modes to the greatest extent possible. However, the distance between destinations in these areas is often great and it is beyond the City's fiscal capacity to build urban-style sidewalks and bike lanes throughout these areas. Instead, those multimodal system performance standards will allow the City greater flexibility in the design of facilities in the Practical Design Zone in order to maximize the linear feet of safe, non-motorized infrastructure.

While the City may adhere to its established "curb-gutter-sidewalk" development standards, it may also apply different standards if – after careful engineering evaluation - this results

in a significant increase in non-motorized infrastructure. This could mean wide asphalt walkways, or wide multi-use shoulders on rural roads. Practical designs can safely accommodate cyclists and pedestrians at a fraction of the cost of more rigid urban standards. Alternate designs can generate more miles of safe and efficient network in less time than is achievable with established standards. Transportation responds to land use development in this zone. In the Practical Design Zone, "function" can take precedence over "form" when appropriate.

Figure 17, on the next page, illustrates the two zones established for purposes of multimodal level of service evaluation in Tumwater.

As Tumwater works to apply these multimodal standards it may be necessary to modify their boundaries somewhat to better account for underlying land use and transportation patterns. For example, the older neighborhood along 2nd Avenue and Linwood Avenue has many characteristics reminiscent of neighborhoods in the Urban Corridor zone though it is separated from that zone by I-5. The Tumwater Transportation Master Plan introduces this concept of multimodal level of service analysis zones; implementation at the work program level is necessary to refine it further.



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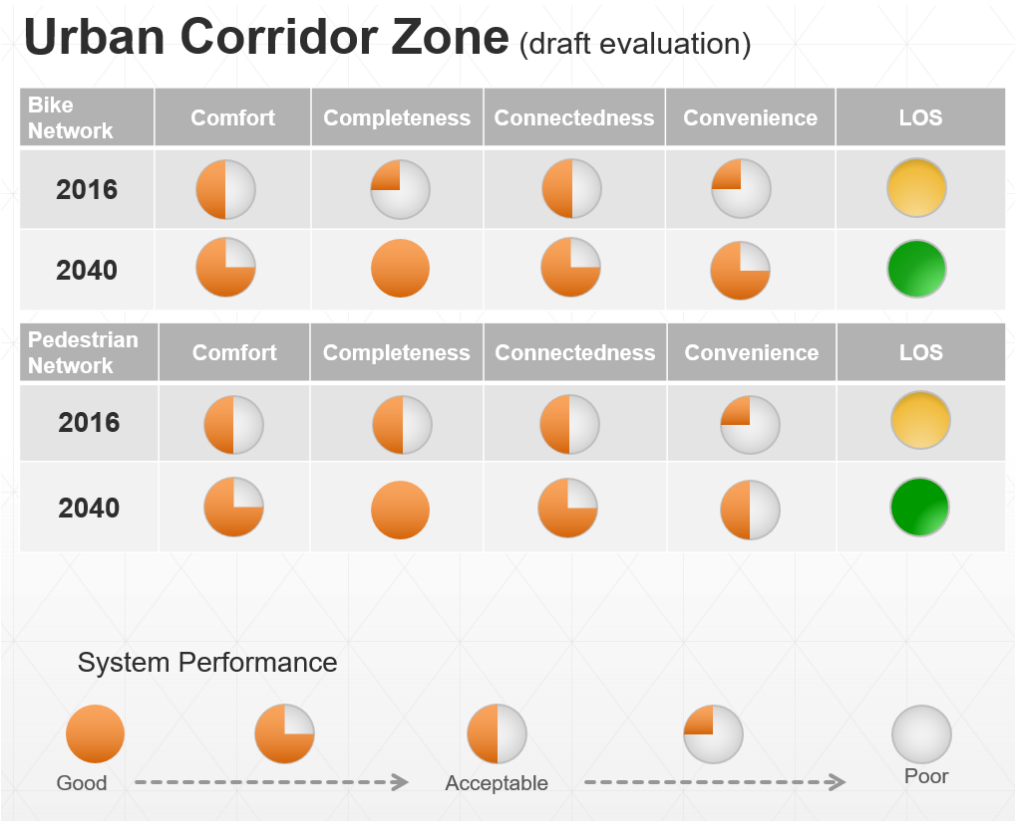
Figure 17
Urban Corridor and Practical Design Zones

Evaluating System Performance

This plan introduces a framework within which the City can evaluate the effectiveness of its policies and investments, prioritize scarce resources, and benchmark progress towards meeting long-range objectives. This initial evaluation is not yet tested with the realities of day-to-day implementation activities; the framework may need to be revised to accommodate practical needs. In the meantime, this plan offers an initial evaluation of non-motorized system performance.

Figure 18 suggests that while much remains to be done, taken as a whole the non-motorized system is generally acceptable in the Urban Corridor Zone. There are certainly system gaps – lack of bike lanes on Capitol Boulevard is a prominent example – but there is also some system redundancy and alternate routes due to the somewhat gridded street system. In fact, those alternate routes – such as Linderson Way – will always be more comfortable for some bikers than Capitol Way will be, even when it has bike lanes. Attractive destinations tend to be on busy streets; Capitol Way will always have a lot of traffic on it due to its role within the regional transportation system.

FIGURE 18: NON-MOTORIZED LOS EVALUATION IN THE URBAN CORRIDOR ZONE



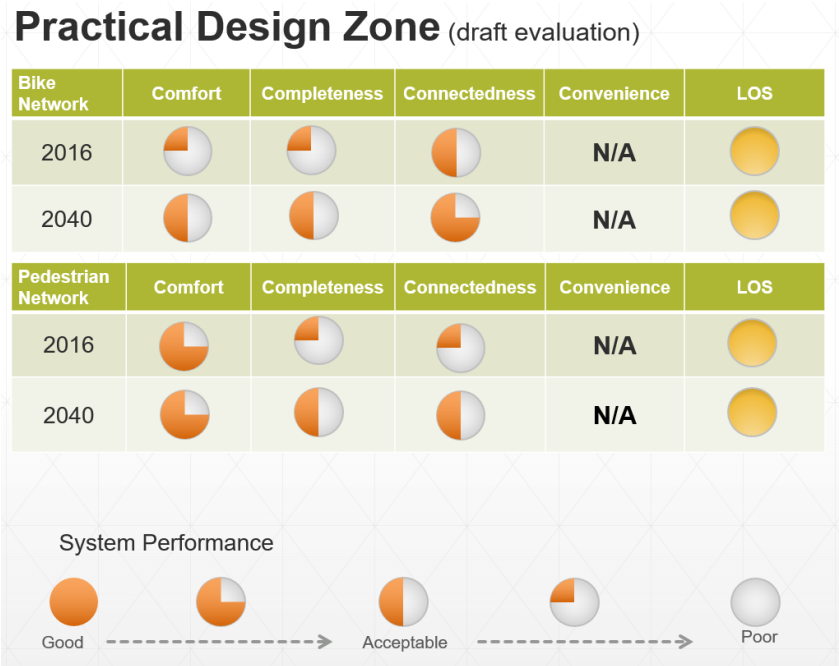
Deficiencies in system convenience is a land use issue as much as a transportation issue. Infill and redevelopment over time will increase the convenience factor in this zone.

Currently 78 percent of the Primary and Secondary Pedestrian Network within the Urban Corridor Zone is complete, with facilities on both sides of the street, and 37 percent of the Primary and Secondary Bike Network is complete. Implementation of the projects included in this plan could raise the non-motorized level of service in the Urban Corridor Zone to Good by 2040.

Factors affecting level of service in the Practical Design Zone are somewhat different than in the Urban Corridor Zone. Land uses are greatly dispersed. The transportation network has many fewer connections than in the Urban Corridor Zone so there are fewer alternate routes; even some direct routes are not very direct. Much of this zone has a distinctly rural feel to it.

Yet population is growing out at the fringes, especially around Black Lake to the west and around Trails End to the south. Residents must drive these "rural" roads to get to and from their day to day activities, creating suburban levels of traffic on streets, some of which still have a rural character. This makes biking and walking a challenging proposition if there are no shoulders.

FIGURE 19: NON-MOTORIZED LOS EVALUATION IN THE PRACTICAL DESIGN ZONE

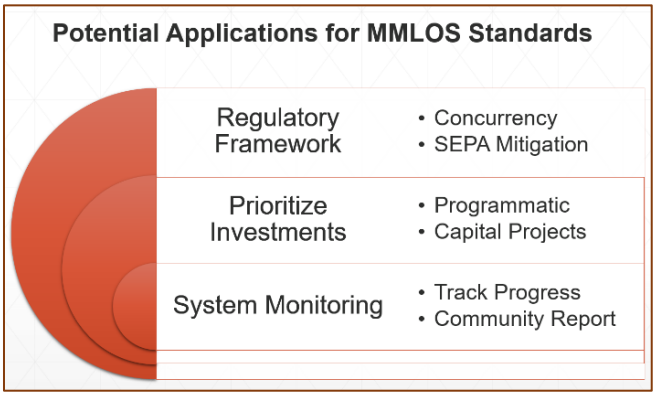


Outside of the oldest neighborhoods, such as those on Tumwater Hill or off of South Street, most non-motorized infrastructure was built to current standards over the last 15-20 years so travel on those facilities where they exist is relatively comfortable. The non-motorized infrastructure is sized appropriately for the adjacent traffic volumes and speeds. The problem is that there are vast stretches of relatively rural streets with no shoulders or off-street facilities, and these serve as important connections between destinations at either end. Currently 39 percent of the Primary and Secondary Pedestrian Network in the Practical Design Zone is complete, with facilities on both sides of the street, and 29 percent of the Bike Network is complete. The challenge in the Practical Design Zone will be to stretch resources as far as possible to maximize the extent of network available to make these connections and satisfy the longer distance travel needs of cyclists in particular. The intent of this zone is to give Tumwater Public Works the flexibility in design it needs to achieve this outcome.

As with the Urban Design Zone, there are serious gaps in the system but taken as a whole throughout the Practical Design Zone, non-motorized level of service is generally acceptable, given conditions of the built environment. Implementation of the projects included in this plan will improve travel conditions by 2040 though it is not expected to materially raise the level of service rating, which is expected to be Acceptable in 2040.

Potential Applications Outside of Transportation Master Plan

The framework introduced in this plan can be applied to a variety of different purposes outside of the long-range planning arena. That includes a potential role in the regulatory environment, as a tool to help prioritize projects and funding, and for monitoring progress over time in meeting City objectives, among other uses.



It will be necessary to take a more fine-grained look at the non-motorized network than can be done in a long-range plan in order to identify and prioritize problems and opportunities. Such an analysis may reveal improvements to the evaluation criteria that can be applied to future plan updates.

PERFORMANCE OF STATE HIGHWAY FACILITIES



Tumwater has sole authority to plan for and implement recommendations for its local transportation system, but not for state routes. The Washington State Department of Transportation (WSDOT) has sole authority to plan for and implement recommendations for I-5, which bisects the city. US 101 and its interchanges, while adjacent to Tumwater, are actually located in Olympia. WSDOT also owns and is responsible for SR 121; since this functions more like a local street than a highway, there is closer collaboration between WSDOT and Tumwater regarding this facility.

Among the various factors it considers when developing its plans, WSDOT uses output from the local long-range forecasting process to estimate how its highway system might perform in the future and where the hotspots are likely to be. WSDOT maintains its own transportation plans and project lists[1].

The GMA directs Tumwater to include level of service standards for state-owned highways in its transportation. However, chapters 47.06 and 47.80 of the Revised Code of Washington (RCW) explain that while the State may consult with local agencies in the matter of system performance, WSDOT retains the sole authority to establish level of service standards for state facilities. WSDOT has established LOS D for state highways within Tumwater's urban area (and that of Olympia and Lacey) and LOS C outside of it. Highways of Statewide Significance – I-5 for Tumwater – are exempted from complying with adopted level of service standards.

All systems analysis, even on local streets, considers projects identified in the statewide multimodal plan since they are incorporated by TRPC into the regional model, which is used by Tumwater for its analysis. WSDOT intends to extend its freeway cameras and other technology improvements through

[1] WSDOT is in the process of updating its Washington Transportation Plan: http://www.wsdot.wa.gov/planning/wtp/ WSDOT maintains a variety of inter-related transportation plans and project lists it uses to inform investment decisions. Projections from local forecasts, such as those required by the GMA, are but one input in its process.

Tumwater in the future. There is little else planned for WSDOT infrastructure in the future, though.

Areas that have been problematic for years will continue to be problematic in the future absent any implementation strategy in state plans to improve system efficiency. This includes at various times of the day the I-5/US 101 system interchange, the I-5 at Trosper Road interchange, the I-5 at Tumwater Boulevard interchange, and the US 101 at Crosby Boulevard interchange.

There are growing concerns about the performance of the 93rd Avenue interchange at I-5; outdated interchange design challenges the efficient movement of trucks on and off the highway there. Currently there are no WSDOT plans to improve mobility at these hotspots or through the Tumwater/Olympia/Lacey I-5 corridor.

Tables 7 and 8 show peak period level of service for I-5 in 2015 and in 2040. For planning purposes, Freeway capacity is 6,000 vehicles per hour northbound and 6,000 vehicles per hour southbound The LOS is based on lane capacity as derived from the regional travel demand model and does not take into account friction-causing factors like merging on or off the highway or weaving between lanes.

TABLE 7: 2015 I-5 MAINLINE PM PEAK PERIOD LEVEL OF SERVICE CONDITIONS

		Southbound		Northbound	
Freeway Segment	Freeway Capacity	Volume	Level of Service (V/C)	Volume	Level of Service (V/C)
South of 93rd Avenue	6000	2,440	A (0.41)	1,765	A (0.29)
South of Tumwater Boulevard	6000	3,045	A (0.51)	2,190	A (0.36)
South of Trosper Road	6000	3,295	A (0.55)	3,355	A (0.56)
South of Deschutes Way	6000	3,955	B (0.66)	4,245	C (0.71)
North of Deschutes Way	6000	3,955	B (0.66)	4,030	B (0.67)

TABLE 8: PROJECTED 2040 I-5 MAINLINE PM PEAK PERIOD LEVEL OF SERVICE CONDITIONS

Freeway Segment	Freeway Capacity	Southbound		Northbound	
		Volume	Level of Service (V/C)	Volume	Level of Service (V/C)
South of 93rd Avenue	6000	3,535	A (0.41)	2,645	A (0.44)
South of Tumwater Boulevard	6000	4,250	C (0.71)	3,095	A (0.52)
South of Trosper Road	6000	4,445	C (0.74	4,220	C (0.70)
South of Deschutes Way	6000	4,990	D (0.83)	5,335	D (0.89)
North of Deschutes Way	6000	4,990	D (0.83)	4,995	D (0.83)

CONCURRENCY

Concurrency, as noted previously, is the process of determining whether transportation infrastructure can accommodate new development and if not, what mitigation measures will be required. Concurrency can result in denial of a development proposal if it cannot mitigate its impacts on adopted LOS standards. In the legislation regarding the transportation element of the Comprehensive Plan, GMA stipulates ***"after adoption of the comprehensive plan…local jurisdictions must adopt and enforce ordinances which prohibit development approval if the development causes the level of service…to decline below the standards adopted in the transportation element…unless improvements or strategies to accommodate the impacts of development are made concurrent with the development."*** This reiterates the importance of LOS standards explained earlier. While the concurrency ordinance is not part of this transportation element, it is informed by the LOS standards and other considerations included in this element.

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Transportation Master Plan

CHAPTER 11

CAPITAL IMPROVEMENTS

Capital Improvements

The Transportation Master Plan includes a list of capital improvements needed in the city between now and 2040 to achieve and maintain adopted levels of service and accomplish other important transportation objectives for the city, such as supporting the development of more walkable, people-oriented places and promoting active travel options that encourage better public health. Following is a list of projects, by project type.

Non-Motorized Projects

Every street project in this transportation plan includes appropriate non-motorized facilities. Non-motorized facilities account for anywhere from 30 percent to 60 percent of the cost of typical street projects. This includes right-of-way acquisition, stormwater treatment, and additional materials in addition to the construction labor.



This 2014 Capitol Way project added bike lanes and improved the sidewalks in this part of the Brewery District in addition to improving stormwater runoff facilities.

The projects identified here are stand-alone projects. Some were previously identified in sub-area plans and other focused studies. Others were identified to support Safe Routes to School programs. The majority come from evaluation of the future needs suggested by the Primary and Secondary networks. The latter source merits some additional explanation to avoid confusion when looking at the map of future network needs and the project list.

For bike projects, “future network needs” were identified on an initial list of project needs. Comparison of that list to the list of street projects revealed a significant number of those non-motorized facilities slated to be built as a part of these street projects. Consequently, those projects are not included on this list as stand-alone projects.

The remaining projects were evaluated for potential low cost improvements. Some future needs can be met with a programmatic approach to non-motorized facility improvements such as striping, signage, and crosswalk improvements. A separate list of these programmatic upgrades is included at the end of the capital improvements list.

Those deficits that remained after consideration of street projects and programmatic opportunities comprised the list of stand-along bike projects found in Table 9. A map of those stand-alone projects can be found in Figure 20. Costs are not developed for these projects; most are still conceptual and others will be designed and built in the course of development or redevelopment projects. Costs will be developed as projects move into the six-year Transportation Improvement Program or as part of a more in-depth bike and pedestrian planning effort.

A slightly different approach was used to identify stand-alone pedestrian facilities.

Similar to bike facilities, many pedestrian deficiencies will be addressed with completion of proposed street projects. Figure 21 shows those deficiencies on the Primary and Secondary Network that will be addressed by future street projects; it also indicates whether the remaining deficiencies are attributed to needs on one side of the street or both.

In looking at the remaining deficiencies, particular attention was focused on the Urban Corridor Zone, where detailed sub-area plans have identified specific pedestrian improvements that will help accommodate future land use activities. Those needs constitute the majority of stand-alone pedestrian projects identified in Table 10. Some number of the remaining deficiencies are likely to be addressed with wide, multi-use shoulders in rural areas, or programmatic investments that create a safer and more comfortable walking route. A detailed pedestrian plan such as that identified in the chapter on Strategic Needs and Opportunities will be useful in identifying and prioritizing needs citywide.

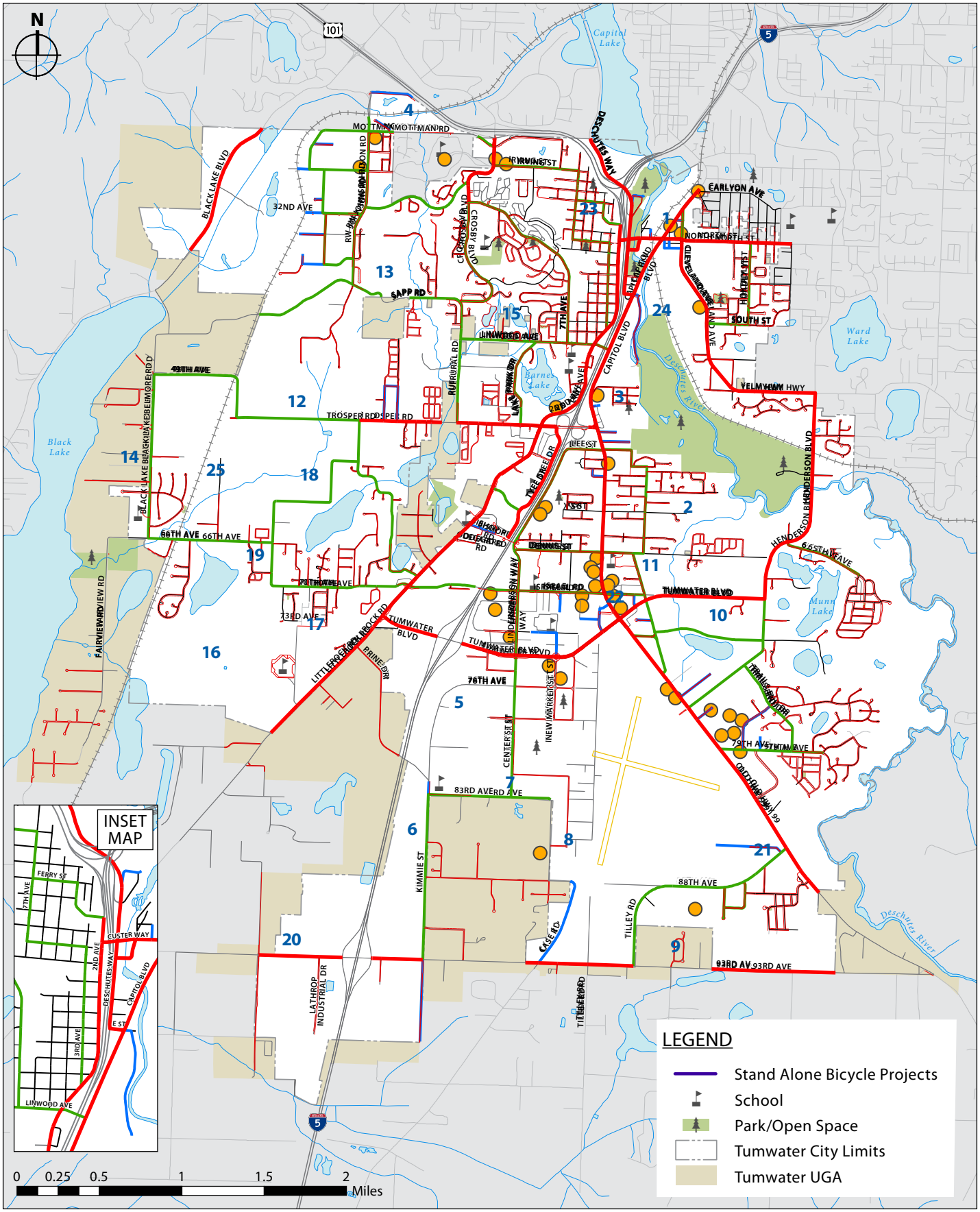
Cost are not developed for these projects; most are still conceptual and others will be designed and built in the course of development or redevelopment projects. Costs will be developed as projects move into the six-year Transportation Improvement Program or as part of a more in-depth bike and pedestrian planning effort

Table 9 Stand-alone Bike Projects

ID	Project	Description
1	Public Alleyway Non-motorized Network	Improve alleyways within the Brewery District "triangle" to provide comfortable, attractive connections for cyclists and pedestrians that also enhance activities on the ground floors of adjacent buildings and increase access to transit.
2	Shared-use Path Along BPA Alignment	Establish a new shared-use pathway running through the east-west BPA alignment and connecting to Linderson Way.
3	Shared-use Path from Trosper Road to South of M Street	New non-motorized connection east of Capitol Boulevard linking the neighborhood in the vicinity of Linda Street and Ruby Street to Capitol Boulevard near M Street.
4	Mottman Road Sidewalk and Bike Lane Improvements	Install sidewalk on the north side of Mottman Road from the vicinity of Crosby Boulevard to R.W. Johnson Boulevard. Note that sidewalks and bike lanes will be added to both sides of Mottman between Mottman Court and R.W. Johnson Boulevard during a pavement resurfacing project.
5	76th Ave / Kimmie Street Bike Facilities (Port property)	From Center Street to 83rd Avenue (Port of Olympia project).
6	76th Ave / Kimmie Street Bike Facilities (City property)	From 83rd Avenue to 93rd Avenue.
7	83rd Avenue Bike Facilities	From Kimmie Street to Center Street
8	Armstrong Road Bike Facilities	From 83rd Avenue to 88th Avenue
9	93rd Avenue Bike Facilities	From I-5 to Old Highway 99
10	73rd Avenue Bike Facilities	From Bonniewood Drive to Henderson Boulevard
11	Bonniewood Drive Bike Facilities	From Dennis Street to Old Highway 99
12	49th Avenue / Trosper Road / 54th Avenue Bike Facilities	From Black Lake-Belmore Road to Rural Road
13	Sapp Road / Rural Road Bike Facilities	From Trosper Road to Black Lake-Belmore Road
14	Black Lake-Belmore Road Bike Lanes	From 66th Avenue to Black Lake Boulevard (some partial programmatic potential)
15	Linwood Avenue Bike Facilities	From Sapp Road to G Street
16	New Pathway to Black Hills High School	New dedicated pathway from the future Gate-Belmore Trail to Black Hills High School
17	Black Hills High School Neighborhood Connection	From Bronington Street to Black Hills High School
18	Kirsop Road Bike Facilities	From 54th Avenue / Trosper Road to 66th Avenue
19	66th Avenue / 70th Avenue Bike Lanes	From Black Lake-Belmore Road to Littlerock Road
20	93rd Avenue Bike Lanes West of I-5	From I-5 to the western City Limits, as development occurs
21	88th Avenue Bike Facilities	From just west of Cabot Drive to 85th Avenue
22	Israel Road Bike Facilities	From Nikolas Street to Bonniewood Drive
23	Desoto Street Bike Lanes	From 2nd Avenue to Emerson Street. Note that additional bike lanes in this vicinity are included as a programmatic improvement.
24	Deschutes Valley Trail	From Henderson Boulevard at Pioneer Park to Tumwater Historical Park
25	Gate to Mottman Trail	Conversion of the old Gate-Belmore rail corridor to a trail between Gate and Mottman. Note that conversion of this rail corridor to a trail south of 66th is in the works, led by Thurston County.

Table 9 Stand-alone Bike projects Continued

Programmatic Bike Improvements (low cost projects that can generally be completed within the existing right-of-way)		
ID	**Project**	**Description**
P1	Trosper Road Bike Facilities	From Lake Park Drive to Rural Road
P2	Center Street Bike Facilities	From Tumwater Boulevard to 83rd Avenue
P3	Trails End Road Bike Facilities	From Henderson Boulevard to 79th Avenue and then to Old Highway 99
P4	Lake Park Drive Bike Facilities	From Linwood Avenue to Trosper Road
P5	Vista Loop Bike Facilities	From Crosby Boulevard to Barnes Boulevard
P6	12th Avenue / Vista Loop Bike Facilities	From Barnes Road to Irving Street
P7	Somerset Hill Road Bike Facilities	From R.W. Johnson Boulevard to Crosby Boulevard
P8	Miner Drive Bike Facilities	From Kirsop Road to Littlerock Road
P9	South Street / Hoadly / Pifer Road Bike Facilities	From North Street to South Street. Note that some segments of this fall within the City of Olympia.
P10	Lee Street / Boston Avenue / Hazelhurst Bike Facilities	From Capitol Boulevard to Elm Street
P11	Dennis Street Bike Facilities	From Linderson Way to Capitol Boulevard, and from Capitol Boulevard to Elm Street
P12	Bates Street / 7th Avenue Bike Facilities	From 2nd Avenue to Irving Street
P13	Desoto / 4th / Ferry / Irving Street Bike Facilities	From 2nd Avenue to Crosby and 3rd Avenue
P14	Shared Bike Streets	Upgrade as necessary and sign with 'sharrows' the key shared bike streets identified in the Brewery District plan to provide good connections between adjacent neighborhoods and the stores and services in the District. (Programmatic potential)
P15	Shared-use Path from Linderson Way to Southgate Shopping Center	New non-motorized connection linking the neighborhood in the vicinity of Gerth Street to the Southgate Shopping Center. Potentially can be incorporated into the 6th Avenue Extension design. (Programmatic potential)
P16	X Street Shared Bike Streets	Upgrade as necessary and sign with 'sharrows' X Street, from Elm Street to 7th Ave. (Programmatic potential)

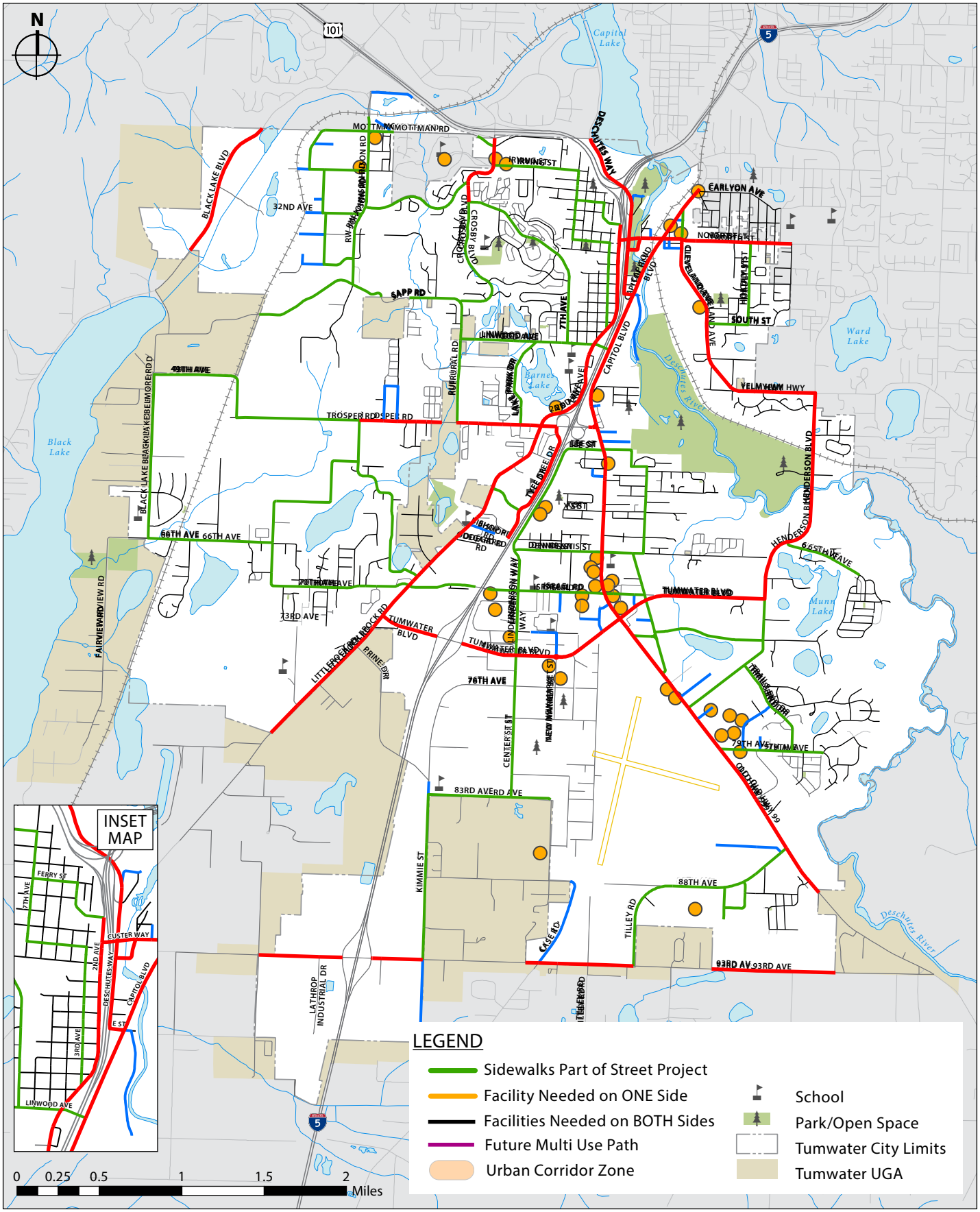


CITY OF TUMWATER
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Figure 20
Stand Alone Bicycle Projects

Table 10 Stand-alone Pedestrian Projects

ID	Project	Description
1	Public Alleyway Non-motorized Network	Improve alleyways within the Brewery District "triangle" to provide comfortable, attractive connections for cyclists and pedestrians that also enhance activities on the ground floors of adjacent buildings and increase access to transit.
2	Improved Sidewalks in Brewery District	Upgrade existing sidewalks (in addition to those being reconstructed as part of street projects) to improve access and circulation throughout the District, including well marked and designed pedestrian crossings at key locations.
3	Cleveland Avenue Retrofit	Retrofit Cleveland Avenue between Custer Way and Capitol Boulevard to be more pedestrian oriented.
4	Pedestrian Crossings at New Transit Station	When the Tumwater Square Transit Station is relocated to Capitol Boulevard establish new pedestrian crossings in the vicinity of the Station, incorporating high visibility flashers and other treatments to ensure safe pedestrian access.
5	New Pedestrian Connection from Linderson Way to Elm Street, in vicinity of T Street	Pedestrian facilities offering a direct route between Linderson Way and Elm Street with a crossing at Capitol Way. Preferred route roughly aligns with T Street and Pinehurst Drive.
6	Elm Street Sidewalks	Completion of sidewalk facilities on Elm Street between Pinehurst and W Street.
7	Shared-use Path Along BPA Alignment	Establish a new shared-use pathway running through the east-west BPA alignment that crosses Capitol Boulevard and connecting to Linderson Way.
8	Capitol Boulevard at U Street Pedestrian Improvement	Create a safe pedestrian crossing opportunity on Capitol Boulevard at U Street incorporating a refuge island and rectangular rapid flashing beacons.
9	North-South Pedestrian Connection between X Street and Dennis Street	Create a new pedestrian / non-motorized connection through the future shared-use pathway on the BPA alignment to connect X Street and Dennis Street in the vicinity of Tumwater High School.
10	Enhanced Access at I-5 Overcrossing	Upgrade pedestrian and cyclist access to the non-motorized crossing of I-5 near Dennis Street.
11	Pedestrian Improvements and Traffic Calming	Various locations throughout the city. Intent is to create a safer and more inviting pedestrian environment by improving crossing opportunities on busy streets and by installing traffic calming devices that slow vehicles in high pedestrian areas. Specific projects developed as a part of the six-year Transportation Improvement Program (TIP) process.
12	Safe Routes to School Projects	Pedestrian facility upgrades in the vicinity of Peter G. Schmidt and Michael T. Simmons schools to promote walking to and from school. Project details developed as a part of the six-year TIP process.
13	Mottman Road Sidewalk and Bike Lane Improvements	Install sidewalk on the north side of Mottman Road from the vicinity of Crosby Boulevard to R.W. Johnson Boulevard. Note that sidewalks and bike lanes will be added to both sides of Mottman between Mottman Court and R.W. Johnson Boulevard during a pavement resurfacing project.



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Figure 21
Pedestrian Network Project Status

MOTORIZED PROJECTS

Motorized projects include street projects – widenings and new connections, primarily – and intersection projects. Tables on the next few pages identify projects needed between now and 2040 to meet adopted levels of service and achieve City objectives. Table 11 identifies roadway projects; Table 12 identifies intersection projects. A map of proposed projects is shown in Figure 22. Note that all street projects include appropriate non-motorized facilities according to City design standards.

TABLE 11: PROPOSED 2040 STREET PROJECTS W/ BIKE LANES AND SIDEWALKS

PROPOSED 2040 STREET PROJECTS w/ Bike Lanes and Sidewalks as Appropriate Based on Street Standards and Design Guidelines

	Street	Extents	Existing Conditions	Proposed Improvement	Notes
R1	Littlerock Road	Tumwater Blvd to Western City Limits	2 lanes, no bike lanes or sidewalks	Widen to 3 lane	Projected volume is approaching need for a 4/5 lane section. Monitor road as development occurs; all building construction should be set back to accommodate 5 lanes.
R2	Tyee Drive	Bishop Rd to Israel Rd	No road	New 3 lane extension with RAB at Israel Rd	This project is currently being designed.
R3	Tyee Drive	Israel Rd to Tumwater Blvd	No road	Construct 5 lane extension, including intersection improvements at Tumwater Blvd	Reassess need for a 5 lane section as the surrounding properties are developed
R4	Tyee Drive	Tumwater Blvd to Prine Dr	No road	Construct 5 lane extension, including intersection improvements at Prine Dr	Reassess need for a 5 lane section as the surrounding properties are developed
R5	Tyee Drive	Prine Dr to Littlerock Rd	No road	Construct 3 lane extension, including intersection improvements at Littlerock Rd	Reassess need for TWLTL as the surrounding properties are developed
R6	Trosper Road	Lake Park Dr to Rural Rd	2 lanes, on-street parking, partial bike lane, sidewalks	Repurpose asphalt to provide 3 travel lanes and bike lanes	
R7	Tumwater Blvd	Capitol Blvd to Henderson Blvd	2 lanes, wide shoulders and no bike lanes or sidewalks	Widen to 3 lanes, including intersection at Bonniewood Dr	
R8	Tumwater Blvd	I-5 Interchange	Currently 3 lane bridge	RAB Intersection control and wider bridge	Note: This is a WSDOT project
R9	Tumwater Blvd	I-5 SB Ramps to Tyee	3 lanes, no bike or sidewalks	Widen to 5 lanes	
R10	E Street	Capitol Blvd to Cleveland Ave	No road	Construct 4 lane extension across Tumwater Valley, incl: E St & Cleveland Ave intersections	This project will also provide access to properties on the valley floor.
R11	Old Highway 99	Tumwater Blvd to 73rd Av	2 lanes, no bike or sidewalks	Widen to 5 lanes	This project is already funded
R12	Old Highway 99	73rd Ave to 88th Ave	2 lanes, no bike lanes or sidewalks	Widen to 5 lanes, including intersection improvements at Bonniewood Dr, Henderson Blvd and 88th Ave	This widening will include the construction of RAB's at Henderson Blvd and 88th Ave
R13	Old Highway 99	88th Ave to 93rd Ave	2 lanes, no bike lanes or sidewalks	Widen to 3 lanes	Projected volume is approaching need for a 5 lane section. Widening Old Hwy 99 would not provide meaningful benefit unless continues south beyond city Limits. This road should be monitored as development occurs.
R14	Henderson Boulevard	Tumwater Blvd to 65th Ave	2 lanes, no bike lanes or sidewalks	Widen to 3 lanes	Construct left-turn lanes where needed, consider TWLTL or median for remaining sections
R15	Henderson Boulevard	Tumwater Blvd to Old Hwy 99	2 lanes, no bike lanes or sidewalks	Widen to 3 lanes	Construct left-turn lanes where needed, consider TWLTL or median for remaining sections
R16	32nd Street	Ferguson St to Black Lake Blvd	3 lanes with sidewalks, no bike lanes	Construct 3 lane extension, including intersection at Black Lake Blvd	This roadway project will be development driven
R17	70th Avenue Extension	Kirsop Rd to 73rd/66th Connector	2 lanes with partial sidewalks and no bike lanes	Construct 3 lane extension, including intersection improvements at Kirsop Rd	This roadway project will be development driven
R18	73rd Avenue	Prine Dr Ext to 73rd/66th Connector	No road	Construct 3 lane road	This roadway project will be development driven. Need for 3rd lane will be assessed during design
R19	Prine Drive	Tyee Rd to 73rd Ave	2 lanes, no bike lanes or sidewalks	Widen to 3 lanes between Tyee Rd & Tumwater Blvd. Construct 3 lane extension, including intersection improvements at Tumwater Blvd	This roadway project will be development driven.
R20	93rd Avenue	Lathrop Industrial Dr to I-5 SB Ramps	2 lanes, no bike lanes or sidewalks	Widen to 5 lanes, including intersection improvements at Lathrop Rd	5 lane section to accommodate commercial properties on both sides of 93rd Ave. Additional lanes will add/drop at Lathrop Industrial Dr and SB ramps (until project R24)

PROPOSED 2040 STREET PROJECTS w/ Bike Lanes and Sidewalks as Appropriate Based on Street Standards and Design Guidelines

	Street	Extents	Existing Conditions	Proposed Improvement	Notes
R21	SR 121 (93rd Avenue)	I-5 NB Ramps to Kimmie St	2 lanes, partial bike lanes and sidewalks	Widen to 5 lanes, including intersection improvements at Kimmie St	5 lane section to accommodate commercial properties on both sides of 93rd Ave. Additional lanes will add/drop at Kimmie St and NB ramps (until project R24)
R22	SR 121 (93rd Avenue)	Kimmie St to Tilley Rd (South)	2 lanes, no bike lanes or sidewalks	Widen to 3 lanes	New development setback for a 5 lane corridor allows for widening long term; 2040 volumes may exceed 3 lanes
R23	SR 121 (93rd Avenue)	Lathrop Industrial Dr to Western City Limits	2 lanes, partial bike lanes and sidewalks	Widen to 3 lanes	
R24	SR 121 (93rd Avenue)	I-5 Interchange	Currently 2 lane bridge	Widen bridge to 5 lanes	This will become a WSDOT project
R25	6th Ave	T St to Lee St	No road	Construct 3 lane roadway as part of Trosper Rd interchange improvements	The connection of this roadway to Trosper Road is included in the Trosper Interchange project
R26	Custer Way	Boston St to Cleveland Ave	4 lanes with sidewalk, no bike lanes	Reduce to 3 lanes, install bike lane EB	This project is dependent on construction of intersection projects I2, I4, I6, I7 and I8
R27	Capitol Boulevard	E St to Cleveland Ave	5 lanes with sidewalk, no bike lanes	Reduce to 3 lanes, install bike lanes	Requires construction of intersection projects I2, I4, I6, I7, I8
R28	Capitol Boulevard	Cleveland Ave to Carlyon Ave	5 lanes with sidewalk, no bike lanes	Reduce to 4 lanes, install bike lanes	Requires construction of intersection projects I2, I4, I6, I7, I8
R29	Capitol Boulevard	Israel Rd to M St	5 lanes with sidewalks, no bike lanes	Reduce to 4 lanes, install bike lanes and curbed median	Requires construction of intersection projects 15, 16, 17, I8
R30	New North/South St	Lee St to Trosper Rd	No road	Construct 2 lane road with sidewalks, bike lanes	
R31	Odegard Road	Littlerock Rd to Tyee Dr	2 lanes, no bike lanes or sidewalks	Construct 2 lane road with on-street parking	
R32	Bishop Road	Littlerock Rd to Tyee Dr	2 lanes, no bike lanes or sidewalks	Construct 2 lane road with on-street parking	
R33	73rd/66th Connector	66th Ave to 73rd Ave	No road	Construct 3 lane roadway	This roadway project will be development driven
R34	New Market Street	Tumwater Blvd to Israel Rd	2 lanes, no bike lanes or sidewalks	Construct 2 lane road with on-street parking	
R35	Town Center Connector	Tumwater Blvd to Israel Rd	No road	Construct 2 lane road with on-street parking	
R36	72nd Avenue	Cleanwater Dr to Linderson Way	Site Access	Construct 2 lane extension	
R37	Dolman Property	South of 73rd Ave	No roads	Construct road system as development occurs	This roadway project will be development driven
R38	Trosper Road Interchange	NB Ramps	Currently accesses Trosper Road	Reroute NB ramps to Ruby St at 6th Ave with new RAB. Existing WB to NB slip ramp (Trosper to I-5) remains. Includes upgrade of NB ramps	This project came out of a follow up to the Capitol Blvd Corridor Plan to address the Trosper Rd/Capitol Blvd intersection
R39	Deschutes Way	E St to US 101 WB On-Ramp	2 lanes, on street parking and sidewalk, no bike lanes	Undetermined	The specific improvement for this roadway will be determined in the E Street Extension project
R40	M Street Connection	M Street to Tumwater Valley Drive	No street	Construct 2 lane connection	
R41	Lambskin St Connection	Lambskin St to Sapp Rd	No street	Construct 2 lane connection	Developer funded

TABLE 12: PROPOSED 2040 INTERSECTION PROJECTS W/ PEDESTRIAN CROSSINGS AND ADA UPGRADES WHERE APPROPRIATE

PROPOSED 2040 INTERSECTION PROJECTS w/ Pedestrian Crossing and ADA Upgrades as Warranted

ID	Cross Streets	2015 Condition	Proposed Improvement	Notes
I1	Black Lake Belmore at Black Lake Blvd	TWSC	Install RAB	
I2	Capitol Blvd at Carlyon Ave	Signal	Install RAB	
I3	2nd Ave at Custer Way	Signal	Restripe SB through lane to be a shared through-left-turn lane	This improvement will provide improved lane utilization at the 2nd Ave at US 101/I-5 Off-ramps intersection
I4	Boston St at Custer Way	TWSC	Install RAB	
I5	Deschutes Way at Boston St	AWSC	Install Traffic Signal	
I6	Capitol Blvd at Cleveland Ave	TWSC	Install RAB	
I7	Capitol Blvd at Custer Way	Signal	Install RAB	
I8	Cleveland Ave at Custer Way/North St	Signal	Install RAB	
I9	Linwood Ave at 2nd Ave	AWSC	Install RAB	
I10	Capitol Blvd at Linwood Ave	Signal	Install RAB	This improvement is to facilitate access along Capitol Blvd as median treatment is installed as part of the Capitol Blvd Corridor Plan. It is not a capacity improvement
I11	Henderson Ave at Yelm Hwy	Signal	Construct a 2nd WB to SB left-turn lane	Construction of a 2 lane roundabout would also improve the traffic signal operations to LOS D. Both of these potential improvements present ROW challenges
I12	Trosper Rd at Rural Rd	TWSC	Construct EB left-turn lane and TWLTL east of Rural, allowing SB lefts to perform two-stage movements	These improvements could be constructed without repurposing the existing ROW along Trosper Rd to Lake Park Dr
I13	Trosper Rd at 2nd Ave/Littlerock Rd	Signal	Install RAB	Construction of a RAB will have ROW impacts. Without improvement intersection is expected to operate at LOS E with congestion along 2nd Ave and Littlerock Rd
I14	Trosper Rd at Tyee Dr/SB I-5 Ramps	Signal	Install RAB	Construction of a RAB will have ROW impacts. Without improvement intersection is expected to operate at LOS F with congestion along Tyee Dr, SB I-5 Ramps and Trosper Rd
I15	Trosper Rd at Capitol Blvd	Signal	Install RAB	
I16	T St at Capitol Blvd	TWSC	Install RAB	

PROPOSED 2040 INTERSECTION PROJECTS w/ Pedestrian Crossings and ADA Upgrades as Warranted

ID	Cross Streets	2015 Condition	Proposed Improvement	Notes
I17	X St at Capitol Blvd	Signal	Install RAB	
I18	Dennis St at Capitol Blvd	Signal	Install RAB	
I19	Old Hwy 99 at 79th Ave	TWSC	Install RAB	
I20	93rd Ave at I-5 NB Ramps	TWSC	Install Traffic Signal	
I21	93rd Ave at Kimmie St	TWSC	Install Traffic Signal	Current development mitigation plans call for a traffic signal here.
I22	93rd Ave at Case Rd	AWSC	Install RAB	
I23	93rd Ave at Tilley Rd (south)	AWSC	Install RAB	Construction of a RAB would be necessary should median control along 93rd Ave be implemented between Case Rd and Tilley Rd
I24	93rd Ave at Tilley Rd (north)	TWSC	Install RAB	
I25	93rd Ave at Old Hwy 99	TWSC	Install RAB	As traffic along Old Hwy 99 grows, acceleration lanes will not be sufficient to accommodate traffic on 93rd Ave

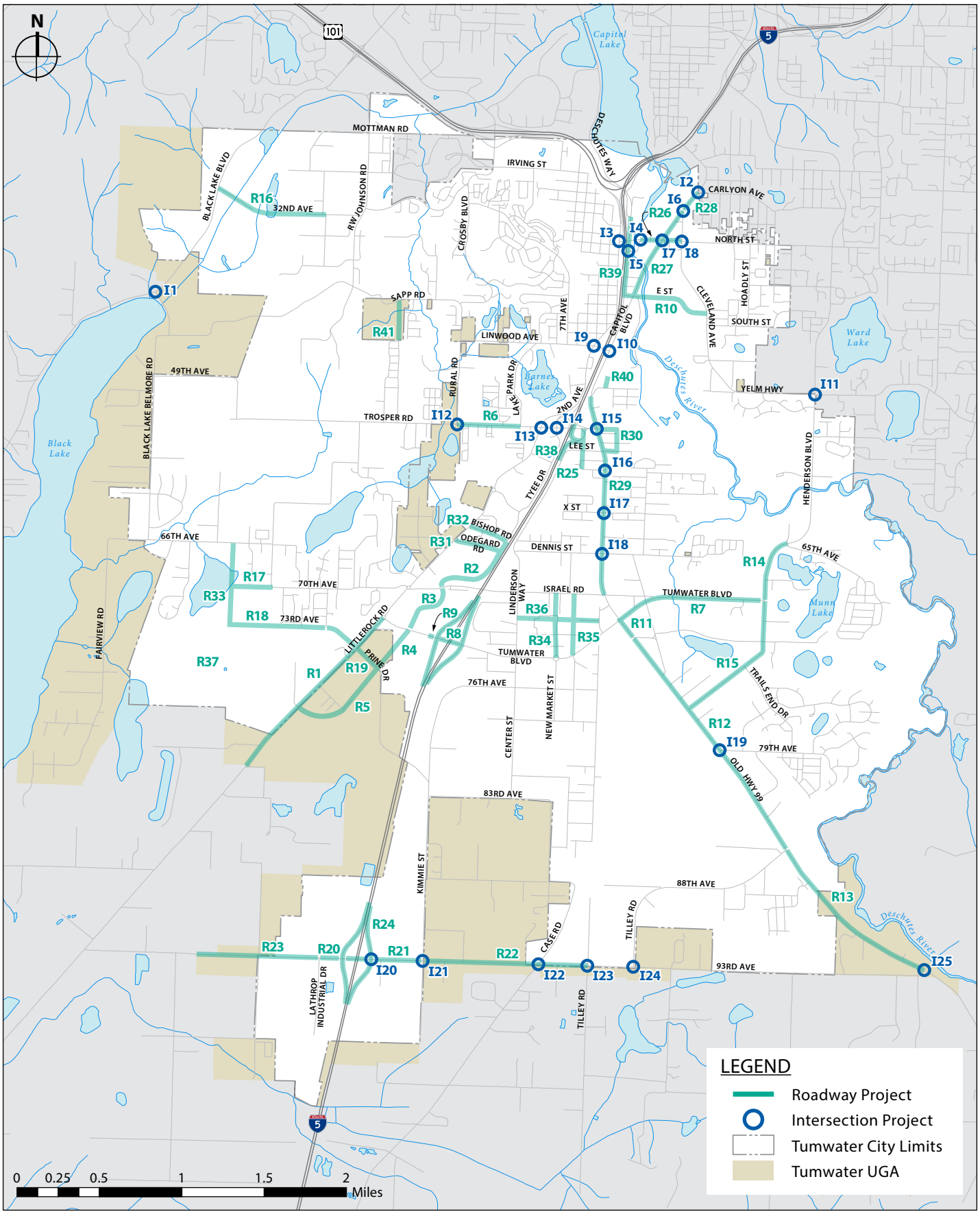
Abbreviations used in the 2040 street and intersection projects tables:

TWLTL Two-way left turn lane

RAB Roundabout

TWSC Two-way stop controlled intersection

AWSC All-way stop controlled intersection



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Figure 22
2040 Street and Intersection Projects
(includes associated non-motorized facilities)



CHAPTER 12

FUNDING

Funding Analysis

Tumwater must demonstrate that it has the financial resources to accomplish recommended actions in this plan. If the City is unlikely to be able to afford the projects necessary to maintain its levels of service as it grows then either additional revenues must be generated, LOS standards need to be revised, future land use patterns need to be reevaluated, or some combination of these actions. It is important that the City's plan be reasonably achievable.



A funding analysis looks at two basic things – revenues and expenditures. This section summarizes key considerations for each and then concludes by demonstrating that the recommendations in this plan are achievable though additional resources may be needed in the outside years of this planning horizon.

Revenues

City revenues for transportation typically fall into three buckets: local revenues, state revenues, and federal revenues.

Local revenues are the ones over which the City has the greatest control and discretion. They come from a variety of different sources – utility tax, Real Estate Excise Tax, impact fees and other developer mitigations, and most recently, from a 2/10 of one percent retail sales tax approved by Tumwater voters to fund a Transportation Benefit District. All of those revenues are directed to capital projects except for Transportation Benefit District (TBD) revenue which is strictly limited to preservation. In addition, transportation receives revenue annually from the City's General Fund during the general budget process, and which is directed to maintenance and operations.

State revenues come primarily from the state gas tax, in two forms. Tumwater receives an annual direct distribution from the state gas tax that is earmarked for cities. The City also receives state grants that are funded by the state gas tax, either from WSDOT or more commonly, from the Transportation

Improvement Board. Grant revenue is project specific and depending on the nature of the grant program, can be for capital or operations.

Federal revenues, which are derived primarily from the federal gas tax, come from grants administered by Thurston Regional Planning Council and occasionally from WSDOT. These funds are typically applied to capital projects or larger preservation projects.

State and federal grants are unpredictable. An entity other than the City determines funding priorities in any particular year and decides which projects will be funded. Tumwater competes with other communities for scarce resources. This makes it difficult for Tumwater to establish a reliable, priority-based funding strategy



The forecast assumes that the City's actual transportation operating expenditures funded with General Fund revenues are an appropriate surrogate for estimating revenues available for operations. Revenues available for capital projects are identified specifically in the capital facilities plan. Transportation benefit district revenues are derived from city sales tax forecasts. This forecast assumes TBD revenue is reapproved in 2025, when the current tax expires.

The revenue forecast assumes a 4.16% average annual rate of change in General Fund revenues available for operations, based on the 2009-2015 rate of change in constant 2015 dollars. Forecasted revenues for capital projects are based on assumptions of 4.67% average annual rate of change for the utility tax, a 6.11% average annual rate of change for the direct distribution state gas tax, and a 3.00% average annual rate of change for real estate excise tax, all in constant 2015 dollars. Grant revenues are volatile; an average annual amount of $2.7 million was assumed, increasing to $3 million by 2022 and to $3.3 million by 2030. In reality, grants received will be higher in some years and lower in others. Impact fee revenues available for projects were assumed to be $600,000 per year for the forecast period. Miscellaneous revenues were assumed to be a flat $1.3 million per year; as with grants, some years will be

higher and others lower. TBD revenues were forecasted to grow at an average annual rate of 2% per year.

EXPENDITURES

City expenditures for transportation typically fall into two broad categories: capital expenditures and operating expenditures. Programs like preservation – which includes overlays, chip seal, fog seal, and other techniques – maintenance, signal timing, engineering, and striping are considered operating expenditures. Construction projects resulting in new or expanded infrastructure – streets, sidewalks, intersections – are considered capital expenditures. It can also include major reconstruction that significantly extends the life of these facilities.

The expenditure forecast assumes that operations expenditures will not exceed operations revenue, and that the additional preservation to be funded by the TBD will be commensurate with the available revenue. That leaves capital project costs to forecast.

Planning level estimates were made for each project in constant 2015 dollars. Professional judgment was used to estimate which projects would likely be wholly funded by developers as a condition of development entailing no direct costs to the city. This amounted to about $60 million in projects assumed to be developer-funded over the forecast period. Several projects will be WSDOT projects but are included to demonstrate projects needed to address future deficiencies. These are illustrative since they are not yet included on a WSDOT project list. These projects totaled about $43 million in costs, which are not included in the following table.

Between now and 2040 Tumwater may need to address other system needs that are not included in this forecast. This includes such things as stormwater retrofits, the upgrade of facilities annexed into the City and which do not meet adopted urban street standards, and potentially raising the elevation of some streets in the Salmon Creek basin. As those projects are defined and costs established they will be included in future updates of the Transportation Master Plan and Capital Facilities Plan.

FINANCIAL SUMMARY

Following is a summary of revenues and expenditures associated with the transportation recommendations included in this Transportation Master Plan. Revenues and expenditures are in constant 2015 dollars.

TABLE 13: REVENUE AND EXPENDITURE FORECAST SUMMARY, 2016-2040

Revenue (in $1,000s) by Functional Area

Time Period	Capital	Operations	TBD Revenue (additional maintenance)	Total
2016-2026	$ 65,645	$ 18,433	$ 10,538	$ 94,616
2027-2040	$ 104,504	$ 30,338	$ 17,200	$152,042
2016-2040	**$170,149**	**$ 48,771**	**$ 27,738**	**$246,658**

Expenditures (in $1,000s) by Functional Area

Time Period	Capital	Operations	Additional Maintenance (TBD-funded)	Total
2016-2026	$ 89,036	$ 18,024	$ 10,538	$117,598
2027-2040	$141,742	$ 28,209	$ 17,200	$187,151
2016-2040	**$230,778**	**$ 46,233**	**$ 27,738**	**$304,749**

This is a long-range plan; it is possible some projects will not be needed in this planning horizon and so total costs may be lower. If not, projected capital expenditures exceed projected revenues for capital projects by about $58 million. The Growth Management Act requires a discussion of how this gap will be closed if a deficit exists.

- Depending on what happens with the local, state, and national economies over the next 20+ years it may be necessary to identify additional revenues in the outside years of this forecast to accomplish some projects. These may come in the form of singularly large grants or appropriations, or some other new grant programs such as may be established in the future by TRPC or WSDOT utilizing newly appropriated revenues.
- Conversely, depending on what happens with the local, state, and national economics over the next couple of decades Tumwater's revenue growth may

exceed what is projected, which would lessen or eliminate the difference. One example of this is the new Toyota dealership relocating from Olympia to Tumwater. This is the region's largest auto dealership. Retail sales tax revenues from this new business is not included in any of these forecasts.

- Impact fee estimates used in this forecast are based on the current Transportation Impact Fee ordinance. Tumwater will update that ordinance after this plan is adopted, based on the new project list. This can result in additional revenues targeted towards capacity-related projects.
- In addition to impact fees, Tumwater can and does require development mitigation projects where appropriate. These are transportation improvements the City requires as a condition for development approval. Several projects on the City's long-range list will likely qualify as developer-funded mitigation projects.
- Tumwater may also choose to finance future projects. This forecast makes no assumptions about financing tools though several projects on Tumwater's list are good candidates for a Local Improvement District (LID), a late-comers agreement, or General Obligation bonds. Financing tools like an LID or a late-comers agreement generate new project revenues while General Obligation bonds provide financing at the front end that is paid off over time, in part by new residents and businesses in the area that benefit from these projects. Bonds incur additional debt service costs.
- Tumwater may also choose to adopt a more congestion-tolerant urban LOS commensurate with its maturation as a city, thereby reducing the number of congestion-related projects on the list. This might entail establishing LOS E as the standard not just on Capitol Way / Capitol Boulevard but on other arterials as well. It can also entail application of the multimodal LOS being introduced with this plan as a concurrency tool used to achieve adopted land use visions. By 2025 or 2030 it is conceivable that larger parts of the city will be more urban in character where

higher levels of congestion are tolerated and where greater emphasis on pedestrian and bike mobility combined with transit service is the preferred means of addressing LOS deficiencies.

- Finally, Tumwater will continue to work towards greater investment in infill and redevelopment of its key corridors as a strategy for addressing future congestion. That is because growth located on these key corridors generates greater opportunity for walking, biking, and transit – opportunities that are minimal or non-existent when growth locates on the outer fringes of the city and in its more rural areas. While it may seem counter-intuitive, attracting more mixed-use, compact development on key corridors is an effective strategy for addressing funding gaps between likely revenues and expensive street widening projects.

This forecast will be updated periodically between now and 2040, during which the underlying assumptions will be revisited and revised as warranted.



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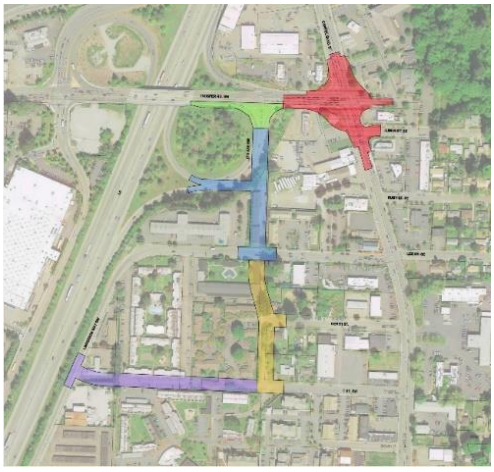
Transportation Master Plan

CHAPTER 13

OPPORTUNITIES & NEEDS

Strategic Opportunities and Needs

Developing the long-range Transportation Master Plan provides an opportunity to inject emerging local initiatives into the long-range planning framework. These are areas identified for follow-up that build on previous work and help the City achieve its broader strategic objectives. They also help support objectives of the City's Strategic Plan, particularly those associated with Strategic Priorities A- C:



Strategic Priority A: Aggressively pursue targeted community development opportunities (including the Brewery District and the Capitol Boulevard Corridor).

Strategic Priority B: Build a community recognized for quality (including sufficient facility maintenance).

Strategic Priority C: Create and maintain a transportation system for all modes of travel (including system maintenance, transformation of Capitol Boulevard, and design and construction of the E Street Connection).

Following are some notable local initiatives that will shape the City's transportation work program over the next few years.

Sub-Area Plan Implementation

Tumwater is implementing recommendations first identified by the Urban Corridors Task Force and later realized in its two seminal sub-area plans related to urban corridors, the Brewery District Plan and the Capitol Boulevard Corridor Plan. Each of those sub-area plans have moved into the implementation phase; work will continue to progress on both over the next several years.

Brewery District

Tumwater and Intercity Transit are partnering on a redesign of the existing Tumwater Square Transit Station to make better use of the right-of-way while enhancing pedestrian access and safety, and overall efficiency of Cleveland Street in the vicinity of the Safeway store. Concurrent with that 2016 work is the analysis and preliminary design of the new E Street Connection

that will divert a significant amount of through-traffic out of the Brewery District neighborhood itself. The City's website has current information on the status of projects and next steps in the implementation of Brewery District plan recommendations.

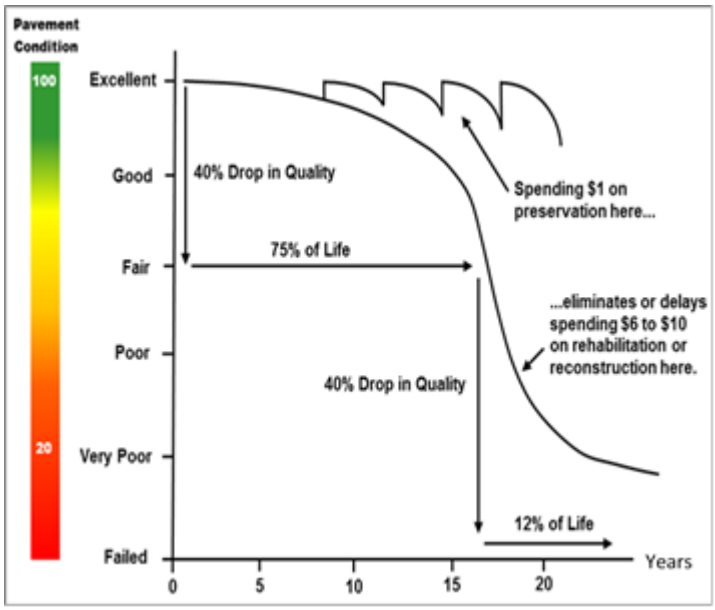
Capitol Boulevard Corridor

Design and engineering for projects identified in the corridor plan are underway. Engineering and design of improvements at the Trosper Road / Capitol Boulevard intersection are key to determining the design for other parts of the Boulevard. Conclusion of that work will result in additional recommendations and next steps in the transformation of this old highway corridor into a vibrant, mixed-use linear urban community. See the City's website for current information on the status of existing projects and next steps.

Pavement Management Program

The City of Tumwater's transportation system is worth hundreds of millions of dollars. As with any investment, it must be maintained so that it doesn't fall into disrepair. Similar to a house that needs routine maintenance in order to avoid expensive and disruptive repairs, pavement preservation helps to keep infrastructure in good shape for the traveling public while keeping lifecycle costs as low as possible.

Even if no vehicles traveled on pavement, especially asphalt pavement, it would degrade over time. The sun's ultraviolet rays break down the structure, and freezing rain seeps into fine cracks and enlarges them. Of course, our streets and roads are used, and this contributes to the degradation. Studded snow tires grind away at the surface, and heavy vehicles like garbage trucks and big freight trucks create ruts.



A regimen of relatively minor investments can avoid or postpone much more expensive reconstruction projects needed to restore a badly degraded facility. In fact, every dollar spent in an optimal pavement preservation

strategy saves anywhere from six to ten dollars needed to reconstruct and rehabilitate that facility later.

In 2015 Tumwater residents approved a Transportation Benefit District sales tax that is dedicated to restoring the City's streets to fair or better condition and keeping them that way at the lowest cost. A pavement management program will help the City know where to make investments to get the most out of its preservation program.

ADA Transition Plan

The 1990 Americans with Disabilities Act, or ADA, is a civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, public places, and all private places that are open to the public. It is often regarded as one of America's most comprehensive pieces of civil rights legislation. Title II of the ADA requires state and local governments to make their programs and services accessible to people with disabilities.

All new transportation infrastructure built in Tumwater and all major infrastructure reconstruction activities result in either the addition of ADA facilities if they do not exist, or retrofitting older facilities to comply with new standards. The most common of these types of facilities are curb ramps. These are the ramps that enable someone in a wheelchair, or walking with a walker or cane, or traveling by means of a scooter to get off a sidewalk into a crosswalk and then back up onto a sidewalk on the other side of the street. There are other types of transportation facilities to consider, too, such as pedestrian crosswalk signals, parking lots, access to transit stops, and even the way construction zones are signed and barricaded.

While all new infrastructure is built to be ADA-compliant it is much more difficult retrofitting older infrastructure, especially as stand-alone projects. That is because there is no dedicated funding for this kind of work, which is often expensive and frequently entails the acquisition of right-of-way to accommodate ADA-compliant design standards. The standards change periodically, too, so that a facility brought into compliance in the early 2000s may not comply with today's standards.

The ADA legislation recognizes that Tumwater and other governments cannot afford to do a wholesale retrofit of all transportation infrastructure but it does expect the City to make progress in this regard. It expects communities to have a strategy for how it will approach this retrofit and to have a process in place to respond to specific needs as they arise.

An ADA transition plan is the tool used by communities like Tumwater to conduct a self-evaluation of transportation facilities, identify deficiencies, and then plan and budget for changes needed to increase accessibility.

Tumwater is currently developing its own ADA transition plan to help guide strategic investments. The Plan will identify and prioritize deficiencies, develop implementation strategies and include policies for collaboration and coordination with the disability community.

MULTIMODAL LOS CONCURRENCY PROGRAM

This Transportation Master Plan introduces the concept of multimodal level of service. It will result in a practical means of evaluating the adequacy of the non-motorized network with the potential for prioritizing needed investments.

To truly integrate its multimodal philosophy with its development regulations, Tumwater will explore ways of incorporating multimodalism into its concurrency program. The expectation is not that sidewalks or bike lanes or improved transit access will noticeably reduce congestion; rather, the expectation is that in select areas where regulatory policies are promoting transit-oriented, walkable, mixed-use development patterns greater benefit will be realized by a non-motorized project than a traditional street or intersection project. This is particularly true in the Brewery District and the Capitol Boulevard Corridor, where very little street widening will occur. In these areas the kind of growth envisioned will generate more bike and walk and transit trips than in other parts of the city; it is appropriate for growth in these areas to contribute towards the completion and improvement of the non-motorized network. That network is essential for the functioning of the districts.

This work program element will evaluate ways in which the existing concurrency ordinance can be modified to effectively

and defensibly incorporate stand-alone non-motorized facilities in the development review and fee collection processes. The objective is to help Tumwater put its growth-related resources where they will make the greatest impact by supporting system level needs and performance priorities, regardless of mode of travel.



Pedestrian Plan and Investment Strategy

This long-range plan attempts to identify and address non-motorized facility needs. This is particularly challenging for pedestrian facilities due to the scale of the pedestrian network and the range of factors that determine the walkability of a place, not just the presence of sidewalks. A citywide Pedestrian Facilities Plan can concentrate on facility needs at an appropriate scale. It should consider not just sidewalks but also crosswalks, street trees and other amenities, and cost-effective design alternatives to enable extension of the pedestrian system as fast as possible with the resources available. Such a plan will consider things like safe walking routes to schools and parks, and access to and from transit corridors. It can take into account those neighborhoods that tend to be transit-dependent due to income or age. It can identify priority pedestrian connections between neighborhoods should be coordinated with codes governing building and site design in order to account for the increased emphasis on pedestrian orientation in certain parts of the city. While a similar planning process for bike facilities would be beneficial, it is most needed for the pedestrian system. The City may consider a standing Pedestrian –Bicycle Advisory Committee advantageous for this effort.



North Street, before and after sidewalks were added.



APPENDIX

A. Analysis of Streets, Roads and Intersections

B. Analysis of Non-motorized Network

C. Capitol Boulevard Plan – Transportation Summary

D. Brewery District Plan – Transportation Summary

A. Analysis of Roads, and Intersections

This Document has been published separately

Appendix A
Analysis of Roads and Intersections

Project Reference: SCJ #625.17

Path: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Report\2016 0607 Appendix A.docx

SCJ ALLIANCE
CONSULTING SERVICES

1. EXISTING ROADWAY CONDITIONS

1.1 TRAFFIC VOLUME COUNTS AND INTERSECTION LANE GEOMETRY

A comprehensive traffic volume count program was conducted to identify base year traffic volumes within the study area. Sixty-nine intersection counts were collected, primarily by Traffic Count Consultants, a traffic data collection firm. Most of the counts were conducted between 4:00 PM and 6:00 PM on June 23, 24, 25 and 30, 2015 and July 1, 2015. The traffic volumes were summarized to identify the highest individual hour within the two-hour count period. These traffic volumes were used for our base year operations analysis and as the basis for future year traffic volume projections. The turning movement count worksheets are provided in **Appendix A-1**. The existing 2015 PM peak hour intersection turning movement volumes are shown on **Figure 1**.

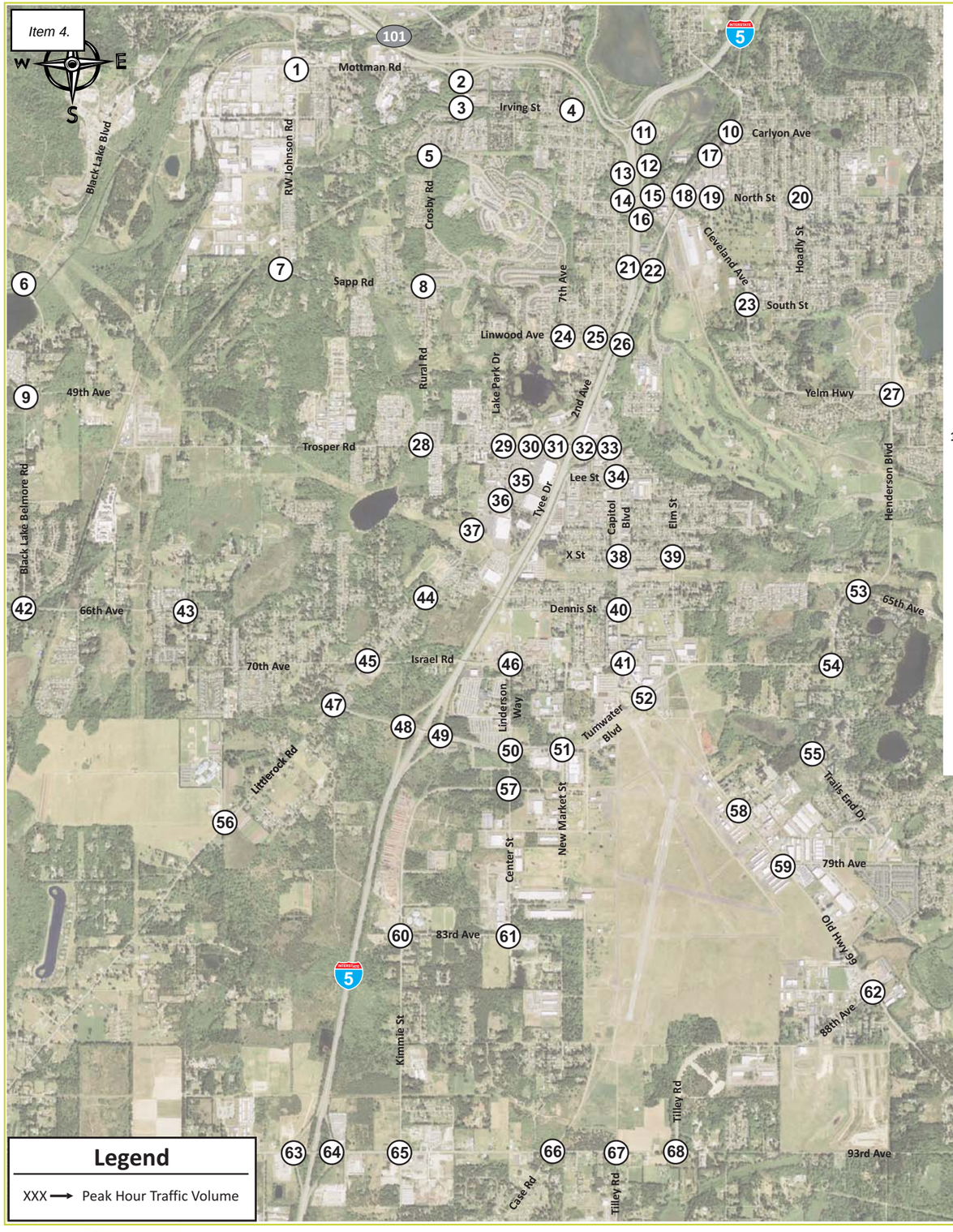
The existing intersection lane geometry and control types are provided on **Figure 2**.

1.2 CRASH HISTORY

A crash history analysis was performed for the study intersections. Washington State Department of Transportation provided collision data for all of the study intersections, including those in the UGA and WSDOT right-of-way. The data includes all reported vehicle crashes occurring over the most current complete five-year span of January 1, 2010 through December 31, 2014. A crash frequency rate per Millions of Entering Vehicles (MEV) was calculated for the study intersections based on the following formula:

$$\text{Crash Rate per MEV} = \frac{1{,}000{,}000 \times \text{Total Collisions}}{365 \times \text{Number of Years} \times \text{Average Daily Entering Traffic}}$$

The crash rates by intersection are summarized in **Table 1**.



Legend

XXX → Peak Hour Traffic Volume

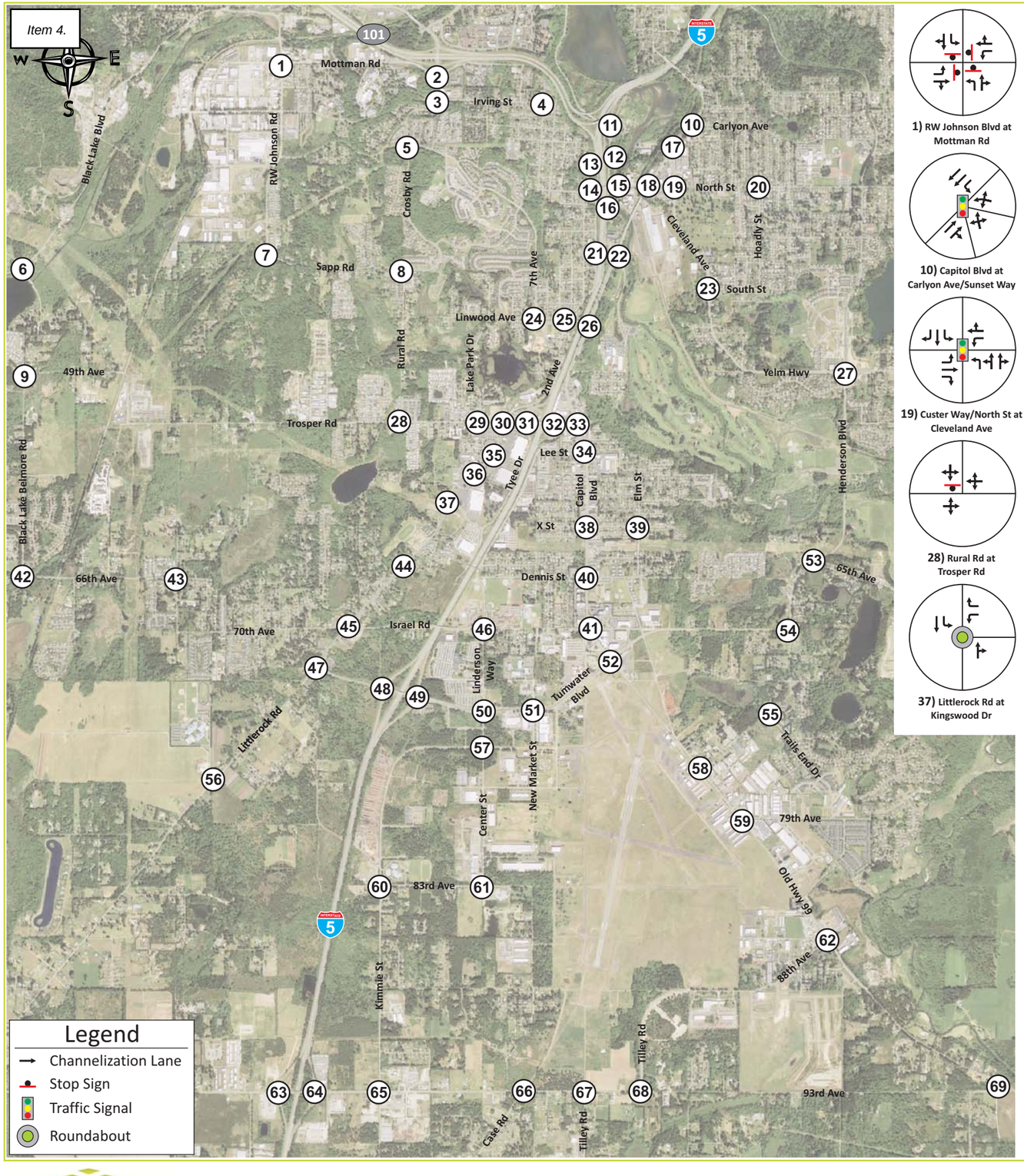


1) RW Johnson Blvd at Mottman Rd
2) Crosby Blvd at Mottman Rd
3) Crosby Blvd at Irving St
4) 7th Ave at Irving St
5) Crosby Blvd at Barnes Blvd
6) Black Lake Blvd at Black Lake Belmore Rd
7) RW Johnson Blvd at Sapp Rd
8) Sapp Rd at Crosby Blvd
9) 49th Ave at Black Lake Belmore Rd
10) Capitol Blvd at Carlyon Ave/Sunset Way
11) Deschutes Way at I-5 NB On-Ramp
12) Deschutes Way at US 101 WB On-Ramp
13) I-5/US 101 Off-Ramps at Desoto St/2nd Ave
14) 2nd Ave at Custer Way
15) Boston St at Custer Way
16) Deschutes Way at Boston St
17) Cleveland Ave at Capitol Blvd
18) Custer Way at Capitol Blvd
19) Custer Way/North St at Cleveland Ave
20) Hoadly St at North St
21) Deschutes Way at I-5 NB Off-Ramp
22) Capitol Blvd at E St
23) Cleveland Ave at South St
24) 7th Ave at Linwood Ave
25) 2nd Ave at Linwood Ave
26) Capitol Blvd at Linwood Ave
27) Henderson Blvd at Yelm Hwy
28) Rural Rd at Trosper Rd
29) Lake Park Dr at Trosper Rd
30) Littlerock Rd at Trosper Rd
31) I-5 SB Ramps/Tyee Dr at Trosper Rd
32) I-5 NB Ramps at Trosper Rd
33) Capitol Blvd at Trosper Rd
34) Capitol Blvd at Lee St
35) Littlerock Rd at Fred Meyer/Costco Drwy
36) Littlerock Rd at Costco Drwy
37) Littlerock Rd at Kingswood Dr
38) Capitol Blvd at X St
39) Elm St at X St
40) Capitol Blvd at Dennis St
41) Capitol Blvd at Israel Rd
42) 66th Ave at Black Lake Belmore Rd
43) Kirsop Rd at 66th Ave
44) Littlerock Rd at Odegard Rd
45) Littlerock Rd at Israel Rd/70th Ave
46) Linderson Way at Israel Rd
47) Littlerock Rd at Tumwater Blvd
48) I-5 SB Ramps at Tumwater Blvd
49) I-5 NB Ramps at Tumwater Blvd
50) Linderson Way at Tumwater Blvd
51) New Market St at Tumwater Blvd
52) Capitol Blvd at Tumwater Blvd
53) 65th Ave at Henderson Blvd
54) Tumwater Blvd at Henderson Blvd
55) Trails End Dr at Henderson Blvd
56) Littlerock Rd at Black Hills School Drwy
57) Center St at 76th Ave
58) Old Hwy 99 at Henderson Blvd
59) Old Hwy 99 at 79th Ave
60) Kimmie St at 83rd Ave
61) Center St at 83rd Ave
62) Old Hwy 99 at 88th Ave
63) I-5 SB Ramps at 93rd Ave
64) I-5 NB Ramps at 93rd Ave
65) Kimmie St at 93rd Ave
66) Case Rd at 93rd Ave
67) Tilley Rd (South) at 93rd Ave
68) Tilley Rd (North) at 93rd Ave
69) Old Hwy 99 at 93rd Ave

Tumwater Transportation Master Plan

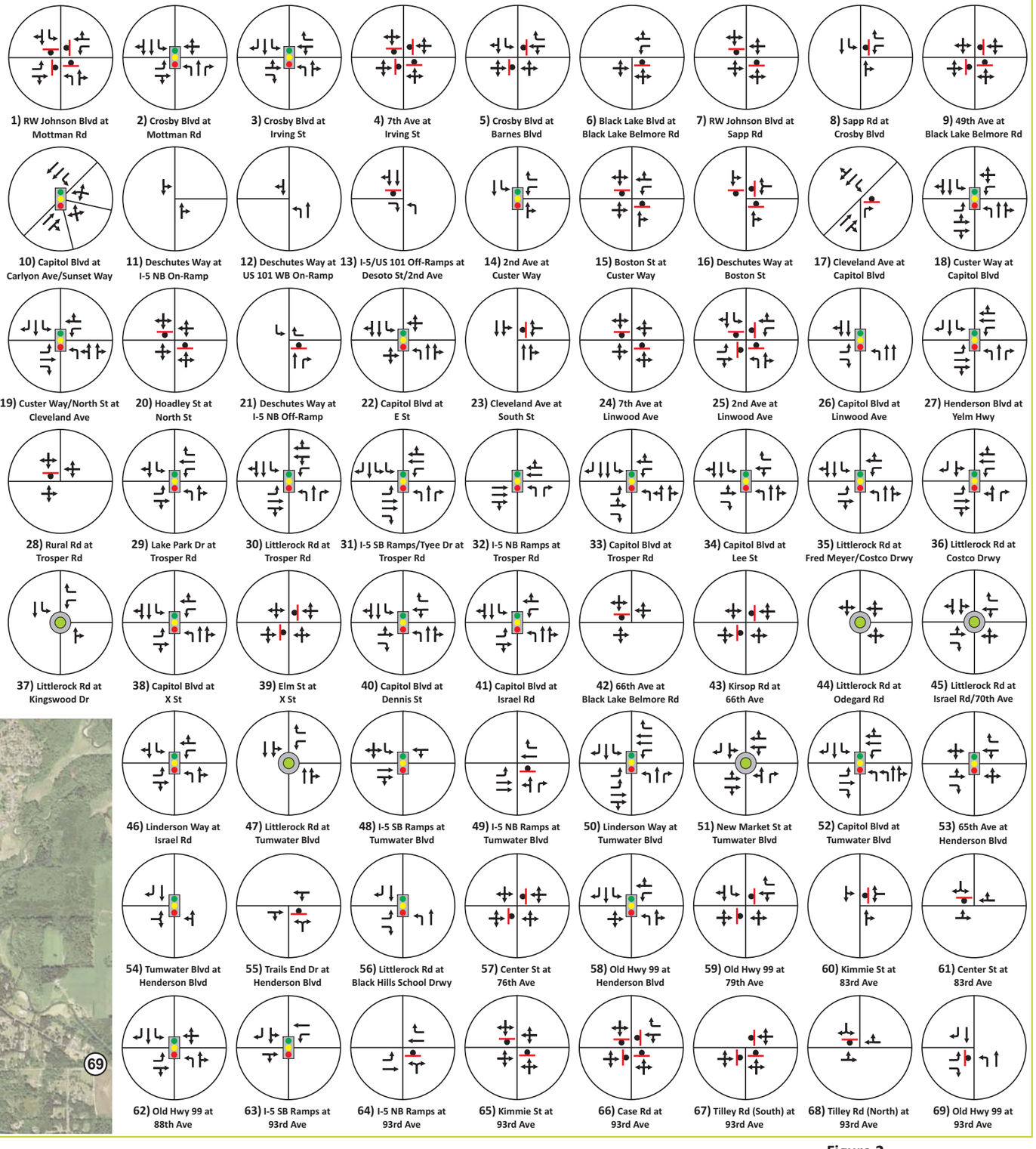
Tumwater, Washington

Figure 1
Existing 2015 PM Peak Hour Intersection Traffic Volumes



Legend

- Channelization Lane
- Stop Sign
- Traffic Signal
- Roundabout



1) RW Johnson Blvd at Mottman Rd
2) Crosby Blvd at Mottman Rd
3) Crosby Blvd at Irving St
4) 7th Ave at Irving St
5) Crosby Blvd at Barnes Blvd
6) Black Lake Blvd at Black Lake Belmore Rd
7) RW Johnson Blvd at Sapp Rd
8) Sapp Rd at Crosby Blvd
9) 49th Ave at Black Lake Belmore Rd
10) Capitol Blvd at Carlyon Ave/Sunset Way
11) Deschutes Way at I-5 NB On-Ramp
12) Deschutes Way at US 101 WB On-Ramp
13) I-5/US 101 Off-Ramps at Desoto St/2nd Ave
14) 2nd Ave at Custer Way
15) Boston St at Custer Way
16) Deschutes Way at Boston St
17) Cleveland Ave at Capitol Blvd
18) Custer Way at Capitol Blvd
19) Custer Way/North St at Cleveland Ave
20) Hoadley St at North St
21) Deschutes Way at I-5 NB Off-Ramp
22) Capitol Blvd at E St
23) Cleveland Ave at South St
24) 7th Ave at Linwood Ave
25) 2nd Ave at Linwood Ave
26) Capitol Blvd at Linwood Ave
27) Henderson Blvd at Yelm Hwy
28) Rural Rd at Trosper Rd
29) Lake Park Dr at Trosper Rd
30) Littlerock Rd at Trosper Rd
31) I-5 SB Ramps/Tyee Dr at Trosper Rd
32) I-5 NB Ramps at Trosper Rd
33) Capitol Blvd at Trosper Rd
34) Capitol Blvd at Lee St
35) Littlerock Rd at Fred Meyer/Costco Drwy
36) Littlerock Rd at Costco Drwy
37) Littlerock Rd at Kingswood Dr
38) Capitol Blvd at X St
39) Elm St at X St
40) Capitol Blvd at Dennis St
41) Capitol Blvd at Israel Rd
42) 66th Ave at Black Lake Belmore Rd
43) Kirsop Rd at 66th Ave
44) Littlerock Rd at Odegard Rd
45) Littlerock Rd at Israel Rd/70th Ave
46) Linderson Way at Israel Rd
47) Littlerock Rd at Tumwater Blvd
48) I-5 SB Ramps at Tumwater Blvd
49) I-5 NB Ramps at Tumwater Blvd
50) Linderson Way at Tumwater Blvd
51) New Market St at Tumwater Blvd
52) Capitol Blvd at Tumwater Blvd
53) 65th Ave at Henderson Blvd
54) Tumwater Blvd at Henderson Blvd
55) Trails End Dr at Henderson Blvd
56) Littlerock Rd at Black Hills School Drwy
57) Center St at 76th Ave
58) Old Hwy 99 at Henderson Blvd
59) Old Hwy 99 at 79th Ave
60) Kimmie St at 83rd Ave
61) Center St at 83rd Ave
62) Old Hwy 99 at 88th Ave
63) I-5 SB Ramps at 93rd Ave
64) I-5 NB Ramps at 93rd Ave
65) Kimmie St at 93rd Ave
66) Case Rd at 93rd Ave
67) Tilley Rd (South) at 93rd Ave
68) Tilley Rd (North) at 93rd Ave
69) Old Hwy 99 at 93rd Ave

Tumwater Transportation Master Plan

Tumwater, Washington

Figure 2
Existing 2015
Intersection Channelization

Table 1. Intersection Crash History 2010 through 2014

	Intersection	Total Number of Reported Crashes	Number Involving Injuries	Number Involving Bikes or Peds	Total Daily Entering Traffic Volume	Crash Rate per MEV
1	RW Johnson Blvd/Mottman Rd	8	3	0	7,950	0.551
2	Crosby Blvd/Mottman Rd	29	8	0	22,860	0.695
3	Crosby Blvd/Irving St	19	4	0	13,470	0.773
4	7th Ave/Irving St	0	0	0	3,880	0.000
5	Crosby Blvd/Barnes Blvd	1	0	0	6,670	0.082
6	Black Lake Blvd/Black Lake Belmore Rd	2	0	0	9,550	0.115
7	RW Johnson Blvd/Sapp Rd	1	0	0	2,700	0.203
8	Sapp Rd/Crosby Blvd	1	0	0	4,040	0.136
9	49th Ave/Black Lake Belmore Rd	2	1	0	6,050	0.181
10	Capitol Blvd/Carlyon Ave/Sunset Way	1	0	0	15,540	0.035
11	Deschutes Way/I-5 NB On-Ramp	0	0	0	8,310	0.000
12	Deschutes Way/US 101 WB On-Ramp	1	0	0	10,920	0.050
13	I-5/US 101 Off-Ramps/Desoto St/2nd Ave	18	5	0	11,700	0.843
14	2nd Ave/Custer Way	4	1	0	14,900	0.147
15	Boston St/Custer Way	5	3	1	16,640	0.165
16	Deschutes Way/Boston St	7	3	0	12,200	0.314
17	Cleveland Ave/Capitol Blvd	4	2	0	14,880	0.147
18	Custer Way/Capitol Blvd	18	4	1	29,760	0.331
19	Custer Way/North St/Cleveland Ave	19	7	1	24,740	0.421
20	Hoadly St/North St	2	1	0	8,250	0.133
21	Deschutes Way/I-5 NB Off-Ramp	0	0	0	8,210	0.000
22	Capitol Blvd/E St	11	6	1	24,120	0.250
23	Cleveland Ave/South St	2	2	0	14,720	0.074
24	7th Ave/Linwood Ave	3	2	0	7,890	0.208
25	2nd Ave/Linwood Ave	11	3	0	13,670	0.441
26	Capitol Blvd/Linwood Ave	8	3	0	20,390	0.215
27	Henderson Blvd/Yelm Hwy	37	14	1	31,600	0.642
28	Rural Rd/Trosper Rd	4	1	0	7,540	0.291
29	Lake Park Dr/Trosper Rd	4	3	1	9,930	0.221
30	Littlerock Rd/Trosper Rd	32	6	0	22,890	0.766
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	65	16	1	31,540	1.129
32	I-5 NB Ramps/Trosper Rd	28	8	0	27,960	0.549
33	Capitol Blvd/Trosper Rd	35	8	0	32,230	0.595
34	Capitol Blvd/Lee St	42	9	3	24,930	0.923
35	Littlerock Rd/Fred Meyer-Costco Drwy	2	1	1	16,800	0.065
36	Littlerock Rd/Costco Drwy	3	1	1	17,740	0.093
37	Littlerock Rd/Kingswood Dr	15	7	1	14,520	0.566
38	Capitol Blvd/X St	4	3	0	17,900	0.122
39	Elm St/X St	1	0	0	1,600	0.342
40	Capitol Blvd/Dennis St	9	4	0	17,630	0.280

Table 1 Cont. Intersection Crash History 2010 through 2014

	Intersection	Total Number of Reported Crashes	Number Involving Injuries	Number Involving Bikes or Peds	Total Daily Entering Traffic Volume	Crash Rate per MEV
41	Capitol Blvd/Israel Rd	20	7	2	18,750	0.584
42	66th Ave/Black Lake Belmore Rd	5	2	0	4,470	0.613
43	Kirsop Rd/66th Ave	4	3	0	4,120	0.532
44	Littlerock Rd/Odegard Rd	5	1	1	13,200	0.208
45	Littlerock Rd/Israel Rd/70th Ave	12	1	0	18,910	0.348
46	Linderson Way/Israel Rd	7	2	0	11,300	0.339
47	Littlerock Rd/Tumwater Blvd	19	3	0	13,300	0.783
48	I-5 SB Ramps/Tumwater Blvd	15	2	0	16,780	0.490
49	I-5 NB Ramps/Tumwater Blvd	14	4	0	26,910	0.285
50	Linderson Way/Tumwater Blvd	15	6	0	31,510	0.261
51	New Market St/Tumwater Blvd	8	2	0	17,690	0.248
52	Capitol Blvd/Tumwater Blvd	27	8	0	22,500	0.658
53	65th Ave/Henderson Blvd	2	1	0	15,630	0.070
54	Tumwater Blvd/Henderson Blvd	5	2	0	13,700	0.200
55	Trails End Dr/Henderson Blvd	1	1	0	5,810	0.094
56	Littlerock Rd/Black Hills School Drwy	1	0	0	6,160	0.089
57	Center St/76th Ave	0	0	0	7,030	0.000
58	Old Hwy 99/Henderson Blvd	15	8	0	17,820	0.461
59	Old Hwy 99/79th Ave	4	1	0	15,540	0.141
60	Kimmie St/83rd Ave	0	0	0	1,700	0.000
61	Center St/83rd Ave	2	1	0	4,230	0.259
62	Old Hwy 99/88th Ave	3	0	0	13,370	0.123
63	I-5 SB Ramps/93rd Ave	22	5	0	13,770	0.875
64	I-5 NB Ramps/93rd Ave	5	2	0	15,000	0.183
65	Kimmie St/93rd Ave	5	5	0	10,020	0.273
66	Case Rd/93rd Ave	0	0	0	10,950	0.000
67	Tilley Rd (South)/93rd Ave	9	1	0	9,140	0.540
68	Tilley Rd (North)/93rd Ave	4	3	0	6,500	0.337
69	Old Hwy 99/93rd Ave	4	3	0	11,120	0.197

*"Under 23U.S. Code §148 and 23 U.S. § 409, Safety Data, reports, surveys, schedules, lists compiled or collected for the purposes of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Fedeeral or State court proceeding or considered for other purposes in any action for damages arising from any occurance at a location mentioned or addressed in such reports, surveys, schedules, lists, or data"

A crash rate under 1.00 per MEV is typically considered within normal range for an urban intersection. In the study area one intersection exceeded the 1.00 crash rate and three others were over 0.80. Those locations are discussed below.

1.2.1 I-5/US 101 Off-Ramps/Desoto St/2nd Ave

This intersection had 18 reported crashes over the 5-year period, a crash rate of 0.843 with an average of 3.6 per crashes per year. The primary collision type was rear-end collision for vehicles on the off-

ramp. This could likely be a result of occasional congestion and queuing on the off-ramp, compounded by vehicles weaving to get into the inside lane to eventually make a left-turn onto Custer Way. The next most common type involved collisions between a vehicle turning left and vehicle going straight. This could reflect occasional driver confusion over the unusual intersection configuration.

There is a planned improvement to allow for two left-turn lanes on 2nd Avenue for vehicles turning onto Custer Way. This is intended to improve the lane utilization on the off-ramp and reduce weaving conflicts as both off-ramp lanes could be used to get into the double left-turn lanes at Custer Way. This intersection should continue to be monitored.

1.2.2 I-5 SB Ramps/Tyee Dr/Trosper Rd

This intersection experienced 65 crashes and a rate of 1.129 crashes per MEV over the five-year study period. Over half of the collisions at this intersection are rear-end collisions, with the primary circumstance being vehicles traveling eastbound on Trosper Rd. This is likely the result of congestion between the SB Ramps/Tyee Drive intersection and the 2nd Ave/Littlerock Rd intersection. The next primary circumstance for rear-end collisions occurs in the NB right-turn lane, likely the result of vehicles unable to make right-turn-on-red maneuvers.

There is a planned improvement to install a two-lane roundabout at this location. It will be built in conjunction with a roundabout at Trosper Rd/2nd Ave/Littlerock Rd, and together they should reduce the congestion experienced today along Trosper Road, which should reduce the number of rear-end collisions.

1.2.3 Capitol Blvd/Lee St

This intersection had 42 reported collisions between 2010 and 2014, equating to a crash rate of 0.923 crashes per MEV. The primary collision type for this intersection was rear-end collisions for vehicles traveling NB on Capitol Blvd. This is likely a result of the congestion and resultant queues created by the Trosper Rd/Capitol Blvd intersection.

There is no improvement specifically planned for this location, however the Trosper Road Interchange project is being constructed to relieve the congestion currently caused by the Trosper Rd/Capitol Blvd intersection. The completion of this improvement should improve congestion along Capitol Blvd and reduce the number of rear-end collisions at this location.

1.2.4 I-5 SB Ramps/93rd Avenue (SR 121)

This intersection experienced 22 crashes over a five year period, resulting in a crash rate of 0.875 crashes per MEV. There was not a predominant collision type at this intersection, but the majority of crashes occurred by vehicles traveling SB on the I-5 SB ramp. 21 of the 22 recorded crashes occurred in 2010 and 2011. After 2011 a traffic signal was installed at this intersection to improve traffic operations for the SB approach. This improvement has seen the crash rate drop to almost zero, with only 1 crash occurring between 2012-2014.

The intersection crash data is provided in **Appendix A-2**.

2. TRAFFIC VOLUME FORECASTS

2.1 OVERVIEW

This report provides operational assessment of the City roadway network for the existing year (2015) for the forecast years of 2022 and 2040. The traffic volume forecasts were prepared using the TRPC regional travel demand model as the basis. The regional model has been calibrated to a 2014 base year and has a 2040 forecast horizon.

2.2 TRAVEL DEMAND MODELING PROCESS

A travel demand model is a computer model that uses mathematical representations of transportation facilities and transportation demand to estimate travel patterns in a specific geographic area. Travel demand modeling typically uses the four-step modeling process described below:

- Trip Generation – is the process of estimating the amount of person-trips that will be generated within the modeled area. Households and employment are the primary drivers of trip generation.
- Trip Distribution – evaluates the attractiveness of compatible land-uses to connect two ends of the same trip, e.g., a work-to-home trip is common during the evening peak hour with an employment base producing an outbound trip and a household attracting an inbound trip.
- Mode Choice – reflects the process of estimating the traveling public's selection of a travel mode such as passenger vehicle (SOV or HOV), heavy vehicle, walk, bike or transit. The availability (supply) of a particular mode affects the demand of that mode, for example, close proximity to a transit stop with good headways makes the transit option more attractive and can influence a traveler's mode choice.
- Assignment – is the final step of determining each traveler's route from their origin to their destination. There are almost always multiple options for a route between two points. The primary consideration in route choice is travel time, which can be affected by roadway speed limits, traffic signals, congestion and other frictions.

2.3 TRPC TRAVEL DEMAND MODEL

The TRPC regional travel demand model was built using INRO's Emme software. The model provides a detailed representation of the arterial and collector roadways throughout Thurston County. Particular detail has been provided in the urban areas of the county, including Tumwater and environs. The model uses household and employment information as a basis for estimating the trip-producing characteristics of neighborhoods, employment centers, retail districts, schools, etc. within the cities and unincorporated county. Measured local travel parameters were incorporated to calibrate the model to local conditions. When model-produced traffic characteristics closely match measured traffic characteristics the model is considered calibrated.

A calibrated model can be used to test the effects of changes of one or many variables on the system. Adding a new roadway provides different route choices which can affect traffic flows, adding transit service or enhanced walk and bike facilities can affect mode choice. Changes to the amount or type of land-use will also affect the volume and characteristics of travel in an area.

The TRPC model has been updated and calibrated to a 2014 base year. The model update was completed with oversight from a regional Transportation Advisory Committee (TAC) that included representation from the City of Tumwater and multiple other affected jurisdictions in the Thurston County. The regional model has a planning horizon year of 2040. The 2040 model reflects predicted changes to household and employment throughout the region consistent with regional forecasting and Tumwater land-use planning.

The 2040 forecast model also includes transportation improvements consistent with the Regional Transportation Plan. The specific improvements that are assumed to be completed in the "base" 2040 network within the City of Tumwater UGA are listed below.

2040 "Base" Model Planned Network Improvements

- Tyee Drive Extension – New street connection from Kingswood Drive to Prine Drive
- E Street Extension – New multi-lane roadway from Capitol Boulevard to Cleveland Avenue
- Old Highway 99 Improvements – Widen existing roadway from 73rd Avenue to 88th Avenue
- Tumwater Boulevard Interchange – Widen over-crossing and improve ramps at existing Tumwater Boulevard/Interstate 5 interchange
- Capitol Boulevard Improvements – Intersection and capacity improvements on Capitol Boulevard between Trosper Road and Israel Road, construction of new 6th Avenue collector, relocation of I-5 NB off-ramp terminal at Trosper Road to 6th Avenue
- Brewery District Plan – Incorporate lane reductions and intersection improvements per the Brewery District Plan

While additional improvements were evaluated, no additional roadway projects were added to the 2040 "base" model for traffic volume forecasting purposes.

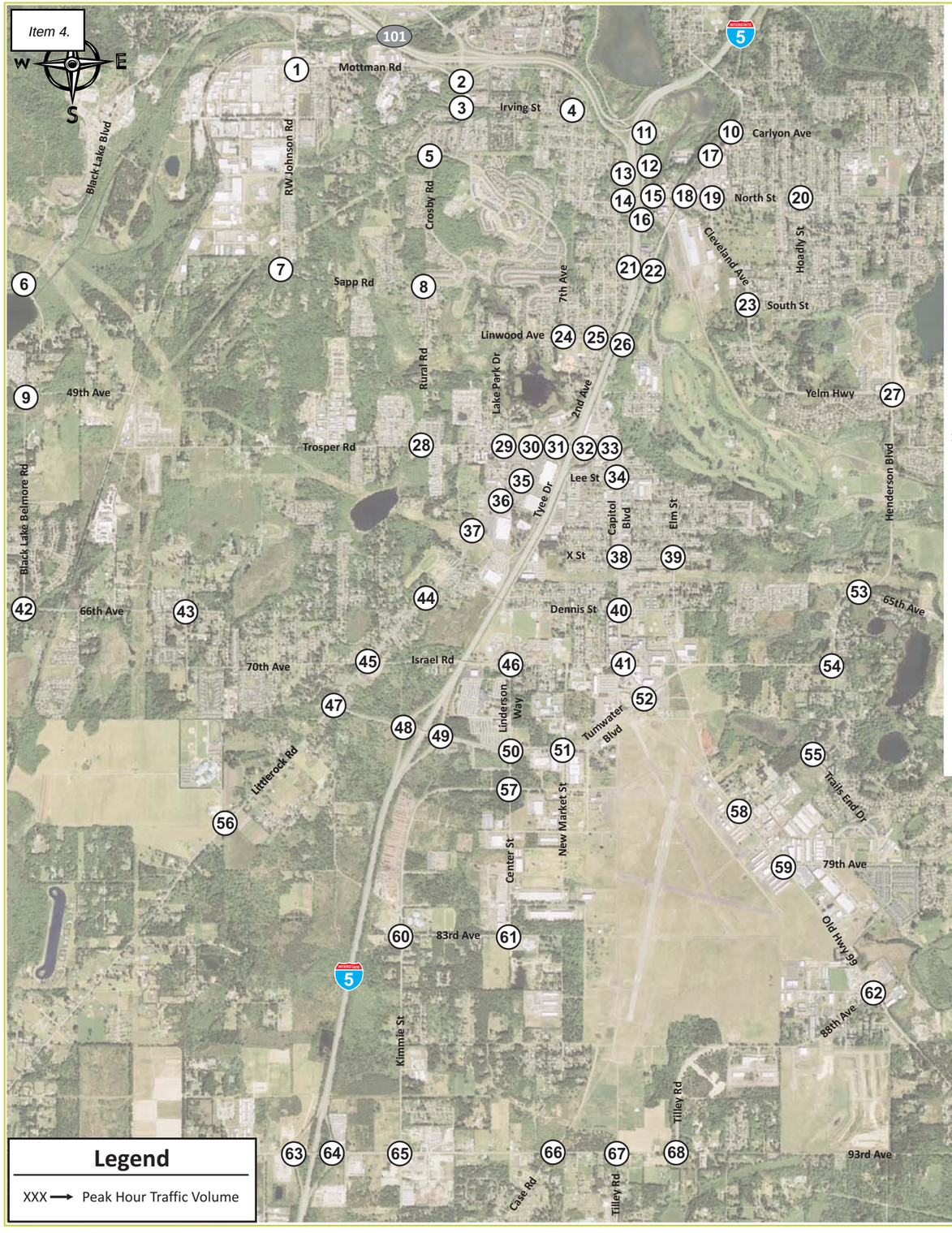
Model plots showing the Traffic Analysis Zone structure, roadway network and "raw" model traffic volumes are included in **Appendix A-3**.

2.4 Model Volume Post-Processing

While the model is calibrated to replicate existing travel patterns, traffic volumes on individual roadways vary somewhat from existing traffic counts. To account for this variance, the transportation model traffic volume assignments were post-processed to align them with existing ground counts. Specifically, the traffic volume growth increment between the 2014 base year model and 2040 forecast model was calculated for each individual study intersection. The traffic growth predicted by the model was then added to the actual counted traffic volumes at each intersection. All traffic volume forecasts were individually reviewed and manually adjusted as appropriate.

For the 2022 horizon the model growth was calculated between the 2014 and 2040 models and 7 years of that growth was added to the 2015 actual counts. The 2040 model was run assuming none of the RTP projects in place by the 2022 horizon.

The 2022 and 2040 traffic volume forecasts are provided on **Figure 3** and **Figure 4**. The traffic volume calculation spreadsheet showing the 2022 and 2040 forecasts attached in **Appendix A-4**.



Legend

XXX → Peak Hour Traffic Volume



1) RW Johnson Blvd at Mottman Rd

2) Crosby Blvd at Mottman Rd

3) Crosby Blvd at Irving St

4) 7th Ave at Irving St

5) Crosby Blvd at Barnes Blvd

6) Black Lake Blvd at Black Lake Belmore Rd

7) RW Johnson Blvd at Sapp Rd

8) Sapp Rd at Crosby Blvd

9) 49th Ave at Black Lake Belmore Rd

10) Capitol Blvd at Carlyon Ave/Sunset Way

11) Deschutes Way at I-5 NB On-Ramp

12) Deschutes Way at US 101 WB On-Ramp

13) I-5/US 101 Off-Ramps at Desoto St/2nd Ave

14) 2nd Ave at Custer Way

15) Boston St at Custer Way

16) Deschutes Way at Boston St

17) Cleveland Ave at Capitol Blvd

18) Custer Way at Capitol Blvd

19) Custer Way/North St at Cleveland Ave

20) Hoadly St at North St

21) Deschutes Way at I-5 NB Off-Ramp

22) Capitol Blvd at E St

23) Cleveland Ave at South St

24) 7th Ave at Linwood Ave

25) 2nd Ave at Linwood Ave

26) Capitol Blvd at Linwood Ave

27) Henderson Blvd at Yelm Hwy

28) Rural Rd at Trosper Rd

29) Lake Park Dr at Trosper Rd

30) Littlerock Rd at Trosper Rd

31) I-5 SB Ramps/Tyee Dr at Trosper Rd

32) I-5 NB Ramps at Trosper Rd

33) Capitol Blvd at Trosper Rd

34) Capitol Blvd at Lee St

35) Littlerock Rd at Fred Meyer/Costco Drwy

36) Littlerock Rd at Costco Drwy

37) Littlerock Rd at Kingswood Dr

38) Capitol Blvd at X St

39) Elm St at X St

40) Capitol Blvd at Dennis St

41) Capitol Blvd at Israel Rd

42) 66th Ave at Black Lake Belmore Rd

43) Kirsop Rd at 66th Ave

44) Littlerock Rd at Odegard Rd

45) Littlerock Rd at Israel Rd/70th Ave

46) Linderson Way at Israel Rd

47) Littlerock Rd at Tumwater Blvd

48) I-5 SB Ramps at Tumwater Blvd

49) I-5 NB Ramps at Tumwater Blvd

50) Linderson Way at Tumwater Blvd

51) New Market St at Tumwater Blvd

52) Capitol Blvd at Tumwater Blvd

53) 65th Ave at Henderson Blvd

54) Tumwater Blvd at Henderson Blvd

55) Trails End Dr at Henderson Blvd

56) Littlerock Rd at Black Hills School Drwy

57) Center St at 76th Ave

58) Old Hwy 99 at Henderson Blvd

59) Old Hwy 99 at 79th Ave

60) Kimmie St at 83rd Ave

61) Center St at 83rd Ave

62) Old Hwy 99 at 88th Ave

63) I-5 SB Ramps at 93rd Ave

64) I-5 NB Ramps at 93rd Ave

65) Kimmie St at 93rd Ave

66) Case Rd at 93rd Ave

67) Tilley Rd (South) at 93rd Ave

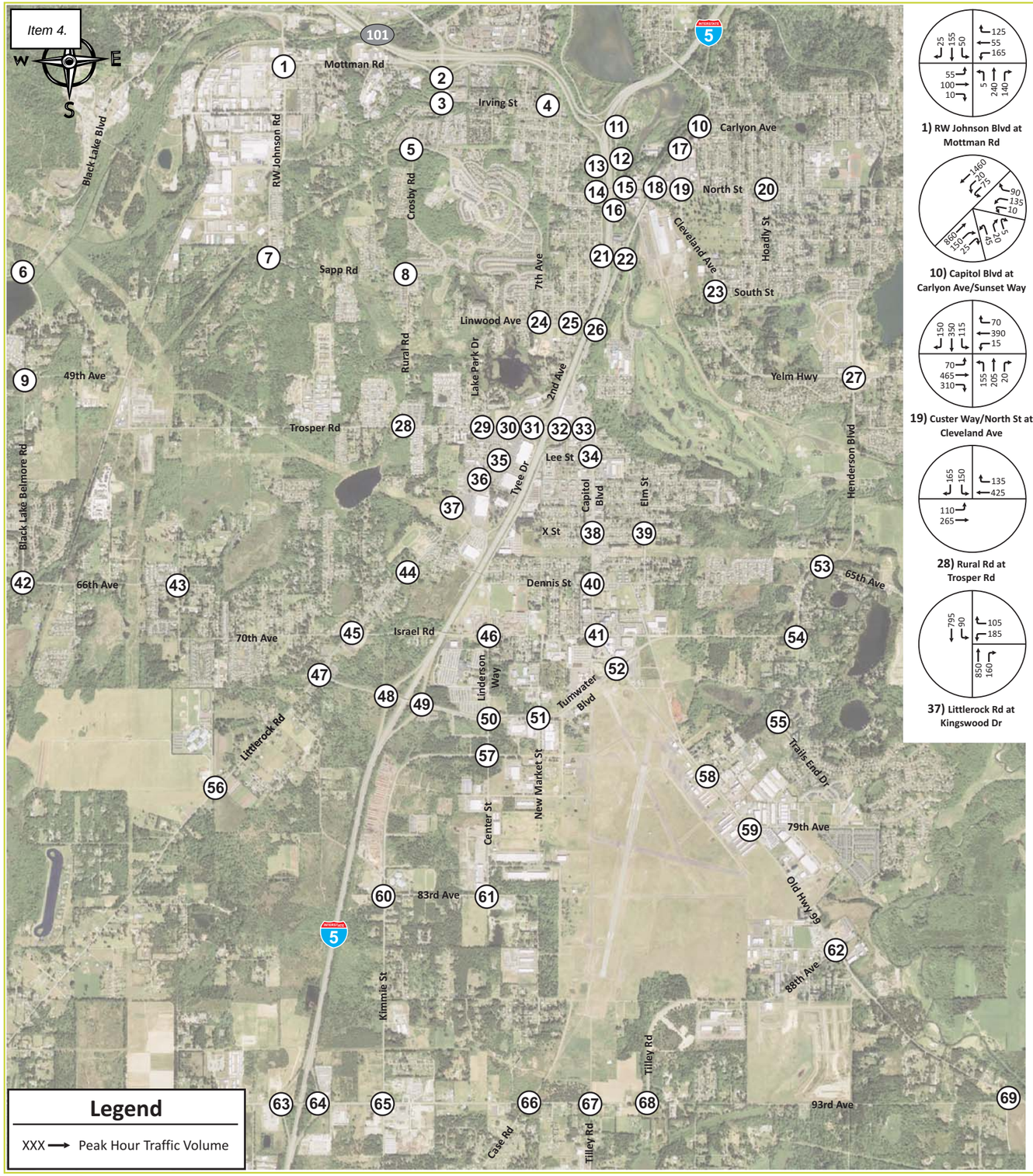
68) Tilley Rd (North) at 93rd Ave

69) Old Hwy 99 at 93rd Ave

Tumwater Transportation Master Plan

Tumwater, Washington

Figure 3
Projected 2022 PM Peak Hour Intersection Traffic Volumes



Legend

XXX → Peak Hour Traffic Volume



1) RW Johnson Blvd at Mottman Rd
2) Crosby Blvd at Mottman Rd
3) Crosby Blvd at Irving St
4) 7th Ave at Irving St
5) Crosby Blvd at Barnes Blvd
6) Black Lake Blvd at Black Lake Belmore Rd
7) RW Johnson Blvd at Sapp Rd
8) Sapp Rd at Crosby Blvd
9) 49th Ave at Black Lake Belmore Rd
10) Capitol Blvd at Carlyon Ave/Sunset Way
11) Deschutes Way at I-5 NB On-Ramp
12) Deschutes Way at US 101 WB On-Ramp
13) I-5/US 101 Off-Ramps at Desoto St/2nd Ave
14) 2nd Ave at Custer Way
15) Boston St at Custer Way
16) Deschutes Way at Boston St
17) Cleveland Ave at Capitol Blvd
18) Custer Way at Capitol Blvd
19) Custer Way/North St at Cleveland Ave
20) Hoadly St at North St
21) Deschutes Way at I-5 NB Off-Ramp
22) Capitol Blvd at E St
23) Cleveland Ave at South St
24) 7th Ave at Linwood Ave
25) 2nd Ave at Linwood Ave
26) Capitol Blvd at Linwood Ave
27) Henderson Blvd at Yelm Hwy
28) Rural Rd at Trosper Rd
29) Lake Park Dr at Trosper Rd
30) Littlerock Rd at Trosper Rd
31) I-5 SB Ramps/Tyee Dr at Trosper Rd
32) I-5 NB Ramps at Trosper Rd
33) Capitol Blvd at Trosper Rd
34) Capitol Blvd at Lee St
35) Littlerock Rd at Fred Meyer/Costco Drwy
36) Littlerock Rd at Costco Drwy
37) Littlerock Rd at Kingswood Dr
38) Capitol Blvd at X St
39) Elm St at X St
40) Capitol Blvd at Dennis St
41) Capitol Blvd at Israel Rd
42) 66th Ave at Black Lake Belmore Rd
43) Kirsop Rd at 66th Ave
44) Littlerock Rd at Odegard Rd
45) Littlerock Rd at Israel Rd/70th Ave
46) Linderson Way at Israel Rd
47) Littlerock Rd at Tumwater Blvd
48) I-5 SB Ramps at Tumwater Blvd
49) I-5 NB Ramps at Tumwater Blvd
50) Linderson Way at Tumwater Blvd
51) New Market St at Tumwater Blvd
52) Capitol Blvd at Tumwater Blvd
53) 65th Ave at Henderson Blvd
54) Tumwater Blvd at Henderson Blvd
55) Trails End Dr at Henderson Blvd
56) Littlerock Rd at Black Hills School Drwy
57) Center St at 76th Ave
58) Old Hwy 99 at Henderson Blvd
59) Old Hwy 99 at 79th Ave
60) Kimmie St at 83rd Ave
61) Center St at 83rd Ave
62) Old Hwy 99 at 88th Ave
63) I-5 SB Ramps at 93rd Ave
64) I-5 NB Ramps at 93rd Ave
65) Kimmie St at 93rd Ave
66) Case Rd at 93rd Ave
67) Tilley Rd (South) at 93rd Ave
68) Tilley Rd (North) at 93rd Ave
69) Old Hwy 99 at 93rd Ave

Tumwater Transportation Master Plan

Tumwater, Washington

Figure 4
Projected 2040 PM Peak Hour Intersection Traffic Volumes

3. ROADWAY AND INTERSECTION OPERATIONS SUMMARY

3.1 ANALYSIS METHODOLOGIES

The acknowledged source for determining overall capacity for intersections is the current edition of the Highway Capacity Manual (HCM). Intersection analysis was performed using version 9 of the Synchro/SimTraffic software package. This software implements the methods of the 2010 HCM. Capacity analysis calculations for intersections determine the amount of "control delay" (in seconds) that drivers will experience while proceeding through an intersection. Control delay includes all deceleration delay, stopped delay and acceleration delay caused by the traffic control device. The LOS is directly related to the amount of delay experienced. Capacity analysis results are described in terms of level of service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion).

For intersections under traffic signal, modern roundabout and all-way stop-control (AWSC) the intersection average delay is considered to represent the intersection LOS. For intersections under two-way stop-control (TWSC), the LOS/delay criteria are different than for signalized intersections because driver expectation is that a signalized intersection is designed to carry higher traffic volumes and experience greater delay. **Table 2** shows the level of service criteria for signalized, modern roundabout and stop sign-controlled intersections.

A planning level evaluation of roadway segments was prepared for most collector and arterial roadway segments within the study area. The analysis was based on the volume to capacity ratio (v/c). This ratio compares the measured or forecasted traffic volume on a roadway segment to the theoretical vehicle carrying capacity of the roadway segment. A roadway segment with a v/c of 1.0 or greater is determined to have higher traffic demand than it can functionally handle. In this analysis the roadway capacities used were taken from the TRPC Regional demand model. The roadway segment LOS standards are also shown on **Table 2**.

Table 2. Level of Service/Delay Criteria for Intersections

Level of Service	Signalized Intersection Delay (seconds/vehicle)	Stop Sign-Controlled and RAB Delay (seconds/vehicle)	Roadway Segment (v/c)
A	≤ 10	≤ 10	0.0 – 0.59
B	> 10-20	> 10-15	0.60 – 0.69
C	> 20-35	> 15-25	0.70 – 0.79
D	> 35-55	> 25-35	0.80 – 0.89
E	> 55-80	> 35-50	0.90 – 0.99
F	> 80	> 50	1.00>

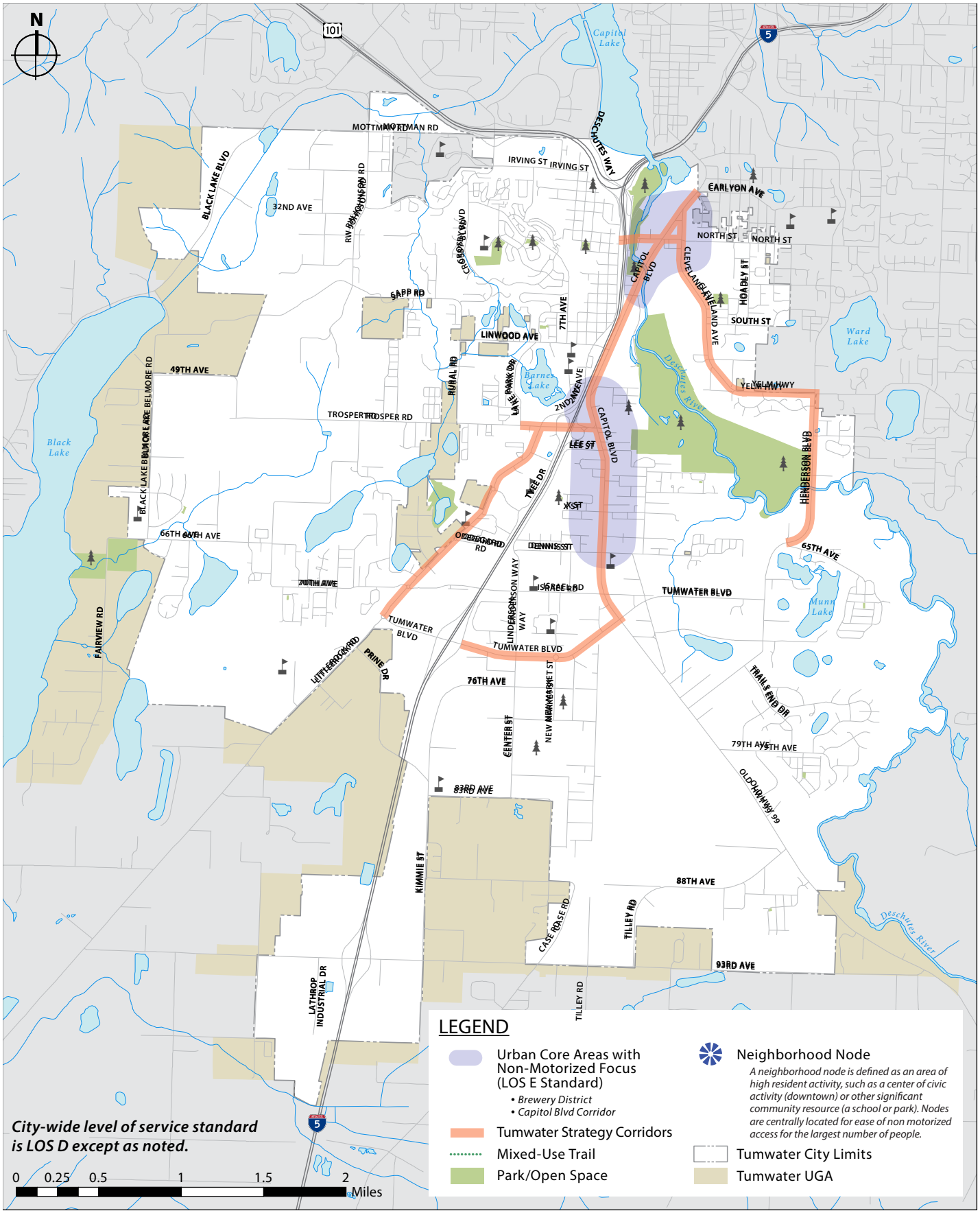
3.1.1 Level of Service Standard

The following LOS designations describe Tumwater's policy in the city and its urban growth area:

- For the designated "Urban Core Areas" LOS E is the acceptable standard of system performance. The Urban Core Areas are shown on **Figure 5** (Figure 9 of the Tumwater Master Plan).
- For the rest of the City and its urban growth area, LOS D will apply.
- The City has established Tumwater Strategy Corridors where the local LOS standard still applies, but it is acknowledged that some intersections or roadways may experience periodic congestion that exceeds the applicable standard. The Tumwater Strategy Corridors are also shown on **Figure 5**.

3.2 EXISTING OPERATIONS

Table 3 shows the existing level of service at each study intersection. For intersections under minor street stop-sign control, the LOS of the most difficult movement (typically the minor street left-turn) represents the intersection level of service for purposes of assessing potential impacts. The intersection average LOS is commonly used as the concurrency threshold for reviewing new development impacts. The operational analysis worksheets are provided in **Appendix A-5**.



CITY OF TUMWATER
Transportation Master Plan

Figure 5
Motorized Level of Service Standards

Table 3. Existing 2015 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2015 Base Year	
			LOS (Delay)	Worst v/c
1	RW Johnson Blvd/Mottman Rd	AWSC	B (12)	0.50
2	Crosby Blvd/Mottman Rd	Signal	B (16)	0.78
3	Crosby Blvd/Irving St	Signal	B (11)	0.59
4	7th Ave/Irving St	AWSC	A (9)	0.25
5	Crosby Blvd/Barnes Blvd	TWSC	C (22)	0.22
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	E (37)	0.75
7	RW Johnson Blvd/Sapp Rd	TWSC	B (10)	0.17
8	Sapp Rd/Crosby Blvd	TWSC	B (12)	0.11
9	49th Ave/Black Lake Belmore Rd[1]	TWSC	A (9)	
10	Capitol Blvd/Carlyon Ave/Sunset Way[2]	Signal	B (10)	0.51
11	Deschutes Way/I-5 NB On-Ramp	Yield	A (9)	0.18
12	Deschutes Way/US 101 WB On-Ramp	Yield	A (10)	0.37
13	I-5/US 101 Off-Ramps/Desoto St/2nd Ave[1]	TWSC	D (32)	
14	2nd Ave/Custer Way	Signal	B (15)	0.79
15	Boston St/Custer Way	TWSC	D (30)	0.52
16	Deschutes Way/Boston St	AWSC	D (29)	0.87
17	Cleveland Ave/Capitol Blvd	TWSC	B (11)	0.35
18	Custer Way/Capitol Blvd	Signal	D (39)	0.90
19	Custer Way/North St/Cleveland Ave	Signal	D (48)	0.96
20	Hoadly St/North St	TWSC	C (20)	0.16
21	Deschutes Way/I-5 NB Off-Ramp[1]	TWSC	B (12)	
22	Capitol Blvd/E St	Signal	C (23)	0.83
23	Cleveland Ave/South St	TWSC	B (15)	0.06
24	7th Ave/Linwood Ave	TWSC	C (18)	0.34
25	2nd Ave/Linwood Ave	AWSC	C (25)	0.76
26	Capitol Blvd/Linwood Ave	Signal	B (17)	0.81
27	Henderson Blvd/Yelm Hwy	Signal	D (49)	1.01
28	Rural Rd/Trosper Rd	TWSC	C (16)	0.23
29	Lake Park Dr/Trosper Rd	Signal	B (14)	0.69
30	Littlerock Rd/Trosper Rd	Signal	D (42)	0.81
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	Signal	D (45)	0.91
32	I-5 NB Ramps/Trosper Rd	Signal	A (7)	0.87
33	Capitol Blvd/Trosper Rd[3]	Signal	F (30)	0.85
34	Capitol Blvd/Lee St[2]	Signal	C (24)	0.86
35	Littlerock Rd/Fred Meyer Drwy/Costco Drwy	Signal	A (8)	0.51
36	Littlerock Rd/Costco Drwy[2]	Signal	C (21)	0.79
37	Littlerock Rd/Kingswood Dr	RAB	A (6)	0.61
38	Capitol Blvd/X St	Signal	A (7)	0.49

Table 3 Cont. Existing 2015 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2015 Base Year	
			LOS (Delay)	Worst v/c
39	Elm St/X St	TWSC	A (10)	0.04
40	Capitol Blvd/Dennis St[2]	Signal	B (12)	0.67
41	Capitol Blvd/Israel Rd	Signal	C (22)	0.82
42	66th Ave/Black Lake Belmore Rd	TWSC	B (11)	0.18
43	Kirsop Rd/66th Ave	TWSC	B (13)	0.21
44	Littlerock Rd/Odegard Rd	RAB	A (5)	0.59
45	Littlerock Rd/Israel Rd/70th Ave	RAB	A (9)	0.61
46	Linderson Way/Israel Rd	Signal	B (17)	0.71
47	Littlerock Rd/Tumwater Blvd	RAB	A (8)	0.37
48	I-5 SB Ramps/Tumwater Blvd	Signal	B (12)	0.83
49	I-5 NB Ramps/Tumwater Blvd	TWSC	F (106)	0.66
50	Linderson Way/Tumwater Blvd	Signal	C (35)	1.09
51	New Market St/Tumwater Blvd	RAB	A (4)	0.32
52	Capitol Blvd/Tumwater Blvd	Signal	D (36)	0.93
53	65th Ave/Henderson Blvd	Signal	A (7)	0.70
54	Tumwater Blvd/Henderson Blvd	Signal	C (34)	0.91
55	Trails End Dr/Henderson Blvd	TWSC	B (13)	0.22
56	Littlerock Rd/Black Hills School Drwy	Signal	A (3)	0.33
57	Center St/76th Ave	TWSC	C (17)	0.19
58	Old Hwy 99/Henderson Blvd	Signal	B (13)	0.70
59	Old Hwy 99/79th Ave	TWSC	F (64)	0.19
60	Kimmie St/83rd Ave	TWSC	A (9)	0.08
61	Center St/83rd Ave	TWSC	B (12)	0.33
62	Old Hwy 99/88th Ave	Signal	A (9)	0.66
63	I-5 SB Ramps/93rd Ave	Signal	B (20)	0.83
64	I-5 NB Ramps/93rd Ave	TWSC	B (12)	0.24
65	Kimmie St/93rd Ave	TWSC	C (21)	0.14
66	Case Rd/93rd Ave	AWSC	C (20)	0.78
67	Tilley Rd (South)/93rd Ave	AWSC	B (15)	0.62
68	Tilley Rd (North)/93rd Ave	TWSC	B (14)	0.28
69	Old Hwy 99/93rd Ave	TWSC	C (18)	0.37

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.
3. This intersection is being graded based on the known congestion along Capitol Boulevard as a result of the signal.

3.3 2040 Baseline Conditions

To accommodate the Regional Transportation Projects included in the forecast model, several intersection improvements are assumed to be in place for the 2040 baseline condition. A brief summary

of the Regional Transportation Projects that affect study intersections and the impacted intersections are provided below:

3.3.1 Brewery District Plan

The Brewery District Plan aims to change the focus of the transportation network around the brewery properties to accommodate multiple modes of travel. Lane reductions along Custer Way and Capitol Blvd are planned to improve pedestrian and bicycle mobility. To accommodate these lane reductions, several roundabouts are planned. The following motorized facilities are impacted by this project:

- Capitol Blvd/Carlyon Ave/Sunset Way – Install Roundabout
- Boston Ave/Custer Way – Install Roundabout
- Deschutes Way/Boston St – Install Signal
- Capitol Blvd/Cleveland Ave – Install Roundabout
- Capitol Blvd/Custer Way – Install Roundabout
- Cleveland Ave/Custer Way/North St – Install Roundabout

3.3.2 E Street Extension

To provide congestion relief to the Custer Way corridor and facilitate the Brewery District Plan, an extension of E Street across Tumwater Valley to Cleveland Avenue is planned. To accommodate this improvement, the following study intersections will be affected:

- Capitol Blvd/E St intersection – Install Roundabout

3.3.3 Old Highway 99 Improvements

The widening of Old Highway 99 from 73rd Avenue to 88th Avenue is planned to accommodate growing traffic volumes to and from the area southeast of Tumwater. This widening project affects the following study intersections:

- Henderson Blvd/Old Hwy 99 – Install Roundabout
- 79th Ave/Old Hwy 99 – Include additional NB and SB through lane
- 88th Ave/Old Hwy 99 – Install Roundabout

3.3.4 Tumwater Boulevard Interchange

The Tumwater Boulevard Interchange will be rebuilt with a wider bridge crossing over I-5 and improved ramps. The following study intersections will be affected by this project:

- Tumwater Blvd/I-5 SB Ramps – Install Roundabout
- Tumwater Blvd/I-5 NB Ramps – Install Roundabout

The operational results for the 2040 baseline conditions are provided in **Table 4**. The intersections that fail to meet the proposed level of service standard are in bold.

Table 4. Projected 2040 Baseline PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2040 Base Year	
			LOS (Delay)	Worst v/c
1	RW Johnson Blvd/Mottman Rd	AWSC	C (17)	0.73
2	Crosby Blvd/Mottman Rd	Signal	B (17)	0.64
3	Crosby Blvd/Irving St	Signal	B (12)	0.77
4	7th Ave/Irving St	AWSC	B (10)	0.35
5	**Crosby Blvd/Barnes Blvd**	**TWSC**	**F (60)**	**0.37**
6	**Black Lake Blvd/Black Lake Belmore Rd**	**TWSC**	**F (200+)**	**1.66**
7	RW Johnson Blvd/Sapp Rd	TWSC	B (15)	0.40
8	Sapp Rd/Crosby Blvd	TWSC	C (21)	0.51
9	49th Ave/Black Lake Belmore Rd[1]	TWSC	B (12)	
10	Capitol Blvd/Carlyon Ave/Sunset Way[2]	RAB	B (12)	0.73
11	Deschutes Way/I-5 NB On-Ramp	Yield	A (9)	0.15
12	Deschutes Way/US 101 WB On-Ramp	Yield	B (11)	0.47
13	**I-5/US 101 Off-Ramps/Desoto St/2nd Ave[1]**	**TWSC**	**F (200+)**	
14	2nd Ave/Custer Way	Signal	D (40)	0.90
15	Boston St/Custer Way	RAB	B (12)	0.70
16	Deschutes Way/Boston St	Signal	C (20)	0.92
17	Cleveland Ave/Capitol Blvd	RAB	B (10)	0.66
18	Custer Way/Capitol Blvd	RAB	D (36)	1.03
19	Custer Way/North St/Cleveland Ave	RAB	B (13)	0.68
20	**Hoadly St/North St**	**TWSC**	**F (54)**	**0.52**
21	Deschutes Way/I-5 NB Off-Ramp[1]	TWSC	D (30)	
22	Capitol Blvd/E St	RAB	D (38)	1.06
23	Cleveland Ave/South St	TWSC	C (21)	0.19
24	7th Ave/Linwood Ave	TWSC	D (33)	0.68
25	**2nd Ave/Linwood Ave**	**AWSC**	**F (58)**	**1.03**
26	Capitol Blvd/Linwood Ave	Signal	D (44)	1.06
27	**Henderson Blvd/Yelm Hwy**	**Signal**	**F (82)**	**1.13**
28	**Rural Rd/Trosper Rd**	**TWSC**	**F (53)**	**0.71**
29	Lake Park Dr/Trosper Rd	Signal	B (14)	0.77
30	Littlerock Rd/Trosper Rd	Signal	E (58)	1.01
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	Signal	D (50)	0.92
32	I-5 NB Ramps/Trosper Rd	TWSC	C (19)	0.37
33	**Capitol Blvd/Trosper Rd**	**Signal**	**F (112)**	**1.31**
34	Capitol Blvd/Lee St[2]	Signal	C (25)	0.92
35	Littlerock Rd/Fred Meyer Drwy/Costco Drwy	Signal	A (10)	0.68
36	Littlerock Rd/Costco Drwy[2]	Signal	C (27)	0.87
37	Littlerock Rd/Kingswood Dr	RAB	B (14)	1.01
38	Capitol Blvd/X St	Signal	A (10)	0.63
39	Elm St/X St	TWSC	A (10)	0.05

Table 4 Cont. Projected 2040 Baseline PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2040 Base Year	
			LOS (Delay)	Worst v/c
40	Capitol Blvd/Dennis St[2]	Signal	B (16)	0.76
41	Capitol Blvd/Israel Rd	Signal	D (42)	1.00
42	66th Ave/Black Lake Belmore Rd	TWSC	C (16)	0.46
43	Kirsop Rd/66th Ave	TWSC	C (19)	0.41
44	Littlerock Rd/Odegard Rd	RAB	A (5)	0.83
45	Littlerock Rd/Israel Rd/70th Ave	RAB	C (25)	1.06
46	Linderson Way/Israel Rd	Signal	D (49)	1.15
47	Littlerock Rd/Tumwater Blvd	RAB	A (9)	0.64
48	I-5 SB Ramps/Tumwater Blvd	RAB	C (22)	0.99
49	I-5 NB Ramps/Tumwater Blvd	RAB	A (7)	0.67
50	Linderson Way/Tumwater Blvd	Signal	D (47)	1.27
51	New Market St/Tumwater Blvd	RAB	A (6)	0.42
52	Capitol Blvd/Tumwater Blvd	Signal	D (55)	1.41
53	65th Ave/Henderson Blvd	Signal	B (10)	0.78
54	Tumwater Blvd/Henderson Blvd	Signal	D (45)	1.01
55	Trails End Dr/Henderson Blvd	TWSC	C (16)	0.31
56	Littlerock Rd/Black Hills School Drwy	Signal	A (4)	0.46
57	Center St/76th Ave	TWSC	D (33)	0.46
58	Old Hwy 99/Henderson Blvd	RAB	B (11)	0.69
59	**Old Hwy 99/79th Ave**	**TWSC**	**F (177)**	**0.67**
60	Kimmie St/83rd Ave	TWSC	B (11)	0.11
61	Center St/83rd Ave	TWSC	C (15)	0.51
62	Old Hwy 99/88th Ave	RAB	A (8)	0.53
63	I-5 SB Ramps/93rd Ave	Signal	D (35)	1.07
64	**I-5 NB Ramps/93rd Ave**	**TWSC**	**F (112)**	**1.06**
65	Kimmie St/93rd Ave	TWSC	D (34)	0.52
66	**Case Rd/93rd Ave**	**AWSC**	**F (53)**	**1.30**
67	**Tilley Rd (South)/93rd Ave**	**AWSC**	**F (54)**	**1.28**
68	**Tilley Rd (North)/93rd Ave**	**TWSC**	**F (60)**	**0.78**
69	**Old Hwy 99/93rd Ave**	**TWSC**	**E (36)**	**0.67**

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.

3.4 PROPOSED CAPITAL IMPROVEMENTS

The City of Tumwater has, through different subarea studies and previous planning efforts, identified future roadway improvements that address the majority of the projected operational deficiencies, several of which are designed to improve network connectivity or secondary modes of travel. All of these previously identified improvement projects have been consolidated into the proposed project list,

with the inclusion of a few new improvements to address new projected operational deficiencies. These projects are summarized below by project type.

3.4.1 Roadway Improvements

R-1 Littlerock Road: Tumwater Blvd to Western City Limits

This is currently a two-lane facility running north/south and providing access from Tumwater to southwest Thurston County. It is planned to be widened to three lanes in the future, providing a two-way left-turn lane (TWLTL). This roadway is a primary entry point to the City, and the current volume projections approach the threshold for multiple through lanes each direction. It is suggested that the roadway operations be monitored and that all future development along the roadway be set back to accommodate a five-lane section.

R-2 Tyee Drive: Bishop Rd to Israel Rd

Tyee Drive is currently a two-lane roadway traveling parallel to Littlerock and providing access to the commercial properties. This project would extend Tyee Drive from its current southern terminus at Bishop Road, south to Israel Road. This extension will be a two lane roadway and will include the installation of a roundabout at Israel Road.

R-3 Tyee Drive: Israel Rd to Tumwater Blvd

This project will continue the extension of Tyee Drive south to Tumwater Blvd. This portion of Tyee Drive is currently planned to be four/five lanes, however the need for this additional capacity should be reassessed as the surrounding properties are developed.

R-4 Tyee Drive: Tumwater Blvd to Prine Dr

This project will continue the extension of Tyee Drive south to Prine Dr. This portion of Tyee Drive will continue to be planned for four/five lanes. As with project R-3, the need for the additional width should be reassessed as the adjacent properties are developed.

R-5 Tyee Drive: Prine Dr to Littlerock Rd

This project will complete the extension of Tyee Drive, connecting into Littlerock Road at the existing Black Hills High School driveway. This portion of Tyee Drive will serve residential properties and is planned as a three lane roadway. This project will also include improvements to the traffic signal at Black Hills High School driveway/Littlerock Rd

R-6 Trosper Road: Lake Park Dr to Rural Rd

This roadway is currently two lanes with on-street parking provided at the west end of the segment and partial bicycle lanes. Repurposing the existing asphalt will allow this roadway to be converted into a three lane section with continuous bicycle lanes.

R-7 Tumwater Boulevard: Capitol Blvd to Henderson Blvd

This roadway is currently two lanes. This improvement will widen Tumwater Blvd to three lanes and include intersection improvements at Bonniewood Dr.

R-8 Tumwater Boulevard: I-5 Interchange

The Tumwater Boulevard interchange is currently a three-lane bridge with stop-control for the NB ramps and signal control for the SB ramps. This improvement will install roundabouts at both ramp terminals and widen the bridge to accommodate these roundabouts. Since WSDOT has jurisdiction over the interchange, this will become a WSDOT project.

R-9 Tumwater Boulevard: Tyee Dr extension to I-5 SB Ramps

Currently this portion of Tumwater Boulevard is three lanes, with two travel lanes eastbound and one travel lane westbound. With the completion of Tyee Dr, this portion of Tumwater Boulevard is projected to experience an increase in traffic. This improvement will widen Tumwater Boulevard to five lanes, providing two travel lanes in each direction and a TWLTL.

R-10 E Street: Capitol Blvd to Cleveland Ave

Currently E Street is a short two-lane roadway connecting Deschutes Way to Capitol Blvd. To facilitate better network connectivity and relieve congestion along Custer Way, this improvement will extend E Street east across the Deschutes River valley to Cleveland Ave. This extension will be four lanes will also provide access to valley floor properties on the east side of the railroad tracks. A separate access is planned for properties on the west side of the railroad tracks. This project will include the installation of roundabouts at Capitol Blvd and Cleveland Ave.

R-11 Old Highway 99: Tumwater Blvd to 73rd Ave

This section of Old Highway 99 is currently a two-lane roadway south Tumwater Blvd. This improvement will widen Old Highway 99 to five lanes and has already been funded.

R-12 Old Highway 99: 73rd Ave to 88th Ave

This section of Old Highway 99 is currently two lanes. This improvement will widen Old Highway 99 to five lanes, continuing the widening of project R-11 south. This project will include intersection improvements at Bonniewood Dr, Henderson Blvd and 88th Ave. The Henderson Blvd and 88th Ave intersections will be converted from signals to roundabouts. This improvement is a Regional Transportation Project.

R-13 Old Highway 99: 88th Ave to 93rd Ave

This portion of Old Highway 99 is currently two lanes. This improvement will widen Old Highway 99 to three lanes, adding a TWLTL and/or median section. The projected 2040 volumes are approaching the threshold for a five-lane section and it is recommended that future development along this segment be constructed with setbacks adequate to accommodate five lanes. To realize full benefit of a five lane roadway section would require Old Highway 99 to be widened to five lanes past the southern boundary of the Tumwater UGA. The segments of Old Highway 99 north and south of 93rd Ave should continue to be monitored.

R-14 Henderson Boulevard: Tumwater Blvd to 65th Ave

This portion of Henderson Boulevard is currently a two-lane roadway. This improvement will widen Henderson Boulevard to three lanes, providing left-turn lanes at intersecting roadways and a TWLTL or a median along the rest of the segment.

R-15 Henderson Boulevard: Old Hwy 99 to Tumwater Blvd

This portion of Henderson Boulevard is currently a two-lane roadway. This improvement will widen Henderson Boulevard to three lanes, providing left-turn lanes at intersecting roadways and a TWLTL or a median along the rest of the segment.

R-16 32nd Avenue: Ferguson St to Black Lake Blvd

32nd Avenue is currently a three-lane roadway between RW Johnson Blvd and Ferguson St, with single travel lanes in each direction and a TWLTL. This improvement will extend 32nd Avenue west to Black Lake Blvd, continuing the three lane section. This improvement will include intersection improvements at Black Lake Blvd. This project will be constructed as development occurs in the surrounding area, and is expected to be developer funded.

R-17 70th Avenue: Kirsop Rd to 73rd/66th Connector

70th Avenue is currently a two-lane roadway. This improvement will extend 70th Avenue west to a future north/south roadway to provide access to the property west of Black Hills High School. This extension will be a three-lane roadway, including a TWLTL. The project will include intersection improvements at Kirsop Rd. This improvement will occur as the property west of Black Hills High School develops, and is expected to be developer funded.

R-18 73rd Avenue: Prine Dr extension to 73rd/66th Connector

73rd Avenue is currently a two-lane road serving a small community of homes east of Littlerock Rd. This project will construct a new segment of 73rd Avenue west of Littlerock Rd, between the extension of Prine Dr and a future north/south roadway further west. This new roadway will be three lanes and will serve the future development of property west of Black Hills High School. It will be constructed as development occurs and the need for a third lane will be reassessed at that time. It is expected to be developer funded.

R-19 Prine Drive: Tyee Dr to 73rd Ave

Prine Drive is currently a two lane neighborhood road east of Littlerock Rd. This improvement will extend Prine Drive west to the proposed 73rd Ave roadway and will widen the existing segment of Prine Drive between Littlerock Rd and the Tyee Dr extension. This roadway improvement is part of the proposed access plan for the property west of Black Hills High School and will be constructed as development occurs. It is expected to be developer funded.

R-20 93rd Avenue: Lathrop Industrial Dr to I-5 SB Ramps

This portion of 93rd Avenue is currently a two lane roadway. This improvement will widen 93rd Avenue to five lanes, providing two lanes in each direction and either a TWLTL or a median. This project will include

intersection improvements at Lathrop Industrial Dr. This improvement is driven by the expected development of properties on both sides of 93rd Avenue. The additional through-lanes will add/drop at Lathrop Industrial Dr.

R-21 SR 121 (93rd Avenue): I-5 NB Ramps to Kimmie St

This portion of 93rd Avenue is currently two lanes. This improvement will widen 93rd Avenue to five lanes, providing two lanes in each direction and a TWLTL. This improvement will include intersection improvements at Kimmie St.

R-22 SR 121 (93rd Avenue): Kimmie St to Tilley Rd (south)

This portion of 93rd Avenue is two lanes. This improvement will add a TWLTL, creating a three lane roadway. Previous studies have found that a five lane section may be needed along this portion of 93rd Avenue, depending on how the area develops. As development occurs, setbacks should allow for a five lane roadway.

R-23 93rd Avenue: Lathrop Industrial Dr to Western City Limits

This segment of 93rd Avenue is currently a two-lane roadway. This improvement will widen 93rd Avenue to include a TWLTL or median control.

R-24 SR 121 (93rd Avenue): I-5 Interchange

Currently the interchange bridge over I-5 is two lanes. As the properties on each side of I-5 develop, the bridge will require widening. This improvement will widen the bridge to five lanes, providing two travel lanes and left-turn pockets for both on-ramps. It is anticipated that this will become a WSDOT project.

R-25 6th Avenue: T St to Lee St

This project is to construct a new north/south roadway west of Capitol Blvd. With the completion of the Trosper Rd interchange project, the NB ramps will be relocated to 6th Avenue north of this location. This improvement will extend the new roadway south to Lee St to provide better network connectivity. It will be a three-lane roadway and will include intersection improvements at Lee St.

R-26 Custer Way: Boston St to Cleveland Ave

This project is a part of the Brewery District Plan. Currently this portion of Custer Way is a four-lane road with sidewalk and no bicycle lanes. The improvement will reduce the travel lanes to three, with the EB direction providing a single through lane and the WB direction providing two through lanes. This lane reduction will allow for the addition a median and an EB bicycle lane. This project requires the construction of roundabouts at brewery area intersections, projects I-2, I-4, I-6, I-7 and I-8.

R-27 Capitol Boulevard: E St to Cleveland Ave

This project is a part of the Brewery District Plan. Currently this segment of Capitol Boulevard is five lanes, with sidewalks and no bicycle lanes. This improvement will reduce the travel lanes to three, providing one NB lane and two SB lanes. With this lane reduction a center median will be installed and

bicycle lanes will be constructed in both directions. This improvement requires the construction of roundabouts at brewery area intersections, projects I-2, I-4, I-6, I-7 and I-8.

R-28 Capitol Boulevard: Cleveland Ave to Carlyon Ave

This improvement is a part of the Brewery District Plan. This section of Capitol Boulevard is currently five lanes with sidewalks and no bicycle lanes. This project will reduce the travel lanes to four, with two lanes in each direction. With this reduction bicycle lanes and a center median will be constructed. This improvement requires the construction of roundabouts at brewery area intersections, projects I-2, I-4, I-6, I-7 and I-8.

R-29 Capitol Boulevard: Israel to M St

This project is a part of the Capitol Boulevard Corridor Plan. This section of Capitol Boulevard currently provides five travel lanes and sidewalks, with no bicycle lanes. The improvement will remove the TWLTL, allowing for the addition of bicycle lanes in both directions and a raised median. This project requires the construction of roundabouts along the corridor, projects I-15, I-16, I-17 and I-18

R-30 North/South Connector: Lee St to Trosper Rd

This project is a part of the Capitol Boulevard Corridor Plan. This improvement will construct a new north/south roadway east of Capitol Blvd. The roadway will provide two travel lanes, and bicycle lanes in both directions. This improvement will provide better access to the commercial properties.

R-31 Odegard Road: Littlerock Rd to Tyee Dr

Odegard Road is currently a two lane roadway extending east from Littlerock Rd, providing access to a small collection of residential units. This improvement constructs a three-lane extension of Odegard Road east to the proposed Tyee Dr extension, providing enhanced network connectivity.

R-32 Bishop Road: Littlerock Rd to Tyee Dr

Bishop Road is currently a two-lane roadway extending east from Littlerock Rd, providing access to commercial and residential properties. This improvement will construct a three lane extension of Bishop Road east to the proposed Tyee Dr extension, providing enhanced network connectivity.

R-33 73rd/66th Connector: 66th Ave to 73rd Ave

This project will construct a new north/south roadway west of Black Hills High School, connecting 66th Ave and 73rd Ave. It will be constructed as a three-lane roadway and will be constructed as development occurs. It is expected to be developer funded.

R-34 New Market Street: Tumwater Blvd to Israel Rd

Currently New Market Street is a two-lane roadway extending north from Tumwater Blvd and providing access to the New Market Skills Center. This improvement will construct a three-lane extension of New Market Street north to Israel Rd.

R-35 Town Center Connector: Tumwater Blvd to Israel Rd

This project will construct a new north/south three-lane roadway east of New Market St, connecting Tumwater Blvd and Israel Rd.

R-36 72nd Avenue: Cleanwater Dr to Linderson Way

This roadway is currently a site access road to property west of Tumwater Blvd. This improvement will improve the existing roadway to a three lane roadway and construct an extension east to Linderson Way, providing a parallel route to Tumwater Blvd to enhance connectivity for the properties north of Tumwater Blvd.

R-37 Doelman Property: South of 73rd Ave

The Doelman property is located south of 73rd Avenue and west of Black Hills High School. This property will construct an internal roadway network to serve the future development, and is expected to be developer funded.

R-38 Trosper Road Interchange: NB Ramps

The existing NB ramps for the Trosper Road interchange provide right turn on-ramp movements in both directions and a full access off-ramp. To address the projected deficiency at Trosper Rd/Capitol Blvd, this improvement will relocate the NB ramp termini south of Trosper Road. The current ramps will be constructed as 6th Ave and provide limited access to Trosper Road The WB to NB right turn on-ramp will remain. Traffic traveling NB on Capitol Blvd will be able to access the NB on-ramp south of Trosper Road, using Lee St and 6th Ave. This project will include improvements to the existing NB Ramp intersection.

R-39 Deschutes Way: E St to US 101 On-ramp

This portion of Deschutes Way is currently two travel lanes with sidewalks and no bicycle lanes. Parking is provided on the west side of the road south of Boston St and on the east side of the road north of Boston St. Multiple improvement alternatives are still under consideration for this roadway, designed to accommodate the additional traffic as a result of the E St extension. The final design recommendation will be determined in the E St extension study.

3.4.2 Intersection Improvements

I-1 Black Lake Belmore at Black Lake Boulevard

This intersection is currently under stop-sign control for the minor street approach, Black Lake Belmore. The intersection is projected to operate at an LOS F in 2040. This project will construct a single lane roundabout.

I-2 Capitol Boulevard at Carlyon Avenue/Sunset Way

This intersection is currently under traffic signal control. It has an unusual layout, with both Carlyon Ave and Sunset Way being WB approaches. This intersection is not projected to have operational issues in the future, but to accommodate the Brewery District Plan improvements along Capitol Boulevard this improvement will construct a two lane roundabout. A roundabout will also better accommodate the unusual intersection configuration.

I-3 2nd Avenue at Custer Way

This intersection is currently under traffic signal control. The projected intersection operations do not require improvements, but the upstream I-5/US-101 off-ramp intersection projects to operate an LOS F. To improve the operations of the upstream intersection, this improvement will restripe the SB approach to convert the existing through lane into a shared through-left lane, providing a second SB left-turn lane. This will greatly improve the lane utilization at the upstream intersection, and will also improve the projected operations at this intersection.

I-4 Boston Street at Custer Way

This intersection currently operates under stop sign-control for the minor street approaches. The NB approach it restricted to through and right turn movements. The Brewery District Plan includes a roundabout at this location to facilitate the lane reduction along Custer Way. This improvement will construct a teardrop roundabout at this location, with the east side of the roundabout connecting to a median and limiting the NB approach to right-turns only.

I-5 Deschutes Way at Boston St

This intersection is currently under all-way stop-control. With the construction of the E Street crossing this intersection will experience a large increase of through traffic along Deschutes Way, which will result in the operations falling below the proposed level of service standard. This improvement will install a traffic signal as a part of the Brewery District Plan.

I-6 Capitol Boulevard at Cleveland Ave

This intersection currently operates under stop-control for the Cleveland Avenue approach. Due to the approach angle of the NB Capitol Boulevard and NB Cleveland Avenue approaches, the Cleveland Ave approach only allows a right-turn movement. This improvement will construct a two lane roundabout, to better serve the existing approach angles and to facilitate the Brewery District Plan's lane reduction along Capitol Boulevard.

I-7 Capitol Boulevard at Custer Way

This intersection is currently operated with a traffic signal. To accommodate the lane reductions along both Custer Way and Capitol Boulevard proposed in the Brewery District Plan, this improvement will construct a two-lane roundabout.

I-8 Cleveland Avenue at Custer Way/North Street

This intersection is currently operated with a traffic signal. As part of the Brewery District Plan, this improvement will construct a two lane roundabout to accommodate the lane reduction along Custer Way.

I-9 Linwood Avenue at 2nd Avenue

This intersection is currently under all-way stop-control. The projected intersection operations are below the proposed level of service standard. This improvement will construct a two-lane roundabout.

I-10 Capitol Boulevard at Linwood Avenue

This intersection is currently under traffic signal control. Although the projected operational analysis is within the proposed level of service standard, to accommodate the median treatment along Capitol Boulevard proposed in the Capitol Boulevard Corridor Plan, this improvement will construct a two-lane roundabout.

I-11 Henderson Avenue at Yelm Highway

This intersection currently operates under traffic signal control. The existing operational analysis results suggests the intersection may experience operational issues in the near future. The projected 2040 analysis falls below the proposed level of service standard. This improvement will widen the WB approach to provide a 2nd left-turn lane. Construction of a two lane roundabout could also provide the same operational benefit. Both improvements present right-of-way challenges. A future intersection design study would identify the preferred solution.

I-12 Trosper Road at Rural Road

This intersection is currently under stop sign-control for Rural Road. The projected 2040 operational analysis will fall below the proposed level of service standard. This improvement will construct an EB left-turn lane. This and the addition of a TWLTL on Trosper Road east of Rural Road completed in project R-6 will allow for the intersection to remain under stop-sign control.

I-13 Trosper Road at 2nd Avenue/Littlerock Road

This intersection is currently under traffic signal control. The projected 2040 level of service is expected to be within the proposed level of service standard, but with some long queues during the peak periods. To provide congestion relief and improve the operations of the intersection, this improvement will construct a two lane roundabout. Due to the close proximity to the Trosper Road/Tyee Drive intersection, this improvement must be constructed with I-14.

I-14 Trosper Road at Tyee Drive/I-5 SB Ramps

This intersection is currently under traffic signal control. The projected 2040 operations are within the proposed LOS Standard, but with heavy congestion along most of the approaches. To improve the projected congestion, this improvement will construct a two lane roundabout. This improvement will require project I-13 to be completed. Construction of a roundabout should also improve the safety performance of the intersection by improving the alignment of the north and south approaches.

I-15 Trosper Road at Capitol Boulevard

Currently this intersection is under traffic signal control. While the existing level of service is within the LOS standard, the current congestion and extended queues experienced during the PM peak period results in this intersection being graded as failing. The Trosper Road interchange improvement, project R-38, was developed to address the existing and projected operational issues at this intersection. This improvement will construct a two-lane roundabout.

I-16 T Street at Capitol Boulevard

This intersection is currently stop sign-controlled. Future redevelopment of the WSDOT Olympic Region property is expected to use T Street as a primary access, which will require intersection improvements. As part of the Capitol Boulevard Corridor Plan and to accommodate the Trosper Road interchange improvement, this project will construct a two-lane roundabout. With the completion of the 6th Avenue roadway project, project R-25, this roundabout will allow for the existing traffic signal at Lee Street to be removed, creating better intersection control spacing along Capitol Boulevard.

I-17 X Street at Capitol Boulevard

This intersection currently operates under traffic signal control. As part of the Capitol Boulevard Corridor Plan, this improvement will construct a two-lane roundabout. This improvement is not needed to improve an operational deficiency, but will facilitate the redevelopment of Capitol Boulevard.

I-18 Dennis Street at Capitol Boulevard

This intersection currently operates under traffic signal control. As part of the Capitol Boulevard Corridor Plan, this improvement will construct a two-lane roundabout. This improvement is not needed to improve an operational deficiency, but will facilitate the redevelopment of Capitol Boulevard.

I-19 Old Highway 99 at 79th Avenue

This intersection is currently under stop sign-control for the 79th Avenue approach. The minor street movement currently operates below the accepted LOS standards, but the volumes are not sufficient to meet traffic signal warrants. In the future the volumes on Old highway 99 are expected to grow enough that intersection control improvements become warranted. This improvement will construct a two-lane roundabout.

I-20 93rd Avenue at I-5 Northbound Ramps

Currently this intersection operates under stop sign-control for the I-5 NB off-ramp. This intersection is projected to operate below the proposed LOS standard in 2040. This improvement will construct a traffic signal.

I-21 93rd Avenue at Kimmie Street

This intersection currently operates with stop sign-control for both approaches of Kimmie Street. Based on the volume projections from the travel demand model, this intersection will operate within the proposed LOS standards. Previous studies have identified operational deficiencies at this location, and if the properties along 93rd Avenue develop, improvements will be needed. This project will construct a traffic signal, which should be built as development occurs.

I-22 93rd Avenue at Case Road

This intersection currently operates under all-way stop-control. This intersection is projected to operate below the proposed LOS standard in 2040. This project is currently identified on the City's traffic impact fee program and will construct a single-lane roundabout. This roundabout should be designed to accommodate widening of 93rd Avenue to five lanes.

I-23 93rd Avenue at Tilley Road (south)

Currently this intersection operates with all-way stop-control. The projected 2040 operational results are below the proposed LOS standard. This improvement will construct a single-lane roundabout. Should median control be implemented along 93rd Avenue between Tilley Road and Case Road, construction of this roundabout would be required.

I-24 93rd Avenue at Tilley Road (north)

This intersection currently operates under all-way stop-control. This intersection is projected to operate below the proposed LOS standard in 2040. This improvement will construct a single-lane roundabout.

I-25 93rd Avenue at Old Highway 99

This intersection is currently operated with stop sign control for the 93rd Avenue approach. Currently acceleration lanes have been constructed for both NB and SB directions on Old Highway 99. As traffic volumes increase along Old Highway 99, these acceleration lanes will not be sufficient to accommodate the traffic on 93rd Avenue. This improvement will construct a single-lane roundabout. This roundabout should be designed to accommodate future widening along Old Highway 99.

3.4.3 Additional Intersection Deficiencies

With completion of the entire roadway and intersection project lists, the projected 2040 operational analysis still indicates a few locations that may operate below the proposed LOS standard. Here is a brief description of these locations:

Crosby Boulevard at Barnes Road

This intersection is projected to operate at an LOS F for the EB approach and an LOS E for the WB approach. The EB approach serves as a driveway for a small apartement complex and has very low peak hour volumes. The WB approach has more volume, but the heavy movement is right-turning traffic, which is provided with a separate turn lane. The peak hour traffic signal volume warrants were reviewed at this location and the forecasted volumes don't meet applicable traffic volume thresholds. This intersection should be monitored, but until signal warrants can be met no intersection improvements are proposed.

Hoadly Street at North Street

This intersection in currently stop sign-controlled for the north and south approaches. The projected 2040 operational analysis indicates the SB approach will operate at an LOS F. This is a low volume approach and is not projected to meet the peak hour traffic signal volume warrant. This intersection should be monitored, but until signal warrants can be met no intersection improvements are proposed.

3.4.4 Roadway Deficiencies

A planning level evaluation of roadway segments was prepared for most collector and arterial roadway segments within the study area. The analysis was based on the volume to capacity ratio (v/c). In this analysis the roadway capacities used were taken from the TRPC Regional demand model. In general, these capacities tend to be conservatively low and offer a "first-screening" of roadways that may be approaching capacity difficulties. In most urban settings the intersections are what determine the

success of the roadway segments. However, in some instances it may be appropriate to consider addressing roadway segment capacity deficiencies, in the following ways:

- Adding through capacity lanes
- Improving signal progression
- Adding right and/or left-turn lanes at intersections
- Adding a continuous two-way left-turn lane or center median
- Consolidating driveways to reduce conflicts

The roadway segment analysis results are provided on **Figures 10, 11 and 12** of the Tumwater Master Plan. The complete roadway segment analysis results are provided in Appendix A-4. Below is a discussion of some of the notable roadway segments.

Henderson Boulevard - Between 65th Avenue and Yelm Highway

Currently this portion of Henderson Boulevard is a two lane roadway with turn lanes at all significant intersections. The 2040 roadway segment analysis indicates that Henderson Blvd will have a v/c ratio greater than 1.0. Given that the intersections already have turn lanes provided, the only meaningful improvement to address the projected volume would be additional through lanes. This segment of Henderson Boulevard has multiple geographic constraints that make roadway widening undesirable. Since the current corridor is built to the long term vision for this roadway, Henderson Boulevard has been designated a Tumwater Strategy Corridor. This roadway should continue to be monitored.

Deschutes Way – Between E Street and US-101 Ramps

This portion of Deschutes Way is currently a two lane roadway. With the completion of the E Street extension Deschutes Way will experience an increase in volume accessing the US-101 and I-5 on-ramps. This roadway is included on the Capital Improvements list, with the exact roadway improvement to be determined in the E Street extension study. Eventually, either with this initial improvement or a future improvement, a 2nd NB travel lane may be needed to accommodate this growth in volume.

Israel Road – Between Linderson Way and Littlerock Road

This portion of Israel Road is a two lane section. The projected 2040 v/c ratio indicates this roadway will operate with a v/c ratio above 1.0. Given the current lack of driveway interruptions along this portion of Israel Road, the intersection analysis at Israel Rd/Linderson Way and Israel Rd/Littlerock Rd should provide a more meaningful indication of how Israel Road is operating. As development occurs on this segment of Israel Road, additional right-turn or left-turn lanes and/or turn movement restrictions at cross-streets may need need to be evaluated to minimize friction on through traffic.

Linderson Way – Between Tumwater Boulevard and Israel Road

Linderson Way north of Tumwater Boulevard is currently a five lane section, which narrows down to three lanes north of 73rd Avenue until Israel Road. Based on the existing counts, this roadway has a v/c ratio above 1.0 during the PM peak hour SB approaching Tumwater Boulevard. Congestion on this roadway tends to be of short duration as the office buildings generate spikes of outbound traffic. As traffic increases this roadway should be monitored for potential efficiency improvements including right turn lanes at cross-streets/major driveways.

Old Highway 99 – South of 93rd Avenue

This portion of Old Highway 99 is currently a two lane section. The segments of Old Highway 99 north of 93rd Avenue are listed in the Capital Improvements list, widening to five lanes north of 88th Avenue and to three lanes between 88th Avenue and 93rd Avenue. As growth continues south of the City, this roadway may require additional through lanes. Although this improvement may not provide meaningful benefit unless it extends south beyond the City boundary.

3.5 2040 With Proposed Capital Improvements

The operational results were prepared for 2040 volume conditions with the proposed improvements in place for affected intersections. The 2040 operational analysis results with the proposed improvements are provided in **Table 5**.

Table 5. Projected 2040 With Improvements PM Peak Hour Level of Service

				2040 With Improvement	
Number	Intersection	Existing Intersection Control	Improvement	LOS (Delay)	Worst v/c
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	RAB	B (11)	0.64
13	I-5/US 101 Off-Ramps/Desoto St/2nd Ave	TWSC	Lanes	E (50)	
14	2nd Ave/Custer Way	Signal	Lanes	C (25)	0.85
25	2nd Ave/Linwood Ave	AWSC	RAB	B (19)	0.80
26	Capitol Blvd/Linwood Ave	Signal	RAB	B (17)	0.84
27	Henderson Blvd/Yelm Hwy	Signal	Signal	D (55)	1.01
28	Rural Rd/Trosper Rd	TWSC	Lanes	C (18)	0.37
30	2nd Ave/Littlerock Rd/Trosper Rd	Signal	RAB	C (32)	0.96
31	Tyee Dr/SB I-5 Ramps/Trosper Rd	Signal	RAB	C (23)	0.92
33	Capitol Blvd/Trosper Rd	Signal	RAB	C (26)	0.94
38	Capitol Blvd/X St	Signal	RAB	A (8)	0.50
40	Capitol Blvd/Dennis St	Signal	RAB	A (9)	0.56
56	Littlerock Rd/Black Hills School Drwy	Signal	Lanes	C (27)	0.83
59	Old Hwy 99/79th Ave	TWSC	RAB	A (8)	0.59
63	I-5 SB Ramps/93rd Ave	Signal	Lanes	B (15)	0.67
64	I-5 NB Ramps/93rd Ave	TWSC	Signal	A (9)	0.77
65	Kimmie St/93rd Ave	TWSC	Signal	B (14)	0.73
66	Case Rd/93rd Ave	AWSC	RAB	B (16)	0.79
67	Tilley Rd (South)/93rd Ave	AWSC	RAB	B (17)	0.79
68	Tilley Rd (North)/93rd Ave	TWSC	RAB	B (12)	0.71
69	Old Hwy 99/93rd Ave	TWSC	RAB	C (24)	0.92

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.

3.6 2022 BASELINE CONDITIONS

The Capital Facilities Plan contains all the perceived roadway and intersection improvements the City will need to construct to maintain the proposed LOS standards in 2040. To determine which of these improvements may be warranted or needed in the short term, a 2022 analysis was performed.

To prepare the analysis volumes for the 2022 analysis, a 2040 forecast was prepared using the TRPC travel demand model, with all of the regional transportation projects removed. Then a portion of the model growth between the existing 2014 travel demand model and this unimproved 2040 travel demand model was added to the existing 2015 turning movement counts to produce 2022 analysis volumes. The operational results for these intersections are provided below in **Table 6**.

Table 6. Projected 2022 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2022 Base Year	
			LOS (Delay)	Worst v/c
1	RW Johnson Blvd/Mottman Rd	AWSC[1]	B (13)	0.55
2	Crosby Blvd/Mottman Rd	Signal	B (17)	0.77
3	Crosby Blvd/Irving St	Signal	B (10)	0.67
4	7th Ave/Irving St	AWSC	A (9)	0.26
5	Crosby Blvd/Barnes Blvd	TWSC[2]	D (29)	0.26
6	Black Lake Blvd/Black Lake Belmore Rd	TWSC	F (72)	0.96
7	RW Johnson Blvd/Sapp Rd	TWSC	B (11)	0.23
8	Sapp Rd/Crosby Blvd	TWSC	B (13)	0.23
9	49th Ave/Black Lake Belmore Rd[1]	TWSC	A (9)	
10	Capitol Blvd/Carlyon Ave/Sunset Way[2]	Signal	B (11)	0.49
11	Deschutes Way/I-5 NB On-Ramp	Yield	A (9)	0.19
12	Deschutes Way/US 101 WB On-Ramp	Yield	A (10)	0.40
13	I-5/US 101 Off-Ramps/Desoto St/2nd Ave[1]	TWSC	C (24)	
14	2nd Ave/Custer Way	Signal	C (31)	1.10
15	Boston St/Custer Way	TWSC	E (42)	0.58
16	Deschutes Way/Boston St	AWSC	E (41)	0.95
17	Cleveland Ave/Capitol Blvd	TWSC	B (13)	0.43
18	Custer Way/Capitol Blvd	Signal	E (60)	1.00
19	Custer Way/North St/Cleveland Ave	Signal	E (70)	1.15
20	Hoadly St/North St	TWSC	C (23)	0.19
21	Deschutes Way/I-5 NB Off-Ramp[1]	TWSC	D (26)	
22	Capitol Blvd/E St	Signal	C (33)	0.87
23	Cleveland Ave/South St	TWSC	C (16)	0.07
24	7th Ave/Linwood Ave	TWSC	C (20)	0.43
25	2nd Ave/Linwood Ave	AWSC	E (38)	0.93
26	Capitol Blvd/Linwood Ave	Signal	C (28)	1.00
27	Henderson Blvd/Yelm Hwy	Signal	E (68)	1.13
28	Rural Rd/Trosper Rd	TWSC	C (20)	0.30
29	Lake Park Dr/Trosper Rd	Signal	B (14)	0.72
30	Littlerock Rd/Trosper Rd	Signal	D (44)	0.83
31	I-5 SB Ramps/Tyee Dr/Trosper Rd	Signal	D (46)	0.92
32	I-5 NB Ramps/Trosper Rd	Signal	A (7)	0.89
33	Capitol Blvd/Trosper Rd[3]	Signal	F (31)	0.89
34	Capitol Blvd/Lee St[2]	Signal	C (26)	0.88
35	Littlerock Rd/Fred Meyer Drwy/Costco Drwy	Signal	A (8)	0.59
36	Littlerock Rd/Costco Drwy[2]	Signal	C (22)	0.84
37	Littlerock Rd/Kingswood Dr	RAB	A (6)	0.75
38	Capitol Blvd/X St	Signal	A (8)	0.53

Table 6 Cont. Projected 2022 PM Peak Hour Level of Service

Number	Intersection	Intersection Control	2022 Base Year	
			LOS (Delay)	Worst v/c
39	Elm St/X St	TWSC	A (10)	0.04
40	Capitol Blvd/Dennis St[2]	Signal	B (13)	0.71
41	Capitol Blvd/Israel Rd	Signal	C (25)	0.85
42	66th Ave/Black Lake Belmore Rd	TWSC	B (12)	0.25
43	Kirsop Rd/66th Ave	TWSC	B (15)	0.28
44	Littlerock Rd/Odegard Rd	RAB	A (5)	0.68
45	Littlerock Rd/Israel Rd/70th Ave	RAB	B (11)	0.76
46	Linderson Way/Israel Rd	Signal	B (19)	0.76
47	Littlerock Rd/Tumwater Blvd	RAB	A (8)	0.49
48	I-5 SB Ramps/Tumwater Blvd	Signal	B (13)	0.87
49	I-5 NB Ramps/Tumwater Blvd	TWSC	F (200+)	1.47
50	Linderson Way/Tumwater Blvd	Signal	D (37)	1.09
51	New Market St/Tumwater Blvd	RAB	A (5)	0.36
52	Capitol Blvd/Tumwater Blvd	Signal	D (39)	1.03
53	65th Ave/Henderson Blvd	Signal	A (8)	0.74
54	Tumwater Blvd/Henderson Blvd	Signal	D (43)	0.99
55	Trails End Dr/Henderson Blvd	TWSC	C (15)	0.27
56	Littlerock Rd/Black Hills School Drwy	Signal	A (3)	0.38
57	Center St/76th Ave	TWSC	C (20)	0.24
58	Old Hwy 99/Henderson Blvd	Signal	B (15)	0.75
59	Old Hwy 99/79th Ave	TWSC	F (79)	0.25
60	Kimmie St/83rd Ave	TWSC	A (10)	0.09
61	Center St/83rd Ave	TWSC	B (13)	0.41
62	Old Hwy 99/88th Ave	Signal	B (12)	0.79
63	I-5 SB Ramps/93rd Ave	Signal	C (22)	0.88
64	I-5 NB Ramps/93rd Ave	TWSC	B (14)	0.35
65	Kimmie St/93rd Ave	TWSC	C (25)	0.28
66	Case Rd/93rd Ave	AWSC	E (43)	1.00
67	Tilley Rd (South)/93rd Ave	AWSC	C (25)	0.84
68	Tilley Rd (North)/93rd Ave	TWSC	C (18)	0.34
69	Old Hwy 99/93rd Ave	TWSC	C (20)	0.45

1. Due to the unique nature of this intersection control, HCM cannot be used to calculate delay. Sim-Traffic simulation was used to calculate average delay.
2. HCM 2000 was used at this signal because the shared through-left lane is not accurately analyzed in HCM 2010.
3. This intersection is being graded based on the known congestion along Capitol Boulevard as a result of the signal.

Based on this analysis, the following intersections are projected to operate at an LOS E or worse by 2022:

- 6) Black Lake Boulevard at Black Lake Belmore
- 15) Boston Street at Custer Way
- 16) Deschutes Way at Boston St
- 18) Custer Way at Capitol Boulevard
- 19) Custer Way/North Street at Cleveland Avenue
- 25) 2nd Avenue at Linwood Avenue
- 27) Henderson Boulevard at Yelm Highway
- 49) I-5 NB Ramps at Tumwater Boulevard
- 59) Old Highway 99 at 79th Avenue
- 66) Case Road at 93rd Avenue

Each of these intersections has an improvement identified in the 2040 improvement package that will accommodate the 2022 traffic volumes.

4. PROJECT COST ESTIMATES

4.1 PLANNING LEVEL ROADWAY PROJECT COST ESTIMATES

Planning level cost estimates were developed using eight elements:

- Preparation
- Roadwork
- Construction Staging
- Right-of-Way
- Environmental
- Utilities
- Engineering
- Permitting

Preparation and Roadwork element estimates were developed by using WSDOT unit bid data and current comparable project bid data. This data was organized to estimate standard project items in basic units: linear feet, square feet and cubic feet. Projects were then measured in GIS and CAD software to estimate each item.

Construction Staging was estimated by using a percentage of the Roadwork estimation based on three different levels:

- Typical Construction (5%) – Typical construction using simple stages and efficient construction practices.
- Staging (20%) – Moderately complex construction that will require more complex staging to complete construction.
- Difficult/Inefficient (35%) – Difficult or inefficient construction that will require complex staging and atypical construction practices to complete.

The Right-of-Way element was estimated using data from Thurston County's Geodata GIS data base. Right-of-Way impact was measured to evaluate how many parcels could be affected by the project. Geodata was used to create an average cost per square foot of the affected parcels. This cost per square foot was combined with typical Right-of-Way acquisition fees to develop the total Right-of-Way cost estimate.

Environmental and Utilities elements were estimated using different levels of risk associated with a percentage of the Roadwork estimation: low (5%), medium (10%) and high (2. This risk was calculated by viewing aerial images and assessing risk of environmental and utilities impact.

The Engineering element was estimated by using industry standards of 15% of construction costs for design and 10% of construction costs for construction engineering.

Permitting was estimated by assuming City specific projects would require 3% of construction costs. Projects involving WSDOT were estimated to require an additional 10% of construction costs for permitting.

A 30% conceptual contingency was included in each project estimate.

The planning level cost estimates for roadway projects is provided in **Table 7**.

4.2 PLANNING LEVEL INTERSECTION PROJECT COST ESTIMATES

Planning level intersection cost estimates were developed using WSDOT unit bid data and current comparable project construction cost data. Each intersection was evaluated using aerial images to determine size and type of intersection improvements. Based on the type of intersection improvements, potential Right-of-Way acquisition area was calculated. Potential Right-of-Way acquisition and size of intersection improvements were compared to recent intersection project construction cost information to develop intersection cost estimates.

The planning level cost estimates for intersections are provided in **Table 8**. A summary of the total Capital Improvements is provided is **Table 9**.

Table 7. Planning Level Cost Estimates – Roadway Projects

Project Number	Project	Total Cost
R-1	Littlerock Road	$8,470,000
R-2	Tyee Drive[1]	$4,800,000
R-3	Tyee Drive	$7,000,000
R-4	Tyee Drive	$6,770,000
R-5	Tyee Drive	$9,220,000
R-6	Trosper Road	$1,050,000
R-7	Tumwater Boulevard	$6,540,000
R-8	Tumwater Boulevard	$15,425,793
R-9	Tumwater Boulevard	$2,370,000
R-10	E Street	$37,790,000
R-11	Old Highway 99[1]	$610,000
R-12	Old Highway 99	$20,270,000
R-13	Old Highway 99	$10,090,000
R-14	Henderson Boulevard	$3,970,000
R-15	Henderson Boulevard	$8,840,000
R-16	32nd Street[2]	$7,770,000
R-17	70th Street[2]	$3,700,000
R-18	73rd Street[2]	$9,640,000
R-19	Prine Drive[2]	$5,730,000
R-20	93rd Avenue	$2,140,000
R-21	93rd Avenue	$4,410,000
R-22	93rd Avenue	$9,770,000
R-23	93rd Avenue	$3,400,000
R-24	93rd Avenue	$10,810,000
R-25	6th Avenue	$5,800,000
R-26	Custer Way	$290,000
R-27	Capitol Boulevard	$1,030,000
R-28	Capitol Boulevard	$1,030,000
R-29	Capitol Boulevard	$3,340,000
R-30	New North/South Street	$2,740,000
R-31	Odegard Road	$3,610,000
R-32	Bishop Road	$937,792
R-33	73rd/66th Connector[2]	$6,030,000
R-34	New Market Street	$4,040,000
R-35	Town Center Connector	$3,480,000
R-36	72nd Avenue	$5,360,000
R-37	Doelman Property[2]	$22,260,000
R-38	Trosper Road Interchange	$5,650,000
R-39	Deschutes Way	$2,850,000
TOTAL		$269,033,585

1. Project is already funded
2. Projected expected to be developer funded

Table 8. Planning Level Cost Estimates – Intersection Projects

Project Number	Project	Total Cost
I-1	Black Lake Belmore/Black Lake Blvd	$2,500,000
I-2	Capitol Blvd/Carlyon Ave	$3,500,000
I-3	2nd Ave/Custer Way	$100,000
I-4	Boston St/Custer Way	$4,000,000
I-5	Deschutes Way/Boston St	$500,000
I-6	Capitol Blvd/Cleveland Ave	$3,500,000
I-7	Capitol Blvd/Custer Way	$3,500,000
I-8	Cleveland Ave/Custer Way/North St	$4,500,000
I-9	Linwood Ave/2nd Ave	$2,500,000
I-10	Capitol Blvd/Linwood Ave	$2,500,000
I-11	Henderson Blvd/Yelm Hwy	$2,500,000
I-12	Trosper Rd/Rural Rd	$500,000
I-13	Trosper Rd/2nd Ave/Littlerock Rd	$2,500,000
I-14	Trosper Rd/Tyee Dr/SB I-5 Ramps	$2,500,000
I-15	Trosper Rd/Capitol Blvd	$6,000,000
I-16	T St/Capitol Blvd	$5,500,000
I-17	X St/Capitol Blvd	$4,000,000
I-18	Dennis St/Capitol Blvd	$3,000,000
I-19	Old Hwy 99/79th Ave	$2,000,000
I-20	93rd Ave/I-5 NB Ramps	$500,000
I-21	93rd Ave/Kimmie St	$500,000
I-22	93rd Ave/Case Rd	$2,500,000
I-23	93rd Ave/Tilley Rd (south)	$2,500,000
I-24	93rd Ave/Tilley Rd (north)	$2,500,000
I-25	93rd Ave/Old Hwy 99	$2,500,000
TOTAL		$66,100,000

Table 9. Planning Level Cost Estimates – Cost Summary

Total Roadway Cost	$269,033,585
Total Intersection Cost	$66,100,000
Total Cost	**$335,133,585**
Developer Funded/ Already Funded	-$60,540,000
Potential Cost for City	**$274,593,585**

APPENDIX A-1
TURNING MOVEMENT COUNTS

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

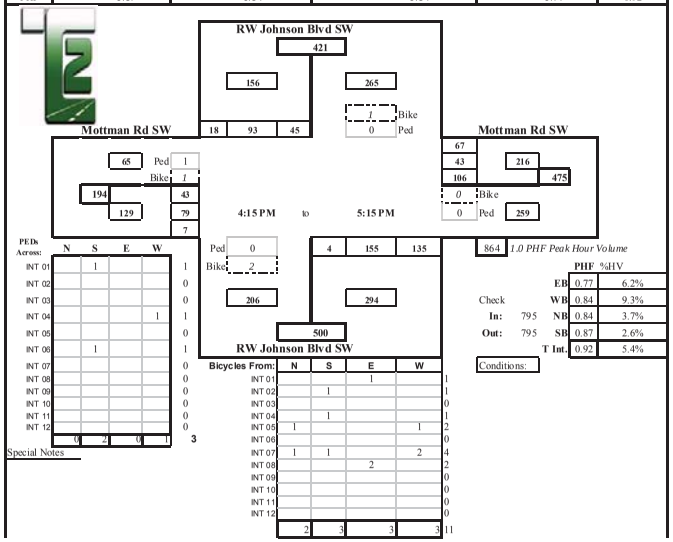
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: RW Johnson Blvd SW & Mottman Rd SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) RW Johnson Blvd SW				From South on (NB) RW Johnson Blvd SW				From East on (WB) Mottman Rd SW				From West on (EB) Mottman Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	4	7	22	9	4	1	44	30	8	25	12	13	4	17	14	2	196
4:30 P	2	17	23	5	3	1	31	30	5	24	9	10	1	6	14	4	174
4:45 P	1	8	19	2	3	0	44	34	7	33	10	18	2	13	26	3	210
5:00 P	0	9	23	5	4	2	29	36	6	24	17	23	2	9	18	0	195
5:15 P	1	11	28	6	1	1	51	35	2	25	7	16	3	15	21	0	216
5:30 P	0	9	15	3	3	0	22	29	4	23	7	21	1	4	6	0	139
5:45 P	1	9	24	4	3	1	40	34	6	15	6	17	1	9	8	1	168
6:00 P	2	4	26	2	1	0	25	20	4	21	5	17	1	4	1	0	125
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	11	74	180	36	22	6	286	248	42	190	73	135	15	77	108	10	1423
Peak Hour:	4:15 PM				to	5:15 PM											
Total	4	45	93	18	11	4	155	135	20	106	43	67	8	43	79	7	795
Approach	156				294				216				129				795
%HV	2.6%				3.7%				9.3%				6.2%				5.4%
PHF	0.87				0.84				0.84				0.77				0.92



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

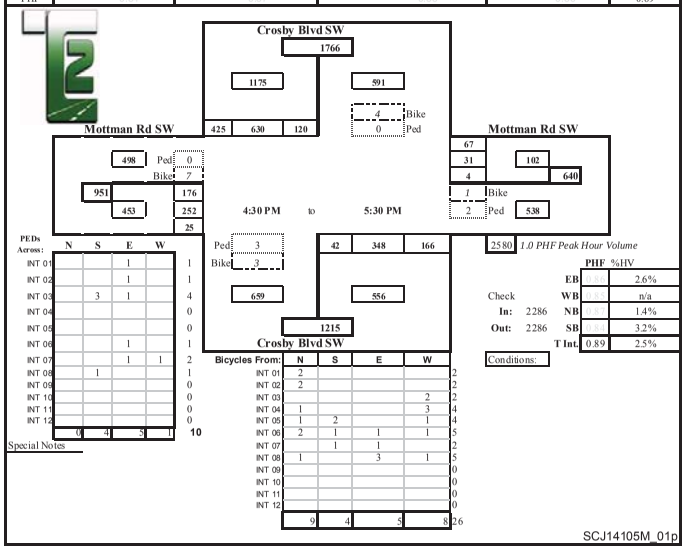
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Crosby Blvd SW & Mottman Rd SW **Date of Count:** Wed 10/08/2014

Location: Tumwater, Washinton **Checked By:** Jess

Time Interval	From North on (SB) Crosby Blvd SW				From South on (NB) Crosby Blvd SW				From East on (WB) Mottman Rd SW				From West on (EB) Mottman Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	10	23	131	90	4	11	75	51	1	2	2	21	1	46	92	7	551
4:30 P	11	30	123	90	2	12	76	40	0	0	3	14	2	28	48	8	472
4:45 P	16	21	133	86	1	9	87	37	0	1	8	21	2	41	84	6	534
5:00 P	10	28	143	82	3	5	72	35	0	1	3	13	5	42	58	3	485
5:15 P	7	37	169	125	0	14	92	53	0	0	8	18	3	57	62	10	645
5:30 P	5	34	185	132	4	14	97	41	0	2	12	15	2	36	48	6	622
5:45 P	5	30	152	71	1	9	83	30	0	3	6	19	1	28	52	4	487
6:00 P	7	21	128	84	2	7	85	20	1	1	4	21	6	14	44	5	434
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	71	224	1164	760	17	81	667	307	2	10	46	142	22	292	488	49	4230
Peak Hour:	4:30 PM				to	5:30 PM											
Total	38	120	630	425	8	42	348	166	0	4	31	67	12	176	252	25	2286
Approach	1175				556				102				453				2286
%HV	3.2%				1.4%				n/a				2.6%				2.5%
PHF	0.84				0.87				0.68				0.88				0.89



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Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

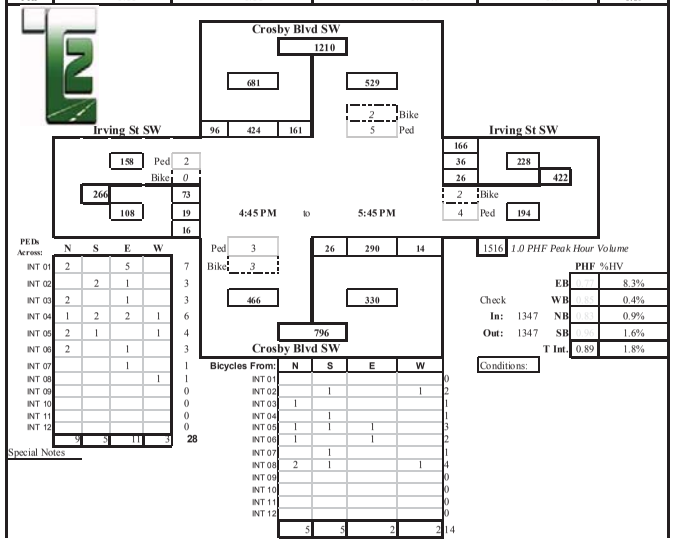
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Crosby Blvd SW & Irving St SW **Date of Count:** Wed 10/08/2014

Location: Tumwater, Washinton **Checked By:** Jess

Time Interval	From North on (SB) Crosby Blvd SW				From South on (NB) Crosby Blvd SW				From East on (WB) Irving St SW				From West on (EB) Irving St SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	3	43	88	13	2	1	60	3	1	3	3	44	1	32	8	2	300
4:30 P	2	34	80	8	1	1	62	2	0	3	2	43	3	21	1	1	258
4:45 P	2	35	94	15	1	2	62	3	0	4	2	45	0	19	3	2	286
5:00 P	3	43	82	23	1	3	54	2	0	9	8	35	4	23	5	3	290
5:15 P	3	46	109	23	0	7	84	8	0	6	12	49	0	24	8	3	379
5:30 P	2	34	113	30	1	13	79	3	1	3	12	44	3	16	2	3	352
5:45 P	3	38	120	20	1	3	73	1	0	8	4	38	2	10	4	7	326
6:00 P	1	36	78	19	1	4	65	4	0	2	4	34	3	14	0	6	266
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	19	309	764	151	8	34	539	26	2	38	47	332	16	159	31	27	2457
Peak Hour: 4:45 PM to 5:45 PM																	
Total	11	161	424	96	3	26	290	14	1	26	36	166	9	73	19	16	1347
Approach	681				330				228				108				1347
%HV	1.6%				0.9%				0.4%				8.3%				1.8%
PHF	0.86				0.85				0.85				0.77				0.89



PEDs Across:	N	S	E	W	
INT 01	2		5		7
INT 02		2	1		3
INT 03	2		1		3
INT 04	1	2	2	1	6
INT 05	2	1		1	4
INT 06	2		1		3
INT 07			1		1
INT 08				1	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	9	3	11	3	28

Bicycles From:	N	S	E	W	
INT 01					0
INT 02		1		1	2
INT 03	1				1
INT 04		1			1
INT 05	1	1	1		3
INT 06	1		1		2
INT 07		1			1
INT 08	2	1		1	4
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	5	3	2	2	14

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

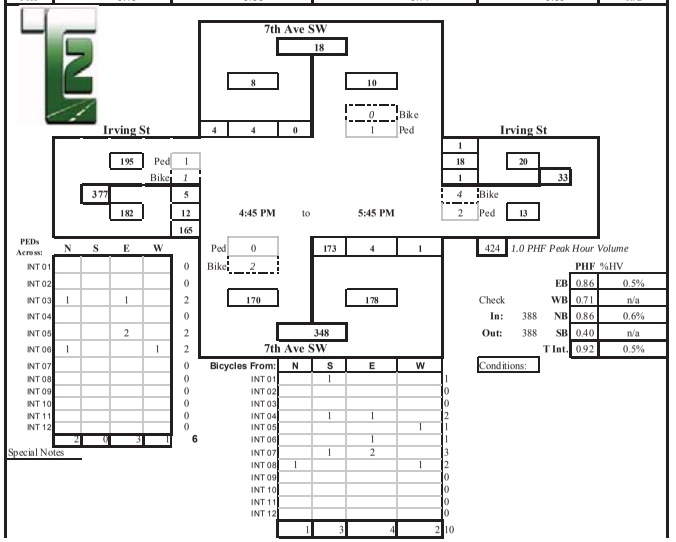
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 7th Ave SW & Irving St **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 7th Ave SW				From South on (NB) 7th Ave SW				From East on (WB) Irving St				From West on (EB) Irving St				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	1	40	1	1	0	0	1	0	0	1	6	36	86
4:30 P	0	0	0	0	0	46	0	0	0	1	9	1	0	0	6	39	102
4:45 P	0	0	0	1	0	46	0	0	1	0	3	1	1	1	5	29	86
5:00 P	0	0	0	0	0	50	1	1	0	1	5	1	1	0	5	39	103
5:15 P	0	0	0	2	0	35	0	0	0	0	2	0	0	1	3	49	92
5:30 P	0	0	4	1	1	47	1	0	0	0	5	0	0	1	2	45	106
5:45 P	0	0	0	1	0	41	2	0	0	0	6	0	0	3	2	32	87
6:00 P	0	0	2	2	0	49	1	1	0	0	6	1	1	1	4	30	97
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	6	7	2	354	6	3	1	2	37	4	3	8	33	299	759
Peak Hour: 4:45 PM to 5:45 PM																	
Total	0	0	4	4	1	173	4	1	0	1	18	1	1	5	12	165	388
Approach	8				178				20				182				388
%HV	n/a				0.6%				n/a				0.5%				0.5%
PHF	0.40				0.86				0.71				0.86				0.92



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03	1		1		2
INT 04					0
INT 05			2		2
INT 06	1			1	2
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	2	0	3	1	6

Bicycles From:	N	S	E	W	
INT 01		1			1
INT 02					0
INT 03					0
INT 04		1	1		2
INT 05				1	1
INT 06			1		1
INT 07		1	2		3
INT 08	1			1	2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	3	4	2	10

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

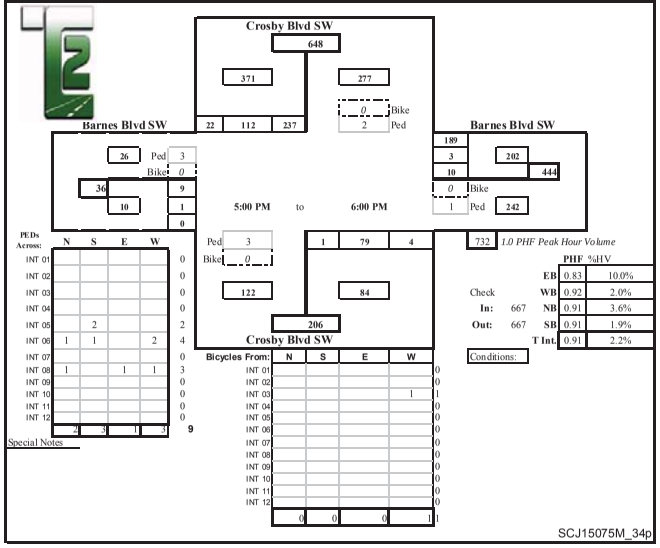
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Crosby Blvd SW & Barnes Blvd SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Crosby Blvd SW				From South on (NB) Crosby Blvd SW				From East on (WB) Barnes Blvd SW				From West on (EB) Barnes Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	45	25	3	0	0	20	1	2	2	1	46	1	3	0	1	147
4:30 P	0	42	21	3	0	0	22	1	1	1	0	32	0	0	0	0	122
4:45 P	2	42	29	5	0	0	17	2	0	1	0	29	0	2	0	0	127
5:00 P	1	58	27	3	0	0	14	2	3	3	0	33	0	1	0	0	141
5:15 P	2	45	28	5	2	0	14	2	0	4	2	40	0	2	0	0	142
5:30 P	0	66	25	8	0	0	22	0	2	1	0	47	0	2	1	0	172
5:45 P	3	63	24	5	0	0	22	1	0	3	0	50	0	2	0	0	170
6:00 P	2	63	35	4	1	1	21	1	2	2	1	52	1	3	0	0	183
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	12	424	214	36	3	1	152	10	10	17	4	329	2	15	1	1	1204
Peak Hour: 5:00 PM to 6:00 PM																	
Total	7	237	112	22	3	1	79	4	4	10	3	189	1	9	1	0	667
Approach	371				84				202				10				667
%HV	1.9%				3.6%				2.0%				10.0%				2.2%
PHF	0.91				0.91				0.92				0.83				0.91



SCJ15075M_34p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

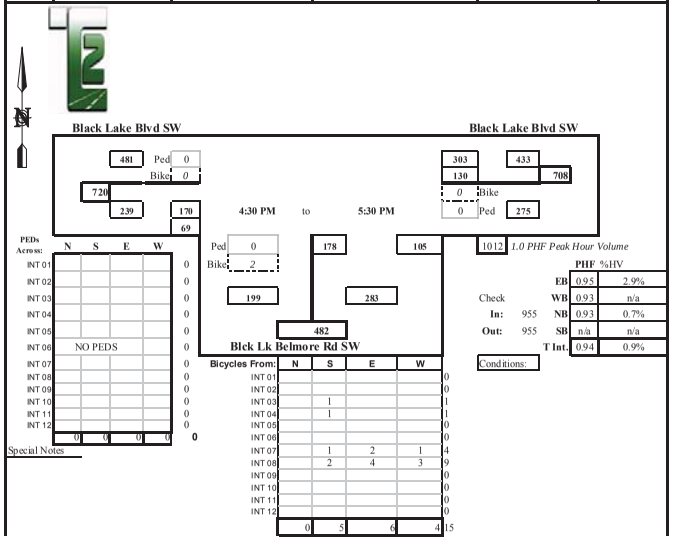
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Black Lake Belmore Rd SW & Black Lake Blvd SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Blck Lk Belmore Rd SW				From East on (WB) Black Lake Blvd SW				From West on (EB) Black Lake Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	0	33	0	13	2	31	64	0	0	0	31	21	193
4:30 P	0	0	0	0	1	35	0	32	1	32	71	0	2	0	46	27	243
4:45 P	0	0	0	0	0	47	0	29	0	37	75	0	2	0	43	17	248
5:00 P	0	0	0	0	0	34	0	27	0	35	67	0	1	0	44	12	219
5:15 P	0	0	0	0	2	41	0	29	0	25	77	0	1	0	44	19	235
5:30 P	0	0	0	0	0	56	0	20	0	33	84	0	3	0	39	21	253
5:45 P	0	0	0	0	0	38	0	18	3	20	81	0	0	0	42	16	215
6:00 P	0	0	0	0	0	40	0	23	0	28	89	0	0	0	54	14	248
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	3	324	0	191	6	241	608	0	9	0	343	147	1854
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	0	0	0	2	178	0	105	0	130	303	0	7	0	170	69	955
Approach	0				283				433				239				955
%HV	n/a				0.7%				n/a				2.9%				0.9%
PHF	n/a				0.93				0.93				0.95				0.94



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

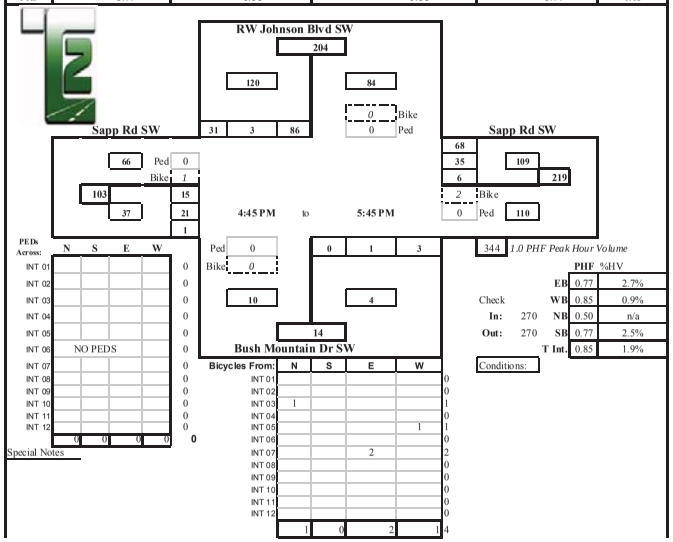
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: RW Johnson Blvd SW/Bush Mountain Dr SW & Sapp Rd SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) RW Johnson Blvd SW				From South on (NB) Bush Mountain Dr SW				From East on (WB) Sapp Rd SW				From West on (EB) Sapp Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	24	2	14	0	0	0	2	0	0	9	18	0	3	14	0	86
4:30 P	0	14	2	7	0	0	1	0	1	1	7	10	0	4	6	0	52
4:45 P	1	16	0	8	0	0	0	0	0	0	5	12	0	6	5	0	52
5:00 P	0	19	1	7	0	0	0	0	1	1	5	16	1	2	4	0	55
5:15 P	1	28	1	10	0	0	1	1	0	2	9	15	0	3	8	1	79
5:30 P	1	13	0	8	0	0	0	0	0	2	10	17	0	5	5	0	60
5:45 P	1	26	1	6	0	0	0	2	0	1	11	20	0	5	4	0	76
6:00 P	0	15	1	5	0	0	1	1	0	2	13	6	0	6	0	2	52
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	5	155	8	65	0	0	3	6	2	9	69	114	1	34	46	3	512
Peak Hour: 4:45 PM to 5:45 PM																	
Total	3	86	3	31	0	0	1	3	1	6	35	68	1	15	21	1	270
Approach	120				4				109				37				270
%HV	2.5%				n/a				0.9%				2.7%				1.9%
PHF	0.77				0.50				0.85				0.77				0.85



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

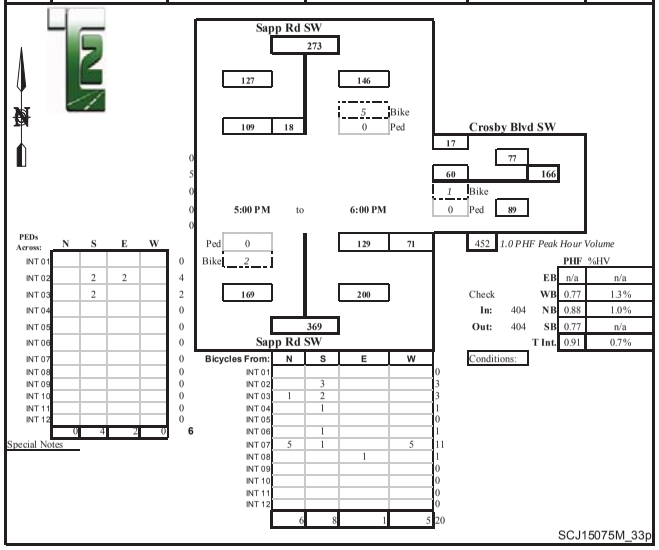
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sapp Rd SW & Crosby Blvd SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sapp Rd SW				From South on (NB) Sapp Rd SW				From East on (WB) Crosby Blvd SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	6	44	0	0	0	34	13	1	14	0	2	0	0	0	0	113
4:30 P	0	2	24	0	2	0	30	23	0	16	0	4	0	0	0	0	99
4:45 P	0	2	29	0	0	0	24	15	0	10	0	3	0	0	0	0	83
5:00 P	0	0	22	0	1	0	28	12	1	22	0	2	0	0	0	0	86
5:15 P	0	4	37	0	2	0	32	13	0	20	0	5	0	0	0	0	111
5:30 P	0	6	24	0	0	0	36	21	0	17	0	3	0	0	0	0	107
5:45 P	0	4	27	0	0	0	30	23	1	11	0	4	0	0	0	0	99
6:00 P	0	4	21	0	0	0	31	14	0	12	0	5	0	0	0	0	87
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	28	228	0	5	0	245	134	3	122	0	28	0	0	0	0	785
Peak Hour: 5:00 PM to 6:00 PM																	
Total	0	18	109	0	2	0	129	71	1	60	0	17	0	0	0	0	404
Approach	127				200				77				0				404
%HV	n/a				1.0%				1.3%				n/a				0.7%
PHF	0.77				0.88				0.77				n/a				0.91



SCJ15075M_33p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

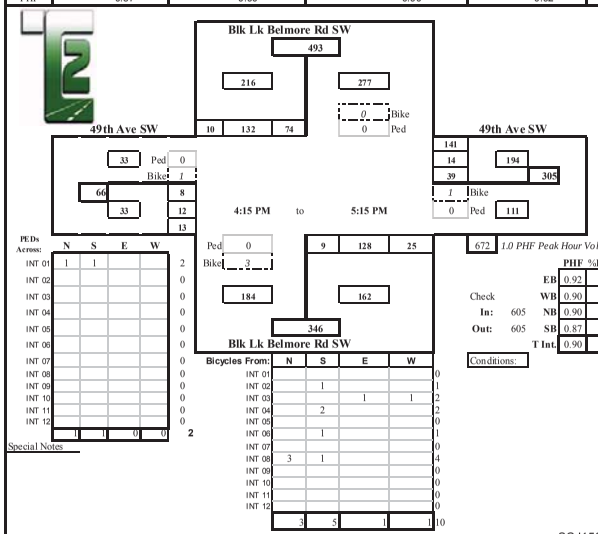
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Black Lake Belmore Rd SW & 49th Ave SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

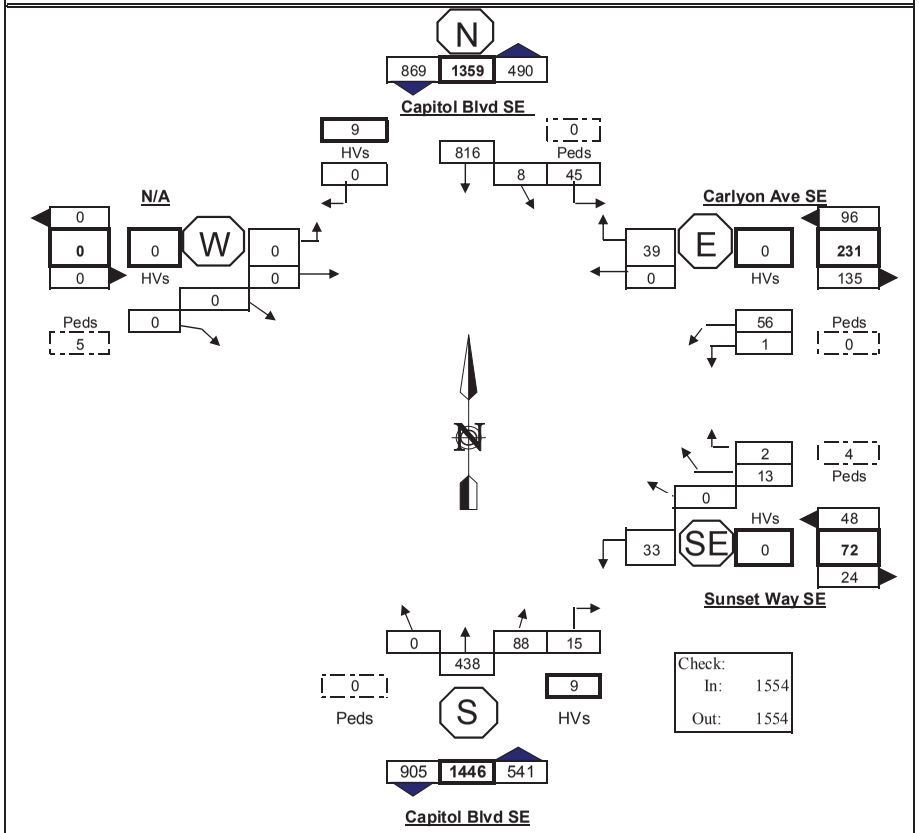
Time Interval Ending at	From North on (SB) Blk Lk Belmore Rd SW				From South on (NB) Blk Lk Belmore Rd SW				From East on (WB) 49th Ave SW				From West on (EB) 49th Ave SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	18	29	2	0	2	19	6	0	9	1	26	0	1	3	0	116
4:30 P	1	21	36	5	2	4	23	3	0	8	3	42	1	3	3	2	153
4:45 P	0	24	34	2	0	2	33	10	1	9	4	41	0	3	2	4	168
5:00 P	0	16	29	2	0	0	37	5	0	13	2	31	0	0	5	4	144
5:15 P	0	13	33	1	1	3	35	7	0	9	5	27	0	2	2	3	140
5:30 P	1	18	34	3	0	2	33	2	0	12	2	27	0	8	1	5	147
5:45 P	0	11	25	4	0	1	20	6	0	12	5	22	0	1	3	3	113
6:00 P	0	10	16	1	1	4	25	4	0	8	3	22	0	3	2	3	101
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	131	236	20	4	18	225	43	1	80	25	238	1	21	21	24	1082
Peak Hour: 4:15 PM to 5:15 PM																	
Total	1	74	132	10	3	9	128	25	1	39	14	141	1	8	12	13	605
Approach	216				162				194				33				605
%HV	0.5%				1.9%				0.5%				3.0%				1.0%
PHF	0.87				0.90				0.90				0.92				0.90



SCJ15075M_37p

Traffic Count Consultants, Inc. DBE/WBE DBE/WBE

Phone: (425) 253 926-6009 E-Mail: Team@TC2inc.com



Intersection: Capitol Blvd SE & Carlyon Ave SE & Sunset Way SE

Location: Tumwater, Washington

Date of Count: Thurs 6/25/2015

Peak Period: 4:30 P - 5:30 P

Checked By: Jess

Prepared For: SCJ Alliance

	%HV	PHF
SB	1.0%	0.80
WB	n/a	0.67
NWB	n/a	0.92
NB	1.7%	0.95
	0.0%	0.00
EB	n/a	n/a
Intersection	1.2%	0.85

SCJ15075M_01p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

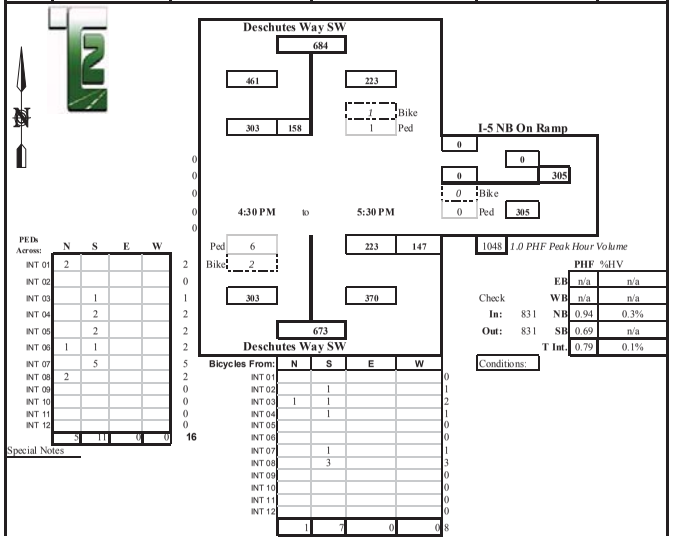
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Deschutes Way SW & I-5 NB On Ramp **Date of Count:** Wed 7/01/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Deschutes Way SW				From South on (NB) Deschutes Way SW				From East on (WB) I-5 NB On Ramp				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	38	49	0	1	0	37	51	0	0	0	0	0	0	0	0	175
4:30 P	0	25	53	0	2	0	36	30	0	0	0	0	0	0	0	0	144
4:45 P	0	32	71	0	0	0	54	38	0	0	0	0	0	0	0	0	195
5:00 P	0	27	48	0	0	0	47	38	0	0	0	0	0	0	0	0	160
5:15 P	0	64	103	0	0	0	56	39	0	0	0	0	0	0	0	0	262
5:30 P	0	35	81	0	1	0	66	32	0	0	0	0	0	0	0	0	214
5:45 P	0	34	51	0	0	0	64	33	0	0	0	0	0	0	0	0	182
6:00 P	0	24	45	0	1	0	43	49	0	0	0	0	0	0	0	0	161
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	279	501	0	5	0	403	310	0	0	0	0	0	0	0	0	1493
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	158	303	0	1	0	223	147	0	0	0	0	0	0	0	0	831
Approach	461				370				0				0				831
%HV	n/a				0.3%				n/a				n/a				0.1%
PHF	0.69				0.94				n/a				n/a				0.79



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

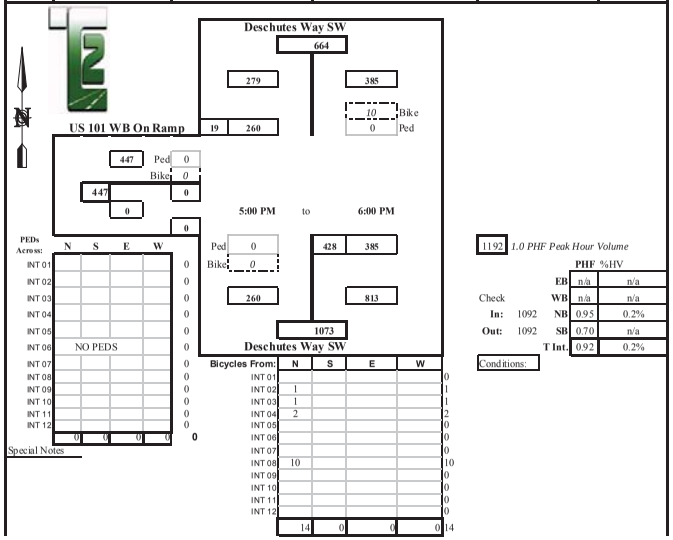
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Deschutes Way SW & US 101 WB On Ramp **Date of Count:** Wed 7/01/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Deschutes Way SW				From South on (NB) Deschutes Way SW				From East on (WB) 0				From West on (EB) US 101 WB On Ramp				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	0	45	2	3	95	87	0	0	0	0	0	0	0	0	0	229
4:30 P	0	0	47	0	2	88	67	0	0	0	0	0	0	0	0	0	202
4:45 P	0	0	72	2	0	93	89	0	0	0	0	0	0	0	0	0	256
5:00 P	0	0	47	4	1	113	81	0	0	0	0	0	0	0	0	0	245
5:15 P	0	0	92	7	0	101	98	0	0	0	0	0	0	0	0	0	298
5:30 P	0	0	76	5	1	105	96	0	0	0	0	0	0	0	0	0	282
5:45 P	0	0	49	3	0	116	97	0	0	0	0	0	0	0	0	0	265
6:00 P	0	0	43	4	1	106	94	0	0	0	0	0	0	0	0	0	247
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	0	471	27	8	817	709	0	0	0	0	0	0	0	0	0	2024
Peak Hour: 5:00 PM to 6:00 PM																	
Total	0	0	260	19	2	428	385	0	0	0	0	0	0	0	0	0	1092
Approach	279				813				0				0				1092
%HV	n/a				0.2%				n/a				n/a				0.2%
PHF	0.70				0.95				n/a				n/a				0.92



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

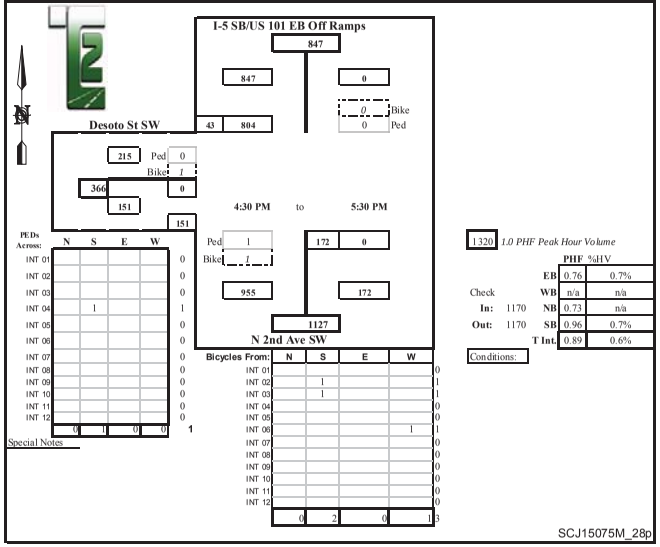
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB/US 101 EB Off Ramps/N 2nd Ave SW & Desoto St SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-5 SB/US 101 EB Off Ramp				From South on (NB) N 2nd Ave SW				From East on (WB) 0				From West on (EB) Desoto St SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	0	195	9	0	33	0	0	0	0	0	0	0	0	0	28	265
4:30 P	1	0	200	9	0	26	0	0	0	0	0	0	0	0	0	33	268
4:45 P	0	0	197	8	0	42	0	0	0	0	0	0	1	0	0	31	278
5:00 P	1	0	195	15	0	38	0	0	0	0	0	0	0	0	0	33	281
5:15 P	1	0	198	13	0	33	0	0	0	0	0	0	0	0	0	37	281
5:30 P	4	0	214	7	0	59	0	0	0	0	0	0	0	0	0	50	330
5:45 P	1	0	202	11	0	36	0	0	0	0	0	0	0	0	0	18	267
6:00 P	0	0	199	9	0	41	0	0	0	0	0	0	1	0	0	28	277
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	9	0	1600	81	0	308	0	0	0	0	0	0	2	0	0	258	2247
Peak Hour: 4:30 PM to 5:30 PM																	
Total	6	0	804	43	0	172	0	0	0	0	0	0	1	0	0	151	1170
Approach	847				172				0				151				1170
%HV	0.7%				n/a				n/a				0.7%				0.6%
PHF	0.96				0.73				n/a				0.76				0.89



1320 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.76	0.7%
Check	WB	n/a	n/a
In: 1170	NB	0.73	n/a
Out: 1170	SB	0.96	0.7%
	T Int.	0.89	0.6%

Conditions:

Special Notes

SCJ15075M_28p

Prepared for: **TENW**

Traffic Count Consultants, Inc.

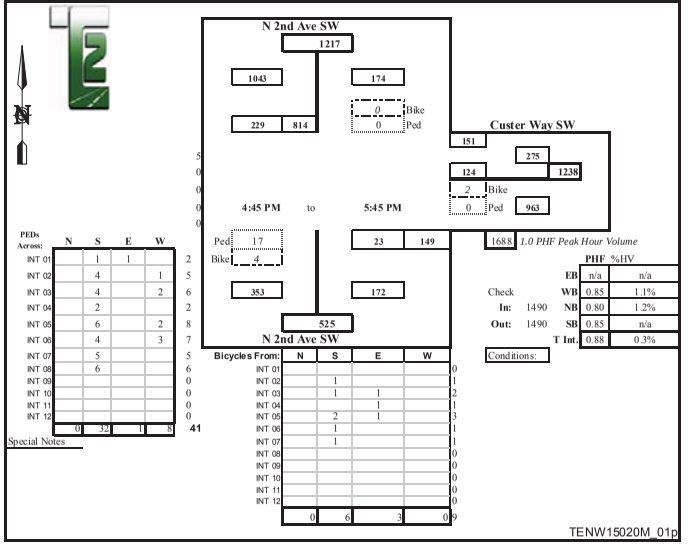
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: N 2nd Ave SW & Custer Way SW **Date of Count:** Tues 2/10/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) N 2nd Ave SW				From South on (NB) N 2nd Ave SW				From East on (WB) Custer Way SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	215	47	0	0	0	4	36	0	18	0	32	0	0	0	0	352
4:30 P	3	199	68	0	1	0	6	25	1	21	0	30	0	0	0	0	349
4:45 P	0	186	45	0	0	0	5	27	0	31	0	27	0	0	0	0	321
5:00 P	0	200	51	0	0	0	5	35	1	28	0	38	0	0	0	0	357
5:15 P	0	186	55	0	1	0	5	49	1	27	0	40	0	0	0	0	362
5:30 P	0	240	65	0	1	0	5	31	1	42	0	39	0	0	0	0	422
5:45 P	0	188	58	0	0	0	8	34	0	27	0	34	0	0	0	0	349
6:00 P	0	160	50	0	0	0	2	40	1	22	0	32	0	0	0	0	306
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	1574	439	0	3	0	40	277	5	216	0	272	0	0	0	0	2818
Peak Hour: 4:45 PM to 5:45 PM																	
Total	0	814	229	0	2	0	23	149	3	124	0	151	0	0	0	0	1490
Approach	1043				172				275				0				1490
%HV	n/a				1.2%				1.1%				n/a				0.3%
PHF	0.85				0.80				0.85				n/a				0.88



1688 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	n/a	n/a
Check	WB	0.85	1.1%
In: 1490	NB	0.80	1.2%
Out: 1490	SB	0.85	n/a
	T Int.	0.88	0.3%

Conditions:

Special Notes

TENW15020M_01p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

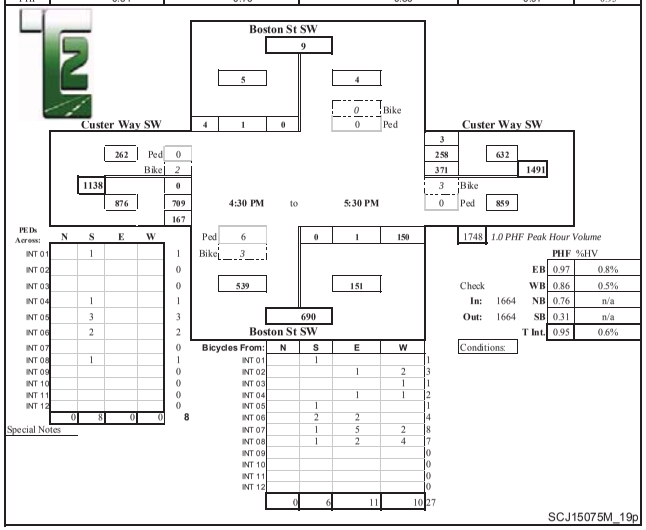
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Boston St SW & Custer Way SW **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Boston St SW				From South on (NB) Boston St SW				From East on (WB) Custer Way SW				From West on (EB) Custer Way SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	1	0	0	0	31	3	80	47	0	1	1	199	40	399
4:30 P	0	0	0	0	0	0	1	34	2	96	53	0	1	0	172	30	386
4:45 P	0	0	0	1	0	0	0	36	1	80	62	0	0	0	184	34	397
5:00 P	0	0	1	3	0	0	1	33	1	92	58	1	3	0	183	42	414
5:15 P	0	0	0	0	0	0	0	50	0	91	64	1	0	0	172	38	416
5:30 P	0	0	0	0	0	0	0	31	1	108	74	1	4	0	170	53	437
5:45 P	0	0	0	1	0	0	0	32	0	111	56	1	0	0	143	35	379
6:00 P	0	0	0	0	0	0	0	24	1	96	46	0	1	0	149	27	342
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	1	6	0	0	2	271	9	754	460	4	10	1	1372	299	3170
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	0	1	4	0	0	1	150	3	371	258	3	7	0	709	167	1664
Approach	5				151				632				876				1664
%HV	n/a				n/a				0.5%				0.8%				0.6%
PHF	0.31				0.76				0.86				0.97				0.95



Special Notes

SCJ15075M_19p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

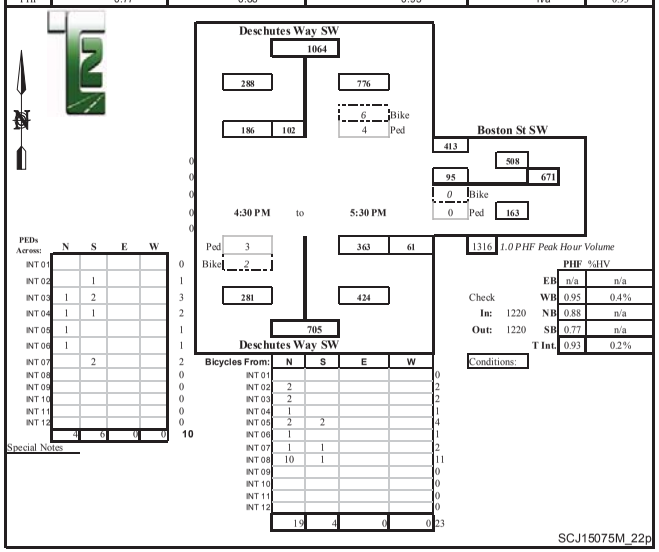
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Deschutes Way SW & Boston St SW **Date of Count:** Wed 7/01/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Deschutes Way SW				From South on (NB) Deschutes Way SW				From East on (WB) Boston St SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	14	29	0	1	0	75	13	2	19	0	106	0	0	0	0	256
4:30 P	0	19	30	0	2	0	60	10	0	34	0	94	0	0	0	0	247
4:45 P	0	21	50	0	0	0	83	14	0	15	0	106	0	0	0	0	289
5:00 P	0	17	31	0	0	0	82	12	1	28	0	105	0	0	0	0	275
5:15 P	0	36	57	0	0	0	97	15	0	22	0	102	0	0	0	0	329
5:30 P	0	28	48	0	0	0	101	20	1	30	0	100	0	0	0	0	327
5:45 P	0	12	37	0	0	0	111	13	0	14	0	102	0	0	0	0	289
6:00 P	0	10	33	0	1	0	91	11	0	12	0	107	0	0	0	0	264
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	157	315	0	4	0	700	108	4	174	0	822	0	0	0	0	2276
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	102	186	0	0	0	363	61	2	95	0	413	0	0	0	0	1220
Approach	288				424				508				0				1220
%HV	n/a				n/a				0.4%				n/a				0.2%
PHF	0.77				0.88				0.95				n/a				0.93



Special Notes

SCJ15075M_22p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

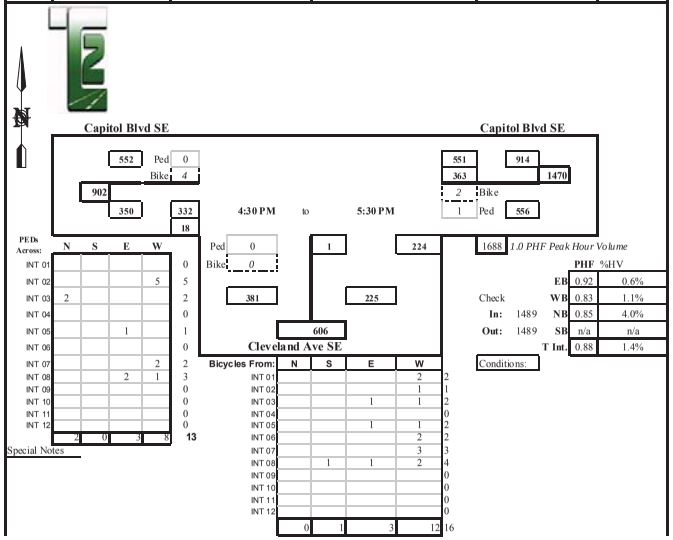
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Cleveland Ave SE & Capitol Blvd SE **Date of Count:** Thurs 6/25/2015

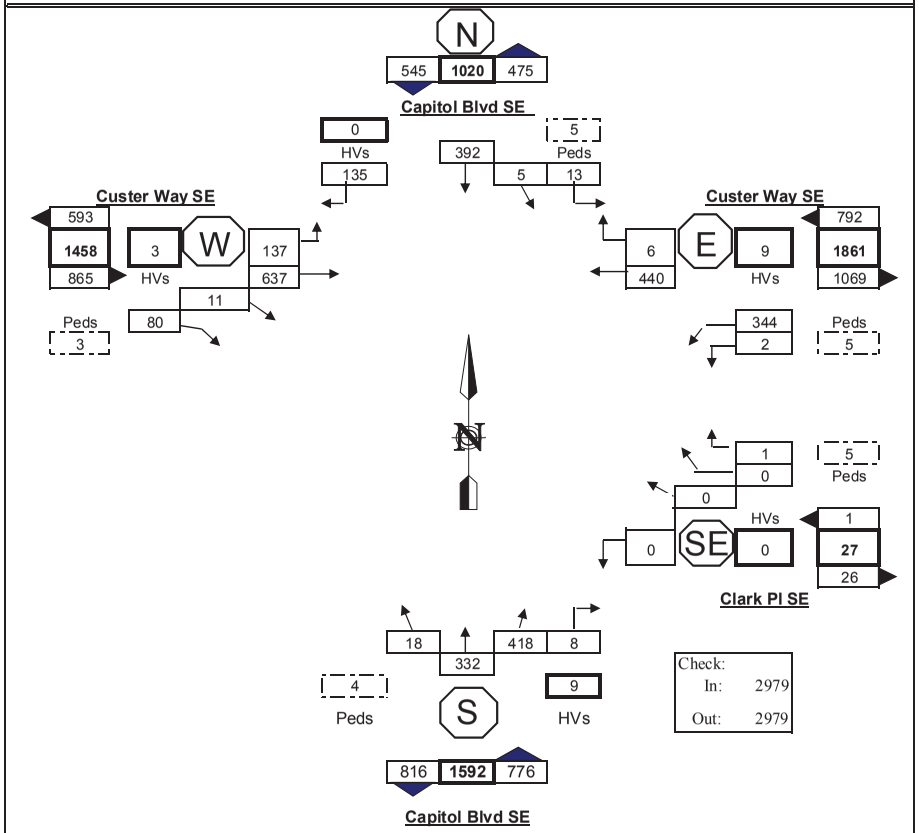
Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Cleveland Ave SE				From East on (WB) Capitol Blvd SE				From West on (EB) Capitol Blvd SE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	4	0	0	51	3	66	82	0	2	0	70	8	277
4:30 P	0	0	0	0	3	0	0	51	2	57	96	0	1	0	69	7	280
4:45 P	0	0	0	0	3	0	0	66	5	89	116	0	1	0	78	7	356
5:00 P	0	0	0	0	2	0	0	51	1	64	110	0	0	0	72	4	301
5:15 P	0	0	0	0	1	0	0	52	2	110	165	0	1	0	90	5	422
5:30 P	0	0	0	0	3	1	0	55	2	100	160	0	0	0	92	2	410
5:45 P	0	0	0	0	1	0	0	44	3	64	100	0	1	0	61	8	277
6:00 P	0	0	0	0	3	0	0	53	1	53	75	0	0	0	72	4	257
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	20	1	0	423	19	603	904	0	6	0	604	45	2580
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	0	0	0	9	1	0	224	10	363	551	0	2	0	332	18	1489
Approach	0				225				914				350				1489
%HV	n/a				4.0%				1.1%				0.6%				1.4%
PHF	n/a				0.85				0.83				0.92				0.88



Traffic Count Consultants, Inc. DBE/WBE DBE/WBE

Phone: (425) 253 926-6009 E-Mail: Team@TC2inc.com



Intersection: Capitol Blvd SE & Custer Way SE & Clark Pl SE

Location: Tumwater, Washington

Date of Count: Tues 2/10/2015

Peak Period: 4:45 P - 5:45 P

Checked By: Jess

Prepared For: TENW

	%HV	PHF
SB	n/a	0.71
WB	1.1%	0.88
NWB	n/a	0.25
NB	1.2%	0.97
	0.0%	0.00
EB	0.3%	0.92
Intersection	0.7%	0.90

TENW15020M_02p

Prepared for: **TENW**

Traffic Count Consultants, Inc.

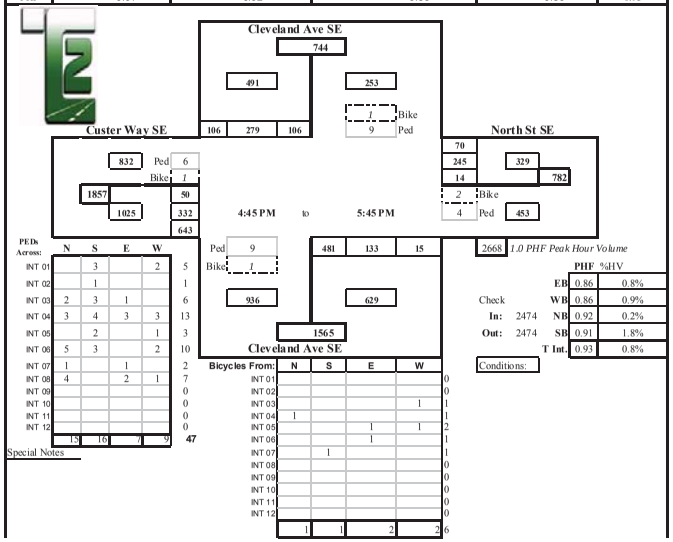
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Cleveland Ave SE & North St SE/Custer Way SE **Date of Count:** Tues 2/10/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Cleveland Ave SE				From South on (NB) Cleveland Ave SE				From East on (WB) North St SE				From West on (EB) Custer Way SE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	13	44	23	0	117	25	4	2	2	64	19	3	14	83	134	542
4:30 P	4	30	56	29	1	131	26	2	0	5	38	20	1	14	73	147	571
4:45 P	3	26	54	20	0	132	27	2	2	3	52	12	3	23	78	135	564
5:00 P	2	22	59	27	1	123	41	7	0	6	50	15	1	12	57	135	554
5:15 P	2	25	80	30	0	112	26	2	2	5	60	20	3	6	86	162	614
5:30 P	3	28	79	18	0	130	34	3	0	2	62	13	1	17	99	182	667
5:45 P	2	31	61	31	0	116	32	3	1	1	73	22	3	15	90	164	639
6:00 P	3	15	54	29	0	115	33	1	0	4	57	18	2	14	79	131	550
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	20	190	487	207	2	976	244	24	7	28	456	139	17	115	645	1190	4701
Peak Hour: 4:45 PM to 5:45 PM																	
Total	9	106	279	106	1	481	133	15	3	14	245	70	8	50	332	643	2474
Approach	491				629				329				1025				2474
%HV	1.8%				0.2%				0.9%				0.8%				0.8%
PHF	0.91				0.92				0.86				0.86				0.93



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

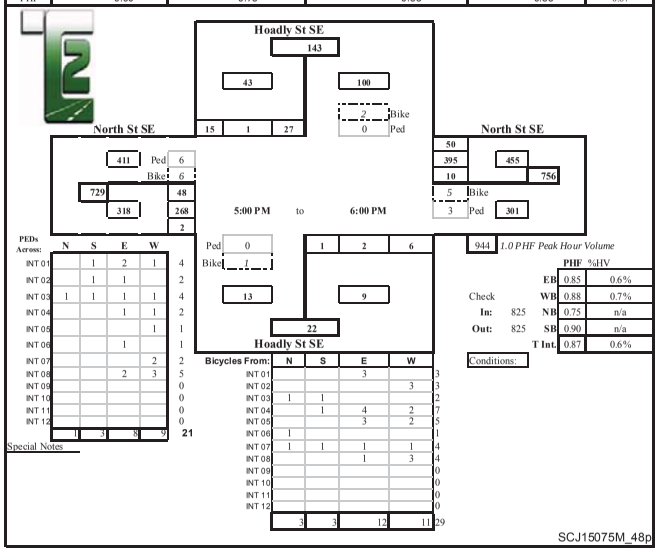
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Hoadly St SE & North St SE **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Hoadly St SE				From South on (NB) Hoadly St SE				From East on (WB) North St SE				From West on (EB) North St SE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	9	0	5	0	1	0	0	1	2	73	9	3	7	51	1	158
4:30 P	0	8	1	3	0	0	0	1	2	2	68	10	1	1	51	0	145
4:45 P	0	9	0	3	0	1	2	1	2	0	100	12	2	4	48	0	180
5:00 P	1	7	2	5	0	0	0	0	1	1	103	11	1	2	52	4	187
5:15 P	0	8	1	1	0	1	0	1	1	1	106	13	1	5	70	0	207
5:30 P	0	6	0	4	0	0	0	2	1	0	92	12	0	5	75	1	197
5:45 P	0	5	0	7	0	0	0	2	0	3	86	13	1	8	60	1	185
6:00 P	0	8	0	3	0	0	2	1	1	6	111	12	0	30	63	0	236
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	60	4	31	0	3	4	8	9	15	739	92	9	62	470	7	1495
Peak Hour: 5:00 PM to 6:00 PM																	
Total	0	27	1	15	0	1	2	6	3	10	395	50	2	48	268	2	825
Approach	43				9				455				318				825
%HV	n/a				n/a				0.7%				0.6%				0.6%
PHF	0.90				0.75				0.88				0.85				0.87



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

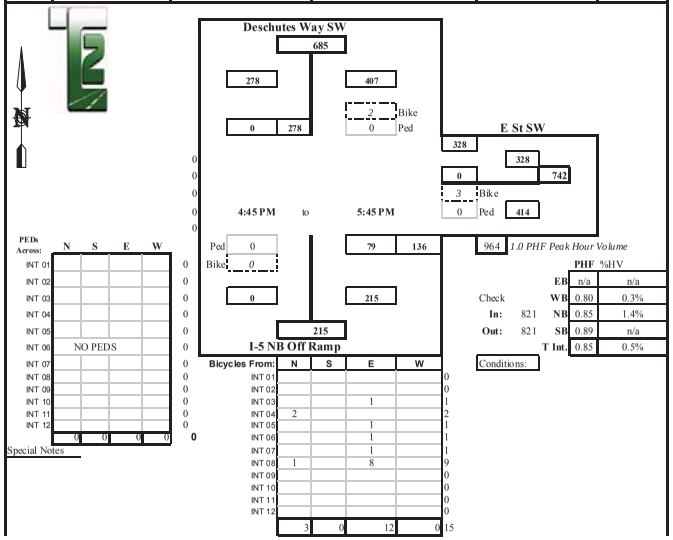
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Deschutes Way SW/I-5 NB Off Ramp & E St SW **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Deschutes Way SW				From South on (NB) I-5 NB Off Ramp				From East on (WB) E St SW				From West on (EB) 0				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	60	0	0	2	0	25	29	2	0	0	58	0	0	0	0	172
4:30 P	1	48	0	0	1	0	15	31	1	0	0	58	0	0	0	0	152
4:45 P	0	63	0	0	0	0	21	29	0	0	0	52	0	0	0	0	165
5:00 P	0	56	0	0	0	0	18	33	0	0	0	55	0	0	0	0	162
5:15 P	0	78	0	0	1	0	22	33	1	0	0	72	0	0	0	0	205
5:30 P	0	68	0	0	1	0	14	32	0	0	0	99	0	0	0	0	213
5:45 P	0	76	0	0	1	0	25	38	0	0	0	102	0	0	0	0	241
6:00 P	0	36	0	0	0	0	15	26	0	0	0	74	0	0	0	0	151
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	485	0	0	6	0	155	251	4	0	0	570	0	0	0	0	1461
Peak Hour: 4:45 PM to 5:45 PM																	
Total	0	278	0	0	3	0	79	136	1	0	0	328	0	0	0	0	821
Approach	278				215				328				0				821
%HV	n/a				1.4%				0.3%				n/a				0.5%
PHF	0.89				0.85				0.80				n/a				0.85



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

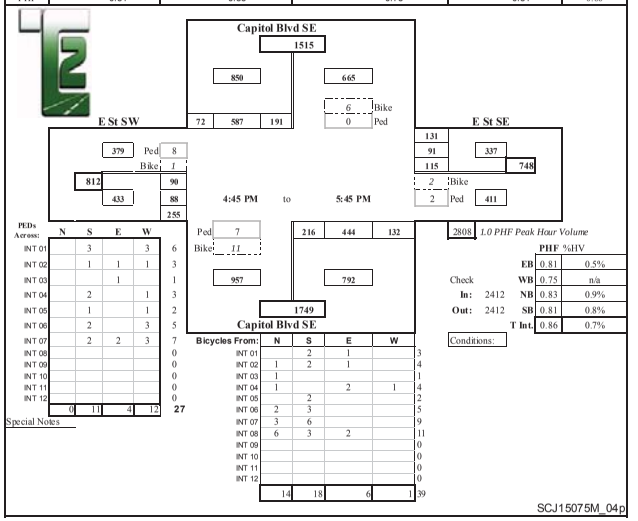
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & E St SE **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) E St SE				From West on (EB) E St SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	43	111	17	3	39	98	23	0	18	11	25	0	17	19	51	472
4:30 P	4	46	106	9	2	42	89	21	0	19	19	23	1	20	19	44	457
4:45 P	4	23	142	5	2	28	130	17	0	14	14	16	0	21	20	56	486
5:00 P	1	47	105	6	1	41	105	33	0	22	19	23	0	21	18	40	480
5:15 P	1	44	175	14	2	53	126	35	0	25	18	30	2	19	25	64	628
5:30 P	3	60	182	20	1	65	130	45	0	35	21	31	0	24	27	62	702
5:45 P	2	40	125	32	3	57	83	19	0	33	33	47	0	26	18	89	602
6:00 P	1	26	116	22	1	38	97	23	0	22	24	30	0	23	8	39	468
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	18	329	1062	125	15	363	858	216	0	188	159	225	3	171	154	445	4295
Peak Hour: 4:45 PM to 5:45 PM																	
Total	7	191	587	72	7	216	444	132	0	115	91	131	2	90	88	255	2412
Approach	850				792				337				433				2412
%HV	0.8%				0.9%				n/a				0.5%				0.7%
PHF	0.81				0.83				0.75				0.81				0.86



SCJ15075M_04p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

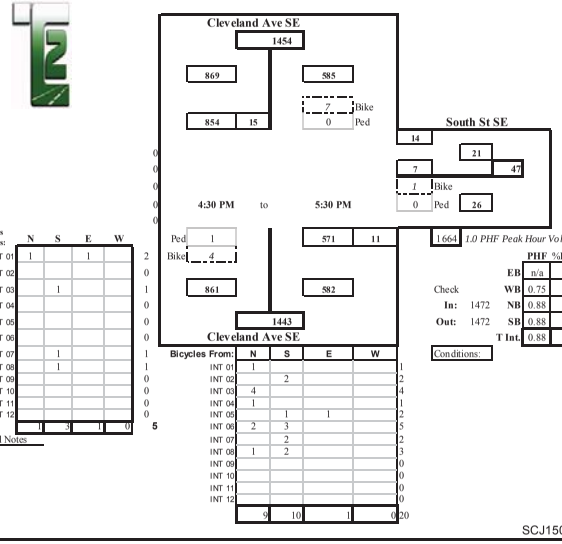
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Cleveland Ave SE & South St SE **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Cleveland Ave SE				From South on (NB) Cleveland Ave SE				From East on (WB) South St SE				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	2	185	0	1	0	141	2	0	1	0	5	0	0	0	0	336
4:30 P	2	4	183	0	4	0	126	1	0	1	0	0	0	0	0	0	315
4:45 P	1	2	197	0	0	0	133	1	0	0	0	7	0	0	0	0	340
5:00 P	1	5	212	0	0	0	132	5	0	2	0	3	0	0	0	0	359
5:15 P	4	5	202	0	2	0	144	2	0	3	0	1	0	0	0	0	357
5:30 P	2	3	243	0	0	0	162	3	0	2	0	3	0	0	0	0	416
5:45 P	2	3	197	0	0	0	131	1	0	0	0	1	0	0	0	0	333
6:00 P	1	5	176	0	0	0	151	1	1	4	0	5	0	0	0	0	342
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	14	29	1595	0	7	0	1120	16	1	13	0	25	0	0	0	0	2798
Peak Hour: 4:30 PM to 5:30 PM																	
Total	8	15	854	0	2	0	571	11	0	7	0	14	0	0	0	0	1472
Approach	869				582				21				0				1472
%HV	0.9%				0.3%				n/a				n/a				0.7%
PHF	0.88				0.88				0.75				n/a				0.88



PEDs Across:	N	S	E	W	
INT 01	1		1		2
INT 02					0
INT 03		1			1
INT 04					0
INT 05					0
INT 06					0
INT 07		1			1
INT 08		1			1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	3	1	0	5

Special Notes

Bicycles From:	N	S	E	W	
INT 01	1				1
INT 02		2			2
INT 03	4				4
INT 04	1				1
INT 05		1	1		2
INT 06	2	3			5
INT 07		2			2
INT 08	1	2			3
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	9	10	1	0	20

SCJ15075M_49p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

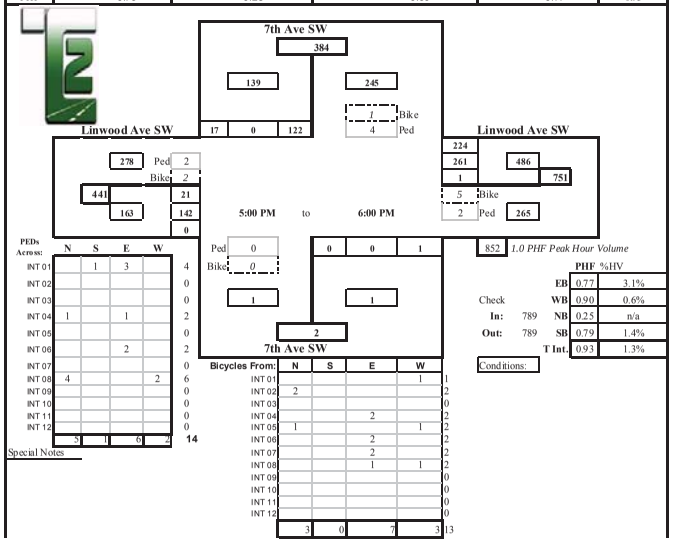
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 7th Ave SW & Linwood Ave SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 7th Ave SW				From South on (NB) 7th Ave SW				From East on (WB) Linwood Ave SW				From West on (EB) Linwood Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	21	0	4	0	0	0	0	1	0	49	55	0	5	49	0	183
4:30 P	0	15	0	3	0	0	0	0	1	0	64	33	1	2	36	0	153
4:45 P	3	27	0	7	0	0	0	0	0	0	50	43	0	2	35	0	164
5:00 P	1	38	0	4	0	0	0	0	2	0	42	30	1	4	31	0	149
5:15 P	1	40	0	4	0	0	0	0	1	0	57	46	2	8	33	0	188
5:30 P	0	26	0	4	0	0	0	0	1	0	65	70	2	5	36	0	206
5:45 P	1	24	0	7	0	0	0	0	0	0	75	48	0	3	25	0	182
6:00 P	0	32	0	2	0	0	0	1	1	1	64	60	1	5	48	0	213
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	223	0	35	0	0	0	1	7	1	466	385	7	34	293	0	1438
Peak Hour: 5:00 PM to 6:00 PM																	
Total	2	122	0	17	0	0	0	1	3	1	261	224	5	21	142	0	789
Approach	139				1				486				163				789
%HV	1.4%				n/a				0.6%				3.1%				1.3%
PHF	0.79				0.25				0.90				0.77				0.93



PEDs Across:	N	S	E	W	
INT 01		1	3		4
INT 02					0
INT 03					0
INT 04	1		1		2
INT 05					0
INT 06			2		2
INT 07					0
INT 08	4			2	6
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	5	1	6	2	14

Special Notes

Bicycles From:	N	S	E	W	
INT 01				1	1
INT 02	2				2
INT 03					0
INT 04			2		2
INT 05	1			1	2
INT 06			2		2
INT 07			2		2
INT 08			1	1	2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	0	7	3	13

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

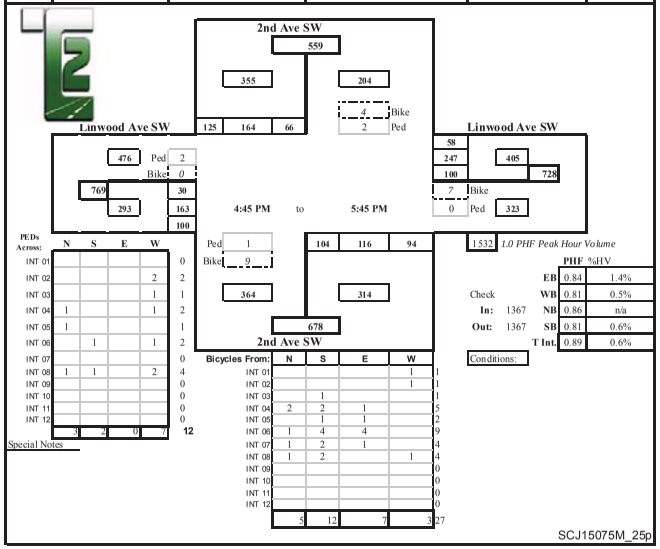
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 2nd Ave SW & Linwood Ave SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 2nd Ave SW				From South on (NB) 2nd Ave SW				From East on (WB) Linwood Ave SW				From West on (EB) Linwood Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	18	47	25	0	30	26	17	0	25	49	15	1	10	39	26	327
4:30 P	1	8	41	25	0	25	24	23	1	17	52	11	1	13	31	14	284
4:45 P	0	21	37	26	1	26	28	15	1	24	43	9	2	15	28	31	303
5:00 P	1	13	37	24	0	23	26	29	1	23	35	14	1	12	40	26	302
5:15 P	0	16	40	29	0	29	38	24	0	21	53	15	1	2	49	36	352
5:30 P	1	25	45	39	0	39	22	22	1	24	75	20	1	11	43	18	383
5:45 P	0	12	42	33	0	13	30	19	0	32	84	9	1	5	31	20	330
6:00 P	1	9	25	32	0	37	28	13	1	25	55	7	1	8	46	16	301
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	122	314	233	1	222	222	162	5	191	446	100	9	76	307	187	2582
Peak Hour: 4:45 PM to 5:45 PM																	
Total	2	66	164	125	0	104	116	94	2	100	247	58	4	30	163	100	1367
Approach	355				314				405				293				1367
%HV	0.6%				n/a				0.5%				1.4%				0.6%
PHF	0.81				0.86				0.81				0.84				0.89



SCJ15075M_25p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

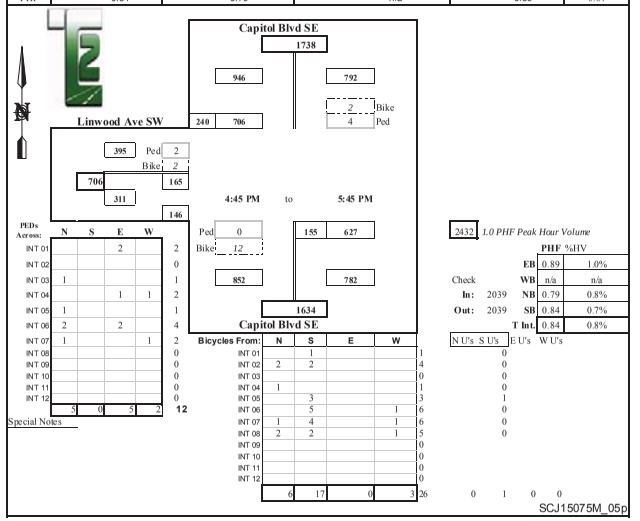
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Linwood Ave SW **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) 0				From West on (EB) Linwood Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	3	0	133	47	2	36	123	0	0	0	0	0	2	37	0	31	407
4:30 P	3	0	145	37	1	45	117	0	0	0	0	0	1	35	0	31	410
4:45 P	3	0	150	54	4	41	140	0	0	0	0	0	1	35	0	26	446
5:00 P	3	0	145	34	1	31	144	0	0	0	0	0	0	35	0	40	429
5:15 P	1	0	195	64	1	46	162	0	0	0	0	0	1	52	0	35	554
5:30 P	1	0	199	83	1	50	196	0	0	0	0	0	1	44	0	36	608
5:45 P	2	0	167	59	3	28	125	0	0	0	0	0	1	34	0	35	448
6:00 P	1	0	124	35	1	32	121	0	0	0	0	0	0	36	0	23	371
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	17	0	1258	413	14	309	1128	0	0	0	0	0	7	308	0	257	3673
Peak Hour: 4:45 PM to 5:45 PM																	
Total	7	0	706	240	6	155	627	0	0	0	0	0	3	165	0	146	2039
Approach	946				782				0				311				2039
%HV	0.7%				0.8%				n/a				1.0%				0.8%
PHF	0.84				0.79				n/a				0.89				0.84



SCJ15075M_05p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

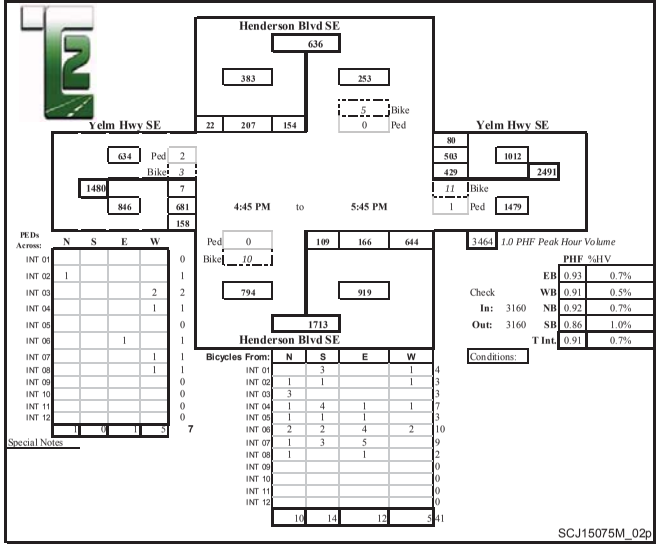
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Henderson Blvd SE & Yelm Hwy SE **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Henderson Blvd SE				From South on (NB) Henderson Blvd SE				From East on (WB) Yelm Hwy SE				From West on (EB) Yelm Hwy SE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	37	32	5	2	24	20	123	4	72	111	12	1	1	142	27	606
4:30 P	1	46	40	9	0	12	20	115	3	85	113	14	0	0	154	22	630
4:45 P	0	32	33	1	1	29	33	169	2	100	118	25	0	1	148	34	723
5:00 P	1	31	42	7	0	33	33	142	0	98	112	21	1	1	178	35	733
5:15 P	0	42	56	2	1	24	40	172	3	90	145	20	2	2	158	30	781
5:30 P	2	51	53	7	1	27	50	174	1	134	125	18	1	1	182	44	866
5:45 P	1	30	56	6	4	25	43	156	1	107	121	21	2	3	163	49	780
6:00 P	1	24	51	2	0	18	40	106	5	87	85	11	1	2	109	26	561
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	293	363	39	9	192	279	1157	19	773	930	142	8	11	1234	267	5680
Peak Hour: 4:45 PM to 5:45 PM																	
Total	4	154	207	22	6	109	166	644	5	429	503	80	6	7	681	158	3160
Approach	383				919				1012				846				3160
%HV	1.0%				0.7%				0.5%				0.7%				0.7%
PHF	0.86				0.92				0.91				0.93				0.91



SCJ15075M_02p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

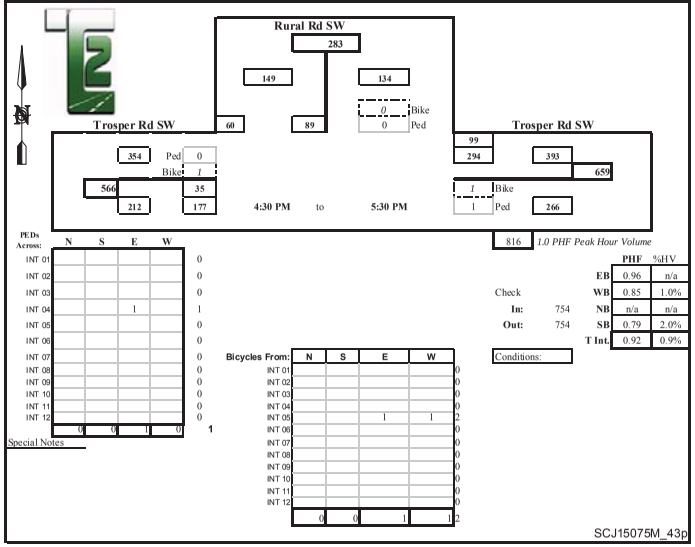
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Rural Rd SW & Trosper Rd SW **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Rural Rd SW				From South on (NB) 0				From East on (WB) Trosper Rd SW				From West on (EB) Trosper Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	16	0	9	0	0	0	0	1	0	69	16	1	8	46	0	164
4:30 P	1	23	0	12	0	0	0	0	4	0	63	19	1	6	49	0	172
4:45 P	0	23	0	14	0	0	0	0	0	0	69	30	0	7	48	0	191
5:00 P	2	17	0	10	0	0	0	0	3	0	75	14	0	10	43	0	169
5:15 P	0	23	0	24	0	0	0	0	0	0	64	26	0	10	43	0	190
5:30 P	1	26	0	12	0	0	0	0	1	0	86	29	0	8	43	0	204
5:45 P	0	25	0	17	0	0	0	0	0	0	68	19	1	7	49	0	185
6:00 P	1	14	0	14	0	0	0	0	1	0	61	20	0	5	32	0	146
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	6	167	0	112	0	0	0	0	10	0	555	173	3	61	353	0	1421
Peak Hour: 4:30 PM to 5:30 PM																	
Total	3	89	0	60	0	0	0	0	4	0	294	99	0	35	177	0	754
Approach	149				0				393				212				754
%HV	2.0%				n/a				1.0%				n/a				0.9%
PHF	0.79				n/a				0.85				0.96				0.92



SCJ15075M_43p

Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

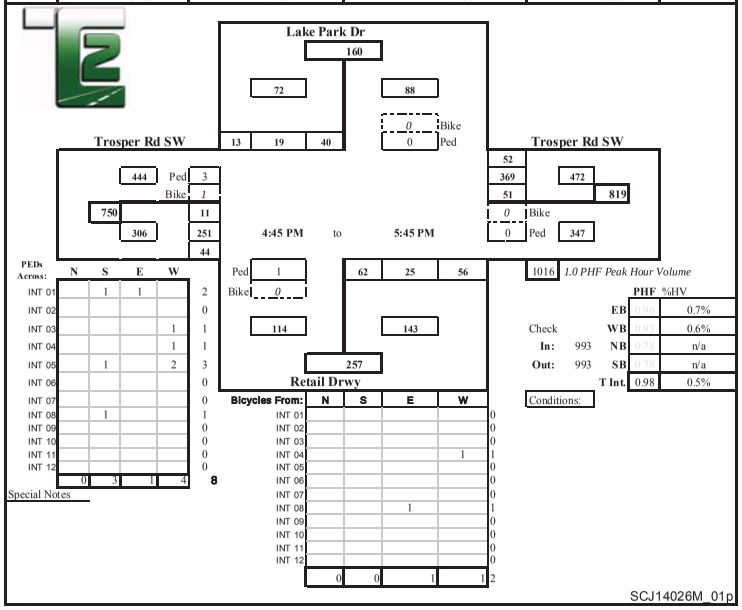
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Lake Park Dr & Trosper Rd SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Lake Park Dr				From South on (NB) Retail Drwy				From East on (WB) Trosper Rd SW				From West on (EB) Trosper Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	9	3	5	0	6	7	7	0	9	87	6	0	2	60	8	209
4:30 P	0	9	1	4	0	10	3	12	1	8	87	8	1	2	62	8	214
4:45 P	0	6	6	2	0	12	2	15	0	17	75	8	0	4	75	10	232
5:00 P	0	12	3	1	0	11	5	14	1	11	103	13	1	2	63	13	251
5:15 P	0	12	5	6	0	17	4	8	0	13	91	11	0	5	59	10	241
5:30 P	0	10	9	1	0	17	5	16	2	16	87	13	1	2	67	11	254
5:45 P	0	6	2	5	0	17	11	18	0	11	88	15	0	2	62	10	247
6:00 P	0	10	2	1	0	12	5	10	1	12	92	5	1	3	56	8	216
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	74	31	25	0	102	42	100	5	97	710	79	4	22	504	78	1864
Peak Hour: 4:45 PM to 5:45 PM																	
Total	0	40	19	13	0	62	25	56	3	51	369	52	2	11	251	44	993
Approach	72				143				472				306				993
%HV	n/a				n/a				0.6%				0.7%				0.5%
PHF	0.78				0.78				0.93				0.96				0.98



SCJ14026M_01p

Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

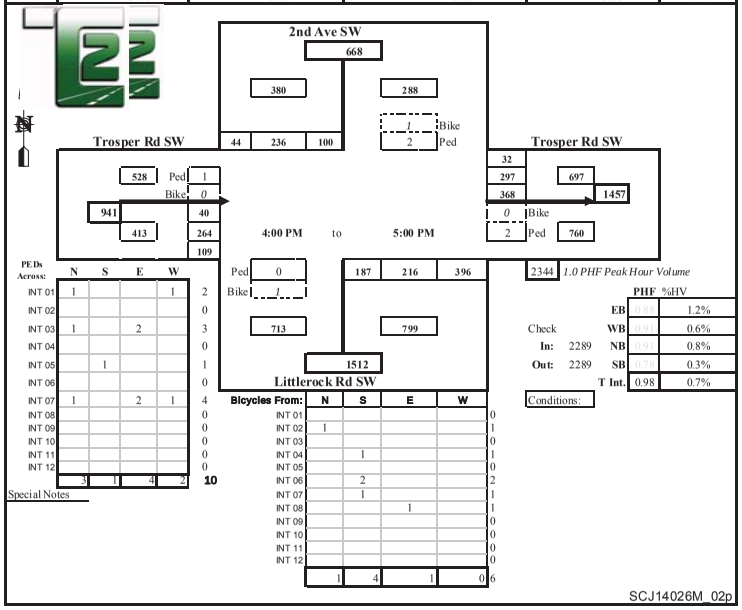
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 2nd Ave SW/Littlerock Rd SW & Trosper Rd SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 2nd Ave SW				From South on (NB) Littlerock Rd SW				From East on (WB) Trosper Rd SW				From West on (EB) Trosper Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	29	49	9	1	41	44	102	1	113	65	13	0	7	63	28	563
4:30 P	0	29	82	11	1	45	57	97	2	71	66	7	3	12	59	36	572
4:45 P	1	23	58	6	1	52	46	95	1	94	87	7	0	11	80	27	586
5:00 P	0	19	47	18	3	49	69	102	0	90	79	5	2	10	62	18	568
5:15 P	0	24	51	7	0	45	57	93	2	104	69	9	0	11	61	21	552
5:30 P	0	13	58	15	1	44	59	95	2	74	59	11	2	13	60	27	528
5:45 P	0	21	62	9	0	31	58	110	0	70	70	10	0	8	68	21	538
6:00 P	1	12	39	13	2	34	47	102	0	68	51	8	1	9	40	22	445
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	170	446	88	9	341	437	796	8	684	546	70	8	81	493	200	4352
Peak Hour: 4:00 PM to 5:00 PM																	
Total	1	100	236	44	6	187	216	396	4	368	297	32	5	40	264	109	2289
Approach	380				799				697				413				2289
%HV	0.3%				0.8%				0.6%				1. %				0.7%
PHF	0.78				0.91				0.91				0.88				0.98



SCJ14026M_02p

Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

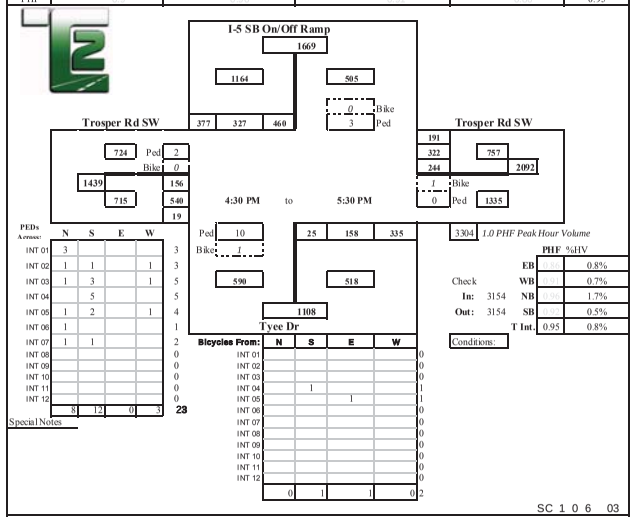
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB On/Off Ramp/Tyee Dr & Trosper Rd SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) I-5 SB On/Off Ramp				From South on (NB) Tyee Dr				From East on (WB) Trosper Rd SW				From West on (EB) Trosper Rd SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	112	93	114	1	7	36	71	4	60	79	46	1	30	165	3	816
4:30 P	6	98	87	87	0	8	31	85	0	55	59	30	0	35	130	8	713
4:45 P	2	117	67	105	4	6	35	80	0	67	99	42	2	45	156	7	826
5:00 P	0	129	90	97	3	5	41	82	1	65	69	58	4	30	123	6	795
5:15 P	1	115	76	89	2	6	45	84	2	57	81	48	0	35	131	4	771
5:30 P	3	99	94	86	0	8	37	89	2	55	73	43	0	46	130	2	762
5:45 P	4	116	94	75	0	3	42	78	0	48	61	63	0	37	153	8	778
6:00 P	1	105	47	62	0	5	33	102	1	62	65	24	2	40	113	4	662
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	19	891	648	715	10	48	300	671	10	469	586	354	9	298	1101	42	6123
Peak Hour: 4:30 PM to 5:30 PM																	
Total	6	460	327	377	9	25	158	335	5	244	322	191	6	156	540	19	3154
Approach	1164				518				757				715				3154
%HV	0.5%				1.7%				0.7%				0.8%				0.8%
PHF	0.9				0.96				0.91				0.86				0.95



PEDs Across:	N	S	E	W	
INT 01	3				3
INT 02	1	1		1	3
INT 03	1	3		1	5
INT 04		5			5
INT 05	1	2		1	4
INT 06	1				1
INT 07	1	1			2
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	8	12	0	3	23

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04		1			1
INT 05			1		1
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	1	1	0	2

Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

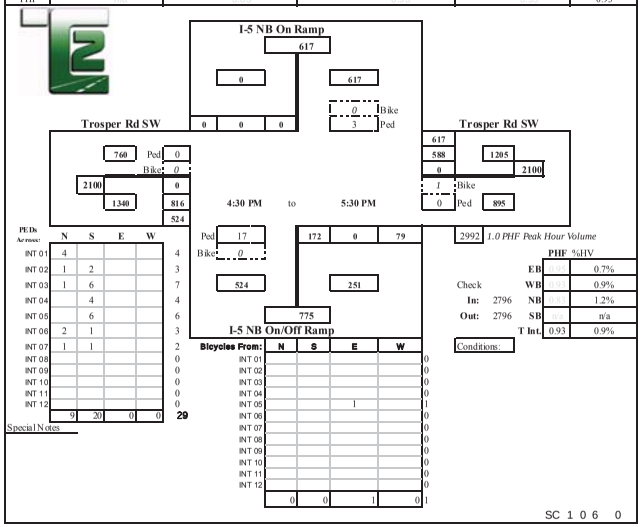
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 NB On/Off Ramp & Trosper Rd SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) I-5 NB On Ramp				From South on (NB) I-5 NB On/Off Ramp				From East on (WB) Trosper Rd SW				From West on (EB) Trosper Rd SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	0	40	0	10	4	0	145	147	2	0	208	140	690
4:30 P	0	0	0	0	2	29	0	22	1	0	115	112	3	0	191	122	591
4:45 P	0	0	0	0	0	49	0	23	5	0	159	164	2	0	216	137	748
5:00 P	0	0	0	0	1	53	0	23	1	0	140	164	3	0	208	129	717
5:15 P	0	0	0	0	1	33	0	12	2	0	155	139	3	0	196	136	671
5:30 P	0	0	0	0	1	37	0	21	3	0	134	150	2	0	196	122	660
5:45 P	0	0	0	0	0	31	0	17	1	0	141	115	3	0	205	143	652
6:00 P	0	0	0	0	0	27	0	6	2	0	125	105	0	0	203	117	583
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	5	299	0	134	19	0	1114	1096	18	0	1623	1046	5312
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	0	0	0	3	172	0	79	11	0	588	617	10	0	816	524	2796
Approach	0				251				1205				1340				2796
%HV	n/a				1. %				0.9%				0.7%				0.9%
PHF	n/a				0.83				0.93				0.95				0.93



PEDs Across:	N	S	E	W	
INT 01	4				4
INT 02	1	2			3
INT 03	1	6			7
INT 04		4			4
INT 05		6			6
INT 06	2	1			3
INT 07	1	1			2
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	9	20	0	0	29

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05			1		1
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	1	0	1

Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

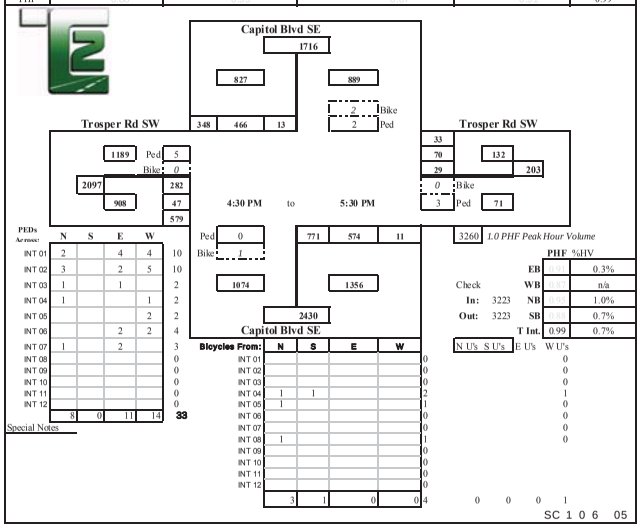
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Trosper Rd SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Trosper Rd SW				From West on (EB) Trosper Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	6	3	88	92	4	190	123	3	0	5	16	3	1	64	10	150	747
4:30 P	1	5	95	51	1	162	86	3	0	7	10	4	1	76	16	144	659
4:45 P	1	4	97	78	2	206	137	5	0	9	17	12	0	83	12	154	814
5:00 P	1	1	105	92	3	225	130	3	0	7	15	6	0	62	15	131	792
5:15 P	3	6	135	95	2	166	146	2	0	6	18	8	2	63	10	160	815
5:30 P	1	2	129	83	6	174	161	1	0	7	20	7	1	74	10	134	802
5:45 P	1	6	128	90	1	184	107	0	0	11	10	9	4	81	6	143	775
6:00 P	1	6	84	72	2	150	89	2	0	6	14	5	1	91	5	137	661
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	15	33	861	653	21	1457	979	19	0	58	120	54	10	594	84	1153	6065
Peak Hour: 4:30 PM to 5:30 PM																	
Total	6	13	466	348	13	771	574	11	0	29	70	33	3	282	47	579	3223
Approach			827			1356				132				908			3223
%HV			0.7%			1.0%				n/a				0.3%			0.7%
PHF			0.88			0.95				0.87				0.93			0.99



SC 1 0 6 05

Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

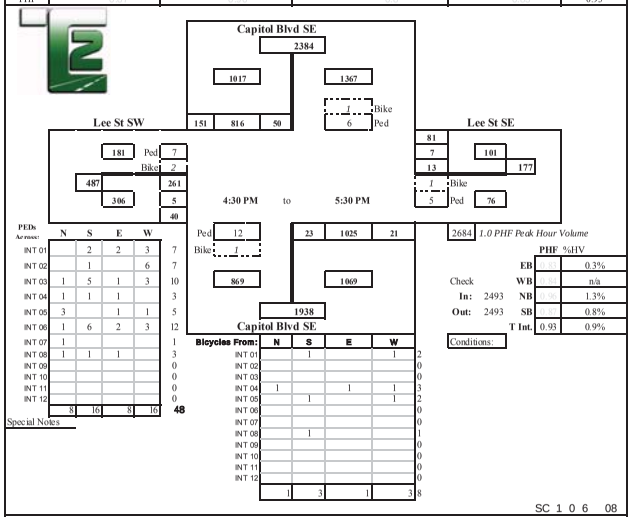
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Lee St SE/SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Lee St SE				From West on (EB) Lee St SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	3	13	184	29	2	9	235	6	0	5	1	11	2	70	0	14	577
4:30 P	2	8	190	31	1	4	204	4	0	1	1	10	0	50	1	5	509
4:45 P	1	10	214	25	1	7	248	10	0	2	2	19	1	78	1	13	629
5:00 P	2	13	166	33	3	6	266	5	0	3	2	13	0	56	1	3	567
5:15 P	3	15	230	46	2	2	260	4	0	6	1	23	0	73	1	10	671
5:30 P	2	12	206	47	8	8	251	2	0	2	2	26	0	54	2	14	626
5:45 P	5	10	229	34	2	3	193	0	0	3	2	16	0	52	2	6	550
6:00 P	2	14	175	31	1	10	179	2	0	1	3	16	1	42	0	14	487
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	20	95	1594	276	20	49	1836	33	0	23	14	134	4	475	8	79	4616
Peak Hour: 4:30 PM to 5:30 PM																	
Total	8	50	816	151	14	23	1025	21	0	13	7	81	1	261	5	40	2493
Approach			1017			1069				101				306			2493
%HV			0.8%			1.3%				n/a				0.3%			0.9%
PHF			0.87			0.98				0.6				0.83			0.93



SC 1 0 6 08

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

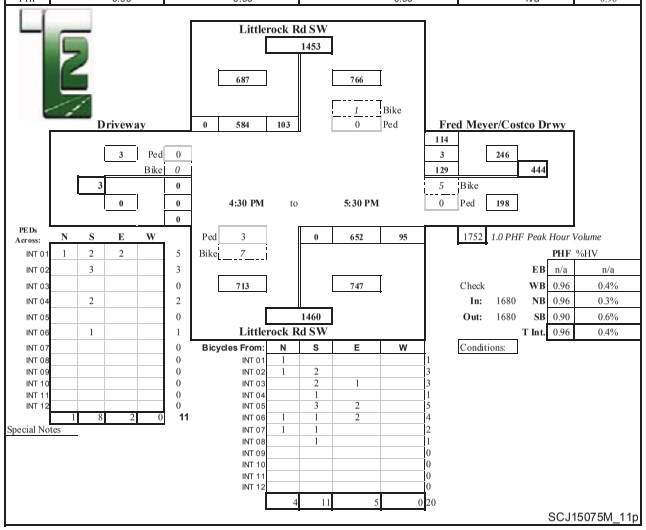
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Fred Meyer/Costco Drwy **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Fred Meyer/Costco Drwy				From West on (EB) Driveway				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	20	135	0	1	0	149	18	0	27	1	29	0	0	0	1	380
4:30 P	3	28	152	0	1	0	135	23	1	26	1	26	0	0	0	0	391
4:45 P	1	34	156	0	0	0	167	26	0	31	0	24	0	0	0	0	438
5:00 P	2	27	144	0	1	0	175	19	1	35	1	28	0	0	0	0	429
5:15 P	0	22	144	0	0	0	157	30	0	30	0	33	0	0	0	0	416
5:30 P	1	20	140	0	1	0	153	20	0	33	2	29	0	0	0	0	397
5:45 P	0	18	111	0	0	0	123	25	0	26	0	28	0	0	0	0	331
6:00 P	0	19	114	0	2	0	128	16	1	28	1	18	0	0	0	0	324
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	8	188	1096	0	6	0	1187	177	3	236	6	215	0	0	0	1	3106
Peak Hour:	4:30 PM to 5:30 PM																
Total	4	103	584	0	2	0	652	95	1	129	3	114	0	0	0	0	1680
Approach	687				747				246				0				1680
%HV	0.6%				0.3%				0.4%				n/a				0.4%
PHF	0.90				0.96				0.96				n/a				0.96



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

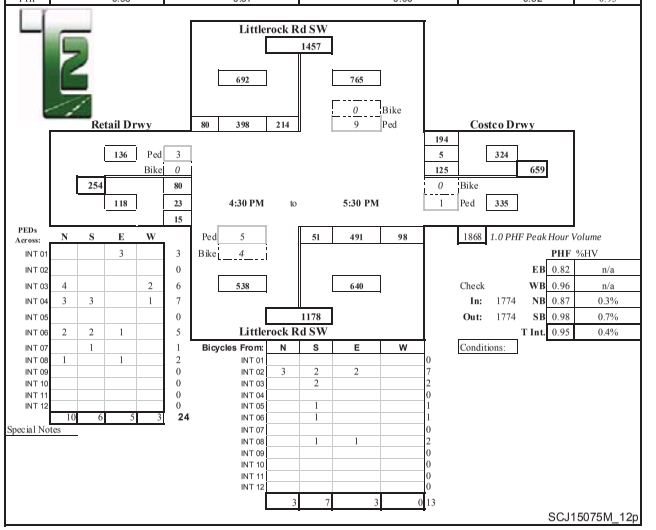
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Costco Drwy **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Costco Drwy				From West on (EB) Retail Drwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	53	87	25	2	8	100	27	1	27	5	48	0	16	9	8	413
4:30 P	3	43	101	30	0	4	98	24	0	33	1	46	0	15	7	9	411
4:45 P	1	53	99	24	0	10	148	26	0	30	0	53	0	16	7	1	467
5:00 P	3	59	92	26	1	13	96	22	0	25	0	59	0	21	8	3	424
5:15 P	0	46	101	20	0	9	128	25	0	36	1	38	0	27	3	6	440
5:30 P	1	56	106	10	1	19	119	25	0	34	4	44	0	16	5	5	443
5:45 P	0	40	91	14	1	15	81	24	0	21	3	38	0	18	8	8	361
6:00 P	3	41	87	0	1	9	86	21	0	13	0	43	0	21	5	13	339
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	12	391	764	149	6	87	856	194	1	219	14	369	0	150	52	53	3298
Peak Hour:	4:30 PM to 5:30 PM																
Total	5	214	398	80	2	51	491	98	0	125	5	194	0	80	23	15	1774
Approach	692				640				324				118				1774
%HV	0.7%				0.3%				n/a				n/a				0.4%
PHF	0.98				0.87				0.96				0.82				0.95



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

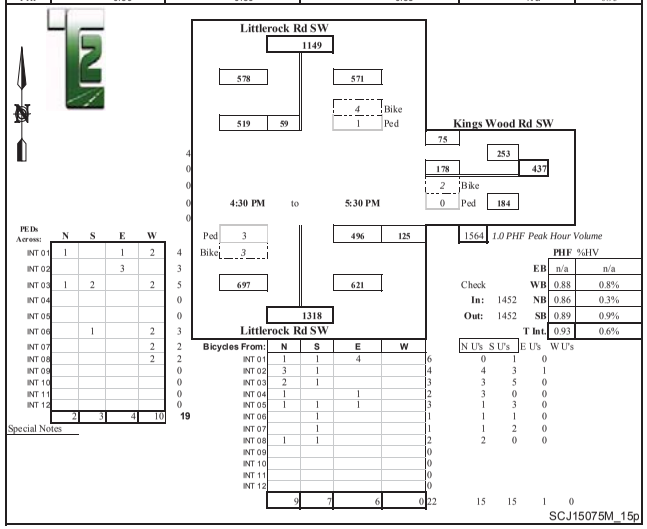
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Kings Wood Dr SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Kings Wood Rd SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	12	129	0	2	0	99	37	0	41	0	22	0	0	0	0	340
4:30 P	2	16	137	0	1	0	103	30	0	28	0	18	0	0	0	0	332
4:45 P	1	20	119	0	0	0	124	33	0	47	0	25	0	0	0	0	368
5:00 P	3	21	118	0	1	0	108	30	1	49	0	14	0	0	0	0	340
5:15 P	0	9	128	0	0	0	114	32	1	48	0	22	0	0	0	0	353
5:30 P	1	9	154	0	1	0	150	30	0	34	0	14	0	0	0	0	391
5:45 P	0	12	138	0	0	0	98	39	0	52	0	14	0	0	0	0	353
6:00 P	2	12	116	0	2	0	76	22	0	50	0	17	0	0	0	0	293
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	10	111	1039	0	7	0	872	253	2	349	0	146	0	0	0	0	2770
Peak Hour:	4:30 PM	to	5:30 PM														
Total	5	59	519	0	2	0	496	125	2	178	0	75	0	0	0	0	1452
Approach	578				621				253				0				1452
%HV	0.9%				0.3%				0.8%				n/a				0.6%
PHF	0.89				0.86				0.88				n/a				0.93



SCJ15075M_15p

Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

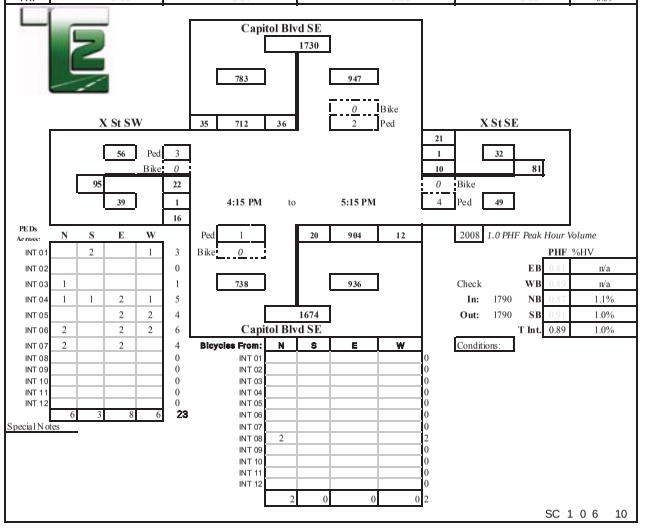
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & X St SE/SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) X St SE				From West on (EB) X St SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	9	173	5	2	2	190	7	0	0	0	3	0	5	1	2	397
4:30 P	3	8	176	10	2	3	192	1	0	2	1	4	0	4	0	2	403
4:45 P	1	6	185	8	2	7	214	3	0	1	0	7	0	5	1	5	442
5:00 P	2	7	161	8	1	7	235	6	0	4	0	5	0	6	0	4	443
5:15 P	2	15	190	9	5	3	263	2	0	3	0	5	0	7	0	5	502
5:30 P	1	10	168	7	2	5	167	0	0	3	1	3	0	2	0	5	371
5:45 P	4	7	195	4	1	5	191	1	0	1	0	3	0	4	0	0	411
6:00 P	2	9	146	9	1	1	121	4	0	3	0	4	0	5	0	1	303
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	17	71	1394	60	16	33	1573	24	0	17	2	34	0	38	2	24	3272
Peak Hour:	4:15 PM	to	5:15 PM														
Total	8	36	712	35	10	20	904	12	0	10	1	21	0	22	1	16	1790
Approach	783				936				32				39				1790
%HV	1.0%				1.1%				n/a				n/a				1.0%
PHF	0.91				0.87				0.89				0.93				0.89



SC 1 0 6 10

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

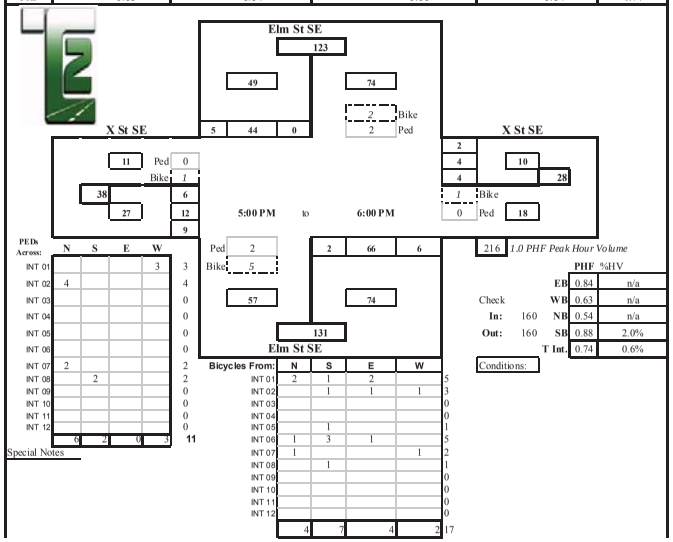
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Elm St SE & X St SE **Date of Count:** Thurs 6/25/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Elm St SE				From South on (NB) Elm St SE				From East on (WB) X St SE				From West on (EB) X St SE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	0	3	0	0	2	13	0	0	0	1	0	0	1	1	1	22
4:30 P	0	0	13	0	0	1	12	1	0	0	2	0	0	0	3	3	35
4:45 P	0	0	10	2	0	1	12	0	0	1	0	0	0	1	3	0	30
5:00 P	0	0	11	2	0	1	7	2	0	1	1	0	0	3	0	0	28
5:15 P	0	0	12	0	0	1	29	4	0	2	0	1	0	1	2	2	54
5:30 P	1	0	8	2	0	1	16	0	0	0	2	0	0	4	1	1	35
5:45 P	0	0	13	1	0	0	10	2	0	0	0	1	0	0	4	4	35
6:00 P	0	0	11	2	0	0	11	0	0	2	2	0	0	1	5	2	36
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	0	81	9	0	7	110	9	0	6	8	2	0	11	19	13	275
Peak Hour: 5:00 PM to 6:00 PM																	
Total	1	0	44	5	0	2	66	6	0	4	4	2	0	6	12	9	160
Approach	49				74				10				27				160
%HV	2.0%				n/a				n/a				n/a				0.6%
PHF	0.88				0.54				0.63				0.84				0.74



Prepared for: **SCJ Alliance/Shea Carr Jewell**

Traffic Count Consultants, Inc.

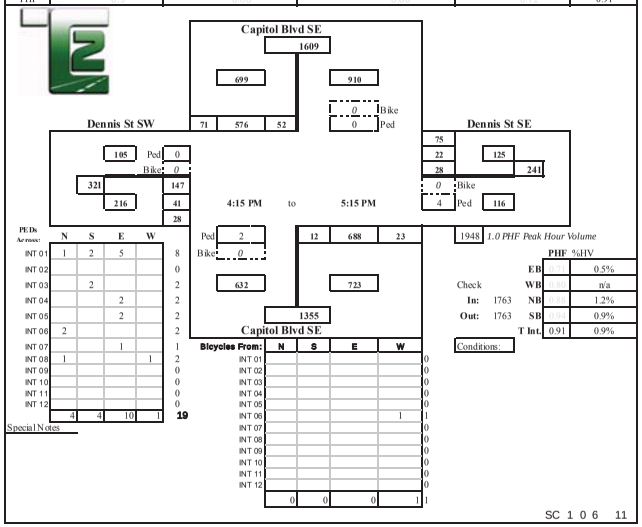
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Dennis St SE/SW **Date of Count:** Wed 3/05/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Dennis St SE				From West on (EB) Dennis St SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	14	135	19	2	2	144	15	0	16	4	15	0	28	7	4	403
4:30 P	3	17	139	13	2	4	151	4	0	7	5	14	0	30	4	7	395
4:45 P	1	7	152	12	2	4	155	7	0	8	8	23	0	32	12	5	425
5:00 P	0	16	134	23	2	3	196	6	0	7	5	16	0	42	4	4	456
5:15 P	2	12	151	23	3	1	186	6	0	6	4	22	1	43	21	12	487
5:30 P	2	15	125	19	2	5	136	4	0	7	4	11	0	25	9	6	366
5:45 P	4	17	156	13	1	3	148	4	0	6	8	18	0	19	7	3	402
6:00 P	2	11	116	15	1	2	91	3	0	8	4	17	1	13	9	4	293
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	16	109	1108	137	15	24	1207	49	0	65	42	136	2	232	73	45	3227
Peak Hour: 4:15 PM to 5:15 PM																	
Total	6	52	576	71	9	12	688	23	0	28	22	75	1	147	41	28	1763
Approach	699				723				125				216				1763
%HV	0.9%				1. %				n/a				0.5%				0.9%
PHF	0.0				0.80				0.00				0.73				0.91



SC 1 0 6 11

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

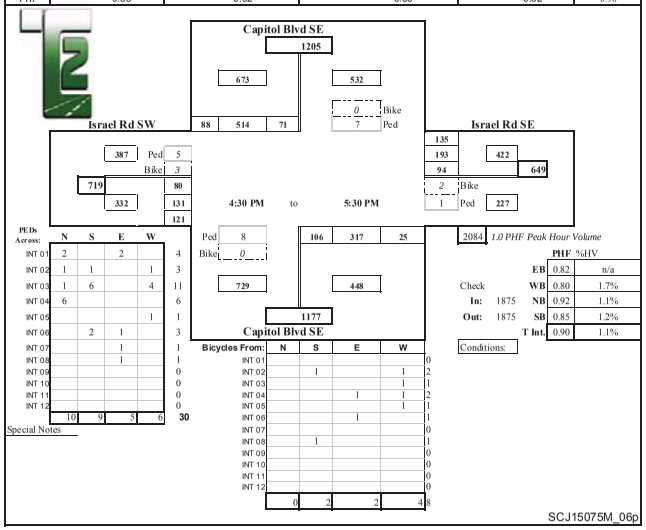
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Israel Rd SE/SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Israel Rd SE				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	20	94	13	1	34	61	12	3	14	53	25	0	35	34	35	430
4:30 P	1	15	106	29	3	19	77	7	1	12	40	25	1	24	31	25	410
4:45 P	1	21	110	22	1	20	78	8	2	30	45	41	0	15	39	28	457
5:00 P	3	17	110	17	2	23	88	11	3	20	40	40	0	21	31	21	439
5:15 P	1	20	137	21	1	32	75	3	1	30	68	34	0	22	30	49	521
5:30 P	3	13	157	28	1	31	76	3	1	14	40	20	0	22	31	23	458
5:45 P	3	13	104	18	2	24	65	4	2	14	28	20	0	29	22	16	357
6:00 P	2	10	94	21	2	23	76	1	5	22	26	9	0	21	22	57	382
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	15	129	912	169	13	206	596	49	18	156	340	214	1	189	240	254	3454
Peak Hour: 4:30 PM to 5:30 PM																	
Total	8	71	514	88	5	106	317	25	7	94	193	135	0	80	131	121	1875
Approach	673				448				422				332				1875
%HV	1.2%				1.1%				1.7%				n/a				1.1%
PHF	0.85				0.92				0.80				0.82				0.90



SCJ15075M_06p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

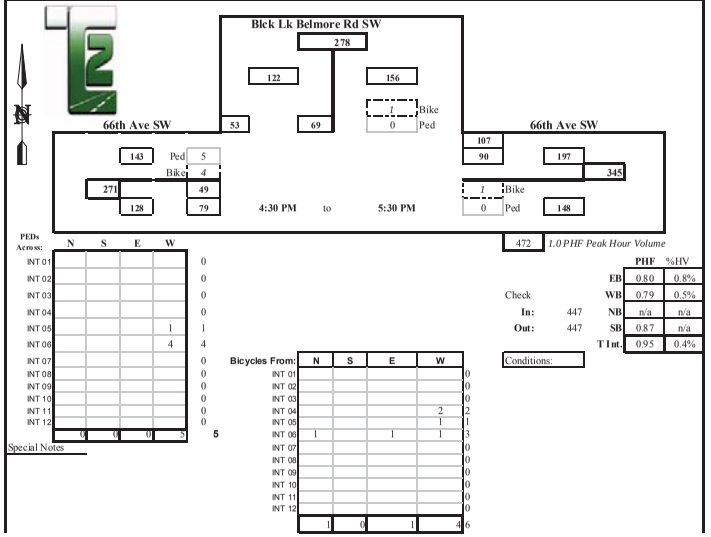
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Black Lake Belmore Rd SW & 66th Ave SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Blck Lk Belmore Rd SW				From South on (NB) 0				From East on (WB) 66th Ave SW				From West on (EB) 66th Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	16	0	17	0	0	0	0	0	0	20	12	0	6	10	0	81
4:30 P	2	21	0	13	0	0	0	0	3	0	19	23	0	10	10	0	96
4:45 P	0	17	0	18	0	0	0	0	1	0	29	25	0	9	20	0	118
5:00 P	0	8	0	19	0	0	0	0	0	0	18	18	0	13	27	0	103
5:15 P	0	22	0	10	0	0	0	0	0	0	21	24	1	18	14	0	109
5:30 P	0	22	0	6	0	0	0	0	0	0	22	40	0	9	18	0	117
5:45 P	0	19	0	12	0	0	0	0	0	0	22	15	0	4	15	0	87
6:00 P	0	10	0	5	0	0	0	0	1	0	22	24	0	7	11	0	79
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	135	0	100	0	0	0	0	5	0	173	181	1	76	125	0	790
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	69	0	53	0	0	0	0	1	0	90	107	1	49	79	0	447
Approach	122				0				197				128				447
%HV	n/a				n/a				0.5%				0.8%				0.4%
PHF	0.87				n/a				0.79				0.80				0.95



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

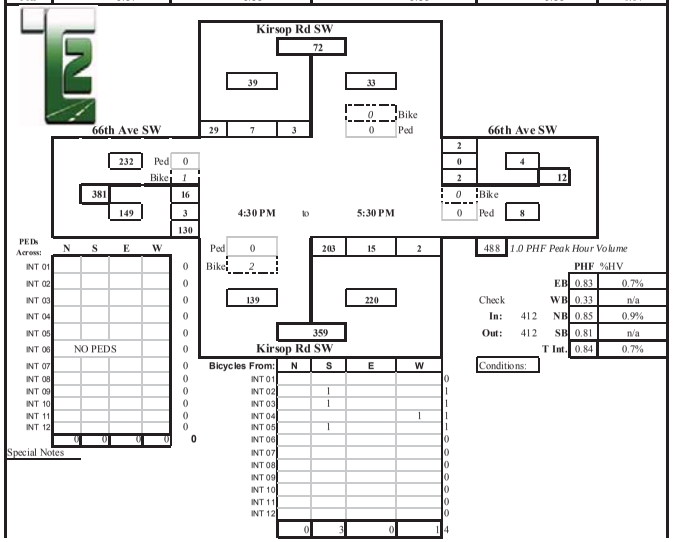
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Kirsop Rd SW & 66th Ave SW **Date of Count:** Tues 6/30/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Kirsop Rd SW				From South on (NB) Kirsop Rd SW				From East on (WB) 66th Ave SW				From West on (EB) 66th Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	1	2	1	41	7	0	0	0	0	0	1	4	2	21	78
4:30 P	0	2	5	3	0	53	6	0	0	0	1	0	1	4	0	27	101
4:45 P	0	1	3	8	1	63	2	0	0	0	0	0	0	4	1	40	122
5:00 P	0	0	2	9	0	35	6	0	0	0	0	0	0	4	0	35	91
5:15 P	0	0	1	7	0	50	2	1	0	1	0	0	1	4	1	27	94
5:30 P	0	2	1	5	1	55	5	1	0	1	0	2	0	4	1	28	105
5:45 P	1	4	2	11	1	45	2	0	0	1	0	0	1	4	1	35	105
6:00 P	2	2	2	4	1	44	4	0	0	0	2	1	0	2	2	26	89
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	11	17	49	5	386	34	2	0	3	3	3	4	30	8	239	785
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	3	7	29	2	203	15	2	0	2	0	2	1	16	3	130	412
Approach	39				220				4				149				412
%HV	n/a				0.9%				n/a				0.7%				0.7%
PHF	0.81				0.85				0.33				0.83				0.84



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

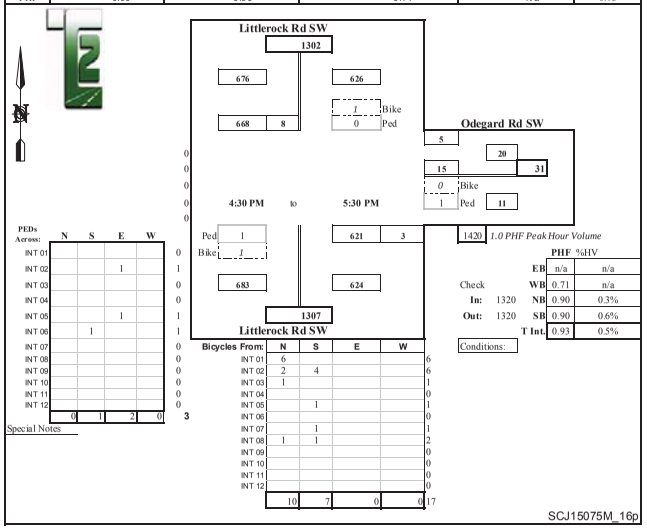
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Odegard Rd SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Odegard Rd SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	1	151	0	2	0	134	1	0	1	0	0	0	0	0	0	288
4:30 P	1	0	184	0	0	0	126	0	0	0	0	1	0	0	0	0	311
4:45 P	1	2	164	0	1	0	160	0	0	3	0	2	0	0	0	0	331
5:00 P	2	0	158	0	0	0	125	3	0	2	0	1	0	0	0	0	289
5:15 P	0	3	161	0	1	0	174	0	0	5	0	2	0	0	0	0	345
5:30 P	1	3	185	0	0	0	162	0	0	5	0	0	0	0	0	0	355
5:45 P	0	3	173	0	2	0	138	0	0	2	0	1	0	0	0	0	317
6:00 P	2	1	149	0	0	0	91	1	0	3	0	0	0	0	0	0	245
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	13	1325	0	6	0	1110	5	0	21	0	7	0	0	0	0	2481
Peak Hour: 4:30 PM to 5:30 PM																	
Total	4	8	668	0	2	0	621	3	0	15	0	5	0	0	0	0	1320
Approach	676				624				20				0				1320
%HV	0.6%				0.3%				n/a				n/a				0.5%
PHF	0.90				0.90				0.71				n/a				0.93



SCJ15075M_16p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

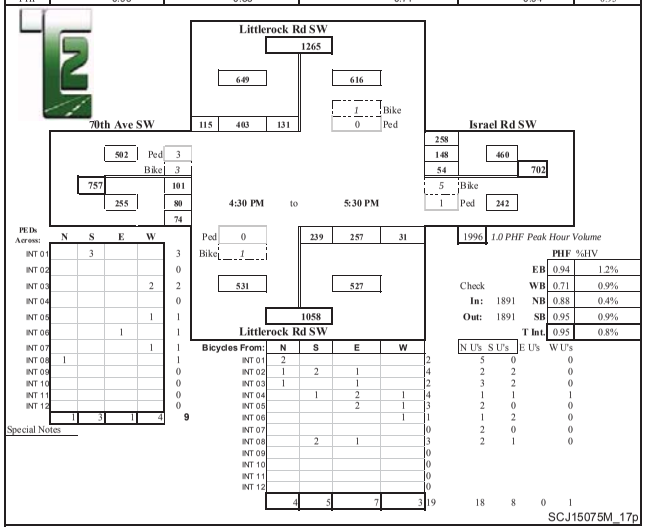
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Israel Rd SW/70th Ave SW **Date of Count:** Wed 6/24/2015

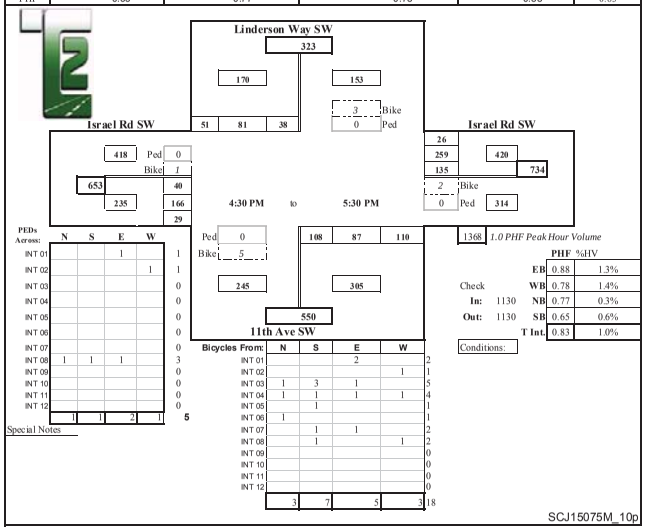
Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Israel Rd SW				From West on (EB) 70th Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	31	81	23	3	40	51	6	2	12	26	60	1	18	13	24	385
4:30 P	1	29	111	26	1	45	52	7	0	11	27	50	0	15	18	21	412
4:45 P	1	38	102	20	1	62	71	4	0	14	37	62	1	20	19	20	469
5:00 P	4	35	91	32	0	52	65	9	1	5	28	45	1	24	25	15	426
5:15 P	0	30	104	26	1	62	46	6	2	26	54	81	1	29	20	15	499
5:30 P	1	28	106	37	0	63	75	12	1	9	29	70	0	28	16	24	497
5:45 P	1	27	99	37	2	47	65	5	1	9	35	52	0	15	24	16	431
6:00 P	2	30	102	33	0	64	50	4	0	7	25	28	2	23	17	23	406
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	10	248	796	234	8	435	475	53	7	93	261	448	6	172	152	158	3525
Peak Hour: 4:30 PM to 5:30 PM																	
Total	6	131	403	115	2	239	257	31	4	54	148	258	3	101	80	74	1891
Approach	649				527				460				255				1891
%HV	0.9%				0.4%				0.9%				1.2%				0.8%
PHF	0.95				0.88				0.71				0.94				0.95



SCJ15075M_17p

Time Interval	From North on (SB) Linderson Way SW				From South on (NB) 11th Ave SW				From East on (WB) Israel Rd SW				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	6	27	14	0	22	13	29	3	46	79	15	0	6	32	19	308
4:30 P	0	10	18	12	1	22	13	16	1	29	62	4	0	2	40	10	238
4:45 P	1	10	22	11	0	35	27	37	2	26	65	7	1	6	46	10	302
5:00 P	0	8	14	7	0	16	21	23	1	27	49	3	2	17	43	7	235
5:15 P	0	15	27	23	1	43	22	30	2	49	79	6	0	6	38	4	342
5:30 P	0	5	18	10	0	14	17	20	1	33	66	10	0	11	39	8	251
5:45 P	0	5	15	12	0	18	21	1	2	30	63	4	1	8	35	10	222
6:00 P	0	2	11	13	0	5	15	16	1	17	50	4	0	14	28	9	184
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	61	152	102	2	175	149	172	13	257	513	53	4	70	301	77	2082
Peak Hour: 4:30 PM to 5:30 PM																	
Total	1	38	81	51	1	108	87	110	6	135	259	26	3	40	166	29	1130
Approach	170				305				420				235				1130
%HV	0.6%				0.3%				1.4%				1.3%				1.0%
PHF	0.65				0.77				0.78				0.88				0.83



SCJ15075M_10p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

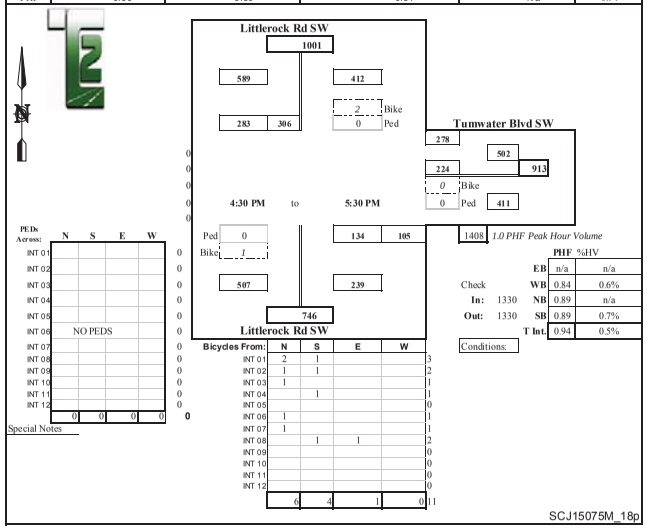
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Tumwater Blvd SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Tumwater Blvd SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	75	61	0	1	0	33	9	3	49	0	54	0	0	0	0	281
4:30 P	0	67	89	0	0	0	32	19	0	48	0	58	0	0	0	0	313
4:45 P	1	74	70	0	0	0	31	28	1	80	0	69	0	0	0	0	352
5:00 P	3	77	54	0	0	0	36	27	1	36	0	69	0	0	0	0	299
5:15 P	0	75	91	0	0	0	35	15	1	71	0	60	0	0	0	0	347
5:30 P	0	80	68	0	0	0	32	35	0	37	0	80	0	0	0	0	332
5:45 P	1	79	68	0	1	0	43	11	1	49	0	67	0	0	0	0	317
6:00 P	2	60	48	0	0	0	29	33	0	43	0	64	0	0	0	0	277
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	587	549	0	2	0	271	177	7	413	0	521	0	0	0	0	2518
Peak Hour: 4:30 PM to 5:30 PM																	
Total	4	306	283	0	0	0	134	105	3	224	0	278	0	0	0	0	1330
Approach	589				239				502				0				1330
%HV	0.7%				n/a				0.6%				n/a				0.8%
PHF	0.89				0.89				0.84				n/a				0.94



SCJ15075M_18p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

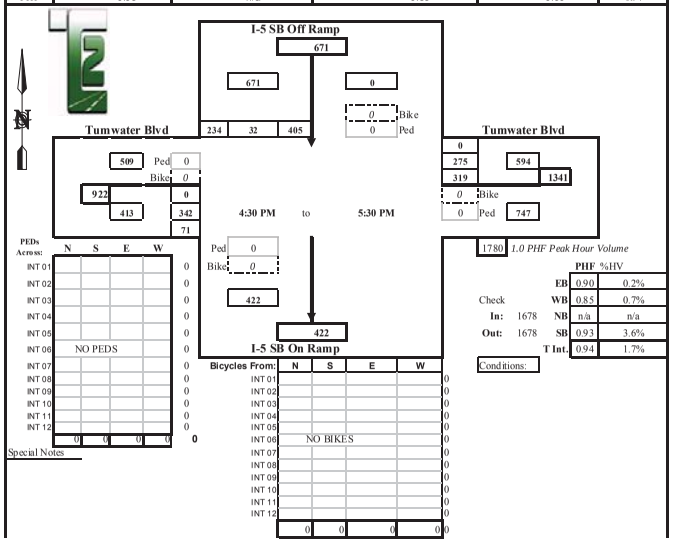
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB Ramps & Tumwater Blvd **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-5 SB Off Ramp				From South on (NB) I-5 SB On Ramp				From East on (WB) Tumwater Blvd				From West on (EB) Tumwater Blvd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	5	119	9	50	0	0	0	0	1	69	53	0	1	0	60	19	379
4:30 P	5	96	6	46	0	0	0	0	0	60	60	0	0	0	79	12	359
4:45 P	3	101	6	60	0	0	0	0	2	77	89	0	0	0	92	11	436
5:00 P	8	102	10	46	0	0	0	0	0	62	58	0	1	0	90	15	383
5:15 P	7	104	8	68	0	0	0	0	0	112	63	0	0	0	64	26	445
5:30 P	6	98	8	60	0	0	0	0	2	68	65	0	0	0	96	19	414
5:45 P	3	94	3	42	0	0	0	0	0	58	66	0	0	0	70	10	343
6:00 P	7	83	9	51	0	0	0	0	0	35	56	0	2	0	85	18	337
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	44	797	59	423	0	0	0	0	5	541	510	0	4	0	636	130	3096
Peak Hour: 4:30 PM to 5:30 PM																	
Total	24	405	32	234	0	0	0	0	4	319	275	0	1	0	342	71	1678
Approach	671				0				594				413				1678
%HV	3.6%				n/a				0.7%				0.2%				1.7%
PHF	0.93				n/a				0.85				0.90				0.94



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

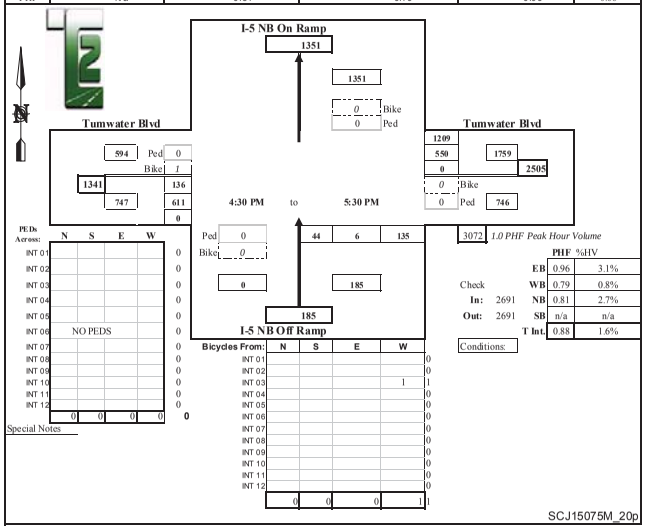
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 NB Ramps & Tumwater Blvd **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-5 NB On Ramp				From South on (NB) I-5 NB Off Ramp				From East on (WB) Tumwater Blvd				From West on (EB) Tumwater Blvd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	1	10	1	21	3	0	112	253	7	19	161	0	577
4:30 P	0	0	0	0	4	13	5	23	3	0	107	197	4	38	137	0	520
4:45 P	0	0	0	0	1	16	1	34	6	0	150	359	1	44	149	0	753
5:00 P	0	0	0	0	2	6	2	29	3	0	114	252	10	28	164	0	595
5:15 P	0	0	0	0	1	5	2	33	1	0	177	383	6	25	143	0	768
5:30 P	0	0	0	0	1	17	1	39	4	0	109	215	6	39	155	0	575
5:45 P	0	0	0	0	1	9	2	31	4	0	116	191	2	40	134	0	523
6:00 P	0	0	0	0	1	12	1	25	2	0	79	131	9	41	129	0	418
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	12	88	15	235	26	0	964	1981	45	274	1172	0	4729
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	0	0	0	5	44	6	135	14	0	550	1209	23	136	611	0	2691
Approach	0				185				1759				747				2691
%HV	n/a				2.7%				0.8%				3.1%				1.6%
PHF	n/a				0.81				0.79				0.96				0.88



SCJ15075M_20p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

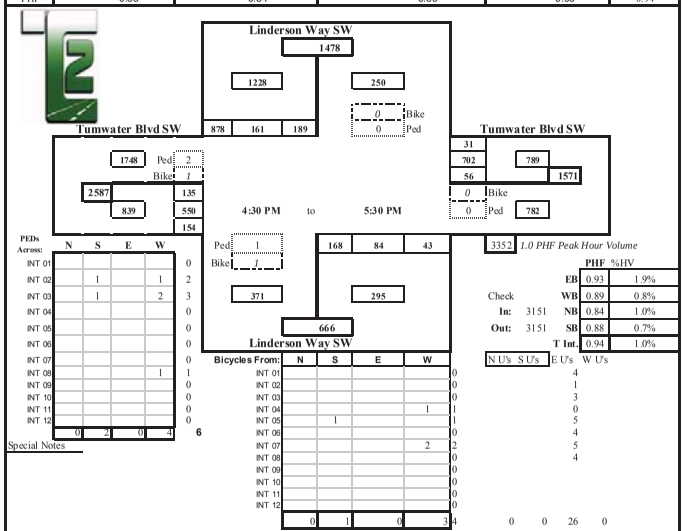
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Linderson Way SW & Tumwater Blvd SW **Date of Count:** Tues 3/03/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Linderson Way SW				From South on (NB) Linderson Way SW				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	6	41	27	138	0	34	9	13	1	11	164	12	9	28	133	30	640
4:30 P	2	32	18	125	1	19	11	11	4	5	128	7	13	39	129	47	571
4:45 P	4	55	27	268	2	49	20	13	0	16	185	9	4	23	131	29	825
5:00 P	1	39	38	171	1	48	28	12	2	10	141	8	6	41	138	46	720
5:15 P	1	61	27	261	0	42	13	8	2	15	196	10	3	36	128	41	838
5:30 P	2	34	69	178	0	29	23	10	2	15	180	4	3	35	153	38	768
5:45 P	2	40	23	136	3	48	28	14	0	13	170	8	1	21	127	23	651
6:00 P	1	16	13	63	1	21	11	12	0	12	119	3	3	24	128	27	449
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	19	318	242	1340	8	290	143	93	11	97	1283	61	42	247	1067	281	5462
Peak Hour: 4:30 PM to 5:30 PM																	
Total	8	189	161	878	3	168	84	43	6	56	702	31	16	135	550	154	3151
Approach	1228				295				789				839				3151
%HV	0.7%				1.0%				0.8%				1.9%				1.0%
PHF	0.88				0.84				0.89				0.93				0.94



SCJ15030M_02p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

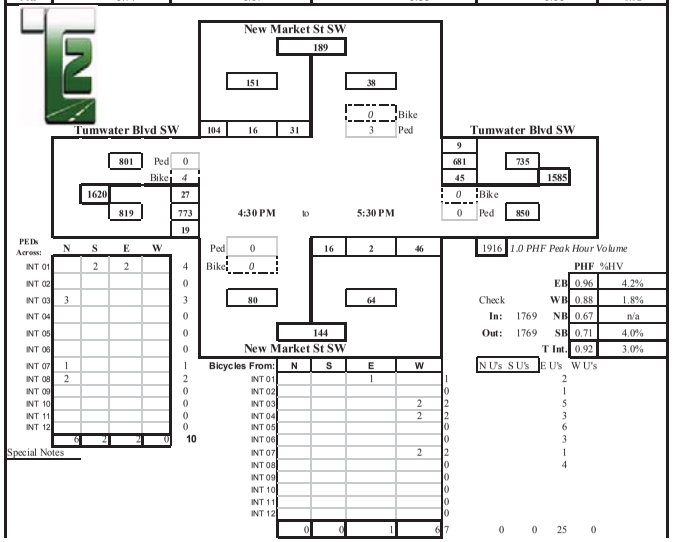
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: New Market St SW& Tumwater Blvd SW **Date of Count:** Tues 3/03/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) New Market St SW				From South on (NB) New Market St SW				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	1	1	10	1	3	0	10	3	3	174	1	5	8	176	2	389
4:30 P	0	1	1	7	1	0	1	3	4	7	134	1	6	2	153	4	314
4:45 P	1	3	0	14	0	7	1	16	0	12	189	0	9	5	197	3	447
5:00 P	0	6	4	24	0	5	1	10	5	12	133	1	5	3	187	6	392
5:15 P	4	12	4	31	0	2	0	17	1	12	193	3	15	13	186	6	479
5:30 P	1	10	8	35	0	2	0	3	7	9	166	5	5	6	203	4	451
5:45 P	1	4	3	33	1	3	0	7	3	10	160	2	2	2	175	6	405
6:00 P	0	2	0	12	1	5	0	4	3	3	123	3	7	2	168	2	324
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	39	21	166	4	27	3	70	26	68	1272	16	54	41	1445	33	3201
Peak Hour: 4:30 PM to 5:30 PM																	
Total	6	31	16	104	0	16	2	46	13	45	681	9	34	27	773	19	1769
Approach	151				64				735				819				1769
%HV	4.0%				n/a				1.8%				4.2%				3.0%
PHF	0.71				0.67				0.88				0.96				0.92



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

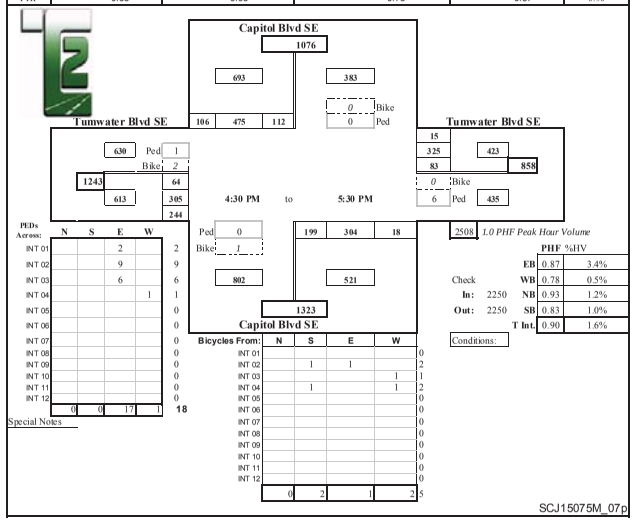
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Tumwater Blvd SE **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Tumwater Blvd SE				From West on (EB) Tumwater Blvd SE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	16	118	19	0	54	85	3	2	12	58	1	7	19	63	59	507
4:30 P	1	11	121	23	2	54	67	4	1	12	53	3	3	24	54	42	468
4:45 P	0	37	94	33	0	52	76	5	0	24	72	1	7	17	82	78	571
5:00 P	4	16	106	19	1	47	72	3	0	14	70	5	5	20	81	62	515
5:15 P	0	33	141	36	4	53	83	4	1	28	104	4	4	13	78	50	627
5:30 P	3	26	134	18	1	47	73	6	1	17	79	5	5	14	64	54	537
5:45 P	3	23	105	28	2	67	69	1	4	14	57	2	3	10	61	52	489
6:00 P	7	20	85	14	1	50	75	3	1	10	45	8	3	7	39	43	399
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	20	182	904	190	11	424	600	29	10	131	538	29	37	124	522	440	4113
Peak Hour: 4:30 PM to 5:30 PM																	
Total	7	112	475	106	6	199	304	18	2	83	325	15	21	64	305	244	2250
Approach	693				521				423				613				2250
%HV	1.0%				1.2%				0.5%				3.4%				1.6%
PHF	0.83				0.93				0.78				0.87				0.90



SCJ15075M_07p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

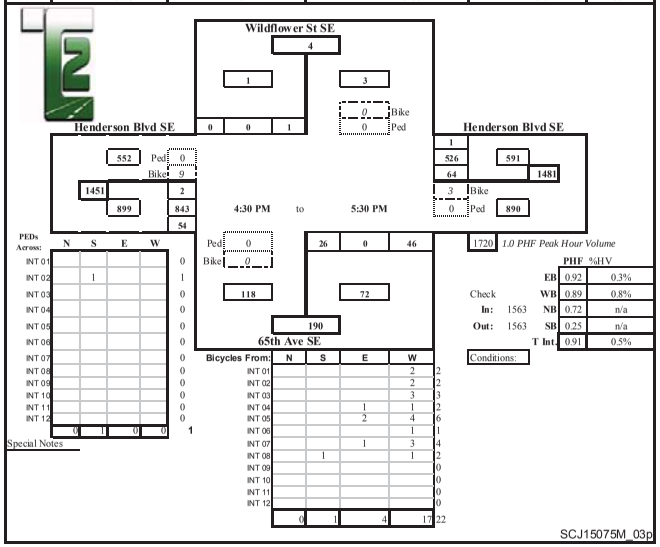
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Wildflower St SE/65th Ave SE & Henderson Blvd SE **Date of Count:** Wed 7/01/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Wildflower St SE				From South on (NB) 65th Ave SE				From East on (WB) Henderson Blvd SE				From West on (EB) Henderson Blvd SE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	2	0	1	0	5	0	6	1	10	97	2	0	0	146	10	279
4:30 P	0	0	0	0	0	10	0	6	1	16	105	0	1	0	157	14	308
4:45 P	0	0	0	0	0	4	0	13	0	14	111	0	0	1	205	12	360
5:00 P	0	0	0	0	0	9	0	7	2	12	126	1	0	1	184	14	354
5:15 P	0	1	0	0	0	3	0	11	3	17	149	0	1	0	222	16	419
5:30 P	0	0	0	0	0	10	0	15	0	21	140	0	2	0	232	12	430
5:45 P	0	0	0	0	0	13	0	7	1	17	129	0	2	1	178	10	355
6:00 P	0	0	0	0	0	6	0	17	4	18	139	0	0	0	131	13	324
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	3	0	1	0	60	0	82	12	125	996	3	6	3	1455	101	2829
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	1	0	0	0	26	0	46	5	64	526	1	3	2	843	54	1563
Approach	1				72				591				899				1563
%HV	n/a				n/a				0.8%				0.3%				0.5%
PHF	0.25				0.72				0.89				0.92				0.91



SCJ15075M_03p

Prepared for: **City of Tumwater**

Traffic Count Consultants, Inc.

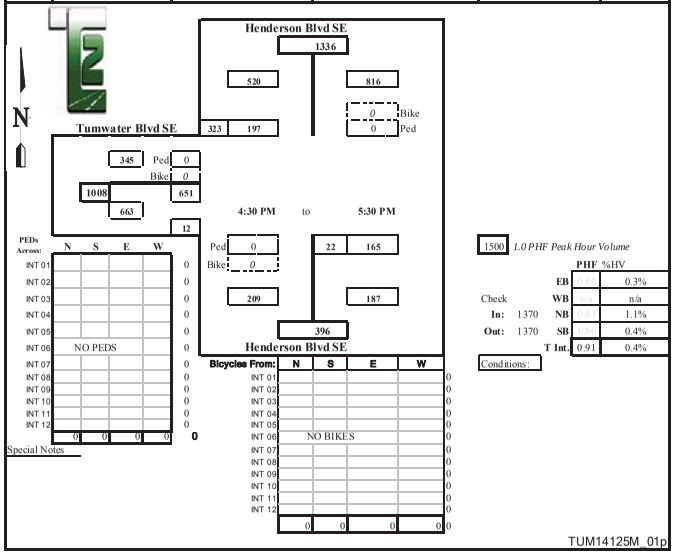
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Henderson Blvd SE & Tumwater Blvd SE **Date of Count:** Thurs 11/13/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Henderson Blvd SE				From South on (NB) Henderson Blvd SE				From East on (WB) 0				From West on (EB) Tumwater Blvd SE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	0	39	57	0	4	34	0	0	0	0	0	0	155	0	7	296
4:30 P	3	0	35	66	0	7	35	0	0	0	0	0	0	124	0	0	267
4:45 P	2	0	46	90	0	8	36	0	0	0	0	0	1	169	0	1	350
5:00 P	0	0	37	72	2	6	38	0	0	0	0	0	1	142	0	2	297
5:15 P	0	0	40	72	0	4	52	0	0	0	0	0	0	201	0	6	375
5:30 P	0	0	74	89	0	4	39	0	0	0	0	0	0	139	0	3	348
5:45 P	1	0	56	61	0	7	29	0	0	0	0	0	0	130	0	3	286
6:00 P	0	0	36	42	0	5	25	0	0	0	0	0	0	93	0	3	204
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	8	0	363	549	2	45	288	0	0	0	0	0	2	1153	0	25	2423
Peak Hour: 4:30 PM to 5:30 PM																	
Total	2	0	197	323	2	22	165	0	0	0	0	0	2	651	0	12	1370
Approach	520				187				0				663				1370
%HV	0.4%				1.1%				n/a				0.3%				0.4%
PHF	0.80				0.83				n/a				0.80				0.91



TUM14125M_01p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

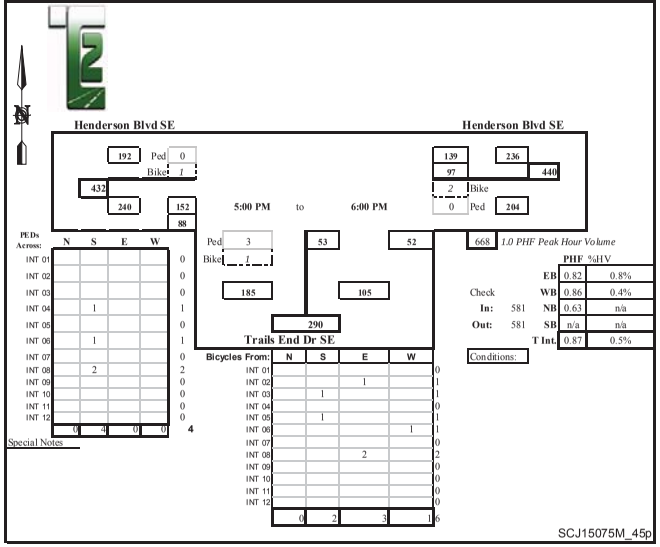
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Trails End Dr SE & Henderson Blvd SE **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Trails End Dr SE				From East on (WB) Henderson Blvd SE				From West on (EB) Henderson Blvd SE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	0	8	0	22	3	15	37	0	1	0	24	12	118
4:30 P	0	0	0	0	0	7	0	10	1	16	31	0	0	0	35	13	112
4:45 P	0	0	0	0	0	5	0	9	0	19	29	0	0	0	31	11	104
5:00 P	0	0	0	0	0	10	0	14	0	15	32	0	0	0	35	17	123
5:15 P	0	0	0	0	0	13	0	12	1	34	35	0	0	0	54	19	167
5:30 P	0	0	0	0	0	9	0	11	0	29	39	0	1	0	28	33	149
5:45 P	0	0	0	0	0	20	0	22	0	14	30	0	0	0	40	13	139
6:00 P	0	0	0	0	0	11	0	7	0	20	35	0	1	0	30	23	126
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	83	0	107	5	162	268	0	3	0	277	141	1038
Peak Hour: 5:00 PM to 6:00 PM																	
Total	0	0	0	0	0	53	0	52	1	97	139	0	2	0	152	88	581
Approach	0				105				236				240				581
%HV	n/a				n/a				0.4%				0.8%				0.5%
PHF	n/a				0.63				0.86				0.82				0.87



SCJ15075M_45p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

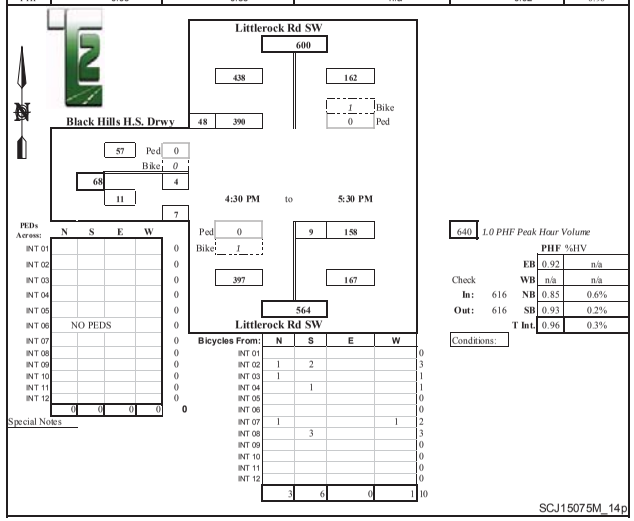
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Black Hills High School Drwy **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) 0				From West on (EB) Black Hills H.S. Drwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	0	88	3	1	1	39	0	0	0	0	0	0	1	0	0	132
4:30 P	0	0	97	15	0	3	38	0	0	0	0	0	1	3	0	2	158
4:45 P	1	0	92	16	0	2	47	0	0	0	0	0	0	1	0	2	160
5:00 P	0	0	83	15	0	2	42	0	0	0	0	0	0	0	0	2	144
5:15 P	0	0	108	6	0	1	35	0	0	0	0	0	0	2	0	1	153
5:30 P	0	0	107	11	1	4	34	0	0	0	0	0	0	1	0	2	159
5:45 P	0	0	94	10	1	2	48	0	0	0	0	0	1	1	0	0	155
6:00 P	1	0	80	17	0	2	35	0	0	0	0	0	0	4	0	2	140
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	0	749	93	3	17	318	0	0	0	0	0	2	13	0	11	1201
Peak Hour: 4:30 PM to 5:30 PM																	
Total	1	0	390	48	1	9	158	0	0	0	0	0	0	4	0	7	616
Approach	438				167				0				11				616
%HV	0.2%				0.6%				n/a				n/a				0.3%
PHF	0.93				0.85				n/a				0.92				0.96



SCJ15075M_14p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

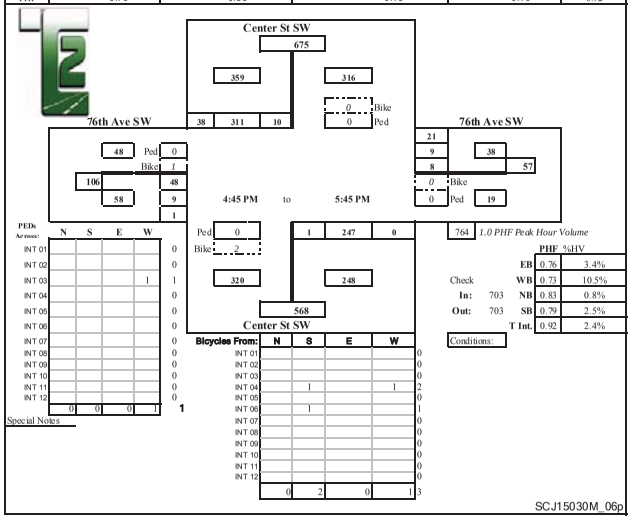
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Center St SW & 76th Ave SW **Date of Count:** Tues 3/03/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Center St SW				From South on (NB) Center St SW				From East on (WB) 76th Ave SW				From West on (EB) 76th Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	7	1	57	12	0	1	20	1	0	0	1	5	0	12	2	1	113
4:30 P	9	0	48	15	1	0	30	0	2	0	3	4	1	10	3	0	113
4:45 P	4	2	58	10	1	0	47	0	3	0	4	6	2	24	8	0	159
5:00 P	3	5	71	13	0	1	60	0	1	2	1	5	1	17	2	0	177
5:15 P	3	1	76	9	0	0	53	0	1	1	3	8	0	6	2	0	159
5:30 P	1	2	101	11	1	0	59	0	0	2	2	1	0	10	3	0	191
5:45 P	2	2	63	5	1	0	75	0	2	3	3	7	1	15	2	1	176
6:00 P	2	2	42	4	0	0	39	0	0	0	1	1	0	7	1	0	97
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	31	15	516	79	4	2	383	1	9	8	18	37	5	101	23	2	1185
Peak Hour:	4:45 PM				to	5:45 PM											
Total	9	10	311	38	2	1	247	0	4	8	9	21	2	48	9	1	703
Approach	359				248				38				58				703
%HV	2.5%				0.8%				10.5%				3.4%				2.4%
PHF	0.79				0.83				0.73				0.76				0.92



SCJ15030M_06p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

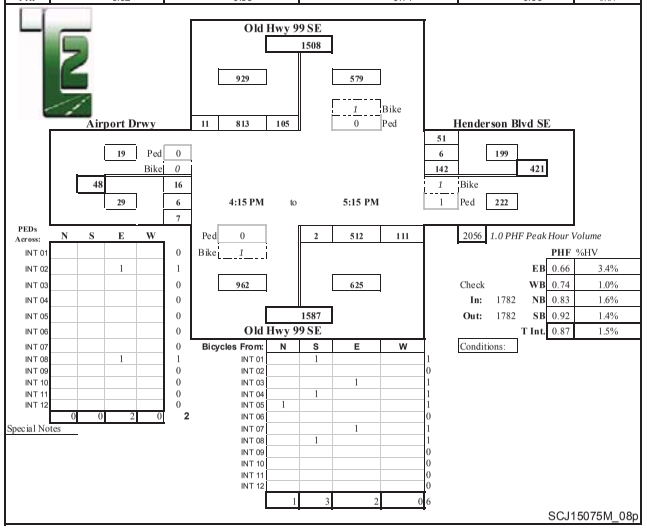
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Old Hwy 99 SE & Henderson Blvd SE **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Old Hwy 99 SE				From South on (NB) Old Hwy 99 SE				From East on (WB) Henderson Blvd SE				From West on (EB) Airport Drwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	11	20	191	0	2	1	119	25	0	31	0	15	0	5	2	1	410
4:30 P	3	26	207	5	6	1	126	25	0	34	0	12	0	1	0	3	440
4:45 P	2	26	196	2	1	0	145	24	0	19	2	14	0	7	2	2	439
5:00 P	3	24	188	3	2	0	95	21	1	37	2	12	0	4	2	1	389
5:15 P	5	29	222	1	1	1	146	41	1	52	2	13	1	4	2	1	514
5:30 P	2	26	224	2	1	0	86	23	0	32	1	21	0	7	3	0	425
5:45 P	6	17	176	1	2	0	93	23	0	28	1	14	0	6	2	1	362
6:00 P	3	26	189	0	3	0	79	30	0	0	0	0	0	3	1	3	331
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	35	194	1593	14	18	3	889	212	2	233	8	101	1	37	14	12	3310
Peak Hour:	4:15 PM				to	5:15 PM											
Total	13	105	813	11	10	2	512	111	2	142	6	51	1	16	6	7	1782
Approach	929				625				199				29				1782
%HV	1.4%				1.6%				1.0%				3.4%				1.5%
PHF	0.92				0.83				0.74				0.66				0.87



SCJ15075M_08p

Prepared for: **City of Tumwater**

Traffic Count Consultants, Inc.

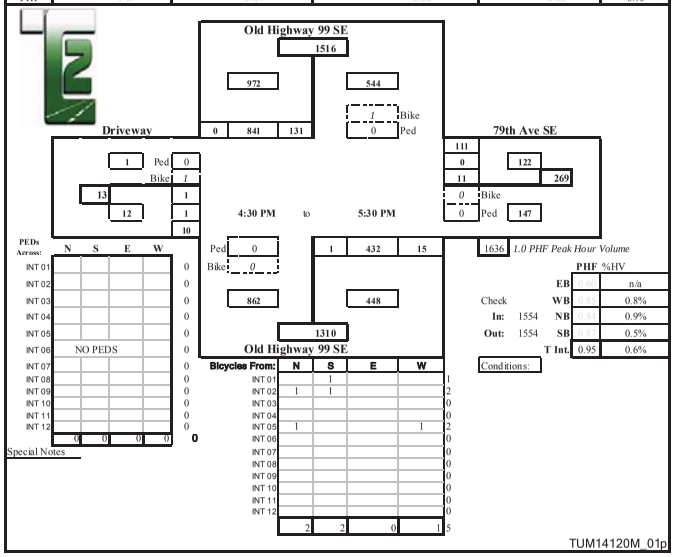
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Old Highway 99 SE & 79th Ave SE **Date of Count:** Tues 10/28/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Old Highway 99 SE				From South on (NB) Old Highway 99 SE				From East on (WB) 79th Ave SE				From West on (EB) Driveway				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	25	174	0	2	0	101	3	1	6	0	30	0	0	0	1	340
4:30 P	2	31	170	0	1	1	92	2	0	5	0	36	0	0	0	0	337
4:45 P	3	31	184	0	1	0	108	5	0	2	0	34	0	1	1	1	367
5:00 P	2	27	209	0	2	0	104	1	1	3	0	25	0	0	0	3	372
5:15 P	0	40	201	0	1	1	130	2	0	2	0	29	0	0	0	1	406
5:30 P	0	33	247	0	0	0	90	7	0	4	0	23	0	0	0	5	409
5:45 P	1	36	205	0	1	0	85	6	0	2	0	26	0	0	1	0	361
6:00 P	3	29	160	0	1	0	78	3	0	1	0	19	0	0	0	1	291
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	12	252	1550	0	9	2	788	29	2	25	0	222	0	1	2	12	2883
Peak Hour:	4:30 PM				to	5:30 PM											
Total	5	131	841	0	4	1	432	15	1	11	0	111	0	1	1	10	1554
Approach	972				448				122				12				1554
%HV	0.5%				0.9%				0.8%				n/a				0.6%
PHF	0.87				0.84				0.85				0.60				0.95



TUM14120M_01p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

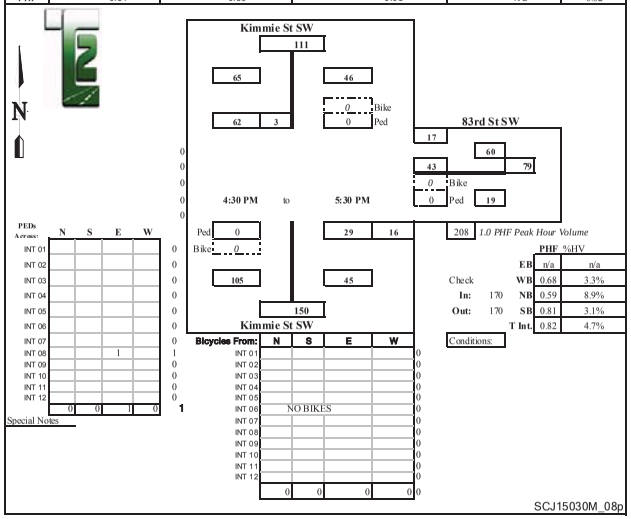
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Kimmie St SW & 83rd Ave SW **Date of Count:** Tues 3/03/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Kimmie St SW				From South on (NB) Kimmie St SW				From East on (WB) 83rd St SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	9	0	2	0	7	3	2	5	0	2	0	0	0	0	26
4:30 P	0	2	14	0	7	0	19	2	0	2	0	1	0	0	0	0	40
4:45 P	1	1	19	0	2	0	4	3	1	6	0	3	0	0	0	0	36
5:00 P	0	0	17	0	2	0	7	4	1	14	0	8	0	0	0	0	50
5:15 P	1	1	13	0	0	0	7	1	0	7	0	3	0	0	0	0	32
5:30 P	0	1	13	0	0	0	11	8	0	16	0	3	0	0	0	0	52
5:45 P	1	0	9	0	0	0	3	2	0	15	0	5	0	0	0	0	34
6:00 P	0	1	7	0	0	0	7	4	1	6	0	1	0	0	0	0	26
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	6	101	0	13	0	65	27	5	71	0	26	0	0	0	0	296
Peak Hour:	4:30 PM				to	5:30 PM											
Total	2	3	62	0	4	0	29	16	2	43	0	17	0	0	0	0	170
Approach	65				45				60				0				170
%HV	3.1%				8.9%				3.3%				n/a				4.7%
PHF	0.81				0.59				0.68				n/a				0.82



SCJ15030M_08p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

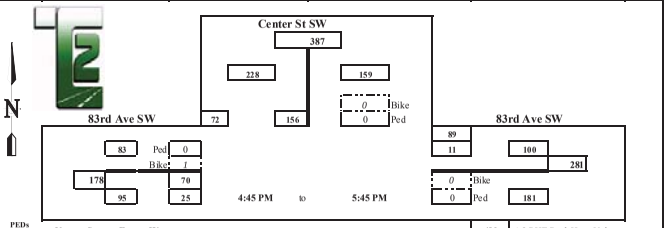
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Center St SW & 83rd Ave SW **Date of Count:** Tues 3/03/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Center St SW				From South on (NB) 0				From East on (WB) 83rd Ave SW				From West on (EB) 83rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	30	0	23	0	0	0	0	3	0	3	12	0	13	4	0	85
4:30 P	0	13	0	15	0	0	0	0	0	0	4	9	0	10	2	0	53
4:45 P	2	25	0	13	0	0	0	0	0	0	2	12	2	15	4	0	71
5:00 P	1	33	0	16	0	0	0	0	0	0	4	17	1	28	6	0	104
5:15 P	0	36	0	23	0	0	0	0	0	0	3	20	0	8	6	0	96
5:30 P	1	56	0	16	0	0	0	0	2	0	4	26	0	16	2	0	120
5:45 P	0	31	0	17	0	0	0	0	1	0	0	26	0	18	11	0	103
6:00 P	1	15	0	13	0	0	0	0	0	0	0	13	0	6	3	0	50
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	6	239	0	136	0	0	0	0	6	0	20	135	3	114	38	0	682
Peak Hour:	4:45 PM to 5:45 PM																
Total	2	156	0	72	0	0	0	0	3	0	11	89	1	70	25	0	423
Approach	228				0				100				95				423
%HV	0.9%				n/a				3.0%				1.1%				1.4%
PHF	0.79				n/a				0.83				0.70				0.88



PEDs Across:	N	S	E	W
INT 01				
INT 02				
INT 03				
INT 04		1		
INT 05				
INT 06				
INT 07		1		
INT 08				
INT 09				
INT 10				
INT 11				
INT 12				
	0	2	0	0

	PHF	%HV
EB	0.70	1.1%
WB	0.83	3.0%
NB	n/a	n/a
SB	0.79	0.9%
T Int.	0.88	1.4%

Check In: 423 Out: 423

Bicycles From:	N	S	E	W	N U's	S U's	E U's	W U's
INT 01					0	0		
INT 02					0	1		
INT 03					0	0		
INT 04				1	1	0		
INT 05					0	0		
INT 06					0	0		
INT 07					0	0		
INT 08					0	0		
INT 09					0			
INT 10					0			
INT 11					0			
INT 12					0			
	0	0	0	1	1	1	0	0

Special Notes

SCJ15030M_09p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

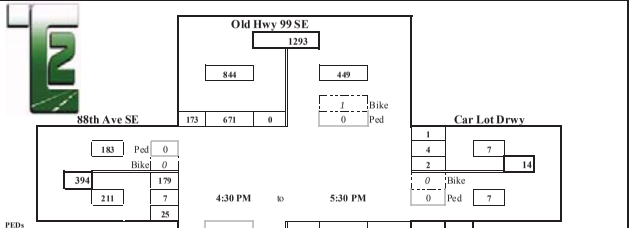
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Old Hwy 99 SE & 88th Ave SE **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Old Hwy 99 SE				From South on (NB) Old Hwy 99 SE				From East on (WB) Car Lot Drwy				From West on (EB) 88th Ave SE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	5	1	144	43	4	1	65	0	0	0	0	0	3	39	3	8	304
4:30 P	3	0	147	48	1	0	76	0	0	0	0	0	2	29	2	2	304
4:45 P	1	0	166	33	0	2	66	0	0	0	0	1	1	53	1	2	324
5:00 P	0	0	138	43	1	1	61	0	0	1	1	0	2	41	2	6	294
5:15 P	3	0	172	48	2	1	79	0	0	0	1	0	2	56	3	11	371
5:30 P	0	0	195	49	0	2	63	0	0	1	2	0	1	29	1	6	348
5:45 P	2	0	142	42	1	1	59	0	0	0	0	0	0	28	0	4	276
6:00 P	2	0	149	32	0	0	50	0	0	0	0	0	0	26	0	4	261
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	16	1	1253	338	9	8	519	0	0	2	4	1	11	301	12	43	2482
Peak Hour:	4:30 PM to 5:30 PM																
Total	4	0	671	173	3	6	269	0	0	2	4	1	6	179	7	25	1337
Approach	844				275				7				211				1337
%HV	0.5%				1.1%				n/a				2.8%				1.0%
PHF	0.86				0.86				0.58				0.75				0.90



PEDs Across:	N	S	E	W
INT 01				
INT 02				
INT 03				
INT 04				
INT 05				
INT 06				
INT 07				
INT 08				
INT 09				
INT 10				
INT 11				
INT 12				
	0	0	0	0

	PHF	%HV
EB	0.75	2.8%
WB	0.58	n/a
NB	0.86	1.1%
SB	0.86	0.5%
T Int.	0.90	1.0%

Check In: 1337 Out: 1337

Bicycles From:	N	S	E	W
INT 01				
INT 02				
INT 03				
INT 04	1			
INT 05				
INT 06				
INT 07				
INT 08		1		
INT 09				
INT 10				
INT 11				
INT 12				
	1	1	0	0

Conditions:

Special Notes

SCJ15075M_09p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

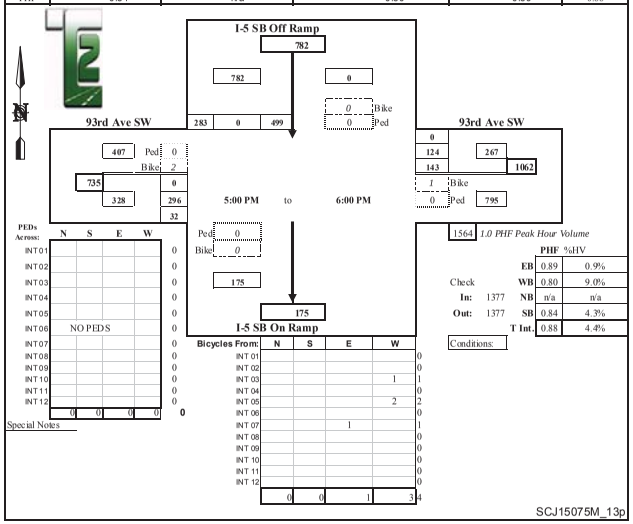
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB Ramps & 93rd Ave SW **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-5 SB Off Ramp				From South on (NB) I-5 SB On Ramp				From East on (WB) 93rd Ave SW				From West on (EB) 93rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	20	101	0	47	0	0	0	0	5	19	23	0	3	0	62	5	257
4:30 P	12	122	0	46	0	0	0	0	9	38	23	0	2	0	50	5	284
4:45 P	14	100	2	47	0	0	0	0	8	59	26	0	0	0	72	5	311
5:00 P	10	117	1	49	0	0	0	0	7	34	22	0	0	0	54	3	280
5:15 P	6	115	0	64	0	0	0	0	6	48	35	0	2	0	80	12	354
5:30 P	7	135	0	98	0	0	0	0	8	35	37	0	1	0	78	8	391
5:45 P	10	133	0	66	0	0	0	0	6	30	28	0	0	0	85	5	347
6:00 P	11	116	0	55	0	0	0	0	4	30	24	0	0	0	53	7	285
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	90	939	3	472	0	0	0	0	53	293	218	0	8	0	534	50	2509
Peak Hour:	5:00 PM to 6:00 PM																
Total	34	499	0	283	0	0	0	0	24	143	124	0	3	0	296	32	1377
Approach	782				0				267				328				1377
%HV	4.3%				n/a				9.0%				0.9%				4.4%
PHF	0.84				n/a				0.80				0.89				0.88



SCJ15075M_13p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

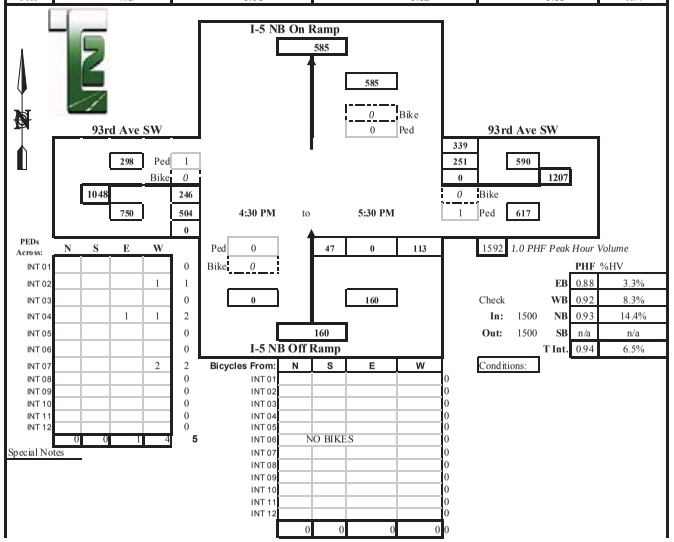
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 NB Ramps & 93rd Ave SW **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-5 NB On Ramp				From South on (NB) I-5 NB Off Ramp				From East on (WB) 93rd Ave SW				From West on (EB) 93rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	8	5	2	24	15	0	42	77	15	44	119	0	313
4:30 P	0	0	0	0	11	4	0	33	12	0	52	88	9	46	126	0	349
4:45 P	0	0	0	0	7	14	0	27	17	0	70	88	10	47	125	0	371
5:00 P	0	0	0	0	4	9	0	28	9	0	47	88	7	54	117	0	343
5:15 P	0	0	0	0	8	16	0	27	16	0	67	94	5	87	107	0	398
5:30 P	0	0	0	0	4	8	0	31	7	0	67	69	3	58	155	0	388
5:45 P	0	0	0	0	4	7	0	17	11	0	48	71	11	69	149	0	361
6:00 P	0	0	0	0	2	7	0	23	11	0	47	73	12	39	130	0	319
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	48	70	2	210	98	0	440	648	72	444	1028	0	2842
Peak Hour:	4:30 PM to 5:30 PM																
Total	0	0	0	0	23	47	0	113	49	0	251	339	25	246	504	0	1500
Approach	0				160				590				750				1500
%HV	n/a				14.4%				8.3%				3.3%				6.5%
PHF	n/a				0.93				0.92				0.88				0.94



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

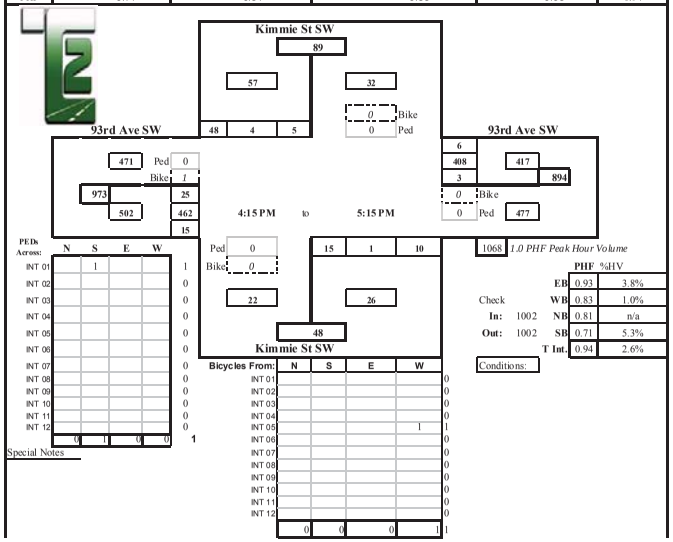
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Kimmie St SW & 93rd Ave SW **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Kimmie St SW				From South on (NB) Kimmie St SW				From East on (WB) 93rd Ave SW				From West on (EB) 93rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	3	4	6	12	0	4	0	3	1	0	78	0	7	13	109	2	231
4:30 P	1	2	1	17	0	3	0	2	0	1	97	0	7	9	120	6	258
4:45 P	0	2	0	16	0	5	0	1	1	0	102	0	6	6	118	0	250
5:00 P	1	1	1	7	0	5	0	3	0	2	84	5	4	5	108	6	227
5:15 P	1	0	2	8	0	2	1	4	3	0	125	1	2	5	116	3	267
5:30 P	1	2	2	14	0	1	2	1	0	2	80	1	1	15	129	4	253
5:45 P	1	3	1	8	0	6	0	3	1	0	66	1	3	11	113	6	218
6:00 P	2	0	3	3	0	3	1	2	1	1	72	1	2	4	117	4	211
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	10	14	16	85	0	29	4	19	7	6	704	9	32	68	930	31	1915
Peak Hour: 4:15 PM to 5:15 PM																	
Total	3	5	4	48	0	15	1	10	4	3	408	6	19	25	462	15	1002
Approach	57				26				417				502				1002
%HV	5.3%				n/a				1.0%				3.8%				2.6%
PHF	0.71				0.81				0.83				0.93				0.94



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

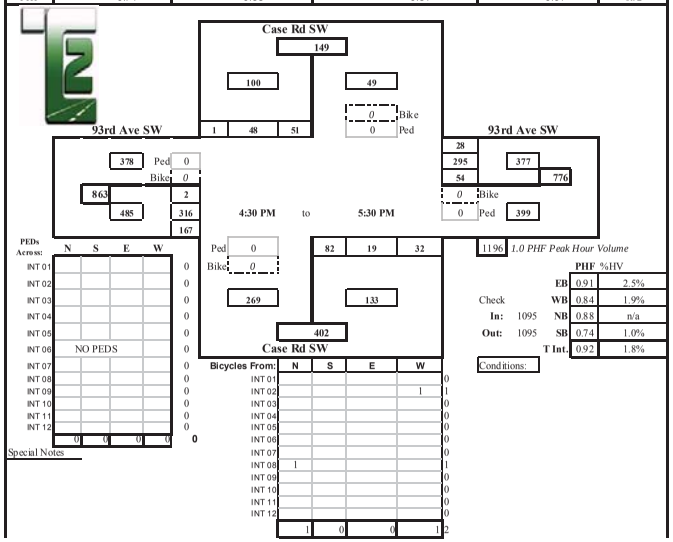
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Case Rd SW & 93rd Ave SW **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Case Rd SW				From South on (NB) Case Rd SW				From East on (WB) 93rd Ave SW				From West on (EB) 93rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	8	9	0	2	16	1	6	1	9	59	5	9	0	73	38	224
4:30 P	0	10	7	0	0	26	2	7	0	12	75	7	6	0	69	44	259
4:45 P	0	10	10	1	0	22	4	9	1	14	73	5	5	0	77	43	268
5:00 P	1	9	8	0	0	25	5	8	0	12	65	10	2	0	72	40	254
5:15 P	0	22	12	0	0	16	6	11	3	15	92	5	3	2	76	42	299
5:30 P	0	10	18	0	0	19	4	4	3	13	65	8	2	0	91	42	274
5:45 P	0	13	12	0	0	16	4	9	0	20	51	3	1	0	70	46	244
6:00 P	0	9	9	0	0	20	4	3	0	9	40	4	1	0	81	36	215
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	91	85	1	2	160	30	57	8	104	520	47	29	2	609	331	2037
Peak Hour: 4:30 PM to 5:30 PM																	
Total	1	51	48	1	0	82	19	32	7	54	295	28	12	2	316	167	1095
Approach	100				133				377				485				1095
%HV	1.0%				n/a				1.9%				2.5%				1.8%
PHF	0.74				0.88				0.84				0.91				0.92



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

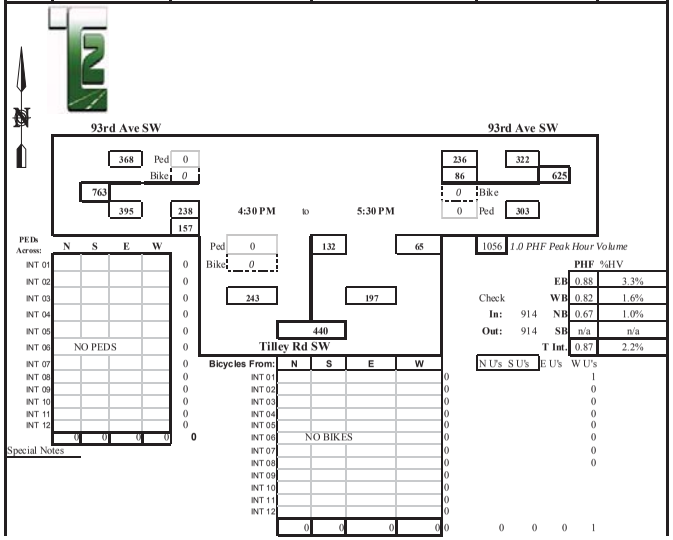
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Tilley Rd SW (South Leg) & 93rd Ave SW **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Tilley Rd SW				From East on (WB) 93rd Ave SW				From West on (EB) 93rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	0	22	0	14	1	19	49	0	10	0	49	37	190
4:30 P	0	0	0	0	0	48	0	16	0	14	53	0	5	0	51	33	215
4:45 P	0	0	0	0	1	43	0	30	0	13	42	0	4	0	55	42	225
5:00 P	0	0	0	0	0	20	0	14	0	24	65	0	3	0	49	36	208
5:15 P	0	0	0	0	0	40	0	14	3	24	74	0	3	0	78	34	264
5:30 P	0	0	0	0	1	29	0	7	2	25	55	0	3	0	56	45	217
5:45 P	0	0	0	0	0	24	0	6	0	14	51	0	1	0	46	46	187
6:00 P	0	0	0	0	0	16	0	5	0	18	35	0	1	0	59	33	166
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	2	242	0	106	6	151	424	0	30	0	443	306	1672
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	0	0	0	2	132	0	65	5	86	236	0	13	0	238	157	914
Approach	0				197				322				395				914
%HV	n/a				1.0%				1.6%				3.3%				2.2%
PHF	n/a				0.67				0.82				0.88				0.87



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

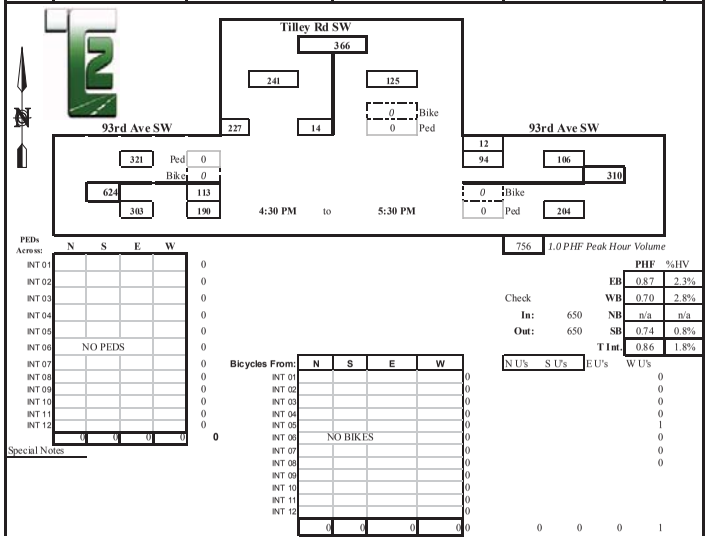
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Tilley Rd SW (North Leg) & 93rd Ave SW **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Tilley Rd SW				From South on (NB) 0				From East on (WB) 93rd Ave SW				From West on (EB) 93rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	4	0	50	0	0	0	0	0	0	18	5	8	22	43	0	142
4:30 P	1	5	0	39	0	0	0	0	1	0	26	2	3	22	38	0	132
4:45 P	0	4	0	40	0	0	0	0	0	0	15	4	2	39	45	0	147
5:00 P	0	2	0	55	0	0	0	0	0	0	35	3	3	34	36	0	165
5:15 P	1	3	0	78	0	0	0	0	2	0	18	3	2	25	62	0	189
5:30 P	1	5	0	54	0	0	0	0	1	0	26	2	0	15	47	0	149
5:45 P	0	3	0	44	0	0	0	0	0	0	22	4	0	21	34	0	128
6:00 P	0	4	0	28	0	0	0	0	0	0	23	0	1	14	53	0	122
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	30	0	388	0	0	0	0	4	0	183	23	19	192	358	0	1174
Peak Hour: 4:30 PM to 5:30 PM																	
Total	2	14	0	227	0	0	0	0	3	0	94	12	7	113	190	0	650
Approach	241				0				106				303				650
%HV	0.8%				n/a				2.8%				2.3%				1.8%
PHF	0.74				n/a				0.70				0.87				0.86



Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

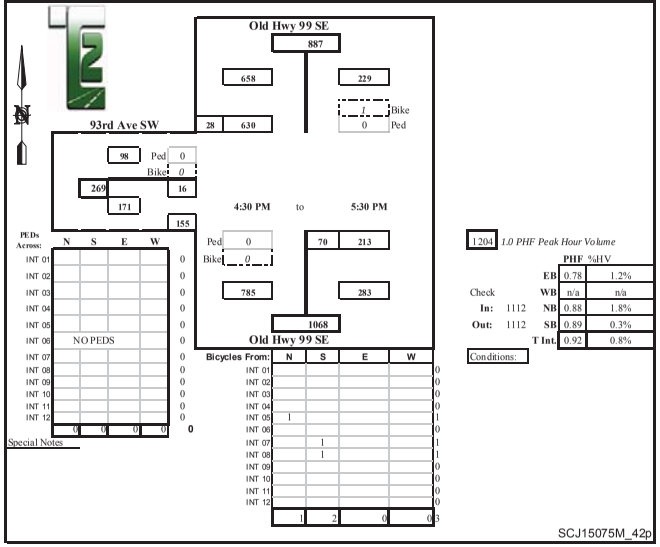
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Old Hwy 99 SE & 93rd Ave SW **Date of Count:** Tues 6/23/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Old Hwy 99 SE				From South on (NB) Old Hwy 99 SE				From East on (WB) 0				From West on (EB) 93rd Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	3	0	122	3	2	12	41	0	0	0	0	0	4	4	0	31	213
4:30 P	1	0	129	10	1	20	53	0	0	0	0	0	1	7	0	26	245
4:45 P	0	0	152	6	0	14	57	0	0	0	0	0	0	3	0	39	271
5:00 P	0	0	130	8	0	21	59	0	0	0	0	0	0	3	0	26	247
5:15 P	2	0	170	7	2	13	48	0	0	0	0	0	2	4	0	51	293
5:30 P	0	0	178	7	3	22	49	0	0	0	0	0	0	6	0	39	301
5:45 P	1	0	121	6	1	16	52	0	0	0	0	0	0	4	0	25	224
6:00 P	1	0	138	7	0	17	37	0	0	0	0	0	1	1	0	38	238
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	8	0	1140	54	9	135	396	0	0	0	0	0	8	32	0	275	2032
Peak Hour: 4:30 PM to 5:30 PM																	
Total	2	0	630	28	5	70	213	0	0	0	0	0	2	16	0	155	1112
Approach	658				283				0				171				1112
%HV	0.3%				1.8%				n/a				1.2%				0.8%
PHF	0.89				0.88				n/a				0.78				0.92



1204 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.78	1.2%
Check	WB	n/a	n/a
In: 1112	NB	0.88	1.8%
Out: 1112	SB	0.89	0.3%
	T Int.	0.92	0.8%

Conditions:

SCJ15075M_42p

APPENDIX A-2
INTERSECTION CRASH DATA

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
1 - R W Johnson Blvd /Mottman Rd														
City Street	R W JOHNSON BLVD SW		2400	MOTTMAN RD SW	4/2/2010	11:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	R W JOHNSON BLVD SW		2400	MOTTMAN RD SW	9/8/2010	14:29	Possible Injury	1	0	1	0	0	At Intersection and Related	Vehicle overturned
City Street	R W JOHNSON BLVD SW		2400	MOTTMAN RD SW	11/3/2011	16:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	R W JOHNSON BLVD SW		2400	MOTTMAN RD SW	10/30/2013	14:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	R W JOHNSON BLVD SW		2400	MOTTMAN RD SW	6/25/2012	16:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	MOTTMAN RD SW		3100	R W JOHNSON BLVD SW	8/7/2014	11:58	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	MOTTMAN RD SW		3200	R W JOHNSON BLVD SW	11/6/2012	16:12	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	MOTTMAN RD SW		3200	R W JOHNSON BLVD SW	11/4/2013	13:03	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
2 - Crosby Blvd /Mottman Rd														
City Street	CROSBY BLVD SW		1000	MOTTMAN RD SW	11/16/2011	13:00	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CROSBY BLVD SW		1000		9/9/2013	17:46	No Injury	0	0	3	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
City Street	CROSBY BLVD SW		1000		12/26/2013	12:59	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	CROSBY BLVD SW		1000		6/27/2013	17:47	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW		1000		1/9/2014	22:50	No Injury	0	0	2	0	0	At Driveway	From same direction - one left turn - one straight
City Street	CROSBY BLVD SW		1000		6/16/2014	15:00	No Injury	0	0	1	0	0	At Driveway	Fire Hydrant
City Street	MOTTMAN RD SW		1700	CROSBY BLVD SW	10/9/2010	15:01	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	MOTTMAN RD SW		1700		1/14/2010	15:51	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	MOTTMAN RD SW		1100		12/4/2014	7:51	No Injury	0	0	2	0	0	At Driveway	Entering at angle
State Route	101LX36642	0.24			11/18/2013	18:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			11/20/2013	17:50	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			11/3/2014	8:42	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			9/2/2014	16:40	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			8/7/2014	17:10	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			1/23/2010	17:45	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			2/11/2011	12:56	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	101LX36642	0.24			12/2/2013	17:43	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			5/26/2010	18:59	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	101LX36642	0.24			10/15/2011	20:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			1/19/2013	13:22	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
State Route	101LX36642	0.24			5/10/2010	13:23	No Injury	0	0	3	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
State Route	101LX36642	0.24			6/1/2012	11:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			2/19/2010	14:53	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
State Route	101LX36642	0.24			6/9/2012	9:15	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			9/4/2012	13:17	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			1/13/2010	12:23	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			11/21/2012	16:22	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			5/24/2013	16:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	101LX36642	0.24			2/4/2010	19:08	Evident Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
3 - Crosby Blvd/Irving St														
City Street	CROSBY BLVD SW		1000	IRVING ST SW	3/5/2010	13:24	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CROSBY BLVD SW		2800	IRVING ST SW	6/1/2014	17:04	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW		2800	IRVING ST SW	11/22/2010	9:46	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CROSBY BLVD SW		2800	IRVING ST SW	11/17/2010	10:59	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CROSBY BLVD SW		2800	IRVING ST SW	7/23/2010	17:51	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW			IRVING ST SW	7/2/2014	17:09	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CROSBY BLVD SW		2800	IRVING ST SW	10/14/2014	7:33	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW		2800	IRVING ST SW	6/24/2010	20:07	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CROSBY BLVD SW		2800	IRVING ST SW	12/11/2013	13:05	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CROSBY BLVD SW		1000	IRVING ST SW	3/2/2010	16:35	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW		1000	IRVING ST SW	12/11/2012	10:39	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW		1000	IRVING ST SW	1/15/2013	17:09	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CROSBY BLVD SW		2800		8/2/2010	13:41	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - all others
City Street	CROSBY LOOP			IRVING ST SW	2/23/2011	7:17	Evident Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - all others
City Street	IRVING ST SW		1500	CROSBY BLVD SW	2/21/2013	18:10	No Injury	0	0	1	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	IRVING ST SW		1550		6/25/2014	13:23	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	IRVING ST SW				9/2/2014	15:12	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - both moving - rear-end
City Street	IRVING ST SW		1400		5/17/2013	14:39	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
Miscellaneous Tr	SPSCC DRIVEWAY				9/25/2012	13:14	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
4 - 7th Ave/Irving St														

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
5 - Crosby Blvd/Barnes Blvd														
City Street	CROSBY BLVD SW		3000	BARNES BLVD SW	10/8/2012	14:37	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - both going straight - one stopped - rear-end
6 - Black Lake Blvd/Black Lake Belmore Rd														
City Street	BLACK LAKE BLVD SW		3510		3/2/2012	14:21	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	BLACK LAKE BLVD SW		3400		7/7/2010	14:38	No Injury	0	0	2	0	0	At Driveway	From same direction - one left turn - one straight
7 - R W Johnson Blvd /Sapp Rd														
City Street	R W JOHNSON BLVD SW		4600	SAPP RD SW	8/24/2012	2:34	No Injury	0	0	1	0	0	At Intersection and Related	Tree or Stump (stationary)
8 -Sapp Rd/Crosby Blvd														
City Street	SAPP RD SW		2000	CROSBY BLVD SW	4/25/2011	6:30	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
9 - 49th Ave/Black Lake Belmore Rd														
City Street	49TH AVE SW			BLACK LAKE BELMORE RD SW	8/8/2011	19:51	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	49TH AVE SW		3700	BLACK LAKE BELMORE RD SW	11/1/2010	15:52	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
10 - Capitol Blvd at Carlyon Ave/Sunset Way														
City Street	CAPITOL BLVD S		3100	CARLYON AVE SE	7/24/2012	12:19	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
11 -Deschutes Way / I-5 NB On-Ramp														
12 -Deschutes Way /US 101 WB On-Ramp														
State Route	005P210402	0.00			7/1/2011	20:51	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
13 -I-5/US 101 Off-Ramp at Desoto St/2nd Avenue														
State Route	005R110435	0.28			2/13/2012	17:07	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.29			9/25/2014	12:55	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.29			10/23/2010	13:20	Possible Injury	2	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.29			1/20/2011	18:25	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			4/19/2013	13:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			3/12/2013	7:01	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005R110435	0.30			7/6/2012	12:08	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005R110435	0.30			7/22/2012	11:38	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			5/28/2010	13:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			7/18/2014	11:05	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			10/31/2012	19:49	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			12/12/2013	15:16	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			11/19/2012	7:01	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R110435	0.30			12/9/2010	7:30	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			9/30/2014	18:47	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			2/19/2014	13:51	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110435	0.30			6/5/2012	13:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005S210373	0.22			6/3/2011	14:44	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
14 - 2nd Ave/Custer Way														
City Street	CUSTER WAY SW		100	N 2ND AVE SW	2/10/2010	7:02	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	CUSTER WAY SW		100	N 2ND AVE SW	7/31/2014	17:36	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	N 2 AV SW			CUSTER WY	11/2/2011	17:23	No Injury	0	0	1	0	0	At Intersection and Related	Bridge Rail - Face
City Street	N 2ND AVE SW		100	CUSTER WAY SW	10/14/2014	8:00	No Injury	0	0	1	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb
15 - Boston St /Custer Way														
City Street	CUSTER WAY SW		100	BOSTON ST SE	2/19/2012	12:48	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	CUSTER WAY SW		200	BOSTON ST SE	8/5/2013	21:20	Evident Injury	1	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
City Street	CUSTER WAY SW		200	BOSTON ST SE	5/24/2011	8:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW		200	BOSTON ST SE	6/14/2012	7:51	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW		200	BOSTON ST SE	1/21/2011	17:40	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
16 - Deschutes Way/Boston St														
City Street	BOSTON ST SE		3600	DESCHUTES WAY SW	8/9/2013	12:25	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	BOSTON ST SE			DESCHUTES WAY SW	10/18/2011	21:09	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- sideswipe
City Street	BOSTON ST SE		3600	DESCHUTES WAY SW	4/25/2012	17:24	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
City Street	BOSTON ST SE		3600	DESCHUTES WAY SW	7/16/2013	18:29	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	BOSTON ST SE		3600	DESCHUTES WAY SW	4/1/2014	9:31	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	BOSTON ST SE		3600		6/22/2011	17:29	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	DESCHUTES WAY SW				10/29/2011	16:49	No Injury	0	0	2	0	0	At Driveway	Entering at angle
17 - Cleveland Ave /Capitol Blvd														

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	CLEVELAND AVE			CAPITOL BLVD	9/10/2014	22:33	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning right hits pedestrian
City Street	CLEVELAND AVE SE		500	CAPITOL BLVD S	11/15/2013	14:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CLEVELAND AVE SE		500	CAPITOL BLVD S	9/4/2013	17:20	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CLEVELAND AVE SE		500	CAPITOL BLVD S	9/26/2014	18:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
18 - Custer Way /Capitol Blvd														
City Street	CAPITOL BLVD S		3500	CUSTER WAY SE	2/8/2014	9:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			CUSTER WAY SE	1/6/2012	6:20	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		3300	CUSTER WAY SE	8/9/2010	13:47	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		3400	CUSTER WAY SE	9/19/2014	12:40	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	CAPITOL BLVD S		3300	CUSTER WAY SW	9/22/2012	15:55	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
City Street	CAPITOL BLVD S		3300	CUSTER WAY SW	1/22/2011	9:42	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			CUSTER WY SW	10/11/2011	12:08	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		3400		7/29/2010	15:55	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY		300	CAPITOL BLVD S	8/20/2011	15:59	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	9/11/2014	18:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	8/13/2013	13:09	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	12/18/2013	10:19	Possible Injury	1	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SE		400	CAPITOL BLVD S	5/20/2014	15:45	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	6/30/2010	7:33	No Injury	0	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	9/15/2012	9:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	7/27/2013	14:45	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CUSTER WAY SW		3500	CAPITOL BLVD S	11/25/2013	12:04	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SW		300	CAPITOL BLVD S	1/27/2013	16:50	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
19 - Custer Way /North St at Cleveland Ave														
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	10/11/2014	14:20	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	11/6/2014	17:18	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	12/22/2011	17:30	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	9/10/2012	18:27	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	12/14/2014	8:43	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	10/22/2012	14:01	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CUSTER WAY SE		500	CLEVELAND AVE SE	5/21/2010	8:33	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CUSTER WAY SE		500		2/11/2011	12:32	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE			CLEVELAND AV SE	10/11/2011	11:40	Evident Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE		300	CLEVELAND AVE SE	1/21/2011	7:59	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	NORTH ST SE		200	CLEVELAND AVE SE	9/1/2011	18:06	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
City Street	NORTH ST SE			CLEVELAND AVE SE	3/14/2013	11:20	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE		300	CLEVELAND AVE SE	2/5/2013	16:03	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CLEVELAND AVE SE		500	NORTH ST	9/24/2013	17:55	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CLEVELAND AVE SE		400	NORTH ST SE	9/25/2013	16:01	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CLEVELAND AVE SE		200	NORTH ST SE	9/16/2011	12:19	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CLEVELAND AVE SE		400	NORTH ST SE	10/6/2013	15:36	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
City Street	CLEVELAND AVE SE			NORTH ST SE	3/17/2012	21:15	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CLEVELAND AVE SE		400	NORTH ST SE	8/28/2013	18:43	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
20 - Hoadly St /North St														
City Street	NORTH ST SE		800		5/23/2012	16:58	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	NORTH ST SE		900		11/7/2012	7:30	Possible Injury	2	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
21 - Deschutes Way / E Street / I-5 NB Off-Ramp														
22 - Capitol Blvd / E St														
City Street	CAPITOL BLVD S		3700	E ST SW	5/18/2014	19:12	Possible Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		0	E ST SW	12/15/2011	18:02	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		4100	E ST SW	11/12/2014	11:03	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning left hits pedestrian
City Street	CAPITOL BLVD S		4100	E ST SW	9/12/2014	12:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		3700	E ST SW	3/25/2011	14:34	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		3700	E ST SW	7/3/2012	14:19	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	E ST SW		100	CAPITOL BLVD S	5/21/2010	15:13	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	E ST SW		100	CAPITOL BLVD S	5/23/2014	12:36	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	E ST SW		100	CAPITOL BLVD S	11/4/2013	17:39	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	E ST SW		100	CAPITOL BLVD S	8/18/2010	18:29	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	E ST SW		4100		4/7/2010	17:01	No Injury	0	0	2	0	0	At Driveway	Entering at angle

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
23 - Cleveland Ave / South St														
City Street	CLEVELAND AVE SE		4200	SOUTH ST SE	8/25/2014	18:37	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	SOUTH ST SE		500	CLEVELAND AVE SE	6/4/2012	19:14	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
24 - 7th Ave / Linwood Ave														
City Street	LINWOOD AVE SW		400	S 7TH AVE SW	4/28/2013	21:41	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW		400	S 7TH AVE SW	5/7/2010	17:36	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW			S 7TH AVE SW	5/12/2014	16:30	Unknown	0	0	1	0	0	At Intersection and Related	Fence
25 - 2nd Ave / Linwood Ave														
City Street	LINWOOD AVE SW			S 2ND AVE SW	12/20/2013	17:24	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW			S 2ND AVE SW	10/10/2012	16:08	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW		300	S 2ND AVE SW	11/13/2012	9:09	No Injury	0	0	3	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW		300	S 2ND AVE SW	3/27/2014	20:30	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	S 2ND AVE SW			LINWOOD AVE SW	4/10/2014	13:19	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	6/27/2010	12:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	10/19/2013	11:21	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	S 2ND AVE SW			LINWOOD AVE SW	4/12/2011	7:48	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	11/25/2014	11:54	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	S 2ND AVE SW		1000	LINWOOD AVE SW	10/31/2010	11:56	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	S 2ND AVE SW		1000		12/3/2013	9:40	No Injury	0	0	2	0	0	At Driveway	Entering at angle
26 - Capitol Blvd / Linwood Ave														
City Street	CAPITOL BLVD SE		4000	LINWOOD AVE SW	11/1/2013	20:14	No Injury	0	0	1	0	0	At Intersection and Related	Bridge Abutment
City Street	CAPITOL BLVD SE		4700	LINWOOD AVE SW	3/2/2012	12:17	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SE			LINWOOD AVE SW	7/29/2011	15:16	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
City Street	CAPITOL BLVD SW			LINWOOD AVE SW	3/30/2013	17:15	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		4100	LINWOOD AVE SW	11/21/2014	12:27	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW			LINWOOD AVE SW	5/3/2014	20:42	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LINWOOD AVE SW			CAPITOL BLVD SE	8/3/2010	7:59	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LINWOOD AVE SW			CAPITOL BLVD SW	11/20/2012	14:42	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
27 - Henderson Blvd / Yelm Hwy														
City Street	HENDERSON BLVD SE		4600	YELM HWY SE	9/20/2014	21:22	Evident Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	8/31/2012	14:55	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE			YELM HWY SE	9/21/2014	10:35	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	11/24/2010	13:40	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	4/4/2011	6:59	Evident Injury	1	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	8/2/2013	21:41	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	12/18/2012	9:13	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	8/9/2012	19:01	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	12/31/2012	19:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE			YELM HWY SE	10/31/2014	14:46	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE			YELM HWY SE	10/14/2013	18:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE		1300	YELM HWY SE	11/19/2011	19:05	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	4/23/2010	19:10	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	10/19/2012	7:18	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	4/17/2013	18:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	2/5/2013	15:12	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE		4600	YELM HWY SE	7/7/2014	19:23	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4600	YELM HWY SE	1/9/2014	17:40	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	HENDERSON BLVD SE			YELM HWY SE	3/21/2014	15:20	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	5/13/2010	8:08	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	HENDERSON BLVD SE		4500	YELM HWY SE	6/30/2013	16:24	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY			HENDERSON BLVD	7/21/2011	22:42	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	9/22/2010	18:08	Evident Injury	1	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	4/30/2010	17:53	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	YELM HWY SE			HENDERSON BLVD SE	10/17/2014	11:40	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	3/7/2014	19:05	Evident Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE			HENDERSON BLVD SE	3/21/2014	7:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	7/11/2013	11:25	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	3/17/2014	18:45	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	1/4/2010	21:20	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	12/10/2014	16:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	5/3/2013	13:38	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	11/24/2010	13:28	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	9/25/2010	14:13	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	9/21/2010	20:07	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	7/12/2010	18:06	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	YELM HWY SE		1700	HENDERSON BLVD SE	7/13/2012	13:44	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
28 - Rural Rd / Trosper Rd														
City Street	TROSPER RD SW		2100	RURAL RD SW	5/27/2010	17:46	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		2100	RURAL RD SW	7/17/2012	15:48	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		2100	RURAL RD SW	1/8/2011	10:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		2100	RURAL RD SW	3/13/2012	8:14	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
29 - Lake Park Dr / Trosper Rd														
City Street	TROSPER RD SW		800	LAKE PARK DR SW	6/1/2012	17:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		800	LAKE PARK DR SW	11/11/2013	19:51	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TROSPER RD SW		800	LAKE PARK DR SW	9/17/2013	11:08	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		1000		4/28/2010	18:49	Serious Injury	1	0	1	0	1	At Driveway	Vehicle - Pedalcyclist
30 - Littlerock Rd / Trosper Rd														
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	12/8/2013	17:09	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	1/9/2013	17:16	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	12/6/2012	17:11	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	7/20/2013	13:13	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	10/7/2011	13:39	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	1/29/2010	8:18	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	5/18/2013	15:01	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	9/12/2012	14:37	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5300	TROSPER RD SW	2/3/2014	22:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	LITTLEROCK RD SW		5300		3/18/2010	19:39	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		4/17/2012	16:49	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	11/14/2013	13:23	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - all others
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	1/11/2014	12:41	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			LITTLEROCK RD SW	1/10/2012	10:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	8/25/2010	19:09	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	4/16/2010	18:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	10/25/2010	12:22	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	9/27/2013	14:49	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW		600	LITTLEROCK RD SW	8/14/2010	11:19	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	LITTLEROCK RD SW		5300		12/30/2013	16:33	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5300		11/10/2014	10:58	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		10/14/2012	19:24	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		11/9/2013	13:20	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		2/10/2010	15:51	Possible Injury	1	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW		5300		11/6/2011	9:00	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LITTLEROCK RD SW			S 2ND AVE SW	12/1/2014	17:00	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5300		9/24/2012	7:21	No Injury	0	0	1	0	0	At Driveway	Fence
City Street	LITTLEROCK RD SW		5300		7/26/2012	17:17	Possible Injury	1	0	2	0	0	At Driveway	Entering at angle
City Street	S 2ND AVE SW		500	TROSPER RD SW	11/24/2011	11:48	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	S 2ND AVE SW		1700		6/24/2010	11:36	No Injury	0	0	2	0	0	At Driveway	Same direction -- both turning right -- both moving -- sideswipe
City Street	TROSPER RD SW		600	S 2ND AVE SW	3/17/2010	16:21	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	TROSPER RD SW		600	S 2ND AVE SW	8/26/2011	20:27	Possible Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
31 - I-5 SB Ramps/Tyee Dr at Trosper Rd														
State Route	005LX10279	0.02			10/7/2014	13:36	Possible Injury	2	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			6/18/2012	22:44	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			5/1/2013	17:30	Possible Injury	3	0	3	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			11/14/2014	13:58	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			10/23/2010	18:24	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			10/13/2012	14:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			2/9/2012	17:38	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			10/1/2013	13:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
State Route	005LX10279	0.02			11/9/2012	16:55	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			2/14/2014	11:38	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX10279	0.02			5/18/2011	19:05	Possible Injury	1	0	4	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			10/29/2010	16:15	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			10/28/2013	11:46	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
State Route	005LX10279	0.02			2/24/2011	16:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			5/7/2014	11:54	Possible Injury	3	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			8/8/2012	13:23	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/25/2010	21:38	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10279	0.02			1/10/2014	13:10	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
State Route	005LX10279	0.02			8/17/2011	16:07	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
State Route	005LX10279	0.02			1/9/2011	11:17	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			2/1/2014	12:48	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			5/19/2014	16:01	Possible Injury	1	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			5/5/2011	12:51	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
State Route	005LX10279	0.02			11/26/2012	8:42	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			12/21/2010	17:55	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			6/16/2011	19:09	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From opposite direction - both going straight - sideswipe
State Route	005LX10279	0.02			4/7/2010	15:46	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
State Route	005LX10279	0.02			2/8/2013	14:23	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			8/3/2012	18:00	No Injury	0	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			9/16/2011	11:18	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			10/5/2010	16:47	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			8/25/2011	11:55	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			7/30/2014	12:46	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/4/2013	15:43	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			3/29/2012	11:32	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			9/16/2013	18:05	No Injury	0	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			12/23/2014	20:40	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			8/28/2013	20:00	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
State Route	005LX10279	0.02			9/6/2013	14:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/10/2014	17:31	Evident Injury	1	0	3	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			3/16/2012	16:28	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			9/15/2013	14:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.02			8/12/2014	17:20	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.02			3/20/2013	14:54	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.02			8/12/2014	18:29	Possible Injury	1	0	1	0	1	At Intersection and Related	Vehicle - Pedalcyclist
State Route	005LX10279	0.02			11/23/2013	12:55	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005LX10279	0.02			9/14/2013	11:42	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005S510247	0.02			12/12/2013	17:07	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.28			7/11/2011	14:26	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
State Route	005R110303	0.30			2/1/2011	16:20	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - all others
State Route	005R110303	0.30			8/18/2011	20:45	No Injury	0	0	1	0	0	Intersection Related but Not at Intersection	Vehicle overturned
State Route	005R110303	0.31			12/31/2014	10:35	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			4/1/2011	12:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
State Route	005R110303	0.32			3/7/2012	19:44	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			4/7/2011	16:22	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			10/5/2010	12:38	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
State Route	005R110303	0.32			10/7/2012	16:13	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			5/21/2012	14:25	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			4/19/2011	12:16	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			2/16/2011	18:06	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			8/24/2011	12:26	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			10/21/2014	11:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R110303	0.32			12/9/2011	9:26	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005R110303	0.32			5/7/2010	14:10	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW		500		8/23/2014	11:35	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
32 - I-5 NB Ramps / Trosper Rd														
State Route	005LX10279	0.12			10/28/2013	17:15	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.12			12/27/2011	11:30	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.12			12/28/2010	16:40	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.16			3/6/2012	14:52	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.18			3/10/2010	11:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX10279	0.18			4/20/2010	8:03	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.18			1/13/2010	6:56	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			1/15/2010	15:13	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			11/3/2010	11:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			1/14/2010	18:00	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			11/1/2014	20:48	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			8/13/2010	8:02	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.19			4/14/2013	15:29	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			3/31/2010	17:38	Unknown	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			7/1/2014	13:37	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			5/24/2013	16:26	No Injury	0	0	3	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			7/22/2011	13:56	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
State Route	005LX10279	0.19			5/25/2014	16:10	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			6/28/2014	14:29	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			7/28/2014	16:48	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.19			3/16/2012	19:24	Possible Injury	1	0	4	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10279	0.19			6/22/2014	16:58	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10279	0.21			12/19/2011	17:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
State Route	005LX10279	0.21			12/5/2011	11:18	Possible Injury	1	0	4	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005P110255	0.31			9/6/2013	18:00	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005P110255	0.31			6/2/2011	8:03	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P110255	0.31			12/6/2010	12:40	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
State Route	005P110255	0.31			4/26/2014	16:30	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
33 - Capitol Blvd / Trosper Rd														
City Street	TROSPER RD SW			CAPITOL BLVD SW	2/14/2013	18:44	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	9/1/2014	9:30	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	2/14/2013	18:44	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	TROSPER RD SW			CAPITOL BLVD SW	9/5/2012	8:05	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	2/10/2010	9:47	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	TROSPER RD SW			CAPITOL BLVD SW	10/29/2010	12:19	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	3/21/2012	12:38	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	10/1/2013	12:13	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TROSPER RD SW			CAPITOL BLVD SW	3/7/2014	8:29	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	7/7/2010	7:43	Possible Injury	2	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TROSPER RD SW			CAPITOL BLVD SW	7/20/2010	11:11	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	9/26/2014	16:40	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	10/22/2013	12:11	Possible Injury	1	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	1/21/2011	13:53	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	8/23/2014	12:30	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	12/28/2010	11:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	9/18/2014	19:59	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	4/26/2012	11:29	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	CAPITOL BLVD SW			TROSPER RD SW	8/7/2014	15:04	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	6/13/2013	13:04	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	4/12/2014	13:24	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	4/10/2010	9:13	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW			TROSPER RD SW	2/8/2012	16:37	Possible Injury	1	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	4/5/2014	16:11	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	6/18/2012	10:58	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	1/18/2014	12:11	Evident Injury	1	0	1	0	0	At Intersection and Related	Vehicle overturned
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	5/6/2011	15:54	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
City Street	CAPITOL BLVD SW		5100	TROSPER RD SW	11/21/2014	13:20	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CAPITOL BLVD SW			TROSPER RD SW	6/26/2012	14:53	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	7/21/2010	21:57	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	11/17/2014	15:31	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	10/15/2014	12:21	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD SW		5200	TROSPER RD SW	3/10/2011	16:04	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		5200		8/29/2014	23:30	Serious Injury	1	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		1000		12/12/2010	14:15	No Injury	0	0	2	0	0	At Driveway	Entering at angle

34 - Capitol Blvd / Lee St

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	CAPITOL BLVD SE			LEE ST SE	10/26/2011	12:01	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		5400	LEE ST SE	2/6/2013	11:26	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5600	LEE ST SE	9/25/2014	12:19	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5600	LEE ST SE	9/4/2014	20:48	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW		5400	LEE ST SE	11/5/2012	16:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SE	12/21/2013	10:36	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		5400	LEE ST SE	3/29/2011	15:16	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SE	11/27/2013	13:47	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW			LEE ST SE	10/30/2011	21:53	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		100	LEE ST SE	3/7/2012	16:04	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SE	6/21/2012	10:39	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SE	8/9/2012	13:12	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SE	11/1/2012	14:29	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SE	2/24/2010	16:10	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SW	4/21/2012	11:35	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SW	1/31/2014	12:42	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CAPITOL BLVD SW		5400	LEE ST SW	2/8/2010	16:13	Possible Injury	4	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SW	5/21/2012	13:36	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW			LEE ST SW	5/7/2013	10:32	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		5400	LEE ST SW	1/11/2010	16:49	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
City Street	CAPITOL BLVD SW		5400	LEE ST SW	2/2/2010	16:08	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SW	10/8/2012	13:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5600	LEE ST SW	9/2/2014	16:36	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5400	LEE ST SW	11/15/2013	16:55	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
City Street	CAPITOL BLVD SW		5400	LEE ST SW	6/14/2011	8:52	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5600	LEE ST SW	12/15/2014	11:57	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
City Street	CAPITOL BLVD SW		5400	LEE ST SW	8/18/2010	15:50	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		5600	LEE ST SW	10/12/2014	13:14	Possible Injury	1	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - both moving - sideswipe
City Street	CAPITOL BLVD SW		5500		8/12/2010	17:08	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
City Street	CAPITOL BLVD SW		5600		1/15/2013	12:24	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
City Street	LEE ST SE			CAPITOL BLVD SE	3/30/2010	10:59	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	LEE ST SE		100	CAPITOL BLVD SW	4/3/2012	15:30	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning left hits pedestrian
City Street	LEE ST SE		100		6/15/2013	19:38	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SE		100		5/10/2011	17:27	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SE		100		7/16/2013	11:45	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SW		200	CAPITOL BLVD SW	8/27/2013	12:14	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	LEE ST SW		100	MCDONALDS	10/6/2010	12:26	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SW		200		9/20/2010	16:37	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	LEE ST SW		200		3/20/2013	10:38	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	LEE ST SW		200		2/20/2012	15:37	No Injury	0	0	2	0	0	At Driveway	From same direction - one right turn - one straight
City Street	LEE ST SW		200		8/26/2013	12:23	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LEE ST SW		200		8/17/2012	12:19	No Injury	0	0	1	0	0	At Driveway	Utility Pole
35 - Littlerock Rd at Fred Meyer / Costco Drwy														
City Street	LITTLEROCK RD SW		5700	FRED MEYER COSTCO	12/2/2013	17:02	Possible Injury	1	0	1	1	0	At Intersection and Related	Vehicle turning left hits pedestrian
City Street	LITTLEROCK RD SW		5400	FRED MEYER COSTCO ENTRANC	5/24/2014	9:35	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
36 - Littlerock Rd / Costco Drwy														
City Street	LITTLEROCK RD SW		5400	COSTCO	10/25/2014	11:19	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	LITTLEROCK RD SW		5600	COSTCO DR	11/10/2014	15:45	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		5700	COSTCO DRVWY	11/14/2012	22:00	Evident Injury	1	0	1	1	0	At Intersection and Related	Vehicle going straight hits pedestrian
37 - Littlerock Rd / Kingswood Dr														
City Street	LITTLEROCK RD SW		6300	KINGSWOOD DR SW	5/14/2012	14:24	No Injury	0	0	1	0	0	Circulating Roundabout	Street Light Pole or Base
City Street	LITTLEROCK RD SW		5700	KINGSWOOD DR SW	6/6/2012	14:55	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5700	KINGSWOOD DR SW	12/31/2014	18:11	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5900	KINGSWOOD DR SW	1/23/2014	17:23	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		5900	KINGSWOOD DR SW	12/9/2014	7:28	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		6300	KINGSWOOD DR SW	11/14/2011	16:04	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		6300	KINGSWOOD DR SW	8/16/2011	13:37	Evident Injury	1	0	1	0	0	Circulating Roundabout	Street Light Pole or Base
City Street	LITTLEROCK RD SW		6300	KINGSWOOD DR SW	7/7/2010	12:20	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	LITTLEROCK RD SW		5900	KINGSWOOD DR SW	11/4/2014	12:43	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		5700	KINGSWOOD DR SW	11/10/2014	16:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	LITTLEROCK RD SW		6000		3/8/2010	13:39	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		6000		10/30/2012	12:22	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		5700		7/28/2012	12:05	Evident Injury	1	0	1	0	1	At Driveway	Vehicle - Pedalcyclist
City Street	LITTLEROCK RD SW		5700		10/1/2011	13:29	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LITTLEROCK RD SW		5700		9/21/2011	19:43	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
38 - Capitol Blvd / X St														
City Street	CAPITOL BLVD SW		6200	X ST SE	10/6/2014	17:17	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		6200	X ST SE	5/11/2013	11:24	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		6200	X ST SW	4/26/2011	17:57	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		6200		9/11/2013	13:59	Possible Injury	1	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
39 - Elm St / X St														
City Street	ELM ST SE		6200	X ST SE	12/14/2012	11:24	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
40 - Capitol Blvd /Dennis St														
City Street	CAPITOL BLVD S		6600	DENNIS ST SE	4/21/2012	10:37	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6600		7/9/2014	17:09	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	2/2/2011	18:12	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	2/24/2012	11:37	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	3/2/2012	17:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD SW		6500	DENNIS ST SE	1/15/2010	14:28	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD SW		6500	DENNIS ST SW	8/9/2012	23:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	CAPITOL BLVD SW		6500	DENNIS ST SW	5/7/2014	17:50	Serious Injury	1	0	1	0	0	At Intersection and Not Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	CAPITOL BLVD SW		6500		5/13/2014	16:05	No Injury	0	0	2	0	0	At Driveway	Entering at angle
41 - Capitol Blvd /Israel Rd														
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	6/28/2013	16:27	Serious Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	12/4/2013	12:54	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S			ISRAEL RD SE	1/24/2012	11:51	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	5/25/2010	7:41	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S			ISRAEL RD SE	3/26/2012	20:24	Evident Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	6/13/2013	9:09	Evident Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6800	ISRAEL RD SE	10/11/2014	0:16	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	2/12/2013	18:01	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		6800	ISRAEL RD SE	10/23/2014	13:44	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	3/5/2011	18:18	No Injury	0	0	2	0	0	At Driveway within Major Intersection	From same direction - one right turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	5/16/2013	18:12	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	6/18/2013	13:06	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S			ISRAEL RD SE	11/17/2011	16:02	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	3/1/2010	8:25	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6800	ISRAEL RD SE	9/25/2014	0:00	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S		6700	ISRAEL RD SE	7/26/2012	13:55	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SE			CAPITOL BLVD S	1/30/2014	19:41	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SE		0	CAPITOL BLVD S	6/15/2010	17:16	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	ISRAEL RD SE		0	CAPITOL BLVD S	5/8/2010	13:36	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	ISRAEL RD SE		200		6/17/2011	8:31	No Injury	0	0	2	0	0	At Driveway	Entering at angle
42 - Black Lake Belmore Rd /66th Ave														
City Street	66TH AVE SW		3800	BLACK LAKE BELMORE RD SW	3/27/2014	7:29	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	12/5/2014	14:54	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	11/16/2012	23:52	Evident Injury	1	0	1	0	0	At Intersection and Related	Tree or Stump (stationary)
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	7/12/2012	17:49	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
City Street	BLACK LAKE BELMORE RD S		6400	66TH AVE SW	9/12/2014	21:28	No Injury	0	0	1	0	0	At Intersection and Related	Over Embankment - No Guardrail Present
43 - Kirsop Rd /66th Ave														
City Street	66TH AVE SW		3100	KIRSOP RD SW	8/1/2011	17:33	No Injury	0	0	1	0	0	At Intersection and Related	Utility Pole
City Street	KIRSOP RD SW		3100	66TH AVE SW	1/6/2012	22:00	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	KIRSOP RD SW		6200		7/24/2010	18:38	Evident Injury	1	0	1	0	0	At Intersection and Not Related	Tree or Stump (stationary)
City Street	KIRSOP RD SW		6200		5/25/2012	1:13	No Injury	0	0	2	0	0	At Driveway	Entering at angle
44 - Littlerock Rd / Odegard Rd														
City Street	LITTLEROCK RD SW			ODEGARD RD SW	10/25/2013	12:17	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		6500	ODEGARD RD SW	11/21/2012	14:41	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		6400		9/11/2014	17:40	Possible Injury	1	0	2	0	0	Roundabout Related but not at Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		6500		11/10/2011	14:58	No Injury	0	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end

JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PEDS	#PEDAL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	LITTLEROCK RD SW		6600		7/3/2013	15:32	No Injury	0	0	1	0	1	At Driveway	Vehicle - Pedalcyclist
45 - Littlerock Rd at Israel Rd / 70th Ave														
City Street	ISRAEL RD SW			LITTLEROCK RD SW	4/14/2014	15:04	No Injury	0	0	1	0	0	At Intersection and Related	Metal Sign Post
City Street	LITTLEROCK RD SW		3300	ISRAEL RD SW	8/11/2013	18:59	No Injury	0	0	1	0	0	Circulating Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW			ISRAEL RD SW	10/12/2012	13:32	No Injury	0	0	1	0	0	Exiting Roundabout	Wood Sign Post
City Street	LITTLEROCK RD SW			ISRAEL RD SW	6/19/2013	17:57	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
City Street	LITTLEROCK RD SW			ISRAEL RD SW	2/23/2013	3:04	No Injury	0	0	1	0	0	Circulating Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW		0		7/5/2014	16:45	No Injury	0	0	1	0	0	Driveway Related but Not at Driveway	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW		1200		12/21/2014	20:45	Unknown	0	0	1	0	0	Circulating Roundabout	Wood Sign Post
City Street	LITTLEROCK RD SW			70TH AVE SW	10/15/2014	19:11	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
City Street	LITTLEROCK RD SW		6900	70TH AVE SW	12/13/2014	16:57	Possible Injury	1	0	1	0	0	Exiting Roundabout	Over Embankment - No Guardrail Present
City Street	LITTLEROCK RD SW			70TH AVE SW	10/7/2014	15:39	No Injury	0	0	2	0	0	Circulating Roundabout	Same direction -- both turning left -- both moving -- sideswipe
City Street	70TH AVE SW			LITTLEROCK RD SW	6/28/2010	13:35	No Injury	0	0	2	0	0	Entering Roundabout	Entering at angle
City Street	70TH AVE SW			LITTLEROCK RD SW	4/5/2010	11:34	No Injury	0	0	1	0	0	Exiting Roundabout	Retaining Wall (concrete, rock, brick, etc.)
46 - Linderson Way / Israel Rd														
City Street	ISRAEL RD SW		900	LINDERSON WAY SW	10/2/2013	7:40	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	ISRAEL RD SW		900	LINDERSON WAY SW	10/23/2013	17:04	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	ISRAEL RD SW		900	LINDERSON WAY SW	10/31/2012	14:24	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SW			LINDERSON WAY SW	11/18/2011	18:05	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	ISRAEL RD SW		900	LINDERSON WAY SW	12/10/2010	14:35	Possible Injury	1	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
City Street	LINDERSON WAY SW		6900		5/6/2014	14:24	No Injury	0	0	2	0	0	At Driveway	Entering at angle
City Street	LINDERSON WAY SW		6800		11/23/2011	7:27	No Injury	0	0	2	0	0	At Driveway	From same direction - one left turn - one straight
47 - Littlerock Rd /Tumwater Blvd														
City Street	LITTLEROCK RD SW		7200	TUMWATER BLVD SW	10/14/2014	14:20	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	8/29/2013	11:27	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		1700	TUMWATER BLVD SW	4/3/2014	10:31	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		7200	TUMWATER BLVD SW	11/5/2013	11:59	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW		7200	TUMWATER BLVD SW	8/7/2014	10:46	No Injury	0	0	2	0	0	Circulating Roundabout	Same direction -- both turning left -- both moving -- sideswipe
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	3/2/2011	12:28	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	3/26/2013	23:50	No Injury	0	0	1	0	0	Entering Roundabout	Concrete Barrier/Jersey Barrier - Face
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	3/26/2010	17:04	Possible Injury	1	0	2	0	0	Entering Roundabout	From same direction - both going straight - one stopped - rear-end
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	12/15/2010	17:22	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - one left turn - one straight
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	5/19/2010	17:12	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	LITTLEROCK RD SW		5100	TUMWATER BLVD SW	2/27/2014	7:29	No Injury	0	0	2	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW			TUMWATER BLVD SW	5/25/2013	14:50	No Injury	0	0	1	0	0	Exiting Roundabout	Metal Sign Post
City Street	LITTLEROCK RD SW		100		8/7/2013	13:11	No Injury	0	0	2	0	0	Circulating Roundabout	Wood Sign Post
City Street	LITTLEROCK RD SW				1/10/2011	8:41	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - both going straight - both moving - rear-end
City Street	LITTLEROCK RD SW		7100		12/6/2014	16:10	No Injury	0	0	1	0	0	Entering Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	LITTLEROCK RD SW				10/27/2012	13:30	No Injury	0	0	2	0	0	Roundabout Related but not at Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW			LITTLEROCK RD SW	1/29/2010	5:15	No Injury	0	0	1	0	0	Exiting Roundabout	Metal Sign Post
City Street	TUMWATER BLVD SW		5500	LITTLEROCK RD SW	9/13/2014	16:25	Evident Injury	1	0	1	0	0	Exiting Roundabout	Vehicle overturned
City Street	TUMWATER BLVD SW			LITTLEROCK RD SW	9/17/2010	18:40	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - one right turn - one straight
48 - I-5 SB Ramps /Tumwater Blvd														
State Route	005R110162	0.36			11/20/2014	6:59	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			2/14/2013	14:30	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			10/23/2014	19:01	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			12/7/2012	7:29	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			4/6/2010	17:09	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			1/24/2014	18:11	No Injury	0	0	3	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			2/22/2014	17:21	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			3/3/2014	10:00	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
State Route	005LX10130	0.00			1/25/2012	17:06	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX10130	0.00			3/5/2014	7:17	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.00			12/4/2012	18:14	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.00			11/3/2012	16:58	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.00			10/20/2011	15:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - all others
State Route	005LX10130	0.00			5/15/2014	12:25	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
State Route	005LX10130	0.00			7/24/2014	16:26	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
49 - I-5 SB Ramps /Tumwater Blvd														
State Route	005LX10130	0.16			6/15/2012	14:18	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle

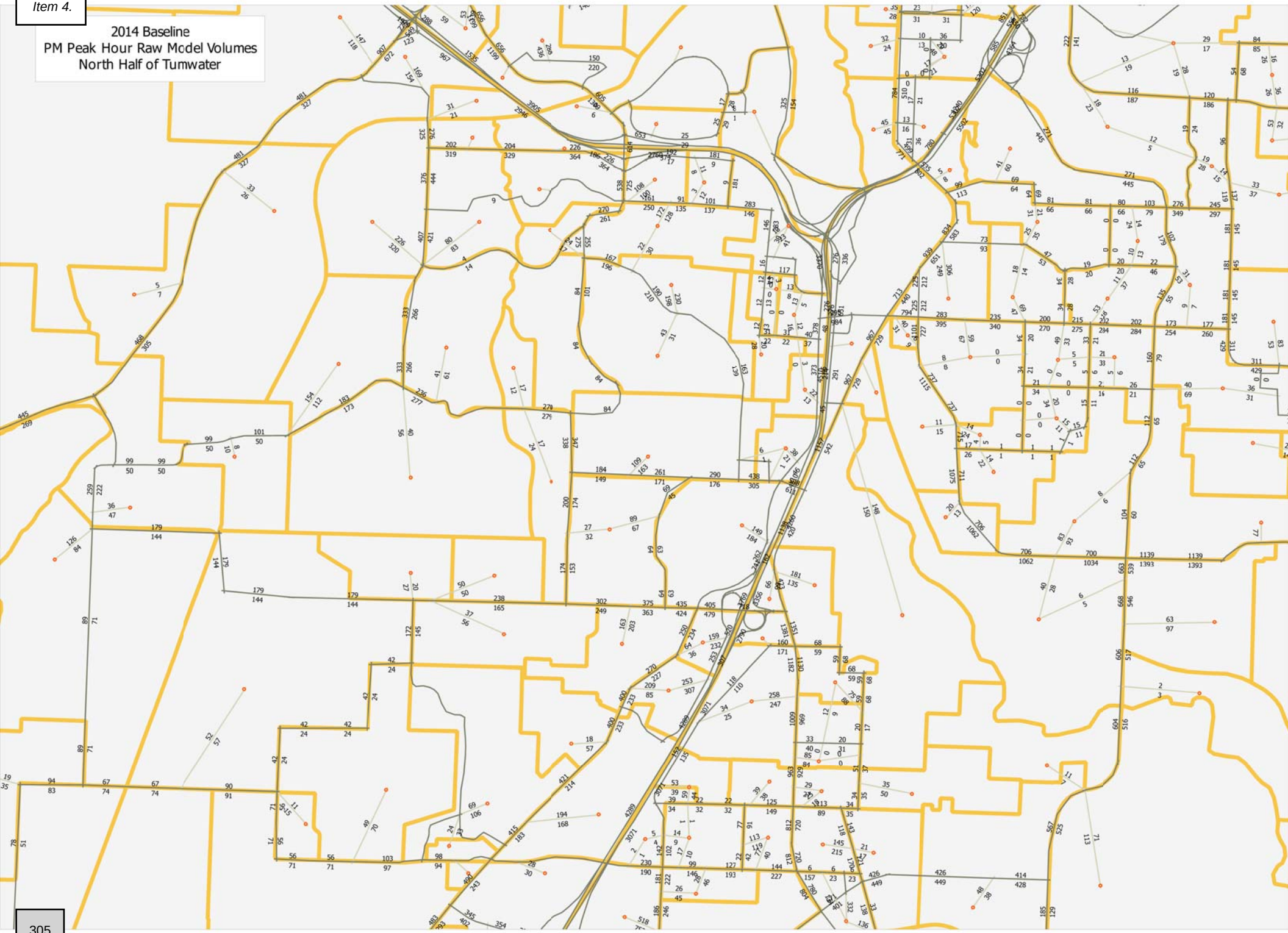
JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PEDS	#PEDAL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX10130	0.16			1/7/2013	16:19	No Injury	0	0	1	0	0	At Intersection and Related	Guardrail - Face
State Route	005LX10130	0.16			5/10/2011	20:36	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			3/1/2014	9:44	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			2/5/2014	14:44	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			11/27/2014	17:12	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			10/25/2010	10:46	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			7/21/2014	11:03	Evident Injury	3	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			1/23/2013	11:47	Evident Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX10130	0.16			6/24/2014	22:33	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX10130	0.16			9/23/2014	16:28	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005P110093	0.39			12/7/2010	7:35	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P110093	0.39			3/3/2013	15:15	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P110093	0.39			6/10/2011	14:02	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
50 - Linderson Way /Tumwater Blvd														
City Street	CENTER ST SW		7500	TUMWATER BLVD SW	1/24/2014	7:15	No Injury	0	0	1	0	0	At Intersection and Related	Curb, Raised Traffic Island or Raised Median Curb
City Street	TUMWATER BLVD SW			CENTER ST SW	9/26/2014	7:53	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			CENTER ST SW	4/26/2012	17:12	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SW			CENTER ST SW	1/27/2014	9:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			CENTER ST SW	3/15/2013	18:04	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			CENTER ST SW	12/12/2013	17:00	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	LINDERSON WAY SW		7400	TUMWATER BLVD SW	12/6/2013	17:01	Possible Injury	1	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	LINDERSON WAY SW		7400	TUMWATER BLVD SW	3/5/2014	8:22	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	1/21/2010	10:55	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	TUMWATER BLVD SW		1000	LINDERSON WAY SW	12/10/2014	16:29	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	10/26/2012	15:45	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	7/12/2012	14:42	Possible Injury	1	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	2/17/2011	6:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	3/19/2013	18:01	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SW			LINDERSON WAY SW	3/27/2012	18:15	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
51 - New Market St / Tumwater Blvd														
City Street	NEW MARKET ST SW			TUMWATER BLVD SW	7/17/2013	10:50	Possible Injury	1	0	1	0	0	Circulating Roundabout	Street Light Pole or Base
City Street	TUMWATER BLVD SW		200	NEW MARKET ST SW	10/1/2010	7:11	No Injury	0	0	2	0	0	Entering Roundabout	From same direction - one right turn - one straight
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	7/2/2011	7:21	Possible Injury	1	0	1	0	0	Entering Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	7/26/2012	7:31	No Injury	0	0	2	0	0	Circulating Roundabout	From same direction - one left turn - one straight
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	2/18/2010	14:12	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	12/30/2012	1:40	No Injury	0	0	1	0	0	Entering Roundabout	Curb, Raised Traffic Island or Raised Median Curb
City Street	TUMWATER BLVD SW			NEW MARKET ST SW	6/5/2012	11:43	No Injury	0	0	2	0	0	Exiting Roundabout	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW				9/28/2012	12:35	No Injury	0	0	3	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
52 -Capitol Blvd / Tumwater Blvd														
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	9/3/2013	15:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	8/21/2014	17:18	Possible Injury	1	0	3	0	0	At Intersection and Related	Entering at angle
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	1/29/2013	22:01	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	10/20/2014	13:47	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	3/11/2014	17:51	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one right turn
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	10/1/2012	12:44	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SE	5/3/2014	13:30	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	2/15/2010	20:05	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning left -- both moving -- sideswipe
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	9/12/2010	13:55	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	5/25/2010	18:46	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S			TUMWATER BLVD SW	7/15/2012	11:12	Evident Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S				1/12/2011	11:59	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S		7200		5/30/2014	7:23	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	CAPITOL BLVD S				2/11/2012	16:18	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	CAPITOL BLVD S				2/25/2012	6:36	Possible Injury	1	0	1	0	0	At Intersection and Not Related	Metal Sign Post
City Street	TUMWATER BLVD SE			CAPITOL BLVD S	10/24/2012	11:50	Possible Injury	1	0	1	0	0	At Intersection and Not Related	Street Light Pole or Base
City Street	TUMWATER BLVD SE			CAPITOL BLVD S	1/16/2013	7:58	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE				3/23/2011	12:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE		100		8/28/2010	17:18	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE		100		2/1/2011	14:30	No Injury	0	0	2	0	0	At Driveway	From opposite direction - one left turn - one straight
City Street	TUMWATER BLVD SE		0		1/9/2010	17:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

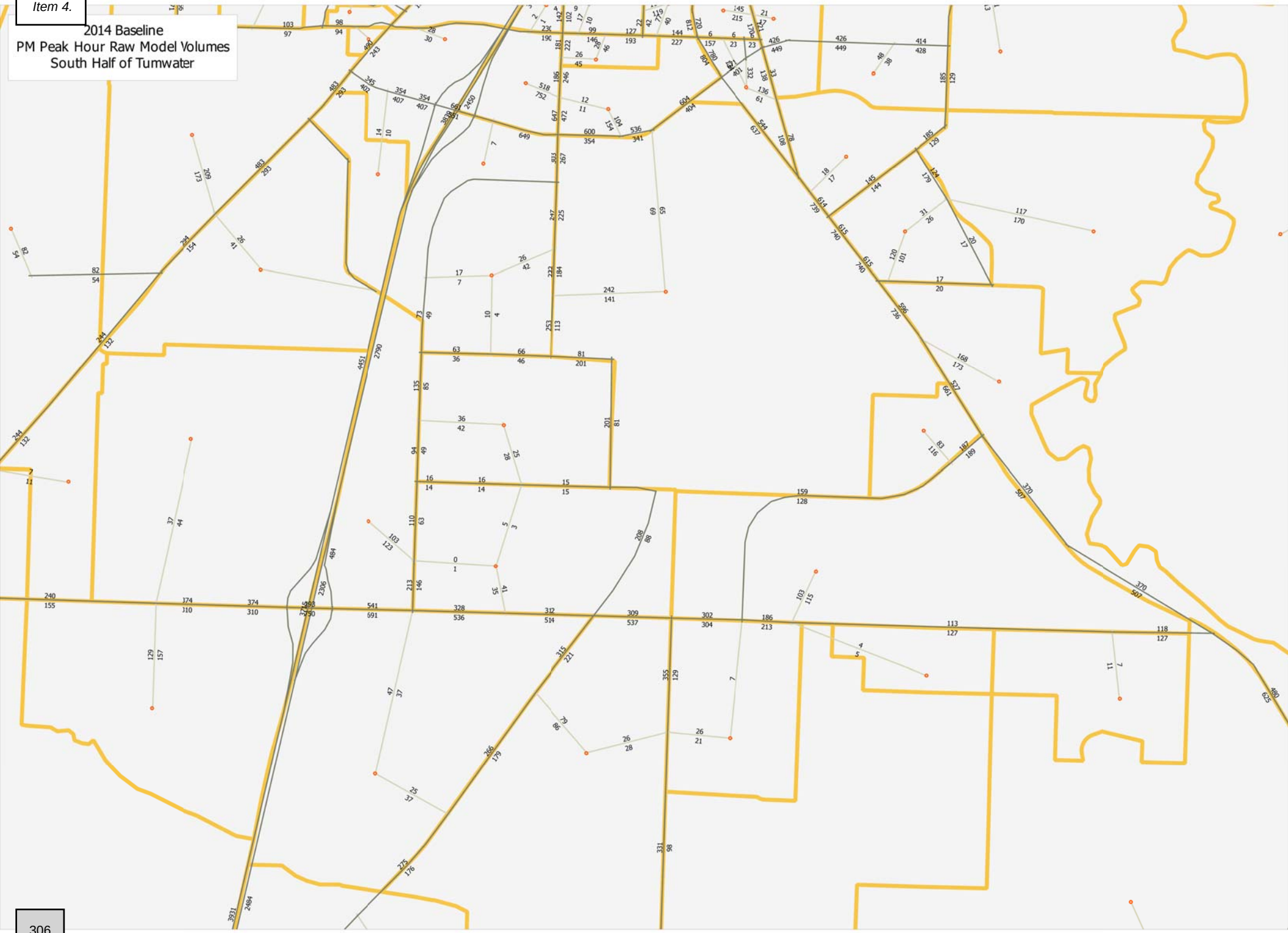
JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	TUMWATER BLVD SW		7200	CAPITOL BLVD S	7/24/2011	10:58	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- one stopped -- rear end
City Street	TUMWATER BLVD SW		100	CAPITOL BLVD S	9/29/2014	7:59	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	2/9/2013	15:03	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	2/19/2010	4:05	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Entering at angle
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	9/24/2012	12:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - sideswipe
City Street	TUMWATER BLVD SW			CAPITOL BLVD S	11/1/2012	7:03	No Injury	0	0	2	0	0	At Intersection and Not Related	From same direction - both going straight - one stopped - rear-end
53 - 65th Ave / Henderson Blvd														
County Road	12120	1.280		16620	9/6/2012	16:40	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
County Road	12120	1.280		16620	9/11/2014	8:55	Possible Injury	3	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
54 -Tumwater Blvd/ Henderson Blvd														
City Street	HENDERSON BLVD SE		6900	TUMWATER BLVD SE	3/30/2010	15:34	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	HENDERSON BLVD SE		7000	TUMWATER BLVD SE	12/31/2012	12:19	No Injury	0	0	1	0	0	At Intersection and Related	Fence
City Street	TUMWATER BLVD SE		1100	HENDERSON BLVD SE	8/8/2013	17:16	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
City Street	TUMWATER BLVD SE		1100	HENDERSON BLVD SE	6/23/2012	13:45	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	TUMWATER BLVD SE		1100	HENDERSON BLVD SE	7/9/2010	15:08	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
55 -Trails End Dr / Henderson Blvd														
City Street	HENDERSON BLVD SE		7500		10/25/2012	7:24	Possible Injury	2	0	2	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
56 - Littlerock Rd / Black Hills School Drwy														
City Street	LITTLEROCK RD SW		7741	THS	1/8/2014	12:45	No Injury	0	0	1	0	0	At Intersection and Related	Signal Pole
57 - Old Hwy 99 / Henderson Blvd														
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	5/15/2014	11:45	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	6/27/2013	18:03	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	7/11/2013	11:15	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	7/20/2010	19:24	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	11/24/2012	14:35	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7700	HENDERSON BLVD SE	12/1/2014	16:30	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7700	HENDERSON BLVD SE	9/20/2011	16:44	No Injury	0	0	3	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	10/13/2013	15:18	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE			HENDERSON BLVD SE	1/16/2013	22:22	No Injury	0	0	1	0	0	At Intersection and Related	Utility Pole
City Street	OLD HIGHWAY 99 SE		7700	HENDERSON BLVD SE	1/9/2012	9:21	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	2/22/2010	8:44	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600	HENDERSON BLVD SE	5/15/2011	13:20	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7600		5/7/2011	14:21	Possible Injury	1	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		7700		11/12/2010	7:34	No Injury	0	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
City Street	OLD HWY 99 SE			HENDERSON BLVD SE	3/8/2010	8:33	Possible Injury	2	0	2	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - both moving - rear-end
58 - Old Hwy 99 / 79th Ave														
City Street	OLD HIGHWAY 99 SE		7900	79TH AVE SE	8/17/2013	13:15	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
City Street	OLD HIGHWAY 99 SE		7900	79TH AVE SE	3/13/2010	15:19	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	OLD HIGHWAY 99 SE		8000		5/27/2011	15:58	No Injury	0	0	3	0	0	At Driveway	From same direction - both going straight - one stopped - rear-end
City Street	OLD HIGHWAY 99 SE		8000		9/16/2011	15:03	No Injury	0	0	2	0	0	At Driveway	From same direction - both going straight - both moving - rear-end
59 - Kimmie St / 83rd Ave														
60 - Center St / 83rd Ave														
City Street	83RD AVE SW		1300	CENTER ST SW	8/26/2014	17:34	Possible Injury	2	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
City Street	83RD AVE SW		800	CENTER ST SW	6/5/2014	11:10	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
61 - Old Hwy 99 / 88th Ave														
County Road	13765	19.722			5/20/2013	15:35	No Injury	0	0	2	0	0	At Driveway	From same direction - one right turn - one straight
County Road	13765	19.730			7/3/2010	15:25	No Injury	0	0	3	0	0	Driveway Related but Not at Driveway	From same direction - both going straight - one stopped - rear-end
County Road	13765	19.741			3/28/2012	10:35	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
62 - I-5 SB Ramps / 93rd Ave														
State Route	005LX09928	0.00			1/22/2011	13:39	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			6/21/2011	22:55	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			9/18/2010	22:17	No Injury	0	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX09928	0.00			4/22/2010	11:54	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			11/1/2010	18:41	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			8/22/2011	12:15	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			7/21/2011	13:06	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- both moving -- sideswipe
State Route	005LX09928	0.00			3/3/2011	6:55	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle

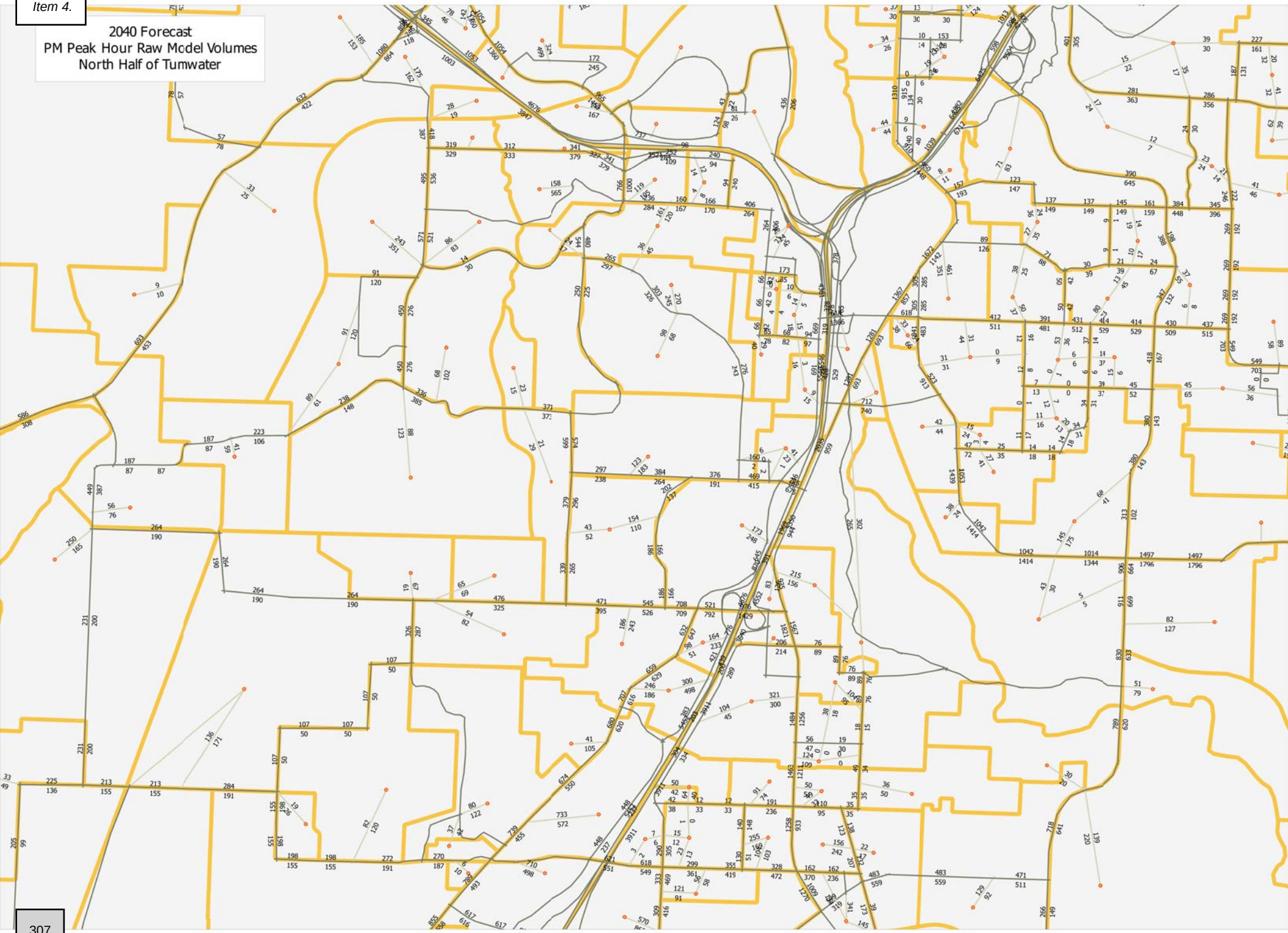
JURISDICTION	PRIMARY TRAFFICWAY	MILE POST	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	#FAT	#VEH	#PED S	#PED AL	JUNCTION RELATIONSHIP	FIRST COLLISION TYPE / OBJECT STRUCK
State Route	005LX09928	0.00			7/15/2011	18:05	Possible Injury	2	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005LX09928	0.00			9/27/2010	13:36	Evident Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005LX09928	0.00			4/13/2012	17:23	Possible Injury	1	0	2	0	0	At Intersection and Related	From opposite direction - one left turn - one straight
State Route	005LX09928	0.00			11/22/2011	16:38	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	005R109958	0.31			3/7/2011	15:15	No Injury	0	0	2	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - one stopped - rear-end
State Route	005R109958	0.32			1/5/2011	16:15	Possible Injury	2	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
State Route	005R109958	0.33			7/13/2010	15:50	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
State Route	005R109958	0.33			3/30/2010	16:18	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - sideswipe
State Route	005R109958	0.33			1/3/2011	18:25	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
State Route	005R109958	0.33			2/17/2011	18:03	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R109958	0.33			8/30/2010	10:02	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
State Route	005R109958	0.33			8/24/2010	13:32	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one left turn - one straight
State Route	005R109958	0.33			4/27/2011	15:27	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005R109958	0.33			9/16/2011	13:13	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - one right turn - one straight
63 - I-5 NB Ramps / 93rd Ave														
State Route	005P109890	0.40			4/17/2012	12:55	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005P109890	0.40			9/17/2010	16:18	Evident Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	005Q109977	0.00			11/21/2014	19:05	No Injury	0	0	1	0	0	At Intersection and Related	All other non-collision
State Route	005Q109977	0.01			9/22/2014	17:29	No Injury	0	0	2	0	0	At Intersection and Related	Same direction -- both turning right -- both moving -- rear end
State Route	005Q109977	0.02			11/22/2014	23:26	No Injury	0	0	1	0	0	At Intersection and Related	Roadway Ditch
64 - Kimmie St / 93rd Ave														
State Route	121	7.24			1/21/2013	7:26	Evident Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	121	7.24			4/25/2013	7:00	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
State Route	121	7.24			9/27/2013	10:20	Possible Injury	2	0	2	0	0	At Intersection and Related	From same direction - both going straight - both moving - rear-end
State Route	121	7.24			5/4/2014	17:08	Evident Injury	1	0	1	0	0	At Intersection and Related	Utility Pole
State Route	121	7.25			5/8/2013	14:42	Possible Injury	1	0	3	0	0	Intersection Related but Not at Intersection	From same direction - both going straight - both moving - rear-end
65 - Case Rd / 93rd Ave														
66 - Tilley Rd (south) / 93rd Ave														
State Route	121	6.24			5/26/2012	13:08	Evident Injury	1	0	1	0	0	At Intersection and Related	Vehicle overturned
State Route	121	6.24			1/22/2010	19:57	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	121	6.24			2/11/2011	5:25	No Injury	0	0	1	0	0	At Intersection and Related	Fence
State Route	121	6.24			7/5/2011	18:23	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
State Route	121	6.24			12/3/2011	6:48	No Injury	0	0	1	0	0	At Intersection and Related	Fence
State Route	121	6.24			7/19/2012	17:19	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	121	6.24			9/3/2013	9:49	No Injury	0	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
State Route	121	6.24			9/11/2014	0:00	No Injury	0	0	1	0	0	At Intersection and Related	Utility Pole
State Route	121	6.24			12/3/2014	18:38	No Injury	0	0	2	0	0	At Driveway within Major Intersection	Other Objects
67 - Tilley Rd (north) / 93rd Ave														
City Street	88TH AVE SE		800		5/14/2010	12:01	Possible Injury	2	0	2	0	0	At Driveway	From same direction - one right turn - one straight
City Street	93RD AVE SE		300		9/26/2012	20:30	Possible Injury	1	0	2	0	0	Not at Intersection and Not Related	From same direction - both going straight - both moving - rear-end
City Street	TILLEY RD SE		400	93RD AVE SE	12/11/2013	7:45	Unknown	0	0	1	0	0	At Intersection and Related	Utility Pole
City Street	TILLEY RD SE		8900		5/10/2014	0:01	Evident Injury	1	0	1	0	0	Not at Intersection and Not Related	Street Light Pole or Base
68 - Old Highway 99 / 93rd Ave														
County Road	17010	16.065		13765	8/30/2013	19:23	Possible Injury	1	0	2	0	0	At Intersection and Related	From same direction - both going straight - one stopped - rear-end
County Road	13765	18.610		17010	8/5/2010	15:44	Evident Injury	1	0	2	0	0	At Intersection and Related	Vehicle overturned
County Road	13765	18.610		17010	12/1/2010	16:48	No Injury	0	0	2	0	0	At Intersection and Related	Entering at angle
County Road	13765	18.610		17010	4/12/2013	19:43	Evident Injury	1	0	1	0	0	At Intersection and Related	Wood Sign Post

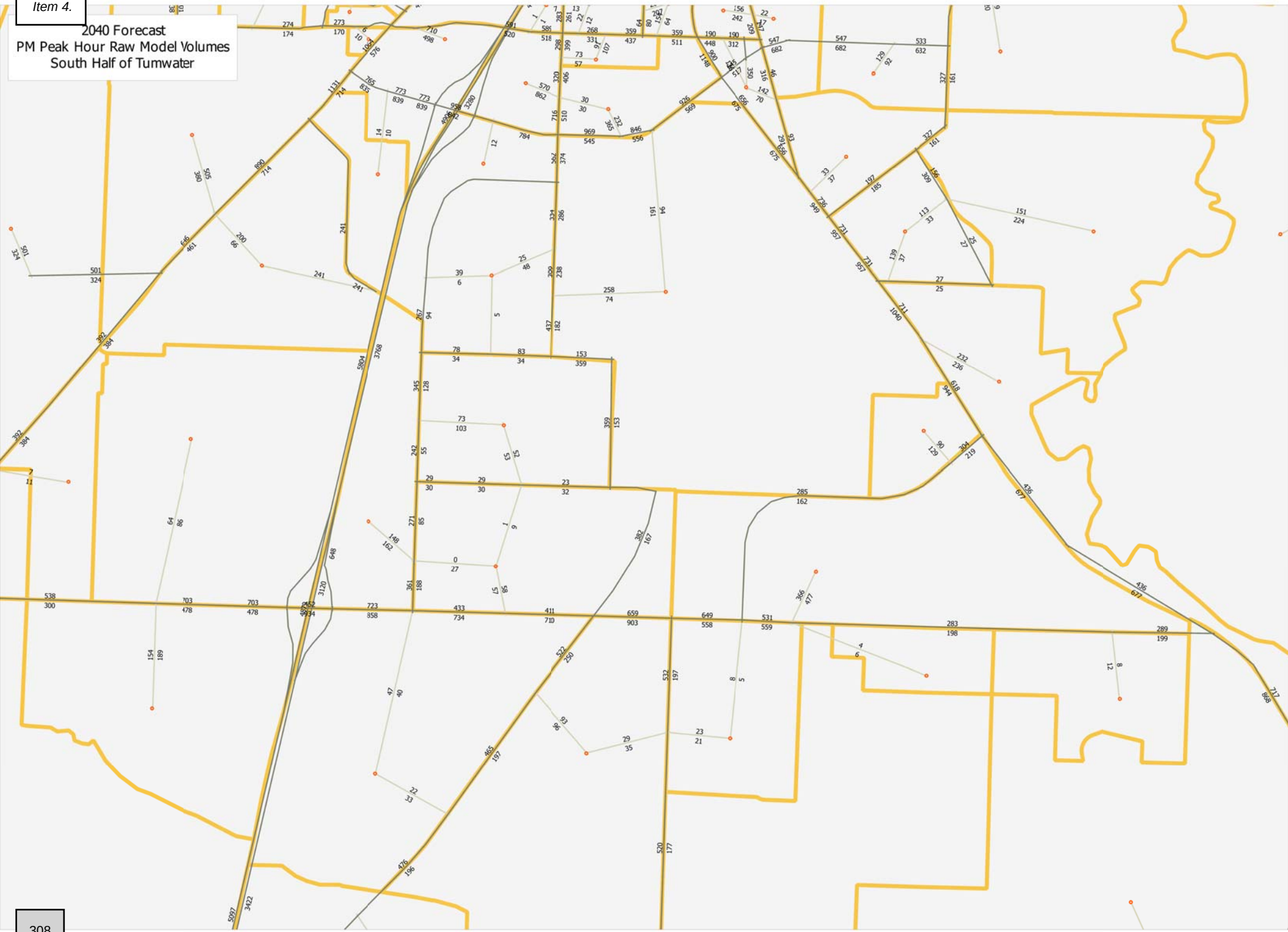
69 -Center / 76th

APPENDIX A-3
TRAVEL DEMAND MODEL PLOTS


2014 Baseline
PM Peak Hour Raw Model Volumes
North Half of Tumwater


2014 Baseline
PM Peak Hour Raw Model Volumes
South Half of Tumwater


2040 Forecast
PM Peak Hour Raw Model Volumes
North Half of Tumwater


2040 Forecast
PM Peak Hour Raw Model Volumes
South Half of Tumwater

APPENDIX A-4
TRAFFIC VOLUME CALCULATION WORKSHEETS

SCJ ALLIANCE
ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	2022 Volumes: BASE MODEL Δ GROWTH	2022 Volumes: 7 YEAR GROWTH	2022 Volumes: BASE MODEL ADJUST	2022 Volumes: PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	2040 Base Model: BASE MODEL Δ GROWTH	2040 Base Model: BASE MODEL ADJUST	2040 Base Model: PROJECTED 2040 VOLUMES
		L	**43**	-	-	-	0	3	**46**	-	0	12	**55**
	EB	T	**79**	-	-	-	0	5	**84**	-	0	22	**101**
		R	**7**	-	-	-	0	0	**7**	-	0	2	**9**
1		L	**106**	158	215	57	15		**121**	218	60		**166**
RW Johnson Blvd SW	WB	T	**43**	-	-	-	0	3	**46**	-	0	12	**55**
Mottman Rd SW		R	**67**	44	102	58	16		**83**	101	57		**124**
		L	**4**	-	-	-	0	0	**4**	-	0	1	**5**
TMC Date: 06/30/15	NB	T	**155**	232	314	82	22		**177**	317	85		**240**
		R	**135**	212	218	6	2		**137**	219	7		**142**
Peak Hour: 4:15 - 5:15		L	**45**	107	111	4	1		**46**	110	3		**48**
PHF: .92	SB	T	**93**	217	280	63	17		**110**	277	60		**153**
		R	**18**	-	-	-	0	1	**19**	-	0	5	**23**
			795	970	1,240	270	28%	6%	**880**	1,242	272	28%	**1,121**
		L	**176**	184	203	19	5		**181**	211	27		**203**
	EB	T	**252**	168	157	-11	-3		**249**	148	-20		**232**
		R	**25**	12	20	8	2		**27**	20	8		**33**
2		L	**4**	0	0	0	0		**4**	0	0		**4**
Crosby Blvd SW	WB	T	**31**	21	23	2	1		**32**	21	0		**31**
Mottman Rd SW		R	**67**	165	225	60	16		**83**	225	60		**127**
		L	**42**	15	23	8	2		**44**	20	5		**47**
TMC Date: 10/08/2014	NB	T	**348**	509	804	295	79		**427**	825	316		**664**
		R	**166**	201	167	-34	-9		**157**	155	-46		**120**
Peak Hour: 4:30 - 5:30		L	**120**	16	63	47	13		**133**	84	68		**188**
PHF: .89	SB	T	**630**	526	740	214	58		**688**	746	220		**850**
		R	**425**	189	293	104	28		**453**	299	110		**535**
			2,286	2,006	2,718					2,754			
		L	**73**	299	304	5	1		**74**	301	2		**75**
	EB	T	**19**	82	112	30	8		**27**	112	30		**49**
		R	**16**	29	54	25	7		**23**	56	27		**43**
3		L	**26**	6	17	11	3		**29**	19	13		**39**
Crosby Blvd SW	WB	T	**36**	25	34	9	2		**38**	35	10		**46**
Irving St SW		R	**166**	200	271	71	19		**185**	256	56		**222**
		L	**26**	14	19	5	1		**27**	21	7		**33**
TMC Date: 10/08/2014	NB	T	**290**	226	420	194	52		**342**	443	217		**507**
		R	**14**	20	56	36	10		**24**	32	12		**26**
Peak Hour: 4:45 - 5:45		L	**161**	209	201	-8	-2		**159**	199	-10		**151**
PHF: .89	SB	T	**424**	235	458	223	60		**484**	470	235		**659**
		R	**96**	94	100	6	2		**98**	97	3		**99**
			1,347	1,439	2,046	607	42%	10%		2,041	602	42%	
		L	**5**	0	0	0	0	0	**5**	0	0	2	**7**
	EB	T	**12**	0	0	0	0	1	**13**	0	0	5	**17**
		R	**165**	0	0	0	0	11	**176**	0	0	69	**234**
4		L	**1**	0	0	0	0	0	**1**	0	0	0	**1**
7th Ave SW	WB	T	**18**	0	0	0	0	1	**19**	0	0	8	**26**
Irving St		R	**1**	0	0	0	0	0	**1**	0	0	0	**1**
		L	**173**	0	0	0	0	11	**184**	0	0	72	**245**
TMC Date: 06/30/15	NB	T	**4**	0	0	0	0	0	**4**	0	0	2	**6**
		R	**1**	0	0	0	0	0	**1**	0	0	0	**1**
Peak Hour: 4:45 - 5:45		L	**0**	0	0	0	0	0	**0**	0	0	0	**0**
PHF: .92	SB	T	**4**	0	0	0	0	0	**4**	0	0	2	**6**
		R	**4**	0	0	0	0	0	**4**	0	0	2	**6**
			388	0	0			10%	**413**	0		42%	**550**
		L	**9**	12	12	0	0		**9**	12	0		**9**
	EB	T	**1**	2	2	0	0		**1**	2	0		**1**
		R	**0**	2	2	0	0		**0**	3	1		**1**
5		L	**10**	10	9	-1	0		**10**	11	1		**11**
Crosby Blvd SW	WB	T	**3**	4	4	0	0		**3**	4	0		**3**
Barnes Blvd SW		R	**189**	153	246	93	25		**214**	249	96		**285**
		L	**1**	2	2	0	0		**1**	2	0		**1**
TMC Date: 06/30/15	NB	T	**79**	90	207	117	32		**111**	219	129		**208**
		R	**4**	9	4	-5	-1		**3**	4	-5	5	**4**
Peak Hour: 5:00 - 6:00		L	**237**	185	282	97	26		**263**	291	106		**343**
PHF: .91	SB	T	**112**	71	230	159	43		**155**	235	164		**276**
		R	**22**	19	18	-1	0		**22**	18	-1		**21**
			667	559	1,018				**792**	1,050			**1,163**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**170**	183	206	23	6		**176**	205	22		**192**
		R	**69**	86	102	16	4		**73**	103	17		**86**
6		L	**130**	174	303	129	35		**165**	292	118		**248**
Black Lake Belmore Rd SW	WB	T	**303**	293	398	105	28		**331**	401	108		**411**
Black Lake Blvd SW		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**178**	152	191	39	11		**189**	185	33		**211**
TMC Date: 06/30/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**105**	122	239	117	32		**137**	248	126		**231**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .94	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			955	1,010	1,439				**1,071**	1,434			**1,379**
		L	**15**	103	41	-62	-17	1	**16**	46	-57	5	**20**
	EB	T	**21**	67	95	28	8		**29**	97	30		**51**
		R	**1**	2	5	3	1		**2**	6	4		**5**
7		L	**6**	21	45	24	6		**12**	46	25		**31**
RW Johnson Blvd SW	WB	T	**35**	74	107	33	9		**44**	109	35		**70**
Sapp Rd SW		R	**68**	141	182	41	11		**79**	182	41		**109**
		L	**0**	2	6	4	1		**1**	6	4		**4**
TMC Date: 06/30/15	NB	T	**1**	22	48	26	7		**8**	48	26		**27**
		R	**3**	16	34	18	5		**8**	33	17		**20**
Peak Hour: 4:45 - 5:45		L	**86**	194	235	41	11		**97**	256	62		**148**
PHF: .85	SB	T	**3**	33	72	39	11		**14**	71	38		**41**
		R	**31**	106	126	20	5		**36**	123	17		**48**
			270	781	996	215	28%	6%	**346**	1,023	242	31%	**574**

SCJ ALLIANCE
ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	BASE MODEL Δ GROWTH	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
8		L	**60**	71	227	156	42		**102**	234	163		**223**
Sapp Rd SW	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
Crosby Blvd SW		R	**17**	13	13	0	0		**17**	16	3		**20**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/30/15	NB	T	**129**	258	362	104	28		**157**	358	100		**229**
		R	**71**	89	205	116	31		**102**	217	128		**199**
Peak Hour: 5:00 - 6:00		L	**18**	12	8	-4	-1		**17**	8	-4		**14**
PHF: .91	SB	T	**109**	267	348	81	22		**131**	365	98		**207**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			404	710	1,163				**526**	1,198			**892**
		L	**8**	38	65	27	7		**15**	65	27		**35**
	EB	T	**12**	43	80	37	10		**22**	82	39		**51**
		R	**13**	3	21	18	5		**18**	17	14		**27**
9		L	**39**	0	0	0	0		**39**	0	0		**39**
Black Lake Belmore Rd SW	WB	T	**14**	60	106	46	12		**26**	105	45		**59**
49th Ave SW		R	**141**	119	160	41	11		**152**	159	40		**181**
		L	**9**	5	29	24	6		**15**	30	25		**34**
TMC Date: 06/30/15	NB	T	**128**	66	166	100	27		**155**	170	104		**232**
		R	**25**	0	0	0	0		**25**	0	0		**25**
Peak Hour: 4:15 - 5:15		L	**74**	101	90	-11	-3		**71**	108	7		**81**
PHF: .90	SB	T	**132**	86	249	163	44		**176**	213	127		**259**
		R	**10**	61	115	54	15		**25**	115	54		**64**
			605	582	1,081				**739**	1,064			**1,087**
		SB Cap	**33**	196	281	85	23	3	**36**	281	85	-75	**43**
	Sunset	NB Cap	**13**	93	146	53	14	1	**14**	146	53	-45	**21**
		Carlyon	**2**	33	34	1	0		**2**	35	2		**4**
10		Sunset	**1**	12	21	9	2		**3**	22	10		**11**
Capitol Blvd SE	Carlyon	SB Cap	**56**	33	34	1	0		**56**	35	2	75	**133**
Carlyon Ave SE/Sunset Way SE		NB Cap	**39**	28	32	4	1		**40**	32	4	45	**88**
		NB Cap	**438**	462	937	475	128		**566**	884	422		**860**
TMC Date: 06/25/15	NB	Carlyon	**88**	44	54	10	3		**91**	50	6	54	**148**
		Sunset	**15**	145	209	64	17	1	**16**	209	64	-54	**25**
Peak Hour: 4:30 - 5:30		SB Cap	**816**	710	1,367	657	177		**993**	1,356	646		**1,462**
PHF: .85	SB	Sunset	**8**	92	120	28	8	1	**9**	120	28	-18	**18**
		Carlyon	**45**	32	43	11	3		**48**	43	11	18	**74**
			1,554	1,880	3,278	266	38%	9%	**1,874**	3,213			**2,887**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
11		L	**0**	-	-	-	0		**0**	-	0		**0**
Deschutes Way SW	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
I-5 NB On Ramp		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 07/01/15	NB	T	**223**	154	227	73	20		**243**	206	52		**275**
		R	**147**	182	159	-23	-6		**141**	175	-7		**140**
Peak Hour: 4:30 - 5:30		L	**158**	49	63	14	4		**162**	58	9		**167**
PHF: .79	SB	T	**303**	276	362	86	23		**326**	378	102		**405**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			831	661	811				**872**	817			**987**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
12		L	**0**	-	-	-	0		**0**	-	0		**0**
Deschutes Way SW	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
US 101 WB On Ramp		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**428**	316	391	75	20		**448**	403	87		**515**
TMC Date: 07/01/15	NB	T	**385**	336	386	50	13		**398**	381	45		**430**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 5:00 - 6:00		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .92	SB	T	**260**	276	362	86	23		**283**	378	102		**362**
		R	**19**	0	0	0	0		**19**	0	0	10	**29**
			1,092	928	1,139					1,162		50%	**1,336**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**151**	145	218	73	20		**171**	200	55		**206**
13		L	**0**	-	-	-	0		**0**	-	0		**0**
I-5 SB/US 101 EB Off Ramps/N 2nd Ave SW	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
Desoto St SW		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**172**	276	382	106	29		**201**	378	102		**274**
TMC Date: 06/30/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .89	SB	T	**804**	1151	1274	123	33		**837**	1280	129		**933**
		R	**43**	40	29	-11	-3		**40**	27	-13		**30**
			1,170	1,612	1,903					1,885			
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
14		L	**124**	28	219	191	51		**175**	237	209	-96	**237**
N 2nd Ave SW	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
Custer Way SW		R	**151**	267	382	115	31		**182**	378	111		**262**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 02/10/15	NB	T	**23**	9	0	-9	-2		**21**	0	-9		**14**
		R	**149**	39	269	230	62		**211**	319	280	-110	**319**
Peak Hour: 4:45 - 5:45		L	**814**	945	1,039	94	25		**839**	1,047	102		**916**
PHF: .88	SB	T	**229**	350	452	102	27		**256**	433	83		**312**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			1,490	1,638	2,361				**1,684**	2,414			**2,060**

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ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	2022 Volumes: BASE MODEL Δ GROWTH	2022 Volumes: 7 YEAR GROWTH	2022 Volumes: BASE MODEL ADJUST	2022 Volumes: PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	2040 Base Model: BASE MODEL Δ GROWTH	2040 Base Model: BASE MODEL ADJUST	2040 Base Model: PROJECTED 2040 VOLUMES
		L	0	-	-	-	0		0	-	0		0
	EB	T	709	917	1,208	291	78		787	1,203	286		995
		R	167	67	101	34	9		176	164	97		264
15		L	371	368	401	33	9		380	234	-134		237
Boston St SW	WB	T	258	247	530	283	76		334	529	282		540
Custer Way SW		R	3	-	-	-	0		3	-	0		3
		L	0	48	71	23	6	-6	0	85	37	-37	0
TMC Date: 06/25/15	NB	T	1	-	-	-	0		1	-	0	-1	0
		R	150	126	179	53	14		164	92	-34		116
Peak Hour: 4:30 - 5:30		L	0	-	-	-	0		0	-	0		0
PHF: .95	SB	T	1	-	-	-	0		1	-	0		1
		R	4	-	-	-	0		4	-	0		4
			1,664	1,773	2,490				1,850	2,307			2,160
		L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
16		L	95	64	135	71	19		114	148	84		179
Deschutes Way SW	WB	T	0	-	-	-	0		0	-	0		0
Boston St SW		R	413	371	366	-5	-1		412	250	-121		292
		L	0	-	-	-	0		0	-	0		0
TMC Date: 07/01/15	NB	T	363	281	410	129	35		398	535	254		617
		R	61	75	121	46	12		73	83	8		69
Peak Hour: 4:30 - 5:30		L	102	98	129	31	8		110	95	-3		99
PHF: .93	SB	T	186	178	234	56	15		201	283	105		291
		R	0	-	-	-	0		0	-	0		0
			1,220	1,067	1,395	328	31%	7%	1,308	1,394			1,547
		L	0	-	-	-	0		0	-	0		0
	EB	T	332	440	916	476	128		460	857	417		749
		R	18	0	0	0	0		18	0	0		18
17		L	363	225	342	117	32		395	305	80		443
Cleveland Ave SE	WB	T	551	713	1341	628	169		720	1367	654		1,205
Capitol Blvd SE		R	0	-	-	-	0		0	-	0		0
		L	0	0	0	0	0		0	0	0		0
TMC Date: 06/25/15	NB	T	0	-	-	-	0		0	-	0		0
		R	224	212	284	72	19		243	285	73		297
Peak Hour: 4:30 - 5:30		L	0	-	-	-	0		0	-	0		0
PHF: .88	SB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
			1,488	1,590	2,883				1,836	2,814			2,712
		L	137	116	270	154	41		178	337	221		358
	EB	T	648	880	1,084	204	55		703	916	36		684
		R	80	47	33	-14	-4		76	42	-5		75
18		L	344	337	534	197	53		397	182	-155		189
Custer Way SE	WB	T	440	491	700	209	56		496	469	-22		418
Capitol Blvd SE		R	6	7	17	10	3		9	0	-7	6	5
		L	18	0	0	0	0		18	4	4		22
TMC Date: 02/10/15	NB	T	332	317	629	312	84		416	520	203		535
		R	426	412	624	212	57		483	169	-243		183
Peak Hour: 4:45 - 5:45		L	18	5	22	17	5		23	20	15		33
PHF: .90	SB	T	392	584	1088	504	136		528	1057	473		865
		R	135	124	231	107	29		164	290	166		301
			2,976	3,320	5,232				3,491	4,006			3,668
		L	50	0	0	0	0	5	55	0	0	21	71
	EB	T	332	375	572	197	53		385	510	135		467
		R	643	892	1,099	207	56		699	557	-335		308
19		L	14	1	4	3	1		15	4	3		17
Custer Way SE/North St SE	WB	T	245	265	465	200	54		299	412	147		392
Cleveland Ave SE		R	70	16	16	0	0		70	16	0		70
		L	481	529	706	177	48		529	205	-324		157
TMC Date: 02/10/15	NB	T	133	195	269	74	20		153	269	74		207
		R	15	2	6	4	1		16	9	7		22
Peak Hour: 4:45 - 5:45		L	106	18	27	9	2		108	26	8		114
PHF: .93	SB	T	279	208	315	107	29		308	279	71		350
		R	106	0	0	0	0	10	116	0	0	44	150
			2,474	2,501	3,479	978	39%	9%	2,752	2,287	445	41%	2,324
		L	48	51	36	-15	-4		44	36	-15	28	76
	EB	T	268	255	485	230	62		330	463	208		476
		R	2	33	26	-7	-2		0	12	-21	1	3
20		L	10	0	0	0	0		10	0	0	6	16
Hoadley St SE	WB	T	395	183	404	221	60		455	378	195		590
North St SE		R	50	18	14	-4	-1		49	14	-4	29	79
		L	1	20	18	-2	-1		0	7	-13	1	2
TMC Date: 06/24/15	NB	T	2	0	0	0	0		2	0	0	1	3
		R	6	0	15	15	4		10	8	8	3	9
Peak Hour: 5:00 - 6:00		L	27	14	10	-4	-1		26	10	-4	16	43
PHF: .87	SB	T	1	0	0	0	0		1	0	0	1	2
		R	15	32	27	-5	-1		14	27	-5	9	24
			825	606	1,035				941	955	349	58%	1,321
		L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
21		L	0	-	-	-	0		0	-	0		0
Deshcutes Way SW/I-5 NB Off Ramp	WB	T	0	-	-	-	0		0	-	0		0
E St SW		R	328	162	273	111	30		358	424	262		590
		L	0	-	-	-	0		0	-	0		0
TMC Date: 06/25/15	NB	T	79	129	114	-15	-4		75	105	-24		55
		R	136	326	444	118	32		168	483	157		293
Peak Hour: 4:45 - 5:45		L	278	214	303	89	24		302	420	206		484
PHF: .85	SB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
			821	831	1,134				903	1,432			1,422

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	BASE MODEL Δ GROWTH	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES
		L	**90**	295	399	104	28		**118**	264	-31		**59**
	EB	T	**88**	37	54	17	5		**93**	363	326		**414**
		R	**255**	209	294	85	23		**278**	277	68		**323**
22		L	**115**	63	145	82	22		**137**	589	526		**641**
Capitol Blvd SE	WB	T	**91**	50	90	40	11		**102**	326	276		**367**
E St SE		R	**131**	35	67	32	9		**140**	42	7		**138**
		L	**216**	112	183	71	19		**235**	98	-14		**202**
TMC Date: 06/25/15	NB	T	**444**	399	788	389	105		**549**	387	-12		**432**
		R	**132**	32	76	44	12		**144**	475	443		**575**
Peak Hour: 4:45 - 5:45		L	**191**	82	134	52	14		**205**	111	29		**220**
PHF: .86	SB	T	**587**	886	1521	635	171		**758**	1169	283		**870**
		R	**72**	0	0	0	0	12	**84**	0	0	62	**134**
			2,412	2,200	3,751	1,551	71%	16%		4,101	1,901	86%	**4,375**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
23		L	**7**	6	7	1	0		**7**	5	-1		**6**
Cleveland Ave SE	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
South St SE		R	**14**	11	21	10	3		**17**	42	31		**45**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/25/15	NB	T	**571**	703	931	228	61		**632**	1,046	343		**914**
		R	**11**	8	8	0	0		**11**	7	-1		**10**
Peak Hour: 4:30 - 5:30		L	**15**	18	33	15	4		**19**	65	47		**62**
PHF: .88	SB	T	**854**	1069	1356	287	77		**931**	1434	365		**1,219**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			1,472	1,815	2,356					2,599			**2,256**
		L	**21**	5	8	3	1		**22**	9	4		**25**
	EB	T	**142**	171	163	-8	-2		**140**	182	11		**153**
		R	**0**	-	-	-	0		**0**	-	0		**0**
24		L	**1**	-	-	-	0		**1**	-	0		**1**
7th Ave SW	WB	T	**261**	284	374	90	24		**285**	366	82		**343**
Linwood Ave SW		R	**224**	154	95	-59	-16		**208**	103	-51		**173**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/30/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**1**	-	-	-	0		**1**	-	0		**1**
Peak Hour: 5:00 - 6:00		L	**122**	134	227	93	25		**147**	233	99		**221**
PHF: .93	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**17**	6	10	4	1		**18**	10	4		**21**
			789	754	877				**822**	903			**938**
		L	**30**	3	86	83	22		**52**	104	101		**131**
	EB	T	**163**	258	228	-30	-8		**155**	241	-17		**146**
		R	**100**	43	74	31	8		**108**	71	28		**128**
25		L	**100**	170	308	138	37		**137**	320	150		**250**
2nd Ave SW	WB	T	**247**	309	371	62	17		**264**	368	59		**306**
Linwood Ave SW		R	**58**	28	28	0	0		**58**	37	9		**67**
		L	**104**	47	115	68	18		**122**	123	76		**180**
TMC Date: 06/30/15	NB	T	**116**	15	166	151	41		**157**	202	187		**303**
		R	**94**	163	150	-13	-4		**90**	132	-31		**63**
Peak Hour: 4:45 - 5:45		L	**66**	190	304	114	31		**97**	302	112		**178**
PHF: .89	SB	T	**164**	78	202	124	33		**197**	246	168		**332**
		R	**125**	81	146	65	18		**143**	137	56		**181**
			1,367	1,385	2,178				**1,580**	2,283			**2,265**
		L	**165**	291	260	-31	-8		**157**	243	-48		**117**
	EB	T	**0**	-	-	-	0	5	**5**	-	0	5	**5**
		R	**146**	320	423	103	28		**174**	431	111		**257**
26		L	**0**	-	-	-	0	15	**15**	-	0	15	**15**
Capitol Blvd SE	WB	T	**0**	-	-	-	0	5	**5**	-	0	5	**5**
Linwood Ave SW		R	**0**	-	-	-	0	10	**10**	-	0	10	**10**
		L	**155**	169	212	43	12		**167**	228	59		**214**
TMC Date: 06/25/15	NB	T	**627**	251	788	537	145		**772**	716	465		**1,092**
		R	**0**	-	-	-	0	15	**15**	-	0	15	**15**
Peak Hour: 4:45 - 5:45		L	**0**	-	-	-	0	10	**10**	-	0	10	**10**
PHF: .84	SB	T	**706**	818	1464	646	174		**880**	1538	720		**1,426**
		R	**240**	339	495	156	42		**282**	497	158		**398**
			2,039	2,188	3,642				**2,492**	3,653			**3,564**
		L	**7**	2	5	3	1		**8**	5	3		**10**
	EB	T	**681**	942	1,156	214	58		**739**	1,214	272		**953**
		R	**158**	90	130	40	11		**169**	125	35		**193**
27		L	**429**	488	607	119	32		**461**	567	79		**508**
Henderson Blvd	WB	T	**503**	635	814	179	48		**551**	911	276		**779**
Yelm Hwy SE		R	**80**	15	19	4	1		**81**	19	4		**84**
		L	**109**	62	102	40	11		**120**	94	32		**141**
TMC Date: 06/25/15	NB	T	**166**	42	78	36	10		**176**	78	36		**202**
		R	**644**	435	516	81	22		**666**	491	56		**700**
Peak Hour: 4:45 - 5:45		L	**154**	16	108	92	25		**179**	90	74		**228**
PHF: .91	SB	T	**207**	85	188	103	28		**235**	214	129		**336**
		R	**22**	3	8	5	1		**23**	9	6		**28**
			3,160	2,815	3,731				**3,408**	3,817			**4,162**
		L	**35**	36	108	72	19		**54**	110	74		**109**
	EB	T	**177**	129	232	103	28		**205**	215	86		**263**
		R	**0**	-	-	-	0		**0**	-	0		**0**
28		L	**0**	-	-	-	0		**0**	-	0		**0**
Rural Rd SW	WB	T	**294**	185	320	135	36		**330**	317	132		**426**
Trosper Rd SW		R	**99**	117	149	32	9		**108**	154	37		**136**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/25/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 4:30 - 5:30		L	**89**	121	150	29	8		**97**	180	59		**148**
PHF: .92	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**60**	54	194	140	38		**98**	159	105		**165**
			754	642	1,153				**892**	1,135			**1,247**

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	BASE MODEL Δ GROWTH	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES
		L	**11**	2	2	0	0		**11**	2	0		**11**
	EB	T	**251**	361	511	150	40		**291**	524	163		**414**
		R	**44**	-	-	-	0	3	**47**	-	0	11	**55**
29		L	**51**	-	-	-	0	3	**54**	-	0	12	**63**
Lake Park Dr	WB	T	**369**	373	542	169	46		**415**	544	171		**540**
Trosper Rd SW		R	**52**	61	155	94	25		**77**	164	103		**155**
		L	**62**	-	-	-	0	4	**66**	-	0	15	**77**
TMC Date: 03/05/14	NB	T	**25**	-	-	-	0	2	**27**	-	0	6	**31**
		R	**56**	-	-	-	0	3	**59**	-	0	13	**69**
Peak Hour: 4:45 - 5:45		L	**40**	63	176	113	30		**70**	185	122		**162**
PHF: .98	SB	T	**19**	-	-	-	0	1	**20**	-	0	5	**24**
		R	**13**	1	1	0	0		**13**	1	0		**13**
			993	861	1,387			6%	**1,149**	1,420	559	24%	**1,614**
		L	**40**	60	95	35	9		**49**	107	47		**87**
	EB	T	**264**	313	505	192	52		**316**	483	170		**434**
		R	**109**	51	86	35	9		**118**	118	67		**176**
30		L	**368**	90	192	102	27		**395**	153	63		**431**
2nd Ave SW/Littlerock Rd SW	WB	T	**297**	282	390	108	29		**326**	351	69		**366**
Trosper Rd SW		R	**32**	32	38	6	2		**34**	18	-14		**18**
		L	**187**	75	171	96	26		**213**	215	140		**327**
TMC Date: 03/05/14	NB	T	**216**	69	251	182	49		**265**	266	197		**413**
		R	**396**	90	257	167	45		**441**	167	77		**473**
Peak Hour: 4:00 - 5:00		L	**100**	77	138	61	16		**116**	142	65		**165**
PHF: .98	SB	T	**236**	108	338	230	62		**298**	361	253		**489**
		R	**44**	77	137	60	16		**60**	142	65		**109**
			2,289	1,324	2,598				**2,631**	2,523			**3,488**
		L	**156**	182	234	52	14		**170**	233	51		**207**
	EB	T	**540**	297	666	369	99		**639**	559	262		**802**
		R	**19**	0	0	0	0		**19**	0	0	6	**25**
31		L	**244**	205	277	72	19		**263**	238	33		**277**
I-5 SB Ramps/Tyee Dr	WB	T	**322**	216	285	69	19		**341**	233	17		**339**
Trosper Rd SW		R	**191**	298	483	185	50		**241**	505	207		**398**
		L	**25**	0	0	0	0		**25**	0	0	8	**33**
TMC Date: 03/05/14	NB	T	**158**	40	157	117	32		**190**	38	-2		**156**
		R	**335**	463	495	32	9		**344**	564	101		**436**
Peak Hour: 4:30 - 5:30		L	**460**	380	266	-114	-31		**429**	306	-74		**386**
PHF: .95	SB	T	**327**	172	182	10	3		**330**	277	105		**432**
		R	**377**	189	336	147	40		**417**	287	98		**475**
			3,154	2,442	3,381				**3,408**	3,240	798	33%	**3,966**
		L	**0**	0	0	0	0		**0**	0	0		**0**
	EB	T	**816**	575	913	338	91		**907**	788	213		**1,029**
		R	**524**	566	647	81	22		**546**	707	141		**665**
32		L	**0**	-	-	-	0		**0**	-	0		**0**
I-5 NB Ramps	WB	T	**588**	550	817	267	72		**660**	976	426		**1,014**
Trosper Rd SW		R	**617**	903	899	-4	-1		**616**	798	-105	-100	**412**
		L	**172**	169	228	59	16		**188**	0	-169	-3	**0**
TMC Date: 03/05/14	NB	T	**0**	0	-	-	0		**0**	-	0		**0**
		R	**79**	112	133	21	6		**85**	178	66		**145**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .93	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			2,796	2,875	3,637					3,447			**3,265**
		L	**282**	77	228	151	41		**323**	391	314		**596**
	EB	T	**47**	-	-	-	0	5	**52**	-	0	20	**67**
		R	**579**	611	685	74	20		**599**	510	-101	-20	**458**
33		L	**29**	-	-	-	0	3	**32**	-	0	21	**50**
Capitol Blvd SE	WB	T	**70**	-	-	-	0	7	**77**	-	0	180	**250**
Trosper Rd SW		R	**33**	-	-	-	0	3	**36**	-	0	17	**50**
		L	**771**	1,005	1,088	83	22		**793**	1,023	18	-100	**689**
TMC Date: 03/05/14	NB	T	**574**	347	730	383	103		**677**	544	197		**771**
		R	**11**	-	-	-	0	1	**12**	-	0		**11**
Peak Hour: 4:30 - 5:30		L	**13**	-	-	-	0	1	**14**	-	0	20	**33**
PHF: .99	SB	T	**466**	771	1320	549	148		**614**	1311	540	-20	**986**
		R	**348**	448	628	180	48		**396**	750	302		**650**
			3,223	3,259	4,679	1,420	44%	10%		4,529			**4,611**
		L	**261**	159	307	148	40		**301**	136	-23		**238**
	EB	T	**5**	0	0	0	0	0	**5**	12	12		**17**
		R	**40**	12	19	7	2	4	**46**	65	53		**93**
34		L	**13**	0	0	0	0	1	**14**	0	0		**13**
Capitol Blvd SE	WB	T	**7**	0	0	0	0	1	**8**	4	4		**11**
Lee St SW		R	**81**	68	69	1	0		**81**	72	4		**85**
		L	**23**	6	10	4	1		**24**	80	74	100	**197**
TMC Date: 03/05/14	NB	T	**1,025**	1,124	1,442	318	86		**1,111**	1,359	235	-100	**1,160**
		R	**21**	0	0	0	0	2	**23**	0	0		**21**
Peak Hour: 4:30 - 5:30		L	**50**	59	83	24	6		**56**	77	18		**68**
PHF: .93	SB	T	**816**	1170	1638	468	126		**942**	1622	452		**1,268**
		R	**151**	153	284	131	35		**186**	122	-31		**120**
			2,493	2,751	3,852	1,101	40%	9%	**2,797**	3,549			**3,291**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
35		L	**129**	37	46	9	2		**131**	47	10		**139**
Littlerock Rd SW	WB	T	**3**	-	-	-	0		**3**	-	0		**3**
Fred Meyer/Costco Drwy		R	**114**	27	32	5	1		**115**	50	23		**137**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/24/15	NB	T	**652**	207	647	440	118		**770**	597	390		**1,042**
		R	**95**	20	36	16	4		**99**	32	12		**107**
Peak Hour: 4:30 - 5:30		L	**103**	17	19	2	1		**104**	20	3		**106**
PHF: .96	SB	T	**584**	233	598	365	98		**682**	612	379		**963**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			1,680	541	1,378				**1,904**	1,358			**2,497**

SCJ ALLIANCE
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Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	2022 Volumes: BASE MODEL Δ GROWTH	2022 Volumes: 7 YEAR GROWTH	2022 Volumes: BASE MODEL ADJUST	2022 Volumes: PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	2040 Base Model: BASE MODEL Δ GROWTH	2040 Base Model: BASE MODEL ADJUST	2040 Base Model: PROJECTED 2040 VOLUMES
		L	80	-	-	-	0		80	-	0	20	100
	EB	T	23	-	-	-	0		23	-	0	6	29
		R	15	-	-	-	0		15	-	0	4	19
36		L	125	160	170	10	3		128	131	-29		96
Littlerock Rd SW	WB	T	5	-	-	-	0		5	-	0	1	6
Costco Drwy		R	194	49	142	93	25		219	115	66		260
		L	51	-	-	-	0		51	-	0	13	64
TMC Date: 06/24/15	NB	T	491	178	541	363	98		589	514	336		827
		R	98	55	108	53	14		112	103	48		146
Peak Hour: 4:30 - 5:30		L	214	31	45	14	4		218	83	52		266
PHF: .95	SB	T	398	240	599	359	97		495	577	337		735
		R	80	-	-	-	0		80	-	0	20	100
			1,774	713	1,605	170	58%	13%	2,015	1,523	810	25%	2,648
		L	0	-	-	-	0		0	-	0		0
	EB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
37		L	178	0	0	0	0	24	202	5	5		183
Littlerock Rd SW	WB	T	0	-	-	-	0		0	-	0		0
Kingswood Dr SW		R	75	0	0	0	0	10	85	29	29		104
		L	0	-	-	-	0		0	-	0		0
TMC Date: 06/24/15	NB	T	496	233	649	416	112		608	587	354		850
		R	125	0	0	0	0	17	142	33	33		158
Peak Hour: 4:30 - 5:30		L	59	0	0	0	0	8	67	32	32		91
PHF: .93	SB	T	519	400	769	369	99		618	675	275		794
		R	0	-	-	-	0		0	-	0		0
			1,452	633	1,418			13%	1,721	1,361			2,180
		L	22	-	-	-	0	2	24	-	0	8	30
	EB	T	1	-	-	-	0	0	1	-	0	0	1
		R	16	-	-	-	0	1	17	-	0	6	22
38		L	10	11	37	26	7		17	36	25		35
Capitol Blvd SE	WB	T	1	-	-	-	0	0	1	-	0	0	1
X St SE		R	21	21	21	0	0		21	20	-1		20
		L	20	-	-	-	0	2	22	-	0	7	27
TMC Date: 03/05/14	NB	T	904	948	1,218	270	73		977	1,236	288		1,192
		R	12	8	17	9	2		14	16	8		20
Peak Hour: 4:15 - 5:15		L	36	32	31	-1	0		36	31	-1		35
PHF: .89	SB	T	712	977	1448	471	127		839	1453	476		1,188
		R	35	-	-	-	0	3	38	-	0	13	48
			1,790	1,997	2,772	775	39%	9%	2,008	2,792		36%	2,619
		L	6	0	0	0	0		6	0	0	2	8
	EB	T	12	-	-	-	0	0	12	-	0	4	16
		R	9	31	30	-1	0		9	30	-1	3	12
39		L	4	-	-	-	0	0	4	-	0	1	5
Elm St SE	WB	T	4	-	-	-	0	0	4	-	0	1	5
X St SE		R	2	-	-	-	0	0	2	-	0	1	3
		L	2	20	19	-1	0		2	19	-1	1	3
TMC Date: 06/25/15	NB	T	66	17	20	3	1		67	15	-2	24	90
		R	6	-	-	-	0	0	6	-	0	2	8
Peak Hour: 5:00 - 6:00		L	0	-	-	-	0	0	0	-	0	0	0
PHF: .74	SB	T	44	20	25	5	1		45	18	-2	16	60
		R	5	0	0	0	0	0	5	0	0	2	7
			160	88	94	6	7%	2%	163	82		36%	218
		L	147	113	194	81	22		169	190	77		224
	EB	T	41	2	3	1	0		41	3	1		42
		R	28	35	53	18	5		33	42	7		35
40		L	28	15	31	16	4		32	28	13		41
Capitol Blvd SE	WB	T	22	2	3	1	0		22	3	1		23
Dennis St SE/SW		R	75	105	106	1	0		75	104	-1		74
		L	12	23	36	13	4		16	33	10		22
TMC Date: 03/05/14	NB	T	688	682	867	185	50		738	867	185		873
		R	23	16	25	9	2		25	33	17		40
Peak Hour: 4:30 - 5:15		L	52	74	71	-3	-1		51	69	-5		47
PHF: .91	SB	T	576	763	1198	435	117		693	1187	424		1,000
		R	71	100	165	65	18		89	156	56		127
			1,763	1,930	2,752				1,984	2,715			2,548
		L	80	46	101	55	15		95	43	-3		77
	EB	T	131	32	144	112	30		161	183	151		282
		R	121	150	266	116	31		152	246	96		217
41		L	94	0	0	0	0	10	104	0	0	47	141
Capitol Blvd SE	WB	T	193	6	111	105	28	21	214	98	92	97	290
Israel Rd SE/SW		R	135	0	79	79	21	15	150	64	64	68	203
		L	106	106	153	47	13		119	183	77		183
TMC Date: 06/25/15	NB	T	317	675	748	73	20		337	826	151		468
		R	25	0	0	0	0		25	0	0	13	38
Peak Hour: 4:30 - 5:30		L	71	125	304	179	48		119	187	62		133
PHF: .90	SB	T	514	654	882	228	61		575	1024	370		884
		R	88	33	96	63	17		105	47	14		102
			1,875	1,827	2,884	873	48%	11%	2,157	2,901	918	50%	3,018
		L	49	46	73	27	7		56	74	28		77
	EB	T	79	37	62	25	7		86	63	26		105
		R	0	-	-	-	0		0	-	0		0
42		L	0	-	-	-	0		0	-	0		0
Black Lake Belmore Rd SW	WB	T	90	42	88	46	12		102	87	45		135
66th Ave SW		R	107	25	122	97	26		133	126	101		208
		L	0	-	-	-	0		0	-	0		0
TMC Date: 06/30/15	NB	T	0	-	-	-	0		0	-	0		0
		R	0	-	-	-	0		0	-	0		0
Peak Hour: 4:30 - 5:30		L	69	37	89	52	14		83	92	55		124
PHF: .95	SB	T	0	-	-	-	0		0	-	0		0
		R	53	52	180	128	34		87	139	87		140
			447	239	614					581			789

SCJ ALLIANCE
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Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	BASE MODEL Δ GROWTH	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES
		L	**16**	21	62	41	11		**27**	45	24		**40**
	EB	T	**3**	4	6	2	1		**4**	7	3		**6**
		R	**130**	65	120	55	15		**145**	139	74		**204**
43		L	**2**	6	9	3	1		**3**	10	4		**6**
Kirsop Rd SW	WB	T	**0**	3	5	2	1		**1**	5	2		**2**
66th Ave SW		R	**2**	3	5	2	1		**3**	4	1		**3**
		L	**203**	50	190	140	38		**241**	188	138		**341**
TMC Date: 06/30/15	NB	T	**15**	0	0	0	0		**15**	0	0		**15**
		R	**2**	6	11	5	1		**3**	10	4		**6**
Peak Hour: 4:30 - 5:30		L	**3**	5	9	4	1		**4**	9	4		**7**
PHF: .84	SB	T	**7**	0	9	9	2		**9**	6	6		**13**
		R	**29**	37	87	50	13		**42**	92	55		**84**
			412	200	513					515			**727**
		L	**0**	0	0	0	0		**0**	0	0		**0**
	EB	T	**0**	0	0	0	0		**0**	0	0		**0**
		R	**0**	0	0	0	0		**0**	0	0		**0**
44		L	**15**	0	0	0	0	1	**16**	0	0	8	**23**
Littlerock Rd SW	WB	T	**0**	0	0	0	0		**0**	0	0		**0**
Odegard Rd SW		R	**5**	0	0	0	0	0	**5**	0	0	3	**8**
		L	**0**	0	0	0	0		**0**	0	0		**0**
TMC Date: 06/24/15	NB	T	**621**	0	0	416	112		**733**	0	354		**975**
		R	**3**	0	0	0	0	0	**3**	0	0	2	**5**
Peak Hour: 4:30 - 5:30		L	**8**	0	0	0	0	1	**9**	0	0	4	**12**
PHF: .93	SB	T	**668**	0	0	369	99		**767**	0	275		**943**
		R	**0**	0	0	0	0		**0**	0	0		**0**
			1,320	0	0			9%	**1,534**	0		50%	**1,965**
		L	**101**	9	38	29	8		**109**	31	22		**123**
	EB	T	**80**	34	78	44	12		**92**	78	44		**124**
		R	**74**	51	58	7	2		**76**	81	30		**104**
45		L	**54**	103	386	283	76		**130**	159	56		**110**
Littlerock Rd SW	WB	T	**148**	35	136	101	27		**175**	122	87		**235**
Israel Rd SW/70th Ave SW		R	**258**	109	348	239	64		**322**	277	168		**426**
		L	**239**	41	90	49	13		**252**	79	38		**277**
TMC Date: 06/24/15	NB	T	**257**	162	283	121	33		**290**	311	149		**406**
		R	**31**	39	203	164	44		**75**	103	64		**95**
Peak Hour: 4:30 - 5:30		L	**131**	135	305	170	46		**177**	225	90		**221**
PHF: .95	SB	T	**403**	336	620	284	76		**479**	549	213		**616**
		R	**115**	22	54	32	9		**124**	76	54		**169**
			1,891	1,076	2,599				**2,301**	2,091			**2,906**
		L	**40**	25	114	89	24		**64**	54	29		**69**
	EB	T	**166**	105	272	167	45		**211**	339	234		**400**
		R	**29**	60	132	72	19		**48**	156	96		**125**
46		L	**135**	15	21	6	2		**137**	13	-2		**133**
Linderson Way SE/11th Ave SW	WB	T	**259**	90	258	168	45		**304**	297	207		**466**
Israel Rd SW		R	**26**	1	1	0	0		**26**	1	0		**26**
		L	**108**	105	194	89	24		**132**	197	92		**200**
TMC Date: 06/24/15	NB	T	**87**	76	146	70	19		**106**	251	175		**262**
		R	**110**	40	59	19	5		**115**	22	-18		**92**
Peak Hour: 4:30 - 5:30		L	**38**	1	1	0	0		**38**	1	0		**38**
PHF: .83	SB	T	**81**	106	145	39	11		**92**	164	58		**139**
		R	**51**	35	137	102	27		**78**	125	90		**141**
			1,130	659	1,480				**1,351**	1,620			**2,091**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
47		L	**224**	217	487	270	73		**297**	387	170		**394**
Littlerock Rd SW	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
Tumwater Blvd SW		R	**278**	129	278	149	40		**318**	231	102		**380**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/24/15	NB	T	**134**	114	299	185	50		**184**	262	148		**282**
		R	**105**	179	415	236	64		**169**	296	117		**222**
Peak Hour: 4:30 - 5:30		L	**306**	223	420	197	53		**359**	320	97		**403**
PHF: .94	SB	T	**283**	267	644	377	102		**385**	469	202		**485**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			1,330	1,129	2,543				**1,712**	1,965			**2,166**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**342**	267	581	314	85		**427**	641	374		**716**
		R	**71**	140	259	119	32		**103**	415	275		**346**
48		L	**319**	473	639	166	45		**364**	499	26		**345**
I-5 SB Ramps	WB	T	**275**	188	320	132	36		**311**	448	260		**535**
Tumwater Blvd SW		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/24/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 4:30 - 5:30		L	**405**	285	261	-24	-6		**399**	263	-22		**383**
PHF: .94	SB	T	**32**	0	0	0	0		**32**	0	0		**32**
		R	**234**	166	453	287	77		**311**	448	282		**516**
			1,678	1,519	2,513				**1,947**	2,714			**2,873**
		L	**136**	136	358	222	60		**196**	388	252		**388**
	EB	T	**611**	415	484	69	19		**630**	516	101		**712**
		R	**0**	-	-	-	0		**0**	-	0		**0**
49		L	**0**	-	-	-	0		**0**	-	0		**0**
I-5 NB Ramps	WB	T	**550**	553	767	214	58		**608**	703	150		**700**
Tumwater Blvd SW		R	**1,209**	485	466	-19	-5		**1,204**	364	-121		**1,088**
		L	**44**	107	191	84	23		**67**	244	137		**181**
TMC Date: 06/24/15	NB	T	**6**	0	0	0	0		**6**	0	0		**6**
		R	**135**	233	297	64	17		**152**	280	47		**182**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .88	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			2,691	1,929	2,563				**2,863**	2,495			**3,257**

SCJ ALLIANCE
ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	BASE MODEL Δ GROWTH	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES
		L	**135**	305	285	-20	-5		**130**	261	-44		**91**
	EB	T	**550**	183	354	171	46		**596**	288	105		**655**
		R	**154**	161	146	-15	-4		**150**	250	89		**243**
50		L	**56**	72	259	187	50		**106**	148	76		**132**
Linderson Way SE	WB	T	**702**	417	611	194	52		**754**	522	105		**807**
Tumwater Blvd SW		R	**31**	110	99	-11	-3		**28**	109	-1		**30**
		L	**168**	179	178	-1	0		**168**	185	6		**174**
TMC Date: 03/03/15	NB	T	**84**	57	126	69	19		**103**	109	52		**136**
		R	**43**	32	69	37	10		**53**	63	31		**74**
Peak Hour: 4:30 - 5:30		L	**189**	139	123	-16	-4		**185**	161	22		**211**
PHF: .94	SB	T	**161**	70	158	88	24		**185**	145	75		**236**
		R	**878**	438	436	-2	-1		**877**	352	-86		**792**
			3,151	2,163	2,844				**3,335**	2,593			**3,581**
		L	**27**	59	126	67	18		**45**	124	65		**92**
	EB	T	**773**	294	420	126	34		**807**	388	94		**867**
		R	**19**	-	-	-	0	6	**25**	-	0	9	**28**
51		L	**45**	-	-	-	0	14	**59**	-	0	21	**66**
New Market St SW	WB	T	**681**	492	740	248	67		**748**	554	62		**743**
Tumwater Blvd SW		R	**9**	45	106	61	16		**25**	97	52		**61**
		L	**16**	-	-	-	0	5	**21**	-	0	7	**23**
TMC Date: 03/03/15	NB	T	**2**	-	-	-	0	1	**3**	-	0	1	**3**
		R	**46**	-	-	-	0	14	**60**	-	0	21	**67**
Peak Hour: 4:30 - 5:30		L	**31**	46	136	90	24		**55**	135	89		**120**
PHF: .92	SB	T	**16**	-	-	-	0	5	**21**	-	0	7	**23**
		R	**104**	108	229	121	33		**137**	225	117		**221**
			1,769	1,044	1,757	713	131%	30%	**2,005**	1,523	479	46%	**2,314**
		L	**64**	37	135	98	26		**90**	146	109		**173**
	EB	T	**305**	276	358	82	22		**327**	319	43		**348**
		R	**244**	91	-	-	0		**244**	145	54		**298**
52		L	**83**	0	-	-	0	4	**87**	0	0	29	**112**
Capitol Blvd SE	WB	T	**325**	396	457	61	16		**341**	417	21		**346**
Tumwater Blvd SE		R	**15**	275	189	-86	-23	1	**16**	182	-93	5	**20**
		L	**199**	75	-	-	0		**199**	101	26		**225**
TMC Date: 06/24/15	NB	T	**304**	469	-	-	0		**304**	680	211		**515**
		R	**18**	0	-	-	0	1	**19**	0	0		**18**
Peak Hour: 4:30 - 5:30		L	**112**	125	159	34	9		**121**	0	-125	39	**151**
PHF: .90	SB	T	**475**	546	-	-	0		**475**	1050	504		**979**
		R	**106**	133	389	256	69		**175**	221	88		**194**
			2,250	2,423	1,687	445	18%	4%		3,261	838	35%	**3,379**
		L	**2**	4	12	8	2		**4**	12	8		**10**
	EB	T	**843**	475	574	99	27		**870**	534	59		**902**
		R	**54**	45	97	52	14		**68**	95	50		**104**
53		L	**64**	68	123	55	15		**79**	125	57		**121**
Wildflower St SE/65th Ave SE	WB	T	**526**	529	672	143	39		**565**	646	117		**643**
Henderson Blvd SE		R	**1**	7	18	11	3		**4**	18	11		**12**
		L	**26**	34	69	35	9		**35**	65	31		**57**
TMC Date: 07/01/15	NB	T	**0**	0	0	0	0		**0**	0	0		**0**
		R	**46**	37	69	32	9		**55**	74	37		**83**
Peak Hour: 4:30 - 5:30		L	**1**	4	11	7	2		**3**	12	8		**9**
PHF: .91	SB	T	**0**	0	0	0	0		**0**	0	0		**0**
		R	**0**	3	9	6	2		**2**	8	5		**5**
			1,563	1,206	1,654					1,589			**1,946**
		L	**651**	399	532	133	36		**687**	502	103		**754**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**12**	29	100	71	19		**31**	10	-19	12	**5**
54		L	**0**	-	-	-	0		**0**	-	0		**0**
Tumwater Blvd SE	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
Henderson Blvd SE		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**22**	4	10	6	2		**24**	10	6		**28**
TMC Date: 11/13/14	NB	T	**165**	126	151	25	7		**172**	139	13		**178**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .91	SB	T	**197**	156	226	70	19		**216**	257	101		**298**
		R	**323**	410	524	114	31		**354**	462	52		**375**
			1,370	1,124	1,543					1,380			**1,638**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**152**	74	95	21	6		**158**	91	17		**169**
		R	**88**	70	90	20	5		**93**	124	54		**142**
55		L	**97**	108	219	111	30		**127**	120	12		**109**
Trails End Dr SE	WB	T	**139**	77	107	30	8		**147**	146	69		**208**
Henderson Blvd SE		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**53**	68	90	22	6		**59**	94	26		**79**
TMC Date: 06/24/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**52**	56	66	10	3		**55**	58	2		**54**
Peak Hour: 5:00 - 6:00		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .87	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			581	453	667				**639**	633			**761**
		L	**4**	143	275	132	36	1	**5**	277	134	2	**6**
	EB	T	**0**	0	3	3	1	0	**0**	3	3	25	**25**
		R	**7**	31	103	72	19	1	**8**	101	70	4	**11**
56		L	**0**	4	53	49	13	0	**0**	52	48	100	**100**
Littlerock Rd SW	WB	T	**0**	0	2	2	1	0	**0**	2	2	50	**50**
Black Hills High School Drwy		R	**0**	22	144	122	33	0	**0**	35	13	25	**25**
		L	**9**	21	102	81	22	1	**10**	95	74	5	**14**
TMC Date: 06/24/15	NB	T	**158**	129	295	166	45		**203**	246	117		**275**
		R	**0**	4	64	60	16	0	**0**	61	57	50	**50**
Peak Hour: 4:30 - 5:30		L	**0**	36	0	-36	-10	0	**0**	43	7	25	**25**
PHF: .96	SB	T	**390**	259	490	231	62		**452**	403	144		**534**
		R	**48**	188	400	212	57	7	**55**	408	220	24	**72**
			616	837	1,931			14%	**733**	1,726		50%	**1,186**

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PM Peak Hour Volumes

Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	BASE MODEL Δ GROWTH	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES
		L	**48**	42	88	46	12		**60**	78	36		**84**
	EB	T	**9**	-	-	-	0		**9**	-	0	5	**14**
		R	**1**	0	0	0	0		**1**	0	0	1	**2**
57		L	**8**	-	-	-	0		**8**	-	0	5	**13**
Center St SW	WB	T	**9**	-	-	-	0		**9**	-	0	5	**14**
76th Ave SW		R	**21**	-	-	-	0		**21**	-	0	12	**33**
		L	**1**	0	0	0	0		**1**	0	0	1	**2**
TMC Date: 03/03/15	NB	T	**247**	225	286	61	16		**263**	279	54		**301**
		R	**0**	-	-	-	0		**0**	-	0	0	**0**
Peak Hour: 4:45 - 5:45		L	**10**	-	-	-	0		**10**	-	0	6	**16**
PHF: .92	SB	T	**311**	247	334	87	23		**334**	361	114		**425**
		R	**38**	56	228	172	46		**84**	183	127		**165**
			703	570	936				**800**	901	331	58%	**1,068**
		L	**16**	-	-	-	0		**16**	-	0	9	**25**
	EB	T	**6**	-	-	-	0		**6**	-	0	3	**9**
		R	**7**	-	-	-	0		**7**	-	0	4	**11**
58		L	**142**	75	102	27	7		**149**	140	65		**207**
Old Hwy 99	WB	T	**6**	-	-	-	0		**6**	-	0	3	**9**
Henderson Blvd SE		R	**51**	70	95	25	7		**58**	100	30		**81**
		L	**2**	-	-	-	0		**2**	-	0	1	**3**
TMC Date: 06/23/15	NB	T	**512**	544	640	96	26		**538**	755	211		**723**
		R	**111**	71	91	20	5		**116**	87	16		**127**
Peak Hour: 4:15 - 5:15		L	**105**	73	94	21	6		**111**	127	54		**159**
PHF: .87	SB	T	**813**	666	855	189	51		**864**	1205	539		**1,352**
		R	**11**	-	-	-	0		**11**	-	0	6	**17**
			1,782	1,499	1,877				**1,884**	2,414	165	57%	**2,724**
		L	**1**	-	-	-	0		**1**	-	0	0	**1**
	EB	T	**1**	-	-	-	0		**1**	-	0	0	**1**
		R	**10**	-	-	-	0		**10**	-	0	1	**11**
59		L	**11**	64	84	20	5		**16**	83	19		**30**
Old Hwy 99	WB	T	**0**	-	-	-	0		**0**	-	0	0	**0**
79th Ave SE		R	**111**	73	82	9	2		**113**	86	13		**124**
		L	**1**	-	-	-	0		**1**	-	0	0	**1**
TMC Date: 10/28/14	NB	T	**432**	543	650	107	29		**461**	756	213		**645**
		R	**15**	53	61	8	2		**17**	60	7		**22**
Peak Hour: 4:30 - 5:30		L	**131**	68	1	-67	-18		**113**	67	-1		**130**
PHF: .95	SB	T	**841**	672	956	284	76		**917**	1279	607		**1,448**
		R	**0**	-	-	-	0		**0**	-	0	0	**0**
			1,554	1,473	1,834				**1,650**	2,331	38	15%	**2,414**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
60		L	**43**	63	78	15	4		**47**	73	10		**53**
Kimmie St SW	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
83rd Ave SW		R	**17**	0	0	0	0		**17**	0	0		**17**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 03/03/15	NB	T	**29**	49	94	45	12		**41**	84	35		**64**
		R	**16**	36	34	-2	-1		**15**	34	-2		**14**
Peak Hour: 4:30 - 5:30		L	**3**	0	0	0	0		**3**	0	0		**3**
PHF: .82	SB	T	**62**	73	267	194	52		**114**	221	148		**210**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			170	221	473				**237**	412			**361**
		L	**70**	36	34	-2	-1		**69**	34	-2		**68**
	EB	T	**25**	10	0	-10	-3		**22**	0	-10		**15**
		R	**0**	-	-	-	0		**0**	-	0		**0**
61		L	**0**	-	-	-	0		**0**	-	0		**0**
Center St SW	WB	T	**11**	4	5	1	0		**11**	5	1		**12**
83rd Ave SW		R	**89**	77	148	71	19		**108**	126	49		**138**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 03/03/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 4:45 - 5:45		L	**156**	191	359	168	45		**201**	309	118		**274**
PHF: .88	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**72**	63	78	15	4		**76**	73	10		**82**
			423	381	624				**487**	547			**589**
		L	**179**	170	201	31	8	18	**205**	230	60		**239**
	EB	T	**7**	-	-	-	0	1	**8**	-	0		**7**
		R	**25**	19	18	-1	0	2	**27**	18	-1		**24**
62		L	**2**	-	-	-	0	0	**2**	-	0		**2**
Old Hwy 99	WB	T	**4**	-	-	-	0	0	**4**	-	0		**4**
88th Ave SE		R	**1**	-	-	-	0	0	**1**	-	0		**1**
		L	**6**	13	18	5	1	1	**8**	14	1		**7**
TMC Date: 06/23/15	NB	T	**269**	357	417	60	16	27	**312**	486	129		**398**
		R	**0**	-	-	-	0	0	**0**	-	0		**0**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0	0	**0**	-	0		**0**
PHF: .90	SB	T	**671**	487	659	172	46	67	**784**	748	261		**932**
		R	**173**	174	285	111	30	17	**220**	510	336		**509**
			1,337	1,220	1,598			0		2,006			**2,123**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**296**	259	371	112	30		**326**	376	117		**413**
		R	**32**	51	107	56	15		**47**	115	64		**96**
63		L	**143**	166	111	-55	-15		**128**	107	-59		**84**
I-5 SB Ramps	WB	T	**124**	127	341	214	58		**182**	309	182		**306**
93rd Ave SW		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**0**	-	-	-	0		**0**	-	0		**0**
TMC Date: 06/23/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 5:00 - 6:00		L	**499**	491	563	72	19		**518**	466	-25		**474**
PHF: .88	SB	T	**0**	0	0	0	0		**0**	0	0		**0**
		R	**283**	246	362	116	31		**314**	386	140		**423**
			1,377	1,340	1,855					1,759			**1,796**

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Intersection	Movement		EXISTING 2015 VOLUMES	EXISTING MODEL VOLUMES	2022 Volumes: 2040 EXISTING MODEL VOLUMES	BASE MODEL Δ GROWTH	7 YEAR GROWTH	BASE MODEL ADJUST	PROJECTED 2022 VOLUMES	2040 Base Model: 2040 BASE MODEL VOLUMES	BASE MODEL Δ GROWTH	BASE MODEL ADJUST	PROJECTED 2040 VOLUMES
		L	**246**	190	248	58	16		**262**	233	43		**289**
	EB	T	**504**	560	686	126	34		**538**	609	49		**553**
		R	**0**	-	-	-	0		**0**	-	0		**0**
64		L	**0**	-	-	-	0		**0**	-	0		**0**
I-5 NB Ramps	WB	T	**251**	247	323	76	20		**271**	286	39		**290**
93rd Ave SW		R	**339**	294	400	106	29		**368**	382	88		**427**
		L	**47**	46	129	83	22		**69**	129	83		**130**
TMC Date: 06/23/15	NB	T	**0**	0	0	0	0		**0**	0	0		**0**
		R	**113**	131	172	41	11		**124**	171	40		**153**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .94	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			1,500	1,468	1,958				**1,632**	1,810			**1,842**
		L	**25**	134	164	30	8		**33**	162	28		**53**
	EB	T	**462**	518	662	144	39		**501**	591	73		**535**
		R	**15**	39	32	-7	-2		**13**	27	-12		**3**
65		L	**3**	0	0	0	0		**3**	0	0		**3**
Kimmie St SW	WB	T	**408**	317	414	97	26		**434**	382	65		**473**
93rd Ave SW		R	**6**	11	18	7	2		**8**	18	7		**13**
		L	**15**	36	34	-2	-1		**14**	34	-2		**13**
TMC Date: 06/23/15	NB	T	**1**	1	6	5	1		**2**	1	0		**1**
		R	**10**	0	0	0	0		**10**	0	0		**10**
Peak Hour: 4:15 - 5:15		L	**5**	18	72	54	15		**20**	41	23		**28**
PHF: .94	SB	T	**4**	8	15	7	2		**6**	19	11		**15**
		R	**48**	188	274	86	23		**71**	252	64		**112**
			1,002	1,270	1,691				**1,115**	1,527			**1,259**
		L	**2**	0	0	0	0		**2**	0	0		**2**
	EB	T	**316**	355	550	195	53		**369**	475	120		**436**
		R	**167**	159	160	1	0		**167**	134	-25		**142**
66		L	**54**	71	262	191	51		**105**	255	184		**238**
Case Rd SW	WB	T	**295**	190	282	92	25		**320**	253	63		**358**
93rd Ave SW		R	**28**	48	115	67	18		**46**	87	39		**67**
		L	**82**	122	128	6	2		**84**	123	1		**83**
TMC Date: 06/23/15	NB	T	**19**	40	51	11	3		**22**	58	18		**37**
		R	**32**	59	71	12	3		**35**	78	19		**51**
Peak Hour: 4:30 - 5:30		L	**51**	122	282	160	43		**94**	212	90		**141**
PHF: .92	SB	T	**48**	86	100	14	4		**52**	120	34		**82**
		R	**1**	0	0	0	0		**1**	0	0		**1**
			1,095	1,252	2,001				**1,297**	1,795			**1,638**
		L	**0**	-	-	-	0		**0**	-	0		**0**
	EB	T	**238**	247	490	243	65		**303**	395	148		**386**
		R	**157**	290	413	123	33		**190**	370	80		**237**
67		L	**86**	66	119	53	14		**100**	245	179		**265**
Tilley Rd SW (south leg)	WB	T	**236**	236	531	295	79		**315**	485	249		**485**
93rd Ave SW		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**132**	73	129	56	15		**147**	110	37		**169**
TMC Date: 06/23/15	NB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**65**	57	68	11	3		**68**	79	22		**87**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .87	SB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**0**	-	-	-	0		**0**	-	0		**0**
			914	969	1,750				**1,123**	1,684			**1,629**
		L	**113**	114	108	-6	-2		**111**	116	2		**115**
	EB	T	**190**	190	450	260	70		**260**	358	168		**358**
		R	**0**	0	0	0	0		**0**	0	0		**0**
68		L	**0**	3	3	0	0		**0**	3	0		**0**
Tilley Rd SW (north leg)	WB	T	**94**	169	477	308	83		**177**	415	246		**340**
93rd AVE SW		R	**12**	14	51	37	10		**22**	68	54		**66**
		L	**0**	0	0	0	0		**0**	0	0		**0**
TMC Date: 06/23/15	NB	T	**0**	0	3	3	1		**1**	3	3		**3**
		R	**0**	0	2	2	1		**1**	2	2		**2**
Peak Hour: 4:30 - 5:30		L	**14**	23	108	85	23		**37**	179	156		**170**
PHF: .86	SB	T	**0**	4	5	1	0		**0**	7	3		**3**
		R	**227**	133	172	39	11		**238**	315	182		**409**
			650	650	1,379				**847**	1,466			**1,466**
		L	**16**	4	3	-1	0		**16**	5	1		**17**
	EB	T	**0**	-	-	-	0		**0**	-	0		**0**
		R	**155**	123	196	73	20		**175**	171	48		**203**
69		L	**0**	-	-	-	0		**0**	-	0		**0**
Old Hwy 99 SE	WB	T	**0**	-	-	-	0		**0**	-	0		**0**
93rd Ave SW		R	**0**	-	-	-	0		**0**	-	0		**0**
		L	**70**	114	284	170	46		**116**	236	122		**192**
TMC Date: 06/23/15	NB	T	**213**	366	433	67	18		**231**	495	129		**342**
		R	**0**	-	-	-	0		**0**	-	0		**0**
Peak Hour: 4:30 - 5:30		L	**0**	-	-	-	0		**0**	-	0		**0**
PHF: .92	SB	T	**630**	503	672	169	46		**676**	761	258		**888**
		R	**28**	4	5	1	0		**28**	6	2		**30**
			1,112	1,114	1,593	479	43%	10%	**1,242**	1,674			**1,672**

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	129	65	165	83	550	550	550	550	550	550	0.23	0.12	0.30	0.15	0.30	0.15
1																	
RW Johnson Blvd SW	WB	216	259	345	291	550	550	550	550	550	550	0.39	0.47	0.63	0.53	0.63	0.53
Mottman Rd SW																	
TMC Date: 06/30/15	NB	294	206	387	328	550	550	550	550	550	550	0.53	0.37	0.70	0.60	0.70	0.60
Peak Hour: 4:15 - 5:15																	
PHF: .92	SB	156	265	224	419	550	550	550	550	550	550	0.28	0.48	0.41	0.76	0.41	0.76
		795															
	EB	453	498	468	613	550	550	550	550	550	550	0.82	0.91	0.85	1.11	0.85	1.11
2																	
Crosby Blvd SW	WB	102	538	162	540	450	450	450	450	450	450	0.23	1.20	0.36	1.20	0.36	1.20
Mottman Rd SW																	
TMC Date: 10/08/2014	NB	556	659	831	887	1800	1800	1800	1800	1800	1800	0.31	0.37	0.46	0.49	0.46	0.49
Peak Hour: 4:30 - 5:30																	
PHF: .89	SB	1,175	591	1,573	994	1800	1800	1800	1800	1800	1800	0.65	0.33	0.87	0.55	0.87	0.55
		2,286															
	EB	108	158	167	178	450	450	450	450	450	450	0.24	0.35	0.37	0.40	0.37	0.40
3																	
Crosby Blvd SW	WB	228	194	307	226	450	450	450	450	450	450	0.51	0.43	0.68	0.50	0.68	0.50
Irving St SW																	
TMC Date: 10/08/2014	NB	330	466	566	741	750	750	750	750	750	750	0.44	0.62	0.75	0.99	0.75	0.99
Peak Hour: 4:45 - 5:45																	
PHF: .89	SB	681	529	909	804	1800	1800	1800	1800	1800	1800	0.38	0.29	0.51	0.45	0.51	0.45
		1,347															
	EB	182	195	258	277	450	450	450	450	450	450	0.40	0.43	0.57	0.61	0.57	0.61
4																	
7th Ave SW	WB	20	13	28	18	450	450	450	450	450	450	0.04	0.03	0.06	0.04	0.06	0.04
Irving St																	
TMC Date: 06/30/15	NB	178	170	252	241	450	450	450	450	450	450	0.40	0.38	0.56	0.54	0.56	0.54
Peak Hour: 4:45 - 5:45																	
PHF: .92	SB	8	10	11	14	450	450	450	450	450	450	0.02	0.02	0.03	0.03	0.03	0.03
		388															

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	10	26	11	25	450	450	450	450	450	450	0.02	0.06	0.02	0.06	0.02	0.06
5																	
Crosby Blvd SW	WB	202	242	299	348	450	450	450	450	450	450	0.45	0.54	0.66	0.77	0.66	0.77
Barnes Blvd SW																	
TMC Date: 06/30/15	NB	84	122	213	288	450	450	450	450	450	450	0.19	0.27	0.47	0.64	0.47	0.64
Peak Hour: 5:00 - 6:00																	
PHF: .91	SB	371	277	640	502	750	750	750	750	750	750	0.49	0.37	0.85	0.67	0.85	0.67
		667															
	EB	239	481	278	622	750	750	750	750	750	750	0.32	0.64	0.37	0.83	0.37	0.83
6																	
Black Lake Belmore Rd SW	WB	433	275	659	423	750	750	750	750	750	750	0.58	0.37	0.88	0.56	0.88	0.56
Black Lake Blvd SW																	
TMC Date: 06/30/15	NB	283	199	442	334	450	450	450	450	450	450	0.63	0.44	0.98	0.74	0.98	0.74
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	0	0	0	0	0	0	0	0	0	0						
		955															
	EB	37	66	76	122	450	450	450	450	450	450	0.08	0.15	0.17	0.27	0.17	0.27
7																	
RW Johnson Blvd SW	WB	109	110	210	219	550	550	550	550	550	550	0.20	0.20	0.38	0.40	0.38	0.40
Sapp Rd SW																	
TMC Date: 06/30/15	NB	4	10	51	77	450	450	450	450	450	450	0.01	0.02	0.11	0.17	0.11	0.17
Peak Hour: 4:45 - 5:45																	
PHF: .85	SB	120	84	237	156	550	550	550	550	550	550	0.22	0.15	0.43	0.28	0.43	0.28
		270															
	EB	0	0	0	0	0	0	0	0	0	0						
8																	
Sapp Rd SW	WB	77	89	243	213	450	450	450	450	450	450	0.17	0.20	0.54	0.47	0.54	0.47
Crosby Blvd SW																	
TMC Date: 06/30/15	NB	200	169	428	430	550	550	550	550	550	550	0.36	0.31	0.78	0.78	0.78	0.78
Peak Hour: 5:00 - 6:00																	
PHF: .91	SB	127	146	221	249	550	550	550	550	550	550	0.23	0.27	0.40	0.45	0.40	0.45
		404															

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	33	33	113	157	450	450	450	450	450	450	0.07	0.07	0.25	0.35	0.25	0.35
9																	
Black Lake Belmore Rd SW	WB	194	111	279	157	450	450	450	450	450	450	0.43	0.25	0.62	0.35	0.62	0.35
49th Ave SW																	
TMC Date: 06/30/15	NB	162	184	291	325	450	450	450	450	450	450	0.36	0.41	0.65	0.72	0.65	0.72
Peak Hour: 4:15 - 5:15																	
PHF: .90	SB	216	277	404	448	450	450	450	450	450	450	0.48	0.62	0.90	1.00	0.90	1.00
		605															
	Sunset	48	24	68	54	450	450	450	450	450	450	0.11	0.05	0.15	0.12	0.15	0.12
10																	
Capitol Blvd SE	Carlyon	96	135	232	226	550	550	550	550	550	550	0.17	0.25	0.42	0.41	0.42	0.41
Carlyon Ave SE/Sunset Way SE																	
TMC Date: 06/25/15	NB	541	905	1,033	1,638	1800	1800	1800	1800	1800	1800	0.30	0.50	0.57	0.91	0.57	0.91
Peak Hour: 4:30 - 5:30																	
PHF: .85	SB	869	490	1,554	969	1800	1800	1800	1800	1800	1800	0.48	0.27	0.86	0.54	0.86	0.54
		1,554															
	EB	0	0	0	0	0	0	0	0	0	0						
11																	
Deschutes Way SW	WB	0	305	0	307	1060	1060	1060	1060	1060	1060	0.00	0.29	0.00	0.29	0.00	0.29
I-5 NB On Ramp																	
TMC Date: 07/01/15	NB	370	303	415	405	550	550	550	550	550	550	0.67	0.55	0.75	0.74	0.75	0.74
Peak Hour: 4:30 - 5:30																	
PHF: .79	SB	461	223	572	275	550	550	550	550	550	550	0.84	0.41	1.04	0.50	1.04	0.50
		831															
	EB	0	447	0	544	1060	1060	1060	1060	1060	1060	0.00	0.42	0.00	0.51	0.00	0.51
12																	
Deschutes Way SW	WB	0	0	0	0	0	0	0	0	0	0						
US 101 WB On Ramp																	
TMC Date: 07/01/15	NB	813	260	945	362	550	550	550	550	550	550	1.48	0.47	1.72	0.66	1.72	0.66
Peak Hour: 5:00 - 6:00																	
PHF: .92	SB	279	385	391	430	550	550	550	550	550	550	0.84	0.41	1.04	0.50	1.04	0.50
		1,092															

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	151	215	206	304	450	450	450	450	450	450	0.34	0.48	0.46	0.68	0.46	0.68
13																	
I-5 SB/US 101 EB Off Ramps/N 2nd Ave SW	WB	0	0	0	0	0	0	0	0	0	0						
Desoto St SW																	
TMC Date: 06/30/15	NB	172	955	274	1,139	750	1500	750	1500	750	1500	0.23	0.64	0.37	0.76	0.37	0.76
Peak Hour: 4:30 - 5:30																	
PHF: .89	SB	847	0	963	0	2120	2120	2120	2120	2120	2120	0.40	0.00	0.45	0.00	0.45	0.00
		1,170															
	EB	0	0	0	0	0	0	0	0	0	0						
14																	
N 2nd Ave SW	WB	275	963	499	1,235	900	1800	900	1800	900	1800	0.31	0.54	0.55	0.69	0.55	0.69
Custer Way SW																	
TMC Date: 02/10/15	NB	172	353	333	549	750	750	750	750	750	750	0.23	0.47	0.44	0.73	0.44	0.73
Peak Hour: 4:45 - 5:45																	
PHF: .88	SB	1,043	174	1,228	276	1500	750	1500	750	1500	750	0.70	0.23	0.82	0.37	0.82	0.37
		1,490															
	EB	876	262	1,259	544	1800	900	1800	900	1800	900	0.49	0.29	0.70	0.60	0.70	0.60
15																	
Boston St SW	WB	632	859	780	1,111	900	1800	900	1800	900	1800	0.70	0.48	0.87	0.62	0.87	0.62
Custer Way SW																	
TMC Date: 06/25/15	NB	151	539	116	502	450	450	450	450	450	450	0.34	1.20	0.26	1.12	0.26	1.12
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	5	4	5	3	450	450	450	450	450	450	0.01	0.01	0.01	0.01	0.01	0.01
		1,664															
	EB	0	0	0	0	0	0	0	0	0	0						
16																	
Deschutes Way SW	WB	508	163	471	168	450	450	450	450	450	450	1.13	0.36	1.05	0.37	1.05	0.37
Boston St SW																	
TMC Date: 07/01/15	NB	424	281	686	470	550	550	550	550	550	550	0.77	0.51	1.25	0.85	1.25	0.85
Peak Hour: 4:30 - 5:30																	
PHF: .93	SB	288	776	390	909	550	550	550	550	550	550	0.52	1.41	0.71	1.65	0.71	1.65
		1,220															

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	350	551	767	1,205	1800	1800	900	1800	900	1800	0.19	0.31	0.85	0.67	0.85	0.67
17																	
Cleveland Ave SE	WB	914	556	1,648	1,046	1800	1800	1800	1800	1800	1800	0.51	0.31	0.92	0.58	0.92	0.58
Capitol Blvd SE																	
TMC Date: 06/25/15	NB	224	381	297	461	900	900	750	750	750	750	0.25	0.42	0.40	0.61	0.40	0.61
Peak Hour: 4:30 - 5:30																	
PHF: .88	SB	0	0	0	0	0	0	0	0	0	0						
		1,488															
	EB	865	593	1,117	741	1800	900	1800	900	1800	900	0.48	0.66	0.62	0.82	0.62	0.82
18																	
Custer Way SE	WB	790	1092	612	900	1800	1800	900	1800	900	1800	0.44	0.61	0.68	0.50	0.68	0.50
Capitol Blvd SE																	
TMC Date: 02/10/15	NB	776	816	740	1,129	1800	1800	900	1800	900	1800	0.43	0.45	0.82	0.63	0.82	0.63
Peak Hour: 4:45 - 5:45																	
PHF: .90	SB	545	475	1,199	898	1800	1800	1800	900	1800	900	0.44	0.61	0.68	0.50	0.68	0.50
		2,976															
	EB	1,025	832	846	699	1800	1800	1800	900	1800	900	0.57	0.46	0.47	0.78	0.47	0.78
19																	
Custer Way SE/North St SE	WB	329	453	479	603	750	750	750	750	750	750	0.44	0.60	0.64	0.80	0.64	0.80
Cleveland Ave SE																	
TMC Date: 02/10/15	NB	629	936	386	675	1800	1800	900	1800	900	1800	0.35	0.52	0.43	0.38	0.43	0.38
Peak Hour: 4:45 - 5:45																	
PHF: .93	SB	491	253	614	348	900	900	750	750	750	750	0.55	0.28	0.82	0.46	0.82	0.46
		2,474															
	EB	318	411	555	615	750	750	750	750	750	750	0.42	0.55	0.74	0.82	0.74	0.82
20																	
Hoadley St SE	WB	455	301	685	528	750	750	750	750	750	750	0.61	0.40	0.91	0.70	0.91	0.70
North St SE																	
TMC Date: 06/24/15	NB	9	13	14	20	450	450	450	450	450	450	0.02	0.03	0.03	0.05	0.03	0.05
Peak Hour: 5:00 - 6:00																	
PHF: .87	SB	43	100	68	158	450	450	450	450	450	450	0.10	0.22	0.15	0.35	0.15	0.35
		825															

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	0	0	0	0	0	0	0	0	0	0						
21																	
Deshcutes Way SW/I-5 NB Off Ramp	WB	328	414	590	777	550	550	1100	1100	1100	1100	0.60	0.75	0.54	0.71	0.54	0.71
E St SW																	
TMC Date: 06/25/15	NB	215	0	348	0	1060	1060	1060	1060	1060	1060	0.20	0.00	0.33	0.00	0.33	0.00
Peak Hour: 4:45 - 5:45																	
PHF: .85	SB	278	407	484	645	550	550	550	550	550	550	0.51	0.74	0.88	1.17	0.88	1.17
		821															
	EB	433	379	796	703	550	550	1100	1100	1100	1100	0.79	0.69	0.72	0.64	0.72	0.64
22																	
Capitol Blvd SE	WB	337	411	1,146	1,209	450	450	1800	1800	1800	1800	0.75	0.91	0.64	0.67	0.64	0.67
E St SE																	
TMC Date: 06/25/15	NB	792	957	1,209	1,834	2100	2100	2100	2100	2100	2100	0.38	0.46	0.58	0.87	0.58	0.87
Peak Hour: 4:45 - 5:45																	
PHF: .86	SB	850	665	1,224	629	1800	1800	1800	900	1800	900	0.47	0.37	0.68	0.70	0.68	0.70
		2,412															
	EB	0	0	0	0	450	450	450	450	450	450	0.00	0.00	0.00	0.00	0.00	0.00
23																	
Cleveland Ave SE	WB	21	26	51	72	450	450	450	450	450	450	0.05	0.06	0.11	0.16	0.11	0.16
South St SE																	
TMC Date: 06/25/15	NB	582	861	924	1,225	1800	1800	1800	1800	1800	1800	0.32	0.48	0.51	0.68	0.51	0.68
Peak Hour: 4:30 - 5:30																	
PHF: .88	SB	869	585	1,281	959	1800	1800	1800	1800	1800	1800	0.48	0.33	0.71	0.53	0.71	0.53
		1,472															
	EB	163	278	178	364	550	550	550	550	550	550	0.30	0.51	0.32	0.66	0.32	0.66
24																	
7th Ave SW	WB	486	265	517	375	550	550	550	550	550	550	0.88	0.48	0.94	0.68	0.94	0.68
Linwood Ave SW																	
TMC Date: 06/30/15	NB	1	1	1	1	450	450	450	450	450	450	0.00	0.00	0.00	0.00	0.00	0.00
Peak Hour: 5:00 - 6:00																	
PHF: .93	SB	139	245	242	198	450	450	450	450	450	450	0.88	0.48	0.94	0.68	0.94	0.68
		789															

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	293	476	405	667	550	550	550	550	550	550	0.53	0.87	0.74	1.21	0.74	1.21
25																	
2nd Ave SW	WB	405	323	623	387	550	550	550	550	550	550	0.74	0.59	1.13	0.70	1.13	0.70
Linwood Ave SW																	
TMC Date: 06/30/15	NB	314	364	546	710	750	750	750	750	750	750	0.42	0.49	0.73	0.95	0.73	0.95
Peak Hour: 4:45 - 5:45																	
PHF: .89	SB	355	204	691	501	750	750	750	750	750	750	0.47	0.27	0.92	0.67	0.92	0.67
		1,367															
	EB	311	395	379	617	550	550	550	550	550	550	0.57	0.72	0.69	1.12	0.69	1.12
26																	
Capitol Blvd SE	WB	0	0	30	30	450	450	450	450	450	450	0.00	0.00	0.07	0.07	0.07	0.07
Linwood Ave SW																	
TMC Date: 06/25/15	NB	782	852	1,321	1,698	2100	2100	2100	2100	2100	2100	0.37	0.41	0.63	0.81	0.63	0.81
Peak Hour: 4:45 - 5:45																	
PHF: .84	SB	946	792	1,834	1,219	2100	2100	2100	2100	2100	2100	0.45	0.38	0.87	0.58	0.87	0.58
		2,039															
	EB	846	634	1,156	948	1800	1800	2100	2100	2100	2100	0.47	0.35	0.55	0.45	0.55	0.45
27																	
Henderson Blvd	WB	1012	1479	1,371	1,881	1800	1800	2100	2100	2100	2100	0.56	0.82	0.65	0.90	0.65	0.90
Yelm Hwy SE																	
TMC Date: 06/25/15	NB	919	794	1,043	1,037	750	750	750	750	750	750	1.23	1.06	1.39	1.38	1.39	1.38
Peak Hour: 4:45 - 5:45																	
PHF: .91	SB	383	253	592	296	750	750	750	750	750	750	0.51	0.34	0.79	0.39	0.79	0.39
		3,160															
	EB	212	354	372	591	550	550	550	550	550	550	0.39	0.64	0.68	1.07	0.68	1.07
28																	
Rural Rd SW	WB	393	266	562	411	550	550	550	550	650	650	0.71	0.48	1.02	0.75	0.86	0.63
Trosper Rd SW																	
TMC Date: 06/25/15	NB	0	0	0	0	0	0	0	0	0	0						
Peak Hour: 4:30 - 5:30																	
PHF: .92	SB	149	134	313	245	550	550	550	550	550	550	0.27	0.24	0.57	0.45	0.57	0.45
		754															

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Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	306	444	480	630	550	550	550	550	650	650	0.56	0.81	0.87	1.15	0.74	0.97
29																	
Lake Park Dr	WB	472	347	758	645	1100	1100	1100	1100	1100	1100	0.43	0.32	0.69	0.59	0.69	0.59
Trosper Rd SW																	
TMC Date: 03/05/14	NB	143	114	177	141	450	450	450	450	450	450	0.32	0.25	0.39	0.31	0.39	0.31
Peak Hour: 4:45 - 5:45																	
PHF: .98	SB	72	88	199	197	450	450	450	450	450	450	0.16	0.20	0.44	0.44	0.44	0.44
		993															
	EB	413	528	697	802	1100	1100	1100	1100	1100	1100	0.38	0.48	0.63	0.73	0.63	0.73
30																	
2nd Ave SW/Littlerock Rd SW	WB	697	760	815	1,072	1500	1500	1500	1500	1500	1500	0.46	0.51	0.54	0.71	0.54	0.71
Trosper Rd SW																	
TMC Date: 03/05/14	NB	799	713	1,213	1,096	1800	1800	1800	1800	1800	1800	0.44	0.40	0.67	0.61	0.67	0.61
Peak Hour: 4:00 - 5:00																	
PHF: .98	SB	380	288	763	518	750	750	750	750	750	750	0.46	0.51	0.54	0.71	0.54	0.71
		2,289															
	EB	715	724	1,034	847	1500	1500	1500	1500	1500	1500	0.48	0.48	0.69	0.56	0.69	0.56
31																	
I-5 SB Ramps/Tyee Dr	WB	757	1335	1,014	1,624	1500	1500	1500	1500	1500	1500	0.50	0.89	0.68	1.08	0.68	1.08
Trosper Rd SW																	
TMC Date: 03/05/14	NB	518	590	625	734	550	550	550	550	550	550	0.94	1.07	1.14	1.33	1.14	1.33
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	1,164	505	1,293	761	4240	1060	4240	1060	4240	1060	0.27	0.48	0.30	0.72	0.30	0.72
		3,154															
	EB	1,340	760	1,694	1,014	2250	1500	2250	1500	2250	1500	0.60	0.51	0.75	0.68	0.75	0.68
32																	
I-5 NB Ramps	WB	1205	895	1,426	1,174	1500	2250	1500	1500	1500	1500	0.80	0.40	0.95	0.78	0.95	0.78
Trosper Rd SW																	
TMC Date: 03/05/14	NB	251	524	145	665	1060	1060	550	550	550	550	0.24	0.49	0.26	1.21	0.26	1.21
Peak Hour: 4:30 - 5:30																	
PHF: .93	SB	0	617	0	412	1060	1060	1060	1060	1060	1060	0.00	0.58	0.00	0.39	0.00	0.39
		2,796															

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PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	908	1,189	1,121	1,589	2250	1500	1500	1500	1500	1500	0.40	0.79	0.75	1.06	0.75	1.06
33																	
Capitol Blvd SE	WB	132	71	350	111	450	450	450	450	450	450	0.29	0.16	0.78	0.25	0.78	0.25
Trosper Rd SW																	
TMC Date: 03/05/14	NB	1,356	1,074	1,471	1,494	1800	1800	2100	2100	2100	2100	0.75	0.60	0.70	0.71	0.70	0.71
Peak Hour: 4:30 - 5:30																	
PHF: .99	SB	827	889	1,669	1,417	2100	2100	2100	2100	2100	2100	0.39	0.42	0.79	0.67	0.79	0.67
		3,223															
	EB	306	181	348	328	550	550	550	550	550	550	0.56	0.33	0.63	0.60	0.63	0.60
34																	
Capitol Blvd SE	WB	101	76	109	106	450	450	450	450	450	450	0.22	0.17	0.24	0.24	0.24	0.24
Lee St SW																	
TMC Date: 03/05/14	NB	1,069	869	1,378	1,374	1800	1800	2100	2100	2100	2100	0.59	0.48	0.66	0.65	0.66	0.65
Peak Hour: 4:30 - 5:30																	
PHF: .93	SB	1,017	1,367	1,456	1,483	1800	1800	2100	2100	2100	2100	0.57	0.76	0.69	0.71	0.69	0.71
		2,493															
	EB	0	3	0	3	450	450	450	450	450	450	0.00	0.01	0.00	0.01	0.00	0.01
35																	
Littlerock Rd SW	WB	246	198	279	213	450	450	450	450	450	450	0.55	0.44	0.62	0.47	0.62	0.47
Fred Meyer/Costco Drwy																	
TMC Date: 06/24/15	NB	747	713	1,149	1,102	1800	1800	1800	1800	1800	1800	0.42	0.40	0.64	0.61	0.64	0.61
Peak Hour: 4:30 - 5:30																	
PHF: .96	SB	687	766	1,069	1,179	1800	1800	1800	1800	1800	1800	0.38	0.43	0.59	0.66	0.59	0.66
		1,680															
	EB	118	136	148	170	450	450	450	450	450	450	0.26	0.30	0.33	0.38	0.33	0.38
36																	
Littlerock Rd SW	WB	324	335	362	441	450	450	450	450	450	450	0.72	0.74	0.81	0.98	0.81	0.98
Costco Drwy																	
TMC Date: 06/24/15	NB	640	538	1,037	850	1800	1800	1800	1800	1800	1800	0.36	0.30	0.58	0.47	0.58	0.47
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	692	765	1,101	1,187	1800	1800	1800	1800	1800	1800	0.72	0.74	0.81	0.98	0.81	0.98
		1,774															

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PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	0	0	0	0	0	0	0	0	0	0						
37																	
Littlerock Rd SW	WB	253	184	287	249	550	550	550	550	550	550	0.46	0.33	0.52	0.45	0.52	0.45
Kingswood Dr SW																	
TMC Date: 06/24/15	NB	621	697	1,008	977	1100	1100	1100	1100	1100	1100	0.56	0.63	0.92	0.89	0.92	0.89
Peak Hour: 4:30 - 5:30																	
PHF: .93	SB	578	571	885	954	1800	1800	1800	1800	1800	1800	0.32	0.32	0.49	0.53	0.49	0.53
		1,452															
	EB	39	56	53	76	450	450	450	450	450	450	0.09	0.12	0.12	0.17	0.12	0.17
38																	
Capitol Blvd SE	WB	32	49	56	56	450	450	450	450	450	450	0.07	0.11	0.13	0.13	0.13	0.13
X St SE																	
TMC Date: 03/05/14	NB	936	738	1,239	1,245	1800	1800	2100	2100	2100	2100	0.52	0.41	0.59	0.59	0.59	0.59
Peak Hour: 4:15 - 5:15																	
PHF: .89	SB	783	947	1,271	1,242	1800	1800	2100	2100	2100	2100	0.44	0.53	0.61	0.59	0.61	0.59
		1,790															
	EB	27	11	37	15	450	450	450	450	450	450	0.06	0.02	0.08	0.03	0.08	0.03
39																	
Elm St SE	WB	10	18	14	24	450	450	450	450	450	450	0.02	0.04	0.03	0.05	0.03	0.05
X St SE																	
TMC Date: 06/25/15	NB	74	57	101	78	450	450	450	450	450	450	0.16	0.13	0.22	0.17	0.22	0.17
Peak Hour: 5:00 - 6:00																	
PHF: .74	SB	49	74	67	101	450	450	450	450	450	450	0.11	0.16	0.15	0.22	0.15	0.22
		160															
	EB	216	105	301	172	450	450	450	450	450	450	0.48	0.23	0.67	0.38	0.67	0.38
40																	
Capitol Blvd SE	WB	125	116	138	129	450	450	450	450	450	450	0.28	0.26	0.31	0.29	0.31	0.29
Dennis St SE/SW																	
TMC Date: 03/05/14	NB	723	632	935	1,076	1800	1800	2100	2100	2100	2100	0.40	0.35	0.45	0.51	0.45	0.51
Peak Hour: 4:30 - 5:15																	
PHF: .91	SB	699	910	1,174	1,171	1800	1800	2100	2100	2100	2100	0.39	0.51	0.56	0.56	0.56	0.56
		1,763															

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PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	332	387	576	575	750	750	750	750	750	750	0.44	0.52	0.77	0.77	0.77	0.77
41																	
Capitol Blvd SE	WB	422	227	635	453	750	750	750	750	750	750	0.56	0.30	0.85	0.60	0.85	0.60
Israel Rd SE/SW																	
TMC Date: 06/25/15	NB	448	729	689	1,242	1800	1800	1800	1800	1800	1800	0.25	0.41	0.38	0.69	0.38	0.69
Peak Hour: 4:30 - 5:30																	
PHF: .90	SB	673	532	1,119	748	1800	1800	2100	2100	2100	2100	0.37	0.30	0.53	0.36	0.53	0.36
		1,875															
	EB	128	143	182	275	450	450	450	450	450	450	0.28	0.32	0.40	0.61	0.40	0.61
42																	
Black Lake Belmore Rd SW	WB	197	148	343	229	450	450	450	450	450	450	0.44	0.33	0.76	0.51	0.76	0.51
66th Ave SW																	
TMC Date: 06/30/15	NB	0	0	0	0	0	0	0	0	0	0						
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	122	156	264	285	450	450	450	450	450	450	0.44	0.33	0.76	0.51	0.76	0.51
		447															
	EB	149	232	250	427	450	450	450	450	450	450	0.33	0.52	0.56	0.95	0.56	0.95
43																	
Kirsop Rd SW	WB	4	8	11	19	450	450	450	450	450	450	0.01	0.02	0.02	0.04	0.02	0.04
66th Ave SW																	
TMC Date: 06/30/15	NB	220	139	362	223	450	450	450	450	450	450	0.49	0.31	0.80	0.50	0.80	0.50
Peak Hour: 4:30 - 5:30																	
PHF: .84	SB	39	33	104	58	450	450	450	450	450	450	0.09	0.07	0.23	0.13	0.23	0.13
		412															
	EB	0	0	0	0	0	0	0	0	0	0						
44																	
Littlerock Rd SW	WB	20	11	30	17	450	450	450	450	450	450	0.04	0.02	0.07	0.04	0.07	0.04
Odegard Rd SW																	
TMC Date: 06/24/15	NB	624	683	980	966	1100	1100	1100	1100	1100	1100	0.57	0.62	0.89	0.88	0.89	0.88
Peak Hour: 4:30 - 5:30																	
PHF: .93	SB	676	626	955	983	1100	1100	1100	1100	1100	1100	0.61	0.57	0.87	0.89	0.87	0.89
		1,320															

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PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	255	502	351	681	450	450	450	450	450	450	0.57	1.12	0.78	1.51	0.78	1.51
45																	
Littlerock Rd SW	WB	460	242	771	440	750	750	750	750	750	750	0.61	0.32	1.03	0.59	1.03	0.59
Israel Rd SW/70th Ave SW																	
TMC Date: 06/24/15	NB	527	531	778	830	1100	2000	1100	2000	1100	2000	0.48	0.27	0.71	0.42	0.71	0.42
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	649	616	1,006	955	1100	1100	1100	1100	1100	1100	0.59	0.56	0.91	0.87	0.91	0.87
		1,891															
	EB	235	418	594	807	750	750	750	750	750	750	0.31	0.56	0.79	1.08	0.79	1.08
46																	
Linderson Way SE/11th Ave SW	WB	420	314	625	530	750	750	750	750	750	750	0.56	0.42	0.83	0.71	0.83	0.71
Israel Rd SW																	
TMC Date: 06/24/15	NB	305	245	554	397	550	550	550	550	550	550	0.55	0.45	1.01	0.72	1.01	0.72
Peak Hour: 4:30 - 5:30																	
PHF: .83	SB	170	153	318	357	550	550	550	550	550	550	0.31	0.28	0.58	0.65	0.58	0.65
		1,130															
	EB	0	0	0	0	0	0	0	0	0	0						
47																	
Littlerock Rd SW	WB	502	411	774	625	900	900	900	900	900	900	0.56	0.46	0.86	0.69	0.86	0.69
Tumwater Blvd SW																	
TMC Date: 06/24/15	NB	239	507	504	879	750	750	750	750	900	900	0.32	0.68	0.67	1.17	0.56	0.98
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	589	412	888	662	2000	1100	2000	1100	2000	1100	0.29	0.37	0.44	0.60	0.44	0.60
		1,330															
	EB	413	509	1,062	1,051	1500	750	1500	1500	1500	1500	0.28	0.68	0.71	0.70	0.71	0.70
48																	
I-5 SB Ramps	WB	594	747	880	1,099	900	1800	1800	1800	1800	1800	0.66	0.42	0.49	0.61	0.49	0.61
Tumwater Blvd SW																	
TMC Date: 06/24/15	NB	0	422	0	723	1060	1060	1060	1060	1060	1060	0.00	0.40	0.00	0.68	0.00	0.68
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	671	0	931	0	1060	1060	1060	1060	1060	1060	0.66	0.42	0.49	0.61	0.49	0.61
		1,678															

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ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	747	594	1,100	881	1800	900	1800	1800	1800	1800	0.42	0.66	0.61	0.49	0.61	0.49
49																	
I-5 NB Ramps	WB	1759	746	1,788	894	1800	1800	1800	1800	1800	1800	0.98	0.41	0.99	0.50	0.99	0.50
Tumwater Blvd SW																	
TMC Date: 06/24/15	NB	185	0	369	0	1060	1060	1060	1060	1060	1060	0.17	0.00	0.35	0.00	0.35	0.00
Peak Hour: 4:30 - 5:30																	
PHF: .88	SB	0	1,351	0	1,482	1060	1060	1060	1060	1060	1060	0.00	1.27	0.00	1.40	0.00	1.40
		2,691															
	EB	839	1,748	989	1,773	1800	1800	1800	1800	1800	1800	0.47	0.97	0.55	0.99	0.55	0.99
50																	
Linderson Way SE	WB	789	782	969	940	1800	1800	1800	1800	1800	1800	0.44	0.43	0.54	0.52	0.54	0.52
Tumwater Blvd SW																	
TMC Date: 03/03/15	NB	295	371	384	611	550	550	550	550	550	550	0.54	0.67	0.70	1.11	0.70	1.11
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	1,228	250	1,239	257	550	550	550	550	550	550	2.23	0.45	2.25	0.47	2.25	0.47
		3,151															
	EB	819	801	987	987	1800	1800	1800	1800	1800	1800	0.46	0.45	0.55	0.55	0.55	0.55
51																	
New Market St SW	WB	735	850	870	1,054	1800	1800	1800	1800	1800	1800	0.41	0.47	0.48	0.59	0.48	0.59
Tumwater Blvd SW																	
TMC Date: 03/03/15	NB	64	80	93	117	550	550	550	550	550	550	0.12	0.15	0.17	0.21	0.17	0.21
Peak Hour: 4:30 - 5:30																	
PHF: .92	SB	151	38	364	156	450	450	550	550	550	550	0.34	0.08	0.66	0.28	0.66	0.28
		1,769															
	EB	613	630	819	765	1800	1800	1800	1800	1800	1800	0.34	0.35	0.46	0.43	0.46	0.43
52																	
Capitol Blvd SE	WB	423	435	478	517	1800	1800	1800	1800	1800	1800	0.24	0.24	0.27	0.29	0.27	0.29
Tumwater Blvd SE																	
TMC Date: 06/24/15	NB	521	802	758	1,389	900	900	1950	1950	1950	1950	0.58	0.89	0.39	0.71	0.39	0.71
Peak Hour: 4:30 - 5:30																	
PHF: .90	SB	693	383	1,324	708	1800	1800	1950	1950	1950	1950	0.39	0.21	0.68	0.36	0.68	0.36
		2,250															

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ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	899	552	1,016	705	750	750	750	750	900	900	1.20	0.74	1.35	0.94	1.13	0.78
53																	
Wildflower St SE/65th Ave SE	WB	591	890	776	994	750	750	750	750	750	750	0.79	1.19	1.03	1.33	1.03	1.33
Henderson Blvd SE																	
TMC Date: 07/01/15	NB	72	118	140	225	550	550	550	550	550	550	0.13	0.21	0.25	0.41	0.25	0.41
Peak Hour: 4:30 - 5:30																	
PHF: .91	SB	1	3	14	22	450	450	450	450	450	450	0.00	0.01	0.03	0.05	0.03	0.05
		1,563															
	EB	663	345	759	403	750	750	750	750	900	900	0.88	0.46	1.01	0.54	0.84	0.45
54																	
Tumwater Blvd SE	WB	0	0	0	0	0	0	0	0	0	0						
Henderson Blvd SE																	
TMC Date: 11/13/14	NB	187	209	206	303	750	750	750	750	900	900	0.25	0.28	0.27	0.40	0.23	0.34
Peak Hour: 4:30 - 5:30																	
PHF: .91	SB	520	816	673	932	750	750	750	750	900	900	0.69	1.09	0.90	1.24	0.75	1.04
		1,370															
	EB	240	192	311	287	750	750	750	750	900	900	0.32	0.26	0.41	0.38	0.35	0.32
55																	
Trails End Dr SE	WB	236	204	317	223	750	750	750	750	900	900	0.31	0.27	0.42	0.30	0.35	0.25
Henderson Blvd SE																	
TMC Date: 06/24/15	NB	105	185	133	251	450	450	450	450	450	450	0.23	0.41	0.30	0.56	0.30	0.56
Peak Hour: 5:00 - 6:00																	
PHF: .87	SB	0	0	0	0	0	0	0	0	0	0						
		581															
	EB	11	57	42	136	450	450	450	450	450	450	0.02	0.13	0.09	0.30	0.09	0.30
56																	
Littlerock Rd SW	WB	0	0	175	100	0	0	450	450	450	450			0.39	0.22	0.39	0.22
Black Hills High School Drwy																	
TMC Date: 06/24/15	NB	167	397	339	645	900	900	900	900	900	900	0.19	0.44	0.38	0.72	0.38	0.72
Peak Hour: 4:30 - 5:30																	
PHF: .96	SB	438	162	631	306	750	750	750	750	900	900	0.58	0.22	0.84	0.41	0.70	0.34
		616															

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ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	58	48	100	181	450	450	450	450	450	450	0.13	0.11	0.22	0.40	0.22	0.40
57																	
Center St SW	WB	38	19	60	30	450	450	450	450	450	450	0.08	0.04	0.13	0.07	0.13	0.07
76th Ave SW																	
TMC Date: 03/03/15	NB	248	320	303	439	550	550	550	550	550	550	0.45	0.58	0.55	0.80	0.55	0.80
Peak Hour: 4:45 - 5:45																	
PHF: .92	SB	359	316	606	418	550	550	550	550	550	550	0.65	0.57	1.10	0.76	1.10	0.76
		703															
	EB	29	19	46	30	450	450	450	450	450	450	0.06	0.04	0.10	0.07	0.10	0.07
58																	
Old Hwy 99	WB	199	222	297	295	750	750	750	750	750	750	0.27	0.30	0.40	0.39	0.40	0.39
Henderson Blvd SE																	
TMC Date: 06/23/15	NB	625	962	853	1,570	900	900	900	900	1950	1950	0.69	1.07	0.95	1.74	0.44	0.81
Peak Hour: 4:15 - 5:15																	
PHF: .87	SB	929	579	1,528	829	900	900	900	900	1950	1950	1.03	0.64	1.70	0.92	0.78	0.43
		1,782															
	EB	12	1	14	1	450	450	450	450	450	450	0.03	0.00	0.03	0.00	0.03	0.00
59																	
Old Hwy 99	WB	122	147	154	153	450	450	450	450	450	450	0.27	0.33	0.34	0.34	0.34	0.34
79th Ave SE																	
TMC Date: 10/28/14	NB	448	862	668	1,489	900	900	900	900	1950	1950	0.50	0.96	0.74	1.65	0.34	0.76
Peak Hour: 4:30 - 5:30																	
PHF: .95	SB	972	544	1,578	770	900	900	900	900	1950	1950	1.08	0.60	1.75	0.86	0.81	0.39
		1,554															
	EB	0	0	0	0	0	0	0	0	0	0						
60																	
Kimmie St SW	WB	60	19	70	17	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
83rd Ave SW																	
TMC Date: 03/03/15	NB	45	105	78	263	450	450	450	450	450	450	0.10	0.23	0.17	0.58	0.17	0.58
Peak Hour: 4:30 - 5:30																	
PHF: .82	SB	65	46	213	81	450	450	450	450	450	450	0.13	0.04	0.16	0.04	0.16	0.04
		170															

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ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	95	83	83	94	450	450	450	450	450	450	0.21	0.18	0.18	0.21	0.18	0.21
61																	
Center St SW	WB	100	181	150	289	450	450	450	450	450	450	0.22	0.40	0.33	0.64	0.33	0.64
83rd Ave SW																	
TMC Date: 03/03/15	NB	0	0	0	0	0	0	0	0	0	0	0.21	0.18	0.18	0.21	0.18	0.21
Peak Hour: 4:45 - 5:45																	
PHF: .88	SB	228	159	356	206	450	450	450	450	450	450	0.51	0.35	0.79	0.46	0.79	0.46
		423															
	EB	211	183	270	520	750	750	750	750	750	750	0.28	0.24	0.36	0.69	0.36	0.69
62																	
Old Hwy 99	WB	7	7	7	7	450	450	450	450	450	450	0.02	0.02	0.02	0.02	0.02	0.02
88th Ave SE																	
TMC Date: 06/23/15	NB	275	698	405	958	900	900	900	900	1050	1050	0.31	0.78	0.45	1.06	0.39	0.91
Peak Hour: 4:30 - 5:30																	
PHF: .90	SB	844	449	1,441	638	900	900	900	900	1950	1950	0.94	0.50	1.60	0.71	0.74	0.33
		1,337															
	EB	328	407	509	729	900	900	900	900	1800	1800	0.36	0.45	0.57	0.81	0.28	0.41
63																	
I-5 SB Ramps	WB	267	795	390	887	900	900	900	900	1800	1800	0.30	0.88	0.43	0.99	0.22	0.49
93rd Ave SW																	
TMC Date: 06/23/15	NB	0	175	0	180	1060	1060	1060	1060	1060	1060	0.00	0.17	0.00	0.17	0.00	0.17
Peak Hour: 5:00 - 6:00																	
PHF: .88	SB	782	0	897	0	1060	1060	1060	1060	1060	1060	0.74	0.00	0.85	0.00	0.85	0.00
		1,377															
	EB	750	298	842	420	900	900	900	900	1800	1800	0.83	0.33	0.94	0.47	0.47	0.23
64																	
I-5 NB Ramps	WB	590	617	717	706	900	900	900	900	1800	1800	0.66	0.69	0.80	0.78	0.40	0.39
93rd Ave SW																	
TMC Date: 06/23/15	NB	160	0	283	0	1060	1060	1060	1060	1060	1060	0.15	0.00	0.27	0.00	0.27	0.00
Peak Hour: 4:30 - 5:30																	
PHF: .94	SB	0	585	0	716	1060	1060	1060	1060	1060	1060	0.00	0.55	0.00	0.68	0.00	0.68
		1,500															

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ENGINEERING AND PLANNING SERVICES

Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	502	471	591	598	900	900	900	900	1800	1800	0.56	0.52	0.66	0.66	0.33	0.33
65																	
Kimmie St SW	WB	417	477	489	573	900	900	900	900	1050	1050	0.46	0.53	0.54	0.64	0.47	0.55
93rd Ave SW																	
TMC Date: 06/23/15	NB	26	22	24	21	450	450	450	450	450	450	0.06	0.05	0.05	0.05	0.05	0.05
Peak Hour: 4:15 - 5:15																	
PHF: .94	SB	57	32	155	67	450	450	450	450	450	450	0.13	0.07	0.34	0.15	0.34	0.15
		1,002															
	EB	485	378	580	442	900	900	900	900	1050	1050	0.54	0.42	0.64	0.49	0.55	0.42
66																	
Case Rd SW	WB	377	399	663	628	900	900	900	900	1050	1050	0.42	0.44	0.74	0.70	0.63	0.60
93rd Ave SW																	
TMC Date: 06/23/15	NB	133	269	171	462	750	750	750	750	750	750	0.18	0.36	0.23	0.62	0.23	0.62
Peak Hour: 4:30 - 5:30																	
PHF: .92	SB	100	49	224	106	450	450	450	450	450	450	0.42	0.44	0.74	0.70	0.63	0.60
		1,095															
	EB	395	368	623	654	900	900	900	900	1050	1050	0.44	0.41	0.69	0.73	0.59	0.62
67																	
Tilley Rd SW (south leg)	WB	322	303	750	473	750	750	750	750	750	750	0.43	0.40	1.00	0.63	1.00	0.63
93rd Ave SW																	
TMC Date: 06/23/15	NB	197	243	256	502	900	900	900	900	900	900	0.22	0.27	0.28	0.56	0.28	0.56
Peak Hour: 4:30 - 5:30																	
PHF: .87	SB	0	0	0	0	0	0	0	0	0	0						
		914															
	EB	303	321	473	749	750	750	750	750	750	750	0.40	0.43	0.63	1.00	0.63	1.00
68																	
Tilley Rd SW (north leg)	WB	106	204	406	530	750	750	750	750	750	750	0.14	0.27	0.54	0.71	0.54	0.71
93rd AVE SW																	
TMC Date: 06/23/15	NB	0	0	5	3	0	0	0	0	0	0						
Peak Hour: 4:30 - 5:30																	
PHF: .86	SB	241	125	582	184	750	750	750	750	750	750	0.32	0.17	0.78	0.25	0.78	0.25
		650															

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Traffic Volume Calculation Worksheet

Tumwater Transportation Master Plan

PM Peak Hour Volumes

		Link Volumes				Link Capacity						Volume to Capacity Ratio					
		Existing		2040 Baseline		Existing		2040 Baseline		2040 With Imp		Existing		2040 Baseline		2040 With Imp	
		APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART	APPROACH	DEPART
Intersection	Movement	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
	EB	171	98	220	222	750	750	750	750	750	750	0.23	0.13	0.29	0.30	0.29	0.30
69																	
Old Hwy 99 SE	WB	0	0	0	0	0	0	0	0	0	0						
93rd Ave SW																	
TMC Date: 06/23/15	NB	283	785	534	1,091	900	900	900	900	900	900	0.31	0.87	0.59	1.21	0.59	1.21
Peak Hour: 4:30 - 5:30																	
PHF: .92	SB	658	229	918	359	900	900	900	900	1050	1050	0.73	0.25	1.02	0.40	0.87	0.34

APPENDIX A-5
CAPACITY ANALYSIS WORKSHEETS

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	45	80	5	0	105	45	65	0	5	155	135
Future Vol, veh/h	0	45	80	5	0	105	45	65	0	5	155	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	6	6	6	2	9	9	9	2	4	4	4
Mvmt Flow	0	49	87	5	0	114	49	71	0	5	168	147
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	10.4	10.8	13.7
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	53%	0%	94%	0%	41%	0%	83%
Vol Right, %	0%	47%	0%	6%	0%	59%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	290	45	85	105	110	45	115
LT Vol	5	0	45	0	105	0	45	0
Through Vol	0	155	0	80	0	45	0	95
RT Vol	0	135	0	5	0	65	0	20
Lane Flow Rate	5	315	49	92	114	120	49	125
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.01	0.495	0.094	0.164	0.217	0.196	0.091	0.21
Departure Headway (Hd)	6.488	5.652	6.937	6.387	6.832	5.906	6.67	6.04
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	552	637	516	561	525	606	537	594
Service Time	4.227	3.391	4.687	4.138	4.578	3.651	4.415	3.785
HCM Lane V/C Ratio	0.009	0.495	0.095	0.164	0.217	0.198	0.091	0.21
HCM Control Delay	9.3	13.8	10.4	10.4	11.5	10.1	10.1	10.4
HCM Lane LOS	A	B	B	B	B	B	B	B
HCM 95th-tile Q	0	2.8	0.3	0.6	0.8	0.7	0.3	0.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	45	95	20
Future Vol, veh/h	0	45	95	20
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	3	3	3
Mvmt Flow	0	49	103	22
Number of Lanes	0	1	1	0

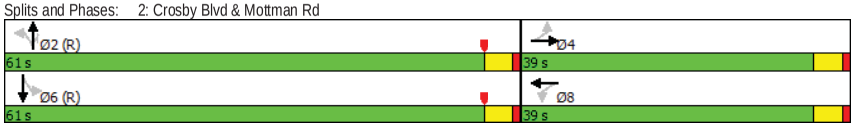
Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.3
HCM LOS	B

Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	250	25	5	30	65	40	350	165	120	630	425
Future Volume (vph)	175	250	25	5	30	65	40	350	165	120	630	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	200		0	100		0
Storage Lanes	1		0	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		940			1116			645			417	
Travel Time (s)		21.4			25.4			14.7			9.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	1%	1%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		20.5	20.5	20.5	20.5	20.5	
Total Split (s)	39.0	39.0		39.0	39.0		61.0	61.0	61.0	61.0	61.0	
Total Split (%)	39.0%	39.0%		39.0%	39.0%		61.0%	61.0%	61.0%	61.0%	61.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 82 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Crosby Blvd & Mottman Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	250	25	5	30	65	40	350	165	120	630	425
Future Volume (veh/h)	175	250	25	5	30	65	40	350	165	120	630	425
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1900	1900	1881	1881	1881	1845	1845	1900
Adj Flow Rate, veh/h	197	281	28	6	34	73	45	393	185	135	708	0
Adj No. of Lanes	1	1	0	0	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	0	0	0	1	1	1	3	3	3
Cap, veh/h	357	358	36	44	123	236	517	1304	1108	561	2430	0
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.69	0.69	0.69	0.69	0.69	0.00
Sat Flow, veh/h	1269	1651	165	29	567	1089	745	1881	1599	824	3597	0
Grp Volume(v), veh/h	197	0	309	113	0	0	45	393	185	135	708	0
Grp Sat Flow(s),veh/h/ln	1269	0	1816	1686	0	0	745	1881	1599	824	1752	0
Q Serve(g_s), s	9.0	0.0	16.1	0.0	0.0	0.0	2.6	8.1	4.0	8.0	7.8	0.0
Cycle Q Clear(g_c), s	13.5	0.0	16.1	5.6	0.0	0.0	12.2	8.1	4.0	17.9	7.8	0.0
Prop In Lane	1.00		0.09	0.05		0.65	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	357	0	394	403	0	0	517	1304	1108	561	2430	0
V/C Ratio(X)	0.55	0.00	0.78	0.28	0.00	0.00	0.09	0.30	0.17	0.24	0.29	0.00
Avail Cap(c_a), veh/h	519	0	626	615	0	0	517	1304	1108	561	2430	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.96	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.7	0.0	37.0	32.8	0.0	0.0	8.6	5.9	5.3	9.9	5.9	0.0
Incr Delay (d2), s/veh	1.3	0.0	3.5	0.4	0.0	0.0	0.3	0.6	0.3	1.0	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	5.1	0.0	8.4	2.6	0.0	0.0	0.6	4.4	1.8	2.0	3.8	0.0
LnGrp Delay(d),s/veh	37.1	0.0	40.4	33.2	0.0	0.0	8.9	6.5	5.6	10.9	6.2	0.0
LnGrp LOS	D		D	C			A	A	A	B	A	
Approach Vol, veh/h		506			113			623			843	
Approach Delay, s/veh		39.1			33.2			6.4			7.0	
Approach LOS		D			C			A			A	

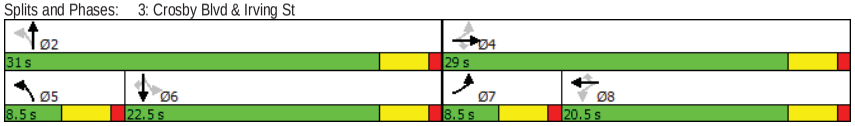
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		74.1		25.9		74.1		25.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		56.5		34.5		56.5		34.5
Max Q Clear Time (g_c+I1), s		14.2		18.1		19.9		7.6
Green Ext Time (p_c), s		12.7		3.0		12.2		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	20	15	165	35	25	25	290	15	160	425	95
Future Volume (vph)	75	20	15	165	35	25	25	290	15	160	425	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		150	200		0	0		250
Storage Lanes	0		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		468			2725			1710			645	
Travel Time (s)		10.6			61.9			38.9			14.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	7	4	4	8	8	8	5	2		6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.5	20.5	20.5	20.5	20.5	20.5	8.5	20.5		20.5	20.5	20.5
Total Split (s)	8.5	29.0	29.0	20.5	20.5	20.5	8.5	31.0		22.5	22.5	22.5
Total Split (%)	14.2%	48.3%	48.3%	34.2%	34.2%	34.2%	14.2%	51.7%		37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 51.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 3: Crosby Blvd & Irving St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	20	15	165	35	25	25	290	15	160	425	95
Future Volume (veh/h)	75	20	15	165	35	25	25	290	15	160	425	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759	1900	1881	1881	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	84	22	17	185	39	28	28	326	17	180	478	0
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	8	8	8	1	1	1	1	1	1	2	2	2
Cap, veh/h	137	20	387	370	61	414	416	980	51	598	807	686
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.55	0.55	0.43	0.43	0.00
Sat Flow, veh/h	11	77	1495	898	236	1599	1792	1772	92	1033	1863	1583
Grp Volume(v), veh/h	106	0	17	224	0	28	28	0	343	180	478	0
Grp Sat Flow(s),veh/h/ln	88	0	1495	1134	0	1599	1792	0	1865	1033	1863	1583
Q Serve(g_s), s	3.1	0.0	0.4	6.6	0.0	0.6	0.4	0.0	4.8	5.7	9.4	0.0
Cycle Q Clear(g_c), s	3.1	0.0	0.4	9.7	0.0	0.6	0.4	0.0	4.8	5.7	9.4	0.0
Prop In Lane	0.79		1.00	0.83		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	387	431	0	414	416	0	1032	598	807	686
V/C Ratio(X)	0.00	0.00	0.04	0.52	0.00	0.07	0.07	0.00	0.33	0.30	0.59	0.00
Avail Cap(c_a), veh/h	0	0	765	539	0	534	519	0	1032	598	807	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	13.3	17.8	0.0	13.4	7.5	0.0	5.9	9.3	10.3	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.0	0.0	0.1	0.1	0.0	0.9	1.3	3.2	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	0.2	2.9	0.0	0.3	0.2	0.0	2.7	1.8	5.5	0.0
LnGrp Delay(d),s/veh	0.0	0.0	13.4	18.8	0.0	13.5	7.5	0.0	6.7	10.6	13.5	0.0
LnGrp LOS			B	B		B	A		A	B	B	
Approach Vol, veh/h		123			252			371			658	
Approach Delay, s/veh		1.8			18.2			6.8			12.7	
Approach LOS		A			B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		31.0		16.9	5.7	25.3		16.9
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		26.5		24.5	4.0	18.0		16.0
Max Q Clear Time (g_c+I1), s		6.8		5.1	2.4	11.4		11.7
Green Ext Time (p_c), s		6.1		2.0	0.0	3.2		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	5	10	165	0	1	20	1	0	175	5	1
Future Vol, veh/h	0	5	10	165	0	1	20	1	0	175	5	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1	2	0	0	0	2	1	1	1
Mvmt Flow	0	5	11	179	0	1	22	1	0	190	5	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8	7.7	9.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	3%	5%	0%
Vol Thru, %	3%	6%	91%	50%
Vol Right, %	1%	92%	5%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	181	180	22	10
LT Vol	175	5	1	0
Through Vol	5	10	20	5
RT Vol	1	165	1	5
Lane Flow Rate	197	196	24	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.246	0.212	0.03	0.013
Departure Headway (Hd)	4.497	3.901	4.579	4.282
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	787	925	785	837
Service Time	2.59	1.904	2.588	2.3
HCM Lane V/C Ratio	0.25	0.212	0.031	0.013
HCM Control Delay	9.1	8	7.7	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.8	0.1	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	5	5
Future Vol, veh/h	0	0	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	5	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.4
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	1	0	10	5	190	1	80	5	235	110	20
Future Vol, veh/h	10	1	0	10	5	190	1	80	5	235	110	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	175	-	-
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, %	10	10	10	2	2	2	4	4	4	2	2	2
Mvmt Flow	11	1	0	11	5	209	1	88	5	258	121	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	744	744	132	742	752	91	143	0	0	93	0	0
Stage 1	648	648	-	93	93	-	-	-	-	-	-	-
Stage 2	96	96	-	649	659	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	321	333	896	332	339	967	1427	-	-	1501	-	-
Stage 1	446	454	-	914	818	-	-	-	-	-	-	-
Stage 2	891	800	-	458	461	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	215	275	896	287	280	967	1427	-	-	1501	-	-
Mov Cap-2 Maneuver	215	275	-	287	280	-	-	-	-	-	-	-
Stage 1	446	376	-	913	817	-	-	-	-	-	-	-
Stage 2	693	799	-	378	382	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.4	10.3	0.1	5.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1427	-	-	219	285	967	1501	-	-
HCM Lane V/C Ratio	0.001	-	-	0.055	0.058	0.216	0.172	-	-
HCM Control Delay (s)	7.5	0	-	22.4	18.4	9.7	7.9	-	-
HCM Lane LOS	A	A	-	C	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0.8	0.6	-	-

Intersection	
Int Delay, s/veh	11.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	170	70	130	305	180	105
Future Vol, veh/h	170	70	130	305	180	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	3	0	0	1	1
Mvmt Flow	181	74	138	324	191	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	255	0	819	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	601	-
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	-	-	1322	-	346	824
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1322	-	310	824
Mov Cap-2 Maneuver	-	-	-	-	310	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	492	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	36.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	403	-	-	1322	-
HCM Lane V/C Ratio	0.752	-	-	0.105	-
HCM Control Delay (s)	36.5	-	-	8	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q(veh)	6.1	-	-	0.3	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	15	20	1	5	35	70	0	1	5	85	5	30
Future Vol, veh/h	15	20	1	5	35	70	0	1	5	85	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	3	3	3
Mvmt Flow	18	24	1	6	41	82	0	1	6	100	6	35

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	124	0	0	25	0	0	174	194	24	157	154	82
Stage 1	-	-	-	-	-	-	59	59	-	94	94	-
Stage 2	-	-	-	-	-	-	115	135	-	63	60	-
Critical Hdwy	4.13	-	-	4.11	-	-	7.1	6.5	6.2	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.209	-	-	3.5	4	3.3	3.527	4.027	3.327
Pot Cap-1 Maneuver	1457	-	-	1596	-	-	793	705	1058	807	736	975
Stage 1	-	-	-	-	-	-	958	850	-	910	815	-
Stage 2	-	-	-	-	-	-	895	789	-	945	843	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1457	-	-	1596	-	-	750	693	1058	791	724	975
Mov Cap-2 Maneuver	-	-	-	-	-	-	750	693	-	791	724	-
Stage 1	-	-	-	-	-	-	946	839	-	898	812	-
Stage 2	-	-	-	-	-	-	853	786	-	926	832	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.1	0.3	8.7	10.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	973	1457	-	-	1596	-	-	827
HCM Lane V/C Ratio	0.007	0.012	-	-	0.004	-	-	0.171
HCM Control Delay (s)	8.7	7.5	0	-	7.3	0	-	10.2
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	60	15	130	70	20	110
Future Vol, veh/h	60	15	130	70	20	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	66	16	143	77	22	121

Major/Minor	Minor1			Major1		Minor2	
Conflicting Flow All	241	181		0	0	181	220
Stage 1	181	-		-	-	0	0
Stage 2	60	-		-	-	181	220
Critical Hdwy	7.11	6.21		-	-	7.1	6.5
Critical Hdwy Stg 1	6.11	-		-	-	-	-
Critical Hdwy Stg 2	-	-		-	-	6.1	5.5
Follow-up Hdwy	3.509	3.309		-	-	3.5	4
Pot Cap-1 Maneuver	715	864		-	-	785	682
Stage 1	823	-		-	-	-	-
Stage 2	-	-		-	-	825	725
Platoon blocked, %				-	-		
Mov Cap-1 Maneuver	618	864		-	-	770	682
Mov Cap-2 Maneuver	618	-		-	-	770	682
Stage 1	823	-		-	-	-	-
Stage 2	-	-		-	-	809	725

Approach	WB	NB	SB
HCM Control Delay, s	11	0	11.2
HCM LOS	B		B

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBLn1	SBLn2
Capacity (veh/h)	-	-	618	864	770	682
HCM Lane V/C Ratio	-	-	0.107	0.019	0.029	0.177
HCM Control Delay (s)	-	-	11.5	9.2	9.8	11.4
HCM Lane LOS	-	-	B	A	A	B
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0.1	0.6

9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Del/Veh (s)	5.9	6.9	3.4	7.0	8.7	4.6	6.2	8.3	4.7	0.8	1.1	0.8

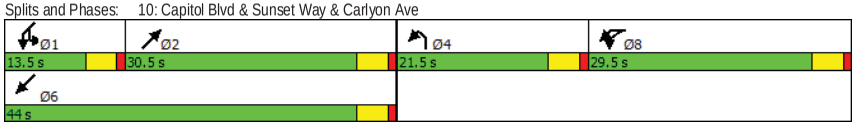
9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	4.4

Lane Group	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
Future Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0			0			150	
Storage Lanes		1	0	1	0			0			1	
Taper Length (ft)		25		25							25	
Right Turn on Red			Yes			Yes			Yes			
Link Speed (mph)		30		30			30					30
Link Distance (ft)		840		629			731					791
Travel Time (s)		19.1		14.3			16.6					18.0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	Prot		Prot			NA			Prot	Prot	NA
Protected Phases	8	8		4			2			1	1	6
Permitted Phases												
Detector Phase	8	8		4			2			1	1	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0			10.0			6.0	6.0	10.0
Minimum Split (s)	29.5	29.5		21.5			29.5			10.5	10.5	20.0
Total Split (s)	29.5	29.5		21.5			30.5			13.5	13.5	44.0
Total Split (%)	31.1%	31.1%		22.6%			32.1%			14.2%	14.2%	46.3%
Yellow Time (s)	3.5	3.5		3.5			3.5			3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0			1.0			1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0				0.0	0.0
Total Lost Time (s)		4.5		4.5			4.5				4.5	4.5
Lead/Lag							Lag			Lead	Lead	
Lead-Lag Optimize?							Yes			Yes	Yes	
Recall Mode	None	None		None			Max			None	None	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 62.3	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: Capitol Blvd & Sunset Way & Carlyon Ave





Movement	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
Future Volume (vph)	1	55	40	35	15	2	440	90	15	45	10	815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5			4.5				4.5	4.5
Lane Util. Factor		1.00		1.00			0.95				1.00	0.95
Frt		0.94		0.96			0.97				1.00	1.00
Flt Protected		0.97		0.97			1.00				0.95	1.00
Satd. Flow (prot)		1742		1757			3437				1787	3574
Flt Permitted		0.97		0.97			1.00				0.95	1.00
Satd. Flow (perm)		1742		1757			3437				1787	3574
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	65	47	41	18	2	518	106	18	53	12	959
RTOR Reduction (vph)	0	104	0	58	0	0	1	0	0	0	0	0
Lane Group Flow (vph)	0	9	0	3	0	0	641	0	0	0	65	959
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	Prot		Prot			NA			Prot	Prot	NA
Protected Phases	8	8		4			2			1	1	6
Permitted Phases												
Actuated Green, G (s)		5.3		3.4			35.6				4.8	44.9
Effective Green, g (s)		5.3		3.4			35.6				4.8	44.9
Actuated g/C Ratio		0.08		0.05			0.53				0.07	0.67
Clearance Time (s)		4.5		4.5			4.5				4.5	4.5
Vehicle Extension (s)		3.0		3.0			3.0				3.0	3.0
Lane Grp Cap (vph)		137		89			1823				127	2391
v/s Ratio Prot		c0.01		c0.00			0.19				0.04	c0.27
v/s Ratio Perm												
v/c Ratio		0.07		0.03			0.35				0.51	0.40
Uniform Delay, d1		28.6		30.3			9.1				30.0	5.0
Progression Factor		1.00		1.00			1.00				1.00	1.00
Incremental Delay, d2		0.2		0.2			0.5				3.5	0.5
Delay (s)		28.8		30.4			9.6				33.5	5.5
Level of Service		C		C			A				C	A
Approach Delay (s)		28.8		30.4			9.6					7.3
Approach LOS		C		C			A					A

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	67.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.7

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	160	305	225	145	0	0
Future Vol, veh/h	160	305	225	145	0	0
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	79	79	79	79	79	79
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	203	386	285	184	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	468	0	-	0	1168	377
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	791	-
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	1104	-	-	-	216	674
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	450	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	165	674
Mov Cap-2 Maneuver	-	-	-	-	165	-
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	345	-

Approach	SE	NW	SW
HCM Control Delay, s	3.1	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1104	-	-
HCM Lane V/C Ratio	-	-	0.183	-	-
HCM Control Delay (s)	-	-	9	0	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	0	430	385	260	20
Future Vol, veh/h	0	0	430	385	260	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	0	0	467	418	283	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1646	-	304	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	1353	-	-	-	-	-
Critical Hdwy	6.4	-	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	-	2.209	-	-	-
Pot Cap-1 Maneuver	111	0	1263	-	-	-
Stage 1	762	0	-	-	-	-
Stage 2	243	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	70	-	1263	-	-	-
Mov Cap-2 Maneuver	70	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	153	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1263	-	-	-	-
HCM Lane V/C Ratio	0.37	-	-	-	-
HCM Control Delay (s)	9.5	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	1.7	-	-	-	-

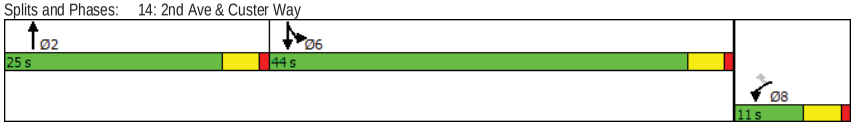
13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.5	0.5	0.4
Total Del/Veh (s)	0.7	1.0	0.9	32.0	12.2	22.6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	125	150	25	150	815	230
Future Volume (vph)	125	150	25	150	815	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225		0	0	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	662		2035			505
Travel Time (s)	15.0		46.3			11.5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	8		2		6	6
Permitted Phases		8				
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	10.0	10.0	24.5		20.0	20.0
Total Split (s)	11.0	11.0	25.0		44.0	44.0
Total Split (%)	13.8%	13.8%	31.3%		55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 66.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 14: 2nd Ave & Custer Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	125	150	25	150	815	230
Future Volume (veh/h)	125	150	25	150	815	230
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	142	5	28	5	926	261
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	181	162	44	8	1174	1233
Arrive On Green	0.10	0.10	0.03	0.03	0.65	0.65
Sat Flow, veh/h	1792	1599	1555	278	1810	1900
Grp Volume(v), veh/h	142	5	0	33	926	261
Grp Sat Flow(s),veh/h/ln	1792	1599	0	1832	1810	1900
Q Serve(g_s), s	4.7	0.2	0.0	1.1	22.4	3.4
Cycle Q Clear(g_c), s	4.7	0.2	0.0	1.1	22.4	3.4
Prop In Lane	1.00	1.00		0.15	1.00	
Lane Grp Cap(c), veh/h	181	162	0	51	1174	1233
V/C Ratio(X)	0.78	0.03	0.00	0.64	0.79	0.21
Avail Cap(c_a), veh/h	191	171	0	617	1174	1233
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	24.7	0.0	29.3	7.7	4.3
Incr Delay (d2), s/veh	16.3	0.0	0.0	4.9	5.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.1	0.0	0.6	12.6	1.9
LnGrp Delay(d),s/veh	43.0	24.7	0.0	34.1	13.1	4.7
LnGrp LOS	D	C		C	B	A
Approach Vol, veh/h	147		33			1187
Approach Delay, s/veh	42.4		34.1			11.2
Approach LOS	D		C			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		6.2				44.0		10.7
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		20.5				39.5		6.5
Max Q Clear Time (g_c+I1), s		3.1				24.4		6.7
Green Ext Time (p_c), s		0.1				5.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	710	165	370	260	5	0	1	150	0	1	5
Future Vol, veh/h	0	710	165	370	260	5	0	1	150	0	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	425	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	0	747	174	389	274	5	0	1	158	0	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	279	0	0	921	0	0	-	1892	461	1429	1976	276
Stage 1	-	-	-	-	-	-	-	834	-	1055	1055	-
Stage 2	-	-	-	-	-	-	-	1058	-	374	921	-
Critical Hdwy	4.115	-	-	4.115	-	-	-	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2095	-	-	2.2095	-	-	-	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1289	-	-	744	-	-	0	71	553	105	63	768
Stage 1	-	-	-	-	-	-	0	386	-	275	305	-
Stage 2	-	-	-	-	-	-	0	304	-	624	352	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1289	-	-	744	-	-	-	34	553	43	30	768
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	34	-	43	30	-
Stage 1	-	-	-	-	-	-	-	386	-	275	146	-
Stage 2	-	-	-	-	-	-	-	145	-	445	352	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.8	15.5	29.9
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	502	1289	-	-	744	-	-	151
HCM Lane V/C Ratio	0.317	-	-	-	0.523	-	-	0.042
HCM Control Delay (s)	15.5	0	-	-	15	-	-	29.9
HCM Lane LOS	C	A	-	-	C	-	-	D
HCM 95th %tile Q(veh)	1.3	0	-	-	3.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	29
Intersection LOS	D

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	95	415	0	365	60	0	100	185
Future Vol, veh/h	0	95	415	0	365	60	0	100	185
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.92	0.93	0.93
Heavy Vehicles, %	2	1	1	2	0	0	2	0	0
Mvmt Flow	0	102	446	0	392	65	0	108	199
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	36	28	17.8
HCM LOS	E	D	C

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	19%	35%
Vol Thru, %	86%	0%	65%
Vol Right, %	14%	81%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	425	510	285
LT Vol	0	95	100
Through Vol	365	0	185
RT Vol	60	415	0
Lane Flow Rate	457	548	306
Geometry Grp	1	1	1
Degree of Util (X)	0.783	0.875	0.561
Departure Headway (Hd)	6.167	5.742	6.587
Convergence, Y/N	Yes	Yes	Yes
Cap	585	631	545
Service Time	4.216	3.782	4.642
HCM Lane V/C Ratio	0.781	0.868	0.561
HCM Control Delay	28	36	17.8
HCM Lane LOS	D	E	C
HCM 95th-tile Q	7.4	10.2	3.4

Intersection	
Int Delay, s/veh	4.1

Movement	NBL	NBR	NET	NER	SWL	SWT
Traffic Vol, veh/h	0	225	330	20	365	550
Future Vol, veh/h	0	225	330	20	365	550
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	1	1	1	1
Mvmt Flow	0	256	375	23	415	625

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	188	0	0	375	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.98	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.34	-	-	2.21	-
Pot Cap-1 Maneuver	0	816	-	-	1187	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	816	-	-	1187	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

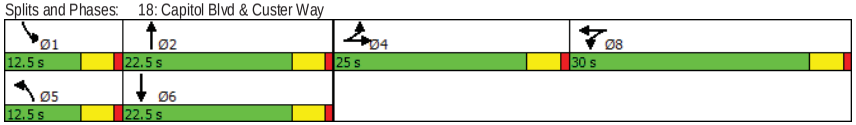
Approach	NB	NE	SW
HCM Control Delay, s	11.4	0	3.9
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	816	1187	-
HCM Lane V/C Ratio	-	-	0.313	0.349	-
HCM Control Delay (s)	-	-	11.4	9.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.3	1.6	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	650	80	345	440	5	20	330	425	20	390	135
Future Volume (vph)	135	650	80	345	440	5	20	330	425	20	390	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		684			631			2019			1179	
Travel Time (s)		15.5			14.3			45.9			26.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)	10%			10%								
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.0	22.0		22.0	22.0		12.5	22.0		12.5	22.0	
Total Split (s)	25.0	25.0		30.0	30.0		12.5	22.5		12.5	22.5	
Total Split (%)	27.8%	27.8%		33.3%	33.3%		13.9%	25.0%		13.9%	25.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 82.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 18: Capitol Blvd & Custer Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	650	80	345	440	5	20	330	425	20	390	135
Future Volume (veh/h)	135	650	80	345	440	5	20	330	425	20	390	135
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1900	1900	1900
Adj Flow Rate, veh/h	150	722	0	383	489	6	22	367	189	22	433	150
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
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
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	410	861	0	525	543	7	69	505	256	70	580	199
Arrive On Green	0.23	0.23	0.00	0.29	0.29	0.29	0.04	0.22	0.22	0.04	0.22	0.22
Sat Flow, veh/h	1792	3762	0	1792	1854	23	1792	2298	1165	1810	2639	906
Grp Volume(v), veh/h	150	722	0	383	0	495	22	284	272	22	295	288
Grp Sat Flow(s),veh/h/ln	1792	1881	0	1792	0	1877	1792	1787	1676	1810	1805	1740
Q Serve(g_s), s	5.8	15.0	0.0	15.7	0.0	20.7	1.0	12.1	12.4	1.0	12.5	12.7
Cycle Q Clear(g_c), s	5.8	15.0	0.0	15.7	0.0	20.7	1.0	12.1	12.4	1.0	12.5	12.7
Prop In Lane	1.00		0.00	1.00		0.01	1.00		0.70	1.00		0.52
Lane Grp Cap(c), veh/h	410	861	0	525	0	550	69	393	368	70	397	383
V/C Ratio(X)	0.37	0.84	0.00	0.73	0.00	0.90	0.32	0.72	0.74	0.32	0.74	0.75
Avail Cap(c_a), veh/h	449	942	0	558	0	585	175	393	368	177	397	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	30.1	0.0	26.0	0.0	27.8	38.3	29.6	29.7	38.3	29.8	29.9
Incr Delay (d2), s/veh	0.5	6.3	0.0	4.5	0.0	16.4	2.6	11.0	12.4	2.6	11.9	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	8.5	0.0	8.4	0.0	13.2	0.5	7.1	7.0	0.5	7.5	7.5
LnGrp Delay(d),s/veh	27.1	36.5	0.0	30.6	0.0	44.2	40.9	40.6	42.2	40.9	41.7	42.7
LnGrp LOS	C	D		C		D	D	D	D	D	D	D
Approach Vol, veh/h		872			878			578			605	
Approach Delay, s/veh		34.9			38.2			41.4			42.1	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	22.5		23.2	7.6	22.5		28.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	8.0	18.0		20.5	8.0	18.0		25.5
Max Q Clear Time (g_c+I1), s	3.0	14.4		17.0	3.0	14.7		22.7
Green Ext Time (p_c), s	0.0	2.2		1.7	0.0	2.1		1.3

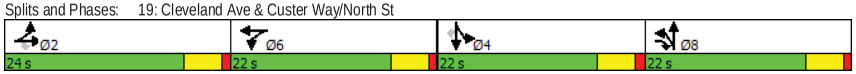
Intersection Summary		
HCM 2010 Ctrl Delay		38.7
HCM 2010 LOS		D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	330	645	15	245	70	480	135	15	105	280	105
Future Volume (vph)	50	330	645	15	245	70	480	135	15	105	280	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	200		0	300		0	150		150
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		631			2207			2922			341	
Travel Time (s)		14.3			50.2			66.4			7.8	
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
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)							50%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Protected Phases	2	2	8	6	6		8	8		4	4	
Permitted Phases			2									4
Detector Phase	2	2	8	6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	6.0	6.0	8.0	6.0	6.0		8.0	8.0		6.0	6.0	6.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	24.0	24.0	22.0	22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (%)	26.7%	26.7%	24.4%	24.4%	24.4%		24.4%	24.4%		24.4%	24.4%	24.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 88.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 19: Cleveland Ave & Custer Way/North St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	330	645	15	245	70	480	135	15	105	280	105
Future Volume (veh/h)	50	330	645	15	245	70	480	135	15	105	280	105
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	54	355	586	16	263	75	516	145	16	113	301	22
Adj No. of Lanes	1	1	1	1	1	0	2	1	0	1	1	1
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, %	1	1	1	1	1	1	1	1	1	2	2	2
Cap, veh/h	391	411	625	350	275	79	619	287	32	325	342	290
Arrive On Green	0.22	0.22	0.22	0.20	0.20	0.20	0.17	0.17	0.17	0.18	0.18	0.18
Sat Flow, veh/h	1792	1881	1599	1792	1409	402	3583	1665	184	1774	1863	1583
Grp Volume(v), veh/h	54	355	586	16	0	338	516	0	161	113	301	22
Grp Sat Flow(s),veh/h/ln	1792	1881	1599	1792	0	1810	1792	0	1849	1774	1863	1583
Q Serve(g_s), s	2.1	15.8	19.0	0.6	0.0	16.1	12.1	0.0	6.9	4.8	13.7	1.0
Cycle Q Clear(g_c), s	2.1	15.8	19.0	0.6	0.0	16.1	12.1	0.0	6.9	4.8	13.7	1.0
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	391	411	625	350	0	354	619	0	319	325	342	290
V/C Ratio(X)	0.14	0.86	0.94	0.05	0.00	0.96	0.83	0.00	0.50	0.35	0.88	0.08
Avail Cap(c_a), veh/h	391	411	625	350	0	354	700	0	361	347	364	310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	32.7	21.9	28.4	0.0	34.6	34.8	0.0	32.6	31.0	34.6	29.4
Incr Delay (d2), s/veh	0.2	17.1	21.8	0.1	0.0	36.1	7.8	0.0	1.2	0.5	20.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	10.1	17.8	0.3	0.0	11.5	6.6	0.0	3.6	2.4	8.9	0.4
LnGrp Delay(d),s/veh	27.5	49.8	43.7	28.5	0.0	70.7	42.6	0.0	33.8	31.4	54.7	29.5
LnGrp LOS	C	D	D	C		E	D		C	C	D	C
Approach Vol, veh/h		995			354			677			436	
Approach Delay, s/veh		45.0			68.8			40.5			47.4	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		24.0		21.0		22.0		20.0
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		19.0		17.0		17.0		17.0
Max Q Clear Time (g_c+I1), s		21.0		15.7		18.1		14.1
Green Ext Time (p_c), s		0.0		0.3		0.0		0.9

Intersection Summary		
HCM 2010 Ctrl Delay		47.6
HCM 2010 LOS		D

Notes

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	50	270	2	10	395	50	1	2	5	25	1	15
Future Vol, veh/h	50	270	2	10	395	50	1	2	5	25	1	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	57	310	2	11	454	57	1	2	6	29	1	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	511	0	0	313	0	0	941	960	311	936	934	483
Stage 1	-	-	-	-	-	-	426	426	-	506	506	-
Stage 2	-	-	-	-	-	-	515	534	-	430	428	-
Critical Hdwy	4.11	-	-	4.11	-	-	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	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1059	-	-	1253	-	-	245	259	734	247	268	588
Stage 1	-	-	-	-	-	-	610	589	-	552	543	-
Stage 2	-	-	-	-	-	-	546	528	-	607	588	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1059	-	-	1253	-	-	223	239	734	229	248	588
Mov Cap-2 Maneuver	-	-	-	-	-	-	223	239	-	229	248	-
Stage 1	-	-	-	-	-	-	570	551	-	516	536	-
Stage 2	-	-	-	-	-	-	523	522	-	561	550	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	14.1	19.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	407	1059	-	-	1253	-	-	296
HCM Lane V/C Ratio	0.023	0.054	-	-	0.009	-	-	0.159
HCM Control Delay (s)	14.1	8.6	0	-	7.9	0	-	19.5
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.6

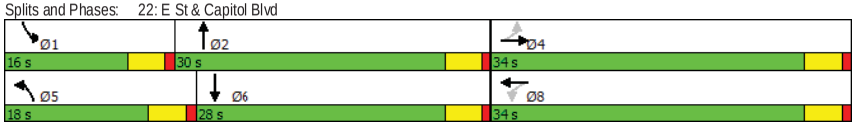
21: I-5 NB Off-Ramp/Deschutes Way & E St Performance by movement

Movement	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.3	0.2	0.2	0.2	0.2
Total Del/Veh (s)	1.3	12.2	2.7	0.8	2.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	90	255	115	90	130	215	445	130	190	585	70
Future Volume (vph)	90	90	255	115	90	130	215	445	130	190	585	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		282			479			1902			2019	
Travel Time (s)		6.4			10.9			43.2			45.9	
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 (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	29.5	29.5		29.5	29.5		9.5	26.5		9.5	26.5	
Total Split (s)	34.0	34.0		34.0	34.0		18.0	30.0		16.0	28.0	
Total Split (%)	42.5%	42.5%		42.5%	42.5%		22.5%	37.5%		20.0%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 74.9	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 22: E St & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	90	255	115	90	130	215	445	130	190	585	70
Future Volume (veh/h)	90	90	255	115	90	130	215	445	130	190	585	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	105	105	0	134	105	151	250	517	151	221	680	81
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
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
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	258	231	0	223	156	190	302	906	263	269	1008	120
Arrive On Green	0.30	0.30	0.00	0.30	0.30	0.30	0.17	0.33	0.33	0.15	0.31	0.31
Sat Flow, veh/h	567	767	0	483	516	631	1792	2734	795	1792	3218	383
Grp Volume(v), veh/h	210	0	0	390	0	0	250	337	331	221	377	384
Grp Sat Flow(s),veh/h/ln	1333	0	0	1630	0	0	1792	1787	1741	1792	1787	1814
Q Serve(g_s), s	0.0	0.0	0.0	5.5	0.0	0.0	8.4	9.7	9.8	7.4	11.4	11.5
Cycle Q Clear(g_c), s	7.9	0.0	0.0	13.3	0.0	0.0	8.4	9.7	9.8	7.4	11.4	11.5
Prop In Lane	0.50		0.00	0.34		0.39	1.00		0.46	1.00		0.21
Lane Grp Cap(c), veh/h	489	0	0	569	0	0	302	592	577	269	560	568
V/C Ratio(X)	0.43	0.00	0.00	0.69	0.00	0.00	0.83	0.57	0.57	0.82	0.67	0.68
Avail Cap(c_a), veh/h	732	0	0	837	0	0	389	732	713	331	675	685
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	0.0	0.0	19.7	0.0	0.0	25.0	17.2	17.2	25.6	18.6	18.6
Incr Delay (d2), s/veh	0.6	0.0	0.0	1.5	0.0	0.0	11.1	0.9	0.9	12.6	2.0	2.0
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	3.1	0.0	0.0	6.3	0.0	0.0	5.1	4.9	4.8	4.6	5.9	6.1
LnGrp Delay(d),s/veh	18.2	0.0	0.0	21.1	0.0	0.0	36.2	18.0	18.1	38.2	20.6	20.6
LnGrp LOS	B			C			D	B	B	D	C	C
Approach Vol, veh/h		210			390			918			982	
Approach Delay, s/veh		18.2			21.1			23.0			24.6	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.9	25.1		23.3	15.0	24.0		23.3
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	11.5	25.5		29.5	13.5	23.5		29.5
Max Q Clear Time (g_c+I1), s	9.4	11.8		9.9	10.4	13.5		15.3
Green Ext Time (p_c), s	0.1	7.5		3.9	0.2	6.0		3.4

Intersection Summary			
HCM 2010 Ctrl Delay		22.9	
HCM 2010 LOS		C	

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	5	15	570	10	15	855
Future Vol, veh/h	5	15	570	10	15	855
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	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	6	17	648	11	17	972

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1173	330	0	0	659	0
Stage 1	653	-	-	-	-	-
Stage 2	520	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.12	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.21	-
Pot Cap-1 Maneuver	188	672	-	-	932	-
Stage 1	485	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	180	672	-	-	932	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	485	-	-	-	-	-
Stage 2	544	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	399	932	-
HCM Lane V/C Ratio	-	-	0.057	0.018	-
HCM Control Delay (s)	-	-	14.6	8.9	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	20	140	0	1	260	225	0	0	1	120	0	15
Future Vol, veh/h	20	140	0	1	260	225	0	0	1	120	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	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, %	3	3	3	1	1	1	0	0	0	1	1	1
Mvmt Flow	22	151	0	1	280	242	0	0	1	129	0	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	522	0	0	151	0	0	605	718	151	597	597	401
Stage 1	-	-	-	-	-	-	194	194	-	403	403	-
Stage 2	-	-	-	-	-	-	411	524	-	194	194	-
Critical Hdwy	4.13	-	-	4.11	-	-	7.1	6.5	6.2	7.11	6.51	6.21
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	2.227	-	-	2.209	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1039	-	-	1436	-	-	413	357	901	416	418	651
Stage 1	-	-	-	-	-	-	812	744	-	626	601	-
Stage 2	-	-	-	-	-	-	622	533	-	810	742	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1039	-	-	1436	-	-	395	348	901	408	408	651
Mov Cap-2 Maneuver	-	-	-	-	-	-	395	348	-	408	408	-
Stage 1	-	-	-	-	-	-	793	727	-	612	600	-
Stage 2	-	-	-	-	-	-	606	532	-	790	725	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	9	17.8
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	901	1039	-	-	1436	-	-	426
HCM Lane V/C Ratio	0.001	0.021	-	-	0.001	-	-	0.341
HCM Control Delay (s)	9	8.5	0	-	7.5	0	-	17.8
HCM Lane LOS	A	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.5

Intersection	
Intersection Delay, s/veh	25
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	30	165	100	0	100	245	60	0	105	115	95
Future Vol, veh/h	0	30	165	100	0	100	245	60	0	105	115	95
Peak Hour Factor	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	0	0	0
Mvmt Flow	0	34	185	112	0	112	275	67	0	118	129	107
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	25.2	28.5	18.5
HCM LOS	D	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	55%	0%	62%	0%	80%	0%	57%
Vol Right, %	0%	45%	0%	38%	0%	20%	0%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	210	30	265	100	305	65	290
LT Vol	105	0	30	0	100	0	65	0
Through Vol	0	115	0	165	0	245	0	165
RT Vol	0	95	0	100	0	60	0	125
Lane Flow Rate	118	236	34	298	112	343	73	326
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.296	0.536	0.084	0.678	0.272	0.768	0.18	0.728
Departure Headway (Hd)	9.024	8.176	8.986	8.193	8.73	8.07	8.874	8.043
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	398	441	399	441	411	449	405	450
Service Time	6.782	5.933	6.742	5.948	6.487	5.826	6.629	5.797
HCM Lane V/C Ratio	0.296	0.535	0.085	0.676	0.273	0.764	0.18	0.724
HCM Control Delay	15.6	20	12.6	26.6	14.7	33	13.6	29.6
HCM Lane LOS	C	C	B	D	B	D	B	D
HCM 95th-tile Q	1.2	3.1	0.3	4.9	1.1	6.6	0.6	5.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	65	165	125
Future Vol, veh/h	0	65	165	125
Peak Hour Factor	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	73	185	140
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	26.7
HCM LOS	D

Lane

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	165	145	155	625	705	240
Future Volume (vph)	165	145	155	625	705	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	150			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	489			2664	1902	
Travel Time (s)	11.1			60.5	43.2	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	
Minimum Split (s)	22.5	19.5	19.5	20.0	21.5	
Total Split (s)	22.6	19.6	19.6	47.4	27.8	
Total Split (%)	32.3%	28.0%	28.0%	67.7%	39.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 63.3	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 26: Capitol Blvd & Linwood Ave



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	165	145	155	625	705	240		
Future Volume (veh/h)	165	145	155	625	705	240		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900		
Adj Flow Rate, veh/h	196	173	185	744	839	286		
Adj No. of Lanes	1	1	1	2	2	0		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84		
Percent Heavy Veh, %	1	1	1	1	1	1		
Cap, veh/h	260	610	598	2526	1038	353		
Arrive On Green	0.15	0.15	0.24	0.71	0.40	0.40		
Sat Flow, veh/h	1792	1599	1792	3668	2713	892		
Grp Volume(v), veh/h	196	173	185	744	572	553		
Grp Sat Flow(s),veh/h/ln	1792	1599	1792	1787	1787	1724		
Q Serve(g_s), s	6.4	4.6	2.3	4.7	17.3	17.3		
Cycle Q Clear(g_c), s	6.4	4.6	2.3	4.7	17.3	17.3		
Prop In Lane	1.00	1.00	1.00			0.52		
Lane Grp Cap(c), veh/h	260	610	598	2526	708	683		
V/C Ratio(X)	0.75	0.28	0.31	0.29	0.81	0.81		
Avail Cap(c_a), veh/h	534	854	620	2526	708	683		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	24.9	13.0	8.4	3.3	16.3	16.3		
Incr Delay (d2), s/veh	1.7	0.1	0.1	0.3	9.6	10.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.3	4.7	1.4	2.4	10.3	10.0		
LnGrp Delay(d),s/veh	26.6	13.1	8.5	3.6	25.9	26.3		
LnGrp LOS	C	B	A	A	C	C		
Approach Vol, veh/h	369			929	1125			
Approach Delay, s/veh	20.3			4.6	26.1			
Approach LOS	C			A	C			

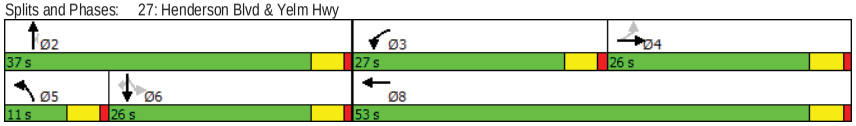
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.4		13.3	18.8	28.6		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.9		18.1	15.1	23.3		
Max Q Clear Time (g_c+I1), s		6.7		8.4	4.3	19.3		
Green Ext Time (p_c), s		15.1		0.5	0.2	3.2		

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	680	160	430	505	80	110	165	645	155	205	20
Future Volume (vph)	5	680	160	430	505	80	110	165	645	155	205	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	450		0	200		100	0		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1947			1645			3441			1606	
Travel Time (s)		44.3			37.4			78.2			36.5	
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Prot	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4								2	6		6
Detector Phase	4	4		3	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		5.0	6.0		5.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	24.5	24.5		9.5	24.5		9.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	26.0	26.0		27.0	53.0		11.0	37.0	37.0	26.0	26.0	26.0
Total Split (%)	28.9%	28.9%		30.0%	58.9%		12.2%	41.1%	41.1%	28.9%	28.9%	28.9%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 85.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	680	160	430	505	80	110	165	645	155	205	20
Future Volume (veh/h)	5	680	160	430	505	80	110	165	645	155	205	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	5	747	176	473	555	88	121	181	0	170	225	22
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	289	738	174	482	1792	283	139	589	501	306	342	291
Arrive On Green	0.26	0.26	0.26	0.27	0.58	0.58	0.08	0.31	0.00	0.18	0.18	0.18
Sat Flow, veh/h	791	2872	677	1792	3093	489	1792	1881	1599	1210	1881	1599
Grp Volume(v), veh/h	5	465	458	473	320	323	121	181	0	170	225	22
Grp Sat Flow(s),veh/h/ln	791	1787	1762	1792	1787	1795	1792	1881	1599	1210	1881	1599
Q Serve(g_s), s	0.4	21.5	21.5	22.0	7.7	7.7	5.6	6.1	0.0	11.2	9.3	1.0
Cycle Q Clear(g_c), s	0.4	21.5	21.5	22.0	7.7	7.7	5.6	6.1	0.0	11.2	9.3	1.0
Prop In Lane	1.00		0.38	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	289	459	452	482	1035	1040	139	589	501	306	342	291
V/C Ratio(X)	0.02	1.01	1.01	0.98	0.31	0.31	0.87	0.31	0.00	0.56	0.66	0.08
Avail Cap(c_a), veh/h	289	459	452	482	1035	1040	139	730	621	397	483	411
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	31.1	31.1	30.4	9.0	9.0	38.2	21.9	0.0	32.6	31.8	28.4
Incr Delay (d2), s/veh	0.1	45.2	45.5	36.3	0.8	0.8	40.6	0.3	0.0	1.6	2.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	16.2	16.0	15.6	4.0	4.0	4.3	3.2	0.0	3.9	5.0	0.4
LnGrp Delay(d),s/veh	23.4	76.3	76.7	66.7	9.8	9.8	78.8	22.1	0.0	34.2	34.0	28.5
LnGrp LOS	C	F	F	E	A	A	E	C		C	C	C
Approach Vol, veh/h		928			1116			302			417	
Approach Delay, s/veh		76.2			33.9			44.8			33.8	
Approach LOS		E			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		30.7	27.0	26.0	11.0	19.7		53.0
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		32.5	22.5	21.5	6.5	21.5		48.5
Max Q Clear Time (g_c+I1), s		8.1	24.0	23.5	7.6	13.2		9.7
Green Ext Time (p_c), s		3.1	0.0	0.0	0.0	2.0		14.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.3
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	35	175	295	100	90	60
Future Vol, veh/h	35	175	295	100	90	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	-	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	38	190	321	109	98	65

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	429	0	-	0	641	375
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1141	-	-	-	439	671
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	779	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1141	-	-	-	423	671
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	750	-

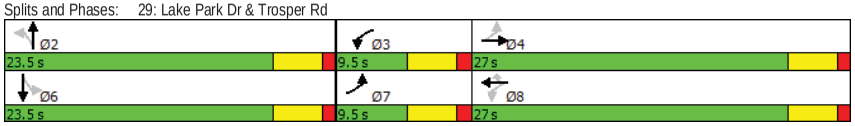
Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1141	-	-	-	423	671
HCM Lane V/C Ratio	0.033	-	-	-	0.231	0.097
HCM Control Delay (s)	8.3	0	-	-	16.1	10.9
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	250	45	50	370	50	60	25	55	40	20	15
Future Volume (vph)	10	250	45	50	370	50	60	25	55	40	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	225		0	100		0	125		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2012			652			269			583	
Travel Time (s)		45.7			14.8			6.1			13.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	26.5		9.5	26.5	26.5	21.5	21.5		21.5	21.5	
Total Split (s)	9.5	27.0		9.5	27.0	27.0	23.5	23.5		23.5	23.5	
Total Split (%)	15.8%	45.0%		15.8%	45.0%	45.0%	39.2%	39.2%		39.2%	39.2%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 45	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 29: Lake Park Dr & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	250	45	50	370	50	60	25	55	40	20	15
Future Volume (veh/h)	10	250	45	50	370	50	60	25	55	40	20	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	263	47	53	389	53	63	26	58	42	21	16
Adj No. of Lanes	1	2	0	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	289	791	139	451	563	479	693	210	469	646	402	306
Arrive On Green	0.01	0.26	0.26	0.05	0.30	0.30	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	1792	3038	536	1792	1881	1599	1393	524	1169	1335	1002	763
Grp Volume(v), veh/h	11	153	157	53	389	53	63	0	84	42	0	37
Grp Sat Flow(s),veh/h/ln	1792	1787	1787	1792	1881	1599	1393	0	1694	1335	0	1765
Q Serve(g_s), s	0.2	3.3	3.4	1.0	8.6	1.1	1.4	0.0	1.5	1.0	0.0	0.6
Cycle Q Clear(g_c), s	0.2	3.3	3.4	1.0	8.6	1.1	2.0	0.0	1.5	2.4	0.0	0.6
Prop In Lane	1.00		0.30	1.00		1.00	1.00		0.69	1.00		0.43
Lane Grp Cap(c), veh/h	289	466	465	451	563	479	693	0	680	646	0	708
V/C Ratio(X)	0.04	0.33	0.34	0.12	0.69	0.11	0.09	0.00	0.12	0.07	0.00	0.05
Avail Cap(c_a), veh/h	452	849	849	545	894	760	693	0	680	646	0	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.0	14.2	14.2	11.6	14.7	12.0	9.3	0.0	8.9	9.7	0.0	8.7
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.1	1.5	0.1	0.3	0.0	0.4	0.2	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	0.1	1.7	1.7	0.5	4.7	0.5	0.6	0.0	0.7	0.4	0.0	0.3
LnGrp Delay(d),s/veh	13.1	14.6	14.6	11.7	16.2	12.1	9.5	0.0	9.3	9.9	0.0	8.8
LnGrp LOS	B	B	B	B	B	B	A		A	A		A
Approach Vol, veh/h		321			495			147			79	
Approach Delay, s/veh		14.5			15.3			9.4			9.4	
Approach LOS		B			B			A			A	

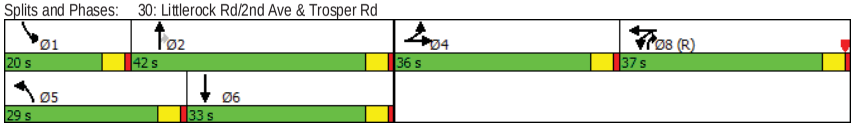
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		23.5	7.0	16.8		23.5	5.2	18.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.0	5.0	22.5		19.0	5.0	22.5
Max Q Clear Time (g_c+I1), s		4.0	3.0	5.4		4.4	2.2	10.6
Green Ext Time (p_c), s		0.8	0.0	4.2		0.8	0.0	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	265	110	370	295	30	185	215	395	100	235	45
Future Volume (vph)	40	265	110	370	295	30	185	215	395	100	235	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	150		0	250		0	150		250
Storage Lanes	1		0	1		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			520			896			1861	
Travel Time (s)		14.8			11.8			20.4			42.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)				38%								
Turn Type	Split	NA		Split	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			
Detector Phase	4	4		8	8		5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	35.6	35.6		33.6	33.6		24.5	30.6	33.6	8.6	31.6	
Total Split (s)	36.0	36.0		37.0	37.0		29.0	42.0	37.0	20.0	33.0	
Total Split (%)	26.7%	26.7%		27.4%	27.4%		21.5%	31.1%	27.4%	14.8%	24.4%	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max		C-Max	C-Max		Max	Max	C-Max	None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 46 (34%), Referenced to phase 8:WBTL, Start of Red	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	

Splits and Phases: 30: Littlerock Rd/2nd Ave & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	265	110	370	295	30	185	215	395	100	235	45
Future Volume (veh/h)	40	265	110	370	295	30	185	215	395	100	235	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	41	270	51	237	499	31	189	219	286	102	240	46
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	417	700	130	430	842	52	324	604	897	126	632	119
Arrive On Green	0.23	0.23	0.23	0.40	0.40	0.40	0.18	0.32	0.32	0.07	0.21	0.21
Sat Flow, veh/h	1792	3009	560	1792	3507	217	1792	1881	1599	1792	3002	566
Grp Volume(v), veh/h	41	159	162	237	267	263	189	219	286	102	141	145
Grp Sat Flow(s),veh/h/ln	1792	1787	1782	1792	1881	1843	1792	1881	1599	1792	1787	1781
Q Serve(g_s), s	2.4	10.1	10.4	13.7	15.1	15.1	13.0	12.1	12.9	7.6	9.2	9.4
Cycle Q Clear(g_c), s	2.4	10.1	10.4	13.7	15.1	15.1	13.0	12.1	12.9	7.6	9.2	9.4
Prop In Lane	1.00		0.31	1.00		0.12	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	417	416	415	430	451	442	324	604	897	126	376	375
V/C Ratio(X)	0.10	0.38	0.39	0.55	0.59	0.59	0.58	0.36	0.32	0.81	0.38	0.39
Avail Cap(c_a), veh/h	417	416	415	430	451	442	324	604	897	204	376	375
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	0.87	0.87	0.87	0.91	0.91	0.91	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	43.6	43.7	34.9	35.3	35.3	50.6	35.2	15.8	61.9	45.7	45.8
Incr Delay (d2), s/veh	0.5	2.6	2.7	4.4	4.9	5.0	6.9	1.5	0.9	11.7	2.9	3.0
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	1.3	5.3	5.4	7.3	8.4	8.3	7.1	6.5	9.0	4.2	4.8	4.9
LnGrp Delay(d),s/veh	41.1	46.2	46.4	39.2	40.1	40.3	57.5	36.8	16.7	73.6	48.6	48.8
LnGrp LOS	D	D	D	D	D	D	E	D	B	E	D	D
Approach Vol, veh/h		362			767			694			388	
Approach Delay, s/veh		45.7			39.9			34.1			55.2	
Approach LOS		D			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.1	47.9		36.0	29.0	33.0		37.0
Change Period (Y+Rc), s	4.6	4.6		4.6	4.6	4.6		4.6
Max Green Setting (Gmax), s	15.4	37.4		31.4	24.4	28.4		32.4
Max Q Clear Time (g_c+I1), s	9.6	14.9		12.4	15.0	11.4		17.1
Green Ext Time (p_c), s	0.1	3.2		1.5	0.3	3.0		3.5

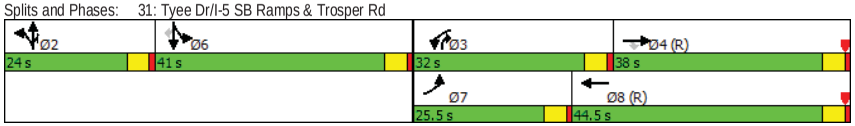
Intersection Summary	
HCM 2010 Ctrl Delay	41.7
HCM 2010 LOS	D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	540	20	245	320	190	25	160	335	460	325	375
Future Volume (vph)	155	540	20	245	320	190	25	160	335	460	325	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		100	275		0	75		125	400		400
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		520			883			832			952	
Travel Time (s)		11.8			20.1			18.9			21.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases			4									6
Detector Phase	7	4	4	3	8		2	2	2 3	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.6	33.6	33.6	8.6	29.6		20.5	20.5		36.6	36.6	36.6
Total Split (s)	25.5	38.0	38.0	32.0	44.5		24.0	24.0		41.0	41.0	41.0
Total Split (%)	18.9%	28.1%	28.1%	23.7%	33.0%		17.8%	17.8%		30.4%	30.4%	30.4%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6		3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 46 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Red	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	

Splits and Phases: 31: Tyee Dr/I-5 SB Ramps & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	540	20	245	320	190	25	160	335	460	325	375
Future Volume (veh/h)	155	540	20	245	320	190	25	160	335	460	325	375
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	163	568	21	258	337	0	26	168	300	484	342	79
Adj No. of Lanes	1	2	1	1	2	0	1	1	1	2	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	187	1046	468	283	1237	0	255	268	477	628	507	431
Arrive On Green	0.21	0.59	0.59	0.26	0.58	0.00	0.14	0.14	0.14	0.27	0.27	0.27
Sat Flow, veh/h	1792	3574	1599	1792	3668	0	1774	1863	1583	2329	1881	1599
Grp Volume(v), veh/h	163	568	21	258	337	0	26	168	300	484	342	79
Grp Sat Flow(s),veh/h/ln	1792	1787	1599	1792	1787	0	1774	1863	1583	1165	1881	1599
Q Serve(g_s), s	11.9	13.0	0.8	18.9	6.4	0.0	1.7	11.5	19.4	25.9	21.9	5.1
Cycle Q Clear(g_c), s	11.9	13.0	0.8	18.9	6.4	0.0	1.7	11.5	19.4	25.9	21.9	5.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	187	1046	468	283	1237	0	255	268	477	628	507	431
V/C Ratio(X)	0.87	0.54	0.04	0.91	0.27	0.00	0.10	0.63	0.63	0.77	0.67	0.18
Avail Cap(c_a), veh/h	277	1046	468	364	1237	0	255	268	477	628	507	431
HCM Platoon Ratio	2.00	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.85	0.85	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	22.5	20.0	48.8	20.0	0.0	50.2	54.4	40.6	45.5	44.0	37.9
Incr Delay (d2), s/veh	16.2	1.8	0.2	20.6	0.5	0.0	0.8	10.7	6.2	8.9	7.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.6	0.4	10.9	3.2	0.0	0.9	6.7	10.4	9.1	12.4	2.4
LnGrp Delay(d),s/veh	68.7	24.3	20.1	69.4	20.4	0.0	51.0	65.1	46.8	54.3	51.0	38.8
LnGrp LOS	E	C	C	E	C		D	E	D	D	D	D
Approach Vol, veh/h		752			595			494			905	
Approach Delay, s/veh		33.8			41.7			53.2			51.7	
Approach LOS		C			D			D			D	

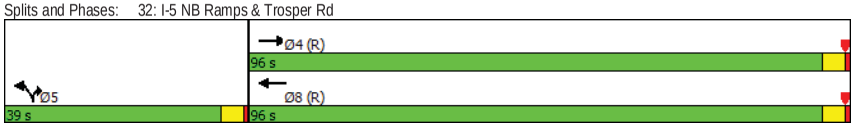
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		24.0	25.9	44.1		41.0	18.7	51.3
Change Period (Y+Rc), s		4.6	4.6	4.6		4.6	4.6	4.6
Max Green Setting (Gmax), s		19.4	27.4	33.4		36.4	20.9	39.9
Max Q Clear Time (g_c+I1), s		21.4	20.9	15.0		27.9	13.9	8.4
Green Ext Time (p_c), s		0.0	0.5	5.6		3.3	0.2	6.6

Intersection Summary	
HCM 2010 Ctrl Delay	44.9
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	815	525	0	590	615	170	0	80	0	0
Future Volume (vph)	0	815	525	0	590	615	170	0	80	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	0		0		0	200	0	0
Storage Lanes	1		0	0		0		1	1	0	0
Taper Length (ft)	25			25				25		25	
Right Turn on Red			Yes			Yes			Yes		
Link Speed (mph)		30			30			30		30	
Link Distance (ft)		883			397			785		593	
Travel Time (s)		20.1			9.0			17.8		13.5	
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
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)											
Turn Type		NA			NA		Prot		Prot		
Protected Phases		4			8		5		5		
Permitted Phases											
Detector Phase		4			8		5		5		
Switch Phase											
Minimum Initial (s)		10.0			10.0		6.0		6.0		
Minimum Split (s)		21.5			21.5		10.6		10.6		
Total Split (s)		96.0			96.0		39.0		39.0		
Total Split (%)		71.1%			71.1%		28.9%		28.9%		
Yellow Time (s)		3.6			3.6		3.6		3.6		
All-Red Time (s)		1.0			1.0		1.0		1.0		
Lost Time Adjust (s)		0.0			0.0		0.0		0.0		
Total Lost Time (s)		4.6			4.6		4.6		4.6		
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		C-Max			C-Max		None		None		

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 103 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Red	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 32: I-5 NB Ramps & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (veh/h)	0	815	525	0	590	615	170	0	80	0	0
Future Volume (veh/h)	0	815	525	0	590	615	170	0	80	0	0
Number	7	4	14	3	8	18	5	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1881	1900	0	1881	1900	1881	1881	1881		
Adj Flow Rate, veh/h	0	876	0	0	634	0	183	183	0		
Adj No. of Lanes	0	3	0	0	2	0	1	1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	0	1	1	0	1	1	1	1	1		
Cap, veh/h	0	4186	0	0	2913	0	209	209	187		
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.12	0.12	0.00		
Sat Flow, veh/h	0	5474	0	0	3762	0	1792	1792	1599		
Grp Volume(v), veh/h	0	876	0	0	634	0	183	183	0		
Grp Sat Flow(s),veh/h/ln	0	1712	0	0	1787	0	1792	1792	1599		
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	13.6	13.6	0.0		
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	13.6	13.6	0.0		
Prop In Lane	0.00		0.00	0.00		0.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	0	4186	0	0	2913	0	209	209	187		
V/C Ratio(X)	0.00	0.21	0.00	0.00	0.22	0.00	0.87	0.87	0.00		
Avail Cap(c_a), veh/h	0	4186	0	0	2913	0	457	457	407		
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.67	1.67	1.00	1.00	1.00		
Upstream Filter(I)	0.00	0.70	0.00	0.00	0.61	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	58.6	58.6	0.0		
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	4.4	4.4	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		
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	7.0	7.0	0.0		
LnGrp Delay(d),s/veh	0.0	0.1	0.0	0.0	0.1	0.0	63.1	63.1	0.0		
LnGrp LOS		A			A		E	E			
Approach Vol, veh/h		876			634		183	183			
Approach Delay, s/veh		0.1			0.1		63.1	63.1			
Approach LOS		A			A		E	E			

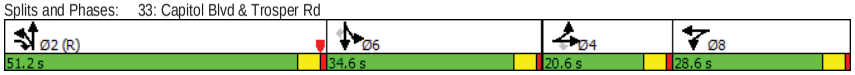
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		20.4		114.6				114.6
Change Period (Y+Rc), s		4.6		4.6				4.6
Max Green Setting (Gmax), s		34.4		91.4				91.4
Max Q Clear Time (g_c+I1), s		15.6		2.0				2.0
Green Ext Time (p_c), s		0.2		12.9				12.9

Intersection Summary	
HCM 2010 Ctrl Delay	6.9
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	45	580	30	70	35	770	575	10	15	465	350
Future Volume (vph)	280	45	580	30	70	35	770	575	10	15	465	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	250		0	100		200
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		397			338			735			2664	
Travel Time (s)		9.0			7.7			16.7			60.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	42%						42%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Protected Phases	4	4	2	8	8		2	2		6	6	
Permitted Phases			4									6
Detector Phase	4	4	2	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	20.6	20.6	29.6	28.6	28.6		29.6	29.6		34.6	34.6	34.6
Total Split (s)	20.6	20.6	51.2	28.6	28.6		51.2	51.2		34.6	34.6	34.6
Total Split (%)	15.3%	15.3%	37.9%	21.2%	21.2%		37.9%	37.9%		25.6%	25.6%	25.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6		3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Min	None	None		C-Min	C-Min		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 6 (4%), Referenced to phase 2:NBTL, Start of Red	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	

Splits and Phases: 33: Capitol Blvd & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	45	580	30	70	35	770	575	10	15	465	350
Future Volume (veh/h)	280	45	580	30	70	35	770	575	10	15	465	350
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900	1881	1881	1900	1881	1881	1881
Adj Flow Rate, veh/h	315	0	359	30	71	35	456	1031	10	15	470	0
Adj No. of Lanes	2	0	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	403	0	1015	134	89	44	936	1943	19	277	553	248
Arrive On Green	0.04	0.00	0.04	0.07	0.07	0.07	0.69	0.69	0.69	0.15	0.15	0.00
Sat Flow, veh/h	3583	0	1599	1810	1203	593	1792	3720	36	1792	3574	1599
Grp Volume(v), veh/h	315	0	359	30	0	106	456	521	520	15	470	0
Grp Sat Flow(s),veh/h/ln	1792	0	1599	1810	0	1795	1792	1881	1875	1792	1787	1599
Q Serve(g_s), s	11.8	0.0	13.0	2.1	0.0	7.8	15.9	18.1	18.1	1.0	17.3	0.0
Cycle Q Clear(g_c), s	11.8	0.0	13.0	2.1	0.0	7.8	15.9	18.1	18.1	1.0	17.3	0.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	403	0	1015	134	0	133	936	982	979	277	553	248
V/C Ratio(X)	0.78	0.00	0.35	0.22	0.00	0.80	0.49	0.53	0.53	0.05	0.85	0.00
Avail Cap(c_a), veh/h	425	0	1025	322	0	319	936	982	979	398	794	355
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.00	0.94	1.00	0.00	1.00	0.86	0.86	0.86	0.55	0.55	0.00
Uniform Delay (d), s/veh	63.3	0.0	12.3	58.8	0.0	61.5	12.3	12.6	12.6	48.6	55.5	0.0
Incr Delay (d2), s/veh	7.3	0.0	0.1	0.3	0.0	4.0	1.6	1.8	1.8	0.0	2.4	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	6.3	0.0	13.5	1.1	0.0	4.0	8.1	9.8	9.8	0.5	8.7	0.0
LnGrp Delay(d),s/veh	70.7	0.0	12.4	59.1	0.0	65.5	13.8	14.4	14.4	48.6	58.0	0.0
LnGrp LOS	E		B	E		E	B	B	B	D	E	
Approach Vol, veh/h		674			136			1497			485	
Approach Delay, s/veh		39.6			64.1			14.2			57.7	
Approach LOS		D			E			B			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		75.1		19.8		25.5		14.6
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6
Max Green Setting (Gmax), s		46.6		16.0		30.0		24.0
Max Q Clear Time (g_c+I1), s		20.1		15.0		19.3		9.8
Green Ext Time (p_c), s		5.6		0.2		1.6		0.2

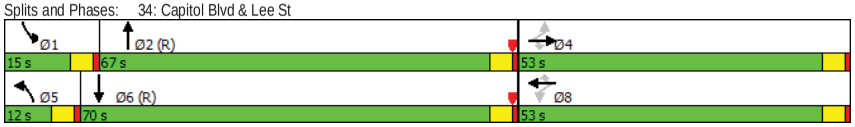
Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Future Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		100	250		0	200		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		718			814			621			735	
Travel Time (s)		16.3			18.5			14.1			16.7	
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
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	12.0		6.0	12.0	
Minimum Split (s)	29.0	29.0	29.0	30.0	30.0	30.0	11.0	25.0		11.0	25.0	
Total Split (s)	53.0	53.0	53.0	53.0	53.0	53.0	12.0	67.0		15.0	70.0	
Total Split (%)	39.3%	39.3%	39.3%	39.3%	39.3%	39.3%	8.9%	49.6%		11.1%	51.9%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		3.6	3.6	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6	4.6	4.6	4.6		4.6	4.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 130 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Red	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 34: Capitol Blvd & Lee St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Future Volume (vph)	260	5	40	15	5	80	25	1025	20	50	815	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1793	1599		1830	1615	1787	3564		1787	3491	
Flt Permitted		0.71	1.00		0.74	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1344	1599		1414	1615	1787	3564		1787	3491	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	280	5	43	16	5	86	27	1102	22	54	876	161
RTOR Reduction (vph)	0	0	32	0	0	65	0	1	0	0	8	0
Lane Group Flow (vph)	0	285	11	0	21	21	27	1123	0	54	1029	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		33.6	33.6		33.6	33.6	4.3	80.4		7.2	83.3	
Effective Green, g (s)		33.6	33.6		33.6	33.6	4.3	80.4		7.2	83.3	
Actuated g/C Ratio		0.25	0.25		0.25	0.25	0.03	0.60		0.05	0.62	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	1.5	3.0		1.6	3.0	
Lane Grp Cap (vph)		334	397		351	401	56	2122		95	2154	
v/s Ratio Prot							0.02	c0.32		c0.03	c0.29	
v/s Ratio Perm		c0.21	0.01		0.01	0.01						
v/c Ratio		0.85	0.03		0.06	0.05	0.48	0.53		0.57	0.48	
Uniform Delay, d1		48.3	38.3		38.7	38.6	64.3	16.1		62.4	14.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		0.83	0.98	
Incremental Delay, d2		18.0	0.0		0.0	0.0	2.4	0.9		3.9	0.7	
Delay (s)		66.3	38.3		38.7	38.6	66.6	17.1		55.9	14.3	
Level of Service		E	D		D	D	E	B		E	B	
Approach Delay (s)		62.7			38.6			18.2			16.4	
Approach LOS		E			D			B			B	

Intersection Summary					
HCM 2000 Control Delay		23.7	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.62			
Actuated Cycle Length (s)		135.0	Sum of lost time (s)		13.8
Intersection Capacity Utilization		66.8%	ICU Level of Service		C
Analysis Period (min)		15			
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	130	5	115	0	650	95	105	585	0
Future Volume (vph)	0	0	0	130	5	115	0	650	95	105	585	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	175		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			426			713			896	
Travel Time (s)		8.9			9.7			16.2			20.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type			Perm	Perm	NA	pm+ov	Prot	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	9.0	9.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	20.0	20.0	20.0	10.0	9.0	20.0		10.0	21.0	
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	20.0%	18.0%	40.0%		20.0%	42.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag						Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 50	
Actuated Cycle Length: 42.1	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 35: Littlerock Rd & Fred Meyer/Costco Drwy



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	130	5	115	0	650	95	105	585	0
Future Volume (veh/h)	0	0	0	130	5	115	0	650	95	105	585	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	0	0	0	137	5	121	0	684	100	111	616	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	0	285	243	400	8	387	5	1355	198	550	2263	0
Arrive On Green	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.43	0.43	0.09	0.63	0.00
Sat Flow, veh/h	0	1900	1615	1387	51	1599	1792	3130	457	1792	3668	0
Grp Volume(v), veh/h	0	0	0	142	0	121	0	390	394	111	616	0
Grp Sat Flow(s),veh/h/ln	0	1900	1615	1438	0	1599	1792	1787	1800	1792	1787	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	5.9	5.9	1.0	2.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	5.9	5.9	1.0	2.8	0.0
Prop In Lane	0.00		1.00	0.96		1.00	1.00		0.25	1.00		0.00
Lane Grp Cap(c), veh/h	0	285	243	407	0	387	5	774	780	550	2263	0
V/C Ratio(X)	0.00	0.00	0.00	0.35	0.00	0.31	0.00	0.50	0.51	0.20	0.27	0.00
Avail Cap(c_a), veh/h	0	823	699	814	0	840	242	774	780	676	2263	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	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	14.8	0.0	11.5	0.0	7.6	7.6	4.5	3.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.2	0.0	2.3	2.3	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.4	0.0	1.0	0.0	3.3	3.3	0.5	1.5	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	15.0	0.0	11.6	0.0	9.9	9.9	4.6	3.3	0.0
LnGrp LOS				B		B		A	A	A	A	
Approach Vol, veh/h		0			263			784			727	
Approach Delay, s/veh		0.0			13.5			9.9			3.5	
Approach LOS					B			A			A	

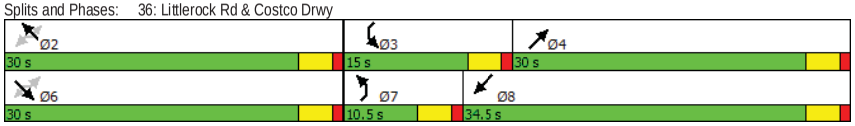
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.4	20.0		9.6	0.0	27.4		9.6
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	6.0	16.0		16.0	5.0	17.0		16.0
Max Q Clear Time (g_c+I1), s	3.0	7.9		0.0	0.0	4.8		5.4
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	6.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	7.8
HCM 2010 LOS	A

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
Future Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		100	150		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		325			608			995			713	
Travel Time (s)		7.4			13.8			22.6			16.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	6	2	2	2	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	9.5	30.0		9.5	30.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	10.5	30.0		15.0	34.5	
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	14.0%	40.0%		20.0%	46.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 66.4	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Littlerock Rd & Costco Drwy



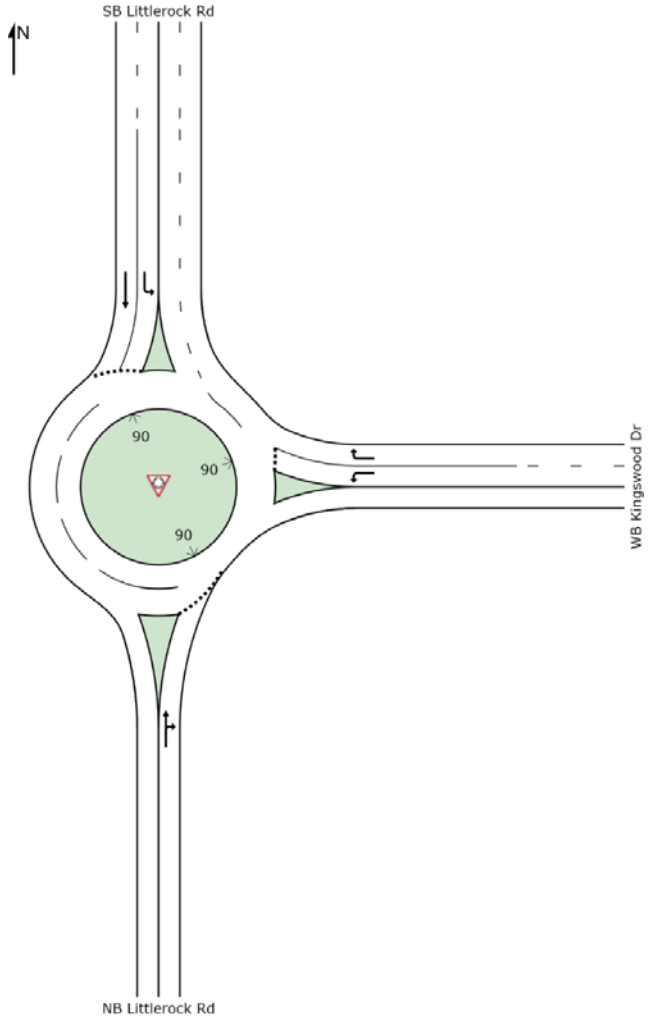
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
Future Volume (vph)	80	25	15	125	5	195	50	490	100	215	400	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	0.98	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1830	1615		1813	1615	1787	3484		1787	3485	
Flt Permitted		0.74	1.00		0.68	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1406	1615		1287	1615	1787	3484		1787	3485	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	26	16	132	5	205	53	516	105	226	421	84
RTOR Reduction (vph)	0	0	10	0	0	126	0	25	0	0	23	0
Lane Group Flow (vph)	0	110	6	0	137	79	53	596	0	226	482	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Actuated Green, G (s)		26.1	26.1		26.1	26.1	3.7	19.0		10.9	26.2	
Effective Green, g (s)		26.1	26.1		26.1	26.1	3.7	19.0		10.9	26.2	
Actuated g/C Ratio		0.38	0.38		0.38	0.38	0.05	0.28		0.16	0.39	
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		539	619		493	619	97	973		286	1342	
v/s Ratio Prot							0.03	c0.17		c0.13	0.14	
v/s Ratio Perm		0.08	0.00		c0.11	0.05						
v/c Ratio		0.20	0.01		0.28	0.13	0.55	0.61		0.79	0.36	
Uniform Delay, d1		14.0	13.0		14.5	13.6	31.3	21.3		27.5	14.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9	0.0		1.4	0.4	6.2	1.1		13.8	0.2	
Delay (s)		14.9	13.0		15.8	14.0	37.5	22.4		41.2	15.1	
Level of Service		B	B		B	B	D	C		D	B	
Approach Delay (s)		14.6			14.7			23.6			23.2	
Approach LOS		B			B			C			C	

Intersection Summary					
HCM 2000 Control Delay		21.2	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.49			
Actuated Cycle Length (s)		68.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization		52.5%	ICU Level of Service		A
Analysis Period (min)		15			
c Critical Lane Group					

SITE LAYOUT

Site: 37) Littlerock Rd at Kingswood Dr

Existing 2015
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 37) Littlerock Rd at Kingswood Dr

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Littlerock Rd											
8	T1	532	1.0	0.614	4.9	LOS A	5.4	136.6	0.38	0.44	36.5
18	R2	134	1.0	0.614	4.7	LOS A	5.4	136.6	0.38	0.44	35.5
Approach		667	1.0	0.614	4.8	LOS A	5.4	136.6	0.38	0.44	36.3
East: WB Kingswood Dr											
1	L2	194	1.0	0.198	12.3	LOS B	1.2	31.0	0.64	0.75	33.3
16	R2	81	1.0	0.049	4.2	LOS A	0.0	0.0	0.00	0.49	36.5
Approach		274	1.0	0.198	9.9	LOS A	1.2	31.0	0.45	0.67	34.2
North: SB Littlerock Rd											
7	L2	65	1.0	0.082	11.3	LOS B	0.4	10.7	0.44	0.65	33.8
4	T1	559	1.0	0.448	5.2	LOS A	3.5	89.2	0.53	0.52	36.0
Approach		624	1.0	0.448	5.8	LOS A	3.5	89.2	0.52	0.53	35.8
All Vehicles		1565	1.0	0.614	6.1	LOS A	5.4	136.6	0.45	0.52	35.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Processed: Friday, October 23, 2015 3:49:29 PM
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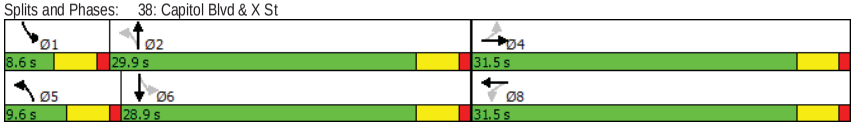
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SIDRA INTERSECTION 6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1	15	10	1	20	20	905	10	35	710	35
Future Volume (vph)	20	1	15	10	1	20	20	905	10	35	710	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	150		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			1326			1300			1368	
Travel Time (s)		14.6			30.1			29.5			31.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	31.5	31.5		31.5	31.5		9.5	25.5		8.5	26.5	
Total Split (s)	31.5	31.5		31.5	31.5		9.6	29.9		8.6	28.9	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		13.7%	42.7%		12.3%	41.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 46.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 38: Capitol Blvd & X St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1	15	10	1	20	20	905	10	35	710	35
Future Volume (veh/h)	20	1	15	10	1	20	20	905	10	35	710	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	22	1	17	11	1	22	22	1017	11	39	798	39
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	260	7	125	264	6	126	511	2092	23	453	2048	100
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.02	0.58	0.58	0.03	0.59	0.59
Sat Flow, veh/h	1410	90	1538	1417	71	1555	1792	3622	39	1792	3469	170
Grp Volume(v), veh/h	22	0	18	11	0	23	22	502	526	39	411	426
Grp Sat Flow(s),veh/h/ln	1410	0	1629	1417	0	1626	1792	1787	1874	1792	1787	1851
Q Serve(g_s), s	0.6	0.0	0.5	0.3	0.0	0.6	0.2	7.3	7.3	0.4	5.4	5.4
Cycle Q Clear(g_c), s	1.2	0.0	0.5	0.8	0.0	0.6	0.2	7.3	7.3	0.4	5.4	5.4
Prop In Lane	1.00		0.94	1.00		0.96	1.00		0.02	1.00		0.09
Lane Grp Cap(c), veh/h	260	0	132	264	0	132	511	1032	1082	453	1055	1093
V/C Ratio(X)	0.08	0.00	0.14	0.04	0.00	0.17	0.04	0.49	0.49	0.09	0.39	0.39
Avail Cap(c_a), veh/h	1011	0	1000	1019	0	998	681	1032	1082	558	1055	1093
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	18.8	19.1	0.0	18.8	3.9	5.5	5.5	4.0	4.8	4.8
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.1	0.0	0.6	0.0	1.6	1.6	0.1	1.1	1.0
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	0.3	0.0	0.2	0.1	0.0	0.3	0.1	4.0	4.1	0.2	2.9	3.0
LnGrp Delay(d),s/veh	19.5	0.0	19.2	19.2	0.0	19.5	3.9	7.1	7.0	4.1	5.9	5.8
LnGrp LOS	B		B	B		B	A	A	A	A	A	A
Approach Vol, veh/h		40			34			1050			876	
Approach Delay, s/veh		19.4			19.4			7.0			5.8	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	29.9		8.1	5.4	30.5		8.1
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	4.1	25.4		27.0	5.1	24.4		27.0
Max Q Clear Time (g_c+I1), s	2.4	9.3		3.2	2.2	7.4		2.8
Green Ext Time (p_c), s	0.0	10.7		0.3	0.0	11.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	6.9
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
Future Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Mvmt Flow	7	14	14	7	7	3	3	88	7	0	61	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	165	164	64	175	165	91	68	0	0	95	0	0
Stage 1	64	64	-	97	97	-	-	-	-	-	-	-
Stage 2	101	100	-	78	68	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.12	-	-
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	-	-	2.218	-	-
Pot Cap-1 Maneuver	804	732	1006	792	731	972	1546	-	-	1499	-	-
Stage 1	952	846	-	914	819	-	-	-	-	-	-	-
Stage 2	910	816	-	936	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	795	731	1006	769	730	972	1546	-	-	1499	-	-
Mov Cap-2 Maneuver	795	731	-	769	730	-	-	-	-	-	-	-
Stage 1	950	846	-	912	817	-	-	-	-	-	-	-
Stage 2	898	814	-	909	842	-	-	-	-	-	-	-

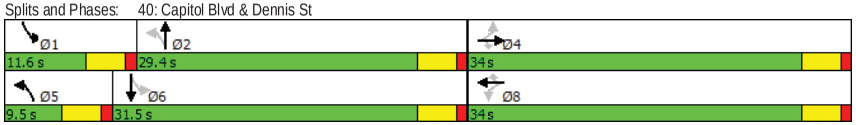
Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9.7	0.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1546	-	-	836	779	1499	-	-
HCM Lane V/C Ratio	0.002	-	-	0.04	0.021	-	-	-
HCM Control Delay (s)	7.3	0	-	9.5	9.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70
Future Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		100	175		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		834			700			1337			1300	
Travel Time (s)		19.0			15.9			30.4			29.5	
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 (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	8.0		7.0	8.0	
Minimum Split (s)	33.5	33.5	33.5	33.5	33.5	33.5	9.5	27.5		11.5	27.5	
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4		11.6	31.5	
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%		15.5%	42.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 58.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 40: Capitol Blvd & Dennis St



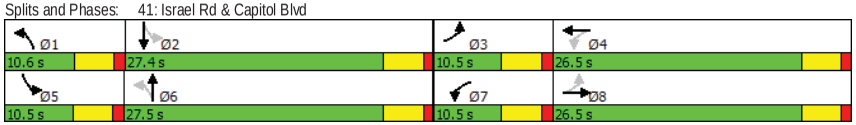
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70
Future Volume (vph)	145	40	30	30	20	75	10	690	25	50	575	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1810	1599		1845	1615	1787	3556		1787	3516	
Flt Permitted		0.74	1.00		0.77	1.00	0.38	1.00		0.27	1.00	
Satd. Flow (perm)		1384	1599		1459	1615	719	3556		512	3516	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	159	44	33	33	22	82	11	758	27	55	632	77
RTOR Reduction (vph)	0	0	26	0	0	64	0	3	0	0	9	0
Lane Group Flow (vph)	0	203	7	0	55	18	11	782	0	55	700	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		13.7	13.7		13.7	13.7	31.8	30.9		38.0	34.0	
Effective Green, g (s)		13.7	13.7		13.7	13.7	31.8	30.9		38.0	34.0	
Actuated g/C Ratio		0.22	0.22		0.22	0.22	0.51	0.50		0.61	0.55	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		305	352		321	356	383	1769		395	1925	
v/s Ratio Prot							0.00	c0.22		c0.01	c0.20	
v/s Ratio Perm		c0.15	0.00		0.04	0.01	0.01			0.08		
v/c Ratio		0.67	0.02		0.17	0.05	0.03	0.44		0.14	0.36	
Uniform Delay, d1		22.1	18.9		19.6	19.1	7.4	10.0		5.4	7.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.4	0.0		0.3	0.1	0.0	0.8		0.2	0.5	
Delay (s)		27.5	19.0		19.9	19.1	7.5	10.9		5.5	8.5	
Level of Service		C	B		B	B	A	B		A	A	
Approach Delay (s)		26.3			19.4			10.8			8.3	
Approach LOS		C			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	130	120	95	195	135	105	315	25	70	515	90
Future Volume (vph)	80	130	120	95	195	135	105	315	25	70	515	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	150		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2751			725			934			1337	
Travel Time (s)		62.5			16.5			21.2			30.4	
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%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	26.5		10.5	26.5		10.5	26.5		10.5	26.5	
Total Split (s)	10.5	26.5		10.5	26.5		10.6	27.5		10.5	27.4	
Total Split (%)	14.0%	35.3%		14.0%	35.3%		14.1%	36.7%		14.0%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 66.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 41: Israel Rd & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	130	120	95	195	135	105	315	25	70	515	90
Future Volume (veh/h)	80	130	120	95	195	135	105	315	25	70	515	90
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	89	144	66	106	217	150	117	350	28	78	572	100
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
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
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	295	314	144	420	266	184	379	1147	91	493	1009	176
Arrive On Green	0.07	0.25	0.25	0.08	0.26	0.26	0.08	0.34	0.34	0.07	0.33	0.33
Sat Flow, veh/h	1810	1234	566	1774	1027	710	1792	3354	267	1792	3044	531
Grp Volume(v), veh/h	89	0	210	106	0	367	117	186	192	78	335	337
Grp Sat Flow(s),veh/h/ln	1810	0	1800	1774	0	1737	1792	1787	1834	1792	1787	1788
Q Serve(g_s), s	2.4	0.0	6.8	2.9	0.0	13.7	2.9	5.3	5.3	1.9	10.7	10.7
Cycle Q Clear(g_c), s	2.4	0.0	6.8	2.9	0.0	13.7	2.9	5.3	5.3	1.9	10.7	10.7
Prop In Lane	1.00		0.31	1.00		0.41	1.00		0.15	1.00		0.30
Lane Grp Cap(c), veh/h	295	0	458	420	0	450	379	611	627	493	593	593
V/C Ratio(X)	0.30	0.00	0.46	0.25	0.00	0.82	0.31	0.30	0.31	0.16	0.57	0.57
Avail Cap(c_a), veh/h	324	0	573	441	0	554	398	611	627	528	593	593
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	0.0	21.7	16.9	0.0	24.0	13.9	16.7	16.7	13.2	19.0	19.0
Incr Delay (d2), s/veh	0.7	0.0	0.9	0.4	0.0	8.1	0.6	1.3	1.3	0.2	3.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	3.5	1.5	0.0	7.5	1.5	2.8	2.9	1.0	5.9	5.9
LnGrp Delay(d),s/veh	18.6	0.0	22.6	17.2	0.0	32.1	14.4	18.0	18.0	13.4	22.9	22.9
LnGrp LOS	B		C	B		C	B	B	B	B	C	C
Approach Vol, veh/h		299			473			495			750	
Approach Delay, s/veh		21.4			28.8			17.1			21.9	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	27.4	9.4	22.4	9.2	28.1	9.7	22.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0
Max Q Clear Time (g_c+I1), s	4.9	12.7	4.4	15.7	3.9	7.3	4.9	8.8
Green Ext Time (p_c), s	0.0	5.2	0.0	2.2	0.0	6.8	0.0	3.5

Intersection Summary			
HCM 2010 Ctrl Delay		22.3	
HCM 2010 LOS		C	

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	50	80	90	105	70	55
Future Vol, veh/h	50	80	90	105	70	55
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	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	53	84	95	111	74	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	205	0	-	0	339	150
Stage 1	-	-	-	-	150	-
Stage 2	-	-	-	-	189	-
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	1372	-	-	-	661	902
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1372	-	-	-	634	902
Mov Cap-2 Maneuver	-	-	-	-	634	-
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	813	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1372	-	-	-	729
HCM Lane V/C Ratio	0.038	-	-	-	0.18
HCM Control Delay (s)	7.7	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	15	5	130	2	0	2	205	15	2	5	5	30
Future Vol, veh/h	15	5	130	2	0	2	205	15	2	5	5	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	0	0	0
Mvmt Flow	18	6	155	2	0	2	244	18	2	6	6	36

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	544	544	24	623	561	19	42	0	0	20	0	0
Stage 1	36	36	-	507	507	-	-	-	-	-	-	-
Stage 2	508	508	-	116	54	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.1	6.5	6.2	4.11	-	-	4.1	-	-
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	3.509	4.009	3.309	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	451	448	1055	401	439	1065	1573	-	-	1609	-	-
Stage 1	982	867	-	552	543	-	-	-	-	-	-	-
Stage 2	549	540	-	894	854	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	395	376	1055	297	369	1065	1573	-	-	1609	-	-
Mov Cap-2 Maneuver	395	376	-	297	369	-	-	-	-	-	-	-
Stage 1	828	864	-	465	458	-	-	-	-	-	-	-
Stage 2	462	455	-	755	851	-	-	-	-	-	-	-

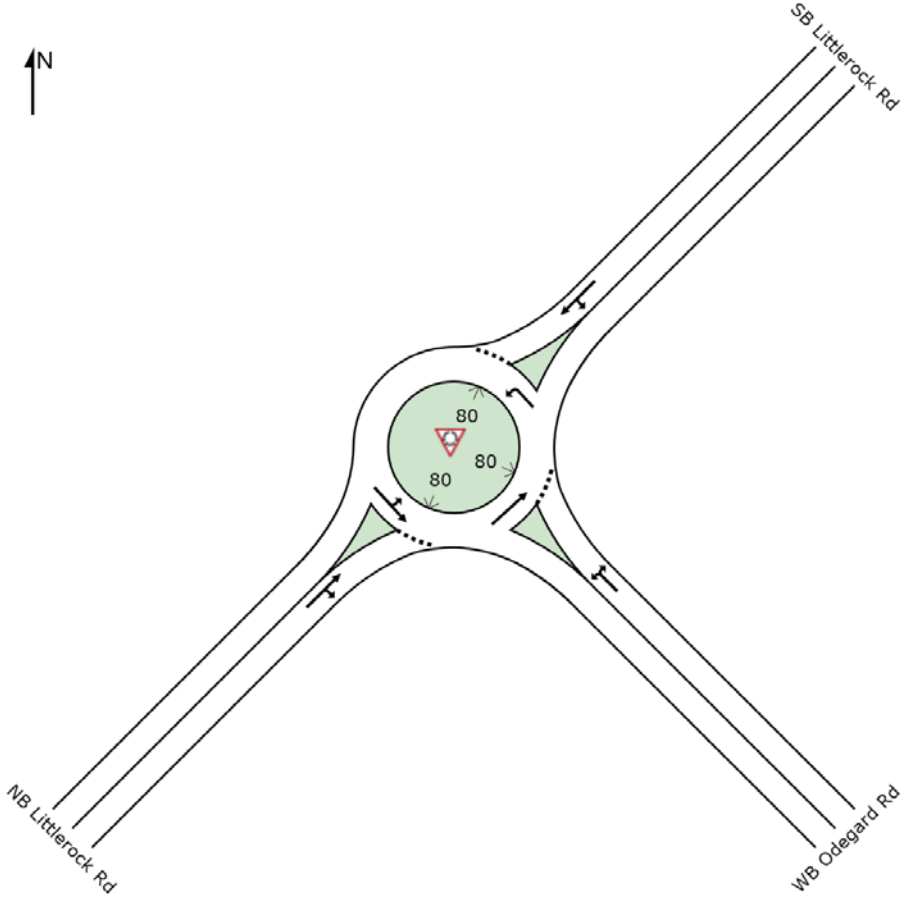
Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	12.8	7.1	0.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1573	-	-	860	464	1609	-	-
HCM Lane V/C Ratio	0.155	-	-	0.208	0.01	0.004	-	-
HCM Control Delay (s)	7.7	0	-	10.3	12.8	7.2	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.8	0	0	-	-

SITE LAYOUT

Site: 44) Littlerock Rd at Odegard Rd

Existing 2015
PM Peak Hour
Roundabout



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8001450, 6017302, SCJ ALLIANCE, PLUS / 1PC

SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: 44) Littlerock Rd at Odegard Rd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: WB Odegard Rd											
3x	L2	16	0.0	0.030	13.6	LOS B	0.2	3.9	0.64	0.70	33.2
18x	R2	5	0.0	0.030	8.2	LOS A	0.2	3.9	0.64	0.70	32.4
Approach		22	0.0	0.030	12.2	LOS B	0.2	3.9	0.64	0.70	33.0
NorthEast: SB Littlerock Rd											
1x	L2	11	1.0	0.594	9.6	LOS A	6.8	172.4	0.21	0.39	36.7
6x	T1	720	1.0	0.594	4.4	LOS A	6.8	172.4	0.21	0.39	36.8
Approach		731	1.0	0.594	4.4	LOS A	6.8	172.4	0.21	0.39	36.8
SouthWest: NB Littlerock Rd											
2x	T1	667	1.0	0.541	4.3	LOS A	5.0	127.2	0.14	0.39	37.1
12x	R2	5	1.0	0.541	4.2	LOS A	5.0	127.2	0.14	0.39	36.1
Approach		672	1.0	0.541	4.3	LOS A	5.0	127.2	0.14	0.39	37.1
All Vehicles		1425	1.0	0.594	4.5	LOS A	6.8	172.4	0.18	0.39	36.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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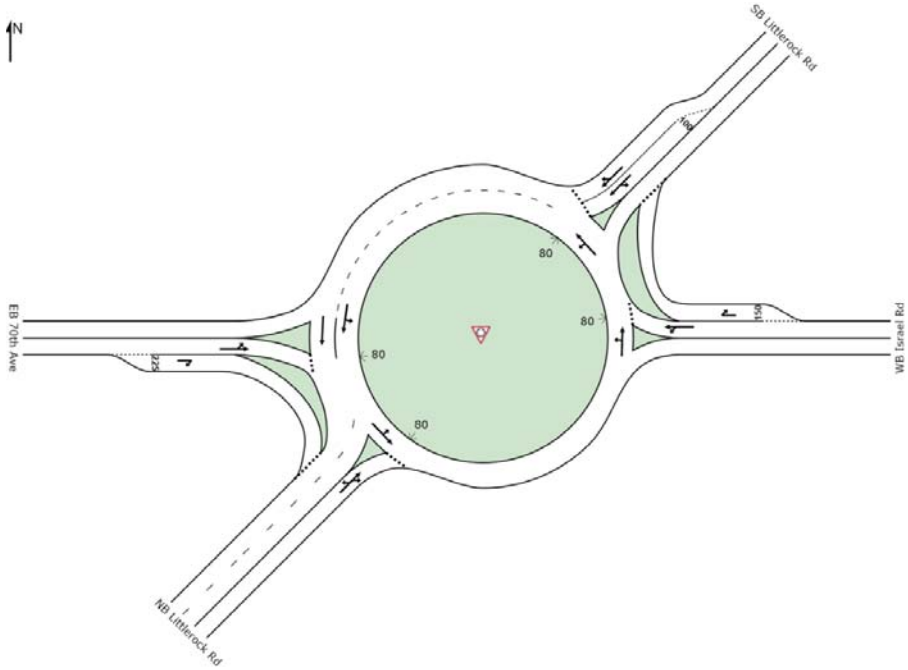
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SIDRA INTERSECTION 6

SITE LAYOUT

Site: 45) Littlerock Rd at Israel Rd

Existing 2015
PM Peak Hour
Roundabout



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SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: 45) Littlerock Rd at Israel Rd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: WB Israel Rd											
1a	L1	58	1.0	0.259	12.0	LOS B	1.8	44.8	0.76	0.76	34.2
6	T1	158	1.0	0.259	7.8	LOS A	1.8	44.8	0.76	0.76	34.5
16b	R3	274	1.0	0.258	6.1	LOS A	1.7	41.6	0.59	0.66	34.9
Approach		489	1.0	0.259	7.4	LOS A	1.8	44.8	0.66	0.71	34.7
NorthEast: SB Littlerock Rd											
1bx	L3	137	1.0	0.364	13.8	LOS B	2.4	60.0	0.69	0.76	34.3
6x	T1	426	1.0	0.364	7.3	LOS A	2.5	62.2	0.68	0.72	34.8
16ax	R1	121	1.0	0.364	6.6	LOS A	2.5	62.2	0.68	0.68	35.0
Approach		684	1.0	0.364	8.5	LOS A	2.5	62.2	0.68	0.72	34.7
West: EB 70th Ave											
5a	L1	105	1.0	0.221	10.5	LOS B	1.0	25.7	0.58	0.73	34.3
2	T1	84	1.0	0.221	6.5	LOS A	1.0	25.7	0.58	0.73	34.7
12b	R3	79	1.0	0.085	5.6	LOS A	0.3	8.8	0.48	0.65	35.3
Approach		268	1.0	0.221	7.8	LOS A	1.0	25.7	0.55	0.71	34.7
SouthWest: NB Littlerock Rd											
5bx	L3	253	1.0	0.606	14.9	LOS B	5.6	140.5	0.75	0.81	33.9
2x	T1	268	1.0	0.606	8.5	LOS A	5.6	140.5	0.75	0.81	33.6
12ax	R1	32	1.0	0.606	8.1	LOS A	5.6	140.5	0.75	0.81	33.4
Approach		553	1.0	0.606	11.4	LOS B	5.6	140.5	0.75	0.81	33.7
All Vehicles		1995	1.0	0.606	8.9	LOS A	5.6	140.5	0.68	0.74	34.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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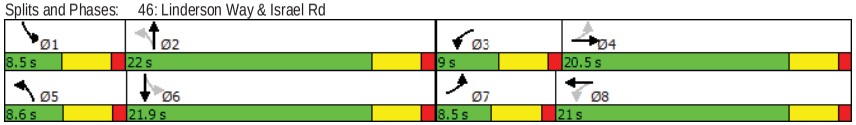
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SIDRA INTERSECTION 6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	165	30	135	260	25	110	85	110	40	80	50
Future Volume (vph)	40	165	30	135	260	25	110	85	110	40	80	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3505			2751			2073			847	
Travel Time (s)		79.7			62.5			47.1			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.0	21.0		8.6	22.0		8.5	21.9	
Total Split (%)	14.2%	34.2%		15.0%	35.0%		14.3%	36.7%		14.2%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 52.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 46: Linderson Way & Israel Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	165	30	135	260	25	110	85	110	40	80	50
Future Volume (veh/h)	40	165	30	135	260	25	110	85	110	40	80	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	42	174	32	142	274	26	116	89	42	42	84	53
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	286	277	51	378	388	37	597	435	205	590	356	224
Arrive On Green	0.03	0.18	0.18	0.09	0.23	0.23	0.07	0.36	0.36	0.03	0.33	0.33
Sat Flow, veh/h	1792	1547	284	1792	1692	161	1792	1210	571	1792	1080	681
Grp Volume(v), veh/h	42	0	206	142	0	300	116	0	131	42	0	137
Grp Sat Flow(s),veh/h/ln	1792	0	1831	1792	0	1853	1792	0	1780	1792	0	1761
Q Serve(g_s), s	1.0	0.0	5.5	3.3	0.0	7.9	2.2	0.0	2.7	0.8	0.0	3.0
Cycle Q Clear(g_c), s	1.0	0.0	5.5	3.3	0.0	7.9	2.2	0.0	2.7	0.8	0.0	3.0
Prop In Lane	1.00		0.16	1.00		0.09	1.00		0.32	1.00		0.39
Lane Grp Cap(c), veh/h	286	0	328	378	0	425	597	0	641	590	0	580
V/C Ratio(X)	0.15	0.00	0.63	0.38	0.00	0.71	0.19	0.00	0.20	0.07	0.00	0.24
Avail Cap(c_a), veh/h	360	0	555	378	0	579	619	0	641	663	0	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	0.0	20.0	15.7	0.0	18.7	10.4	0.0	11.7	10.9	0.0	12.9
Incr Delay (d2), s/veh	0.1	0.0	2.0	0.2	0.0	2.4	0.1	0.0	0.7	0.0	0.0	1.0
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	0.5	0.0	2.9	1.6	0.0	4.3	1.1	0.0	1.4	0.4	0.0	1.6
LnGrp Delay(d),s/veh	17.1	0.0	22.0	16.0	0.0	21.1	10.5	0.0	12.4	11.0	0.0	13.8
LnGrp LOS	B		C	B		C	B		B	B		B
Approach Vol, veh/h		248			442			247			179	
Approach Delay, s/veh		21.2			19.5			11.5			13.2	
Approach LOS		C			B			B			B	

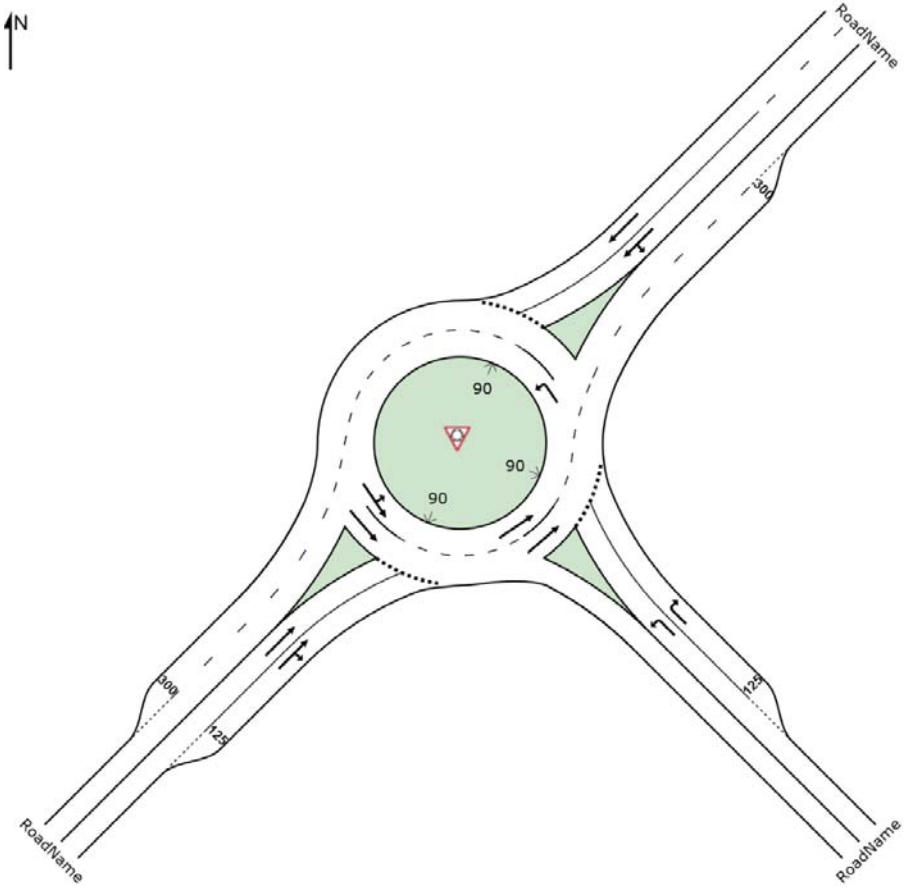
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	23.5	9.0	14.0	7.9	21.9	6.3	16.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5
Max Q Clear Time (g_c+I1), s	2.8	4.7	5.3	7.5	4.2	5.0	3.0	9.9
Green Ext Time (p_c), s	0.0	1.2	0.0	2.0	0.0	1.2	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

SITE LAYOUT

Site: 47) Littlerock Rd at Tumwater Blvd

Existing 2015
PM Peak Hour
Roundabout



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SIDRA INTERSECTION 6

MOVEMENT SUMMARY

Site: 47) Littlerock Rd at Tumwater Blvd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: RoadName											
3x	L2	239	1.0	0.212	10.4	LOS B	1.1	26.8	0.32	0.64	34.2
18x	R2	298	1.0	0.251	4.9	LOS A	1.3	33.2	0.33	0.51	35.8
Approach		537	1.0	0.251	7.3	LOS A	1.3	33.2	0.32	0.57	35.0
NorthEast: RoadName											
1x	L2	324	1.0	0.365	11.0	LOS B	2.1	52.2	0.45	0.67	34.4
6x	T1	303	1.0	0.365	5.6	LOS A	2.1	52.2	0.43	0.56	35.8
Approach		628	1.0	0.365	8.4	LOS A	2.1	52.2	0.44	0.62	35.1
SouthWest: RoadName											
2x	T1	144	0.0	0.137	5.6	LOS A	0.7	16.7	0.44	0.52	36.3
12x	R2	112	0.0	0.115	5.6	LOS A	0.5	13.5	0.44	0.58	35.5
Approach		255	0.0	0.137	5.6	LOS A	0.7	16.7	0.44	0.55	35.9
All Vehicles		1420	0.8	0.365	7.5	LOS A	2.1	52.2	0.40	0.59	35.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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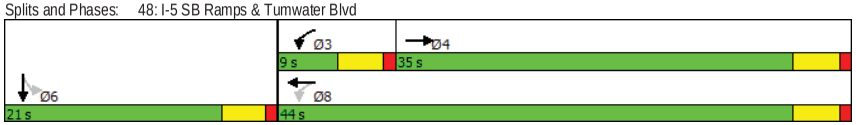
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SIDRA INTERSECTION 6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	340	70	320	275	0	0	0	0	405	30	235
Future Volume (vph)	0	340	70	320	275	0	0	0	0	405	30	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	350		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1843			807			1457			1571	
Travel Time (s)		41.9			18.3			33.1			35.7	
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 (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										14%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		35.0		9.0	44.0					21.0	21.0	
Total Split (%)		53.8%		13.8%	67.7%					32.3%	32.3%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0			0.0					0.0	0.0	
Total Lost Time (s)		4.5			4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Max					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 64.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 48: I-5 SB Ramps & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	340	70	320	275	0	0	0	0	405	30	235
Future Volume (veh/h)	0	340	70	320	275	0	0	0	0	405	30	235
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1900	1900	1881	0				1827	1827	1900
Adj Flow Rate, veh/h	0	362	74	340	293	0				269	259	74
Adj No. of Lanes	0	2	0	0	1	0				1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	1	1	1	1	0				4	4	4
Cap, veh/h	0	1864	377	90	26	0				396	311	89
Arrive On Green	0.00	0.63	0.63	0.63	0.63	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	3057	599	2	42	0				1740	1367	391
Grp Volume(v), veh/h	0	217	219	633	0	0				269	0	333
Grp Sat Flow(s),veh/h/ln	0	1787	1775	44	0	0				1740	0	1758
Q Serve(g_s), s	0.0	3.2	3.3	17.2	0.0	0.0				8.9	0.0	11.3
Cycle Q Clear(g_c), s	0.0	3.2	3.3	17.2	0.0	0.0				8.9	0.0	11.3
Prop In Lane	0.00		0.34	0.54		0.00				1.00		0.22
Lane Grp Cap(c), veh/h	0	1124	1117	0	0	0				396	0	400
V/C Ratio(X)	0.00	0.19	0.20	0.00	0.00	0.00				0.68	0.00	0.83
Avail Cap(c_a), veh/h	0	1124	1117	0	0	0				457	0	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	4.9	4.9	0.0	0.0	0.0				22.2	0.0	23.1
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.0	0.0				3.3	0.0	11.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	1.6	0.0	0.0	0.0				4.6	0.0	6.7
LnGrp Delay(d),s/veh	0.0	5.0	5.0	0.0	0.0	0.0				25.5	0.0	34.1
LnGrp LOS		A	A							C		C
Approach Vol, veh/h		436			633						602	
Approach Delay, s/veh		5.0			0.0						30.3	
Approach LOS		A			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				44.0		18.8		44.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				30.5		16.5		39.5
Max Q Clear Time (g_c+I1), s				5.3		13.3		19.2
Green Ext Time (p_c), s				9.0		0.9		8.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	135	610	0	0	550	1210	45	5	135	0	0	0
Future Vol, veh/h	135	610	0	0	550	1210	45	5	135	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	150	-	-	-	-	0	-	-	150	-	-	-
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, %	3	3	3	1	1	1	3	3	3	0	0	0
Mvmt Flow	153	693	0	0	625	1375	51	6	153	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	625	0	-	-	-	0	1625	1625	347
Stage 1	-	-	-	-	-	-	1000	1000	-
Stage 2	-	-	-	-	-	-	625	625	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	949	-	0	0	-	0	102	101	647
Stage 1	-	-	0	0	-	0	316	318	-
Stage 2	-	-	0	0	-	0	530	474	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	949	-	-	-	-	-	86	0	647
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	0	-
Stage 1	-	-	-	-	-	-	265	0	-
Stage 2	-	-	-	-	-	-	530	0	-

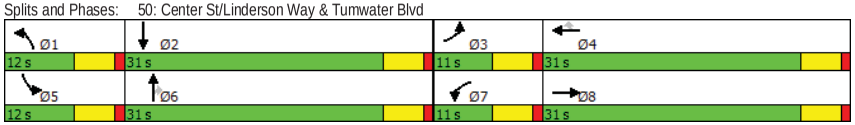
Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	37.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	86	647	949	-	-
HCM Lane V/C Ratio	0.661	0.237	0.162	-	-
HCM Control Delay (s)	105.7	12.3	9.5	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	3.1	0.9	0.6	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	550	155	55	700	30	170	85	45	190	160	880
Future Volume (vph)	135	550	155	55	700	30	170	85	45	190	160	880
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			1275			1023			2073	
Travel Time (s)		20.3			29.0			23.3			47.1	
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 (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	11.0	31.0		11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	36.5%	14.1%	36.5%	36.5%	14.1%	36.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 70.7	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 50: Center St/Linderson Way & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	550	155	55	700	30	170	85	45	190	160	880
Future Volume (veh/h)	135	550	155	55	700	30	170	85	45	190	160	880
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	144	585	165	59	745	32	181	90	48	202	170	0
Adj No. of Lanes	2	2	0	1	2	1	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	284	1108	312	106	1369	612	185	258	219	185	258	219
Arrive On Green	0.08	0.41	0.41	0.06	0.38	0.38	0.10	0.14	0.14	0.10	0.14	0.00
Sat Flow, veh/h	3442	2729	768	1792	3574	1599	1792	1881	1599	1792	1881	1599
Grp Volume(v), veh/h	144	379	371	59	745	32	181	90	48	202	170	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1727	1792	1787	1599	1792	1881	1599	1792	1881	1599
Q Serve(g_s), s	2.7	11.0	11.0	2.2	11.0	0.9	6.8	2.9	1.8	7.0	5.8	0.0
Cycle Q Clear(g_c), s	2.7	11.0	11.0	2.2	11.0	0.9	6.8	2.9	1.8	7.0	5.8	0.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	284	719	701	106	1369	612	185	258	219	185	258	219
V/C Ratio(X)	0.51	0.53	0.53	0.56	0.54	0.05	0.98	0.35	0.22	1.09	0.66	0.00
Avail Cap(c_a), veh/h	304	719	701	158	1369	612	185	720	612	185	720	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.8	15.2	15.3	31.1	16.3	13.2	30.4	26.6	26.1	30.5	27.8	0.0
Incr Delay (d2), s/veh	1.4	2.8	2.8	4.5	1.6	0.2	60.2	0.8	0.5	93.5	2.9	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	1.3	5.9	5.8	1.2	5.7	0.4	6.4	1.6	0.8	8.2	3.2	0.0
LnGrp Delay(d),s/veh	31.2	18.0	18.1	35.5	17.9	13.4	90.6	27.4	26.6	123.9	30.7	0.0
LnGrp LOS	C	B	B	D	B	B	F	C	C	F	C	
Approach Vol, veh/h		894			836			319			372	
Approach Delay, s/veh		20.2			19.0			63.1			81.3	
Approach LOS		C			B			E			F	

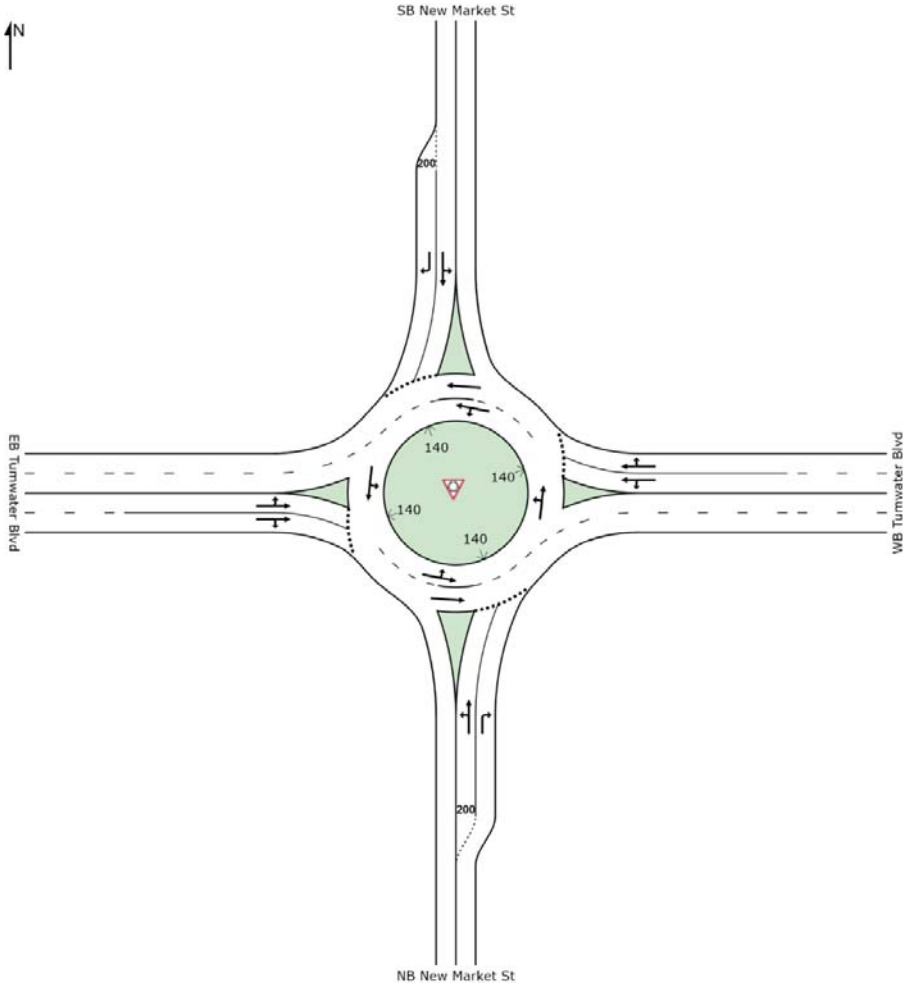
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	14.3	10.6	31.0	12.0	14.3	9.0	32.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0
Max Q Clear Time (g_c+I1), s	8.8	7.8	4.7	13.0	9.0	4.9	4.2	13.0
Green Ext Time (p_c), s	0.0	1.5	0.1	7.9	0.0	1.6	0.0	7.9

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

SITE LAYOUT

Site: 51) New Market Rd at Tumwater Blvd

Existing 2015
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 51) New Market Rd at Tumwater Blvd

Existing 2015
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB New Market St											
3	L2	16	0.0	0.029	13.3	LOS B	0.1	2.6	0.57	0.76	34.6
8	T1	2	0.0	0.029	6.2	LOS A	0.1	2.6	0.57	0.76	34.2
18	R2	49	0.0	0.052	5.6	LOS A	0.2	5.1	0.54	0.65	36.0
Approach		67	0.0	0.052	7.5	LOS A	0.2	5.1	0.55	0.68	35.6
East: WB Tumwater Blvd											
1	L2	49	2.0	0.271	10.5	LOS B	1.7	42.4	0.20	0.38	38.5
6	T1	739	2.0	0.271	3.4	LOS A	1.7	42.7	0.19	0.34	38.4
16	R2	11	2.0	0.271	3.8	LOS A	1.7	42.7	0.19	0.32	37.0
Approach		799	2.0	0.271	3.8	LOS A	1.7	42.7	0.19	0.35	38.4
North: SB New Market St											
7	L2	33	4.0	0.072	13.3	LOS B	0.3	6.6	0.54	0.76	35.2
4	T1	16	4.0	0.072	6.2	LOS A	0.3	6.6	0.54	0.76	34.8
14	R2	114	4.0	0.121	5.7	LOS A	0.5	12.0	0.52	0.66	36.0
Approach		163	4.0	0.121	7.2	LOS A	0.5	12.0	0.53	0.69	35.7
West: EB Tumwater Blvd											
5	L2	27	4.0	0.323	10.8	LOS B	2.1	54.2	0.32	0.39	38.2
2	T1	842	4.0	0.323	3.7	LOS A	2.1	54.9	0.31	0.38	38.0
12	R2	22	4.0	0.323	4.1	LOS A	2.1	54.9	0.30	0.36	36.5
Approach		891	4.0	0.323	3.9	LOS A	2.1	54.9	0.31	0.38	37.9
All Vehicles		1921	3.0	0.323	4.3	LOS A	2.1	54.9	0.29	0.40	37.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SIDRA INTERSECTION 6.0.24.4877
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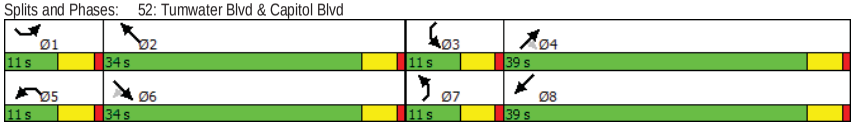
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SIDRA INTERSECTION 6

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	110	475	105	200	305	20	65	305	245	85	325	15
Future Volume (vph)	110	475	105	200	305	20	65	305	245	85	325	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	200		0	275		0	200		0
Storage Lanes	1		1	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		934			3620			2404			1729	
Travel Time (s)		12.7			49.4			54.6			39.3	
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 (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6						4			
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%		11.6%	41.1%	41.1%	11.6%	41.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 82.1	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 52: Tumwater Blvd & Capitol Blvd



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	110	475	105	200	305	20	65	305	245	85	325	15
Future Volume (veh/h)	110	475	105	200	305	20	65	305	245	85	325	15
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	122	528	39	222	339	22	72	339	33	94	361	17
Adj No. of Lanes	1	1	1	2	2	0	1	1	1	1	2	0
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
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	132	669	569	261	1237	80	107	461	392	120	877	41
Arrive On Green	0.08	0.36	0.36	0.08	0.36	0.36	0.06	0.24	0.24	0.07	0.25	0.25
Sat Flow, veh/h	1757	1845	1568	3476	3409	220	1792	1881	1599	1792	3476	163
Grp Volume(v), veh/h	122	528	39	222	177	184	72	339	33	94	185	193
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1738	1787	1842	1792	1881	1599	1792	1787	1852
Q Serve(g_s), s	5.5	20.4	1.3	5.0	5.6	5.7	3.1	13.3	1.3	4.1	6.9	7.0
Cycle Q Clear(g_c), s	5.5	20.4	1.3	5.0	5.6	5.7	3.1	13.3	1.3	4.1	6.9	7.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	132	669	569	261	648	668	107	461	392	120	451	467
V/C Ratio(X)	0.93	0.79	0.07	0.85	0.27	0.28	0.67	0.74	0.08	0.78	0.41	0.41
Avail Cap(c_a), veh/h	132	669	569	261	648	668	134	800	680	134	760	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	22.7	16.6	36.5	18.0	18.0	36.8	27.8	23.3	36.7	24.9	25.0
Incr Delay (d2), s/veh	56.0	9.2	0.2	22.6	1.0	1.0	4.8	2.3	0.1	19.8	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	12.1	0.6	3.2	2.9	3.1	1.7	7.2	0.6	2.7	3.5	3.6
LnGrp Delay(d),s/veh	92.8	31.9	16.9	59.1	19.1	19.1	41.6	30.1	23.4	56.6	25.5	25.5
LnGrp LOS	F	C	B	E	B	B	D	C	C	E	C	C
Approach Vol, veh/h		689			583			444			472	
Approach Delay, s/veh		41.8			34.3			31.5			31.7	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	34.0	10.4	24.6	11.0	34.0	9.8	25.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0
Max Q Clear Time (g_c+I1), s	7.5	7.7	6.1	15.3	7.0	22.4	5.1	9.0
Green Ext Time (p_c), s	0.0	6.1	0.0	4.3	0.0	3.1	0.0	4.7

Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	845	55	65	525	1	25	0	45	1	0	0
Future Volume (vph)	2	845	55	65	525	1	25	0	45	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2111			1760			704			354	
Travel Time (s)		48.0			40.0			16.0			8.0	
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 (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.5	27.5		27.5	27.5		12.5	12.5		27.5	27.5	
Total Split (s)	52.5	52.5		52.5	52.5		27.5	27.5		27.5	27.5	
Total Split (%)	65.6%	65.6%		65.6%	65.6%		34.4%	34.4%		34.4%	34.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 74.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 53: 65th Ave & Henderson Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	845	55	65	525	1	25	0	45	1	0	0
Future Volume (veh/h)	2	845	55	65	525	1	25	0	45	1	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	2	929	60	71	577	1	27	0	49	1	0	0
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
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
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	667	1334	86	397	1432	2	116	14	96	263	0	0
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.09	0.00	0.09	0.09	0.00	0.00
Sat Flow, veh/h	840	1748	113	573	1877	3	414	150	1023	1581	0	0
Grp Volume(v), veh/h	2	0	989	71	0	578	76	0	0	1	0	0
Grp Sat Flow(s),veh/h/ln	840	0	1861	573	0	1881	1587	0	0	1581	0	0
Q Serve(g_s), s	0.1	0.0	16.9	4.5	0.0	6.6	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.7	0.0	16.9	21.4	0.0	6.6	2.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.00	0.36		0.64	1.00		0.00
Lane Grp Cap(c), veh/h	667	0	1420	397	0	1435	227	0	0	263	0	0
V/C Ratio(X)	0.00	0.00	0.70	0.18	0.00	0.40	0.34	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	667	0	1420	397	0	1435	647	0	0	637	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.7	0.0	3.8	9.2	0.0	2.6	27.0	0.0	0.0	25.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.8	1.0	0.0	0.8	1.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	9.4	0.8	0.0	3.7	1.3	0.0	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	3.7	0.0	6.6	10.2	0.0	3.4	28.1	0.0	0.0	25.8	0.0	0.0
LnGrp LOS	A		A	B		A	C			C		
Approach Vol, veh/h		991			649			76			1	
Approach Delay, s/veh		6.6			4.1			28.1			25.8	
Approach LOS		A			A			C			C	

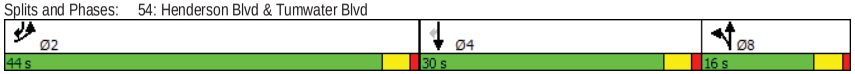
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		52.5		10.4		52.5		10.4
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		48.0		23.0		48.0		23.0
Max Q Clear Time (g_c+I1), s		18.9		2.0		23.4		4.8
Green Ext Time (p_c), s		18.6		0.4		16.5		0.4

Intersection Summary		
HCM 2010 Ctrl Delay		6.6
HCM 2010 LOS		A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	650	10	20	165	195	325
Future Volume (vph)	650	10	20	165	195	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	3122			2394	2111	
Travel Time (s)	60.8			46.6	41.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		Split	NA	NA	pm+ov
Protected Phases	2		8	8	4	2
Permitted Phases						4
Detector Phase	2		8	8	4	2
Switch Phase						
Minimum Initial (s)	6.0		6.0	6.0	6.0	6.0
Minimum Split (s)	20.5		10.5	10.5	30.0	20.5
Total Split (s)	44.0		16.0	16.0	30.0	44.0
Total Split (%)	48.9%		17.8%	17.8%	33.3%	48.9%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.0			4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max		None	None	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 89.8	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 54: Henderson Blvd & Tumwater Blvd



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	650	10	20	165	195	325
Future Volume (veh/h)	650	10	20	165	195	325
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1900	1881	1881	1881
Adj Flow Rate, veh/h	714	11	22	181	214	236
Adj No. of Lanes	0	0	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	786	12	26	214	547	1179
Arrive On Green	0.45	0.45	0.13	0.13	0.29	0.29
Sat Flow, veh/h	1759	27	203	1668	1881	1599
Grp Volume(v), veh/h	726	0	203	0	214	236
Grp Sat Flow(s),veh/h/ln	1788	0	1871	0	1881	1599
Q Serve(g_s), s	33.8	0.0	9.5	0.0	8.1	4.1
Cycle Q Clear(g_c), s	33.8	0.0	9.5	0.0	8.1	4.1
Prop In Lane	0.98	0.02	0.11			1.00
Lane Grp Cap(c), veh/h	800	0	240	0	547	1179
V/C Ratio(X)	0.91	0.00	0.85	0.00	0.39	0.20
Avail Cap(c_a), veh/h	800	0	251	0	547	1179
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	0.0	38.1	0.0	25.4	3.6
Incr Delay (d2), s/veh	16.0	0.0	22.3	0.0	2.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.1	0.0	6.4	0.0	4.5	5.0
LnGrp Delay(d),s/veh	39.1	0.0	60.5	0.0	27.5	4.0
LnGrp LOS	D		E		C	A
Approach Vol, veh/h	726			203	450	
Approach Delay, s/veh	39.1			60.5	15.2	
Approach LOS	D			E	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		44.0		30.0				15.5
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		40.0		26.0				12.0
Max Q Clear Time (g_c+I1), s		35.8		10.1				11.5
Green Ext Time (p_c), s		1.4		2.2				0.1

Intersection Summary	
HCM 2010 Ctrl Delay	34.4
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	3.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Traffic Vol, veh/h	55	50	150	90	95	140
Future Vol, veh/h	55	50	150	90	95	140
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	87	87	87	87	87	87
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	63	57	172	103	109	161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	603	224	0	0	276	0
Stage 1	224	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	465	820	-	-	1293	-
Stage 1	818	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	422	820	-	-	1293	-
Mov Cap-2 Maneuver	422	-	-	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	631	-	-	-	-	-

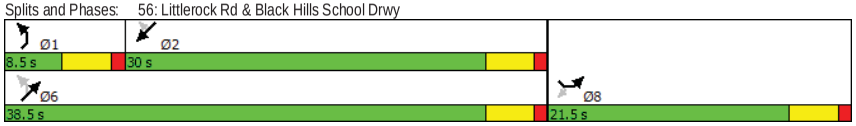
Approach	NW	NE	SW
HCM Control Delay, s	13.4	0	3.3
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	549	1293	-
HCM Lane V/C Ratio	-	-	0.22	0.084	-
HCM Control Delay (s)	-	-	13.4	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.3	-

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	5	5	10	160	390	50
Future Volume (vph)	5	5	10	160	390	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	175			350
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1065			1067	3970	
Travel Time (s)	24.2			24.3	90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	7.0	7.0	7.0
Minimum Split (s)	21.5	21.5	8.5	24.5	27.5	27.5
Total Split (s)	21.5	21.5	8.5	38.5	30.0	30.0
Total Split (%)	35.8%	35.8%	14.2%	64.2%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 54.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 56: Littlerock Rd & Black Hills School Drwy



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	5	5	10	160	390	50
Future Volume (veh/h)	5	5	10	160	390	50
Number	3	18	1	6	2	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1881	1881
Adj Flow Rate, veh/h	5	5	11	168	411	53
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	33	30	715	1460	1245	1059
Arrive On Green	0.02	0.02	0.01	0.78	0.66	0.66
Sat Flow, veh/h	1810	1615	1792	1881	1881	1599
Grp Volume(v), veh/h	5	5	11	168	411	53
Grp Sat Flow(s),veh/h/ln	1810	1615	1792	1881	1881	1599
Q Serve(g_s), s	0.1	0.1	0.1	1.0	4.1	0.5
Cycle Q Clear(g_c), s	0.1	0.1	0.1	1.0	4.1	0.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	33	30	715	1460	1245	1059
V/C Ratio(X)	0.15	0.17	0.02	0.12	0.33	0.05
Avail Cap(c_a), veh/h	702	627	858	1460	1245	1059
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	21.2	2.2	1.2	3.2	2.6
Incr Delay (d2), s/veh	2.1	2.7	0.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.5	2.1	0.2
LnGrp Delay(d),s/veh	23.2	23.8	2.2	1.4	3.4	2.6
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	10			179	464	
Approach Delay, s/veh	23.5			1.4	3.3	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	33.5				38.5		5.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	4.0	25.5				34.0		17.0
Max Q Clear Time (g_c+I1), s	2.1	6.1				3.0		2.1
Green Ext Time (p_c), s	0.0	4.4				5.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	3.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	50	10	1	10	10	20	1	245	1	10	310	40
Future Vol, veh/h	50	10	1	10	10	20	1	245	1	10	310	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	11	11	11	1	1	1	3	3	3
Mvmt Flow	54	11	1	11	11	22	1	266	1	11	337	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	665	650	359	655	671	267	380	0	0	267	0	0
Stage 1	380	380	-	269	269	-	-	-	-	-	-	-
Stage 2	285	270	-	386	402	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.21	6.61	6.31	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.599	4.099	3.399	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	372	387	683	367	366	750	1184	-	-	1291	-	-
Stage 1	640	612	-	717	670	-	-	-	-	-	-	-
Stage 2	720	684	-	620	585	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	350	382	683	355	362	750	1184	-	-	1291	-	-
Mov Cap-2 Maneuver	350	382	-	355	362	-	-	-	-	-	-	-
Stage 1	639	605	-	716	669	-	-	-	-	-	-	-
Stage 2	687	683	-	601	579	-	-	-	-	-	-	-

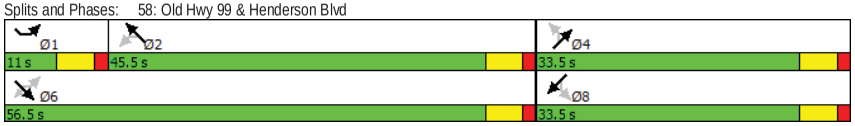
Approach	EB	WB	NB	SB
HCM Control Delay, s	17.3	13.2	0	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1184	-	-	358	485	1291	-	-
HCM Lane V/C Ratio	0.001	-	-	0.185	0.09	0.008	-	-
HCM Control Delay (s)	8	0	-	17.3	13.2	7.8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.3	0	-	-

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	105	815	10	2	510	110	15	5	5	140	5	50
Future Volume (vph)	105	815	10	2	510	110	15	5	5	140	5	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		50	50		0	0		0	150		0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		3620			1652			415			2274	
Travel Time (s)		49.4			22.5			9.4			51.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6		6	2			4			8		
Detector Phase	1	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	25.5	25.5	26.5	26.5		33.5	33.5		33.5	33.5	
Total Split (s)	11.0	56.5	56.5	45.5	45.5		33.5	33.5		33.5	33.5	
Total Split (%)	12.2%	62.8%	62.8%	50.6%	50.6%		37.2%	37.2%		37.2%	37.2%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max	Max	Max	Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 77.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 58: Old Hwy 99 & Henderson Blvd



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	105	815	10	2	510	110	15	5	5	140	5	50
Future Volume (veh/h)	105	815	10	2	510	110	15	5	5	140	5	50
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1863	1863	1900	1900	1845	1900	1881	1881	1900
Adj Flow Rate, veh/h	121	937	11	2	586	126	17	6	6	161	6	57
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	2	2	2	3	3	3	1	1	1
Cap, veh/h	433	1342	1141	353	851	183	163	57	37	302	21	195
Arrive On Green	0.06	0.71	0.71	0.57	0.57	0.57	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1792	1881	1599	589	1487	320	627	428	275	1410	154	1468
Grp Volume(v), veh/h	121	937	11	2	0	712	29	0	0	161	0	63
Grp Sat Flow(s),veh/h/ln	1792	1881	1599	589	0	1806	1331	0	0	1410	0	1622
Q Serve(g_s), s	1.7	20.3	0.1	0.1	0.0	19.9	0.0	0.0	0.0	4.7	0.0	2.5
Cycle Q Clear(g_c), s	1.7	20.3	0.1	10.4	0.0	19.9	2.5	0.0	0.0	7.2	0.0	2.5
Prop In Lane	1.00		1.00	1.00		0.18	0.59		0.21	1.00		0.90
Lane Grp Cap(c), veh/h	433	1342	1141	353	0	1035	257	0	0	302	0	216
V/C Ratio(X)	0.28	0.70	0.01	0.01	0.00	0.69	0.11	0.00	0.00	0.53	0.00	0.29
Avail Cap(c_a), veh/h	457	1342	1141	353	0	1035	633	0	0	666	0	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.3	5.9	3.0	11.7	0.0	10.8	27.3	0.0	0.0	29.8	0.0	28.0
Incr Delay (d2), s/veh	0.1	3.0	0.0	0.0	0.0	3.7	0.1	0.0	0.0	0.5	0.0	0.3
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	0.9	11.5	0.1	0.0	0.0	10.8	0.5	0.0	0.0	3.1	0.0	1.1
LnGrp Delay(d),s/veh	8.4	8.9	3.0	11.7	0.0	14.5	27.4	0.0	0.0	30.4	0.0	28.2
LnGrp LOS	A	A	A	B		B	C			C		C
Approach Vol, veh/h		1069			714			29			224	
Approach Delay, s/veh		8.8			14.5			27.4			29.8	
Approach LOS		A			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.0	46.5		15.0		56.5		15.0
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		5.5
Max Green Setting (Gmax), s	5.5	40.0		28.0		51.0		28.0
Max Q Clear Time (g_c+I1), s	3.7	21.9		4.5		22.3		9.2
Green Ext Time (p_c), s	0.0	10.5		0.4		13.5		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	1	1	10	10	0	110	130	840	0	1	430	15
Future Vol, veh/h	1	1	10	10	0	110	130	840	0	1	430	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	300	250	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	1	11	11	0	116	137	884	0	1	453	16

Major/Minor	Minor1			Minor2			Major1			Major2		
Conflicting Flow All	1621	1629	884	1627	1621	461	468	0	0	884	0	0
Stage 1	1158	1158	-	463	463	-	-	-	-	-	-	-
Stage 2	463	471	-	1164	1158	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	83	102	344	82	103	603	1099	-	-	770	-	-
Stage 1	239	270	-	581	566	-	-	-	-	-	-	-
Stage 2	579	560	-	238	272	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	61	89	344	71	90	603	1099	-	-	770	-	-
Mov Cap-2 Maneuver	61	89	-	71	90	-	-	-	-	-	-	-
Stage 1	209	236	-	509	565	-	-	-	-	-	-	-
Stage 2	467	559	-	201	238	-	-	-	-	-	-	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	23.1	16.7	1.2	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NWL	NWT	NWR	EBLn1	WBLn1	WBLn2	SEL	SET	SER
Capacity (veh/h)	770	-	-	212	71	603	1099	-	-
HCM Lane V/C Ratio	0.001	-	-	0.06	0.148	0.192	0.125	-	-
HCM Control Delay (s)	9.7	0	-	23.1	64.3	12.4	8.7	-	-
HCM Lane LOS	A	A	-	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.5	0.7	0.4	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	45	15	30	15	5	60
Future Vol, veh/h	45	15	30	15	5	60
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	82	82	82	82	82	82
Heavy Vehicles, %	3	3	9	9	3	3
Mvmt Flow	55	18	37	18	6	73

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	131	46	0	0	55	0
Stage 1	46	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	861	1021	-	-	1544	-
Stage 1	974	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	858	1021	-	-	1544	-
Mov Cap-2 Maneuver	858	-	-	-	-	-
Stage 1	974	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	894	1544	-
HCM Lane V/C Ratio	-	-	0.082	0.004	-
HCM Control Delay (s)	-	-	9.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	70	25	10	90	155	70
Future Vol, veh/h	70	25	10	90	155	70
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	88	88	88	88	88	88
Heavy Vehicles, %	1	1	3	3	1	1
Mvmt Flow	80	28	11	102	176	80

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	114	0	-	0	251	63
Stage 1	-	-	-	-	63	-
Stage 2	-	-	-	-	188	-
Critical Hdwy	4.11	-	-	-	7.11	6.21
Critical Hdwy Stg 1	-	-	-	-	6.11	-
Critical Hdwy Stg 2	-	-	-	-	6.11	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1481	-	-	-	704	1004
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	816	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1481	-	-	-	674	1004
Mov Cap-2 Maneuver	-	-	-	-	674	-
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	771	-

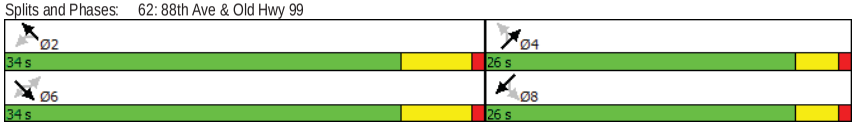
Approach	EB	WB	SB
HCM Control Delay, s	5.6	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1481	-	-	-	751
HCM Lane V/C Ratio	0.054	-	-	-	0.34
HCM Control Delay (s)	7.6	0	-	-	12.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.5

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	670	175	5	270	0	180	5	25	2	5	1
Future Volume (vph)	0	670	175	5	270	0	180	5	25	2	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		150	150		0	150		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		3849			1410			1160			265	
Travel Time (s)		52.5			19.2			26.4			6.0	
Peak Hour Factor	0.92	0.90	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	1%	1%	1%	2%	3%	2%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2			4			8		
Detector Phase	6	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0		24.0	24.0		26.0	26.0	
Total Split (s)	34.0	34.0	34.0	34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%	56.7%	56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		4.0	4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 55.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 62: 88th Ave & Old Hwy 99



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	670	175	5	270	0	180	5	25	2	5	1
Future Volume (veh/h)	0	670	175	5	270	0	180	5	25	2	5	1
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1881	1881	1881	1900	1845	1847	1900	1900	1863	1900
Adj Flow Rate, veh/h	0	744	194	6	300	0	200	5	28	2	5	1
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.90	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	1	1	1	3	2	2	2	2	2
Cap, veh/h	155	1131	961	359	1131	0	412	45	251	136	243	40
Arrive On Green	0.00	0.60	0.60	0.60	0.60	0.00	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1075	1881	1599	601	1881	0	1391	243	1363	211	1319	219
Grp Volume(v), veh/h	0	744	194	6	300	0	200	0	33	8	0	0
Grp Sat Flow(s),veh/h/ln	1075	1881	1599	601	1881	0	1391	0	1607	1748	0	0
Q Serve(g_s), s	0.0	12.2	2.6	0.3	3.5	0.0	6.2	0.0	0.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	12.2	2.6	12.5	3.5	0.0	6.3	0.0	0.8	0.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.85	0.25		0.12
Lane Grp Cap(c), veh/h	155	1131	961	359	1131	0	412	0	296	419	0	0
V/C Ratio(X)	0.00	0.66	0.20	0.02	0.27	0.00	0.49	0.00	0.11	0.02	0.00	0.00
Avail Cap(c_a), veh/h	155	1131	961	359	1131	0	813	0	759	901	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	6.1	4.2	10.2	4.4	0.0	18.1	0.0	15.8	15.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.0	0.5	0.1	0.6	0.0	0.9	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.1	1.3	0.1	1.9	0.0	2.5	0.0	0.4	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.1	4.7	10.3	5.0	0.0	18.9	0.0	16.0	15.6	0.0	0.0
LnGrp LOS		A	A	B	A		B		B	B		
Approach Vol, veh/h		938			306			233			8	
Approach Delay, s/veh		8.2			5.1			18.5			15.6	
Approach LOS		A			A			B			B	

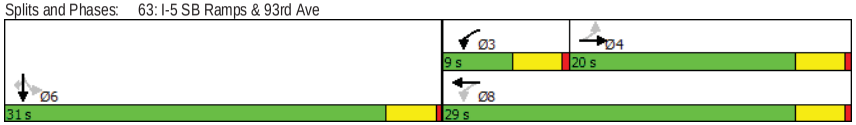
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		34.0		12.6		34.0		12.6
Change Period (Y+Rc), s		6.0		4.0		6.0		4.0
Max Green Setting (Gmax), s		28.0		22.0		28.0		22.0
Max Q Clear Time (g_c+I1), s		14.5		8.3		14.2		2.2
Green Ext Time (p_c), s		5.8		0.6		5.9		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	9.2
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	295	30	145	125	0	0	0	0	500	0	285
Future Volume (vph)	0	295	30	145	125	0	0	0	0	500	0	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		300
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			40			30			30	
Link Distance (ft)		1124			936			1099			1644	
Travel Time (s)		25.5			16.0			25.0			37.4	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)												
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases	4			8						6		6
Detector Phase	4	4		3	8					6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0					4.0	4.0	4.0
Minimum Split (s)	20.0	20.0		8.0	20.0					20.0	20.0	20.0
Total Split (s)	20.0	20.0		9.0	29.0					31.0	31.0	31.0
Total Split (%)	33.3%	33.3%		15.0%	48.3%					51.7%	51.7%	51.7%
Yellow Time (s)	3.5	3.5		3.5	3.5					3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5					0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		4.0		4.0	4.0						4.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None					Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 56.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 63: I-5 SB Ramps & 93rd Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	295	30	145	125	0	0	0	0	500	0	285
Future Volume (veh/h)	0	295	30	145	125	0	0	0	0	500	0	285
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1743	1743	0				1900	1827	1827
Adj Flow Rate, veh/h	0	335	34	165	142	0				568	0	131
Adj No. of Lanes	0	1	0	1	1	0				0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88				0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	9	9	0				4	4	4
Cap, veh/h	0	402	41	315	689	0				812	0	725
Arrive On Green	0.00	0.24	0.24	0.09	0.40	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	1681	171	1660	1743	0				1740	0	1553
Grp Volume(v), veh/h	0	0	369	165	142	0				568	0	131
Grp Sat Flow(s),veh/h/ln	0	0	1851	1660	1743	0				1740	0	1553
Q Serve(g_s), s	0.0	0.0	11.0	4.1	3.1	0.0				15.0	0.0	2.8
Cycle Q Clear(g_c), s	0.0	0.0	11.0	4.1	3.1	0.0				15.0	0.0	2.8
Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	0	443	315	689	0				812	0	725
V/C Ratio(X)	0.00	0.00	0.83	0.52	0.21	0.00				0.70	0.00	0.18
Avail Cap(c_a), veh/h	0	0	512	315	753	0				812	0	725
HCM Platoon Ratio	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	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	20.9	14.9	11.5	0.0				12.2	0.0	9.0
Incr Delay (d2), s/veh	0.0	0.0	10.0	1.6	0.1	0.0				5.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	6.8	2.0	1.5	0.0				8.2	0.0	1.3
LnGrp Delay(d),s/veh	0.0	0.0	30.9	16.5	11.7	0.0				17.2	0.0	9.5
LnGrp LOS			C	B	B					B		A
Approach Vol, veh/h		369			307						699	
Approach Delay, s/veh		30.9			14.3						15.8	
Approach LOS		C			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			9.0	17.9		31.0		26.9
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			5.0	16.0		27.0		25.0
Max Q Clear Time (g_c+I1), s			6.1	13.0		17.0		5.1
Green Ext Time (p_c), s			0.0	0.9		3.1		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	245	505	0	0	250	340	45	0	115	0	0	0
Future Vol, veh/h	245	505	0	0	250	340	45	0	115	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	125	-	-	-	-	300	-	-	-	-	-	-
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, %	3	3	3	8	8	8	14	14	14	0	0	0
Mvmt Flow	261	537	0	0	266	362	48	0	122	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	266	0	-	-	-	0	1325	1325	537
Stage 1	-	-	-	-	-	-	1059	1059	-
Stage 2	-	-	-	-	-	-	266	266	-
Critical Hdwy	4.13	-	-	-	-	-	6.54	6.64	6.34
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.64	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.626	4.126	3.426
Pot Cap-1 Maneuver	1292	-	0	0	-	-	162	147	521
Stage 1	-	-	0	0	-	-	316	287	-
Stage 2	-	-	0	0	-	-	752	667	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1292	-	-	-	-	-	129	0	521
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	0	-
Stage 1	-	-	-	-	-	-	252	0	-
Stage 2	-	-	-	-	-	-	752	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.8	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	725	1292	-	-	-
HCM Lane V/C Ratio	0.235	0.202	-	-	-
HCM Control Delay (s)	11.5	8.5	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.9	0.8	-	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	25	460	15	5	410	5	15	1	10	5	5	50
Future Vol, veh/h	25	460	15	5	410	5	15	1	10	5	5	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	4	4	4	1	1	1	0	0	0	5	5	5
Mvmt Flow	27	489	16	5	436	5	16	1	11	5	5	53

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	441	0	0	505	0	0	1030	1003	497	1005	1008	439
Stage 1	-	-	-	-	-	-	551	551	-	449	449	-
Stage 2	-	-	-	-	-	-	479	452	-	556	559	-
Critical Hdwy	4.14	-	-	4.11	-	-	7.1	6.5	6.2	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-
Follow-up Hdwy	2.236	-	-	2.209	-	-	3.5	4	3.3	3.545	4.045	3.345
Pot Cap-1 Maneuver	1108	-	-	1065	-	-	214	244	577	217	238	612
Stage 1	-	-	-	-	-	-	522	519	-	584	567	-
Stage 2	-	-	-	-	-	-	571	574	-	510	506	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1108	-	-	1065	-	-	186	234	577	206	229	612
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	234	-	206	229	-
Stage 1	-	-	-	-	-	-	504	501	-	564	564	-
Stage 2	-	-	-	-	-	-	513	571	-	483	489	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	20.9	13.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	254	1108	-	-	1065	-	-	469
HCM Lane V/C Ratio	0.109	0.024	-	-	0.005	-	-	0.136
HCM Control Delay (s)	20.9	8.3	0	-	8.4	0	-	13.9
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.5

Intersection	
Intersection Delay, s/veh	20.3
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NEU	NEL	NET	NER
Traffic Vol, veh/h	0	2	315	165	0	55	295	30	0	80	20	30
Future Vol, veh/h	0	2	315	165	0	55	295	30	0	80	20	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	3	3	3	2	2	2	2	2	0	0	0
Mvmt Flow	0	2	342	179	0	60	321	33	0	87	22	33
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NE
Opposing Approach	WB	EB	SW
Opposing Lanes	2	1	1
Conflicting Approach Left	SW	NE	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	25.4	18.8	12.2
HCM LOS	D	C	B

Lane	NELn1	EBLn1	WBLn1	WBLn2	SWLn1
Vol Left, %	62%	0%	16%	0%	50%
Vol Thru, %	15%	65%	84%	0%	50%
Vol Right, %	23%	34%	0%	100%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	130	482	350	30	101
LT Vol	80	2	55	0	50
Through Vol	20	315	295	0	50
RT Vol	30	165	0	30	1
Lane Flow Rate	141	524	380	33	110
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.266	0.784	0.648	0.048	0.213
Departure Headway (Hd)	6.769	5.388	6.132	5.341	7
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	534	665	582	663	515
Service Time	4.775	3.476	3.926	3.134	5.008
HCM Lane V/C Ratio	0.264	0.788	0.653	0.05	0.214
HCM Control Delay	12.2	25.4	19.7	8.4	11.9
HCM Lane LOS	B	D	C	A	B
HCM 95th-tile Q	1.1	7.6	4.7	0.2	0.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Traffic Vol, veh/h	0	50	50	1
Future Vol, veh/h	0	50	50	1
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	54	54	1
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.9
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	14.5
Intersection LOS	B

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	240	155	0	85	235	0	130	65
Future Vol, veh/h	0	240	155	0	85	235	0	130	65
Peak Hour Factor	0.92	0.87	0.87	0.92	0.87	0.87	0.92	0.87	0.87
Heavy Vehicles, %	2	3	3	2	2	2	2	1	1
Mvmt Flow	0	276	178	0	98	270	0	149	75
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	15.8	14.4	12.2
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	67%	0%	27%
Vol Thru, %	0%	61%	73%
Vol Right, %	33%	39%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	195	395	320
LT Vol	130	0	85
Through Vol	0	240	235
RT Vol	65	155	0
Lane Flow Rate	224	454	368
Geometry Grp	1	1	1
Degree of Util (X)	0.364	0.622	0.54
Departure Headway (Hd)	5.849	4.933	5.287
Convergence, Y/N	Yes	Yes	Yes
Cap	614	731	680
Service Time	3.889	2.965	3.321
HCM Lane V/C Ratio	0.365	0.621	0.541
HCM Control Delay	12.2	15.8	14.4
HCM Lane LOS	B	C	B
HCM 95th-tile Q	1.7	4.4	3.3

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	115	190	95	10	15	225
Future Vol, veh/h	115	190	95	10	15	225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	3	3	1	1
Mvmt Flow	134	221	110	12	17	262

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	604	116
Stage 1	-	-	-	-	116	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	4.12	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.218	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1465	-	-	-	463	939
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1465	-	-	-	415	939
Mov Cap-2 Maneuver	-	-	-	-	415	-
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	555	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1465	-	-	-	415	939
HCM Lane V/C Ratio	0.091	-	-	-	0.042	0.279
HCM Control Delay (s)	7.7	0	-	-	14.1	10.3
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.1	1.1

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NEL	NER
Traffic Vol, veh/h	630	30	70	215	15	155
Future Vol, veh/h	630	30	70	215	15	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	450	300	-	300	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	685	33	76	234	16	168

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	685	0	1071	685
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	386	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	908	-	246	450
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	908	-	225	450
Mov Cap-2 Maneuver	-	-	-	-	419	-
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NE
HCM Control Delay, s	0	2.3	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	419	450	-	-	908	-
HCM Lane V/C Ratio	0.039	0.374	-	-	0.084	-
HCM Control Delay (s)	13.9	17.7	-	-	9.3	-
HCM Lane LOS	B	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	1.7	-	-	0.3	-

Intersection	
Intersection Delay, s/veh	17.4
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	55	100	10	0	165	55	125	0	5	240	140
Future Vol, veh/h	0	55	100	10	0	165	55	125	0	5	240	140
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	6	6	6	2	9	9	9	2	4	4	4
Mvmt Flow	0	58	105	11	0	174	58	132	0	5	253	147
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	12.4	14	25.1
HCM LOS	B	B	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	63%	0%	91%	0%	31%	0%	86%
Vol Right, %	0%	37%	0%	9%	0%	69%	0%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	380	55	110	165	180	50	180
LT Vol	5	0	55	0	165	0	50	0
Through Vol	0	240	0	100	0	55	0	155
RT Vol	0	140	0	10	0	125	0	25
Lane Flow Rate	5	400	58	116	174	189	53	189
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.011	0.732	0.13	0.241	0.372	0.353	0.112	0.372
Departure Headway (Hd)	7.36	6.588	8.061	7.482	7.712	6.704	7.671	7.059
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	486	548	445	479	467	536	467	510
Service Time	5.101	4.328	5.813	5.234	5.459	4.45	5.419	4.807
HCM Lane V/C Ratio	0.01	0.73	0.13	0.242	0.373	0.353	0.113	0.371
HCM Control Delay	10.2	25.3	12	12.6	15	13.1	11.4	14
HCM Lane LOS	B	D	B	B	B	B	B	B
HCM 95th-tile Q	0	6.1	0.4	0.9	1.7	1.6	0.4	1.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	50	155	25
Future Vol, veh/h	0	50	155	25
Peak Hour Factor	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	3	3	3
Mvmt Flow	0	53	163	26
Number of Lanes	0	1	1	0

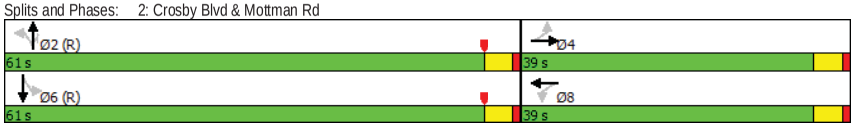
Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	13.4
HCM LOS	B

Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	230	35	5	30	125	45	665	120	190	850	535
Future Volume (vph)	205	230	35	5	30	125	45	665	120	190	850	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	200		0	100		0
Storage Lanes	1		0	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		940			1116			645			417	
Travel Time (s)		21.4			25.4			14.7			9.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	1%	1%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		20.5	20.5	20.5	20.5	20.5	
Total Split (s)	39.0	39.0		39.0	39.0		61.0	61.0	61.0	61.0	61.0	
Total Split (%)	39.0%	39.0%		39.0%	39.0%		61.0%	61.0%	61.0%	61.0%	61.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 82 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Crosby Blvd & Mottman Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	230	35	5	30	125	45	665	120	190	850	535
Future Volume (veh/h)	205	230	35	5	30	125	45	665	120	190	850	535
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1900	1900	1881	1881	1881	1845	1845	1900
Adj Flow Rate, veh/h	216	242	37	5	32	132	47	700	126	200	895	0
Adj No. of Lanes	1	1	0	0	1	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	0	0	0	1	1	1	3	3	3
Cap, veh/h	337	388	59	41	87	322	413	1245	1058	374	2319	0
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.66	0.66	0.66	0.66	0.66	0.00
Sat Flow, veh/h	1205	1563	239	15	349	1297	625	1881	1599	654	3597	0
Grp Volume(v), veh/h	216	0	279	169	0	0	47	700	126	200	895	0
Grp Sat Flow(s),veh/h/ln	1205	0	1802	1661	0	0	625	1881	1599	654	1752	0
Q Serve(g_s), s	11.4	0.0	13.8	0.0	0.0	0.0	3.7	20.1	2.9	23.7	11.6	0.0
Cycle Q Clear(g_c), s	19.9	0.0	13.8	8.5	0.0	0.0	15.3	20.1	2.9	43.8	11.6	0.0
Prop In Lane	1.00		0.13	0.03		0.78	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	337	0	448	450	0	0	413	1245	1058	374	2319	0
V/C Ratio(X)	0.64	0.00	0.62	0.38	0.00	0.00	0.11	0.56	0.12	0.54	0.39	0.00
Avail Cap(c_a), veh/h	454	0	622	608	0	0	413	1245	1058	374	2319	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.89	0.89	0.89	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.6	0.0	33.4	31.4	0.0	0.0	11.2	9.1	6.2	20.9	7.7	0.0
Incr Delay (d2), s/veh	2.0	0.0	1.4	0.5	0.0	0.0	0.5	1.6	0.2	5.4	0.5	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	5.8	0.0	7.0	4.0	0.0	0.0	0.7	10.9	1.3	4.8	5.8	0.0
LnGrp Delay(d),s/veh	38.7	0.0	34.8	31.9	0.0	0.0	11.7	10.8	6.4	26.3	8.2	0.0
LnGrp LOS	D		C	C			B	B	A	C	A	
Approach Vol, veh/h		495			169			873			1095	
Approach Delay, s/veh		36.5			31.9			10.2			11.5	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		70.7		29.3		70.7		29.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		56.5		34.5		56.5		34.5
Max Q Clear Time (g_c+I1), s		22.1		21.9		45.8		10.5
Green Ext Time (p_c), s		19.7		3.0		8.4		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	50	45	40	45	220	35	505	25	150	660	100
Future Volume (vph)	75	50	45	40	45	220	35	505	25	150	660	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		150	200		0	0		250
Storage Lanes	0		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		468			2725			1710			645	
Travel Time (s)		10.6			61.9			38.9			14.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	7	4	4	8	8	8	5	2		6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.5	20.5	20.5	20.5	20.5	20.5	8.5	20.5		20.5	20.5	20.5
Total Split (s)	8.5	29.0	29.0	20.5	20.5	20.5	8.5	46.0		37.5	37.5	37.5
Total Split (%)	11.3%	38.7%	38.7%	27.3%	27.3%	27.3%	11.3%	61.3%		50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 63.8	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 3: Crosby Blvd & Irving St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	50	45	40	45	220	35	505	25	150	660	100
Future Volume (veh/h)	75	50	45	40	45	220	35	505	25	150	660	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759	1900	1881	1881	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	79	53	47	42	47	232	37	532	26	158	695	0
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
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, %	8	8	8	1	1	1	1	1	1	2	2	2
Cap, veh/h	94	39	282	153	141	301	400	1186	58	561	1051	893
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.03	0.67	0.67	0.56	0.56	0.00
Sat Flow, veh/h	9	207	1495	357	750	1599	1792	1779	87	848	1863	1583
Grp Volume(v), veh/h	132	0	47	89	0	232	37	0	558	158	695	0
Grp Sat Flow(s),veh/h/ln	216	0	1495	1108	0	1599	1792	0	1866	848	1863	1583
Q Serve(g_s), s	6.0	0.0	1.6	0.6	0.0	8.6	0.5	0.0	8.8	6.8	16.1	0.0
Cycle Q Clear(g_c), s	6.0	0.0	1.6	6.6	0.0	8.6	0.5	0.0	8.8	9.2	16.1	0.0
Prop In Lane	0.60		1.00	0.47		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	282	294	0	301	400	0	1244	561	1051	893
V/C Ratio(X)	0.00	0.00	0.17	0.30	0.00	0.77	0.09	0.00	0.45	0.28	0.66	0.00
Avail Cap(c_a), veh/h	0	0	589	401	0	411	461	0	1244	561	1051	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	21.2	22.1	0.0	24.0	7.2	0.0	4.9	8.6	9.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.6	0.0	6.0	0.1	0.0	1.2	1.3	3.3	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	0.7	1.5	0.0	4.2	0.2	0.0	4.9	1.8	9.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	21.4	22.6	0.0	29.9	7.3	0.0	6.1	9.9	12.7	0.0
LnGrp LOS			C	C		C	A		A	A	B	
Approach Vol, veh/h		179			321			595			853	
Approach Delay, s/veh		5.6			27.9			6.2			12.2	
Approach LOS		A			C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		46.0		16.2	6.4	39.6		16.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		41.5		24.5	4.0	33.0		16.0
Max Q Clear Time (g_c+I1), s		10.8		8.0	2.5	18.1		10.6
Green Ext Time (p_c), s		12.1		2.1	0.0	8.3		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.3
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	5	15	235	0	1	25	1	0	245	5	1
Future Vol, veh/h	0	5	15	235	0	1	25	1	0	245	5	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	1	1	1	2	0	0	0	2	1	1	1
Mvmt Flow	0	5	16	247	0	1	26	1	0	258	5	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.9	8.1	10.3
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	98%	2%	4%	0%
Vol Thru, %	2%	6%	93%	50%
Vol Right, %	0%	92%	4%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	251	255	27	10
LT Vol	245	5	1	0
Through Vol	5	15	25	5
RT Vol	1	235	1	5
Lane Flow Rate	264	268	28	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.349	0.305	0.038	0.013
Departure Headway (Hd)	4.752	4.089	4.859	4.56
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	756	880	736	781
Service Time	2.788	2.109	2.895	2.608
HCM Lane V/C Ratio	0.349	0.305	0.038	0.014
HCM Control Delay	10.3	8.9	8.1	7.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.6	1.3	0.1	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	5	5
Future Vol, veh/h	0	0	5	5
Peak Hour Factor	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	5	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.7
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	1	1	10	5	285	1	210	5	345	275	20
Future Vol, veh/h	10	1	1	10	5	285	1	210	5	345	275	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	10	10	10	2	2	2	4	4	4	2	2	2
Mvmt Flow	11	1	1	11	5	300	1	221	5	363	289	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1254	1254	300	1253	1263	224	311	0	0	226	0	0
Stage 1	1026	1026	-	226	226	-	-	-	-	-	-	-
Stage 2	228	228	-	1027	1037	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	143	166	721	149	170	815	1238	-	-	1342	-	-
Stage 1	274	302	-	777	717	-	-	-	-	-	-	-
Stage 2	757	701	-	283	308	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	69	121	721	117	124	815	1238	-	-	1342	-	-
Mov Cap-2 Maneuver	69	121	-	117	124	-	-	-	-	-	-	-
Stage 1	274	220	-	776	716	-	-	-	-	-	-	-
Stage 2	474	700	-	205	225	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	59.9	13.4	0	4.7
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1238	-	-	78	119	815	1342	-	-
HCM Lane V/C Ratio	0.001	-	-	0.162	0.133	0.368	0.271	-	-
HCM Control Delay (s)	7.9	0	-	59.9	39.8	12	8.7	-	-
HCM Lane LOS	A	A	-	F	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.4	1.7	1.1	-	-

Intersection	
Int Delay, s/veh	111.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	190	85	250	410	210	230
Future Vol, veh/h	190	85	250	410	210	230
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	0	0	1	1
Mvmt Flow	200	89	263	432	221	242

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	289	0	1203	245
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	958	-
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	-	-	1284	-	~ 205	796
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	374	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1284	-	~ 163	796
Mov Cap-2 Maneuver	-	-	-	-	~ 163	-
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	297	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	$ 344.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	279	-	-	1284	-
HCM Lane V/C Ratio	1.66	-	-	0.205	-
HCM Control Delay (s)	$ 344.5	-	-	8.5	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	29	-	-	0.8	-

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

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	20	50	5	30	70	110	5	25	20	150	40	50
Future Vol, veh/h	20	50	5	30	70	110	5	25	20	150	40	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	3	3	3
Mvmt Flow	21	53	5	32	74	116	5	26	21	158	42	53

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	189	0	0	58	0	0	339	350	55	316	295	132
Stage 1	-	-	-	-	-	-	97	97	-	195	195	-
Stage 2	-	-	-	-	-	-	242	253	-	121	100	-
Critical Hdwy	4.13	-	-	4.11	-	-	7.1	6.5	6.2	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.209	-	-	3.5	4	3.3	3.527	4.027	3.327
Pot Cap-1 Maneuver	1379	-	-	1553	-	-	619	577	1018	635	615	915
Stage 1	-	-	-	-	-	-	914	819	-	804	737	-
Stage 2	-	-	-	-	-	-	766	701	-	881	810	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1379	-	-	1553	-	-	536	555	1018	582	591	915
Mov Cap-2 Maneuver	-	-	-	-	-	-	536	555	-	582	591	-
Stage 1	-	-	-	-	-	-	899	806	-	791	720	-
Stage 2	-	-	-	-	-	-	664	685	-	821	797	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	1.1	10.8	14.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	675	1379	-	-	1553	-	-	631
HCM Lane V/C Ratio	0.078	0.015	-	-	0.02	-	-	0.4
HCM Control Delay (s)	10.8	7.7	0	-	7.4	0	-	14.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	1.9

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	225	20	230	200	15	205
Future Vol, veh/h	225	20	230	200	15	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	237	21	242	211	16	216

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	594	347	0	0	453	0
Stage 1	347	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	469	698	-	-	1118	-
Stage 1	718	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	462	698	-	-	1118	-
Mov Cap-2 Maneuver	462	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	785	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	462	698	1118	-
HCM Lane V/C Ratio	-	-	0.513	0.03	0.014	-
HCM Control Delay (s)	-	-	20.7	10.3	8.3	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2.9	0.1	0	-

9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Total Del/Veh (s)	8.2	9.5	5.0	10.7	12.0	7.2	10.8	11.7	7.4	1.8	2.2	1.2

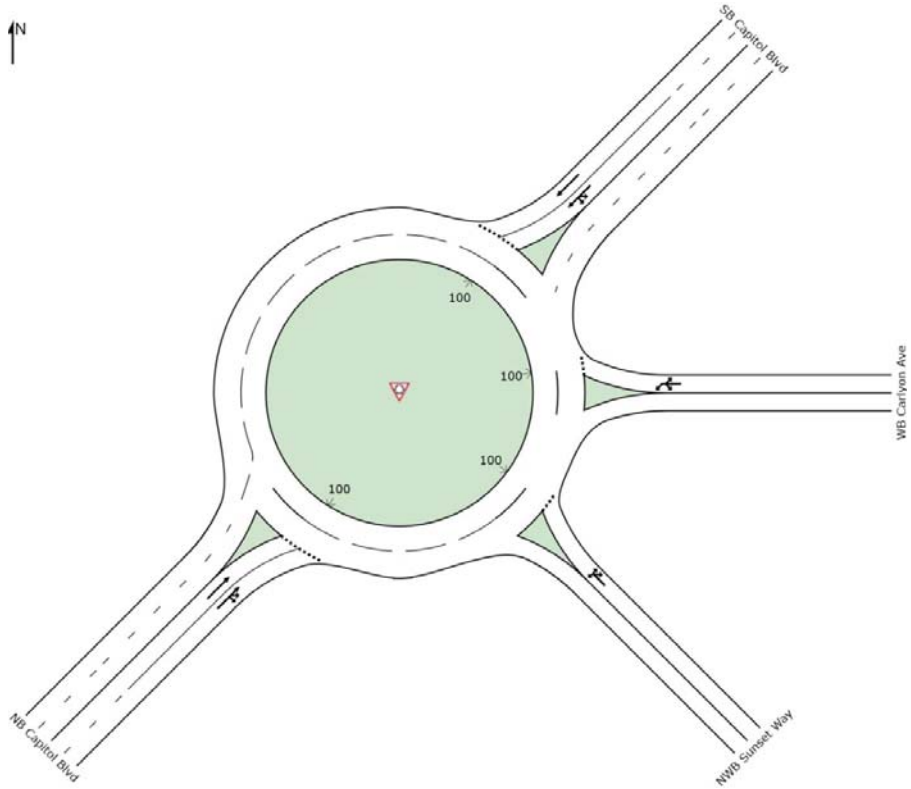
9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	6.7

SITE LAYOUT

Site: 10) Carlyon Ave at Capitol Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 10) Carlyon Ave at Capitol Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NWB Sunset Way											
3x	L2	47	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65	32.2
18x	R2	21	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65	31.2
18bx	R3	5	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65	30.8
Approach		74	2.0	0.130	7.9	LOS A	0.5	12.8	0.65	0.65	31.8
East: WB Carlyon Ave											
1b	L3	11	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80	29.7
1a	L1	142	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80	29.0
16b	R3	95	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80	28.2
Approach		247	2.0	0.476	15.4	LOS B	2.5	62.8	0.74	0.80	28.7
NorthEast: SB Capitol Blvd											
1bx	L3	79	2.0	0.728	15.0	LOS B	8.0	203.6	0.71	0.54	30.7
1x	L2	21	2.0	0.728	15.0	LOS B	8.0	203.6	0.71	0.54	30.4
6x	T1	1537	2.0	0.728	14.9	LOS B	8.0	203.6	0.71	0.53	30.5
Approach		1637	2.0	0.728	14.9	LOS B	8.0	203.6	0.71	0.53	30.5
SouthWest: NB Capitol Blvd											
2x	T1	905	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21	33.9
12ax	R1	158	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21	33.6
12x	R2	26	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21	32.9
Approach		1089	2.0	0.450	7.6	LOS A	3.2	80.2	0.38	0.21	33.9
All Vehicles		3047	2.0	0.728	12.2	LOS B	8.0	203.6	0.59	0.44	31.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection	
Int Delay, s/veh	1.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	165	405	275	140	0	0
Future Vol, veh/h	165	405	275	140	0	0
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	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	174	426	289	147	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	437	0	-	0	1137	363
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	774	-
Critical Hdwy	4.1	-	-	-	7.1	6.2
Critical Hdwy Stg 1	-	-	-	-	6.1	-
Critical Hdwy Stg 2	-	-	-	-	6.1	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1134	-	-	-	181	686
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	394	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1134	-	-	-	153	686
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	315	-

Approach	SE	NW	SW
HCM Control Delay, s	2.5	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1	
Capacity (veh/h)	-	-	1134	-	-
HCM Lane V/C Ratio	-	-	0.153	-	-
HCM Control Delay (s)	-	-	8.7	0	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.5	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	0	515	430	360	30
Future Vol, veh/h	0	0	515	430	360	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	0	0	542	453	379	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1932	-	411	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	1537	-	-	-	-	-
Critical Hdwy	6.4	-	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	-	2.209	-	-	-
Pot Cap-1 Maneuver	74	0	1153	-	-	-
Stage 1	685	0	-	-	-	-
Stage 2	198	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	39	-	1153	-	-	-
Mov Cap-2 Maneuver	39	-	-	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	105	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	5.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1153	-	-	-	-
HCM Lane V/C Ratio	0.47	-	-	-	-
HCM Control Delay (s)	10.9	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	2.6	-	-	-	-

SimTraffic Performance Report

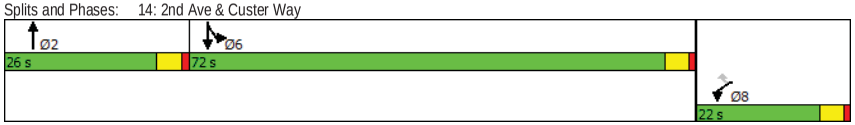
13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	518.6	471.9	349.2
Total Del/Veh (s)	1.0	0.9	1.4	117.1	41.7	70.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	235	260	15	320	915	310
Future Volume (vph)	235	260	15	320	915	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225		0	0	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	662		2035			505
Travel Time (s)	15.0		46.3			11.5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	8		2		6	6
Permitted Phases		8				
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	10.0	10.0	24.5		20.0	20.0
Total Split (s)	22.0	22.0	26.0		72.0	72.0
Total Split (%)	18.3%	18.3%	21.7%		60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 107.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 14: 2nd Ave & Custer Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	235	260	15	320	915	310
Future Volume (veh/h)	235	260	15	320	915	310
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	247	121	16	184	963	326
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	273	244	18	211	1065	1118
Arrive On Green	0.15	0.15	0.14	0.14	0.59	0.59
Sat Flow, veh/h	1792	1599	129	1489	1810	1900
Grp Volume(v), veh/h	247	121	0	200	963	326
Grp Sat Flow(s),veh/h/ln	1792	1599	0	1618	1810	1900
Q Serve(g_s), s	15.5	8.0	0.0	13.9	53.7	9.8
Cycle Q Clear(g_c), s	15.5	8.0	0.0	13.9	53.7	9.8
Prop In Lane	1.00	1.00		0.92	1.00	
Lane Grp Cap(c), veh/h	273	244	0	229	1065	1118
V/C Ratio(X)	0.90	0.50	0.00	0.87	0.90	0.29
Avail Cap(c_a), veh/h	273	244	0	303	1065	1118
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	44.6	0.0	48.2	20.8	11.7
Incr Delay (d2), s/veh	30.1	0.6	0.0	15.9	12.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	3.6	0.0	7.2	30.2	5.3
LnGrp Delay(d),s/veh	77.8	45.1	0.0	64.2	33.2	12.4
LnGrp LOS	E	D		E	C	B
Approach Vol, veh/h	368		200			1289
Approach Delay, s/veh	67.1		64.2			27.9
Approach LOS	E		E			C

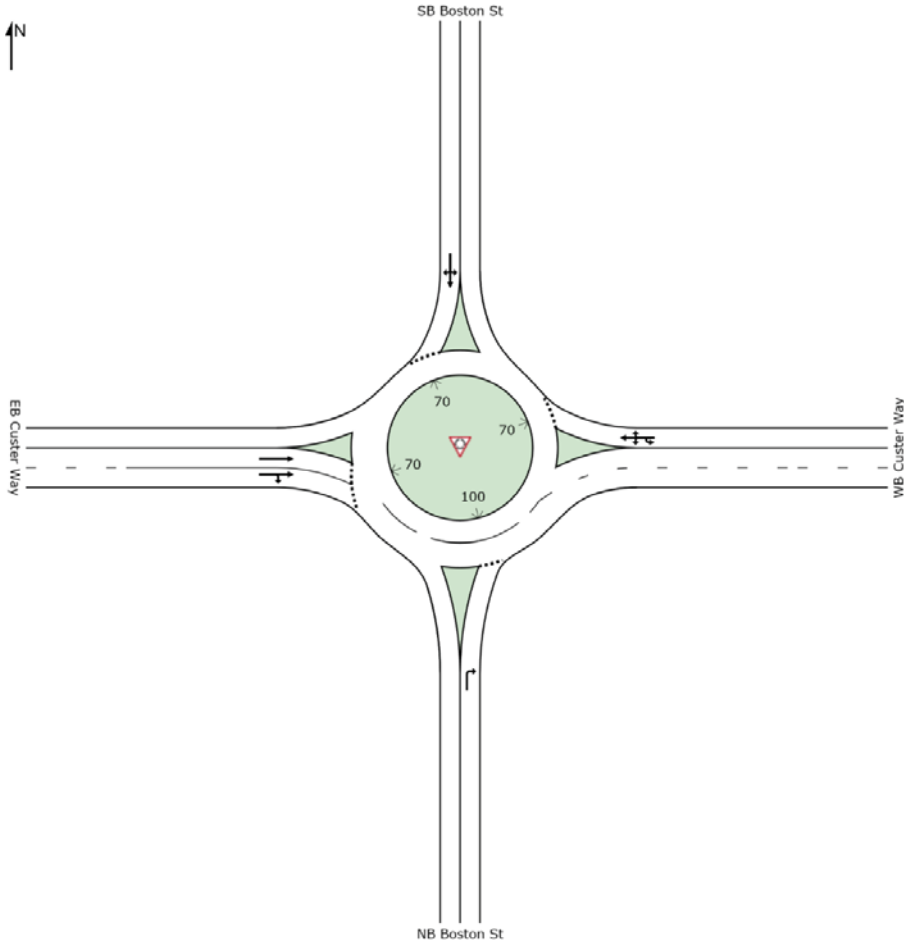
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		20.7				72.0		22.0
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		21.5				67.5		17.5
Max Q Clear Time (g_c+I1), s		15.9				55.7		17.5
Green Ext Time (p_c), s		0.4				4.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.6
HCM 2010 LOS	D

SITE LAYOUT

Site: 15) Custer Way at Boston St

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 15) Custer Way at Boston St

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Boston St											
18	R2	121	2.0	0.234	10.2	LOS B	1.1	26.8	0.72	0.72	31.7
Approach		121	2.0	0.234	10.2	LOS B	1.1	26.8	0.72	0.72	31.7
East: WB Custer Way											
1u	U	26	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	37.1
1	L2	247	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	36.1
6	T1	568	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	36.3
16	R2	5	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	35.4
Approach		847	2.0	0.697	13.0	LOS B	0.0	0.0	0.00	0.00	36.2
North: SB Boston St											
7	L2	5	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	33.0
4	T1	5	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	32.8
14	R2	5	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	32.1
Approach		16	2.0	0.027	6.5	LOS A	0.1	3.6	0.70	0.54	32.6
West: EB Custer Way											
2	T1	1047	2.0	0.609	11.4	LOS B	5.4	136.1	0.67	0.55	31.7
12	R2	279	2.0	0.609	11.1	LOS B	5.3	134.8	0.67	0.53	30.7
Approach		1326	2.0	0.609	11.4	LOS B	5.4	136.1	0.67	0.54	31.4
All Vehicles		2311	2.0	0.697	11.9	LOS B	5.4	136.1	0.43	0.35	33.1

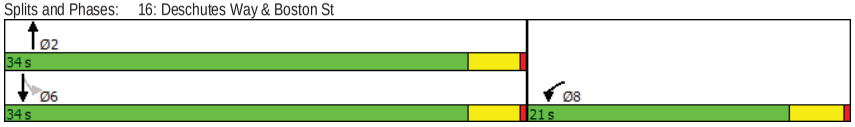
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	180	290	615	70	100	290
Future Volume (vph)	180	290	615	70	100	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	679		1427			1098
Travel Time (s)	15.4		32.4			25.0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	20.0		20.0		20.0	20.0
Total Split (s)	21.0		34.0		34.0	34.0
Total Split (%)	38.2%		61.8%		61.8%	61.8%
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	4.0		4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		Min		Min	Min

Intersection Summary	
Area Type:	Other
Cycle Length: 55	
Actuated Cycle Length: 45.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 16: Deschutes Way & Boston St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	180	290	615	70	100	290
Future Volume (veh/h)	180	290	615	70	100	290
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	189	305	647	74	105	305
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	206	332	880	101	165	435
Arrive On Green	0.32	0.32	0.53	0.53	0.53	0.53
Sat Flow, veh/h	637	1028	1675	192	150	828
Grp Volume(v), veh/h	495	0	0	721	410	0
Grp Sat Flow(s),veh/h/ln	1668	0	0	1866	978	0
Q Serve(g_s), s	15.1	0.0	0.0	15.7	6.2	0.0
Cycle Q Clear(g_c), s	15.1	0.0	0.0	15.7	21.9	0.0
Prop In Lane	0.38	0.62		0.10	0.26	
Lane Grp Cap(c), veh/h	538	0	0	980	600	0
V/C Ratio(X)	0.92	0.00	0.00	0.74	0.68	0.00
Avail Cap(c_a), veh/h	538	0	0	1063	660	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.2	0.0	0.0	9.7	10.1	0.0
Incr Delay (d2), s/veh	21.1	0.0	0.0	2.5	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	0.0	0.0	8.7	5.7	0.0
LnGrp Delay(d),s/veh	38.3	0.0	0.0	12.1	12.7	0.0
LnGrp LOS	D			B	B	
Approach Vol, veh/h	495		721			410
Approach Delay, s/veh	38.3		12.1			12.7
Approach LOS	D		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		31.7				31.7		21.0
Change Period (Y+Rc), s		4.0				4.0		4.0
Max Green Setting (Gmax), s		30.0				30.0		17.0
Max Q Clear Time (g_c+I1), s		17.7				23.9		17.1
Green Ext Time (p_c), s		6.4				3.8		0.0

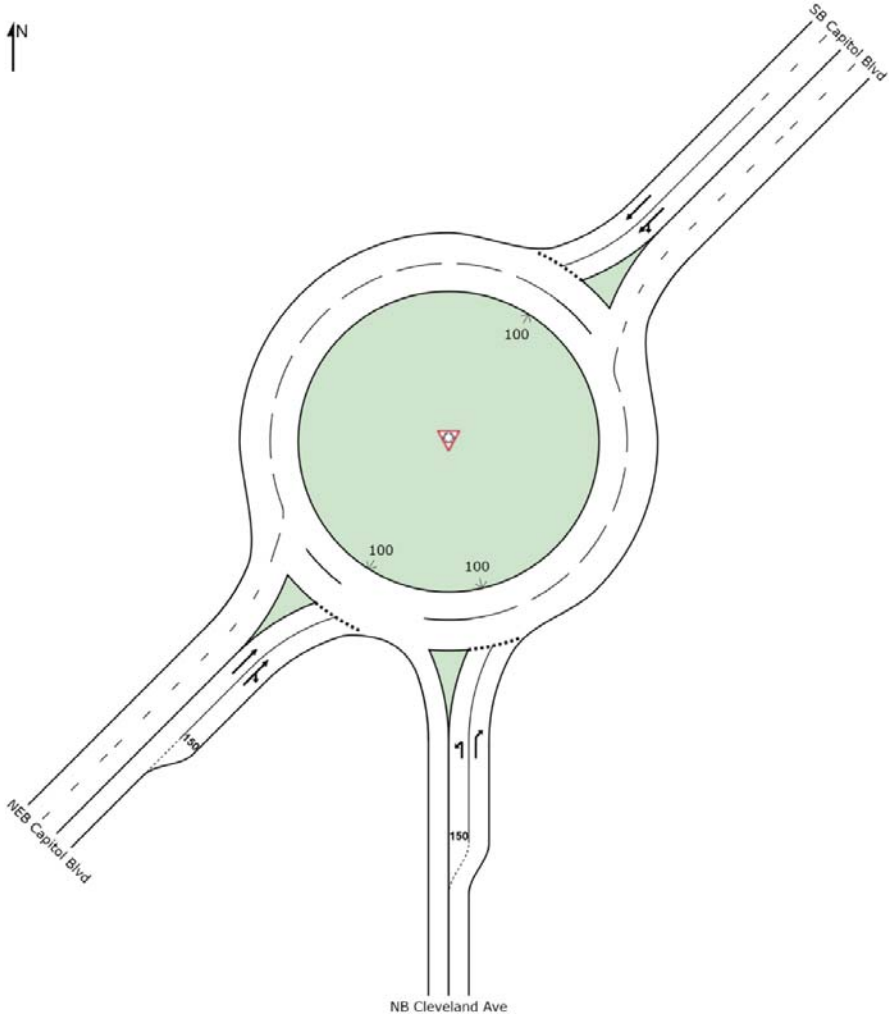
Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Notes

SITE LAYOUT

Site: 17) Cleveland Ave at Capitol Blvd

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 17) Cleveland Ave at Capitol Blvd

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Cleveland Ave											
3b	L3	26	2.0	0.059	8.8	LOS A	0.2	5.5	0.61	0.59	30.9
18a	R1	311	2.0	0.382	9.0	LOS A	1.9	49.2	0.67	0.68	33.0
Approach		337	2.0	0.382	9.0	LOS A	1.9	49.2	0.67	0.68	32.9
NorthEast: SB Capitol Blvd											
1ax	L1	468	2.0	0.663	11.3	LOS B	7.4	187.8	0.27	0.09	30.9
6x	T1	1268	2.0	0.663	11.3	LOS B	7.4	187.8	0.27	0.09	31.8
Approach		1737	2.0	0.663	11.3	LOS B	7.4	187.8	0.27	0.09	31.6
SouthWest: NEB Capitol Blvd											
2x	T1	789	2.0	0.434	8.9	LOS A	2.6	66.7	0.64	0.56	33.3
12bx	R3	21	2.0	0.434	8.8	LOS A	2.6	66.7	0.64	0.55	31.9
Approach		811	2.0	0.434	8.9	LOS A	2.6	66.7	0.64	0.56	33.2
All Vehicles		2884	2.0	0.663	10.4	LOS B	7.4	187.8	0.42	0.29	32.2

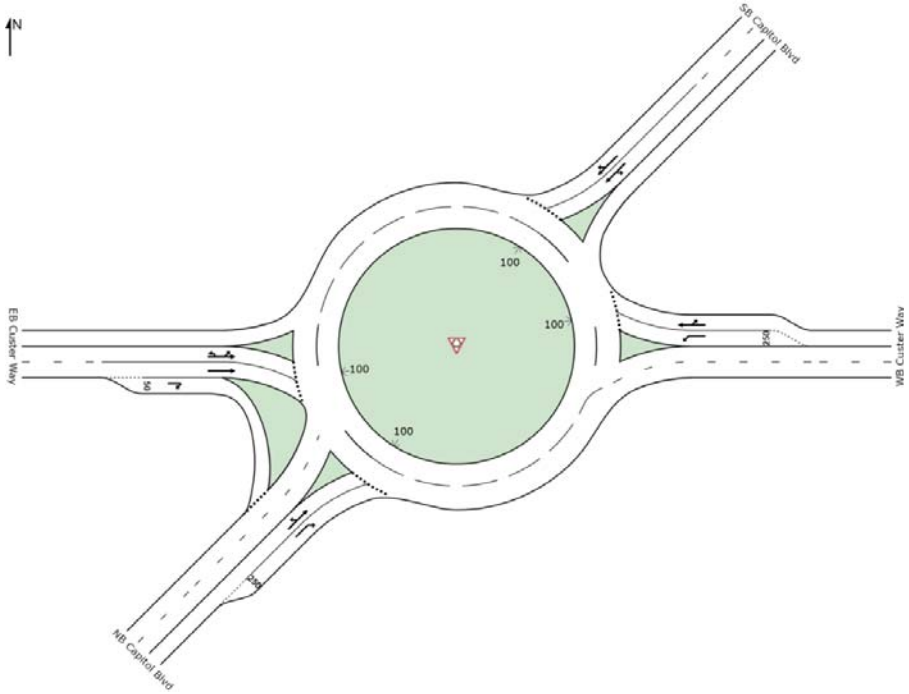
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 18) Custer Way at Capitol Blvd

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 18) Custer Way at Capitol Blvd

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: WB Custer Way											
1a	L1	200	2.0	0.508	20.8	LOS C	3.7	94.1	0.92	1.00	26.8
6	T1	442	2.0	0.841	37.2	LOS D	12.5	317.8	1.00	1.38	23.6
16b	R3	5	2.0	0.841	37.2	LOS D	12.5	317.8	1.00	1.38	22.9
Approach		647	2.0	0.841	32.1	LOS C	12.5	317.8	0.97	1.26	24.5
NorthEast: SB Capitol Blvd											
1bx	L3	37	2.0	0.830	28.4	LOS C	9.3	236.5	0.95	1.15	26.1
6x	T1	911	2.0	0.830	27.7	LOS C	9.6	244.8	0.95	1.15	26.1
16ax	R1	316	2.0	0.830	26.5	LOS C	9.6	244.8	0.96	1.15	26.3
Approach		1263	2.0	0.830	27.4	LOS C	9.6	244.8	0.95	1.15	26.1
West: EB Custer Way											
5u	U	26	2.0	0.850	36.4	LOS D	9.1	230.8	0.99	1.25	23.4
5a	L1	379	2.0	0.850	36.4	LOS D	9.1	230.8	0.99	1.25	22.8
2	T1	721	2.0	0.850	30.5	LOS C	10.3	261.1	1.00	1.27	25.2
12b	R3	79	2.0	0.099	5.5	LOS A	0.6	14.2	0.75	0.65	33.4
Approach		1205	2.0	0.850	30.8	LOS C	10.3	261.1	0.98	1.22	24.7
SouthWest: NB Capitol Blvd											
5bx	L3	21	2.0	1.032	73.4	LOS F	20.8	528.5	1.00	1.78	17.3
2x	T1	563	2.0	1.032	73.4	LOS F	20.8	528.5	1.00	1.78	17.2
12ax	R1	195	2.0	0.538	23.6	LOS C	2.9	73.8	0.84	0.90	27.2
Approach		779	2.0	1.032	60.9	LOS E	20.8	528.5	0.96	1.56	18.9
All Vehicles		3895	2.0	1.032	36.0	LOS D	20.8	528.5	0.97	1.27	23.6

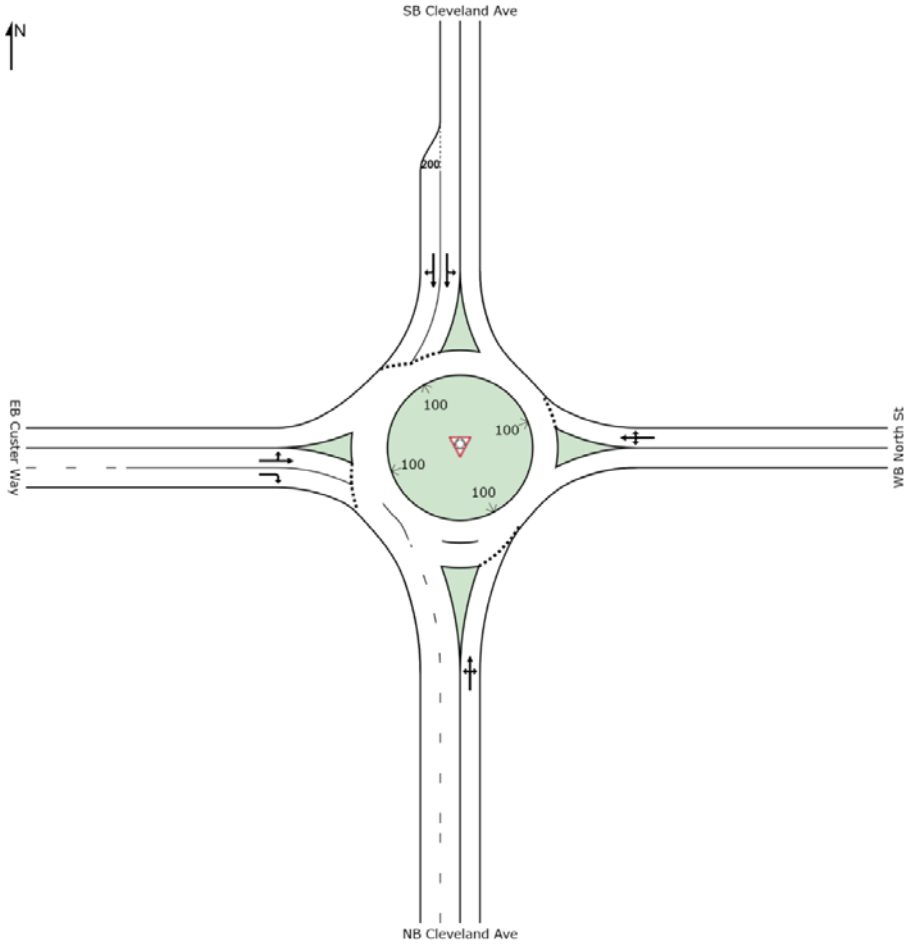
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 19) Custer Way at Cleveland Ave/North St

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 19) Custer Way at Cleveland Ave/North St

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Cleveland Ave											
3	L2	163	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	27.3
8	T1	216	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	27.3
18	R2	21	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	26.7
Approach		400	2.0	0.683	21.8	LOS C	6.5	166.3	0.93	1.06	27.3
East: WB North St											
1	L2	16	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	30.3
6	T1	411	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	30.3
16	R2	74	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	29.5
Approach		500	2.0	0.636	15.4	LOS B	6.5	165.5	0.88	0.88	30.2
North: SB Cleveland Ave											
7	L2	121	2.0	0.397	9.9	LOS A	2.8	70.4	0.80	0.73	31.8
4	T1	368	2.0	0.397	9.3	LOS A	3.0	75.1	0.80	0.71	32.5
14	R2	158	2.0	0.397	8.7	LOS A	3.0	75.1	0.80	0.69	32.2
Approach		647	2.0	0.397	9.3	LOS A	3.0	75.1	0.80	0.71	32.3
West: EB Custer Way											
5	L2	74	2.0	0.587	11.9	LOS B	5.8	146.5	0.85	0.80	31.6
2	T1	489	2.0	0.587	11.9	LOS B	5.8	146.5	0.85	0.80	31.6
12	R2	326	2.0	0.427	10.3	LOS B	3.0	75.6	0.77	0.70	31.3
Approach		889	2.0	0.587	11.3	LOS B	5.8	146.5	0.82	0.76	31.5
All Vehicles		2437	2.0	0.683	13.3	LOS B	6.5	166.3	0.84	0.82	30.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	75	475	5	15	590	80	2	5	10	45	2	25
Future Vol, veh/h	75	475	5	15	590	80	2	5	10	45	2	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	79	500	5	16	621	84	2	5	11	47	2	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	705	0	0	505	0	0	1370	1398	503	1363	1358	663
Stage 1	-	-	-	-	-	-	661	661	-	695	695	-
Stage 2	-	-	-	-	-	-	709	737	-	668	663	-
Critical Hdwy	4.11	-	-	4.11	-	-	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	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	898	-	-	1065	-	-	125	142	573	126	150	465
Stage 1	-	-	-	-	-	-	455	463	-	436	447	-
Stage 2	-	-	-	-	-	-	428	428	-	451	462	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	898	-	-	1065	-	-	104	122	573	106	128	465
Mov Cap-2 Maneuver	-	-	-	-	-	-	104	122	-	106	128	-
Stage 1	-	-	-	-	-	-	399	407	-	383	436	-
Stage 2	-	-	-	-	-	-	392	417	-	384	406	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	22.9	53.6
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	219	898	-	-	1065	-	-	146
HCM Lane V/C Ratio	0.082	0.088	-	-	0.015	-	-	0.519
HCM Control Delay (s)	22.9	9.4	0	-	8.4	0	-	53.6
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-	-	2.5

SimTraffic Performance Report

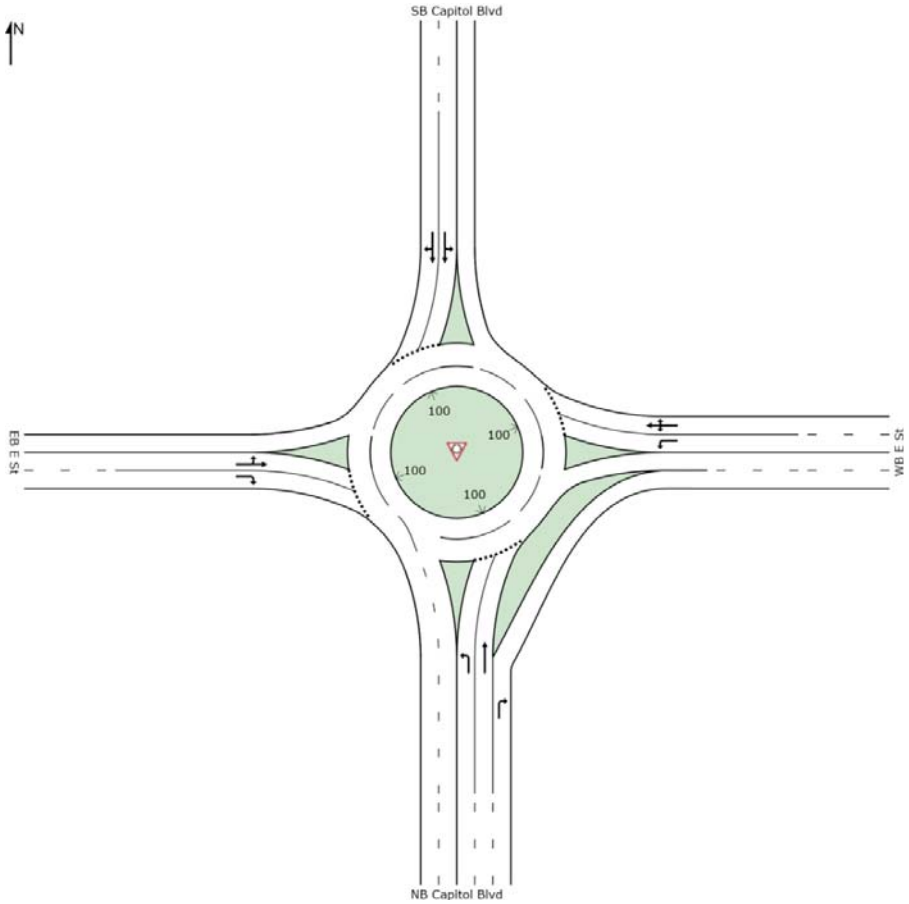
21: I-5 NB Off-Ramp/Deschutes Way & E St Performance by movement

Movement	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.5	0.3	0.3	0.4	0.4
Total Del/Veh (s)	2.3	30.3	4.8	1.2	3.5

SITE LAYOUT

Site: 22) E St at Capitol Blvd

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 22) E St at Capitol Blvd

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Capitol Blvd											
3	L2	211	2.0	0.274	7.8	LOS A	1.8	46.3	0.78	0.69	31.4
8	T1	453	2.0	0.439	8.4	LOS A	3.7	92.8	0.86	0.74	33.5
18	R2	605	2.0	0.369	0.1	LOS A	0.0	0.0	0.00	0.00	37.1
Approach		1268	2.0	0.439	4.3	LOS A	3.7	92.8	0.44	0.38	34.7
East: WB E St											
1	L2	674	2.0	0.710	18.3	LOS B	6.6	168.0	0.86	0.98	27.8
6	T1	384	2.0	0.710	16.4	LOS B	6.6	168.0	0.86	0.97	29.6
16	R2	147	2.0	0.710	16.4	LOS B	6.6	168.0	0.86	0.97	28.8
Approach		1205	2.0	0.710	17.4	LOS B	6.6	168.0	0.86	0.97	28.5
North: SB Capitol Blvd											
7	L2	232	2.0	1.062	85.0	LOS F	23.7	601.8	1.00	1.96	15.7
4	T1	916	2.0	1.062	79.3	LOS F	29.1	740.3	1.00	2.05	16.3
14	R2	142	2.0	1.062	76.1	LOS F	29.1	740.3	1.00	2.10	16.5
Approach		1289	2.0	1.062	79.9	LOS E	29.1	740.3	1.00	2.04	16.2
West: EB E St											
5	L2	63	2.0	0.917	47.9	LOS D	12.6	319.5	1.00	1.49	21.2
2	T1	437	2.0	0.917	47.9	LOS D	12.6	319.5	1.00	1.49	21.1
12	R2	342	2.0	0.895	56.2	LOS E	9.2	232.9	0.97	1.35	19.1
Approach		842	2.0	0.917	51.3	LOS D	12.6	319.5	0.99	1.44	20.3
All Vehicles		4605	2.0	1.062	37.5	LOS D	29.1	740.3	0.81	1.19	23.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	5	45	915	10	60	1220
Future Vol, veh/h	5	45	915	10	60	1220
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	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	5	47	963	11	63	1284

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1736	487	0	0	974	0
Stage 1	968	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.12	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.21	-
Pot Cap-1 Maneuver	80	532	-	-	710	-
Stage 1	334	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	55	532	-	-	710	-
Mov Cap-2 Maneuver	55	-	-	-	-	-
Stage 1	334	-	-	-	-	-
Stage 2	293	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	1.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	285	710	-
HCM Lane V/C Ratio	-	-	0.185	0.089	-
HCM Control Delay (s)	-	-	20.5	10.6	1.5
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	25	155	0	1	345	175	0	0	1	220	0	20
Future Vol, veh/h	25	155	0	1	345	175	0	0	1	220	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	1	1	1
Mvmt Flow	26	163	0	1	363	184	0	0	1	232	0	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	547	0	0	163	0	0	684	765	163	673	673	455
Stage 1	-	-	-	-	-	-	216	216	-	457	457	-
Stage 2	-	-	-	-	-	-	468	549	-	216	216	-
Critical Hdwy	4.13	-	-	4.11	-	-	7.1	6.5	6.2	7.11	6.51	6.21
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	2.227	-	-	2.209	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1017	-	-	1422	-	-	365	336	887	370	378	607
Stage 1	-	-	-	-	-	-	791	728	-	585	569	-
Stage 2	-	-	-	-	-	-	579	520	-	789	726	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1017	-	-	1422	-	-	345	326	887	361	367	607
Mov Cap-2 Maneuver	-	-	-	-	-	-	345	326	-	361	367	-
Stage 1	-	-	-	-	-	-	769	708	-	569	568	-
Stage 2	-	-	-	-	-	-	558	519	-	766	706	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0	9.1	32.5
HCM LOS			A	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	887	1017	-	-	1422	-	-	374
HCM Lane V/C Ratio	0.001	0.026	-	-	0.001	-	-	0.675
HCM Control Delay (s)	9.1	8.6	0	-	7.5	0	-	32.5
HCM Lane LOS	A	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	4.8

Intersection	
Intersection Delay, s/veh	57.6
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	130	145	130	0	250	305	65	0	180	305	65
Future Vol, veh/h	0	130	145	130	0	250	305	65	0	180	305	65
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	0	0	0
Mvmt Flow	0	137	153	137	0	263	321	68	0	189	321	68
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	35	62	61
HCM LOS	D	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	82%	0%	53%	0%	82%	0%	65%
Vol Right, %	0%	18%	0%	47%	0%	18%	0%	35%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	370	130	275	250	370	180	510
LT Vol	180	0	130	0	250	0	180	0
Through Vol	0	305	0	145	0	305	0	330
RT Vol	0	65	0	130	0	65	0	180
Lane Flow Rate	189	389	137	289	263	389	189	537
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.543	1	0.407	0.795	0.749	1	0.549	1
Departure Headway (Hd)	10.324	9.703	10.717	9.888	10.242	9.621	10.429	9.644
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	351	378	338	368	355	378	351	381
Service Time	8.049	7.428	8.428	7.599	7.964	7.343	8.062	7.317
HCM Lane V/C Ratio	0.538	1.029	0.405	0.785	0.741	1.029	0.538	1.409
HCM Control Delay	24.7	78.6	20.6	41.8	38	78.2	25	78.1
HCM Lane LOS	C	F	C	E	E	F	C	F
HCM 95th-tile Q	3.1	11.8	1.9	6.7	5.8	11.8	3.1	11.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	180	330	180
Future Vol, veh/h	0	180	330	180
Peak Hour Factor	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	189	347	189
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	64.2
HCM LOS	F

Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	5	255	15	5	10	215	1090	15	10	1425	400
Future Volume (vph)	115	5	255	15	5	10	215	1090	15	10	1425	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	100		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		489			427			2664			1902	
Travel Time (s)		11.1			9.7			60.5			43.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	1%	2%	2%	2%	1%	1%	2%	2%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		4.0	4.0		15.0	15.0		4.0	15.0	
Minimum Split (s)	22.5	22.5		20.5	20.5		19.5	20.0		8.5	21.5	
Total Split (s)	22.6	22.6		22.6	22.6		20.0	69.4		8.5	57.4	
Total Split (%)	22.5%	22.5%		22.5%	22.5%		19.9%	69.1%		8.5%	57.1%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100.5	
Actuated Cycle Length: 94.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 26: Capitol Blvd & Linwood Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	5	255	15	5	10	215	1090	15	10	1425	400
Future Volume (veh/h)	115	5	255	15	5	10	215	1090	15	10	1425	400
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1863	1900	1881	1881	1900	1863	1881	1900
Adj Flow Rate, veh/h	121	5	268	16	5	11	226	1147	16	11	1500	421
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	2	2	2	2	2	1	1	1	2	1	1
Cap, veh/h	317	5	286	88	94	208	270	2424	34	19	1482	398
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.15	0.67	0.67	0.01	0.53	0.53
Sat Flow, veh/h	1405	29	1574	1102	519	1142	1792	3609	50	1774	2787	749
Grp Volume(v), veh/h	121	0	273	16	0	16	226	568	595	11	938	983
Grp Sat Flow(s),veh/h/ln	1405	0	1603	1102	0	1661	1792	1787	1872	1774	1787	1749
Q Serve(g_s), s	7.7	0.0	16.7	1.4	0.0	0.8	12.2	15.2	15.2	0.6	51.4	52.9
Cycle Q Clear(g_c), s	8.5	0.0	16.7	18.1	0.0	0.8	12.2	15.2	15.2	0.6	51.4	52.9
Prop In Lane	1.00		0.98	1.00		0.69	1.00		0.03	1.00		0.43
Lane Grp Cap(c), veh/h	317	0	292	88	0	302	270	1200	1258	19	950	930
V/C Ratio(X)	0.38	0.00	0.94	0.18	0.00	0.05	0.84	0.47	0.47	0.59	0.99	1.06
Avail Cap(c_a), veh/h	317	0	292	88	0	302	279	1200	1258	71	950	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	0.0	40.1	49.1	0.0	33.6	41.1	7.9	7.9	49.0	22.9	23.3
Incr Delay (d2), s/veh	0.3	0.0	35.6	1.0	0.0	0.1	18.0	1.3	1.3	26.1	26.1	45.8
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	3.0	0.0	10.2	0.5	0.0	0.4	7.4	7.9	8.2	0.4	31.9	37.2
LnGrp Delay(d),s/veh	37.4	0.0	75.7	50.0	0.0	33.7	59.1	9.2	9.1	75.1	49.1	69.1
LnGrp LOS	D		E	D		C	E	A	A	E	D	F
Approach Vol, veh/h		394			32			1389			1932	
Approach Delay, s/veh		63.9			41.9			17.3			59.4	
Approach LOS		E			D			B			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	71.3		22.6	19.5	57.4		22.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	4.0	64.9		18.1	15.5	52.9		18.1
Max Q Clear Time (g_c+I1), s	2.6	17.2		18.7	14.2	54.9		20.1
Green Ext Time (p_c), s	0.0	35.6		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	955	195	510	780	85	140	200	700	230	335	30
Future Volume (vph)	10	955	195	510	780	85	140	200	700	230	335	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	450		0	200		100	0		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1947			1645			3441			1606	
Travel Time (s)		44.3			37.4			78.2			36.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	Perm
Protected Phases		4		3	8		5	2	3		6	
Permitted Phases	4								2	6		6
Detector Phase	4	4		3	8		5	2	3	6	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		5.0	6.0		5.0	6.0	5.0	6.0	6.0	6.0
Minimum Split (s)	24.5	24.5		9.5	24.5		9.5	24.5	9.5	24.5	24.5	24.5
Total Split (s)	44.0	44.0		39.0	83.0		15.0	47.0	39.0	32.0	32.0	32.0
Total Split (%)	33.8%	33.8%		30.0%	63.8%		11.5%	36.2%	30.0%	24.6%	24.6%	24.6%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag		Lead			Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes	Yes	Yes
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30
Future Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	11	1005	205	537	821	89	147	211	0	242	353	32
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	243	899	183	475	1965	213	145	615	947	304	398	338
Arrive On Green	0.30	0.30	0.30	0.27	0.60	0.60	0.08	0.33	0.00	0.21	0.21	0.21
Sat Flow, veh/h	617	2960	602	1792	3253	353	1792	1881	1599	1177	1881	1599
Grp Volume(v), veh/h	11	606	604	537	451	459	147	211	0	242	353	32
Grp Sat Flow(s),veh/h/ln	617	1787	1775	1792	1787	1819	1792	1881	1599	1177	1881	1599
Q Serve(g_s), s	1.6	39.5	39.5	34.5	17.4	17.4	10.5	11.1	0.0	26.5	23.7	2.1
Cycle Q Clear(g_c), s	1.6	39.5	39.5	34.5	17.4	17.4	10.5	11.1	0.0	26.5	23.7	2.1
Prop In Lane	1.00		0.34	1.00		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	243	543	539	475	1079	1098	145	615	947	304	398	338
V/C Ratio(X)	0.05	1.12	1.12	1.13	0.42	0.42	1.02	0.34	0.00	0.79	0.89	0.09
Avail Cap(c_a), veh/h	243	543	539	475	1079	1098	145	615	947	304	398	338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	45.2	45.3	47.8	13.6	13.6	59.8	33.2	0.0	50.9	49.7	41.2
Incr Delay (d2), s/veh	0.4	74.6	76.1	81.8	1.2	1.2	79.1	0.3	0.0	13.6	20.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	30.7	30.7	27.8	8.9	9.0	8.4	5.8	0.0	9.8	14.6	0.9
LnGrp Delay(d),s/veh	32.4	119.8	121.3	129.5	14.8	14.8	138.9	33.5	0.0	64.4	70.5	41.4
LnGrp LOS	C	F	F	F	B	B	F	C		E	E	D
Approach Vol, veh/h		1221			1447			358			627	
Approach Delay, s/veh		119.8			57.4			76.8			66.7	
Approach LOS		F			E			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		47.0	39.0	44.0	15.0	32.0		83.0
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		42.5	34.5	39.5	10.5	27.5		78.5
Max Q Clear Time (g_c+I1), s		13.1	36.5	41.5	12.5	28.5		19.4
Green Ext Time (p_c), s		4.9	0.0	0.0	0.0	0.0		26.7

Intersection Summary	
HCM 2010 Ctrl Delay	81.7
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	110	265	425	135	150	165
Future Vol, veh/h	110	265	425	135	150	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	116	279	447	142	158	174

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	589	0	-	0	1029	518
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	511	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	996	-	-	-	259	558
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	996	-	-	-	223	558
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	519	-

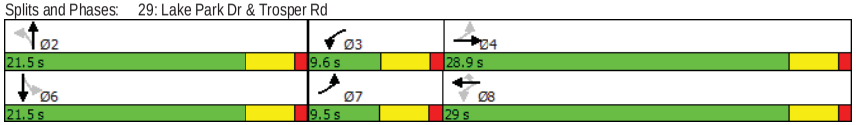
Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	32.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	996	-	-	-	223	558
HCM Lane V/C Ratio	0.116	-	-	-	0.708	0.311
HCM Control Delay (s)	9.1	0	-	-	52.7	14.3
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.4	-	-	-	4.6	1.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	415	55	65	540	155	75	30	70	160	25	15
Future Volume (vph)	10	415	55	65	540	155	75	30	70	160	25	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	225		0	100		0	125		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2012			652			269			583	
Travel Time (s)		45.7			14.8			6.1			13.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	26.5		9.5	26.5	26.5	21.5	21.5		21.5	21.5	
Total Split (s)	9.5	28.9		9.6	29.0	29.0	21.5	21.5		21.5	21.5	
Total Split (%)	15.8%	48.2%		16.0%	48.3%	48.3%	35.8%	35.8%		35.8%	35.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 47.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 29: Lake Park Dr & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	415	55	65	540	155	75	30	70	160	25	15
Future Volume (veh/h)	10	415	55	65	540	155	75	30	70	160	25	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	437	58	68	568	163	79	32	74	168	26	16
Adj No. of Lanes	1	2	0	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	261	1102	146	468	740	629	575	169	390	513	364	224
Arrive On Green	0.01	0.35	0.35	0.06	0.39	0.39	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1792	3175	419	1792	1881	1599	1386	511	1181	1308	1102	678
Grp Volume(v), veh/h	11	245	250	68	568	163	79	0	106	168	0	42
Grp Sat Flow(s),veh/h/ln	1792	1787	1807	1792	1881	1599	1386	0	1692	1308	0	1780
Q Serve(g_s), s	0.2	5.3	5.4	1.2	13.5	3.5	2.1	0.0	2.3	5.4	0.0	0.8
Cycle Q Clear(g_c), s	0.2	5.3	5.4	1.2	13.5	3.5	3.0	0.0	2.3	7.7	0.0	0.8
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.70	1.00		0.38
Lane Grp Cap(c), veh/h	261	621	628	468	740	629	575	0	559	513	0	588
V/C Ratio(X)	0.04	0.39	0.40	0.15	0.77	0.26	0.14	0.00	0.19	0.33	0.00	0.07
Avail Cap(c_a), veh/h	409	847	856	537	895	761	575	0	559	513	0	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	12.7	12.7	9.7	13.6	10.5	12.8	0.0	12.3	15.1	0.0	11.8
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.1	3.3	0.2	0.5	0.0	0.8	1.7	0.0	0.2
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	0.1	2.7	2.7	0.6	7.6	1.6	0.9	0.0	1.2	2.2	0.0	0.4
LnGrp Delay(d),s/veh	11.9	13.1	13.1	9.8	16.9	10.8	13.3	0.0	13.1	16.8	0.0	12.1
LnGrp LOS	B	B	B	A	B	B	B		B	B		B
Approach Vol, veh/h		506			799			185			210	
Approach Delay, s/veh		13.1			15.0			13.2			15.8	
Approach LOS		B			B			B			B	

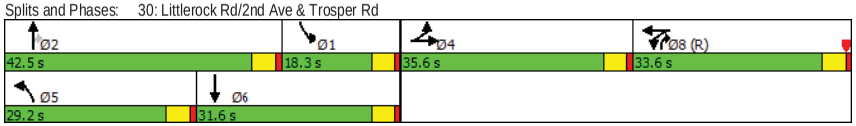
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.5	7.6	22.4		21.5	5.2	24.8
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		17.0	5.1	24.4		17.0	5.0	24.5
Max Q Clear Time (g_c+I1), s		5.0	3.2	7.4		9.7	2.2	15.5
Green Ext Time (p_c), s		1.3	0.0	7.0		1.0	0.0	4.8

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	435	175	430	365	20	325	415	475	165	490	110
Future Volume (vph)	85	435	175	430	365	20	325	415	475	165	490	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	150		0	250		0	150		250
Storage Lanes	1		0	1		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			520			896			1861	
Travel Time (s)		14.8			11.8			20.4			42.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)				38%								
Turn Type	Split	NA		Split	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			
Detector Phase	4	4		8	8		5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	35.6	35.6		33.6	33.6		24.5	30.6	33.6	8.6	31.6	
Total Split (s)	35.6	35.6		33.6	33.6		29.2	42.5	33.6	18.3	31.6	
Total Split (%)	27.4%	27.4%		25.8%	25.8%		22.5%	32.7%	25.8%	14.1%	24.3%	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	
Lead/Lag							Lead	Lead		Lag	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max		C-Max	C-Max		Max	Max	C-Max	None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 126 (97%), Referenced to phase 8:WBTL, Start of Red	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	

Splits and Phases: 30: Littlerock Rd/2nd Ave & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	435	175	430	365	20	325	415	475	165	490	110
Future Volume (veh/h)	85	435	175	430	365	20	325	415	475	165	490	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	89	458	121	286	618	21	342	437	379	174	516	116
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	427	668	175	400	807	27	339	548	823	189	603	135
Arrive On Green	0.24	0.24	0.24	0.37	0.37	0.37	0.19	0.29	0.29	0.11	0.21	0.21
Sat Flow, veh/h	1792	2803	735	1792	3618	123	1792	1881	1599	1792	2904	650
Grp Volume(v), veh/h	89	291	288	286	321	318	342	437	379	174	317	315
Grp Sat Flow(s),veh/h/ln	1792	1787	1751	1792	1881	1860	1792	1881	1599	1792	1787	1767
Q Serve(g_s), s	5.2	19.2	19.5	17.8	19.5	19.5	24.6	27.9	19.6	12.5	22.2	22.4
Cycle Q Clear(g_c), s	5.2	19.2	19.5	17.8	19.5	19.5	24.6	27.9	19.6	12.5	22.2	22.4
Prop In Lane	1.00		0.42	1.00		0.07	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	427	426	418	400	420	415	339	548	823	189	371	367
V/C Ratio(X)	0.21	0.68	0.69	0.72	0.77	0.77	1.01	0.80	0.46	0.92	0.85	0.86
Avail Cap(c_a), veh/h	427	426	418	400	420	415	339	548	823	189	371	367
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.72	0.72	0.72	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.7	45.0	45.1	37.3	37.8	37.8	52.7	42.5	20.1	57.6	49.6	49.7
Incr Delay (d2), s/veh	1.0	7.9	8.3	7.7	9.3	9.4	45.7	9.2	1.5	43.8	21.3	22.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	10.5	10.4	9.6	11.2	11.1	16.5	15.9	13.0	8.5	13.1	13.2
LnGrp Delay(d),s/veh	40.7	52.9	53.5	45.0	47.1	47.2	98.4	51.7	21.5	101.4	70.9	71.9
LnGrp LOS	D	D	D	D	D	D	F	D	C	F	E	E
Approach Vol, veh/h		668			925			1158			806	
Approach Delay, s/veh		51.5			46.5			55.6			77.9	
Approach LOS		D			D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.3	42.5		35.6	29.2	31.6		33.6
Change Period (Y+Rc), s	4.6	4.6		4.6	4.6	4.6		4.6
Max Green Setting (Gmax), s	13.7	37.9		31.0	24.6	27.0		29.0
Max Q Clear Time (g_c+I1), s	14.5	29.9		21.5	26.6	24.4		21.5
Green Ext Time (p_c), s	0.0	2.2		2.3	0.0	1.1		2.9

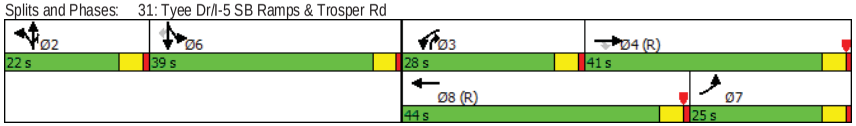
Intersection Summary		
HCM 2010 Ctrl Delay		57.5
HCM 2010 LOS		E

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	800	25	275	340	400	35	155	435	385	430	475
Future Volume (vph)	205	800	25	275	340	400	35	155	435	385	430	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		100	275		0	75		125	400		400
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		520			883			832			952	
Travel Time (s)		11.8			20.1			18.9			21.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases			4									6
Detector Phase	7	4	4	3	8		2	2	2 3	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.6	33.6	33.6	8.6	29.6		20.5	20.5		36.6	36.6	36.6
Total Split (s)	25.0	41.0	41.0	28.0	44.0		22.0	22.0		39.0	39.0	39.0
Total Split (%)	19.2%	31.5%	31.5%	21.5%	33.8%		16.9%	16.9%		30.0%	30.0%	30.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6		3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 118 (91%), Referenced to phase 4:EBT and 8:WBT, Start of Red	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	

Splits and Phases: 31: Tyee Dr/I-5 SB Ramps & Trosper Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	800	25	275	340	400	35	155	435	385	430	475
Future Volume (veh/h)	205	800	25	275	340	400	35	155	435	385	430	475
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	216	842	26	289	358	0	37	163	405	405	453	184
Adj No. of Lanes	1	2	1	1	2	0	1	1	1	2	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	281	1020	456	313	1083	0	237	249	489	616	498	423
Arrive On Green	0.31	0.57	0.57	0.17	0.30	0.00	0.13	0.13	0.13	0.26	0.26	0.26
Sat Flow, veh/h	1792	3574	1599	1792	3668	0	1774	1863	1583	2329	1881	1599
Grp Volume(v), veh/h	216	842	26	289	358	0	37	163	405	405	453	184
Grp Sat Flow(s),veh/h/ln	1792	1787	1599	1792	1787	0	1774	1863	1583	1165	1881	1599
Q Serve(g_s), s	14.2	24.9	0.9	20.6	10.1	0.0	2.4	10.8	17.4	20.1	30.3	12.4
Cycle Q Clear(g_c), s	14.2	24.9	0.9	20.6	10.1	0.0	2.4	10.8	17.4	20.1	30.3	12.4
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	281	1020	456	313	1083	0	237	249	489	616	498	423
V/C Ratio(X)	0.77	0.83	0.06	0.92	0.33	0.00	0.16	0.65	0.83	0.66	0.91	0.43
Avail Cap(c_a), veh/h	281	1020	456	322	1083	0	237	249	489	616	498	423
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	25.3	20.2	52.8	35.1	0.0	49.8	53.4	41.8	42.6	46.3	39.7
Incr Delay (d2), s/veh	8.2	5.1	0.2	30.7	0.8	0.0	1.4	12.6	14.9	5.4	23.2	3.2
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	7.6	12.9	0.4	12.9	5.1	0.0	1.3	6.4	15.5	6.9	18.9	5.9
LnGrp Delay(d),s/veh	50.6	30.4	20.3	83.5	35.9	0.0	51.2	66.1	56.7	48.0	69.5	43.0
LnGrp LOS	D	C	C	F	D		D	E	E	D	E	D
Approach Vol, veh/h		1084			647			605			1042	
Approach Delay, s/veh		34.2			57.2			58.9			56.5	
Approach LOS		C			E			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		22.0	27.3	41.7		39.0	25.0	44.0
Change Period (Y+Rc), s		4.6	4.6	4.6		4.6	4.6	4.6
Max Green Setting (Gmax), s		17.4	23.4	36.4		34.4	20.4	39.4
Max Q Clear Time (g_c+I1), s		19.4	22.6	26.9		32.3	16.2	12.1
Green Ext Time (p_c), s		0.0	0.1	4.2		1.2	2.3	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	49.9
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Traffic Vol, veh/h	0	1030	665	0	1015	410	0	145	0	0
Future Vol, veh/h	0	1030	665	0	1015	410	0	145	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	Yield	-	-
Storage Length	300	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	0	0
Mvmt Flow	0	1084	700	0	1068	432	0	153	0	0

Major/Minor	Major1			Major2			Minor1	
Conflicting Flow All	-	0	-	-	-	0	-	542
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	3.91
Pot Cap-1 Maneuver	0	-	0	0	-	0	0	417
Stage 1	0	-	0	0	-	0	0	-
Stage 2	0	-	0	0	-	0	0	-
Platoon blocked, %		-			-			
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	417
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

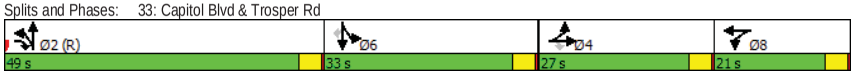
Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	417	-	-
HCM Lane V/C Ratio	0.366	-	-
HCM Control Delay (s)	18.5	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	1.6	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	595	65	460	50	250	50	690	770	10	35	985	650
Future Volume (vph)	595	65	460	50	250	50	690	770	10	35	985	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	250		0	100		200
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		397			338			735			2664	
Travel Time (s)		9.0			7.7			16.7			60.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	45%						31%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Protected Phases	4	4	2	8	8		2	2		6	6	
Permitted Phases			4									6
Detector Phase	4	4	2	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		20.0	20.0		20.0	20.0	20.0
Total Split (s)	27.0	27.0	49.0	21.0	21.0		49.0	49.0		33.0	33.0	33.0
Total Split (%)	20.8%	20.8%	37.7%	16.2%	16.2%		37.7%	37.7%		25.4%	25.4%	25.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Min	None	None		C-Min	C-Min		Min	Min	Min

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green, Master Intersection	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	

Splits and Phases: 33: Capitol Blvd & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	595	65	460	50	250	50	690	770	10	35	985	650
Future Volume (veh/h)	595	65	460	50	250	50	690	770	10	35	985	650
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900	1881	1881	1900	1881	1881	1881
Adj Flow Rate, veh/h	675	0	247	53	263	53	516	1105	11	37	1037	0
Adj No. of Lanes	2	0	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	634	0	836	237	201	40	620	1287	13	400	797	357
Arrive On Green	0.24	0.00	0.24	0.13	0.13	0.13	0.11	0.11	0.11	0.22	0.22	0.00
Sat Flow, veh/h	3583	0	1599	1810	1536	310	1792	3719	37	1792	3574	1599
Grp Volume(v), veh/h	675	0	247	53	0	316	516	559	557	37	1037	0
Grp Sat Flow(s),veh/h/ln	1792	0	1599	1810	0	1845	1792	1881	1875	1792	1787	1599
Q Serve(g_s), s	23.0	0.0	11.2	3.4	0.0	17.0	36.6	37.9	37.9	2.1	29.0	0.0
Cycle Q Clear(g_c), s	23.0	0.0	11.2	3.4	0.0	17.0	36.6	37.9	37.9	2.1	29.0	0.0
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	634	0	836	237	0	241	620	651	649	400	797	357
V/C Ratio(X)	1.06	0.00	0.30	0.22	0.00	1.31	0.83	0.86	0.86	0.09	1.30	0.00
Avail Cap(c_a), veh/h	634	0	836	237	0	241	620	651	649	400	797	357
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	0.17	0.17	0.00
Uniform Delay (d), s/veh	49.7	0.0	16.2	50.6	0.0	56.5	53.9	54.4	54.4	40.1	50.5	0.0
Incr Delay (d2), s/veh	54.2	0.0	0.2	0.5	0.0	165.8	10.0	11.2	11.2	0.0	136.9	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	16.1	0.0	8.6	1.7	0.0	19.8	19.9	21.8	21.7	1.1	29.4	0.0
LnGrp Delay(d),s/veh	103.9	0.0	16.4	51.1	0.0	222.3	63.8	65.6	65.7	40.1	187.4	0.0
LnGrp LOS	F		B	D		F	E	E	E	D	F	
Approach Vol, veh/h		922			369			1632			1074	
Approach Delay, s/veh		80.5			197.7			65.1			182.3	
Approach LOS		F			F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		49.0		27.0		33.0		21.0
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		45.0		23.0		29.0		17.0
Max Q Clear Time (g_c+I1), s		39.9		25.0		31.0		19.0
Green Ext Time (p_c), s		3.6		0.0		0.0		0.0

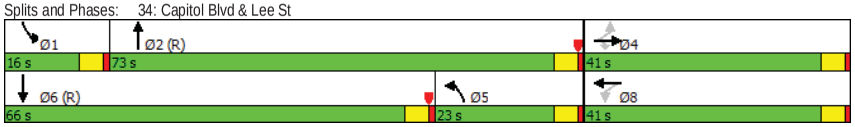
Intersection Summary	
HCM 2010 Ctrl Delay	112.4
HCM 2010 LOS	F

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Future Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		100	250		0	200		0
Storage Lanes	0		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		718			814			621			735	
Travel Time (s)		16.3			18.5			14.1			16.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	4	4	4	8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	12.0		6.0	12.0	
Minimum Split (s)	29.0	29.0	29.0	30.0	30.0		11.0	25.0		11.0	25.0	
Total Split (s)	41.0	41.0	41.0	41.0	41.0		23.0	73.0		16.0	66.0	
Total Split (%)	31.5%	31.5%	31.5%	31.5%	31.5%		17.7%	56.2%		12.3%	50.8%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 116 (89%), Referenced to phase 2:NBT and 6:SBT, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 34: Capitol Blvd & Lee St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Future Volume (vph)	240	15	95	15	10	85	195	1160	20	70	1270	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85	1.00	0.87		1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1797	1599	1805	1646		1787	3565		1787	3528	
Flt Permitted		0.64	1.00	0.36	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1208	1599	675	1646		1787	3565		1787	3528	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	16	100	16	11	89	205	1221	21	74	1337	126
RTOR Reduction (vph)	0	0	69	0	67	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	269	31	16	33	0	205	1241	0	74	1458	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		31.6	31.6	31.6	31.6		19.3	76.7		7.9	65.3	
Effective Green, g (s)		31.6	31.6	31.6	31.6		19.3	76.7		7.9	65.3	
Actuated g/C Ratio		0.24	0.24	0.24	0.24		0.15	0.59		0.06	0.50	
Clearance Time (s)		4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		2.0	2.0	2.0	2.0		1.5	3.0		1.6	3.0	
Lane Grp Cap (vph)		293	388	164	400		265	2103		108	1772	
v/s Ratio Prot					0.02		c0.11	0.35		0.04	c0.41	
v/s Ratio Perm		c0.22	0.02	0.02								
v/c Ratio		0.92	0.08	0.10	0.08		0.77	0.59		0.69	0.82	
Uniform Delay, d1		47.9	38.0	38.1	38.0		53.2	16.8		59.8	27.4	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.43	0.37	
Incremental Delay, d2		31.2	0.0	0.1	0.0		12.0	1.2		1.3	0.4	
Delay (s)		79.2	38.0	38.2	38.0		65.3	18.0		87.0	10.7	
Level of Service		E	D	D	D		E	B		F	B	
Approach Delay (s)		68.0			38.1			24.7			14.3	
Approach LOS		E			D			C			B	

Intersection Summary					
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.84				
Actuated Cycle Length (s)	130.0	Sum of lost time (s)		13.8	
Intersection Capacity Utilization	82.0%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	140	5	135	0	1040	105	105	965	0
Future Volume (vph)	0	0	0	140	5	135	0	1040	105	105	965	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	175		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			426			713			896	
Travel Time (s)		8.9			9.7			16.2			20.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type			Perm	Perm	NA	pm+ov	Prot	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	9.0	9.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	20.0	20.0	20.0	9.0	9.0	26.0		9.0	26.0	
Total Split (%)	36.4%	36.4%	36.4%	36.4%	36.4%	16.4%	16.4%	47.3%		16.4%	47.3%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag						Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 55	
Actuated Cycle Length: 48.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 35: Littlerock Rd & Fred Meyer/Costco Drwy



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	140	5	135	0	1040	105	105	965	0
Future Volume (veh/h)	0	0	0	140	5	135	0	1040	105	105	965	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	0	0	0	147	5	142	0	1095	111	111	1016	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	0	291	247	372	7	379	4	1618	164	423	2385	0
Arrive On Green	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.49	0.49	0.08	0.67	0.00
Sat Flow, veh/h	0	1900	1615	1390	47	1599	1792	3278	332	1792	3668	0
Grp Volume(v), veh/h	0	0	0	152	0	142	0	597	609	111	1016	0
Grp Sat Flow(s),veh/h/ln	0	1900	1615	1437	0	1599	1792	1787	1823	1792	1787	0
Q Serve(g_s), s	0.0	0.0	0.0	4.5	0.0	3.3	0.0	11.3	11.3	1.1	5.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.5	0.0	3.3	0.0	11.3	11.3	1.1	5.9	0.0
Prop In Lane	0.00		1.00	0.97		1.00	1.00		0.18	1.00		0.00
Lane Grp Cap(c), veh/h	0	291	247	379	0	379	4	882	900	423	2385	0
V/C Ratio(X)	0.00	0.00	0.00	0.40	0.00	0.37	0.00	0.68	0.68	0.26	0.43	0.00
Avail Cap(c_a), veh/h	0	682	580	675	0	708	201	882	900	474	2385	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	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	17.9	0.0	14.2	0.0	8.6	8.6	6.0	3.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.2	0.0	4.1	4.1	0.2	0.6	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	1.8	0.0	1.5	0.0	6.5	6.6	0.6	3.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	18.1	0.0	14.5	0.0	12.7	12.7	6.2	4.0	0.0
LnGrp LOS				B		B		B	B	A	A	
Approach Vol, veh/h		0			294			1206			1127	
Approach Delay, s/veh		0.0			16.4			12.7			4.2	
Approach LOS					B			B			A	

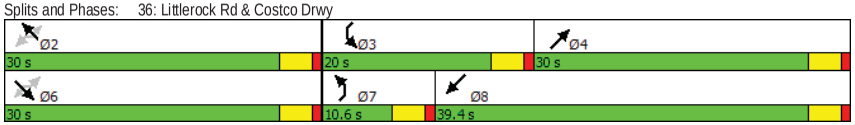
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	26.0		10.8	0.0	33.7		10.8
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	5.0	22.0		16.0	5.0	22.0		16.0
Max Q Clear Time (g_c+I1), s	3.1	13.3		0.0	0.0	7.9		6.5
Green Ext Time (p_c), s	0.0	6.9		0.0	0.0	10.3		0.5

Intersection Summary		
HCM 2010 Ctrl Delay	9.5	
HCM 2010 LOS	A	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	100
Future Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		100	150		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		325			608			995			713	
Travel Time (s)		7.4			13.8			22.6			16.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	6	2	2	2	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	9.5	30.0		9.5	30.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	10.6	30.0		20.0	39.4	
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	13.3%	37.5%		25.0%	49.3%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 78.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Littlerock Rd & Costco Drwy



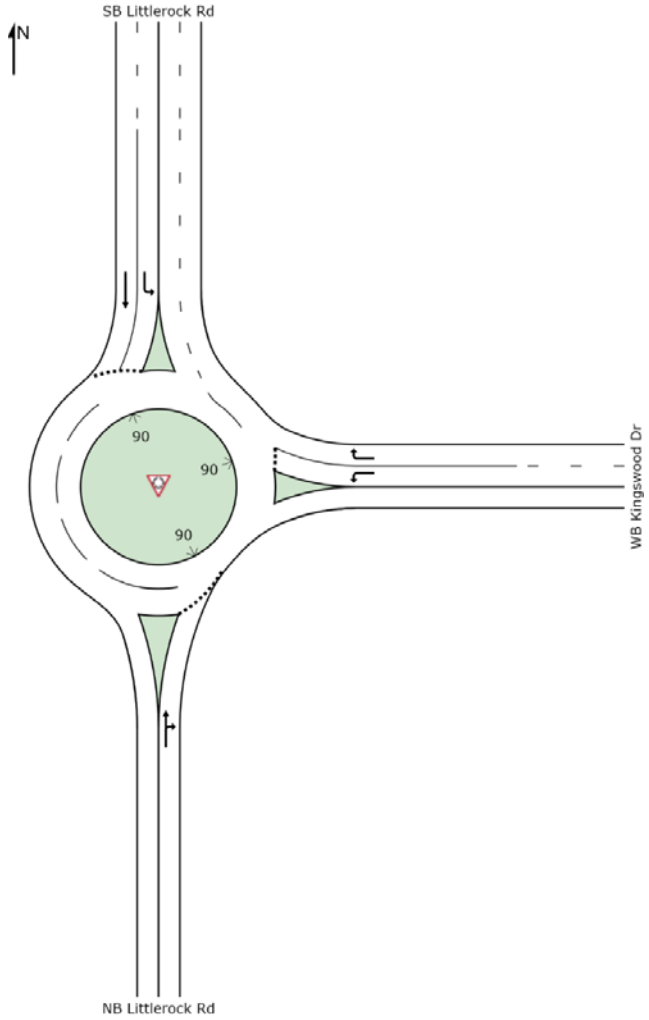
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	100
Future Volume (vph)	100	30	20	95	5	260	65	825	145	265	735	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1830	1615		1814	1615	1787	3494		1787	3510	
Flt Permitted		0.73	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1389	1615		1278	1615	1787	3494		1787	3510	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	32	21	100	5	274	68	868	153	279	774	105
RTOR Reduction (vph)	0	0	14	0	0	184	0	18	0	0	13	0
Lane Group Flow (vph)	0	137	7	0	105	90	68	1003	0	279	866	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Actuated Green, G (s)		26.0	26.0		26.0	26.0	5.2	26.1		15.0	35.9	
Effective Green, g (s)		26.0	26.0		26.0	26.0	5.2	26.1		15.0	35.9	
Actuated g/C Ratio		0.33	0.33		0.33	0.33	0.07	0.33		0.19	0.45	
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		456	530		420	530	117	1152		338	1593	
v/s Ratio Prot							0.04	c0.29		c0.16	0.25	
v/s Ratio Perm		c0.10	0.00		0.08	0.06						
v/c Ratio		0.30	0.01		0.25	0.17	0.58	0.87		0.83	0.54	
Uniform Delay, d1		19.8	17.9		19.4	18.9	35.9	24.9		30.8	15.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7	0.0		1.4	0.7	7.2	7.4		15.0	0.4	
Delay (s)		21.5	17.9		20.8	19.6	43.1	32.3		45.8	16.0	
Level of Service		C	B		C	B	D	C		D	B	
Approach Delay (s)		21.0			19.9			33.0			23.2	
Approach LOS		C			B			C			C	

Intersection Summary					
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	79.1	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	65.9%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

SITE LAYOUT

Site: 37) Littlerock Rd at Kingswood Dr

Projected 2040 Baseline
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 37) Littlerock Rd at Kingswood Dr

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Littlerock Rd											
8	T1	895	1.0	1.009	22.0	LOS F	48.8	1229.0	1.00	0.81	29.2
18	R2	168	1.0	1.009	21.9	LOS F	48.8	1229.0	1.00	0.81	28.5
Approach		1063	1.0	1.009	22.0	LOS C	48.8	1229.0	1.00	0.81	29.1
East: WB Kingswood Dr											
1	L2	195	1.0	0.364	16.1	LOS B	3.0	75.4	0.99	0.93	31.7
16	R2	111	1.0	0.067	4.2	LOS A	0.0	0.0	0.00	0.49	36.5
Approach		305	1.0	0.364	11.8	LOS B	3.0	75.4	0.63	0.77	33.2
North: SB Littlerock Rd											
7	L2	95	1.0	0.123	11.4	LOS B	0.7	17.4	0.48	0.66	33.7
4	T1	837	1.0	0.684	5.7	LOS A	7.7	195.2	0.75	0.57	35.2
Approach		932	1.0	0.684	6.3	LOS A	7.7	195.2	0.73	0.58	35.1
All Vehicles		2300	1.0	1.009	14.3	LOS B	48.8	1229.0	0.84	0.71	31.8

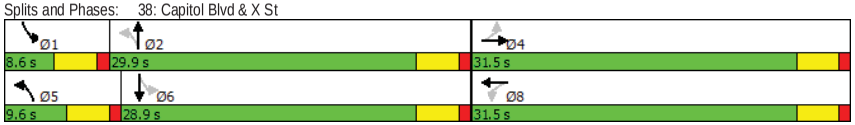
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 6.1 | Copyright © 2000-2015 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: SCJ ALLIANCE | Processed: Wednesday, February 17, 2016 2:14:41 PM
Project: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Operations\sidra\2040 Baseline\Projected 2040 Baseline PM.sip6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1	20	35	1	20	25	1190	20	35	1190	50
Future Volume (vph)	30	1	20	35	1	20	25	1190	20	35	1190	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	150		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			1326			1300			1368	
Travel Time (s)		14.6			30.1			29.5			31.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	31.5	31.5		31.5	31.5		9.5	25.5		8.5	26.5	
Total Split (s)	31.5	31.5		31.5	31.5		9.6	29.9		8.6	28.9	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		13.7%	42.7%		12.3%	41.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 46	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 38: Capitol Blvd & X St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1	20	35	1	20	25	1190	20	35	1190	50
Future Volume (veh/h)	30	1	20	35	1	20	25	1190	20	35	1190	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	32	1	21	37	1	21	26	1253	21	37	1253	53
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	285	7	157	285	7	157	347	2034	34	365	2005	85
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.02	0.57	0.57	0.03	0.57	0.57
Sat Flow, veh/h	1412	74	1552	1412	74	1552	1792	3597	60	1792	3495	148
Grp Volume(v), veh/h	32	0	22	37	0	22	26	622	652	37	640	666
Grp Sat Flow(s),veh/h/ln	1412	0	1626	1412	0	1626	1792	1787	1871	1792	1787	1855
Q Serve(g_s), s	0.9	0.0	0.6	1.1	0.0	0.6	0.3	10.4	10.4	0.4	10.7	10.7
Cycle Q Clear(g_c), s	1.5	0.0	0.6	1.7	0.0	0.6	0.3	10.4	10.4	0.4	10.7	10.7
Prop In Lane	1.00		0.95	1.00		0.95	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	285	0	164	285	0	164	347	1011	1058	365	1025	1064
V/C Ratio(X)	0.11	0.00	0.13	0.13	0.00	0.13	0.08	0.62	0.62	0.10	0.62	0.63
Avail Cap(c_a), veh/h	992	0	978	992	0	978	506	1011	1058	469	1025	1064
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	18.4	19.2	0.0	18.4	5.1	6.5	6.5	5.0	6.4	6.4
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.2	0.0	0.4	0.1	2.8	2.7	0.1	2.9	2.8
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	0.4	0.0	0.3	0.4	0.0	0.3	0.1	5.8	6.0	0.2	6.0	6.2
LnGrp Delay(d),s/veh	19.3	0.0	18.8	19.4	0.0	18.8	5.2	9.3	9.2	5.1	9.2	9.1
LnGrp LOS	B		B	B		B	A	A	A	A	A	A
Approach Vol, veh/h		54			59			1300			1343	
Approach Delay, s/veh		19.1			19.1			9.2			9.1	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	29.9		9.0	5.6	30.3		9.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	4.1	25.4		27.0	5.1	24.4		27.0
Max Q Clear Time (g_c+I1), s	2.4	12.4		3.5	2.3	12.7		3.7
Green Ext Time (p_c), s	0.0	11.3		0.4	0.0	10.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	15	10	5	5	5	5	90	10	0	60	5
Future Vol, veh/h	10	15	10	5	5	5	5	90	10	0	60	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Mvmt Flow	11	16	11	5	5	5	5	95	11	0	63	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	182	182	66	190	179	100	68	0	0	105	0	0
Stage 1	66	66	-	111	111	-	-	-	-	-	-	-
Stage 2	116	116	-	79	68	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.12	-	-
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	-	-	2.218	-	-
Pot Cap-1 Maneuver	784	716	1003	774	718	961	1546	-	-	1486	-	-
Stage 1	950	844	-	899	807	-	-	-	-	-	-	-
Stage 2	894	803	-	935	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	774	714	1003	751	716	961	1546	-	-	1486	-	-
Mov Cap-2 Maneuver	774	714	-	751	716	-	-	-	-	-	-	-
Stage 1	947	844	-	896	805	-	-	-	-	-	-	-
Stage 2	881	801	-	908	842	-	-	-	-	-	-	-

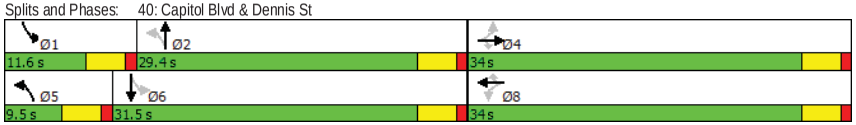
Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	9.6	0.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1546	-	-	797	796	1486	-	-
HCM Lane V/C Ratio	0.003	-	-	0.046	0.02	-	-	-
HCM Control Delay (s)	7.3	0	-	9.7	9.6	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	40	35	40	25	75	20	875	40	45	1000	125
Future Volume (vph)	225	40	35	40	25	75	20	875	40	45	1000	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		100	175		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		834			700			1337			1300	
Travel Time (s)		19.0			15.9			30.4			29.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	8.0		7.0	8.0	
Minimum Split (s)	33.5	33.5	33.5	33.5	33.5	33.5	9.5	27.5		11.5	27.5	
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4		11.6	31.5	
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%		15.5%	42.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 61.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 40: Capitol Blvd & Dennis St



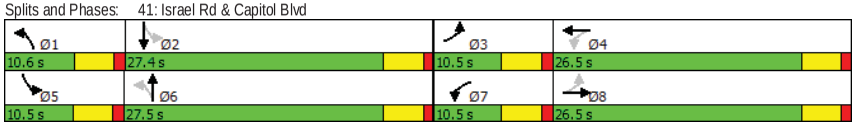
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	40	35	40	25	75	20	875	40	45	1000	125
Future Volume (vph)	225	40	35	40	25	75	20	875	40	45	1000	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1805	1599		1843	1615	1787	3551		1787	3515	
Flt Permitted		0.71	1.00		0.74	1.00	0.16	1.00		0.18	1.00	
Satd. Flow (perm)		1337	1599		1402	1615	303	3551		348	3515	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	42	37	42	26	79	21	921	42	47	1053	132
RTOR Reduction (vph)	0	0	27	0	0	57	0	3	0	0	10	0
Lane Group Flow (vph)	0	279	10	0	68	22	21	960	0	47	1175	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		17.8	17.8		17.8	17.8	30.2	29.4		36.2	32.4	
Effective Green, g (s)		17.8	17.8		17.8	17.8	30.2	29.4		36.2	32.4	
Actuated g/C Ratio		0.28	0.28		0.28	0.28	0.47	0.46		0.56	0.50	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		368	441		386	445	160	1618		280	1765	
v/s Ratio Prot							0.00	0.27		c0.01	c0.33	
v/s Ratio Perm		c0.21	0.01		0.05	0.01	0.06			0.08		
v/c Ratio		0.76	0.02		0.18	0.05	0.13	0.59		0.17	0.67	
Uniform Delay, d1		21.4	17.0		17.8	17.1	10.0	13.1		7.6	12.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.7	0.0		0.2	0.0	0.4	1.6		0.3	2.0	
Delay (s)		30.0	17.0		18.0	17.2	10.3	14.7		7.9	14.0	
Level of Service		C	B		B	B	B	B		A	B	
Approach Delay (s)		28.5			17.6			14.6			13.8	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	280	215	140	290	205	185	470	40	135	885	100
Future Volume (vph)	75	280	215	140	290	205	185	470	40	135	885	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	150		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2751			725			934			1337	
Travel Time (s)		62.5			16.5			21.2			30.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	26.5		10.5	26.5		10.5	26.5		10.5	26.5	
Total Split (s)	10.5	26.5		10.5	26.5		10.6	27.5		10.5	27.4	
Total Split (%)	14.0%	35.3%		14.0%	35.3%		14.1%	36.7%		14.0%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 74.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 41: Israel Rd & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	280	215	140	290	205	185	470	40	135	885	100
Future Volume (veh/h)	75	280	215	140	290	205	185	470	40	135	885	100
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	79	295	163	147	305	216	195	495	42	142	932	105
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	215	328	181	276	305	216	261	1051	89	405	1001	113
Arrive On Green	0.07	0.29	0.29	0.08	0.30	0.30	0.08	0.31	0.31	0.08	0.31	0.31
Sat Flow, veh/h	1810	1151	636	1774	1016	720	1792	3336	282	1792	3239	365
Grp Volume(v), veh/h	79	0	458	147	0	521	195	265	272	142	514	523
Grp Sat Flow(s),veh/h/ln	1810	0	1788	1774	0	1736	1792	1787	1831	1792	1787	1817
Q Serve(g_s), s	2.2	0.0	18.2	4.2	0.0	22.2	5.5	8.8	8.9	3.9	20.7	20.7
Cycle Q Clear(g_c), s	2.2	0.0	18.2	4.2	0.0	22.2	5.5	8.8	8.9	3.9	20.7	20.7
Prop In Lane	1.00		0.36	1.00		0.41	1.00		0.15	1.00		0.20
Lane Grp Cap(c), veh/h	215	0	510	276	0	521	261	563	577	405	553	562
V/C Ratio(X)	0.37	0.00	0.90	0.53	0.00	1.00	0.75	0.47	0.47	0.35	0.93	0.93
Avail Cap(c_a), veh/h	244	0	531	277	0	521	261	563	577	413	553	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	25.4	18.9	0.0	25.9	18.8	20.4	20.4	15.7	24.8	24.8
Incr Delay (d2), s/veh	1.3	0.0	17.9	2.3	0.0	39.2	11.5	2.8	2.8	0.6	24.5	24.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	11.4	2.2	0.0	16.2	3.5	4.8	4.9	2.0	13.9	14.1
LnGrp Delay(d),s/veh	20.6	0.0	43.3	21.2	0.0	65.1	30.4	23.2	23.2	16.4	49.3	49.0
LnGrp LOS	C		D	C		E	C	C	C	B	D	D
Approach Vol, veh/h		537			668			732			1179	
Approach Delay, s/veh		40.0			55.5			25.1			45.2	
Approach LOS		D			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	27.4	9.3	26.7	10.2	27.8	10.4	25.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0
Max Q Clear Time (g_c+I1), s	7.5	22.7	4.2	24.2	5.9	10.9	6.2	20.2
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	8.4	0.0	0.9

Intersection Summary		
HCM 2010 Ctrl Delay		41.8
HCM 2010 LOS		D

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	75	105	135	210	125	140
Future Vol, veh/h	75	105	135	210	125	140
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	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	79	111	142	221	132	147

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	363	0	-	0	521	253
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	268	-
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	1201	-	-	-	519	791
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	782	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1201	-	-	-	483	791
Mov Cap-2 Maneuver	-	-	-	-	483	-
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	727	-

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1201	-	-	-	608
HCM Lane V/C Ratio	0.066	-	-	-	0.459
HCM Control Delay (s)	8.2	0	-	-	15.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.4

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	40	5	205	5	2	5	340	15	5	5	15	85
Future Vol, veh/h	40	5	205	5	2	5	340	15	5	5	15	85
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	0	0	0
Mvmt Flow	42	5	216	5	2	5	358	16	5	5	16	89

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	809	808	61	916	850	18	105	0	0	21	0	0
Stage 1	71	71	-	734	734	-	-	-	-	-	-	-
Stage 2	738	737	-	182	116	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.1	6.5	6.2	4.11	-	-	4.1	-	-
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	3.509	4.009	3.309	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	300	316	1007	255	300	1066	1493	-	-	1608	-	-
Stage 1	941	838	-	415	429	-	-	-	-	-	-	-
Stage 2	411	426	-	824	803	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	240	238	1007	160	226	1066	1493	-	-	1608	-	-
Mov Cap-2 Maneuver	240	238	-	160	226	-	-	-	-	-	-	-
Stage 1	712	835	-	314	325	-	-	-	-	-	-	-
Stage 2	308	322	-	641	801	-	-	-	-	-	-	-

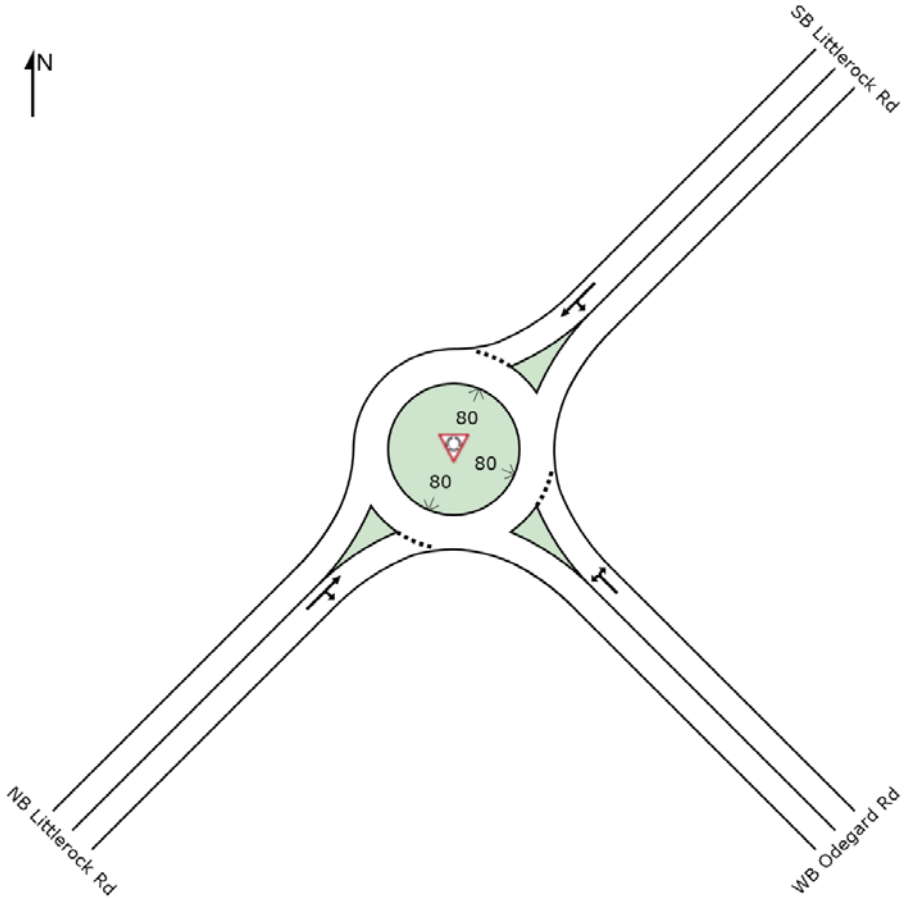
Approach	EB	WB	NB	SB
HCM Control Delay, s	14.5	19.1	7.7	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1493	-	-	639	268	1608	-	-
HCM Lane V/C Ratio	0.24	-	-	0.412	0.047	0.003	-	-
HCM Control Delay (s)	8.2	0	-	14.5	19.1	7.2	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.9	-	-	2	0.1	0	-	-

SITE LAYOUT

Site: 44) Littlerock Rd at Odegard Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 44) Littlerock Rd at Odegard Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: WB Odegard Rd											
3x	L2	26	0.0	0.082	18.7	LOS B	0.5	12.5	0.85	0.84	31.0
18x	R2	11	0.0	0.082	13.4	LOS B	0.5	12.5	0.85	0.84	30.3
Approach		37	0.0	0.082	17.2	LOS B	0.5	12.5	0.85	0.84	30.8
NorthEast: SB Littlerock Rd											
1x	L2	11	1.0	0.829	10.2	LOS B	19.5	491.0	0.57	0.38	35.5
6x	T1	995	1.0	0.829	4.9	LOS A	19.5	491.0	0.57	0.38	35.6
Approach		1005	1.0	0.829	4.9	LOS A	19.5	491.0	0.57	0.38	35.6
SouthWest: NB Littlerock Rd											
2x	T1	1026	1.0	0.832	4.5	LOS A	20.5	517.5	0.35	0.36	36.3
12x	R2	5	1.0	0.832	4.4	LOS A	20.5	517.5	0.35	0.36	35.4
Approach		1032	1.0	0.832	4.5	LOS A	20.5	517.5	0.35	0.36	36.3
All Vehicles		2074	1.0	0.832	4.9	LOS A	20.5	517.5	0.47	0.38	35.9

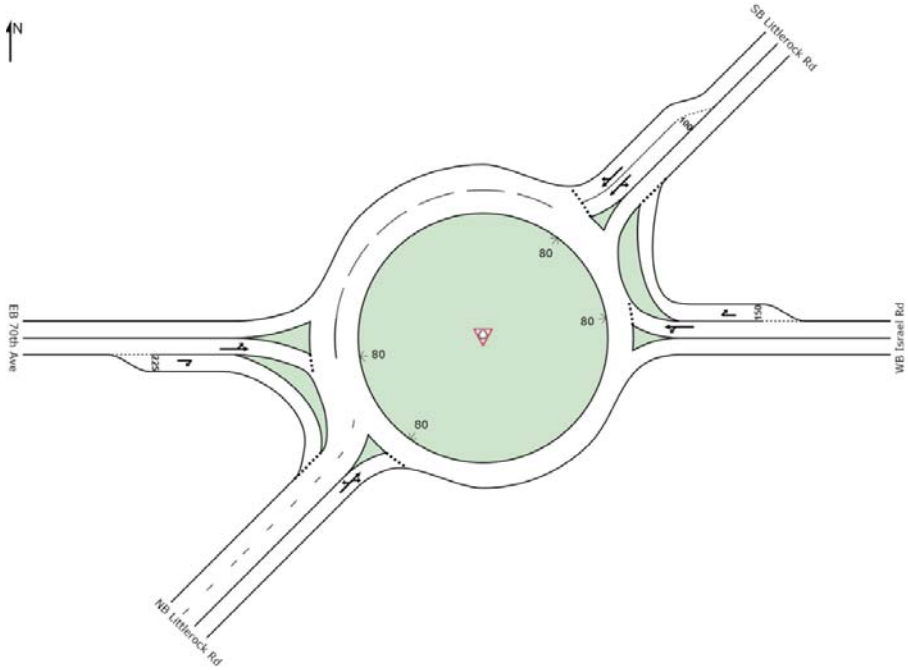
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 45) Littlerock Rd at Israel Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 45) Littlerock Rd at Israel Rd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: WB Israel Rd											
1a	L1	116	1.0	0.581	17.9	LOS B	5.9	148.5	1.00	1.06	31.6
6	T1	247	1.0	0.581	13.7	LOS B	5.9	148.5	1.00	1.06	31.8
16b	R3	447	1.0	0.504	8.3	LOS A	4.3	108.2	0.83	0.84	33.9
Approach		811	1.0	0.581	11.3	LOS B	5.9	148.5	0.91	0.94	32.9
NorthEast: SB Littlerock Rd											
1bx	L3	232	1.0	0.684	21.0	LOS C	7.7	193.8	0.95	1.10	31.1
6x	T1	647	1.0	0.684	13.9	LOS B	8.2	205.5	0.96	1.08	32.0
16ax	R1	179	1.0	0.684	12.8	LOS B	8.2	205.5	0.96	1.06	32.5
Approach		1058	1.0	0.684	15.2	LOS B	8.2	205.5	0.96	1.08	31.9
West: EB 70th Ave											
5a	L1	132	1.0	0.415	12.4	LOS B	2.4	59.3	0.79	0.89	33.6
2	T1	132	1.0	0.415	8.4	LOS A	2.4	59.3	0.79	0.89	34.0
12b	R3	121	1.0	0.159	6.3	LOS A	0.7	18.2	0.62	0.78	35.0
Approach		384	1.0	0.415	9.1	LOS A	2.4	59.3	0.73	0.86	34.1
SouthWest: NB Littlerock Rd											
5bx	L3	289	1.0	1.055	63.4	LOS F	39.7	1001.2	1.00	2.01	19.8
2x	T1	426	1.0	1.055	57.0	LOS F	39.7	1001.2	1.00	2.01	19.7
12ax	R1	100	1.0	1.055	56.7	LOS F	39.7	1001.2	1.00	2.01	19.6
Approach		816	1.0	1.055	59.2	LOS E	39.7	1001.2	1.00	2.01	19.7
All Vehicles		3068	1.0	1.055	25.1	LOS C	39.7	1001.2	0.93	1.26	27.7

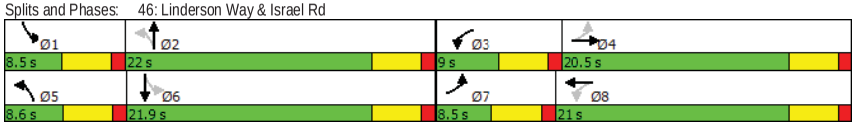
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Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	400	125	135	465	25	200	260	90	40	140	140
Future Volume (vph)	70	400	125	135	465	25	200	260	90	40	140	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3505			2751			2073			847	
Travel Time (s)		79.7			62.5			47.1			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.0	21.0		8.6	22.0		8.5	21.9	
Total Split (%)	14.2%	34.2%		15.0%	35.0%		14.3%	36.7%		14.2%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 58.3	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 46: Linderson Way & Israel Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	400	125	135	465	25	200	260	90	40	140	140
Future Volume (veh/h)	70	400	125	135	465	25	200	260	90	40	140	140
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	74	421	132	142	489	26	211	274	21	42	147	147
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	227	366	115	254	521	28	400	560	43	395	251	251
Arrive On Green	0.05	0.27	0.27	0.08	0.29	0.29	0.07	0.32	0.32	0.03	0.29	0.29
Sat Flow, veh/h	1792	1374	431	1792	1770	94	1792	1726	132	1792	864	864
Grp Volume(v), veh/h	74	0	553	142	0	515	211	0	295	42	0	294
Grp Sat Flow(s),veh/h/ln	1792	0	1805	1792	0	1865	1792	0	1858	1792	0	1729
Q Serve(g_s), s	1.8	0.0	16.0	3.4	0.0	16.2	4.1	0.0	7.6	1.0	0.0	8.7
Cycle Q Clear(g_c), s	1.8	0.0	16.0	3.4	0.0	16.2	4.1	0.0	7.6	1.0	0.0	8.7
Prop In Lane	1.00		0.24	1.00		0.05	1.00		0.07	1.00		0.50
Lane Grp Cap(c), veh/h	227	0	481	254	0	549	400	0	603	395	0	501
V/C Ratio(X)	0.33	0.00	1.15	0.56	0.00	0.94	0.53	0.00	0.49	0.11	0.00	0.59
Avail Cap(c_a), veh/h	262	0	481	254	0	549	400	0	603	455	0	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	22.0	16.3	0.0	20.6	16.2	0.0	16.3	14.3	0.0	18.2
Incr Delay (d2), s/veh	0.3	0.0	88.7	1.7	0.0	24.1	0.7	0.0	2.8	0.0	0.0	5.0
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	0.9	0.0	19.8	1.7	0.0	12.0	1.2	0.0	4.4	0.5	0.0	4.9
LnGrp Delay(d),s/veh	16.9	0.0	110.7	17.9	0.0	44.7	16.9	0.0	19.1	14.4	0.0	23.2
LnGrp LOS	B		F	B		D	B		B	B		C
Approach Vol, veh/h		627			657			506			336	
Approach Delay, s/veh		99.7			38.9			18.2			22.1	
Approach LOS		F			D			B			C	

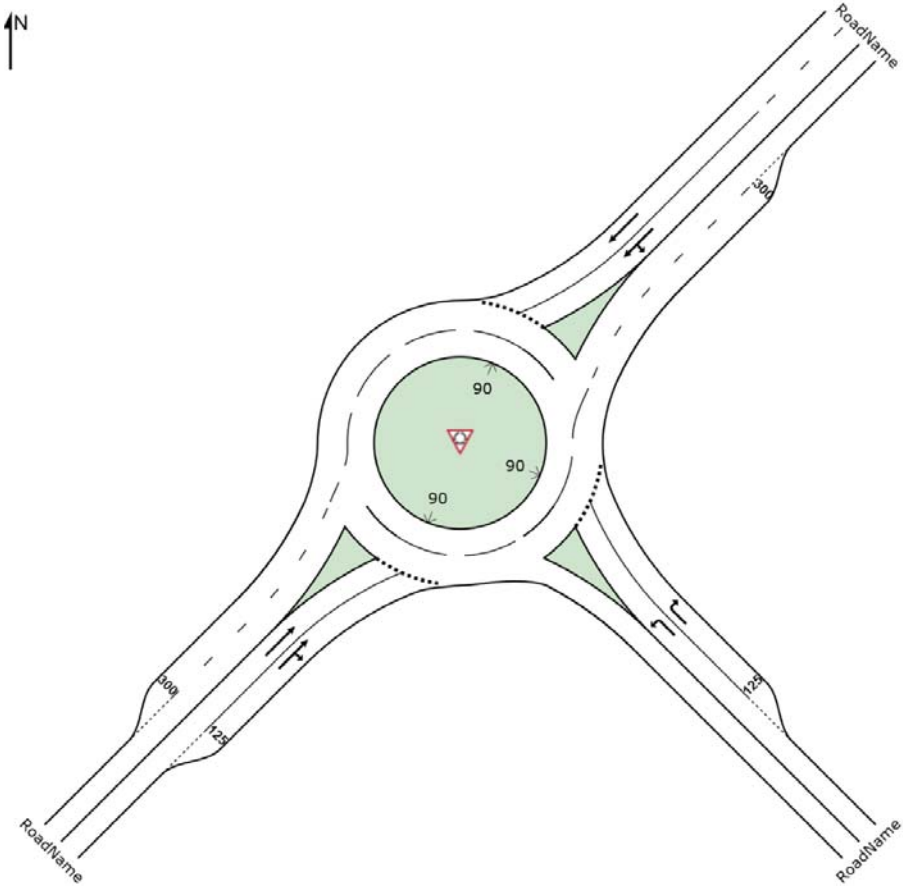
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	24.0	9.0	20.5	8.6	21.9	7.3	22.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5
Max Q Clear Time (g_c+I1), s	3.0	9.6	5.4	18.0	6.1	10.7	3.8	18.2
Green Ext Time (p_c), s	0.0	2.3	0.0	0.0	0.0	2.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.2
HCM 2010 LOS	D

SITE LAYOUT

Site: 47) Littlerock Rd at Tumwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 47) Littlerock Rd at Tumwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: RoadName											
3x	L2	416	1.0	0.396	11.3	LOS B	2.5	62.2	0.54	0.72	33.7
18x	R2	400	1.0	0.390	5.8	LOS A	2.4	60.5	0.54	0.63	35.2
Approach		816	1.0	0.396	8.6	LOS A	2.5	62.2	0.54	0.68	34.4
NorthEast: RoadName											
1x	L2	426	1.0	0.640	14.1	LOS B	6.0	150.6	0.77	0.87	33.5
6x	T1	511	1.0	0.640	7.7	LOS A	6.0	150.6	0.69	0.75	34.7
Approach		937	1.0	0.640	10.6	LOS B	6.0	150.6	0.73	0.80	34.1
SouthWest: RoadName											
2x	T1	295	0.0	0.314	6.4	LOS A	1.9	47.9	0.62	0.59	35.6
12x	R2	232	0.0	0.268	6.4	LOS A	1.5	38.5	0.60	0.69	35.1
Approach		526	0.0	0.314	6.4	LOS A	1.9	47.9	0.61	0.64	35.4
All Vehicles		2279	0.8	0.640	8.9	LOS A	6.0	150.6	0.63	0.72	34.5

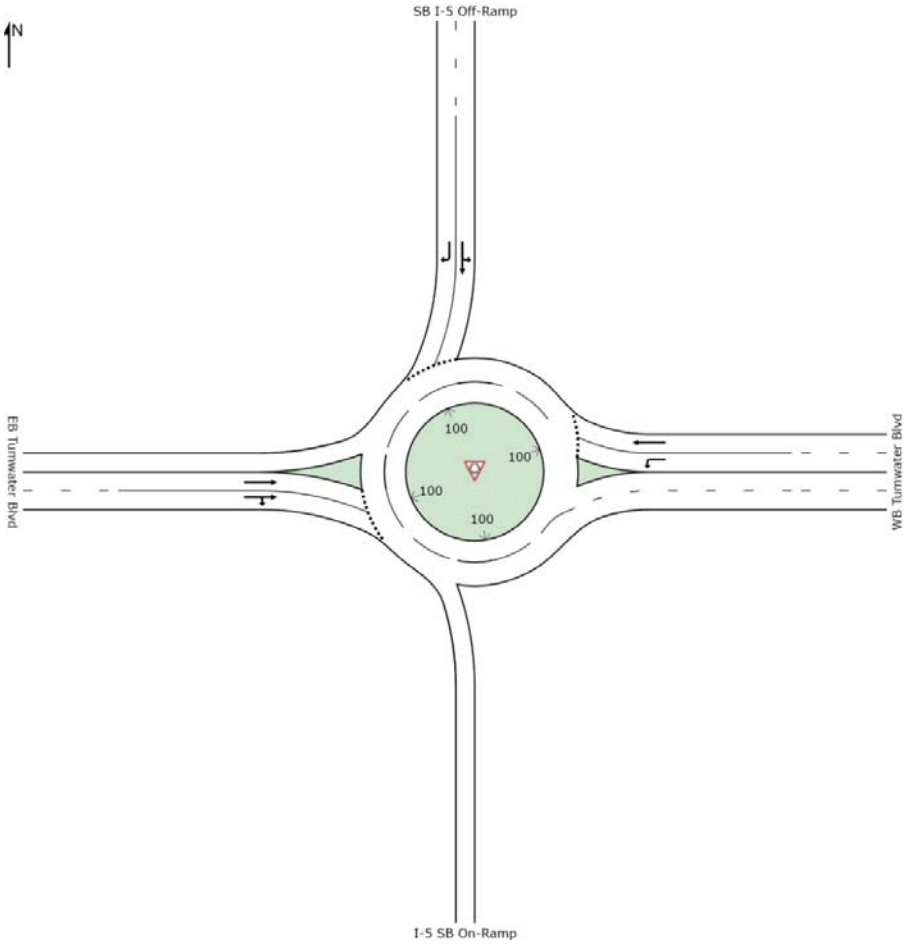
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 48) Tumwater Blvd at I-5 SB Ramps

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 48) Tumwater Blvd at I-5 SB Ramps

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: WB Tumwater Blvd											
1	L2	363	2.0	0.243	4.4	LOS A	0.0	0.0	0.00	0.00	28.0
6	T1	563	2.0	0.315	4.5	LOS A	0.0	0.0	0.00	0.00	26.0
Approach		926	2.0	0.315	4.5	LOS A	0.0	0.0	0.00	0.00	26.8
North: SB I-5 Off-Ramp											
7	L2	405	2.0	0.568	13.5	LOS B	3.4	87.4	0.71	0.80	24.6
4	T1	32	2.0	0.568	13.5	LOS B	3.4	87.4	0.71	0.80	27.1
14	R2	542	2.0	0.600	12.8	LOS B	4.0	101.0	0.72	0.81	24.6
Approach		979	2.0	0.600	13.1	LOS B	4.0	101.0	0.71	0.81	24.7
West: EB Tumwater Blvd											
2	T1	753	2.0	0.988	37.4	LOS D	26.8	681.7	0.96	1.64	18.2
12	R2	363	2.0	0.988	54.4	LOS D	26.8	681.7	1.00	2.17	17.0
Approach		1116	2.0	0.988	42.9	LOS D	26.8	681.7	0.98	1.81	17.8
All Vehicles		3021	2.0	0.988	21.5	LOS C	26.8	681.7	0.59	0.93	22.1

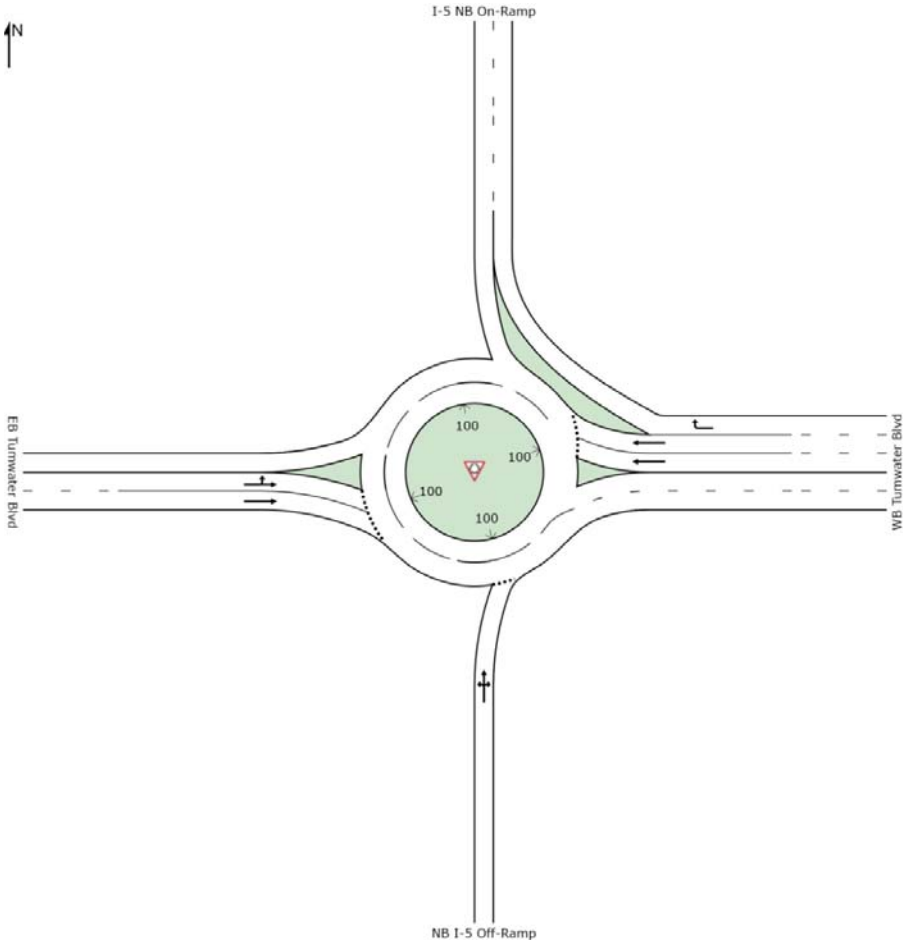
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 49) Tumwater Blvd at I-5 NB Ramps

Projected 2040 Baseline
Roundabout



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MOVEMENT SUMMARY

Site: 49) Tumwater Blvd at I-5 NB Ramps

Projected 2040 Baseline
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB I-5 Off-Ramp											
3	L2	182	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	24.5
8	T1	5	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	27.0
18	R2	182	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	23.4
Approach		369	2.0	0.571	15.6	LOS B	3.4	86.8	0.75	0.86	24.0
East: WB Tumwater Blvd											
6	T1	737	2.0	0.654	12.8	LOS B	7.3	185.2	0.85	0.90	22.7
16	R2	1101	2.0	0.671	0.2	LOS A	0.0	0.0	0.00	0.00	25.0
Approach		1838	2.0	0.671	5.3	LOS A	7.3	185.2	0.34	0.36	24.0
West: EB Tumwater Blvd											
5	L2	394	2.0	0.294	5.0	LOS A	0.0	0.0	0.00	0.00	28.1
2	T1	747	2.0	0.420	5.7	LOS A	0.0	0.0	0.00	0.00	26.1
Approach		1141	2.0	0.420	5.5	LOS A	0.0	0.0	0.00	0.00	26.7
All Vehicles		3348	2.0	0.671	6.5	LOS A	7.3	185.2	0.27	0.29	24.9

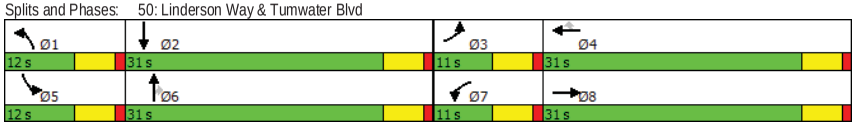
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	655	245	130	805	30	175	135	75	210	235	790
Future Volume (vph)	90	655	245	130	805	30	175	135	75	210	235	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			1275			1018			2073	
Travel Time (s)		20.3			29.0			23.1			47.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	11.0	31.0		11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	36.5%	14.1%	36.5%	36.5%	14.1%	36.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 74	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 50: Linderson Way & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	655	245	130	805	30	175	135	75	210	235	790
Future Volume (veh/h)	90	655	245	130	805	30	175	135	75	210	235	790
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	95	689	258	137	847	32	184	142	79	221	247	0
Adj No. of Lanes	2	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	244	909	340	149	1333	596	174	342	291	174	342	291
Arrive On Green	0.07	0.36	0.36	0.08	0.37	0.37	0.10	0.18	0.18	0.10	0.18	0.00
Sat Flow, veh/h	3442	2522	944	1792	3574	1599	1792	1881	1599	1792	1881	1599
Grp Volume(v), veh/h	95	484	463	137	847	32	184	142	79	221	247	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1696	1792	1787	1599	1792	1881	1599	1792	1881	1599
Q Serve(g_s), s	1.9	17.3	17.3	5.5	14.0	0.9	7.0	4.8	3.1	7.0	8.9	0.0
Cycle Q Clear(g_c), s	1.9	17.3	17.3	5.5	14.0	0.9	7.0	4.8	3.1	7.0	8.9	0.0
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	638	611	149	1333	596	174	342	291	174	342	291
V/C Ratio(X)	0.39	0.76	0.76	0.92	0.64	0.05	1.06	0.41	0.27	1.27	0.72	0.00
Avail Cap(c_a), veh/h	286	638	611	149	1333	596	174	678	576	174	678	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.0	20.3	20.3	32.8	18.6	14.5	32.6	26.1	25.4	32.6	27.8	0.0
Incr Delay (d2), s/veh	1.0	8.2	8.6	50.3	2.3	0.2	84.5	0.8	0.5	159.2	2.9	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	0.9	9.9	9.6	4.8	7.4	0.4	7.5	2.6	1.4	11.1	4.9	0.0
LnGrp Delay(d),s/veh	33.0	28.5	28.9	83.2	20.9	14.6	117.1	26.9	25.9	191.7	30.7	0.0
LnGrp LOS	C	C	C	F	C	B	F	C	C	F	C	
Approach Vol, veh/h		1042			1016			405			468	
Approach Delay, s/veh		29.1			29.1			67.7			106.7	
Approach LOS		C			C			E			F	

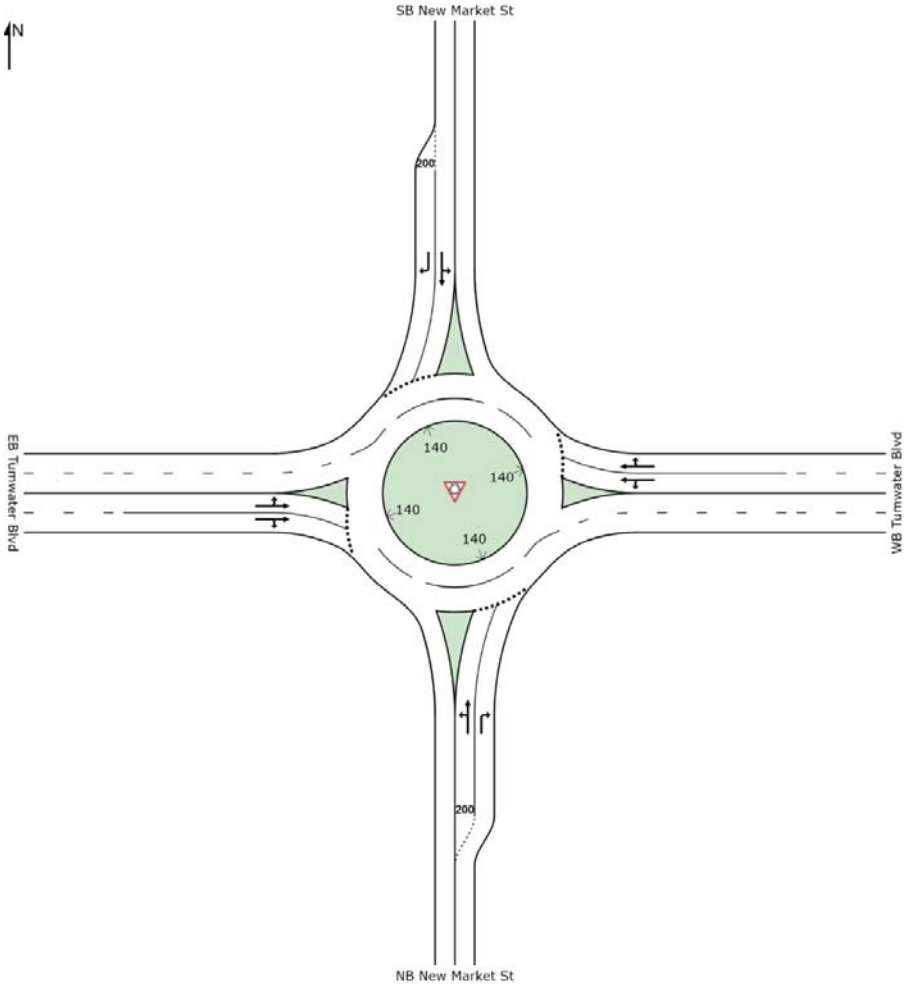
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	18.1	10.1	31.9	12.0	18.1	11.0	31.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0
Max Q Clear Time (g_c+I1), s	9.0	10.9	3.9	16.0	9.0	6.8	7.5	19.3
Green Ext Time (p_c), s	0.0	2.2	0.0	7.4	0.0	2.4	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	46.8
HCM 2010 LOS	D

SITE LAYOUT

Site: 51) New Market Rd at Tumwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 51) New Market Rd at Tumwater Blvd

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB New Market St											
3	L2	26	0.0	0.055	13.9	LOS B	0.2	5.4	0.65	0.82	34.5
8	T1	5	0.0	0.055	6.8	LOS A	0.2	5.4	0.65	0.82	34.1
18	R2	68	0.0	0.085	6.2	LOS A	0.4	9.4	0.65	0.72	35.7
Approach		100	0.0	0.085	8.2	LOS A	0.4	9.4	0.65	0.75	35.3
East: WB Tumwater Blvd											
1	L2	68	2.0	0.335	11.0	LOS B	2.3	57.4	0.38	0.44	37.7
6	T1	784	2.0	0.335	3.8	LOS A	2.3	58.6	0.37	0.41	37.6
16	R2	63	2.0	0.335	4.2	LOS A	2.3	58.6	0.36	0.38	36.3
Approach		916	2.0	0.335	4.4	LOS A	2.3	58.6	0.37	0.41	37.5
North: SB New Market St											
7	L2	126	4.0	0.215	13.4	LOS B	0.9	22.7	0.61	0.84	34.6
4	T1	26	4.0	0.215	6.3	LOS A	0.9	22.7	0.61	0.84	34.3
14	R2	232	4.0	0.262	6.1	LOS A	1.1	29.7	0.61	0.71	35.7
Approach		384	4.0	0.262	8.5	LOS A	1.1	29.7	0.61	0.76	35.2
West: EB Tumwater Blvd											
5	L2	95	4.0	0.420	11.8	LOS B	3.0	77.5	0.54	0.52	36.9
2	T1	911	4.0	0.420	4.5	LOS A	3.1	80.0	0.52	0.47	36.9
12	R2	32	4.0	0.420	4.8	LOS A	3.1	80.0	0.51	0.44	35.7
Approach		1037	4.0	0.420	5.2	LOS A	3.1	80.0	0.53	0.48	36.9
All Vehicles		2437	3.1	0.420	5.5	LOS A	3.1	80.0	0.48	0.51	36.8

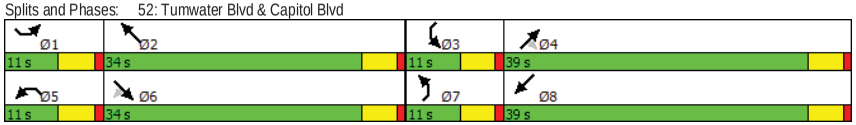
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Operations\sidra\2040 Baseline\Projected 2040 Baseline PM.sip6

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	150	980	195	225	515	20	175	350	300	110	345	20
Future Volume (vph)	150	980	195	225	515	20	175	350	300	110	345	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	200		0	275		0	200		0
Storage Lanes	1		1	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		934			3620			2404			1729	
Travel Time (s)		12.7			49.4			54.6			39.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6						4			
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%		11.6%	41.1%	41.1%	11.6%	41.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 84.3	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 52: Tumwater Blvd & Capitol Blvd



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	150	980	195	225	515	20	175	350	300	110	345	20
Future Volume (veh/h)	150	980	195	225	515	20	175	350	300	110	345	20
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	158	1032	131	237	542	21	184	368	90	116	363	21
Adj No. of Lanes	1	2	1	2	2	0	1	1	1	1	2	0
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	1	1	1	1	1	1	1	1	1
Cap, veh/h	128	1233	552	253	1234	48	130	489	416	130	893	51
Arrive On Green	0.07	0.35	0.35	0.07	0.35	0.35	0.07	0.26	0.26	0.07	0.26	0.26
Sat Flow, veh/h	1757	3505	1568	3476	3509	136	1792	1881	1599	1792	3435	198
Grp Volume(v), veh/h	158	1032	131	237	276	287	184	368	90	116	188	196
Grp Sat Flow(s),veh/h/ln	1757	1752	1568	1738	1787	1857	1792	1881	1599	1792	1787	1846
Q Serve(g_s), s	6.0	22.3	4.9	5.6	9.8	9.8	6.0	14.8	3.6	5.3	7.2	7.2
Cycle Q Clear(g_c), s	6.0	22.3	4.9	5.6	9.8	9.8	6.0	14.8	3.6	5.3	7.2	7.2
Prop In Lane	1.00		1.00	1.00		0.07	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	128	1233	552	253	629	653	130	489	416	130	465	480
V/C Ratio(X)	1.24	0.84	0.24	0.94	0.44	0.44	1.41	0.75	0.22	0.89	0.41	0.41
Avail Cap(c_a), veh/h	128	1233	552	253	629	653	130	776	659	130	737	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	24.5	18.9	38.0	20.5	20.5	38.2	28.1	23.9	37.9	25.2	25.2
Incr Delay (d2), s/veh	156.2	6.9	1.0	39.7	2.2	2.1	224.1	2.4	0.3	46.0	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	11.9	2.2	4.1	5.2	5.4	11.1	8.0	1.6	4.3	3.6	3.8
LnGrp Delay(d),s/veh	194.4	31.4	19.9	77.7	22.7	22.6	262.3	30.4	24.2	83.9	25.8	25.8
LnGrp LOS	F	C	B	E	C	C	F	C	C	F	C	C
Approach Vol, veh/h		1321			800			642			500	
Approach Delay, s/veh		49.8			39.0			96.0			39.3	
Approach LOS		D			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	34.0	11.0	26.4	11.0	34.0	11.0	26.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0
Max Q Clear Time (g_c+I1), s	8.0	11.8	7.3	16.8	7.6	24.3	8.0	9.2
Green Ext Time (p_c), s	0.0	10.8	0.0	4.6	0.0	3.7	0.0	5.2

Intersection Summary		
HCM 2010 Ctrl Delay		54.6
HCM 2010 LOS		D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	900	105	120	645	10	55	0	85	10	0	5
Future Volume (vph)	10	900	105	120	645	10	55	0	85	10	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2111			1760			704			354	
Travel Time (s)		48.0			40.0			16.0			8.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.5	27.5		27.5	27.5		12.5	12.5		27.5	27.5	
Total Split (s)	52.5	52.5		52.5	52.5		27.5	27.5		27.5	27.5	
Total Split (%)	65.6%	65.6%		65.6%	65.6%		34.4%	34.4%		34.4%	34.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 71.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 53: 65th Ave & Henderson Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	900	105	120	645	10	55	0	85	10	0	5
Future Volume (veh/h)	10	900	105	120	645	10	55	0	85	10	0	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	947	111	126	679	11	58	0	89	11	0	5
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	551	1216	143	315	1358	22	141	15	120	213	17	62
Arrive On Green	0.74	0.74	0.74	0.74	0.74	0.74	0.13	0.00	0.13	0.13	0.00	0.13
Sat Flow, veh/h	757	1653	194	536	1846	30	504	115	950	945	135	491
Grp Volume(v), veh/h	11	0	1058	126	0	690	147	0	0	16	0	0
Grp Sat Flow(s),veh/h/ln	757	0	1847	536	0	1876	1568	0	0	1571	0	0
Q Serve(g_s), s	0.4	0.0	23.2	12.4	0.0	10.0	4.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.4	0.0	23.2	35.6	0.0	10.0	5.8	0.0	0.0	0.5	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.02	0.39		0.61	0.69		0.31
Lane Grp Cap(c), veh/h	551	0	1358	315	0	1380	276	0	0	292	0	0
V/C Ratio(X)	0.02	0.00	0.78	0.40	0.00	0.50	0.53	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	551	0	1358	315	0	1380	623	0	0	610	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.8	0.0	5.3	16.4	0.0	3.6	27.4	0.0	0.0	25.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	4.5	3.8	0.0	1.3	1.9	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	13.1	2.1	0.0	5.5	2.7	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	5.9	0.0	9.8	20.1	0.0	4.9	29.3	0.0	0.0	25.2	0.0	0.0
LnGrp LOS	A		A	C		A	C			C		
Approach Vol, veh/h		1069			816			147			16	
Approach Delay, s/veh		9.8			7.3			29.3			25.2	
Approach LOS		A			A			C			C	

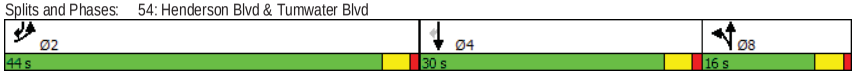
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		52.5		12.8		52.5		12.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		48.0		23.0		48.0		23.0
Max Q Clear Time (g_c+I1), s		25.2		2.5		37.6		7.8
Green Ext Time (p_c), s		17.9		1.0		9.1		0.9

Intersection Summary		
HCM 2010 Ctrl Delay		10.3
HCM 2010 LOS		B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	755	5	30	180	300	375
Future Volume (vph)	755	5	30	180	300	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	3122			2394	2111	
Travel Time (s)	60.8			46.6	41.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		Split	NA	NA	pm+ov
Protected Phases	2		8	8	4	2
Permitted Phases						4
Detector Phase	2		8	8	4	2
Switch Phase						
Minimum Initial (s)	6.0		6.0	6.0	6.0	6.0
Minimum Split (s)	20.5		10.5	10.5	30.0	20.5
Total Split (s)	44.0		16.0	16.0	30.0	44.0
Total Split (%)	48.9%		17.8%	17.8%	33.3%	48.9%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.0			4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max		None	None	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 54: Henderson Blvd & Tumwater Blvd



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	755	5	30	180	300	375
Future Volume (veh/h)	755	5	30	180	300	375
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1900	1881	1881	1881
Adj Flow Rate, veh/h	795	5	32	189	316	279
Adj No. of Lanes	0	0	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	790	5	36	213	543	1173
Arrive On Green	0.44	0.44	0.13	0.13	0.29	0.29
Sat Flow, veh/h	1777	11	270	1597	1881	1599
Grp Volume(v), veh/h	801	0	221	0	316	279
Grp Sat Flow(s),veh/h/ln	1790	0	1868	0	1881	1599
Q Serve(g_s), s	40.0	0.0	10.5	0.0	12.9	5.1
Cycle Q Clear(g_c), s	40.0	0.0	10.5	0.0	12.9	5.1
Prop In Lane	0.99	0.01	0.14			1.00
Lane Grp Cap(c), veh/h	796	0	249	0	543	1173
V/C Ratio(X)	1.01	0.00	0.89	0.00	0.58	0.24
Avail Cap(c_a), veh/h	796	0	249	0	543	1173
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	0.0	38.3	0.0	27.3	3.9
Incr Delay (d2), s/veh	33.5	0.0	29.9	0.0	4.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.1	0.0	7.5	0.0	7.3	6.1
LnGrp Delay(d),s/veh	58.6	0.0	68.2	0.0	31.8	4.4
LnGrp LOS	F		E		C	A
Approach Vol, veh/h	801			221	595	
Approach Delay, s/veh	58.6			68.2	19.0	
Approach LOS	E			E	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		44.0		30.0				16.0
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		40.0		26.0				12.0
Max Q Clear Time (g_c+I1), s		42.0		14.9				12.5
Green Ext Time (p_c), s		0.0		2.6				0.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.3
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	4

Movement	NWL	NWR	NET	NER	SWL	SWT
Traffic Vol, veh/h	80	55	170	140	110	210
Future Vol, veh/h	80	55	170	140	110	210
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	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	84	58	179	147	116	221

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	706	253	0	0	326	0
Stage 1	253	-	-	-	-	-
Stage 2	453	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	405	791	-	-	1239	-
Stage 1	794	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	791	-	-	1239	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	576	-	-	-	-	-

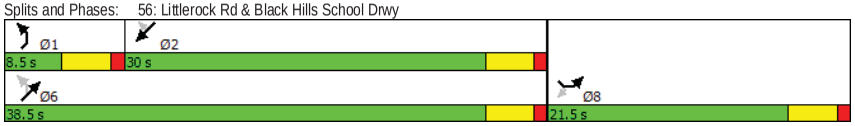
Approach	NW	NE	SW
HCM Control Delay, s	16.1	0	2.8
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	465	1239	-
HCM Lane V/C Ratio	-	-	0.306	0.093	-
HCM Control Delay (s)	-	-	16.1	8.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.3	-

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	5	10	15	275	535	70
Future Volume (vph)	5	10	15	275	535	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	175			350
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1065			1067	3970	
Travel Time (s)	24.2			24.3	90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	7.0	7.0	7.0
Minimum Split (s)	21.5	21.5	8.5	24.5	27.5	27.5
Total Split (s)	21.5	21.5	8.5	38.5	30.0	30.0
Total Split (%)	35.8%	35.8%	14.2%	64.2%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 53.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 56: Littlerock Rd & Black Hills School Drwy



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	5	10	15	275	535	70
Future Volume (veh/h)	5	10	15	275	535	70
Number	3	18	1	6	2	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1881	1881
Adj Flow Rate, veh/h	5	11	16	289	563	74
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	51	46	590	1445	1224	1040
Arrive On Green	0.03	0.03	0.02	0.77	0.65	0.65
Sat Flow, veh/h	1810	1615	1792	1881	1881	1599
Grp Volume(v), veh/h	5	11	16	289	563	74
Grp Sat Flow(s),veh/h/ln	1810	1615	1792	1881	1881	1599
Q Serve(g_s), s	0.1	0.3	0.1	1.9	6.6	0.8
Cycle Q Clear(g_c), s	0.1	0.3	0.1	1.9	6.6	0.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	51	46	590	1445	1224	1040
V/C Ratio(X)	0.10	0.24	0.03	0.20	0.46	0.07
Avail Cap(c_a), veh/h	695	620	724	1445	1224	1040
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	21.0	2.7	1.4	3.9	2.8
Incr Delay (d2), s/veh	0.8	2.7	0.0	0.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.1	1.0	3.4	0.3
LnGrp Delay(d),s/veh	21.8	23.7	2.7	1.7	4.2	2.9
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	16			305	637	
Approach Delay, s/veh	23.1			1.8	4.0	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.2	33.3				38.5		5.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	4.0	25.5				34.0		17.0
Max Q Clear Time (g_c+I1), s	2.1	8.6				3.9		2.3
Green Ext Time (p_c), s	0.0	6.4				8.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	3.6	
HCM 2010 LOS	A	

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	85	15	2	15	15	35	2	300	0	15	425	165
Future Vol, veh/h	85	15	2	15	15	35	2	300	0	15	425	165
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	11	11	11	1	1	1	3	3	3
Mvmt Flow	89	16	2	16	16	37	2	316	0	16	447	174

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	912	886	534	895	973	316	621	0	0	316	0	0
Stage 1	566	566	-	320	320	-	-	-	-	-	-	-
Stage 2	346	320	-	575	653	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.21	6.61	6.31	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.599	4.099	3.399	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	254	282	544	252	243	704	965	-	-	1239	-	-
Stage 1	507	506	-	673	636	-	-	-	-	-	-	-
Stage 2	668	651	-	488	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	224	276	544	236	237	704	965	-	-	1239	-	-
Mov Cap-2 Maneuver	224	276	-	236	237	-	-	-	-	-	-	-
Stage 1	505	496	-	671	634	-	-	-	-	-	-	-
Stage 2	615	649	-	461	441	-	-	-	-	-	-	-

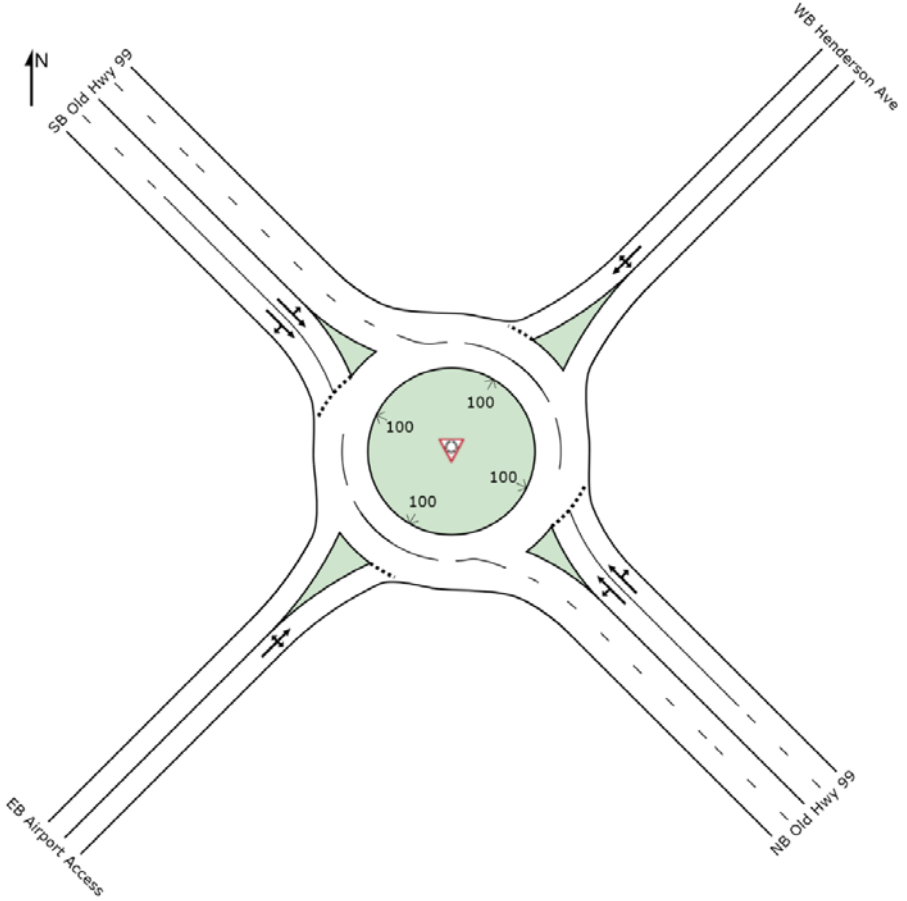
Approach	EB	WB	NB	SB
HCM Control Delay, s	33	17	0.1	0.2
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	965	-	-	233	368	1239	-	-
HCM Lane V/C Ratio	0.002	-	-	0.461	0.186	0.013	-	-
HCM Control Delay (s)	8.7	0	-	33	17	7.9	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.2	0.7	0	-	-

SITE LAYOUT

Site: 58) Henderson Ave at Old Hwy 99

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 58) Henderson Ave at Old Hwy 99

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB Old Hwy 99											
3x	L2	5	2.0	0.381	7.1	LOS A	2.7	69.3	0.52	0.35	34.2
8x	T1	763	2.0	0.381	6.8	LOS A	2.8	70.9	0.52	0.34	34.2
18x	R2	132	2.0	0.381	6.6	LOS A	2.8	70.9	0.51	0.33	33.2
Approach		900	2.0	0.381	6.8	LOS A	2.8	70.9	0.51	0.34	34.1
NorthEast: WB Henderson Ave											
1x	L2	216	1.0	0.468	12.5	LOS B	2.5	63.9	0.71	0.75	30.1
6x	T1	11	1.0	0.468	12.5	LOS B	2.5	63.9	0.71	0.75	30.0
16x	R2	84	1.0	0.468	12.5	LOS B	2.5	63.9	0.71	0.75	29.3
Approach		311	1.0	0.468	12.5	LOS B	2.5	63.9	0.71	0.75	29.9
NorthWest: SB Old Hwy 99											
7x	L2	168	1.0	0.690	13.6	LOS B	7.9	199.3	0.78	0.60	30.7
4x	T1	1421	1.0	0.690	13.1	LOS B	7.9	199.3	0.77	0.57	31.2
14x	R2	16	1.0	0.690	12.7	LOS B	7.8	197.2	0.76	0.56	30.6
Approach		1605	1.0	0.690	13.1	LOS B	7.9	199.3	0.77	0.58	31.1
SouthWest: EB Airport Access											
5x	L2	26	3.0	0.146	13.7	LOS B	0.6	16.5	0.81	0.81	29.9
2x	T1	11	3.0	0.146	13.7	LOS B	0.6	16.5	0.81	0.81	29.8
12x	R2	11	3.0	0.146	13.7	LOS B	0.6	16.5	0.81	0.81	29.1
Approach		47	3.0	0.146	13.7	LOS B	0.6	16.5	0.81	0.81	29.7
All Vehicles		2863	1.3	0.690	11.1	LOS B	7.9	199.3	0.68	0.52	31.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Operations\sidra\2040 Baseline\58) Henderson Ave at Old Hwy 99.sip6

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	1	1	10	30	0	125	130	1450	0	1	645	20
Future Vol, veh/h	1	1	10	30	0	125	130	1450	0	1	645	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	300	250	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	1	11	32	0	132	137	1526	0	1	679	21

Major/Minor	Minor1			Minor2			Major1			Major2		
Conflicting Flow All	2142	2502	763	1729	2492	350	700	0	0	1526	0	0
Stage 1	1800	1800	-	692	692	-	-	-	-	-	-	-
Stage 2	342	702	-	1037	1800	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	28	28	347	57	29	649	899	-	-	438	-	-
Stage 1	83	130	-	403	446	-	-	-	-	-	-	-
Stage 2	646	439	-	249	132	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	20	24	347	47	24	649	899	-	-	438	-	-
Mov Cap-2 Maneuver	20	24	-	47	24	-	-	-	-	-	-	-
Stage 1	70	110	-	342	444	-	-	-	-	-	-	-
Stage 2	513	437	-	203	112	-	-	-	-	-	-	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	46.1	43.9	0.8	0
HCM LOS	E	E		

Minor Lane/Major Mvmt	NWL	NWT	NWR	EBLn1	WBLn1	WBLn2	SEL	SET	SER
Capacity (veh/h)	438	-	-	100	47	649	899	-	-
HCM Lane V/C Ratio	0.002	-	-	0.126	0.672	0.203	0.152	-	-
HCM Control Delay (s)	13.2	0	-	46.1	176.9	12	9.7	-	-
HCM Lane LOS	B	A	-	E	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	2.6	0.8	0.5	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	55	15	65	15	5	210
Future Vol, veh/h	55	15	65	15	5	210
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	95	95	95	95	95	95
Heavy Vehicles, %	3	3	9	9	3	3
Mvmt Flow	58	16	68	16	5	221

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	308	76	0	0	84	0
Stage 1	76	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	682	982	-	-	1506	-
Stage 1	944	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	679	982	-	-	1506	-
Mov Cap-2 Maneuver	679	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	801	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	727	1506	-
HCM Lane V/C Ratio	-	-	0.101	0.003	-
HCM Control Delay (s)	-	-	10.5	7.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	9.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	70	15	10	140	275	80
Future Vol, veh/h	70	15	10	140	275	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	3	3	1	1
Mvmt Flow	74	16	11	147	289	84

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	158	0	-	0	247	84
Stage 1	-	-	-	-	84	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	4.11	-	-	-	7.11	6.21
Critical Hdwy Stg 1	-	-	-	-	6.11	-
Critical Hdwy Stg 2	-	-	-	-	6.11	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1428	-	-	-	709	978
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	841	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1428	-	-	-	681	978
Mov Cap-2 Maneuver	-	-	-	-	681	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	797	-

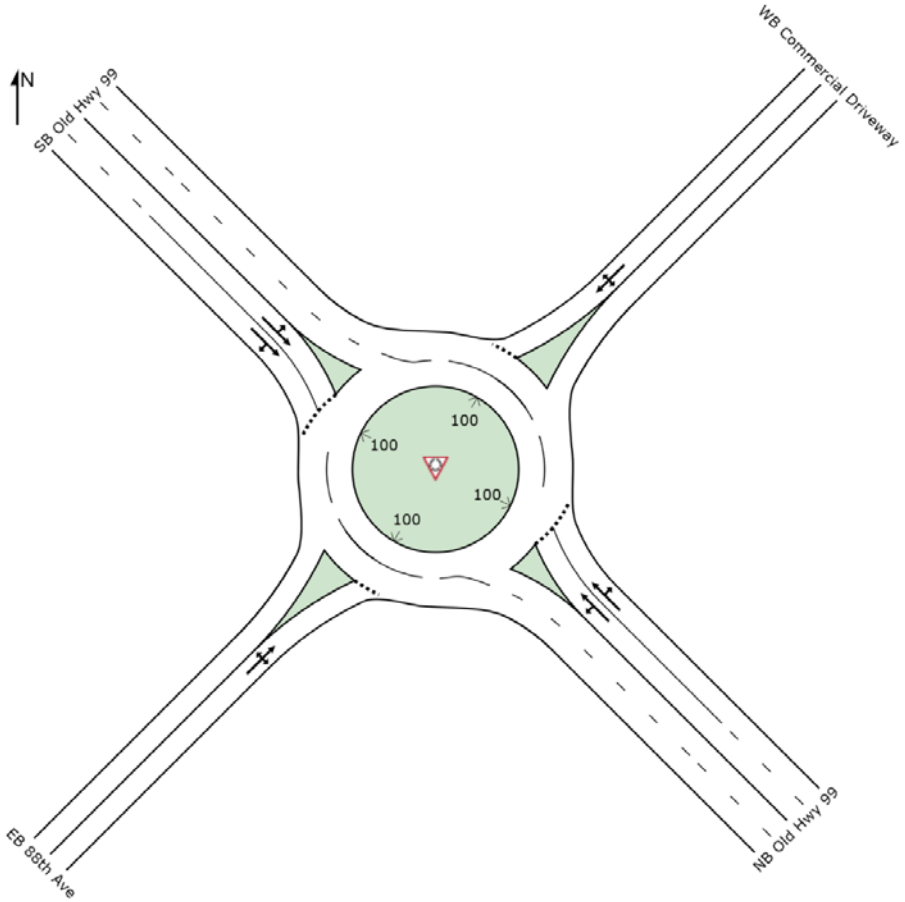
Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	15
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1428	-	-	-	731
HCM Lane V/C Ratio	0.052	-	-	-	0.511
HCM Control Delay (s)	7.7	0	-	-	15
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.9

SITE LAYOUT

Site: 62) 88th Ave at Old Hwy 99

Projected 2040 Baseline
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 62) 88th Ave at Old Hwy 99

Projected 2040 Baseline
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB Old Hwy 99											
3x	L2	5	1.0	0.189	5.1	LOS A	1.2	29.3	0.50	0.34	35.2
8x	T1	421	1.0	0.189	4.9	LOS A	1.2	30.2	0.50	0.33	35.3
18x	R2	1	1.0	0.189	4.7	LOS A	1.2	30.2	0.49	0.32	34.3
Approach		427	1.0	0.189	4.9	LOS A	1.2	30.2	0.50	0.33	35.3
NorthEast: WB Commercial Driveway											
1x	L2	5	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	33.9
6x	T1	5	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	33.8
16x	R2	1	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	32.9
Approach		12	2.0	0.016	5.2	LOS A	0.1	1.6	0.53	0.39	33.8
NorthWest: SB Old Hwy 99											
7x	L2	1	1.0	0.525	8.0	LOS A	4.9	123.9	0.16	0.04	33.8
4x	T1	979	1.0	0.525	7.9	LOS A	4.9	123.9	0.16	0.04	33.7
14x	R2	537	1.0	0.525	7.7	LOS A	4.9	123.8	0.15	0.04	32.6
Approach		1517	1.0	0.525	7.8	LOS A	4.9	123.9	0.16	0.04	33.3
SouthWest: EB 88th Ave											
5x	L2	253	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79	29.5
2x	T1	5	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79	29.4
12x	R2	26	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79	28.7
Approach		284	3.0	0.462	13.1	LOS B	2.5	64.5	0.73	0.79	29.4
All Vehicles		2240	1.3	0.525	7.9	LOS A	4.9	123.9	0.30	0.19	33.1

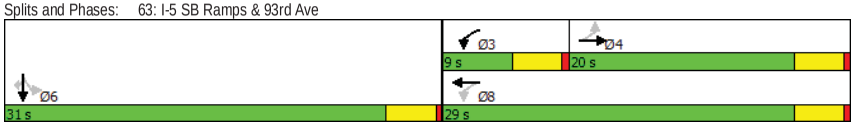
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Future Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		300
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			40			30			30	
Link Distance (ft)		1124			936			1099			1644	
Travel Time (s)		25.5			16.0			25.0			37.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)												
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases	4			8						6		6
Detector Phase	4	4		3	8					6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0					4.0	4.0	4.0
Minimum Split (s)	20.0	20.0		8.0	20.0					20.0	20.0	20.0
Total Split (s)	20.0	20.0		9.0	29.0					31.0	31.0	31.0
Total Split (%)	33.3%	33.3%		15.0%	48.3%					51.7%	51.7%	51.7%
Yellow Time (s)	3.5	3.5		3.5	3.5					3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5					0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		4.0		4.0	4.0						4.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None					Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 58.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 63: I-5 SB Ramps & 93rd Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	415	95	85	305	0	0	0	0	475	0	425
Future Volume (veh/h)	0	415	95	85	305	0	0	0	0	475	0	425
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1743	1743	0				1900	1827	1827
Adj Flow Rate, veh/h	0	437	100	89	321	0				500	0	268
Adj No. of Lanes	0	1	0	1	1	0				0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	9	9	0				4	4	4
Cap, veh/h	0	408	93	213	694	0				808	0	721
Arrive On Green	0.00	0.28	0.28	0.05	0.40	0.00				0.46	0.00	0.46
Sat Flow, veh/h	0	1482	339	1660	1743	0				1740	0	1553
Grp Volume(v), veh/h	0	0	537	89	321	0				500	0	268
Grp Sat Flow(s),veh/h/ln	0	0	1821	1660	1743	0				1740	0	1553
Q Serve(g_s), s	0.0	0.0	16.0	2.1	7.9	0.0				12.6	0.0	6.5
Cycle Q Clear(g_c), s	0.0	0.0	16.0	2.1	7.9	0.0				12.6	0.0	6.5
Prop In Lane	0.00		0.19	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	0	501	213	694	0				808	0	721
V/C Ratio(X)	0.00	0.00	1.07	0.42	0.46	0.00				0.62	0.00	0.37
Avail Cap(c_a), veh/h	0	0	501	267	750	0				808	0	721
HCM Platoon Ratio	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	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	21.1	15.2	12.9	0.0				11.7	0.0	10.1
Incr Delay (d2), s/veh	0.0	0.0	60.6	1.3	0.5	0.0				3.5	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	16.4	1.0	3.8	0.0				6.8	0.0	3.0
LnGrp Delay(d),s/veh	0.0	0.0	81.7	16.5	13.4	0.0				15.2	0.0	11.5
LnGrp LOS			F	B	B					B		B
Approach Vol, veh/h		537			410						768	
Approach Delay, s/veh		81.7			14.1						14.0	
Approach LOS		F			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			7.1	20.0		31.0		27.1
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			5.0	16.0		27.0		25.0
Max Q Clear Time (g_c+I1), s			4.1	18.0		14.6		9.9
Green Ext Time (p_c), s			0.0	0.0		3.5		4.9

Intersection Summary	
HCM 2010 Ctrl Delay	35.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	18.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	290	555	0	0	290	425	130	0	155	0	0	0
Future Vol, veh/h	290	555	0	0	290	425	130	0	155	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	125	-	-	-	-	300	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	8	8	8	14	14	14	0	0	0
Mvmt Flow	305	584	0	0	305	447	137	0	163	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	305	0	-	-	-	0	1500	1500	584
Stage 1	-	-	-	-	-	-	1195	1195	-
Stage 2	-	-	-	-	-	-	305	305	-
Critical Hdwy	4.13	-	-	-	-	-	6.54	6.64	6.34
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.64	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.626	4.126	3.426
Pot Cap-1 Maneuver	1250	-	0	0	-	-	~ 126	115	490
Stage 1	-	-	0	0	-	-	271	246	-
Stage 2	-	-	0	0	-	-	721	641	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1250	-	-	-	-	-	~ 95	0	490
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 95	0	-
Stage 1	-	-	-	-	-	-	205	0	-
Stage 2	-	-	-	-	-	-	721	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3	0	111.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	282	1250	-	-	-
HCM Lane V/C Ratio	1.064	0.244	-	-	-
HCM Control Delay (s)	111.6	8.8	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	11.8	1	-	-	-

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

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	55	535	5	5	475	15	15	1	10	30	15	110
Future Vol, veh/h	55	535	5	5	475	15	15	1	10	30	15	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	1	1	1	0	0	0	5	5	5
Mvmt Flow	58	563	5	5	500	16	16	1	11	32	16	116

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	516	0	0	568	0	0	1266	1208	566	1205	1202	508
Stage 1	-	-	-	-	-	-	682	682	-	518	518	-
Stage 2	-	-	-	-	-	-	584	526	-	687	684	-
Critical Hdwy	4.14	-	-	4.11	-	-	7.1	6.5	6.2	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-
Follow-up Hdwy	2.236	-	-	2.209	-	-	3.5	4	3.3	3.545	4.045	3.345
Pot Cap-1 Maneuver	1040	-	-	1009	-	-	147	185	528	158	182	559
Stage 1	-	-	-	-	-	-	443	453	-	535	528	-
Stage 2	-	-	-	-	-	-	501	532	-	432	444	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1040	-	-	1009	-	-	101	169	528	144	166	559
Mov Cap-2 Maneuver	-	-	-	-	-	-	101	169	-	144	166	-
Stage 1	-	-	-	-	-	-	407	416	-	491	524	-
Stage 2	-	-	-	-	-	-	383	528	-	388	408	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	34.3	28.4
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	150	1040	-	-	1009	-	-	313
HCM Lane V/C Ratio	0.182	0.056	-	-	0.005	-	-	0.521
HCM Control Delay (s)	34.3	8.7	0	-	8.6	0	-	28.4
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0	-	-	2.8

Intersection	
Intersection Delay, s/veh	53.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NEU	NEL	NET	NER
Traffic Vol, veh/h	0	2	435	140	0	240	360	65	0	85	35	50
Future Vol, veh/h	0	2	435	140	0	240	360	65	0	85	35	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	3	3	3	2	2	2	2	2	0	0	0
Mvmt Flow	0	2	458	147	0	253	379	68	0	89	37	53
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NE
Opposing Approach	WB	EB	SW
Opposing Lanes	2	1	1
Conflicting Approach Left	SW	NE	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	65.8	62.9	16.9
HCM LOS	F	F	C

Lane	NELn1	EBLn1	WBLn1	WBLn2	SWLn1
Vol Left, %	50%	0%	40%	0%	63%
Vol Thru, %	21%	75%	60%	0%	36%
Vol Right, %	29%	24%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	170	577	600	65	221
LT Vol	85	2	240	0	140
Through Vol	35	435	360	0	80
RT Vol	50	140	0	65	1
Lane Flow Rate	179	607	632	68	233
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.408	1	1	0.127	0.526
Departure Headway (Hd)	8.218	6.931	7.562	6.66	8.139
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	437	528	486	542	442
Service Time	6.286	4.931	5.262	4.36	6.196
HCM Lane V/C Ratio	0.41	1.15	1.3	0.125	0.527
HCM Control Delay	16.9	65.8	68.6	10.3	19.9
HCM Lane LOS	C	F	F	B	C
HCM 95th-tile Q	1.9	14	13.4	0.4	3

HCM 2010 AWSC
66: Case Rd & 93rd Ave
Projected 2040 No Build
PM Peak Hour

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Traffic Vol, veh/h	0	140	80	1
Future Vol, veh/h	0	140	80	1
Peak Hour Factor	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	147	84	1
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	19.9
HCM LOS	C

Lane

Tumwater Transportation Master Plan
SCJ Alliance
Synchro 9 Report
6/10/2016

Intersection	
Intersection Delay, s/veh	53.5
Intersection LOS	F

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	385	235	0	265	485	0	170	85
Future Vol, veh/h	0	385	235	0	265	485	0	170	85
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	3	3	2	2	2	2	1	1
Mvmt Flow	0	405	247	0	279	511	0	179	89
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	59.4	61	17.2
HCM LOS	F	F	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	67%	0%	35%
Vol Thru, %	0%	62%	65%
Vol Right, %	33%	38%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	255	620	750
LT Vol	170	0	265
Through Vol	0	385	485
RT Vol	85	235	0
Lane Flow Rate	268	653	789
Geometry Grp	1	1	1
Degree of Util (X)	0.518	1	1
Departure Headway (Hd)	6.947	5.692	5.973
Convergence, Y/N	Yes	Yes	Yes
Cap	523	640	616
Service Time	4.947	3.717	3.998
HCM Lane V/C Ratio	0.512	1.02	1.281
HCM Control Delay	17.2	59.4	61
HCM Lane LOS	C	F	F
HCM 95th-tile Q	2.9	15.4	15

Intersection	
Int Delay, s/veh	13.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	115	360	340	65	170	410
Future Vol, veh/h	115	360	340	65	170	410
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	3	3	1	1
Mvmt Flow	121	379	358	68	179	432

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	426	0	-	0	1013	392
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	621	-
Critical Hdwy	4.12	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.218	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1133	-	-	-	266	659
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	538	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1133	-	-	-	230	659
Mov Cap-2 Maneuver	-	-	-	-	230	-
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	465	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	31.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1133	-	-	-	230	659
HCM Lane V/C Ratio	0.107	-	-	-	0.778	0.655
HCM Control Delay (s)	8.6	0	-	-	60	20.2
HCM Lane LOS	A	A	-	-	F	C
HCM 95th %tile Q(veh)	0.4	-	-	-	5.6	4.9

Intersection	
Int Delay, s/veh	6

Movement	EBT	EBR	WBL	WBT	NEL	NER
Traffic Vol, veh/h	890	30	190	340	15	205
Future Vol, veh/h	890	30	190	340	15	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	450	300	-	300	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	937	32	200	358	16	216

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	937	0	1695	937
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	758	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	731	-	103	322
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	465	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	731	-	75	322
Mov Cap-2 Maneuver	-	-	-	-	250	-
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	338	-

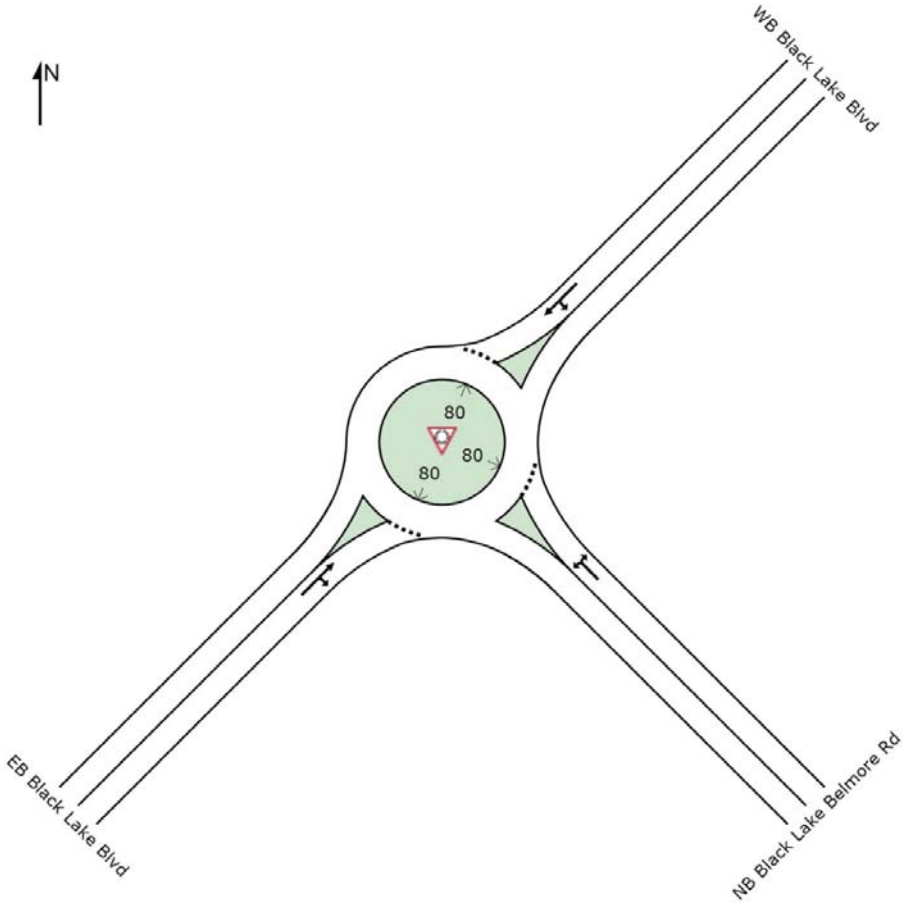
Approach	EB	WB	NE
HCM Control Delay, s	0	4.2	35.1
HCM LOS			E

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	250	322	-	-	731	-
HCM Lane V/C Ratio	0.063	0.67	-	-	0.274	-
HCM Control Delay (s)	20.4	36.2	-	-	11.8	-
HCM Lane LOS	C	E	-	-	B	-
HCM 95th %tile Q(veh)	0.2	4.5	-	-	1.1	-

SITE LAYOUT

Site: 6) Black Lake Belmore Rd at Black Lake Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 6) Black Lake Belmore Rd at Black Lake Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB Black Lake Belmore Rd											
3x	L2	221	1.0	0.457	8.8	LOS A	3.4	86.2	0.57	0.40	31.7
18x	R2	242	1.0	0.457	8.8	LOS A	3.4	86.2	0.57	0.40	30.9
Approach		463	1.0	0.457	8.8	LOS A	3.4	86.2	0.57	0.40	31.3
NorthEast: WB Black Lake Blvd											
1x	L2	263	0.0	0.674	13.8	LOS B	7.3	182.6	0.75	0.58	29.9
6x	T1	432	0.0	0.674	13.8	LOS B	7.3	182.6	0.75	0.58	29.9
Approach		695	0.0	0.674	13.8	LOS B	7.3	182.6	0.75	0.58	29.9
SouthWest: EB Black Lake Blvd											
2x	T1	200	3.0	0.313	7.2	LOS A	2.1	52.5	0.57	0.42	33.5
12x	R2	89	3.0	0.313	7.2	LOS A	2.1	52.5	0.57	0.42	32.7
Approach		289	3.0	0.313	7.2	LOS A	2.1	52.5	0.57	0.42	33.2
All Vehicles		1447	0.9	0.674	10.9	LOS B	7.3	182.6	0.66	0.49	30.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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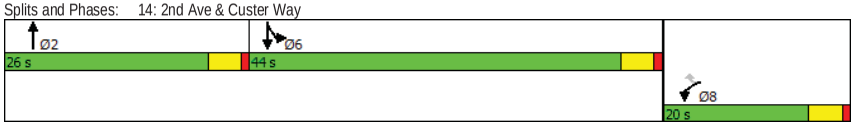
13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	1.3	1.8	0.9
Total Del/Veh (s)	0.7	0.9	0.8	49.8	43.1	33.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	235	260	15	320	915	310
Future Volume (vph)	235	260	15	320	915	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225		0	0	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	662		2035			505
Travel Time (s)	15.0		46.3			11.5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)					34%	
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	8		2		6	6
Permitted Phases		8				
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	10.0	10.0	24.5		20.0	20.0
Total Split (s)	20.0	20.0	26.0		44.0	44.0
Total Split (%)	22.2%	22.2%	28.9%		48.9%	48.9%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 74.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 14: 2nd Ave & Custer Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	235	260	15	320	915	310
Future Volume (veh/h)	235	260	15	320	915	310
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	247	121	16	184	644	772
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	291	260	20	224	926	972
Arrive On Green	0.16	0.16	0.15	0.15	0.51	0.51
Sat Flow, veh/h	1792	1599	129	1489	1810	1900
Grp Volume(v), veh/h	247	121	0	200	644	772
Grp Sat Flow(s),veh/h/ln	1792	1599	0	1618	1810	1900
Q Serve(g_s), s	10.3	5.3	0.0	9.2	20.8	25.8
Cycle Q Clear(g_c), s	10.3	5.3	0.0	9.2	20.8	25.8
Prop In Lane	1.00	1.00		0.92	1.00	
Lane Grp Cap(c), veh/h	291	260	0	244	926	972
V/C Ratio(X)	0.85	0.47	0.00	0.82	0.70	0.79
Avail Cap(c_a), veh/h	360	321	0	451	926	972
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	29.3	0.0	31.8	14.3	15.5
Incr Delay (d2), s/veh	12.3	0.5	0.0	2.6	4.3	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	2.4	0.0	4.3	11.3	15.1
LnGrp Delay(d),s/veh	43.7	29.8	0.0	34.4	18.6	22.1
LnGrp LOS	D	C		C	B	C
Approach Vol, veh/h	368		200			1416
Approach Delay, s/veh	39.1		34.4			20.5
Approach LOS	D		C			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		16.1				44.0		17.1
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		21.5				39.5		15.5
Max Q Clear Time (g_c+I1), s		11.2				27.8		12.3
Green Ext Time (p_c), s		0.5				6.1		0.2

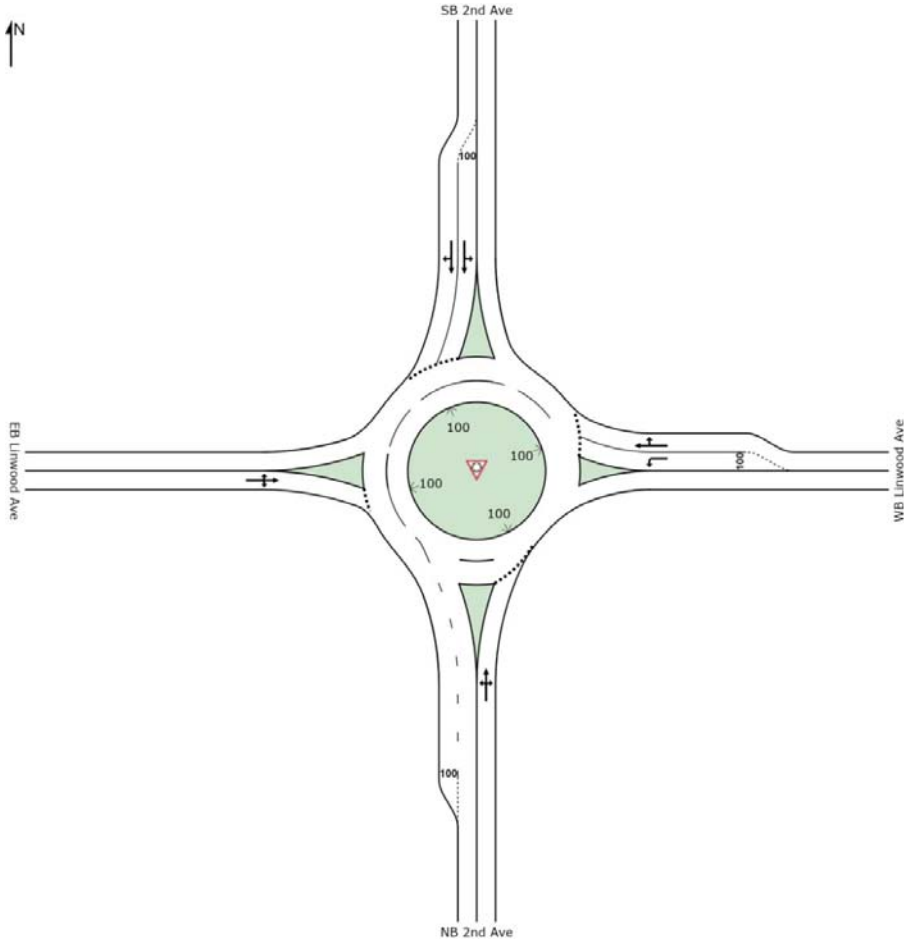
Intersection Summary	
HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C

Notes

SITE LAYOUT

Site: 25) Linwood Ave at 2nd Ave

Projected 2040 with Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 25) Linwood Ave at 2nd Ave

Projected 2040 with Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB 2nd Ave											
3	L2	189	2.0	0.780	23.6	LOS C	9.4	239.8	0.93	1.07	26.9
8	T1	321	2.0	0.780	23.6	LOS C	9.4	239.8	0.93	1.07	26.8
18	R2	68	2.0	0.780	23.6	LOS C	9.4	239.8	0.93	1.07	26.2
Approach		579	2.0	0.780	23.6	LOS C	9.4	239.8	0.93	1.07	26.8
East: WB Linwood Ave											
1	L2	263	2.0	0.401	11.1	LOS B	2.8	72.4	0.84	0.79	30.1
6	T1	321	2.0	0.479	10.8	LOS B	4.1	103.6	0.88	0.82	32.3
16	R2	68	2.0	0.479	10.8	LOS B	4.1	103.6	0.88	0.82	31.3
Approach		653	2.0	0.479	10.9	LOS B	4.1	103.6	0.87	0.81	31.2
North: SB 2nd Ave											
7	L2	189	2.0	0.679	17.0	LOS B	5.5	140.7	0.84	0.94	29.2
4	T1	347	2.0	0.679	17.0	LOS B	5.5	140.7	0.84	0.94	29.1
14	R2	189	2.0	0.359	12.4	LOS B	1.7	43.8	0.71	0.72	30.6
Approach		726	2.0	0.679	15.8	LOS B	5.5	140.7	0.81	0.88	29.5
West: EB Linwood Ave											
5	L2	137	2.0	0.803	33.0	LOS C	9.7	246.5	1.00	1.27	24.2
2	T1	153	2.0	0.803	33.0	LOS C	9.7	246.5	1.00	1.27	24.2
12	R2	137	2.0	0.803	33.0	LOS C	9.7	246.5	1.00	1.27	23.7
Approach		426	2.0	0.803	33.0	LOS C	9.7	246.5	1.00	1.27	24.0
All Vehicles		2384	2.0	0.803	19.4	LOS B	9.7	246.5	0.89	0.98	28.1

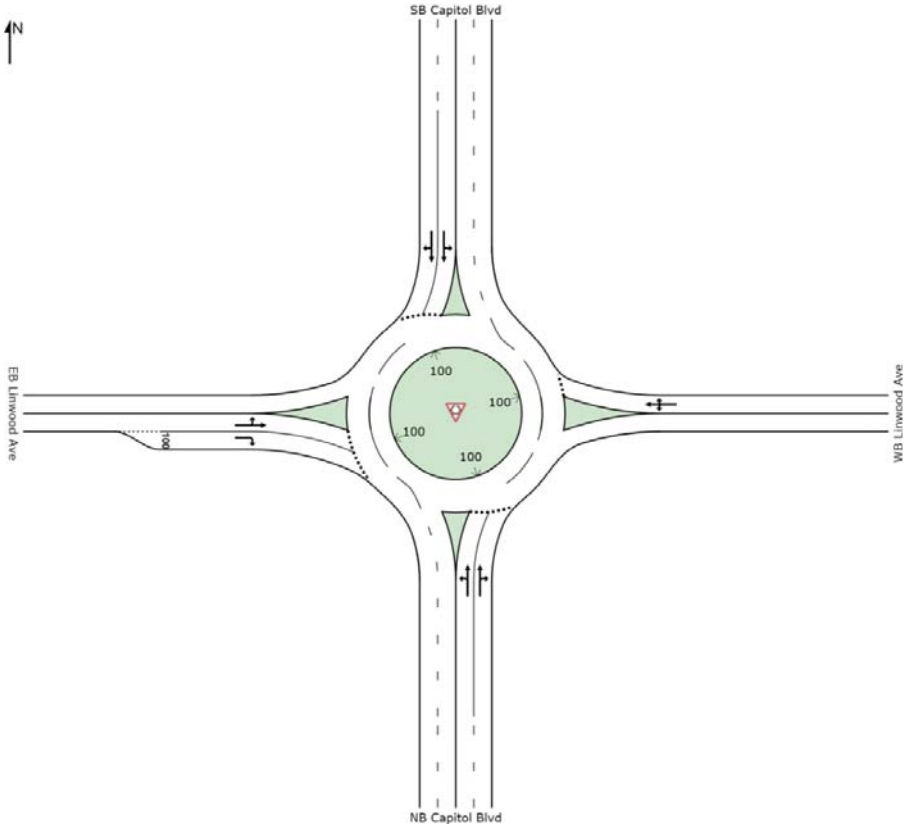
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 26) Linwood Ave at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 26) Linwood Ave at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Capitol Blvd											
3	L2	226	2.0	0.556	9.5	LOS A	5.3	133.8	0.56	0.34	32.2
8	T1	1147	2.0	0.556	9.1	LOS A	5.4	136.3	0.55	0.33	32.8
18	R2	16	2.0	0.556	8.9	LOS A	5.4	136.3	0.54	0.32	32.2
Approach		1389	2.0	0.556	9.2	LOS A	5.4	136.3	0.55	0.33	32.7
East: WB Linwood Ave											
1	L2	16	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	32.0
6	T1	5	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	31.8
16	R2	11	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	31.1
Approach		32	2.0	0.071	9.1	LOS A	0.3	7.4	0.72	0.72	31.6
North: SB Capitol Blvd											
7	L2	11	2.0	0.843	22.3	LOS C	15.5	393.4	0.98	0.88	27.8
4	T1	1500	2.0	0.843	21.7	LOS C	15.5	393.4	0.97	0.86	28.0
14	R2	421	2.0	0.843	20.7	LOS C	15.5	393.2	0.96	0.82	27.5
Approach		1932	2.0	0.843	21.5	LOS C	15.5	393.4	0.97	0.85	27.9
West: EB Linwood Ave											
5	L2	121	2.0	0.427	23.1	LOS C	2.2	57.1	0.87	0.91	26.1
2	T1	5	2.0	0.427	23.1	LOS C	2.2	57.1	0.87	0.91	26.0
12	R2	268	2.0	0.648	26.5	LOS C	4.5	115.5	0.95	1.05	25.6
Approach		395	2.0	0.648	25.4	LOS C	4.5	115.5	0.92	1.00	25.8
All Vehicles		3747	2.0	0.843	17.2	LOS B	15.5	393.4	0.81	0.67	29.3

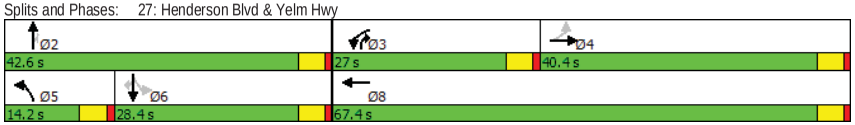
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	955	195	510	780	85	140	200	700	230	335	30
Future Volume (vph)	10	955	195	510	780	85	140	200	700	230	335	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	450		0	200		100	0		150
Storage Lanes	1		0	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1947			1645			444			1606	
Travel Time (s)		44.3			37.4			10.1			36.5	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Prot	NA		Prot	NA	pm+ov	Perm	NA	Perm
Protected Phases		4		3	8		5	2	3		6	
Permitted Phases	4								2	6		6
Detector Phase	4	4		3	8		5	2	3	6	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		5.0	6.0		5.0	6.0	5.0	6.0	6.0	6.0
Minimum Split (s)	24.5	24.5		9.5	24.5		9.5	24.5	9.5	24.5	24.5	24.5
Total Split (s)	40.4	40.4		27.0	67.4		14.2	42.6	27.0	28.4	28.4	28.4
Total Split (%)	36.7%	36.7%		24.5%	61.3%		12.9%	38.7%	24.5%	25.8%	25.8%	25.8%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag		Lead			Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes		Yes	Yes	Yes	Yes
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 109.3	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30
Future Volume (veh/h)	10	955	195	510	780	85	140	200	700	230	335	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	10	974	184	520	796	82	143	204	0	235	342	5
Adj No. of Lanes	1	2	0	2	2	0	1	1	1	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	274	983	185	515	1876	193	158	648	879	320	405	344
Arrive On Green	0.33	0.33	0.33	0.21	0.57	0.57	0.09	0.34	0.00	0.22	0.22	0.22
Sat Flow, veh/h	635	3002	566	2508	3272	337	1792	1881	1599	1185	1881	1599
Grp Volume(v), veh/h	10	579	579	520	435	443	143	204	0	235	342	5
Grp Sat Flow(s),veh/h/ln	635	1787	1781	1254	1787	1822	1792	1881	1599	1185	1881	1599
Q Serve(g_s), s	1.2	35.4	35.5	22.5	15.0	15.0	8.7	8.7	0.0	21.3	19.1	0.3
Cycle Q Clear(g_c), s	1.2	35.4	35.5	22.5	15.0	15.0	8.7	8.7	0.0	21.3	19.1	0.3
Prop In Lane	1.00		0.32	1.00		0.18	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	274	585	583	515	1025	1045	158	648	879	320	405	344
V/C Ratio(X)	0.04	0.99	0.99	1.01	0.42	0.42	0.90	0.31	0.00	0.73	0.85	0.01
Avail Cap(c_a), veh/h	274	585	583	515	1025	1045	158	653	883	324	410	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	36.7	36.8	43.6	13.2	13.2	49.5	26.4	0.0	42.2	41.3	33.9
Incr Delay (d2), s/veh	0.2	35.0	35.5	42.4	1.3	1.3	44.3	0.3	0.0	8.2	14.8	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	0.2	23.1	23.1	10.7	7.7	7.9	6.2	4.6	0.0	7.7	11.6	0.1
LnGrp Delay(d),s/veh	25.5	71.7	72.2	86.0	14.5	14.5	93.9	26.7	0.0	50.4	56.1	33.9
LnGrp LOS	C	E	E	F	B	B	F	C		D	E	C
Approach Vol, veh/h		1168			1398			347			582	
Approach Delay, s/veh		71.6			41.1			54.4			53.6	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		42.3	27.0	40.4	14.2	28.1		67.4
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		38.1	22.5	35.9	9.7	23.9		62.9
Max Q Clear Time (g_c+I1), s		10.7	24.5	37.5	10.7	23.3		17.0
Green Ext Time (p_c), s		4.5	0.0	0.0	0.0	0.3		22.4

Intersection Summary		
HCM 2010 Ctrl Delay	54.7	
HCM 2010 LOS	D	

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	110	265	425	135	150	165
Future Vol, veh/h	110	265	425	135	150	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	150	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	2	2
Mvmt Flow	116	279	447	142	158	174

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	589	0	-	0	1029	518
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	511	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	996	-	-	-	259	558
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	996	-	-	-	229	558
Mov Cap-2 Maneuver	-	-	-	-	427	-
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	532	-

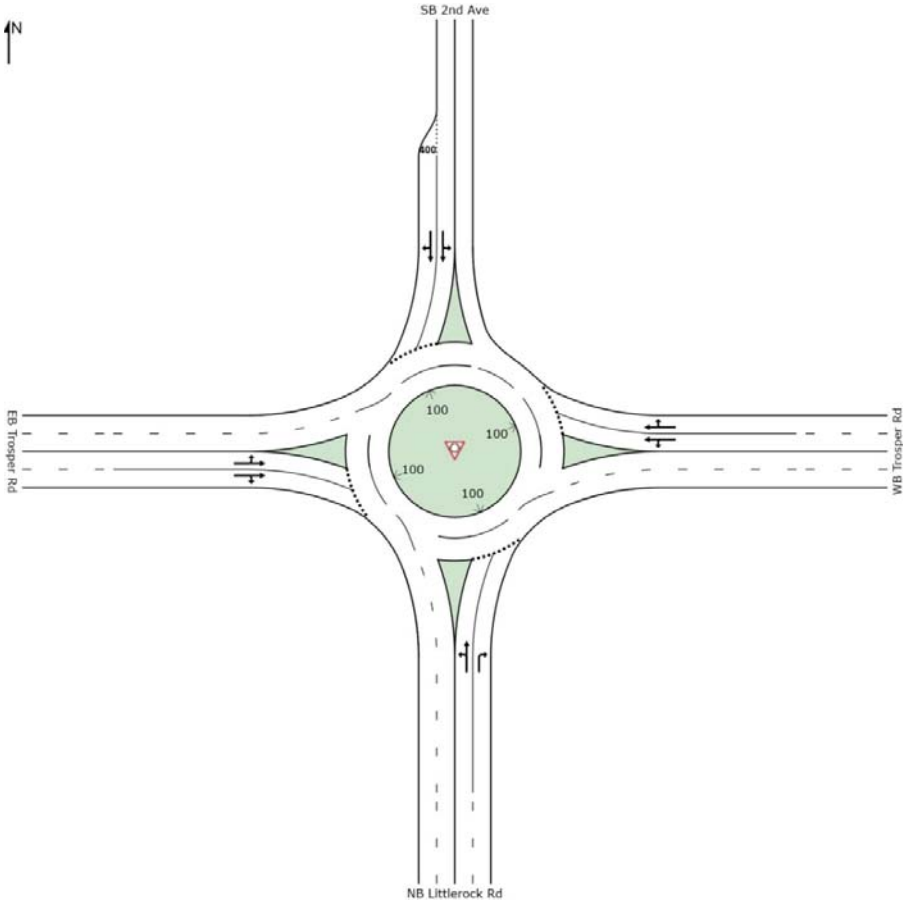
Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	996	-	-	-	427	558
HCM Lane V/C Ratio	0.116	-	-	-	0.37	0.311
HCM Control Delay (s)	9.1	-	-	-	18.3	14.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1.7	1.3

SITE LAYOUT

Site: 30) Trosper Rd at 2nd Ave/Littlerock Rd

Projected 2040 with imp
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 30) Trosper Rd at 2nd Ave/Littlerock Rd

Projected 2040 with imp
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Littlerock Rd											
3	L2	342	2.0	0.961	45.2	LOS D	18.5	469.2	1.00	1.50	21.4
8	T1	437	2.0	0.961	45.2	LOS D	18.5	469.2	1.00	1.50	21.4
18	R2	500	2.0	0.738	22.5	LOS C	6.5	164.8	0.88	1.01	26.9
Approach		1279	2.0	0.961	36.3	LOS D	18.5	469.2	0.95	1.31	23.2
East: WB Trosper Rd											
1	L2	453	2.0	0.853	38.8	LOS D	12.5	317.3	1.00	1.33	22.2
6	T1	384	2.0	0.853	42.1	LOS D	12.5	317.3	1.00	1.32	22.4
16	R2	21	2.0	0.853	42.1	LOS D	11.6	294.9	1.00	1.32	22.0
Approach		858	2.0	0.853	40.4	LOS D	12.5	317.3	1.00	1.32	22.3
North: SB 2nd Ave											
7	L2	174	2.0	0.751	30.1	LOS C	6.0	152.6	0.93	1.09	24.9
4	T1	516	2.0	0.751	27.7	LOS C	6.5	165.1	0.93	1.10	25.8
14	R2	116	2.0	0.751	26.2	LOS C	6.5	165.1	0.94	1.10	25.9
Approach		805	2.0	0.751	28.0	LOS C	6.5	165.1	0.93	1.10	25.6
West: EB Trosper Rd											
5	L2	89	2.0	0.636	21.2	LOS C	4.5	114.2	0.88	0.99	27.9
2	T1	458	2.0	0.636	20.0	LOS B	4.8	122.3	0.88	0.99	28.4
12	R2	184	2.0	0.636	18.5	LOS B	4.8	122.3	0.89	1.00	28.3
Approach		732	2.0	0.636	19.7	LOS B	4.8	122.3	0.88	0.99	28.3
All Vehicles		3674	2.0	0.961	32.1	LOS C	18.5	469.2	0.94	1.20	24.3

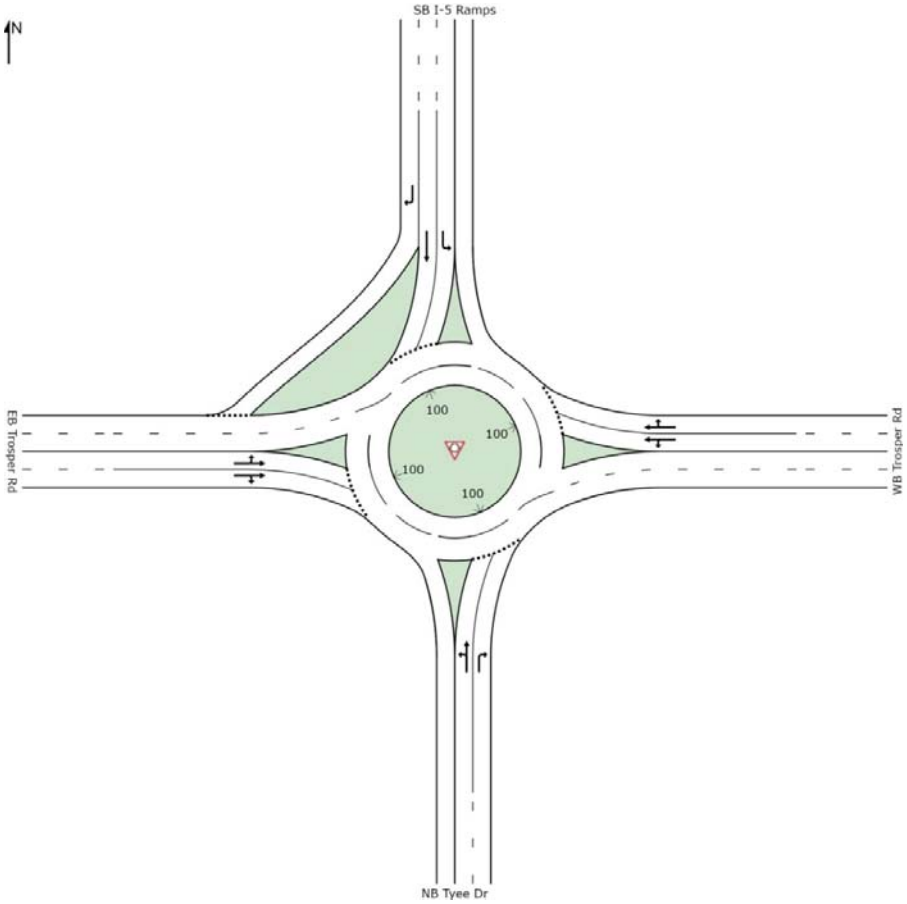
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 31) Tropser Rd at Tyee Dr/SB I-5 Ramps

Projected 2040 With Imp
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 31) Tropser Rd at Tyee Dr/SB I-5 Ramps

Projected 2040 With Imp
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Tyee Dr											
3	L2	37	2.0	0.571	25.9	LOS C	3.3	83.3	0.87	0.96	26.5
8	T1	163	2.0	0.571	25.9	LOS C	3.3	83.3	0.87	0.96	26.4
18	R2	458	2.0	0.918	50.9	LOS D	11.0	279.7	1.00	1.40	20.0
Approach		658	2.0	0.918	43.3	LOS D	11.0	279.7	0.96	1.26	21.6
East: WB Trosper Rd											
1	L2	289	2.0	0.564	11.6	LOS B	4.5	113.3	0.72	0.66	30.8
6	T1	358	2.0	0.564	11.5	LOS B	4.5	114.2	0.71	0.66	31.2
16	R2	421	2.0	0.564	11.2	LOS B	4.5	114.2	0.71	0.65	31.1
Approach		1068	2.0	0.564	11.4	LOS B	4.5	114.2	0.71	0.65	31.1
North: SB I-5 Ramps											
7	L2	405	2.0	0.472	10.2	LOS B	3.0	77.1	0.73	0.74	30.4
4	T1	453	2.0	0.426	8.0	LOS A	2.7	68.2	0.70	0.64	33.7
14	R2	500	2.0	0.399	6.8	LOS A	2.3	59.2	0.54	0.43	33.2
Approach		1358	2.0	0.472	8.2	LOS A	3.0	77.1	0.65	0.59	32.5
West: EB Trosper Rd											
5	L2	216	2.0	0.898	44.3	LOS D	10.4	264.7	0.96	1.33	21.6
2	T1	842	2.0	0.898	41.1	LOS D	11.3	288.1	0.97	1.34	22.5
12	R2	26	2.0	0.898	39.5	LOS D	11.3	288.1	0.98	1.35	22.5
Approach		1084	2.0	0.898	41.7	LOS D	11.3	288.1	0.97	1.34	22.3
All Vehicles		4168	2.0	0.918	23.3	LOS C	11.3	288.1	0.80	0.91	26.9

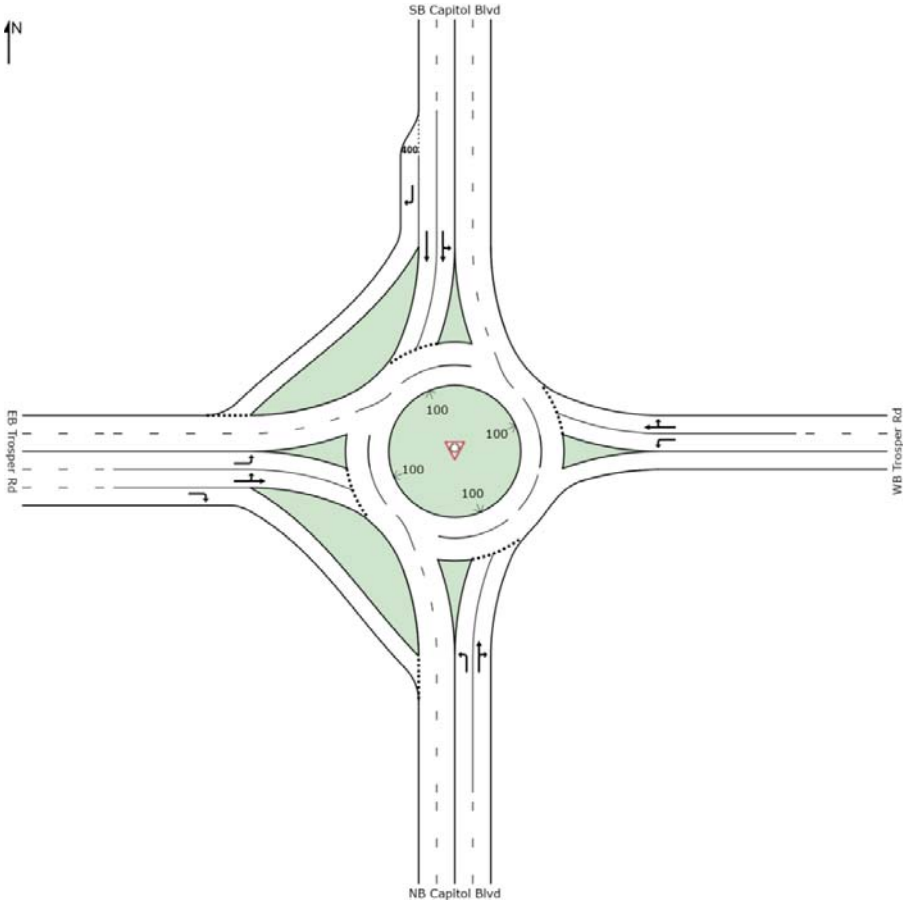
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HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 33) Trosper Rd at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 33) Trosper Rd at Capitol Blvd

Projected 2040 With Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Capitol Blvd											
3	L2	697	2.0	0.933	41.9	LOS D	15.0	380.4	1.00	1.44	18.9
8	T1	778	2.0	0.944	41.0	LOS D	16.7	424.4	1.00	1.47	21.4
18	R2	10	2.0	0.944	41.0	LOS D	16.7	424.4	1.00	1.47	19.0
Approach		1485	2.0	0.944	41.4	LOS D	16.7	424.4	1.00	1.46	20.1
East: WB Trosper Rd											
1	L2	51	2.0	0.208	19.7	LOS B	1.0	24.1	0.87	0.87	22.7
6	T1	253	2.0	0.805	43.2	LOS D	7.0	176.9	0.98	1.36	17.4
16	R2	51	2.0	0.805	43.2	LOS D	7.0	176.9	0.98	1.36	18.7
Approach		354	2.0	0.805	39.8	LOS D	7.0	176.9	0.96	1.29	18.2
North: SB Capitol Blvd											
7	L2	35	2.0	0.695	21.1	LOS C	5.9	149.7	0.93	1.06	23.8
4	T1	995	2.0	0.695	18.5	LOS B	6.7	170.6	0.94	1.07	27.0
14	R2	657	2.0	0.782	21.7	LOS C	8.7	221.1	0.99	1.17	22.4
Approach		1687	2.0	0.782	19.8	LOS B	8.7	221.1	0.96	1.11	25.0
West: EB Trosper Rd											
5	L2	601	2.0	0.516	11.1	LOS B	3.6	91.4	0.82	0.87	24.9
2	T1	66	2.0	0.516	11.2	LOS B	3.6	91.4	0.84	0.90	22.3
12	R2	465	2.0	0.533	11.4	LOS B	3.8	96.6	0.84	0.91	25.0
Approach		1131	2.0	0.533	11.2	LOS B	3.8	96.6	0.83	0.89	24.8
All Vehicles		4657	2.0	0.944	26.1	LOS C	16.7	424.4	0.94	1.18	22.5

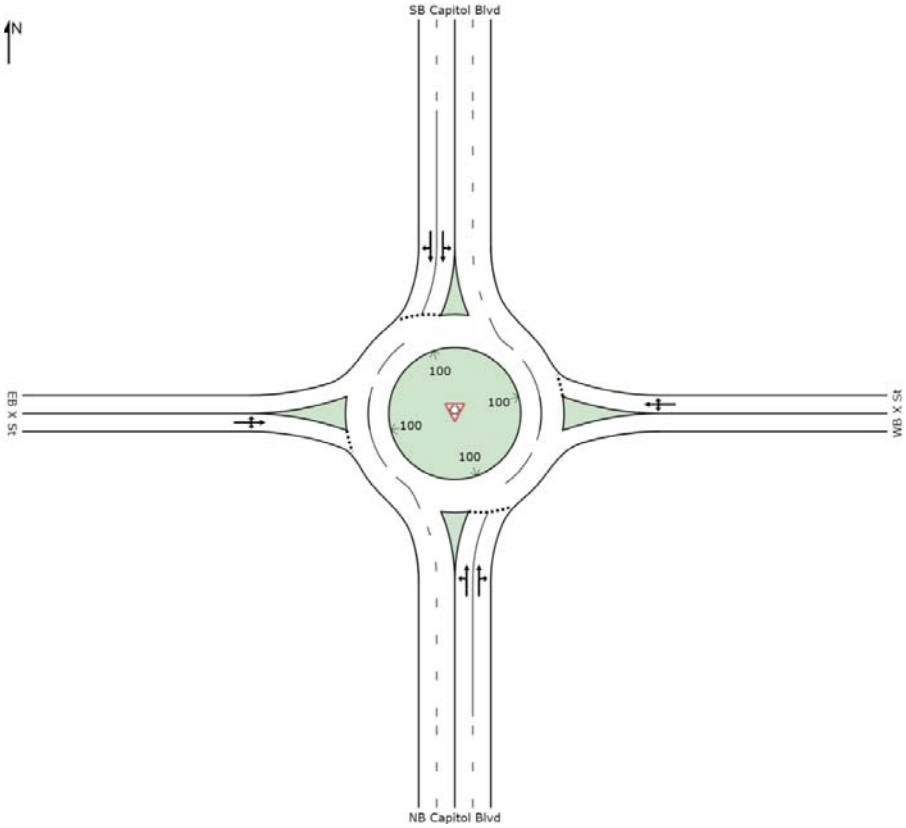
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 38) X St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 38) X St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Capitol Blvd											
3	L2	26	2.0	0.481	7.7	LOS A	3.9	99.9	0.35	0.17	33.8
8	T1	1253	2.0	0.481	7.5	LOS A	4.0	100.5	0.34	0.16	33.9
18	R2	21	2.0	0.481	7.3	LOS A	4.0	100.5	0.33	0.16	32.9
Approach		1300	2.0	0.481	7.5	LOS A	4.0	100.5	0.34	0.16	33.9
East: WB X St											
1	L2	37	2.0	0.118	8.2	LOS A	0.5	11.5	0.66	0.66	32.2
6	T1	5	2.0	0.118	8.2	LOS A	0.5	11.5	0.66	0.66	32.0
16	R2	21	2.0	0.118	8.2	LOS A	0.5	11.5	0.66	0.66	31.2
Approach		63	2.0	0.118	8.2	LOS A	0.5	11.5	0.66	0.66	31.8
North: SB Capitol Blvd											
7	L2	37	2.0	0.495	7.9	LOS A	4.2	107.4	0.35	0.16	33.6
4	T1	1253	2.0	0.495	7.7	LOS A	4.3	108.1	0.34	0.16	33.8
14	R2	53	2.0	0.495	7.5	LOS A	4.3	108.1	0.33	0.15	32.8
Approach		1342	2.0	0.495	7.7	LOS A	4.3	108.1	0.34	0.16	33.7
West: EB X St											
5	L2	32	2.0	0.110	8.2	LOS A	0.4	10.8	0.66	0.66	32.3
2	T1	5	2.0	0.110	8.2	LOS A	0.4	10.8	0.66	0.66	32.1
12	R2	21	2.0	0.110	8.2	LOS A	0.4	10.8	0.66	0.66	31.3
Approach		58	2.0	0.110	8.2	LOS A	0.4	10.8	0.66	0.66	31.9
All Vehicles		2763	2.0	0.495	7.6	LOS A	4.3	108.1	0.35	0.18	33.7

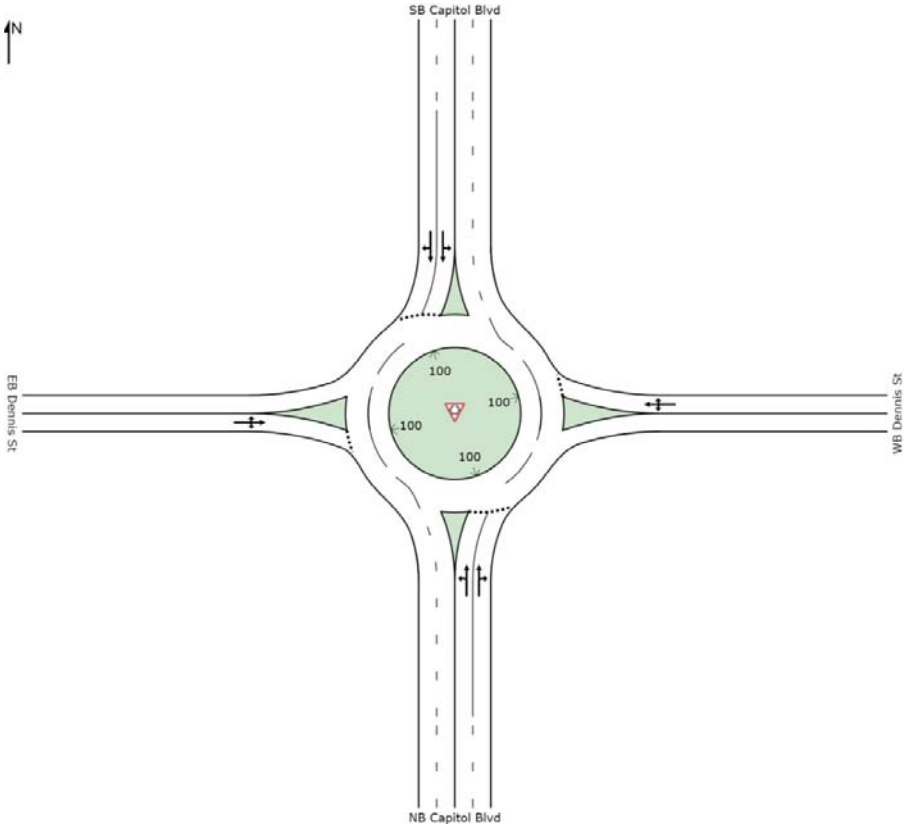
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 40) Dennis St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 40) Dennis St at Capitol Blvd

Projected 2040 with Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Capitol Blvd											
3	L2	21	2.0	0.467	9.1	LOS A	3.5	89.4	0.68	0.54	33.1
8	T1	921	2.0	0.467	8.7	LOS A	3.6	92.6	0.67	0.52	33.3
18	R2	42	2.0	0.467	8.4	LOS A	3.6	92.6	0.67	0.51	32.4
Approach		984	2.0	0.467	8.7	LOS A	3.6	92.6	0.67	0.52	33.2
East: WB Dennis St											
1	L2	42	2.0	0.293	11.5	LOS B	1.3	33.6	0.74	0.74	31.4
6	T1	26	2.0	0.293	11.5	LOS B	1.3	33.6	0.74	0.74	31.3
16	R2	79	2.0	0.293	11.5	LOS B	1.3	33.6	0.74	0.74	30.5
Approach		147	2.0	0.293	11.5	LOS B	1.3	33.6	0.74	0.74	30.9
North: SB Capitol Blvd											
7	L2	47	2.0	0.466	7.6	LOS A	3.9	98.8	0.39	0.20	33.7
4	T1	1053	2.0	0.466	7.4	LOS A	3.9	99.9	0.39	0.20	33.9
14	R2	132	2.0	0.466	7.2	LOS A	3.9	99.9	0.38	0.19	32.9
Approach		1232	2.0	0.466	7.4	LOS A	3.9	99.9	0.39	0.20	33.8
West: EB Dennis St											
5	L2	237	2.0	0.562	17.1	LOS B	3.2	81.9	0.78	0.86	28.3
2	T1	42	2.0	0.562	17.1	LOS B	3.2	81.9	0.78	0.86	28.2
12	R2	37	2.0	0.562	17.1	LOS B	3.2	81.9	0.78	0.86	27.6
Approach		316	2.0	0.562	17.1	LOS B	3.2	81.9	0.78	0.86	28.2
All Vehicles		2679	2.0	0.562	9.3	LOS A	3.9	99.9	0.56	0.42	32.6

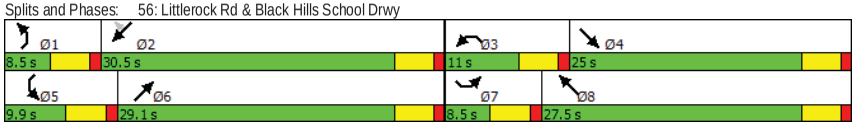
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
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Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	5	25	10	100	50	25	15	275	50	25	535	70
Future Volume (vph)	5	25	10	100	50	25	15	275	50	25	535	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	175		0	100		350
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1065			515			1067			3970	
Travel Time (s)		24.2			11.7			24.3			90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	2%	2%	2%	1%	1%	2%	2%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												2
Detector Phase	7	4		3	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	4.0	7.0		4.0	7.0		4.0	7.0		4.0	7.0	7.0
Minimum Split (s)	8.5	24.5		8.5	27.5		8.5	24.5		8.5	27.5	27.5
Total Split (s)	8.5	25.0		11.0	27.5		8.5	29.1		9.9	30.5	30.5
Total Split (%)	11.3%	33.3%		14.7%	36.7%		11.3%	38.8%		13.2%	40.7%	40.7%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max		None	None		None	Max		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 67.1	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 56: Littlerock Rd & Black Hills School Drwy



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	5	25	10	100	50	25	15	275	50	25	535	70
Future Volume (veh/h)	5	25	10	100	50	25	15	275	50	25	535	70
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1874	1900	1863	1863	1900	1881	1878	1900	1863	1881	1881
Adj Flow Rate, veh/h	5	26	11	105	53	26	16	289	53	26	563	74
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	1	1	1	2	1	1
Cap, veh/h	97	366	155	134	372	182	27	543	100	40	675	574
Arrive On Green	0.05	0.29	0.29	0.08	0.31	0.31	0.02	0.35	0.35	0.02	0.36	0.36
Sat Flow, veh/h	1810	1251	529	1774	1181	579	1792	1545	283	1774	1881	1599
Grp Volume(v), veh/h	5	0	37	105	0	79	16	0	342	26	563	74
Grp Sat Flow(s),veh/h/ln	1810	0	1780	1774	0	1760	1792	0	1828	1774	1881	1599
Q Serve(g_s), s	0.2	0.0	1.1	4.1	0.0	2.3	0.6	0.0	10.4	1.0	19.2	2.2
Cycle Q Clear(g_c), s	0.2	0.0	1.1	4.1	0.0	2.3	0.6	0.0	10.4	1.0	19.2	2.2
Prop In Lane	1.00		0.30	1.00		0.33	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	97	0	522	134	0	554	27	0	643	40	675	574
V/C Ratio(X)	0.05	0.00	0.07	0.78	0.00	0.14	0.58	0.00	0.53	0.65	0.83	0.13
Avail Cap(c_a), veh/h	103	0	522	165	0	579	102	0	643	137	699	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	0.0	17.9	31.8	0.0	17.2	34.2	0.0	18.1	33.9	20.5	15.1
Incr Delay (d2), s/veh	0.2	0.0	0.3	17.7	0.0	0.1	7.1	0.0	3.1	16.0	8.5	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	0.1	0.0	0.6	2.6	0.0	1.1	0.4	0.0	5.8	0.7	11.5	1.0
LnGrp Delay(d),s/veh	31.6	0.0	18.1	49.5	0.0	17.3	41.4	0.0	21.2	50.0	29.1	15.2
LnGrp LOS	C		B	D		B	D		C	D	C	B
Approach Vol, veh/h		42			184			358			663	
Approach Delay, s/veh		19.7			35.7			22.1			28.3	
Approach LOS		B			D			C			C	

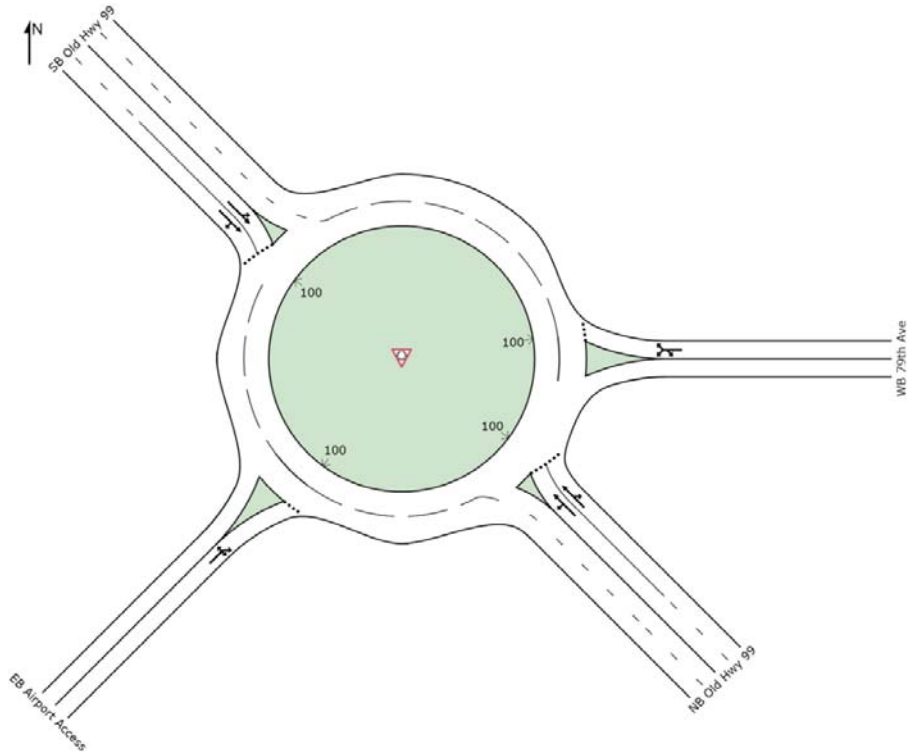
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	29.6	9.8	25.0	6.1	29.1	8.3	26.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	26.0	6.5	20.5	5.4	24.6	4.0	23.0
Max Q Clear Time (g_c+I1), s	2.6	21.2	6.1	3.1	3.0	12.4	2.2	4.3
Green Ext Time (p_c), s	0.0	2.8	0.0	0.6	0.0	5.6	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	27.4
HCM 2010 LOS	C

SITE LAYOUT

Site: 59) 79th Ave at Old Hwy 99

Projected 2040 with Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 59) 79th Ave at Old Hwy 99

Projected 2040 with Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB Old Hwy 99											
3x	L2	1	1.0	0.272	5.4	LOS A	1.7	41.8	0.36	0.21	35.2
8x	T1	679	1.0	0.272	5.2	LOS A	1.7	42.3	0.36	0.20	35.2
18bx	R3	21	1.0	0.272	5.0	LOS A	1.7	42.3	0.35	0.19	33.7
Approach		701	1.0	0.272	5.2	LOS A	1.7	42.3	0.36	0.20	35.1
East: WB 79th Ave											
1b	L3	32	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56	34.0
1a	L1	1	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56	33.1
16a	R1	132	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56	33.2
Approach		164	1.0	0.224	7.5	LOS A	0.9	23.0	0.57	0.56	33.3
NorthWest: SB Old Hwy 99											
7ax	L1	137	1.0	0.588	9.3	LOS A	6.4	160.8	0.29	0.10	32.4
4x	T1	1526	1.0	0.588	9.0	LOS A	6.4	161.3	0.28	0.10	33.0
14x	R2	1	1.0	0.588	8.9	LOS A	6.4	161.3	0.28	0.10	32.2
Approach		1664	1.0	0.588	9.1	LOS A	6.4	161.3	0.28	0.10	33.0
SouthWest: EB Airport Access											
5x	L2	1	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65	33.5
12ax	R1	1	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65	33.0
12x	R2	11	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65	32.5
Approach		13	2.0	0.027	8.1	LOS A	0.1	2.6	0.69	0.65	32.6
All Vehicles		2542	1.0	0.588	7.9	LOS A	6.4	161.3	0.32	0.16	33.6

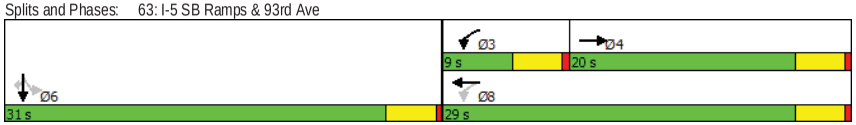
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: SCJ ALLIANCE | Processed: Wednesday, February 17, 2016 3:14:11 PM
Project: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Operations\sidra\2040 With Imp\59) 79th Ave at Old Hwy 99.sip6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Future Volume (vph)	0	415	95	85	305	0	0	0	0	475	0	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		300
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			40			30			30	
Link Distance (ft)		732			936			1099			1644	
Travel Time (s)		16.6			16.0			25.0			37.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)												
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases				8						6		6
Detector Phase		4		3	8					6	6	6
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	4.0
Minimum Split (s)		20.0		8.0	20.0					20.0	20.0	20.0
Total Split (s)		20.0		9.0	29.0					31.0	31.0	31.0
Total Split (%)		33.3%		15.0%	48.3%					51.7%	51.7%	51.7%
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	3.5
All-Red Time (s)		0.5		0.5	0.5					0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		4.0		4.0	4.0						4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	None					Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 55.5	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 63: I-5 SB Ramps & 93rd Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	415	95	85	305	0	0	0	0	475	0	425
Future Volume (veh/h)	0	415	95	85	305	0	0	0	0	475	0	425
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1900	1743	1743	0				1900	1827	1827
Adj Flow Rate, veh/h	0	437	100	89	321	0				500	0	268
Adj No. of Lanes	0	2	0	1	2	0				0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	9	9	0				4	4	4
Cap, veh/h	0	657	149	296	1180	0				864	0	771
Arrive On Green	0.00	0.23	0.23	0.06	0.36	0.00				0.50	0.00	0.50
Sat Flow, veh/h	0	2989	657	1660	3399	0				1740	0	1553
Grp Volume(v), veh/h	0	268	269	89	321	0				500	0	268
Grp Sat Flow(s),veh/h/ln	0	1787	1765	1660	1656	0				1740	0	1553
Q Serve(g_s), s	0.0	7.4	7.5	2.1	3.8	0.0				11.0	0.0	5.7
Cycle Q Clear(g_c), s	0.0	7.4	7.5	2.1	3.8	0.0				11.0	0.0	5.7
Prop In Lane	0.00		0.37	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	405	400	296	1180	0				864	0	771
V/C Ratio(X)	0.00	0.66	0.67	0.30	0.27	0.00				0.58	0.00	0.35
Avail Cap(c_a), veh/h	0	526	519	356	1523	0				864	0	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.1	19.2	14.2	12.5	0.0				9.7	0.0	8.3
Incr Delay (d2), s/veh	0.0	2.0	2.2	0.6	0.1	0.0				2.8	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	3.9	1.0	1.7	0.0				6.0	0.0	2.6
LnGrp Delay(d),s/veh	0.0	21.1	21.4	14.8	12.6	0.0				12.5	0.0	9.6
LnGrp LOS		C	C	B	B					B		A
Approach Vol, veh/h		537			410						768	
Approach Delay, s/veh		21.2			13.1						11.5	
Approach LOS		C			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			7.0	16.3		31.0		23.4
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			5.0	16.0		27.0		25.0
Max Q Clear Time (g_c+I1), s			4.1	9.5		13.0		5.8
Green Ext Time (p_c), s			0.0	2.8		3.7		5.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	555	0	0	290	425	130	0	155	0	0	0
Future Volume (vph)	290	555	0	0	290	425	130	0	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	0		300	0		200	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		936			1635			1212			341	
Travel Time (s)		16.0			27.9			27.5			7.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	3%	3%	8%	8%	8%	14%	14%	14%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Minimum Split (s)	8.0	20.0			20.0	20.0	20.0	20.0	20.0			
Total Split (s)	19.0	39.0			20.0	20.0	21.0	21.0	21.0			
Total Split (%)	31.7%	65.0%			33.3%	33.3%	35.0%	35.0%	35.0%			
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5	3.5			
All-Red Time (s)	0.5	0.5			0.5	0.5	0.5	0.5	0.5			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0	0.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	None			None	None	Min	Min	Min			

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 45.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 64: I-5 NB Ramps & 93rd Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	290	555	0	0	290	425	130	0	155	0	0	0
Future Volume (veh/h)	290	555	0	0	290	425	130	0	155	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1759	1759	1900	1667	1667			
Adj Flow Rate, veh/h	305	584	0	0	305	0	137	0	0			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	3	3	0	0	8	8	14	14	14			
Cap, veh/h	395	2124	0	0	875	391	246	0	219			
Arrive On Green	0.22	0.61	0.00	0.00	0.26	0.00	0.15	0.00	0.00			
Sat Flow, veh/h	1757	3597	0	0	3431	1495	1587	0	1417			
Grp Volume(v), veh/h	305	584	0	0	305	0	137	0	0			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1671	1495	1587	0	1417			
Q Serve(g_s), s	5.5	2.6	0.0	0.0	2.5	0.0	2.7	0.0	0.0			
Cycle Q Clear(g_c), s	5.5	2.6	0.0	0.0	2.5	0.0	2.7	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	395	2124	0	0	875	391	246	0	219			
V/C Ratio(X)	0.77	0.27	0.00	0.00	0.35	0.00	0.56	0.00	0.00			
Avail Cap(c_a), veh/h	787	3665	0	0	1598	715	806	0	719			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	12.2	3.1	0.0	0.0	10.0	0.0	13.1	0.0	0.0			
Incr Delay (d2), s/veh	3.2	0.1	0.0	0.0	0.2	0.0	2.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.0	1.2	0.0	0.0	1.2	0.0	1.3	0.0	0.0			
LnGrp Delay(d),s/veh	15.4	3.2	0.0	0.0	10.3	0.0	15.1	0.0	0.0			
LnGrp LOS	B	A			B		B					
Approach Vol, veh/h		889			305			137				
Approach Delay, s/veh		7.4			10.3			15.1				
Approach LOS		A			B			B				

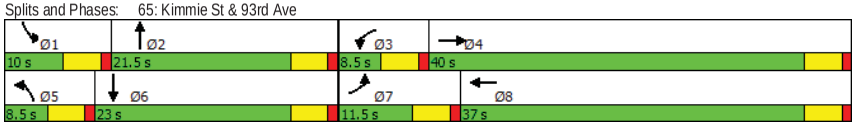
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		9.2		24.3			11.5	12.8
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		17.0		35.0			15.0	16.0
Max Q Clear Time (g_c+I1), s		4.7		4.6			7.5	4.5
Green Ext Time (p_c), s		0.5		6.3			0.5	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	535	5	5	475	15	15	1	10	30	15	110
Future Volume (vph)	55	535	5	5	475	15	15	1	10	30	15	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		250	100		0	100		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		1635			3676			860			5320	
Travel Time (s)		27.9			62.7			19.5			120.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	0%	0%	0%	5%	5%	5%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	20.5		8.5	20.5	
Total Split (s)	11.5	40.0		8.5	37.0		8.5	21.5		10.0	23.0	
Total Split (%)	14.4%	50.0%		10.6%	46.3%		10.6%	26.9%		12.5%	28.8%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 40.5	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 65: Kimmie St & 93rd Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	535	5	5	475	15	15	1	10	30	15	110
Future Volume (veh/h)	55	535	5	5	475	15	15	1	10	30	15	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1881	1881	1900	1900	1900	1900	1810	1810	1900
Adj Flow Rate, veh/h	58	563	5	5	500	16	16	1	11	32	16	116
Adj No. of Lanes	1	1	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	1	1	1	0	0	0	5	5	5
Cap, veh/h	80	803	7	10	1428	46	29	17	185	50	26	188
Arrive On Green	0.05	0.44	0.44	0.01	0.40	0.40	0.02	0.12	0.12	0.03	0.14	0.14
Sat Flow, veh/h	1740	1808	16	1792	3535	113	1810	136	1499	1723	190	1377
Grp Volume(v), veh/h	58	0	568	5	252	264	16	0	12	32	0	132
Grp Sat Flow(s),veh/h/ln	1740	0	1824	1792	1787	1861	1810	0	1635	1723	0	1567
Q Serve(g_s), s	1.5	0.0	11.4	0.1	4.4	4.5	0.4	0.0	0.3	0.8	0.0	3.6
Cycle Q Clear(g_c), s	1.5	0.0	11.4	0.1	4.4	4.5	0.4	0.0	0.3	0.8	0.0	3.6
Prop In Lane	1.00		0.01	1.00		0.06	1.00		0.92	1.00		0.88
Lane Grp Cap(c), veh/h	80	0	810	10	722	752	29	0	202	50	0	214
V/C Ratio(X)	0.73	0.00	0.70	0.52	0.35	0.35	0.55	0.00	0.06	0.63	0.00	0.62
Avail Cap(c_a), veh/h	269	0	1430	158	1283	1336	160	0	614	209	0	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	10.2	22.5	9.4	9.4	22.1	0.0	17.5	21.7	0.0	18.4
Incr Delay (d2), s/veh	11.9	0.0	1.1	37.0	0.3	0.3	15.1	0.0	0.1	12.4	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	5.9	0.2	2.2	2.3	0.3	0.0	0.1	0.6	0.0	1.7
LnGrp Delay(d),s/veh	33.3	0.0	11.3	59.5	9.7	9.7	37.2	0.0	17.6	34.2	0.0	21.3
LnGrp LOS	C		B	E	A	A	D		B	C		C
Approach Vol, veh/h		626			521			28			164	
Approach Delay, s/veh		13.3			10.1			28.8			23.8	
Approach LOS		B			B			C			C	

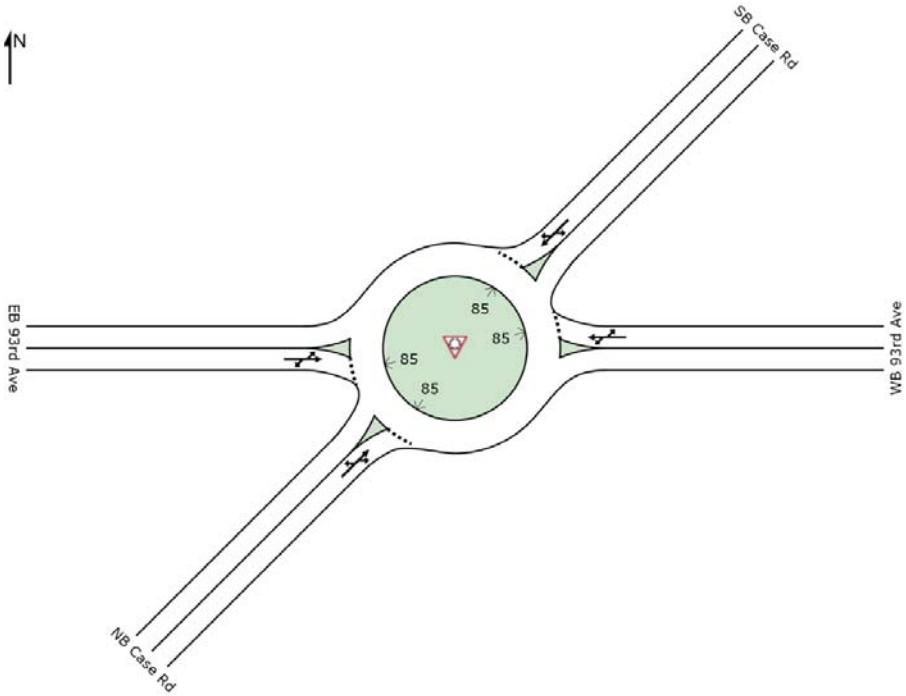
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	10.1	4.7	24.6	5.2	10.7	6.6	22.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	17.0	4.0	35.5	4.0	18.5	7.0	32.5
Max Q Clear Time (g_c+I1), s	2.8	2.3	2.1	13.4	2.4	5.6	3.5	6.5
Green Ext Time (p_c), s	0.0	0.6	0.0	6.7	0.0	0.6	0.0	7.1

Intersection Summary			
HCM 2010 Ctrl Delay		13.7	
HCM 2010 LOS		B	

SITE LAYOUT

Site: 66) Case Rd at 93rd Ave

Projected 2040 With Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 66) Case Rd at 93rd Ave

Projected 2040 With Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: WB 93rd Ave											
1a	L1	253	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	30.1
6	T1	379	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	30.4
16b	R3	68	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	29.4
Approach		700	2.0	0.659	13.0	LOS B	7.1	179.9	0.66	0.42	30.2
NorthEast: SB Case Rd											
1bx	L3	147	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	30.0
6x	T1	84	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	29.8
16ax	R1	5	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	29.6
Approach		237	2.0	0.407	12.4	LOS B	2.9	72.4	0.85	0.85	29.9
West: EB 93rd Ave											
5a	L1	5	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	26.7
2	T1	458	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	27.0
12b	R3	147	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	26.2
Approach		611	2.0	0.789	23.7	LOS C	11.1	282.6	0.98	1.14	26.8
SouthWest: NB Case Rd											
5bx	L3	89	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.6
2x	T1	37	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.4
12ax	R1	53	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.2
Approach		179	2.0	0.280	9.2	LOS A	1.8	45.8	0.78	0.71	31.4
All Vehicles		1726	2.0	0.789	16.3	LOS B	11.1	282.6	0.81	0.76	29.0

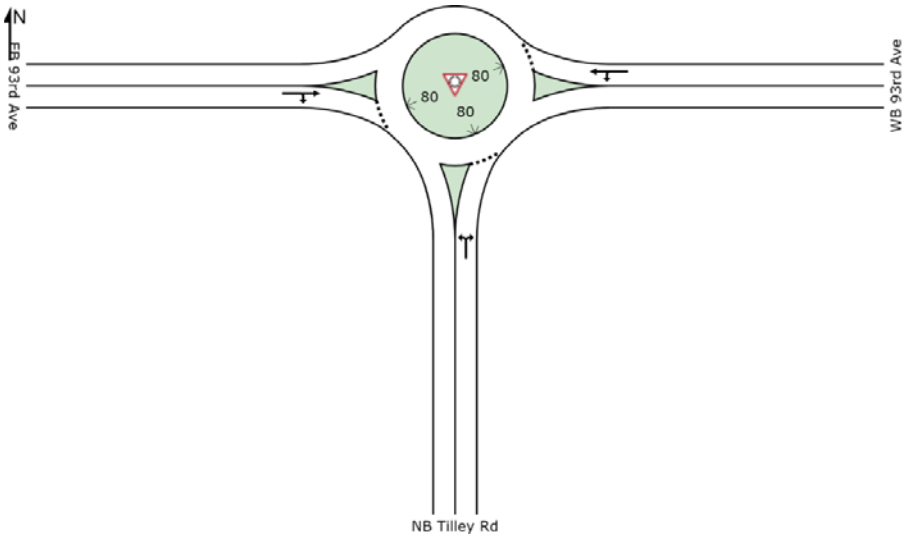
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 67) 93rd Ave at Tilley Rd (South)

Projected 2040 with Improvements
Roundabout



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MOVEMENT SUMMARY

Site: 67) 93rd Ave at Tilley Rd (South)

Projected 2040 with Improvements
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Tilley Rd											
3	L2	179	2.0	0.345	8.8	LOS A	2.3	58.9	0.71	0.60	31.2
18	R2	89	2.0	0.345	8.8	LOS A	2.3	58.9	0.71	0.60	30.5
Approach		268	2.0	0.345	8.8	LOS A	2.3	58.9	0.71	0.60	31.0
East: WB 93rd Ave											
1	L2	279	2.0	0.788	19.4	LOS B	12.0	305.6	0.89	0.70	27.8
6	T1	511	2.0	0.788	19.4	LOS B	12.0	305.6	0.89	0.70	27.8
Approach		789	2.0	0.788	19.4	LOS B	12.0	305.6	0.89	0.70	27.8
West: EB 93rd Ave											
2	T1	405	2.0	0.732	17.9	LOS B	9.5	241.7	0.90	0.82	28.9
12	R2	247	2.0	0.732	17.9	LOS B	9.5	241.7	0.90	0.82	28.3
Approach		653	2.0	0.732	17.9	LOS B	9.5	241.7	0.90	0.82	28.7
All Vehicles		1711	2.0	0.788	17.2	LOS B	12.0	305.6	0.86	0.73	28.6

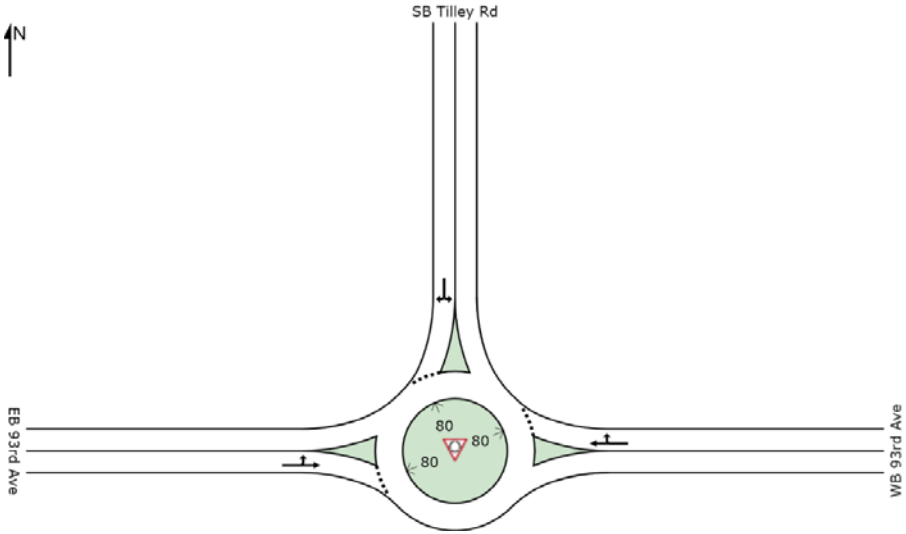
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 68) 93rd Ave at Tilley Rd (Notth)

Projected 2040 with Improvements
Roundabout



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MOVEMENT SUMMARY

Site: 68) 93rd Ave at Tilley Rd (Notth)

Projected 2040 with Improvements
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: WB 93rd Ave											
6	T1	358	2.0	0.398	7.6	LOS A	2.9	74.5	0.44	0.26	33.4
16	R2	68	2.0	0.398	7.6	LOS A	2.9	74.5	0.44	0.26	32.5
Approach		426	2.0	0.398	7.6	LOS A	2.9	74.5	0.44	0.26	33.2
North: SB Tilley Rd											
7	L2	179	2.0	0.712	17.4	LOS B	8.5	215.1	0.87	0.87	28.4
14	R2	432	2.0	0.712	17.4	LOS B	8.5	215.1	0.87	0.87	27.9
Approach		611	2.0	0.712	17.4	LOS B	8.5	215.1	0.87	0.87	28.0
West: EB 93rd Ave											
5	L2	121	2.0	0.503	9.7	LOS A	4.2	106.7	0.61	0.42	31.7
2	T1	379	2.0	0.503	9.7	LOS A	4.2	106.7	0.61	0.42	31.8
Approach		500	2.0	0.503	9.7	LOS A	4.2	106.7	0.61	0.42	31.8
All Vehicles		1537	2.0	0.712	12.2	LOS B	8.5	215.1	0.67	0.55	30.5

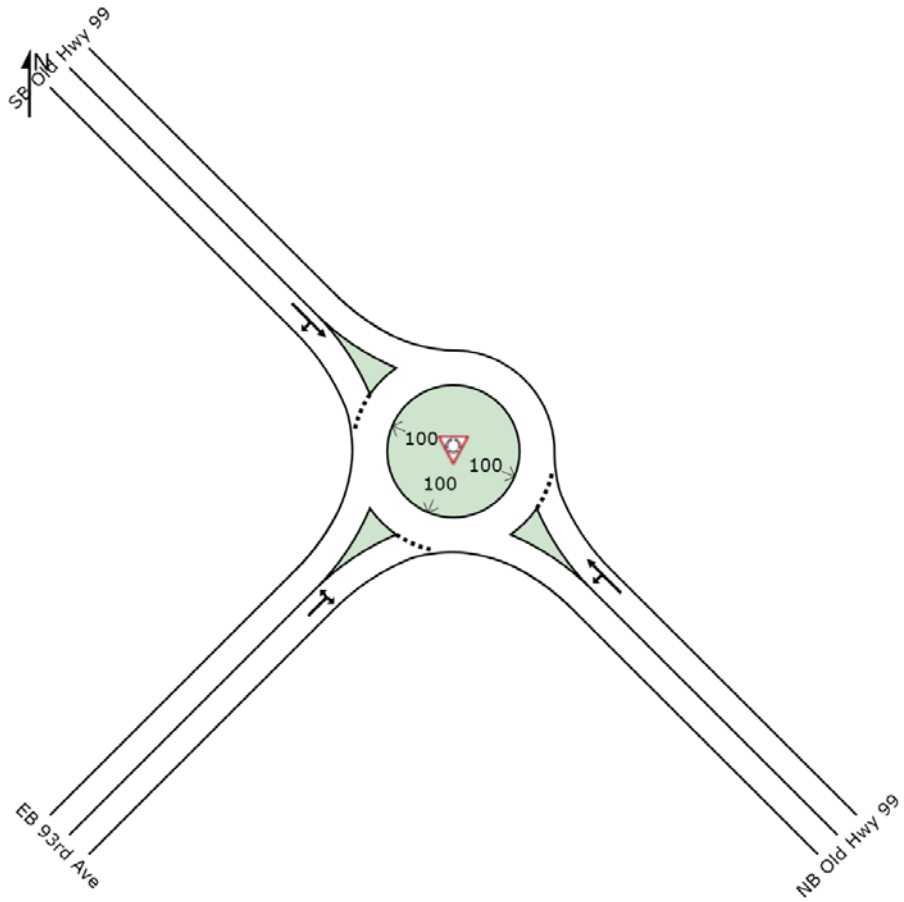
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 69) 93rd Ave at Old Hwy 99

Projected 2040 With Improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 69) 93rd Ave at Old Hwy 99

Projected 2040 With Improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB Old Hwy 99											
3x	L2	200	2.0	0.447	7.4	LOS A	4.3	109.6	0.18	0.05	33.1
8x	T1	358	2.0	0.447	7.4	LOS A	4.3	109.6	0.18	0.05	33.0
Approach		558	2.0	0.447	7.4	LOS A	4.3	109.6	0.18	0.05	33.0
NorthWest: SB Old Hwy 99											
4x	T1	937	2.0	0.922	32.1	LOS C	24.0	608.9	1.00	0.96	24.8
14x	R2	32	2.0	0.922	32.1	LOS C	24.0	608.9	1.00	0.96	24.3
Approach		968	2.0	0.922	32.1	LOS C	24.0	608.9	1.00	0.96	24.8
SouthWest: EB 93rd Ave											
5x	L2	16	2.0	0.623	27.5	LOS C	5.9	150.0	1.00	1.13	25.8
12x	R2	216	2.0	0.623	27.5	LOS C	5.9	150.0	1.00	1.13	25.2
Approach		232	2.0	0.623	27.5	LOS C	5.9	150.0	1.00	1.13	25.3
All Vehicles		1758	2.0	0.922	23.7	LOS C	24.0	608.9	0.74	0.69	27.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
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 2010).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	45	85	5	0	120	45	85	0	5	175	135
Future Vol, veh/h	0	45	85	5	0	120	45	85	0	5	175	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	6	6	6	2	9	9	9	2	4	4	4
Mvmt Flow	0	49	92	5	0	130	49	92	0	5	190	147
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	10.8	11.4	15.4
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	56%	0%	94%	0%	35%	0%	85%
Vol Right, %	0%	44%	0%	6%	0%	65%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	310	45	90	120	130	45	130
LT Vol	5	0	45	0	120	0	45	0
Through Vol	0	175	0	85	0	45	0	110
RT Vol	0	135	0	5	0	85	0	20
Lane Flow Rate	5	337	49	98	130	141	49	141
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.01	0.548	0.098	0.18	0.254	0.237	0.094	0.246
Departure Headway (Hd)	6.676	5.86	7.177	6.629	7.009	6.036	6.884	6.267
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	535	613	498	539	511	593	519	571
Service Time	4.43	3.614	4.943	4.394	4.766	3.794	4.647	4.029
HCM Lane V/C Ratio	0.009	0.55	0.098	0.182	0.254	0.238	0.094	0.247
HCM Control Delay	9.5	15.5	10.7	10.9	12.2	10.7	10.4	11.1
HCM Lane LOS	A	C	B	B	B	B	B	B
HCM 95th-tile Q	0	3.3	0.3	0.7	1	0.9	0.3	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	45	110	20
Future Vol, veh/h	0	45	110	20
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	3	3	3
Mvmt Flow	0	49	120	22
Number of Lanes	0	1	1	0

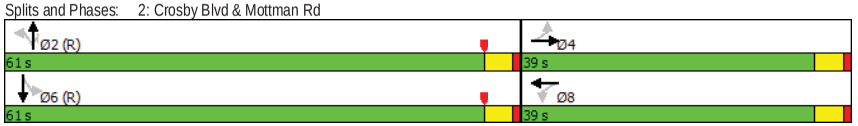
Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.9
HCM LOS	B

Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	250	25	5	30	85	45	425	155	135	690	455
Future Volume (vph)	180	250	25	5	30	85	45	425	155	135	690	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	200		0	100		0
Storage Lanes	1		0	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		940			1116			645			417	
Travel Time (s)		21.4			25.4			14.7			9.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	1%	1%	1%	3%	3%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		20.5	20.5	20.5	20.5	20.5	
Total Split (s)	39.0	39.0		39.0	39.0		61.0	61.0	61.0	61.0	61.0	
Total Split (%)	39.0%	39.0%		39.0%	39.0%		61.0%	61.0%	61.0%	61.0%	61.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 82 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	

Splits and Phases: 2: Crosby Blvd & Mottman Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	250	25	5	30	85	45	425	155	135	690	455
Future Volume (veh/h)	180	250	25	5	30	85	45	425	155	135	690	455
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1900	1900	1881	1881	1881	1845	1845	1900
Adj Flow Rate, veh/h	202	281	28	6	34	96	51	478	174	152	775	0
Adj No. of Lanes	1	1	0	0	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	0	0	0	1	1	3	3	3	3
Cap, veh/h	262	389	39	42	106	267	488	1269	1078	516	2364	0
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.67	0.67	0.67	0.67	0.67	0.00
Sat Flow, veh/h	1243	1651	165	21	452	1135	700	1881	1599	769	3597	0
Grp Volume(v), veh/h	202	0	309	136	0	0	51	478	174	152	775	0
Grp Sat Flow(s),veh/h/ln	1243	0	1816	1608	0	0	700	1881	1599	769	1752	0
Q Serve(g_s), s	9.6	0.0	15.7	0.1	0.0	0.0	3.2	11.1	4.0	10.4	9.2	0.0
Cycle Q Clear(g_c), s	23.6	0.0	15.7	16.9	0.0	0.0	11.2	11.1	4.0	20.2	9.2	0.0
Prop In Lane	1.00		0.09	0.04		0.71	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	262	0	428	416	0	0	488	1269	1078	516	2364	0
V/C Ratio(X)	0.77	0.00	0.72	0.33	0.00	0.00	0.10	0.38	0.16	0.29	0.33	0.00
Avail Cap(c_a), veh/h	398	0	626	596	0	0	488	1269	1078	516	2364	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.93	0.93	0.93	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.3	0.0	35.2	31.8	0.0	0.0	8.9	7.1	5.9	11.2	6.8	0.0
Incr Delay (d2), s/veh	5.0	0.0	2.3	0.5	0.0	0.0	0.4	0.8	0.3	1.5	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	5.9	0.0	8.1	3.2	0.0	0.0	0.7	6.0	1.8	2.4	4.5	0.0
LnGrp Delay(d),s/veh	46.3	0.0	37.5	32.2	0.0	0.0	9.3	7.9	6.2	12.6	7.2	0.0
LnGrp LOS	D		D	C			A	A	A	B	A	
Approach Vol, veh/h		511			136			703			927	
Approach Delay, s/veh		41.0			32.2			7.6			8.1	
Approach LOS		D			C			A			A	

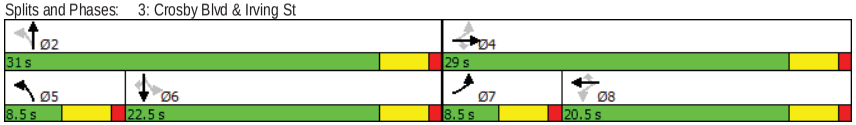
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		69.8		30.2		69.8		30.2
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		56.5		34.5		56.5		34.5
Max Q Clear Time (g_c+I1), s		13.2		25.6		22.2		18.9
Green Ext Time (p_c), s		15.4		2.4		14.2		3.1

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	25	25	30	40	185	25	340	25	160	485	100
Future Volume (vph)	75	25	25	30	40	185	25	340	25	160	485	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		150	200		0	0		250
Storage Lanes	0		1	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		468			2725			1710			645	
Travel Time (s)		10.6			61.9			38.9			14.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	8%	8%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	7	4	4	8	8	8	5	2		6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.5	20.5	20.5	20.5	20.5	20.5	8.5	20.5		20.5	20.5	20.5
Total Split (s)	8.5	29.0	29.0	20.5	20.5	20.5	8.5	31.0		22.5	22.5	22.5
Total Split (%)	14.2%	48.3%	48.3%	34.2%	34.2%	34.2%	14.2%	51.7%		37.5%	37.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 47.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 3: Crosby Blvd & Irving St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	25	25	30	40	185	25	340	25	160	485	100
Future Volume (veh/h)	75	25	25	30	40	185	25	340	25	160	485	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759	1900	1881	1881	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	84	28	28	34	45	208	28	382	28	180	545	0
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	8	8	8	1	1	1	1	1	1	2	2	2
Cap, veh/h	146	28	291	193	204	311	431	1041	76	623	880	748
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.03	0.60	0.60	0.47	0.47	0.00
Sat Flow, veh/h	15	142	1495	392	1047	1599	1792	1732	127	972	1863	1583
Grp Volume(v), veh/h	112	0	28	79	0	208	28	0	410	180	545	0
Grp Sat Flow(s),veh/h/ln	156	0	1495	1439	0	1599	1792	0	1859	972	1863	1583
Q Serve(g_s), s	3.7	0.0	0.7	0.1	0.0	5.3	0.3	0.0	5.0	5.3	9.6	0.0
Cycle Q Clear(g_c), s	3.7	0.0	0.7	3.8	0.0	5.3	0.3	0.0	5.0	5.3	9.6	0.0
Prop In Lane	0.75		1.00	0.43		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	291	397	0	311	431	0	1117	623	880	748
V/C Ratio(X)	0.00	0.00	0.10	0.20	0.00	0.67	0.06	0.00	0.37	0.29	0.62	0.00
Avail Cap(c_a), veh/h	0	0	831	668	0	580	546	0	1117	623	880	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	14.6	14.9	0.0	16.4	6.2	0.0	4.5	7.5	8.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.2	0.0	2.5	0.1	0.0	0.9	1.2	3.3	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	0.3	0.8	0.0	2.5	0.2	0.0	2.8	1.6	5.6	0.0
LnGrp Delay(d),s/veh	0.0	0.0	14.7	15.2	0.0	18.9	6.3	0.0	5.4	8.7	11.9	0.0
LnGrp LOS			B	B		B	A		A	A	B	
Approach Vol, veh/h		140			287			438			725	
Approach Delay, s/veh		2.9			17.9			5.5			11.1	
Approach LOS		A			B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		31.0		13.1	5.7	25.3		13.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		26.5		24.5	4.0	18.0		16.0
Max Q Clear Time (g_c+I1), s		7.0		5.7	2.3	11.6		7.3
Green Ext Time (p_c), s		7.3		1.9	0.0	3.6		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	5	15	175	0	1	20	1	0	185	5	1
Future Vol, veh/h	0	5	15	175	0	1	20	1	0	185	5	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1	2	0	0	0	2	1	1	1
Mvmt Flow	0	5	16	190	0	1	22	1	0	201	5	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.1	7.8	9.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	3%	5%	0%
Vol Thru, %	3%	8%	91%	50%
Vol Right, %	1%	90%	5%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	191	195	22	10
LT Vol	185	5	1	0
Through Vol	5	15	20	5
RT Vol	1	175	1	5
Lane Flow Rate	208	212	24	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.261	0.232	0.031	0.013
Departure Headway (Hd)	4.631	3.943	4.629	4.335
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	781	916	776	826
Service Time	2.631	1.945	2.638	2.357
HCM Lane V/C Ratio	0.266	0.231	0.031	0.013
HCM Control Delay	9.3	8.1	7.8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.9	0.1	0

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	5	5
Future Vol, veh/h	0	0	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	5	5
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.4
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	10	1	0	10	5	215	1	110	5	265	155	20
Future Vol, veh/h	10	1	0	10	5	215	1	110	5	265	155	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	175	-	-
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, %	10	10	10	2	2	2	4	4	4	2	2	2
Mvmt Flow	11	1	0	11	5	236	1	121	5	291	170	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	893	893	181	890	901	124	192	0	0	126	0	0
Stage 1	764	764	-	126	126	-	-	-	-	-	-	-
Stage 2	129	129	-	764	775	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.6	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	254	273	841	264	278	927	1370	-	-	1460	-	-
Stage 1	384	401	-	878	792	-	-	-	-	-	-	-
Stage 2	856	774	-	396	408	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	157	218	841	223	222	927	1370	-	-	1460	-	-
Mov Cap-2 Maneuver	157	218	-	223	222	-	-	-	-	-	-	-
Stage 1	384	321	-	877	791	-	-	-	-	-	-	-
Stage 2	633	773	-	316	327	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.2	11	0.1	4.9
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	161	223	927	1460	-	-
HCM Lane V/C Ratio	0.001	-	-	0.075	0.074	0.255	0.199	-	-
HCM Control Delay (s)	7.6	0	-	29.2	22.4	10.2	8.1	-	-
HCM Lane LOS	A	A	-	D	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	1	0.7	-	-

Intersection	
Int Delay, s/veh	23

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	175	75	165	330	190	135
Future Vol, veh/h	175	75	165	330	190	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	3	0	0	1	1
Mvmt Flow	186	80	176	351	202	144

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	266	0	928	226
Stage 1	-	-	-	-	226	-
Stage 2	-	-	-	-	702	-
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	-	-	1310	-	299	816
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1310	-	259	816
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	427	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	71.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	361	-	-	1310	-
HCM Lane V/C Ratio	0.958	-	-	0.134	-
HCM Control Delay (s)	71.7	-	-	8.2	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	10.5	-	-	0.5	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	15	30	2	10	45	80	1	10	10	95	15	35
Future Vol, veh/h	15	30	2	10	45	80	1	10	10	95	15	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	1	1	1	0	0	0	3	3	3
Mvmt Flow	18	35	2	12	53	94	1	12	12	112	18	41

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	147	0	0	38	0	0	225	243	36	208	197	100
Stage 1	-	-	-	-	-	-	72	72	-	124	124	-
Stage 2	-	-	-	-	-	-	153	171	-	84	73	-
Critical Hdwy	4.13	-	-	4.11	-	-	7.1	6.5	6.2	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.209	-	-	3.5	4	3.3	3.527	4.027	3.327
Pot Cap-1 Maneuver	1429	-	-	1579	-	-	735	662	1042	747	697	953
Stage 1	-	-	-	-	-	-	943	839	-	878	791	-
Stage 2	-	-	-	-	-	-	854	761	-	922	832	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1429	-	-	1579	-	-	678	648	1042	717	682	953
Mov Cap-2 Maneuver	-	-	-	-	-	-	678	648	-	717	682	-
Stage 1	-	-	-	-	-	-	931	828	-	867	785	-
Stage 2	-	-	-	-	-	-	792	755	-	887	821	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.5	9.7	11.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	792	1429	-	-	1579	-	-	758
HCM Lane V/C Ratio	0.031	0.012	-	-	0.007	-	-	0.225
HCM Control Delay (s)	9.7	7.6	0	-	7.3	0	-	11.1
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.9

Intersection	
Int Delay, s/veh	6.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	100	15	155	100	15	130
Future Vol, veh/h	100	15	155	100	15	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	110	16	170	110	16	143

Major/Minor	Minor1		Major1		Minor2	
Conflicting Flow All	296	225	0	0	225	280
Stage 1	225	-	-	-	0	0
Stage 2	71	-	-	-	225	280
Critical Hdwy	7.11	6.21	-	-	7.1	6.5
Critical Hdwy Stg 1	6.11	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	6.1	5.5
Follow-up Hdwy	3.509	3.309	-	-	3.5	4
Pot Cap-1 Maneuver	658	817	-	-	735	632
Stage 1	780	-	-	-	-	-
Stage 2	-	-	-	-	782	683
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	543	817	-	-	720	632
Mov Cap-2 Maneuver	543	-	-	-	720	632
Stage 1	780	-	-	-	-	-
Stage 2	-	-	-	-	766	683

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	12.2
HCM LOS	B		B

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBLn1	SBLn2
Capacity (veh/h)	-	-	543	817	720	632
HCM Lane V/C Ratio	-	-	0.202	0.02	0.023	0.226
HCM Control Delay (s)	-	-	13.3	9.5	10.1	12.4
HCM Lane LOS	-	-	B	A	B	B
HCM 95th %tile Q(veh)	-	-	0.8	0.1	0.1	0.9

9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2
Total Del/Veh (s)	5.7	7.1	3.3	7.6	8.3	4.7	7.8	8.5	5.6	0.8	1.1	0.7

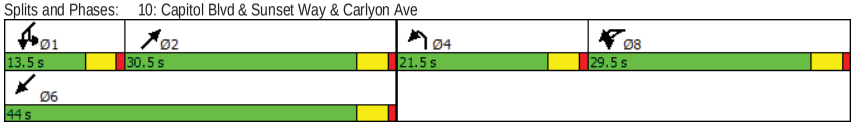
9: Black Lake Belmore Rd & 49th Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	4.6

Lane Group	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
Future Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0	0	0			0			150	
Storage Lanes		1	0	1	0			0			1	
Taper Length (ft)		25		25							25	
Right Turn on Red			Yes			Yes			Yes			
Link Speed (mph)		30		30			30					30
Link Distance (ft)		840		629			731					791
Travel Time (s)		19.1		14.3			16.6					18.0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	Prot		Prot			NA			Prot	Prot	NA
Protected Phases	8	8		4			2			1	1	6
Permitted Phases												
Detector Phase	8	8		4			2			1	1	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0			10.0			6.0	6.0	10.0
Minimum Split (s)	29.5	29.5		21.5			29.5			10.5	10.5	20.0
Total Split (s)	29.5	29.5		21.5			30.5			13.5	13.5	44.0
Total Split (%)	31.1%	31.1%		22.6%			32.1%			14.2%	14.2%	46.3%
Yellow Time (s)	3.5	3.5		3.5			3.5			3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0			1.0			1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0				0.0	0.0
Total Lost Time (s)		4.5		4.5			4.5				4.5	4.5
Lead/Lag							Lag			Lead	Lead	
Lead-Lag Optimize?							Yes			Yes	Yes	
Recall Mode	None	None		None			Max			None	None	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 62.4	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 10: Capitol Blvd & Sunset Way & Carlyon Ave



Movement	WBL2	WBL	WBR	NBL	NBR	NBR2	NET	NER	NER2	SWL2	SWL	SWT
Lane Configurations												
Traffic Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
Future Volume (vph)	5	55	40	35	15	2	565	90	15	50	10	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5			4.5				4.5	4.5
Lane Util. Factor		1.00		1.00			0.95				1.00	0.95
Frt		0.95		0.96			0.98				1.00	1.00
Flt Protected		0.97		0.97			1.00				0.95	1.00
Satd. Flow (prot)		1745		1757			3456				1787	3574
Flt Permitted		0.97		0.97			1.00				0.95	1.00
Satd. Flow (perm)		1745		1757			3456				1787	3574
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	6	65	47	41	18	2	665	106	18	59	12	1171
RTOR Reduction (vph)	0	108	0	58	0	0	1	0	0	0	0	0
Lane Group Flow (vph)	0	10	0	3	0	0	788	0	0	0	71	1171
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	Prot		Prot			NA			Prot	Prot	NA
Protected Phases	8	8		4			2			1	1	6
Permitted Phases												
Actuated Green, G (s)		5.4		3.4			32.9				6.5	43.9
Effective Green, g (s)		5.4		3.4			32.9				6.5	43.9
Actuated g/C Ratio		0.08		0.05			0.50				0.10	0.66
Clearance Time (s)		4.5		4.5			4.5				4.5	4.5
Vehicle Extension (s)		3.0		3.0			3.0				3.0	3.0
Lane Grp Cap (vph)		142		90			1717				175	2370
v/s Ratio Prot		c0.01		c0.00			0.23				0.04	c0.33
v/s Ratio Perm												
v/c Ratio		0.07		0.03			0.46				0.41	0.49
Uniform Delay, d1		28.1		29.8			10.8				28.0	5.6
Progression Factor		1.00		1.00			1.00				1.00	1.00
Incremental Delay, d2		0.2		0.2			0.9				1.5	0.7
Delay (s)		28.3		30.0			11.7				29.6	6.3
Level of Service		C		C			B				C	A
Approach Delay (s)		28.3		30.0			11.7					7.7
Approach LOS		C		C			B					A

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.7

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	160	325	245	140	0	0
Future Vol, veh/h	160	325	245	140	0	0
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	79	79	79	79	79	79
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	203	411	310	177	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	487	0	-	0	1215	399
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	816	-
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	1086	-	-	-	202	655
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	438	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1086	-	-	-	153	655
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	332	-

Approach	SE	NW	SW
HCM Control Delay, s	3	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1	
Capacity (veh/h)	-	-	1086	-	-
HCM Lane V/C Ratio	-	-	0.186	-	-
HCM Control Delay (s)	-	-	9.1	0	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	0	450	400	285	20
Future Vol, veh/h	0	0	450	400	285	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	0	0	489	435	310	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1734	-	332	0	-	0
Stage 1	321	-	-	-	-	-
Stage 2	1413	-	-	-	-	-
Critical Hdwy	6.4	-	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	-	2.209	-	-	-
Pot Cap-1 Maneuver	98	0	1233	-	-	-
Stage 1	740	0	-	-	-	-
Stage 2	227	0	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	59	-	1233	-	-	-
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	740	-	-	-	-	-
Stage 2	137	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	5.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1233	-	-	-	-
HCM Lane V/C Ratio	0.397	-	-	-	-
HCM Control Delay (s)	9.8	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	1.9	-	-	-	-

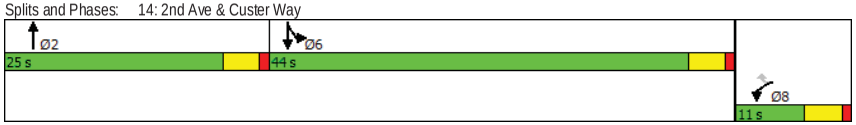
13: 2nd Ave/US 101/I-5 Off-Ramps Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.4	0.4	0.3
Total Del/Veh (s)	0.7	1.0	1.0	24.0	10.0	16.7

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	180	20	210	840	255
Future Volume (vph)	175	180	20	210	840	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	225		0	0	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Right Turn on Red		Yes		Yes		
Link Speed (mph)	30		30			30
Link Distance (ft)	662		2035			505
Travel Time (s)	15.0		46.3			11.5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	8		2		6	6
Permitted Phases		8				
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	10.0	10.0	24.5		20.0	20.0
Total Split (s)	11.0	11.0	25.0		44.0	44.0
Total Split (%)	13.8%	13.8%	31.3%		55.0%	55.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 66.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 14: 2nd Ave & Custer Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	175	180	20	210	840	255		
Future Volume (veh/h)	175	180	20	210	840	255		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900		
Adj Flow Rate, veh/h	199	40	23	74	955	290		
Adj No. of Lanes	1	1	1	0	1	1		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88		
Percent Heavy Veh, %	1	1	1	1	0	0		
Cap, veh/h	181	161	30	96	1110	1165		
Arrive On Green	0.10	0.10	0.08	0.08	0.61	0.61		
Sat Flow, veh/h	1792	1599	393	1265	1810	1900		
Grp Volume(v), veh/h	199	40	0	97	955	290		
Grp Sat Flow(s),veh/h/ln	1792	1599	0	1658	1810	1900		
Q Serve(g_s), s	6.5	1.5	0.0	3.7	27.8	4.5		
Cycle Q Clear(g_c), s	6.5	1.5	0.0	3.7	27.8	4.5		
Prop In Lane	1.00	1.00		0.76	1.00			
Lane Grp Cap(c), veh/h	181	161	0	126	1110	1165		
V/C Ratio(X)	1.10	0.25	0.00	0.77	0.86	0.25		
Avail Cap(c_a), veh/h	181	161	0	528	1110	1165		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	28.9	26.7	0.0	29.2	10.2	5.7		
Incr Delay (d2), s/veh	96.4	0.3	0.0	3.7	8.8	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.0	0.7	0.0	1.8	16.2	2.5		
LnGrp Delay(d),s/veh	125.3	27.0	0.0	32.9	19.0	6.2		
LnGrp LOS	F	C		C	B	A		
Approach Vol, veh/h	239		97			1245		
Approach Delay, s/veh	108.9		32.9			16.0		
Approach LOS	F		C			B		

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		9.4				44.0		11.0
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		20.5				39.5		6.5
Max Q Clear Time (g_c+I1), s		5.7				29.8		8.5
Green Ext Time (p_c), s		0.3				4.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	785	175	380	335	5	0	1	165	0	1	5
Future Vol, veh/h	0	785	175	380	335	5	0	1	165	0	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	425	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	0	826	184	400	353	5	0	1	174	0	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	358	0	0	1011	0	0	-	2076	505	1569	2166	355
Stage 1	-	-	-	-	-	-	-	918	-	1155	1155	-
Stage 2	-	-	-	-	-	-	-	1158	-	414	1011	-
Critical Hdwy	4.115	-	-	4.115	-	-	-	6.5	6.9	7.3	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2095	-	-	2.2095	-	-	-	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1205	-	-	689	-	-	0	54	518	83	48	693
Stage 1	-	-	-	-	-	-	0	353	-	242	274	-
Stage 2	-	-	-	-	-	-	0	273	-	592	320	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1205	-	-	689	-	-	-	23	518	29	20	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	23	-	29	20	-
Stage 1	-	-	-	-	-	-	-	353	-	242	115	-
Stage 2	-	-	-	-	-	-	-	115	-	392	320	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	9.1	17.6	41.5
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	459	1205	-	-	689	-	-	105
HCM Lane V/C Ratio	0.381	-	-	-	0.581	-	-	0.06
HCM Control Delay (s)	17.6	0	-	-	17.2	-	-	41.5
HCM Lane LOS	C	A	-	-	C	-	-	E
HCM 95th %tile Q(veh)	1.8	0	-	-	3.8	-	-	0.2

Intersection	
Intersection Delay, s/veh	41.2
Intersection LOS	E

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	115	410	0	400	75	0	110	200
Future Vol, veh/h	0	115	410	0	400	75	0	110	200
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.92	0.93	0.93
Heavy Vehicles, %	2	1	1	2	0	0	2	0	0
Mvmt Flow	0	124	441	0	430	81	0	118	215
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	50	44.2	21.5
HCM LOS	E	E	C

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	22%	35%
Vol Thru, %	84%	0%	65%
Vol Right, %	16%	78%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	475	525	310
LT Vol	0	115	110
Through Vol	400	0	200
RT Vol	75	410	0
Lane Flow Rate	511	565	333
Geometry Grp	1	1	1
Degree of Util (X)	0.908	0.949	0.639
Departure Headway (Hd)	6.401	6.054	6.896
Convergence, Y/N	Yes	Yes	Yes
Cap	567	598	520
Service Time	4.465	4.107	4.969
HCM Lane V/C Ratio	0.901	0.945	0.64
HCM Control Delay	44.2	50	21.5
HCM Lane LOS	E	E	C
HCM 95th-tile Q	10.9	12.7	4.5

Intersection	
Int Delay, s/veh	4.1

Movement	NBL	NBR	NET	NER	SWL	SWT
Traffic Vol, veh/h	0	245	460	20	395	720
Future Vol, veh/h	0	245	460	20	395	720
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	-	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	1	1	1	1
Mvmt Flow	0	278	523	23	449	818

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	261	0	0	523	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.98	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.34	-	-	2.21	-
Pot Cap-1 Maneuver	0	732	-	-	1047	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	732	-	-	1047	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

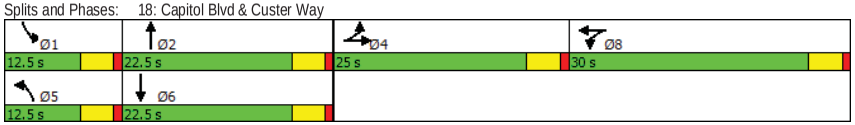
Approach	NB	NE	SW
HCM Control Delay, s	12.9	0	3.9
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	732	1047	-
HCM Lane V/C Ratio	-	-	0.38	0.429	-
HCM Control Delay (s)	-	-	12.9	11	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	1.8	2.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	705	75	395	495	10	20	415	485	25	530	165
Future Volume (vph)	180	705	75	395	495	10	20	415	485	25	530	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		684			631			2019			1179	
Travel Time (s)		15.5			14.3			45.9			26.8	
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)	10%			10%								
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.0	22.0		22.0	22.0		12.5	22.0		12.5	22.0	
Total Split (s)	25.0	25.0		30.0	30.0		12.5	22.5		12.5	22.5	
Total Split (%)	27.8%	27.8%		33.3%	33.3%		13.9%	25.0%		13.9%	25.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 82.5	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 18: Capitol Blvd & Custer Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	705	75	395	495	10	20	415	485	25	530	165
Future Volume (veh/h)	180	705	75	395	495	10	20	415	485	25	530	165
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1900	1900	1900
Adj Flow Rate, veh/h	200	783	0	439	550	11	22	461	256	28	589	183
Adj No. of Lanes	1	2	0	1	1	0	1	2	0	1	2	0
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
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	0	0	0
Cap, veh/h	419	880	0	535	549	11	68	469	259	82	593	184
Arrive On Green	0.23	0.23	0.00	0.30	0.30	0.30	0.04	0.21	0.21	0.05	0.22	0.22
Sat Flow, veh/h	1792	3762	0	1792	1838	37	1792	2224	1227	1810	2715	842
Grp Volume(v), veh/h	200	783	0	439	0	561	22	370	347	28	391	381
Grp Sat Flow(s),veh/h/ln	1792	1881	0	1792	0	1875	1792	1787	1665	1810	1805	1751
Q Serve(g_s), s	8.2	17.2	0.0	19.4	0.0	25.5	1.0	17.6	17.7	1.3	18.5	18.5
Cycle Q Clear(g_c), s	8.2	17.2	0.0	19.4	0.0	25.5	1.0	17.6	17.7	1.3	18.5	18.5
Prop In Lane	1.00		0.00	1.00		0.02	1.00		0.74	1.00		0.48
Lane Grp Cap(c), veh/h	419	880	0	535	0	560	68	377	351	82	394	382
V/C Ratio(X)	0.48	0.89	0.00	0.82	0.00	1.00	0.32	0.98	0.99	0.34	0.99	1.00
Avail Cap(c_a), veh/h	430	904	0	535	0	560	168	377	351	170	394	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	31.6	0.0	27.8	0.0	29.9	40.0	33.5	33.6	39.5	33.3	33.3
Incr Delay (d2), s/veh	0.8	10.7	0.0	9.8	0.0	38.4	2.7	41.9	45.4	2.4	43.6	45.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	10.2	0.0	11.1	0.0	19.0	0.6	13.0	12.5	0.7	13.9	13.7
LnGrp Delay(d),s/veh	29.0	42.3	0.0	37.6	0.0	68.3	42.7	75.4	78.9	41.9	76.9	78.4
LnGrp LOS	C	D		D		F	D	E	E	D	E	E
Approach Vol, veh/h		983			1000			739			800	
Approach Delay, s/veh		39.6			54.8			76.1			76.4	
Approach LOS		D			D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	22.5		24.5	7.8	23.1		30.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	8.0	18.0		20.5	8.0	18.0		25.5
Max Q Clear Time (g_c+I1), s	3.3	19.7		19.2	3.0	20.5		27.5
Green Ext Time (p_c), s	0.0	0.0		0.8	0.0	0.0		0.0

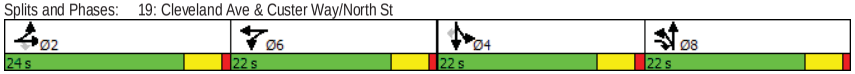
Intersection Summary		
HCM 2010 Ctrl Delay		59.9
HCM 2010 LOS		E

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	385	700	15	300	70	530	155	15	110	310	115
Future Volume (vph)	55	385	700	15	300	70	530	155	15	110	310	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	200		0	300		0	150		150
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		631			2207			2922			341	
Travel Time (s)		14.3			50.2			66.4			7.8	
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
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Shared Lane Traffic (%)							50%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Protected Phases	2	2	8	6	6		8	8		4	4	
Permitted Phases			2									4
Detector Phase	2	2	8	6	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	6.0	6.0	8.0	6.0	6.0		8.0	8.0		6.0	6.0	6.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (s)	24.0	24.0	22.0	22.0	22.0		22.0	22.0		22.0	22.0	22.0
Total Split (%)	26.7%	26.7%	24.4%	24.4%	24.4%		24.4%	24.4%		24.4%	24.4%	24.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 19: Cleveland Ave & Custer Way/North St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	385	700	15	300	70	530	155	15	110	310	115
Future Volume (veh/h)	55	385	700	15	300	70	530	155	15	110	310	115
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1881	1881	1900	1863	1863	1863
Adj Flow Rate, veh/h	59	414	645	16	323	75	570	167	16	118	333	33
Adj No. of Lanes	1	1	1	1	1	0	2	1	0	1	1	1
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, %	1	1	1	1	1	1	1	1	1	2	2	2
Cap, veh/h	381	400	632	341	281	65	653	308	30	338	355	302
Arrive On Green	0.21	0.21	0.21	0.19	0.19	0.19	0.18	0.18	0.18	0.19	0.19	0.19
Sat Flow, veh/h	1792	1881	1599	1792	1478	343	3583	1691	162	1774	1863	1583
Grp Volume(v), veh/h	59	414	645	16	0	398	570	0	183	118	333	33
Grp Sat Flow(s),veh/h/ln	1792	1881	1599	1792	0	1821	1792	0	1853	1774	1863	1583
Q Serve(g_s), s	2.4	19.0	19.0	0.7	0.0	17.0	13.8	0.0	8.0	5.1	15.7	1.5
Cycle Q Clear(g_c), s	2.4	19.0	19.0	0.7	0.0	17.0	13.8	0.0	8.0	5.1	15.7	1.5
Prop In Lane	1.00		1.00	1.00		0.19	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	381	400	632	341	0	347	653	0	338	338	355	302
V/C Ratio(X)	0.15	1.03	1.02	0.05	0.00	1.15	0.87	0.00	0.54	0.35	0.94	0.11
Avail Cap(c_a), veh/h	381	400	632	341	0	347	682	0	353	338	355	302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	35.1	22.1	29.5	0.0	36.1	35.5	0.0	33.1	31.3	35.6	29.9
Incr Delay (d2), s/veh	0.2	54.0	41.2	0.1	0.0	94.9	11.6	0.0	1.5	0.5	32.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	15.8	22.7	0.3	0.0	17.6	7.9	0.0	4.2	2.6	11.2	0.7
LnGrp Delay(d),s/veh	28.8	89.2	63.3	29.6	0.0	131.0	47.1	0.0	34.7	31.8	67.8	30.0
LnGrp LOS	C	F	F	C		F	D		C	C	E	C
Approach Vol, veh/h		1118			414			753			484	
Approach Delay, s/veh		71.0			127.1			44.1			56.5	
Approach LOS		E			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		24.0		22.0		22.0		21.3
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		19.0		17.0		17.0		17.0
Max Q Clear Time (g_c+I1), s		21.0		17.7		19.0		15.8
Green Ext Time (p_c), s		0.0		0.0		0.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	69.5
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	45	330	0	10	455	50	0	2	10	25	1	15
Future Vol, veh/h	45	330	0	10	455	50	0	2	10	25	1	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	52	379	0	11	523	57	0	2	11	29	1	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	580	0	0	379	0	0	1067	1086	379	1065	1058	552
Stage 1	-	-	-	-	-	-	483	483	-	575	575	-
Stage 2	-	-	-	-	-	-	584	603	-	490	483	-
Critical Hdwy	4.11	-	-	4.11	-	-	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	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	999	-	-	1185	-	-	202	218	672	202	227	537
Stage 1	-	-	-	-	-	-	569	556	-	507	506	-
Stage 2	-	-	-	-	-	-	501	492	-	564	556	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	999	-	-	1185	-	-	183	201	672	185	209	537
Mov Cap-2 Maneuver	-	-	-	-	-	-	183	201	-	185	209	-
Stage 1	-	-	-	-	-	-	531	519	-	474	499	-
Stage 2	-	-	-	-	-	-	477	485	-	515	519	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.2	12.7	23.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	483	999	-	-	1185	-	-	244
HCM Lane V/C Ratio	0.029	0.052	-	-	0.01	-	-	0.193
HCM Control Delay (s)	12.7	8.8	0	-	8.1	0	-	23.3
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.7

SimTraffic Performance Report

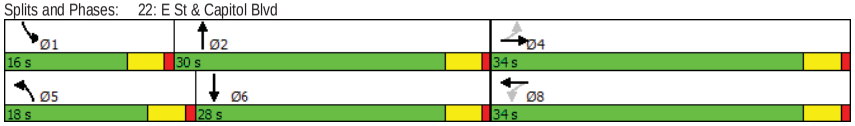
21: I-5 NB Off-Ramp/Deschutes Way & E St Performance by movement

Movement	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.3	0.1
Total Del/Veh (s)	1.4	2.3	25.6	6.2	1.6	4.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	95	280	135	100	140	235	550	145	205	760	85
Future Volume (vph)	120	95	280	135	100	140	235	550	145	205	760	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	175		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		282			479			1902			2019	
Travel Time (s)		6.4			10.9			43.2			45.9	
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 (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	29.5	29.5		29.5	29.5		9.5	26.5		9.5	26.5	
Total Split (s)	34.0	34.0		34.0	34.0		18.0	30.0		16.0	28.0	
Total Split (%)	42.5%	42.5%		42.5%	42.5%		22.5%	37.5%		20.0%	35.0%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 22: E St & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	95	280	135	100	140	235	550	145	205	760	85
Future Volume (veh/h)	120	95	280	135	100	140	235	550	145	205	760	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	140	110	0	157	116	163	273	640	169	238	884	99
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
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
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	265	189	0	233	153	191	314	934	246	278	1016	114
Arrive On Green	0.33	0.33	0.00	0.33	0.33	0.33	0.18	0.33	0.33	0.16	0.31	0.31
Sat Flow, veh/h	577	576	0	507	468	582	1792	2800	738	1792	3241	363
Grp Volume(v), veh/h	250	0	0	436	0	0	273	408	401	238	487	496
Grp Sat Flow(s),veh/h/ln	1154	0	0	1557	0	0	1792	1787	1751	1792	1787	1817
Q Serve(g_s), s	0.0	0.0	0.0	5.1	0.0	0.0	10.9	14.5	14.6	9.5	19.0	19.0
Cycle Q Clear(g_c), s	14.1	0.0	0.0	19.2	0.0	0.0	10.9	14.5	14.6	9.5	19.0	19.0
Prop In Lane	0.56		0.00	0.36		0.37	1.00		0.42	1.00		0.20
Lane Grp Cap(c), veh/h	454	0	0	577	0	0	314	596	584	278	560	570
V/C Ratio(X)	0.55	0.00	0.00	0.76	0.00	0.00	0.87	0.68	0.69	0.86	0.87	0.87
Avail Cap(c_a), veh/h	553	0	0	689	0	0	328	619	606	280	570	580
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	0.0	0.0	23.0	0.0	0.0	29.5	21.2	21.2	30.3	23.9	23.9
Incr Delay (d2), s/veh	1.0	0.0	0.0	4.0	0.0	0.0	20.6	3.0	3.1	21.9	13.5	13.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	0.0	8.9	0.0	0.0	7.2	7.6	7.5	6.4	11.4	11.6
LnGrp Delay(d),s/veh	22.0	0.0	0.0	26.9	0.0	0.0	50.1	24.2	24.3	52.2	37.3	37.2
LnGrp LOS	C			C			D	C	C	D	D	D
Approach Vol, veh/h		250			436			1082			1221	
Approach Delay, s/veh		22.0			26.9			30.8			40.2	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.9	29.1		28.6	17.4	27.6		28.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	11.5	25.5		29.5	13.5	23.5		29.5
Max Q Clear Time (g_c+I1), s	11.5	16.6		16.1	12.9	21.0		21.2
Green Ext Time (p_c), s	0.0	6.6		3.9	0.1	2.1		2.9

Intersection Summary	
HCM 2010 Ctrl Delay	33.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	5	15	630	10	20	930
Future Vol, veh/h	5	15	630	10	20	930
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	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	6	17	716	11	23	1057

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1296	364	0	0	727	0
Stage 1	722	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.12	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.21	-
Pot Cap-1 Maneuver	156	639	-	-	879	-
Stage 1	447	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	146	639	-	-	879	-
Mov Cap-2 Maneuver	146	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	498	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	346	879	-
HCM Lane V/C Ratio	-	-	0.066	0.026	-
HCM Control Delay (s)	-	-	16.1	9.2	0.3
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	20	140	0	1	285	210	0	0	1	145	0	20
Future Vol, veh/h	20	140	0	1	285	210	0	0	1	145	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	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, %	3	3	3	1	1	1	0	0	0	1	1	1
Mvmt Flow	22	151	0	1	306	226	0	0	1	156	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	532	0	0	151	0	0	626	728	151	616	616	419
Stage 1	-	-	-	-	-	-	194	194	-	422	422	-
Stage 2	-	-	-	-	-	-	432	534	-	194	194	-
Critical Hdwy	4.13	-	-	4.11	-	-	7.1	6.5	6.2	7.11	6.51	6.21
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	2.227	-	-	2.209	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1030	-	-	1436	-	-	400	353	901	404	407	636
Stage 1	-	-	-	-	-	-	812	744	-	611	590	-
Stage 2	-	-	-	-	-	-	606	528	-	810	742	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1030	-	-	1436	-	-	379	345	901	396	397	636
Mov Cap-2 Maneuver	-	-	-	-	-	-	379	345	-	396	397	-
Stage 1	-	-	-	-	-	-	793	727	-	597	589	-
Stage 2	-	-	-	-	-	-	585	527	-	790	725	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	9	20
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	901	1030	-	-	1436	-	-	415
HCM Lane V/C Ratio	0.001	0.021	-	-	0.001	-	-	0.428
HCM Control Delay (s)	9	8.6	0	-	7.5	0	-	20
HCM Lane LOS	A	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.1

Intersection	
Intersection Delay, s/veh	38.2
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	50	155	110	0	135	265	60	0	120	155	90
Future Vol, veh/h	0	50	155	110	0	135	265	60	0	120	155	90
Peak Hour Factor	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	0	0	0
Mvmt Flow	0	56	174	124	0	152	298	67	0	135	174	101
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	31.3	43.2	25.8
HCM LOS	D	E	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	63%	0%	58%	0%	82%	0%	57%
Vol Right, %	0%	37%	0%	42%	0%	18%	0%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	245	50	265	135	325	95	340
LT Vol	120	0	50	0	135	0	95	0
Through Vol	0	155	0	155	0	265	0	195
RT Vol	0	90	0	110	0	60	0	145
Lane Flow Rate	135	275	56	298	152	365	107	382
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.367	0.688	0.154	0.749	0.402	0.9	0.283	0.925
Departure Headway (Hd)	9.791	8.999	9.886	9.058	9.531	8.874	9.55	8.717
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	367	402	362	399	378	409	376	416
Service Time	7.568	6.775	7.662	6.833	7.305	6.648	7.321	6.487
HCM Lane V/C Ratio	0.368	0.684	0.155	0.747	0.402	0.892	0.285	0.918
HCM Control Delay	18.2	29.5	14.5	34.5	18.6	53.4	16.1	57.4
HCM Lane LOS	C	D	B	D	C	F	C	F
HCM 95th-tile Q	1.6	5	0.5	6	1.9	9.4	1.1	10.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	95	195	145
Future Vol, veh/h	0	95	195	145
Peak Hour Factor	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	107	219	163
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	48.4
HCM LOS	E

Lane

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	155	175	165	770	880	280
Future Volume (vph)	155	175	165	770	880	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	150			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	489			2664	1902	
Travel Time (s)	11.1			60.5	43.2	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	pm+ov	pm+pt	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	15.0	
Minimum Split (s)	22.5	19.5	19.5	20.0	21.5	
Total Split (s)	22.6	19.6	19.6	47.4	27.8	
Total Split (%)	32.3%	28.0%	28.0%	67.7%	39.7%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 62.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 26: Capitol Blvd & Linwood Ave



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	155	175	165	770	880	280
Future Volume (veh/h)	155	175	165	770	880	280
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	185	208	196	917	1048	333
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	251	607	549	2540	1063	334
Arrive On Green	0.14	0.14	0.24	0.71	0.40	0.40
Sat Flow, veh/h	1792	1599	1792	3668	2771	843
Grp Volume(v), veh/h	185	208	196	917	696	685
Grp Sat Flow(s),veh/h/ln	1792	1599	1792	1787	1787	1732
Q Serve(g_s), s	6.0	5.6	2.5	6.0	23.2	23.8
Cycle Q Clear(g_c), s	6.0	5.6	2.5	6.0	23.2	23.8
Prop In Lane	1.00	1.00	1.00			0.49
Lane Grp Cap(c), veh/h	251	607	549	2540	709	688
V/C Ratio(X)	0.74	0.34	0.36	0.36	0.98	1.00
Avail Cap(c_a), veh/h	537	862	569	2540	709	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	13.4	9.3	3.4	18.0	18.1
Incr Delay (d2), s/veh	1.6	0.1	0.1	0.4	29.6	33.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.7	1.4	3.1	17.2	17.6
LnGrp Delay(d),s/veh	26.5	13.5	9.4	3.8	47.6	51.4
LnGrp LOS	C	B	A	A	D	D
Approach Vol, veh/h	393			1113	1381	
Approach Delay, s/veh	19.6			4.8	49.5	
Approach LOS	B			A	D	

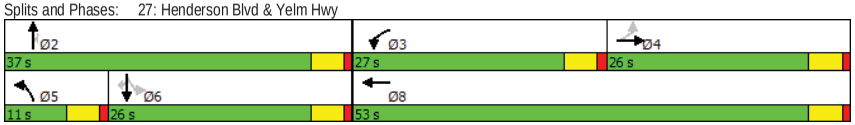
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.4		13.0	18.9	28.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.9		18.1	15.1	23.3		
Max Q Clear Time (g_c+I1), s		8.0		8.0	4.5	25.8		
Green Ext Time (p_c), s		20.1		0.5	0.2	0.0		

Intersection Summary		
HCM 2010 Ctrl Delay	28.2	
HCM 2010 LOS	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	740	170	460	550	80	120	175	665	180	235	25
Future Volume (vph)	10	740	170	460	550	80	120	175	665	180	235	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	450		0	200		100	0		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1947			1645			3441			1606	
Travel Time (s)		44.3			37.4			78.2			36.5	
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Prot	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4								2	6		6
Detector Phase	4	4		3	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	6.0	6.0		5.0	6.0		5.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	24.5	24.5		9.5	24.5		9.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	26.0	26.0		27.0	53.0		11.0	37.0	37.0	26.0	26.0	26.0
Total Split (%)	28.9%	28.9%		30.0%	58.9%		12.2%	41.1%	41.1%	28.9%	28.9%	28.9%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	Yes
Recall Mode	Max	Max		None	Max		None	None	None	None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 86.8	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 27: Henderson Blvd & Yelm Hwy



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	740	170	460	550	80	120	175	665	180	235	25
Future Volume (veh/h)	10	740	170	460	550	80	120	175	665	180	235	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	11	813	187	505	604	88	132	192	0	198	258	27
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
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
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	273	723	166	469	1769	257	136	622	529	326	381	324
Arrive On Green	0.25	0.25	0.25	0.26	0.56	0.56	0.08	0.33	0.00	0.20	0.20	0.20
Sat Flow, veh/h	756	2887	664	1792	3132	455	1792	1881	1599	1198	1881	1599
Grp Volume(v), veh/h	11	503	497	505	344	348	132	192	0	198	258	27
Grp Sat Flow(s),veh/h/ln	756	1787	1764	1792	1787	1801	1792	1881	1599	1198	1881	1599
Q Serve(g_s), s	1.0	21.5	21.5	22.5	8.9	9.0	6.3	6.5	0.0	13.6	10.9	1.2
Cycle Q Clear(g_c), s	1.0	21.5	21.5	22.5	8.9	9.0	6.3	6.5	0.0	13.6	10.9	1.2
Prop In Lane	1.00		0.38	1.00		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	447	442	469	1009	1017	136	622	529	326	381	324
V/C Ratio(X)	0.04	1.13	1.13	1.08	0.34	0.34	0.97	0.31	0.00	0.61	0.68	0.08
Avail Cap(c_a), veh/h	273	447	442	469	1009	1017	136	712	605	384	471	400
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	32.2	32.2	31.7	10.1	10.1	39.6	21.4	0.0	32.7	31.7	27.8
Incr Delay (d2), s/veh	0.3	81.3	81.6	63.5	0.9	0.9	69.0	0.3	0.0	2.0	2.8	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	0.2	20.5	20.3	19.2	4.7	4.7	5.7	3.4	0.0	4.6	6.0	0.5
LnGrp Delay(d),s/veh	24.8	113.5	113.8	95.2	11.0	11.0	108.6	21.7	0.0	34.7	34.5	27.9
LnGrp LOS	C	F	F	F	B	B	F	C		C	C	C
Approach Vol, veh/h		1011			1197			324			483	
Approach Delay, s/veh		112.7			46.5			57.1			34.2	
Approach LOS		F			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		32.9	27.0	26.0	11.0	21.9		53.0
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		32.5	22.5	21.5	6.5	21.5		48.5
Max Q Clear Time (g_c+I1), s		8.5	24.5	23.5	8.3	15.6		11.0
Green Ext Time (p_c), s		3.6	0.0	0.0	0.0	1.8		15.6

Intersection Summary	
HCM 2010 Ctrl Delay	67.9
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	55	205	330	110	95	100
Future Vol, veh/h	55	205	330	110	95	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	150	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	60	223	359	120	103	109

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	478	0	-	0	760	418
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	342	-
Critical Hdwy	4.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1095	-	-	-	374	635
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1095	-	-	-	350	635
Mov Cap-2 Maneuver	-	-	-	-	350	-
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	674	-

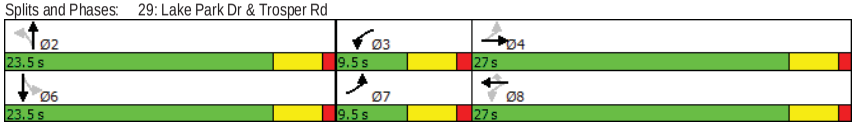
Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1095	-	-	-	350	635
HCM Lane V/C Ratio	0.055	-	-	-	0.295	0.171
HCM Control Delay (s)	8.5	0	-	-	19.5	11.8
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	0.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	290	45	55	415	75	65	25	60	70	20	15
Future Volume (vph)	10	290	45	55	415	75	65	25	60	70	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	225		0	100		0	125		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2012			652			269			583	
Travel Time (s)		45.7			14.8			6.1			13.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	26.5		9.5	26.5	26.5	21.5	21.5		21.5	21.5	
Total Split (s)	9.5	27.0		9.5	27.0	27.0	23.5	23.5		23.5	23.5	
Total Split (%)	15.8%	45.0%		15.8%	45.0%	45.0%	39.2%	39.2%		39.2%	39.2%	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	None		None	None	None	Max	Max		Max	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 46	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 29: Lake Park Dr & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	290	45	55	415	75	65	25	60	70	20	15
Future Volume (veh/h)	10	290	45	55	415	75	65	25	60	70	20	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1881	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	11	305	47	58	437	79	68	26	63	74	21	16
Adj No. of Lanes	1	2	0	1	1	1	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	277	875	133	456	607	516	668	191	463	617	388	296
Arrive On Green	0.01	0.28	0.28	0.06	0.32	0.32	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1792	3110	474	1792	1881	1599	1393	493	1196	1329	1002	763
Grp Volume(v), veh/h	11	174	178	58	437	79	68	0	89	74	0	37
Grp Sat Flow(s),veh/h/ln	1792	1787	1797	1792	1881	1599	1393	0	1689	1329	0	1765
Q Serve(g_s), s	0.2	3.8	3.9	1.1	10.0	1.7	1.6	0.0	1.7	1.9	0.0	0.6
Cycle Q Clear(g_c), s	0.2	3.8	3.9	1.1	10.0	1.7	2.2	0.0	1.7	3.5	0.0	0.6
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.71	1.00		0.43
Lane Grp Cap(c), veh/h	277	503	506	456	607	516	668	0	655	617	0	684
V/C Ratio(X)	0.04	0.35	0.35	0.13	0.72	0.15	0.10	0.00	0.14	0.12	0.00	0.05
Avail Cap(c_a), veh/h	435	820	825	539	863	734	668	0	655	617	0	684
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.9	14.0	14.1	11.3	14.6	11.8	10.1	0.0	9.7	10.9	0.0	9.4
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.1	1.7	0.1	0.3	0.0	0.4	0.4	0.0	0.2
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	0.1	1.9	2.0	0.5	5.4	0.8	0.7	0.0	0.8	0.7	0.0	0.3
LnGrp Delay(d),s/veh	13.0	14.4	14.5	11.4	16.3	12.0	10.4	0.0	10.1	11.2	0.0	9.5
LnGrp LOS	B	B	B	B	B	B	B		B	B		A
Approach Vol, veh/h		363			574			157			111	
Approach Delay, s/veh		14.4			15.2			10.2			10.7	
Approach LOS		B			B			B			B	

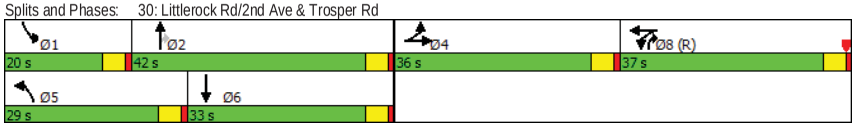
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		23.5	7.2	18.3		23.5	5.2	20.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.0	5.0	22.5		19.0	5.0	22.5
Max Q Clear Time (g_c+I1), s		4.2	3.1	5.9		5.5	2.2	12.0
Green Ext Time (p_c), s		0.9	0.0	4.8		0.9	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	315	120	395	325	35	215	265	440	115	300	60
Future Volume (vph)	50	315	120	395	325	35	215	265	440	115	300	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	150		0	250		0	150		250
Storage Lanes	1		0	1		0	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			520			896			1861	
Travel Time (s)		14.8			11.8			20.4			42.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)				37%								
Turn Type	Split	NA		Split	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8		5	2	8	1	6	
Permitted Phases									2			
Detector Phase	4	4		8	8		5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	35.6	35.6		33.6	33.6		24.5	30.6	33.6	8.6	31.6	
Total Split (s)	36.0	36.0		37.0	37.0		29.0	42.0	37.0	20.0	33.0	
Total Split (%)	26.7%	26.7%		27.4%	27.4%		21.5%	31.1%	27.4%	14.8%	24.4%	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6	3.6	3.6	3.6	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	4.6		4.6	4.6		4.6	4.6	4.6	4.6	4.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max		C-Max	C-Max		Max	Max	C-Max	None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 46 (34%), Referenced to phase 8:WBTL, Start of Red	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	

Splits and Phases: 30: Littlerock Rd/2nd Ave & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	315	120	395	325	35	215	265	440	115	300	60
Future Volume (veh/h)	50	315	120	395	325	35	215	265	440	115	300	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	51	321	61	257	536	36	219	270	332	117	306	61
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	417	699	131	430	837	56	324	587	883	141	627	123
Arrive On Green	0.23	0.23	0.23	0.40	0.40	0.40	0.18	0.31	0.31	0.08	0.21	0.21
Sat Flow, veh/h	1792	3004	564	1792	3487	234	1792	1881	1599	1792	2979	586
Grp Volume(v), veh/h	51	189	193	257	289	283	219	270	332	117	182	185
Grp Sat Flow(s),veh/h/ln	1792	1787	1782	1792	1881	1840	1792	1881	1599	1792	1787	1778
Q Serve(g_s), s	3.0	12.3	12.6	15.3	16.7	16.8	15.4	15.6	15.8	8.7	12.1	12.4
Cycle Q Clear(g_c), s	3.0	12.3	12.6	15.3	16.7	16.8	15.4	15.6	15.8	8.7	12.1	12.4
Prop In Lane	1.00		0.32	1.00		0.13	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	417	416	414	430	451	442	324	587	883	141	376	374
V/C Ratio(X)	0.12	0.46	0.46	0.60	0.64	0.64	0.68	0.46	0.38	0.83	0.48	0.49
Avail Cap(c_a), veh/h	417	416	414	430	451	442	324	587	883	204	376	374
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	0.83	0.83	0.83	0.87	0.87	0.87	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	44.5	44.6	35.3	35.7	35.8	51.6	37.3	17.1	61.3	46.9	47.0
Incr Delay (d2), s/veh	0.6	3.5	3.6	5.0	5.6	5.8	9.5	2.2	1.1	16.6	4.4	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	6.4	6.6	8.1	9.3	9.2	8.5	8.5	11.0	5.0	6.4	6.5
LnGrp Delay(d),s/veh	41.5	47.9	48.2	40.3	41.4	41.6	61.1	39.5	18.1	77.8	51.3	51.6
LnGrp LOS	D	D	D	D	D	D	E	D	B	E	D	D
Approach Vol, veh/h		433			829			821			484	
Approach Delay, s/veh		47.3			41.1			36.6			57.8	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.3	46.7		36.0	29.0	33.0		37.0
Change Period (Y+Rc), s	4.6	4.6		4.6	4.6	4.6		4.6
Max Green Setting (Gmax), s	15.4	37.4		31.4	24.4	28.4		32.4
Max Q Clear Time (g_c+I1), s	10.7	17.8		14.6	17.4	14.4		18.8
Green Ext Time (p_c), s	0.1	4.0		1.8	0.3	3.6		3.7

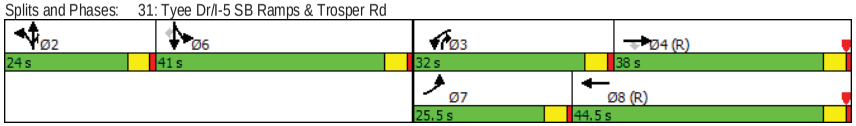
Intersection Summary		
HCM 2010 Ctrl Delay		43.9
HCM 2010 LOS		D

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	640	20	265	340	240	25	190	345	430	330	415
Future Volume (vph)	170	640	20	265	340	240	25	190	345	430	330	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		100	275		0	75		125	400		400
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		520			883			832			952	
Travel Time (s)		11.8			20.1			18.9			21.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases			4									6
Detector Phase	7	4	4	3	8		2	2	2 3	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.6	33.6	33.6	8.6	29.6		20.5	20.5		36.6	36.6	36.6
Total Split (s)	25.5	38.0	38.0	32.0	44.5		24.0	24.0		41.0	41.0	41.0
Total Split (%)	18.9%	28.1%	28.1%	23.7%	33.0%		17.8%	17.8%		30.4%	30.4%	30.4%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6		3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max		Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 46 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Red	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	

Splits and Phases: 31: Tyee Dr/I-5 SB Ramps & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	640	20	265	340	240	25	190	345	430	330	415
Future Volume (veh/h)	170	640	20	265	340	240	25	190	345	430	330	415
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	179	674	21	279	358	0	26	200	310	453	347	121
Adj No. of Lanes	1	2	1	1	2	0	1	1	1	2	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	202	1006	450	303	1206	0	255	268	495	628	507	431
Arrive On Green	0.23	0.56	0.56	0.28	0.56	0.00	0.14	0.14	0.14	0.27	0.27	0.27
Sat Flow, veh/h	1792	3574	1599	1792	3668	0	1774	1863	1583	2329	1881	1599
Grp Volume(v), veh/h	179	674	21	279	358	0	26	200	310	453	347	121
Grp Sat Flow(s),veh/h/ln	1792	1787	1599	1792	1787	0	1774	1863	1583	1165	1881	1599
Q Serve(g_s), s	13.0	17.9	0.8	20.4	7.1	0.0	1.7	13.9	19.4	23.8	22.3	8.1
Cycle Q Clear(g_c), s	13.0	17.9	0.8	20.4	7.1	0.0	1.7	13.9	19.4	23.8	22.3	8.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	202	1006	450	303	1206	0	255	268	495	628	507	431
V/C Ratio(X)	0.88	0.67	0.05	0.92	0.30	0.00	0.10	0.75	0.63	0.72	0.68	0.28
Avail Cap(c_a), veh/h	277	1006	450	364	1206	0	255	268	495	628	507	431
HCM Platoon Ratio	2.00	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.82	0.82	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	25.1	21.4	47.6	21.1	0.0	50.2	55.4	39.7	44.7	44.2	39.0
Incr Delay (d2), s/veh	18.6	3.0	0.2	22.5	0.5	0.0	0.8	17.3	5.9	7.0	7.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	9.1	0.4	12.0	3.6	0.0	0.9	8.4	10.7	8.3	12.6	3.7
LnGrp Delay(d),s/veh	70.0	28.1	21.5	70.1	21.6	0.0	51.0	72.7	45.5	51.7	51.5	40.6
LnGrp LOS	E	C	C	E	C		D	E	D	D	D	D
Approach Vol, veh/h		874			637			536			921	
Approach Delay, s/veh		36.5			42.9			55.9			50.2	
Approach LOS		D			D			E			D	

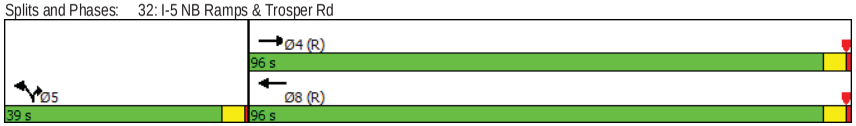
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		24.0	27.4	42.6		41.0	19.9	50.1
Change Period (Y+Rc), s		4.6	4.6	4.6		4.6	4.6	4.6
Max Green Setting (Gmax), s		19.4	27.4	33.4		36.4	20.9	39.9
Max Q Clear Time (g_c+I1), s		21.4	22.4	19.9		25.8	15.0	9.1
Green Ext Time (p_c), s		0.0	0.4	5.6		3.9	0.2	7.8

Intersection Summary	
HCM 2010 Ctrl Delay	45.6
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (vph)	0	905	545	0	660	615	190	0	85	0	0
Future Volume (vph)	0	905	545	0	660	615	190	0	85	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	0		0		0	200	0	0
Storage Lanes	1		0	0		0		1	1	0	0
Taper Length (ft)	25			25				25		25	
Right Turn on Red			Yes			Yes			Yes		
Link Speed (mph)		30			30			30		30	
Link Distance (ft)		883			397			785		593	
Travel Time (s)		20.1			9.0			17.8		13.5	
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
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)											
Turn Type		NA			NA		Prot		Prot		
Protected Phases		4			8		5		5		
Permitted Phases											
Detector Phase		4			8		5		5		
Switch Phase											
Minimum Initial (s)		10.0			10.0		6.0		6.0		
Minimum Split (s)		21.5			21.5		10.6		10.6		
Total Split (s)		96.0			96.0		39.0		39.0		
Total Split (%)		71.1%			71.1%		28.9%		28.9%		
Yellow Time (s)		3.6			3.6		3.6		3.6		
All-Red Time (s)		1.0			1.0		1.0		1.0		
Lost Time Adjust (s)		0.0			0.0		0.0		0.0		
Total Lost Time (s)		4.6			4.6		4.6		4.6		
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode		C-Max			C-Max		None		None		

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 103 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Red	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	

Splits and Phases: 32: I-5 NB Ramps & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Traffic Volume (veh/h)	0	905	545	0	660	615	190	0	85	0	0
Future Volume (veh/h)	0	905	545	0	660	615	190	0	85	0	0
Number	7	4	14	3	8	18	5	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1881	1900	0	1881	1900	1881	1881	1881		
Adj Flow Rate, veh/h	0	973	0	0	710	0	204	204	0		
Adj No. of Lanes	0	3	0	0	2	0	1	1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	0	1	1	0	1	1	1	1	1		
Cap, veh/h	0	4125	0	0	2871	0	230	230	206		
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.13	0.13	0.00		
Sat Flow, veh/h	0	5474	0	0	3762	0	1792	1792	1599		
Grp Volume(v), veh/h	0	973	0	0	710	0	204	204	0		
Grp Sat Flow(s),veh/h/ln	0	1712	0	0	1787	0	1792	1792	1599		
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	15.1	15.1	0.0		
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	15.1	15.1	0.0		
Prop In Lane	0.00		0.00	0.00		0.00	1.00	1.00	1.00		
Lane Grp Cap(c), veh/h	0	4125	0	0	2871	0	230	230	206		
V/C Ratio(X)	0.00	0.24	0.00	0.00	0.25	0.00	0.89	0.89	0.00		
Avail Cap(c_a), veh/h	0	4125	0	0	2871	0	457	457	407		
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	0.66	0.00	0.00	0.49	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	57.8	57.8	0.0		
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0	4.5	4.5	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	7.8	7.8	0.0		
LnGrp Delay(d),s/veh	0.0	0.1	0.0	0.0	0.1	0.0	62.3	62.3	0.0		
LnGrp LOS		A			A		E	E			
Approach Vol, veh/h		973			710		204	204			
Approach Delay, s/veh		0.1			0.1		62.3	62.3			
Approach LOS		A			A		E	E			

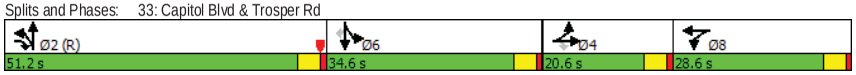
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		22.0		113.0				113.0
Change Period (Y+Rc), s		4.6		4.6				4.6
Max Green Setting (Gmax), s		34.4		91.4				91.4
Max Q Clear Time (g_c+I1), s		17.1		2.0				2.0
Green Ext Time (p_c), s		0.3		15.7				15.7

Intersection Summary		
HCM 2010 Ctrl Delay		6.8
HCM 2010 LOS		A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	50	600	30	75	35	795	675	10	15	615	395
Future Volume (vph)	325	50	600	30	75	35	795	675	10	15	615	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	250		0	100		200
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		397			338			735			2664	
Travel Time (s)		9.0			7.7			16.7			60.5	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)	43%						39%					
Turn Type	Split	NA	pm+ov	Split	NA		Split	NA		Split	NA	Perm
Protected Phases	4	4	2	8	8		2	2		6	6	
Permitted Phases			4									6
Detector Phase	4	4	2	8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	20.6	20.6	29.6	28.6	28.6		29.6	29.6		34.6	34.6	34.6
Total Split (s)	20.6	20.6	51.2	28.6	28.6		51.2	51.2		34.6	34.6	34.6
Total Split (%)	15.3%	15.3%	37.9%	21.2%	21.2%		37.9%	37.9%		25.6%	25.6%	25.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6		3.6	3.6		3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6		4.6	4.6		4.6	4.6	4.6
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Min	None	None		C-Min	C-Min		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 6 (4%), Referenced to phase 2:NBTL, Start of Red	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	

Splits and Phases: 33: Capitol Blvd & Trosper Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	50	600	30	75	35	795	675	10	15	615	395
Future Volume (veh/h)	325	50	600	30	75	35	795	675	10	15	615	395
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1900	1900	1900	1881	1881	1900	1881	1881	1881
Adj Flow Rate, veh/h	364	0	379	30	76	35	498	1109	10	15	621	0
Adj No. of Lanes	2	0	1	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	425	0	947	139	95	44	849	1764	16	349	696	311
Arrive On Green	0.04	0.00	0.04	0.08	0.08	0.08	0.79	0.79	0.79	0.19	0.19	0.00
Sat Flow, veh/h	3583	0	1599	1810	1232	568	1792	3723	34	1792	3574	1599
Grp Volume(v), veh/h	364	0	379	30	0	111	498	560	559	15	621	0
Grp Sat Flow(s),veh/h/ln	1792	0	1599	1810	0	1800	1792	1881	1875	1792	1787	1599
Q Serve(g_s), s	13.6	0.0	15.4	2.1	0.0	8.2	14.6	16.7	16.7	0.9	22.9	0.0
Cycle Q Clear(g_c), s	13.6	0.0	15.4	2.1	0.0	8.2	14.6	16.7	16.7	0.9	22.9	0.0
Prop In Lane	1.00		1.00	1.00		0.32	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	425	0	947	139	0	138	849	891	888	349	696	311
V/C Ratio(X)	0.86	0.00	0.40	0.22	0.00	0.80	0.59	0.63	0.63	0.04	0.89	0.00
Avail Cap(c_a), veh/h	425	0	947	322	0	320	849	891	888	398	794	355
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.00	0.92	1.00	0.00	1.00	0.80	0.80	0.80	0.23	0.23	0.00
Uniform Delay (d), s/veh	63.7	0.0	15.7	58.5	0.0	61.3	9.0	9.2	9.2	44.2	53.0	0.0
Incr Delay (d2), s/veh	14.2	0.0	0.1	0.3	0.0	4.0	2.4	2.7	2.7	0.0	2.8	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	7.6	0.0	14.2	1.1	0.0	4.2	7.4	8.9	8.9	0.5	11.6	0.0
LnGrp Delay(d),s/veh	77.9	0.0	15.8	58.8	0.0	65.3	11.3	11.9	11.9	44.2	55.8	0.0
LnGrp LOS	E		B	E		E	B	B	B	D	E	
Approach Vol, veh/h		743			141			1617			636	
Approach Delay, s/veh		46.2			63.9			11.7			55.5	
Approach LOS		D			E			B			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		68.5		20.6		30.9		15.0
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6
Max Green Setting (Gmax), s		46.6		16.0		30.0		24.0
Max Q Clear Time (g_c+I1), s		18.7		17.4		24.9		10.2
Green Ext Time (p_c), s		6.4		0.0		1.4		0.2

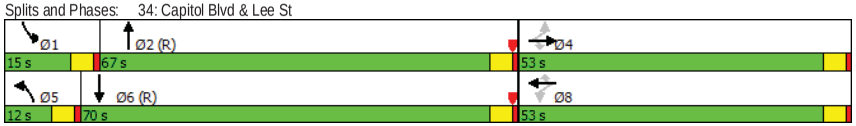
Intersection Summary	
HCM 2010 Ctrl Delay	31.1
HCM 2010 LOS	C

Notes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	5	45	15	10	80	25	1110	25	55	940	185
Future Volume (vph)	300	5	45	15	10	80	25	1110	25	55	940	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		100	250		0	200		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		718			814			621			735	
Travel Time (s)		16.3			18.5			14.1			16.7	
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
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	12.0		6.0	12.0	
Minimum Split (s)	29.0	29.0	29.0	30.0	30.0	30.0	11.0	25.0		11.0	25.0	
Total Split (s)	53.0	53.0	53.0	53.0	53.0	53.0	12.0	67.0		15.0	70.0	
Total Split (%)	39.3%	39.3%	39.3%	39.3%	39.3%	39.3%	8.9%	49.6%		11.1%	51.9%	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6		3.6	3.6	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.6	4.6		4.6	4.6	4.6	4.6		4.6	4.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 135	
Actuated Cycle Length: 135	
Offset: 130 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Red	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 34: Capitol Blvd & Lee St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	5	45	15	10	80	25	1110	25	55	940	185
Future Volume (vph)	300	5	45	15	10	80	25	1110	25	55	940	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.6	4.6	4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.95	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1793	1599		1845	1615	1787	3562		1787	3486	
Flt Permitted		0.71	1.00		0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1335	1599		1458	1615	1787	3562		1787	3486	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	323	5	48	16	11	86	27	1194	27	59	1011	199
RTOR Reduction (vph)	0	0	35	0	0	62	0	1	0	0	10	0
Lane Group Flow (vph)	0	328	13	0	27	24	27	1220	0	59	1200	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		37.8	37.8		37.8	37.8	4.1	76.2		7.2	79.3	
Effective Green, g (s)		37.8	37.8		37.8	37.8	4.1	76.2		7.2	79.3	
Actuated g/C Ratio		0.28	0.28		0.28	0.28	0.03	0.56		0.05	0.59	
Clearance Time (s)		4.6	4.6		4.6	4.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	1.5	3.0		1.6	3.0	
Lane Grp Cap (vph)		373	447		408	452	54	2010		95	2047	
v/s Ratio Prot							0.02	c0.34		c0.03	c0.34	
v/s Ratio Perm		c0.25	0.01		0.02	0.01						
v/c Ratio		0.88	0.03		0.07	0.05	0.50	0.61		0.62	0.59	
Uniform Delay, d1		46.4	35.3		35.7	35.5	64.4	19.5		62.6	17.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		0.79	0.96	
Incremental Delay, d2		19.8	0.0		0.0	0.0	2.6	1.4		6.7	0.9	
Delay (s)		66.2	35.3		35.7	35.5	67.1	20.9		56.4	17.7	
Level of Service		E	D		D	D	E	C		E	B	
Approach Delay (s)		62.2			35.6			21.9			19.5	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	130	5	115	0	770	100	105	680	0
Future Volume (vph)	0	0	0	130	5	115	0	770	100	105	680	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	175		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			426			713			896	
Travel Time (s)		8.9			9.7			16.2			20.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type			Perm	Perm	NA	pm+ov	Prot	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	4	8	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	9.0	9.0	20.0		9.0	20.0	
Total Split (s)	20.0	20.0	20.0	20.0	20.0	10.0	9.0	20.0		10.0	21.0	
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	20.0%	18.0%	40.0%		20.0%	42.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag						Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 50	
Actuated Cycle Length: 42.1	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 35: Littlerock Rd & Fred Meyer/Costco Drwy



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	130	5	115	0	770	100	105	680	0
Future Volume (veh/h)	0	0	0	130	5	115	0	770	100	105	680	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1881	1881	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	0	0	0	137	5	121	0	811	105	111	716	0
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	0	285	243	400	8	387	5	1378	178	506	2263	0
Arrive On Green	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.43	0.43	0.09	0.63	0.00
Sat Flow, veh/h	0	1900	1615	1387	51	1599	1792	3183	412	1792	3668	0
Grp Volume(v), veh/h	0	0	0	142	0	121	0	455	461	111	716	0
Grp Sat Flow(s),veh/h/ln	0	1900	1615	1438	0	1599	1792	1787	1808	1792	1787	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	7.2	7.2	1.0	3.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	0.0	2.3	0.0	7.2	7.2	1.0	3.4	0.0
Prop In Lane	0.00		1.00	0.96		1.00	1.00		0.23	1.00		0.00
Lane Grp Cap(c), veh/h	0	285	243	407	0	387	5	774	783	506	2263	0
V/C Ratio(X)	0.00	0.00	0.00	0.35	0.00	0.31	0.00	0.59	0.59	0.22	0.32	0.00
Avail Cap(c_a), veh/h	0	823	699	814	0	840	242	774	783	632	2263	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	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	14.8	0.0	11.5	0.0	8.0	8.0	4.9	3.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.2	0.0	3.3	3.2	0.2	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	0.0	1.4	0.0	1.0	0.0	4.1	4.2	0.5	1.7	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	15.0	0.0	11.6	0.0	11.2	11.2	5.0	3.5	0.0
LnGrp LOS				B		B		B	B	A	A	
Approach Vol, veh/h		0			263			916			827	
Approach Delay, s/veh		0.0			13.5			11.2			3.7	
Approach LOS					B			B			A	

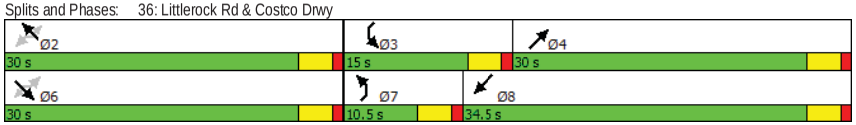
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.4	20.0		9.6	0.0	27.4		9.6
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	6.0	16.0		16.0	5.0	17.0		16.0
Max Q Clear Time (g_c+I1), s	3.0	9.2		0.0	0.0	5.4		5.4
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	6.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
Future Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		100	150		0	150		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		325			608			995			713	
Travel Time (s)		7.4			13.8			22.6			16.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Detector Phase	6	6	6	2	2	2	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	9.5	30.0		9.5	30.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	10.5	30.0		15.0	34.5	
Total Split (%)	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	14.0%	40.0%		20.0%	46.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 69.7	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 36: Littlerock Rd & Costco Drwy



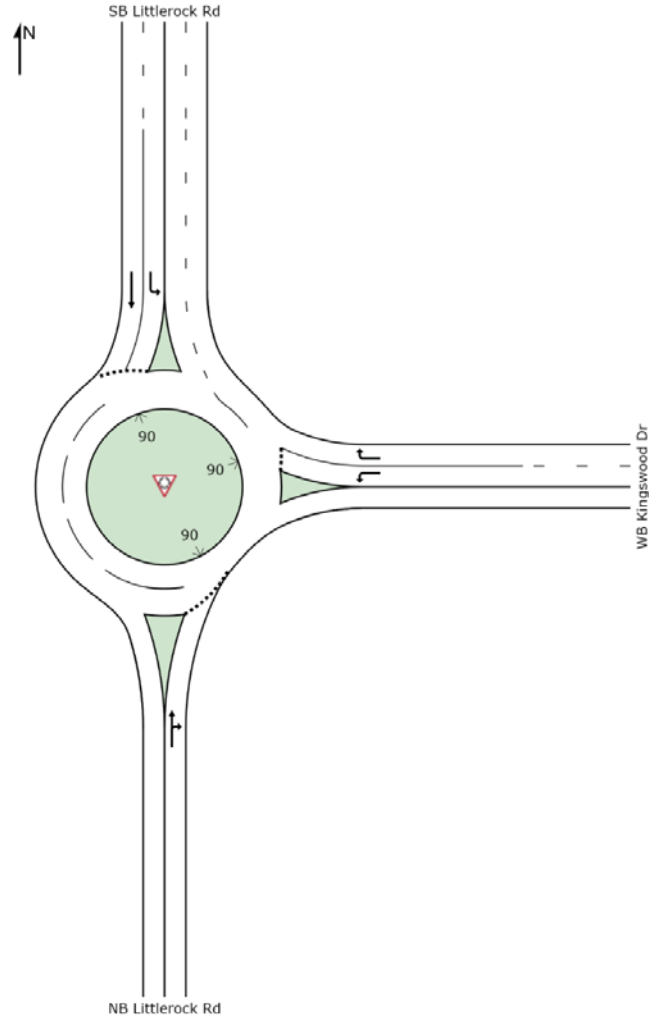
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
Future Volume (vph)	80	25	15	130	5	220	50	590	110	220	495	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1830	1615		1813	1615	1787	3490		1787	3500	
Flt Permitted		0.73	1.00		0.67	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1395	1615		1275	1615	1787	3490		1787	3500	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	26	16	137	5	232	53	621	116	232	521	84
RTOR Reduction (vph)	0	0	10	0	0	147	0	21	0	0	17	0
Lane Group Flow (vph)	0	110	6	0	142	85	53	716	0	232	588	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Actuated Green, G (s)		26.1	26.1		26.1	26.1	3.7	22.2		11.0	29.5	
Effective Green, g (s)		26.1	26.1		26.1	26.1	3.7	22.2		11.0	29.5	
Actuated g/C Ratio		0.37	0.37		0.37	0.37	0.05	0.31		0.15	0.41	
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		510	591		466	591	92	1086		275	1448	
v/s Ratio Prot							0.03	c0.21		c0.13	0.17	
v/s Ratio Perm		0.08	0.00		c0.11	0.05						
v/c Ratio		0.22	0.01		0.30	0.14	0.58	0.66		0.84	0.41	
Uniform Delay, d1		15.6	14.4		16.1	15.1	33.0	21.3		29.3	14.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.0		1.7	0.5	8.5	1.5		20.4	0.2	
Delay (s)		16.5	14.4		17.8	15.6	41.5	22.7		49.7	14.9	
Level of Service		B	B		B	B	D	C		D	B	
Approach Delay (s)		16.3			16.5			24.0			24.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

SITE LAYOUT

Site: 37) Littlerock Rd at Kingswood Dr

Projected 2022 without improvements
PM Peak Hour
Roundabout



MOVEMENT SUMMARY

Site: 37) Littlerock Rd at Kingswood Dr

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Littlerock Rd											
8	T1	656	1.0	0.747	5.2	LOS A	9.0	226.0	0.54	0.47	36.0
18	R2	151	1.0	0.747	5.1	LOS A	9.0	226.0	0.54	0.47	35.0
Approach		806	1.0	0.747	5.2	LOS A	9.0	226.0	0.54	0.47	35.8
East: WB Kingswood Dr											
1	L2	215	1.0	0.254	13.3	LOS B	1.7	43.9	0.76	0.81	33.0
16	R2	91	1.0	0.055	4.2	LOS A	0.0	0.0	0.00	0.49	36.5
Approach		306	1.0	0.254	10.6	LOS B	1.7	43.9	0.53	0.71	33.9
North: SB Littlerock Rd											
7	L2	70	1.0	0.092	11.5	LOS B	0.5	12.2	0.47	0.66	33.8
4	T1	667	1.0	0.547	5.5	LOS A	4.9	123.5	0.63	0.55	35.7
Approach		737	1.0	0.547	6.1	LOS A	4.9	123.5	0.61	0.56	35.5
All Vehicles		1849	1.0	0.747	6.4	LOS A	9.0	226.0	0.57	0.55	35.3

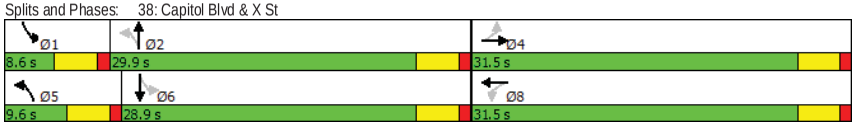
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 6.1 | Copyright © 2000-2015 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: SCJ ALLIANCE | Processed: Wednesday, June 8, 2016 9:37:03 AM
Project: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Operations\sidra\2022 Baseline\Existing 2022 PM.sip6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	1	15	15	1	20	20	975	15	35	840	40
Future Volume (vph)	25	1	15	15	1	20	20	975	15	35	840	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	150		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		642			1326			1300			1368	
Travel Time (s)		14.6			30.1			29.5			31.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	31.5	31.5		31.5	31.5		9.5	25.5		8.5	26.5	
Total Split (s)	31.5	31.5		31.5	31.5		9.6	29.9		8.6	28.9	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		13.7%	42.7%		12.3%	41.3%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 46.3	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 38: Capitol Blvd & X St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1	15	15	1	20	20	975	15	35	840	40
Future Volume (veh/h)	25	1	15	15	1	20	20	975	15	35	840	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	28	1	17	17	1	22	22	1096	17	39	944	45
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	269	8	136	273	6	137	448	2063	32	421	2035	97
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.02	0.57	0.57	0.03	0.59	0.59
Sat Flow, veh/h	1410	90	1538	1417	71	1555	1792	3603	56	1792	3474	166
Grp Volume(v), veh/h	28	0	18	17	0	23	22	544	569	39	486	503
Grp Sat Flow(s),veh/h/ln	1410	0	1629	1417	0	1626	1792	1787	1871	1792	1787	1852
Q Serve(g_s), s	0.8	0.0	0.5	0.5	0.0	0.6	0.2	8.3	8.3	0.4	6.9	6.9
Cycle Q Clear(g_c), s	1.4	0.0	0.5	0.9	0.0	0.6	0.2	8.3	8.3	0.4	6.9	6.9
Prop In Lane	1.00		0.94	1.00		0.96	1.00		0.03	1.00		0.09
Lane Grp Cap(c), veh/h	269	0	144	273	0	144	448	1024	1072	421	1047	1085
V/C Ratio(X)	0.10	0.00	0.13	0.06	0.00	0.16	0.05	0.53	0.53	0.09	0.46	0.46
Avail Cap(c_a), veh/h	1003	0	992	1011	0	990	615	1024	1072	525	1047	1085
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	18.6	19.1	0.0	18.7	4.2	5.8	5.8	4.3	5.2	5.2
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.0	0.5	0.0	2.0	1.9	0.1	1.5	1.4
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	0.3	0.0	0.2	0.2	0.0	0.3	0.1	4.5	4.7	0.2	3.7	3.8
LnGrp Delay(d),s/veh	19.5	0.0	19.0	19.2	0.0	19.2	4.2	7.8	7.7	4.4	6.7	6.7
LnGrp LOS	B		B	B		B	A	A	A	A	A	A
Approach Vol, veh/h		46			40			1135			1028	
Approach Delay, s/veh		19.3			19.2			7.7			6.6	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	29.9		8.4	5.4	30.5		8.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	4.1	25.4		27.0	5.1	24.4		27.0
Max Q Clear Time (g_c+I1), s	2.4	10.3		3.4	2.2	8.9		2.9
Green Ext Time (p_c), s	0.0	11.2		0.3	0.0	11.5		0.3

Intersection Summary			
HCM 2010 Ctrl Delay			7.6
HCM 2010 LOS			A

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
Future Vol, veh/h	5	10	10	5	5	2	2	65	5	0	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	2	2
Mvmt Flow	7	14	14	7	7	3	3	88	7	0	61	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	165	164	64	175	165	91	68	0	0	95	0	0
Stage 1	64	64	-	97	97	-	-	-	-	-	-	-
Stage 2	101	100	-	78	68	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.12	-	-
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	-	-	2.218	-	-
Pot Cap-1 Maneuver	804	732	1006	792	731	972	1546	-	-	1499	-	-
Stage 1	952	846	-	914	819	-	-	-	-	-	-	-
Stage 2	910	816	-	936	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	795	731	1006	769	730	972	1546	-	-	1499	-	-
Mov Cap-2 Maneuver	795	731	-	769	730	-	-	-	-	-	-	-
Stage 1	950	846	-	912	817	-	-	-	-	-	-	-
Stage 2	898	814	-	909	842	-	-	-	-	-	-	-

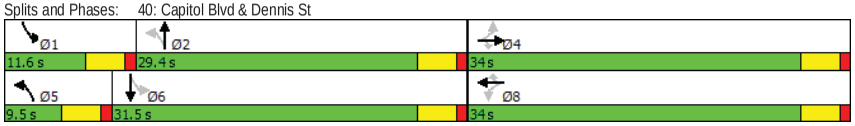
Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9.7	0.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1546	-	-	836	779	1499	-	-
HCM Lane V/C Ratio	0.002	-	-	0.04	0.021	-	-	-
HCM Control Delay (s)	7.3	0	-	9.5	9.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
Future Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		100	175		0	225		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		834			700			1337			1300	
Travel Time (s)		19.0			15.9			30.4			29.5	
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 (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	8.0		7.0	8.0	
Minimum Split (s)	33.5	33.5	33.5	33.5	33.5	33.5	9.5	27.5		11.5	27.5	
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	9.5	29.4		11.6	31.5	
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	12.7%	39.2%		15.5%	42.0%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 59.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 40: Capitol Blvd & Dennis St



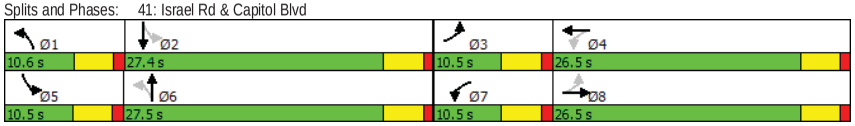
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
Future Volume (vph)	170	40	35	30	20	75	15	740	25	50	695	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1599		1845	1615	1787	3557		1787	3513	
Flt Permitted		0.73	1.00		0.76	1.00	0.30	1.00		0.24	1.00	
Satd. Flow (perm)		1372	1599		1453	1615	568	3557		461	3513	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	187	44	38	33	22	82	16	813	27	55	764	99
RTOR Reduction (vph)	0	0	29	0	0	62	0	3	0	0	10	0
Lane Group Flow (vph)	0	231	9	0	55	20	16	837	0	55	853	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		15.0	15.0		15.0	15.0	31.3	30.4		37.3	33.4	
Effective Green, g (s)		15.0	15.0		15.0	15.0	31.3	30.4		37.3	33.4	
Actuated g/C Ratio		0.24	0.24		0.24	0.24	0.50	0.48		0.59	0.53	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		327	381		347	385	300	1721		356	1868	
v/s Ratio Prot							0.00	0.24		c0.01	c0.24	
v/s Ratio Perm		c0.17	0.01		0.04	0.01	0.03			0.08		
v/c Ratio		0.71	0.02		0.16	0.05	0.05	0.49		0.15	0.46	
Uniform Delay, d1		21.9	18.3		18.9	18.4	8.0	10.9		6.1	9.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.8	0.0		0.2	0.1	0.1	1.0		0.2	0.8	
Delay (s)		28.7	18.3		19.1	18.5	8.1	11.9		6.3	9.9	
Level of Service		C	B		B	B	A	B		A	A	
Approach Delay (s)		27.2			18.7			11.8			9.7	
Approach LOS		C			B			B			A	

Intersection Summary					
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	62.8	Sum of lost time (s)		13.5	
Intersection Capacity Utilization	56.5%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	160	150	105	215	150	120	335	25	120	575	105
Future Volume (vph)	95	160	150	105	215	150	120	335	25	120	575	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	150		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2751			725			934			1337	
Travel Time (s)		62.5			16.5			21.2			30.4	
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%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	26.5		10.5	26.5		10.5	26.5		10.5	26.5	
Total Split (s)	10.5	26.5		10.5	26.5		10.6	27.5		10.5	27.4	
Total Split (%)	14.0%	35.3%		14.0%	35.3%		14.1%	36.7%		14.0%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 67.5	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 41: Israel Rd & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	160	150	105	215	150	120	335	25	120	575	105
Future Volume (veh/h)	95	160	150	105	215	150	120	335	25	120	575	105
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	106	178	100	117	239	167	133	372	28	133	639	117
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
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
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	288	313	176	388	281	197	339	1084	81	475	971	177
Arrive On Green	0.07	0.27	0.27	0.08	0.28	0.28	0.08	0.32	0.32	0.08	0.32	0.32
Sat Flow, veh/h	1810	1144	643	1774	1022	714	1792	3371	253	1792	3019	552
Grp Volume(v), veh/h	106	0	278	117	0	406	133	196	204	133	378	378
Grp Sat Flow(s),veh/h/ln	1810	0	1787	1774	0	1737	1792	1787	1837	1792	1787	1784
Q Serve(g_s), s	2.9	0.0	9.6	3.3	0.0	15.8	3.4	6.0	6.0	3.4	13.0	13.1
Cycle Q Clear(g_c), s	2.9	0.0	9.6	3.3	0.0	15.8	3.4	6.0	6.0	3.4	13.0	13.1
Prop In Lane	1.00		0.36	1.00		0.41	1.00		0.14	1.00		0.31
Lane Grp Cap(c), veh/h	288	0	488	388	0	478	339	575	591	475	575	574
V/C Ratio(X)	0.37	0.00	0.57	0.30	0.00	0.85	0.39	0.34	0.34	0.28	0.66	0.66
Avail Cap(c_a), veh/h	306	0	550	402	0	534	353	575	591	486	575	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	22.4	17.0	0.0	24.5	15.4	18.5	18.5	14.2	20.9	20.9
Incr Delay (d2), s/veh	0.9	0.0	1.3	0.5	0.0	11.7	0.9	1.6	1.6	0.4	5.8	5.8
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	1.5	0.0	4.9	1.6	0.0	9.1	1.7	3.2	3.3	1.7	7.3	7.3
LnGrp Delay(d),s/veh	19.1	0.0	23.7	17.5	0.0	36.2	16.3	20.1	20.1	14.6	26.7	26.7
LnGrp LOS	B		C	B		D	B	C	C	B	C	C
Approach Vol, veh/h		384			523			533			889	
Approach Delay, s/veh		22.4			32.0			19.2			24.9	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	27.5	9.8	24.2	10.1	27.5	9.9	24.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.1	22.9	6.0	22.0	6.0	23.0	6.0	22.0
Max Q Clear Time (g_c+I1), s	5.4	15.1	4.9	17.8	5.4	8.0	5.3	11.6
Green Ext Time (p_c), s	0.0	4.7	0.0	1.9	0.0	7.4	0.0	3.7

Intersection Summary		
HCM 2010 Ctrl Delay	24.8	
HCM 2010 LOS	C	

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	55	85	100	135	85	85
Future Vol, veh/h	55	85	100	135	85	85
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	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	58	89	105	142	89	89

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	247	0	-	0	381	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	205	-
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	1325	-	-	-	625	872
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	834	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1325	-	-	-	596	872
Mov Cap-2 Maneuver	-	-	-	-	596	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1325	-	-	-	708
HCM Lane V/C Ratio	0.044	-	-	-	0.253
HCM Control Delay (s)	7.8	0	-	-	11.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	25	5	145	5	1	5	240	15	5	5	10	40
Future Vol, veh/h	25	5	145	5	1	5	240	15	5	5	10	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	0	0	0	1	1	1	0	0	0
Mvmt Flow	30	6	173	6	1	6	286	18	6	6	12	48

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	644	643	36	729	663	21	60	0	0	24	0	0
Stage 1	48	48	-	592	592	-	-	-	-	-	-	-
Stage 2	596	595	-	137	71	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.1	6.5	6.2	4.11	-	-	4.1	-	-
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	3.509	4.009	3.309	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	387	393	1039	341	384	1062	1550	-	-	1604	-	-
Stage 1	968	857	-	496	497	-	-	-	-	-	-	-
Stage 2	492	494	-	871	840	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	328	318	1039	239	311	1062	1550	-	-	1604	-	-
Mov Cap-2 Maneuver	328	318	-	239	311	-	-	-	-	-	-	-
Stage 1	787	854	-	403	404	-	-	-	-	-	-	-
Stage 2	397	402	-	718	837	-	-	-	-	-	-	-

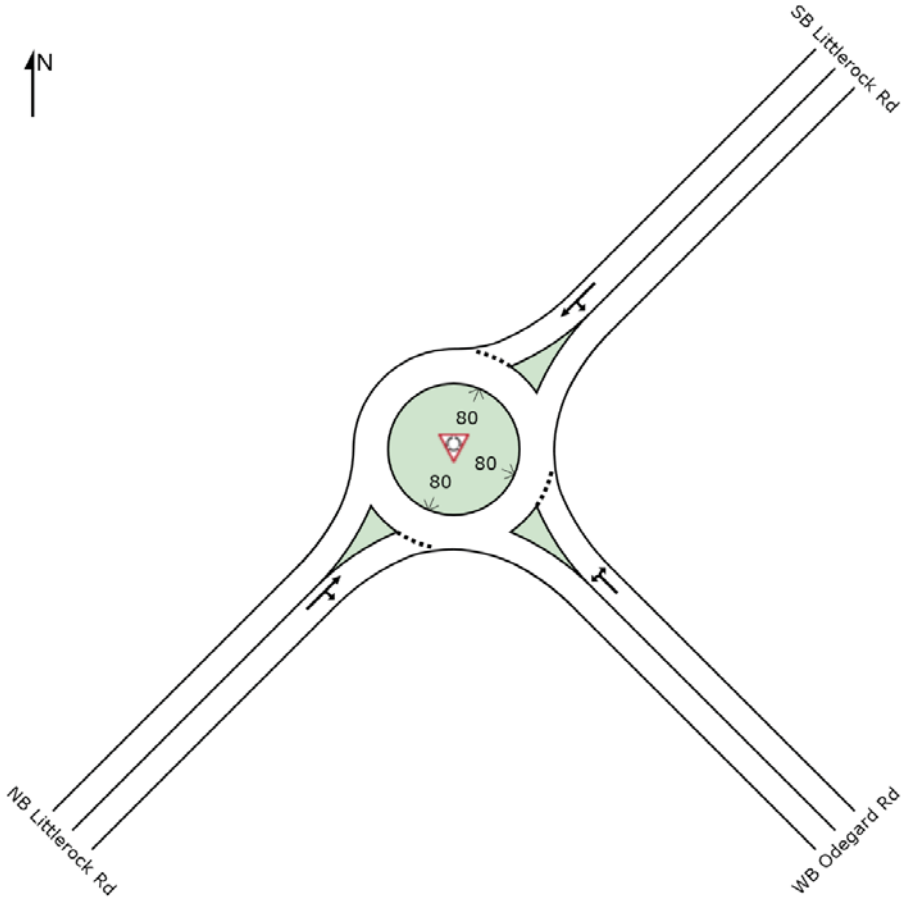
Approach	EB	WB	NB	SB
HCM Control Delay, s	11.6	14.8	7.2	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1550	-	-	756	381	1604	-	-
HCM Lane V/C Ratio	0.184	-	-	0.276	0.034	0.004	-	-
HCM Control Delay (s)	7.8	0	-	11.6	14.8	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.7	-	-	1.1	0.1	0	-	-

SITE LAYOUT

Site: 44) Littlerock Rd at Odegard Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 44) Littlerock Rd at Odegard Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: WB Odegard Rd											
3x	L2	16	0.0	0.034	14.9	LOS B	0.2	4.6	0.70	0.73	32.6
18x	R2	5	0.0	0.034	9.5	LOS A	0.2	4.6	0.70	0.73	31.8
Approach		22	0.0	0.034	13.5	LOS B	0.2	4.6	0.70	0.73	32.4
NorthEast: SB Littlerock Rd											
1x	L2	11	1.0	0.677	9.7	LOS A	9.6	242.9	0.26	0.38	36.6
6x	T1	823	1.0	0.677	4.4	LOS A	9.6	242.9	0.26	0.38	36.6
Approach		833	1.0	0.677	4.5	LOS A	9.6	242.9	0.26	0.38	36.6
SouthWest: NB Littlerock Rd											
2x	T1	790	1.0	0.641	4.3	LOS A	7.5	189.4	0.17	0.38	37.0
12x	R2	5	1.0	0.641	4.2	LOS A	7.5	189.4	0.17	0.38	36.0
Approach		796	1.0	0.641	4.3	LOS A	7.5	189.4	0.17	0.38	37.0
All Vehicles		1651	1.0	0.677	4.5	LOS A	9.6	242.9	0.22	0.39	36.7

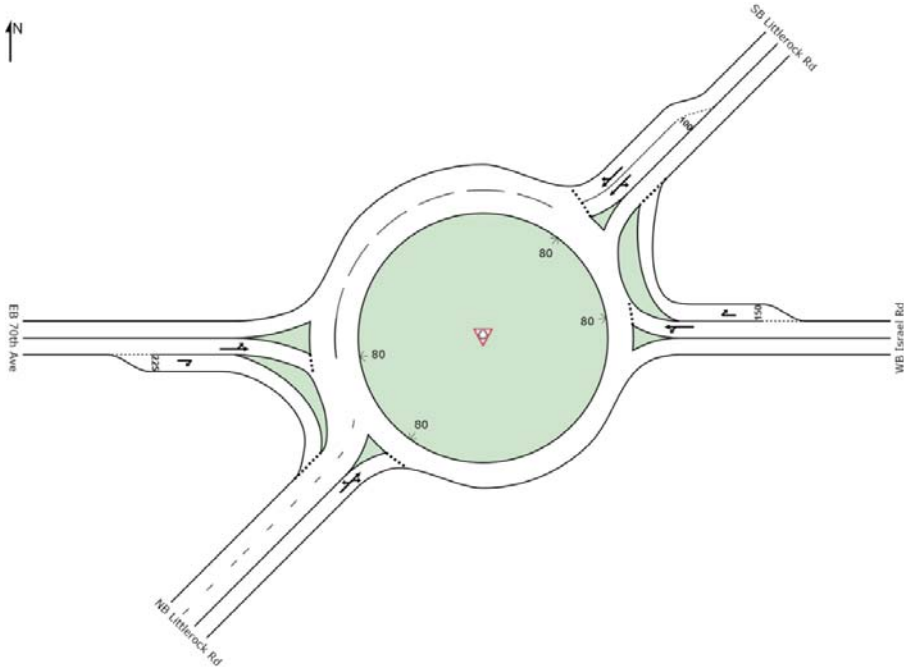
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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SITE LAYOUT

Site: 45) Littlerock Rd at Israel Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 45) Littlerock Rd at Israel Rd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: WB Israel Rd											
1a	L1	137	1.0	0.426	13.0	LOS B	3.3	84.3	0.88	0.87	33.5
6	T1	184	1.0	0.426	8.8	LOS A	3.3	84.3	0.88	0.87	33.8
16b	R3	337	1.0	0.336	6.6	LOS A	2.3	58.8	0.67	0.71	34.8
Approach		658	1.0	0.426	8.5	LOS A	3.3	84.3	0.77	0.79	34.2
NorthEast: SB Littlerock Rd											
1bx	L3	184	1.0	0.493	16.1	LOS B	3.9	98.7	0.82	0.90	33.3
6x	T1	505	1.0	0.493	9.3	LOS A	4.0	101.8	0.82	0.86	34.1
16ax	R1	132	1.0	0.493	8.4	LOS A	4.0	101.8	0.82	0.83	34.5
Approach		821	1.0	0.493	10.7	LOS B	4.0	101.8	0.82	0.87	34.0
West: EB 70th Ave											
5a	L1	116	1.0	0.283	11.2	LOS B	1.4	35.1	0.68	0.80	34.0
2	T1	95	1.0	0.283	7.2	LOS A	1.4	35.1	0.68	0.80	34.4
12b	R3	79	1.0	0.094	6.0	LOS A	0.4	9.9	0.55	0.70	35.1
Approach		289	1.0	0.283	8.5	LOS A	1.4	35.1	0.64	0.77	34.4
SouthWest: NB Littlerock Rd											
5bx	L3	263	1.0	0.757	19.4	LOS B	10.0	253.2	0.92	1.02	31.9
2x	T1	305	1.0	0.757	13.0	LOS B	10.0	253.2	0.92	1.02	31.7
12ax	R1	79	1.0	0.757	12.6	LOS B	10.0	253.2	0.92	1.02	31.5
Approach		647	1.0	0.757	15.5	LOS B	10.0	253.2	0.92	1.02	31.8
All Vehicles		2416	1.0	0.757	11.1	LOS B	10.0	253.2	0.81	0.87	33.5

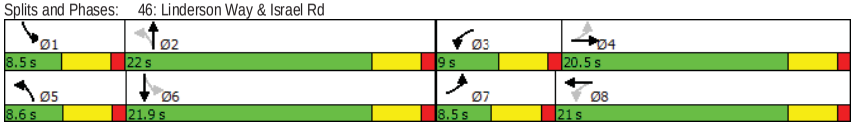
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	210	50	135	305	25	130	105	115	40	90	80
Future Volume (vph)	65	210	50	135	305	25	130	105	115	40	90	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	150		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3505			2751			2073			847	
Travel Time (s)		79.7			62.5			47.1			19.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	5.0		4.0	5.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	21.5		8.5	21.5	
Total Split (s)	8.5	20.5		9.0	21.0		8.6	22.0		8.5	21.9	
Total Split (%)	14.2%	34.2%		15.0%	35.0%		14.3%	36.7%		14.2%	36.5%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Max		None	Max	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 53.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 46: Linderson Way & Israel Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	210	50	135	305	25	130	105	115	40	90	80
Future Volume (veh/h)	65	210	50	135	305	25	130	105	115	40	90	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	68	221	53	142	321	26	137	111	47	42	95	84
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	287	310	74	353	421	34	543	441	187	546	288	254
Arrive On Green	0.05	0.21	0.21	0.08	0.25	0.25	0.07	0.35	0.35	0.03	0.31	0.31
Sat Flow, veh/h	1792	1467	352	1792	1718	139	1792	1256	532	1792	922	815
Grp Volume(v), veh/h	68	0	274	142	0	347	137	0	158	42	0	179
Grp Sat Flow(s),veh/h/ln	1792	0	1819	1792	0	1857	1792	0	1787	1792	0	1737
Q Serve(g_s), s	1.6	0.0	7.8	3.4	0.0	9.7	2.8	0.0	3.5	0.9	0.0	4.4
Cycle Q Clear(g_c), s	1.6	0.0	7.8	3.4	0.0	9.7	2.8	0.0	3.5	0.9	0.0	4.4
Prop In Lane	1.00		0.19	1.00		0.07	1.00		0.30	1.00		0.47
Lane Grp Cap(c), veh/h	287	0	385	353	0	456	543	0	627	546	0	542
V/C Ratio(X)	0.24	0.00	0.71	0.40	0.00	0.76	0.25	0.00	0.25	0.08	0.00	0.33
Avail Cap(c_a), veh/h	332	0	522	353	0	549	543	0	627	613	0	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	20.4	15.8	0.0	19.5	11.6	0.0	12.9	12.2	0.0	14.7
Incr Delay (d2), s/veh	0.2	0.0	2.9	0.3	0.0	5.1	0.1	0.0	1.0	0.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	4.2	1.7	0.0	5.6	1.4	0.0	1.9	0.4	0.0	2.3
LnGrp Delay(d),s/veh	16.7	0.0	23.3	16.1	0.0	24.6	11.7	0.0	13.9	12.3	0.0	16.4
LnGrp LOS	B		C	B		C	B		B	B		B
Approach Vol, veh/h		342			489			295			221	
Approach Delay, s/veh		22.0			22.2			12.9			15.6	
Approach LOS		C			C			B			B	

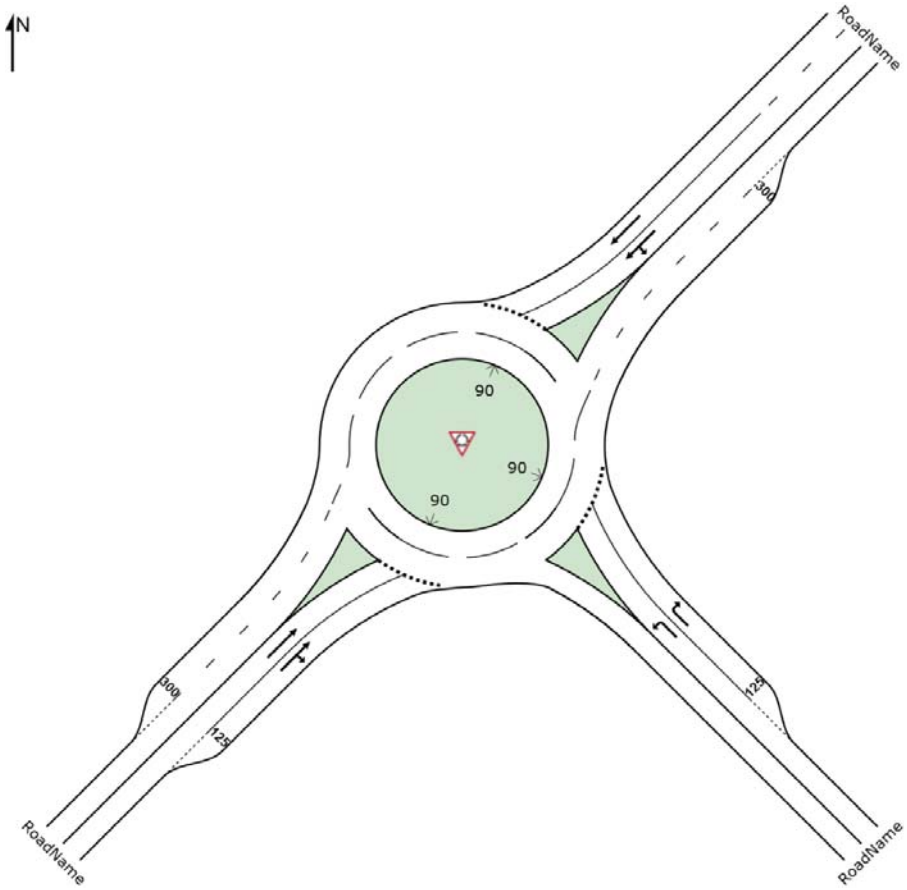
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	24.1	9.0	16.3	8.6	21.9	7.1	18.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	17.5	4.5	16.0	4.1	17.4	4.0	16.5
Max Q Clear Time (g_c+I1), s	2.9	5.5	5.4	9.8	4.8	6.4	3.6	11.7
Green Ext Time (p_c), s	0.0	1.5	0.0	2.0	0.0	1.5	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

SITE LAYOUT

Site: 47) Littlerock Rd at Tumwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 47) Littlerock Rd at Tumwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: RoadName											
3x	L2	314	1.0	0.282	10.7	LOS B	1.5	38.9	0.40	0.66	34.0
18x	R2	340	1.0	0.299	5.1	LOS A	1.7	42.1	0.40	0.55	35.6
Approach		654	1.0	0.299	7.8	LOS A	1.7	42.1	0.40	0.60	34.8
NorthEast: RoadName											
1x	L2	383	1.0	0.491	11.7	LOS B	3.2	80.8	0.58	0.71	34.3
6x	T1	410	1.0	0.491	6.2	LOS A	3.2	80.8	0.54	0.63	35.4
Approach		793	1.0	0.491	8.9	LOS A	3.2	80.8	0.56	0.67	34.8
SouthWest: RoadName											
2x	T1	197	0.0	0.198	5.9	LOS A	1.1	26.5	0.52	0.55	36.0
12x	R2	181	0.0	0.190	6.0	LOS A	1.0	24.9	0.52	0.63	35.3
Approach		378	0.0	0.198	5.9	LOS A	1.1	26.5	0.52	0.59	35.7
All Vehicles		1824	0.8	0.491	7.9	LOS A	3.2	80.8	0.50	0.63	35.0

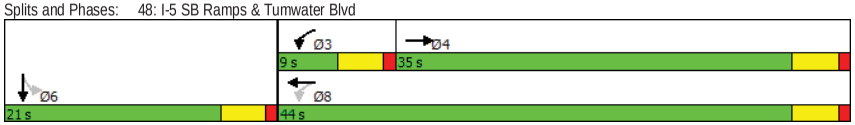
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	425	105	365	310	0	0	0	0	400	30	310
Future Volume (vph)	0	425	105	365	310	0	0	0	0	400	30	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	350		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1843			807			1457			1571	
Travel Time (s)		41.9			18.3			33.1			35.7	
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 (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										10%		
Turn Type		NA		pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases				8						6		
Detector Phase		4		3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0		4.0	4.0					4.0	4.0	
Minimum Split (s)		20.5		8.5	20.5					20.5	20.5	
Total Split (s)		35.0		9.0	44.0					21.0	21.0	
Total Split (%)		53.8%		13.8%	67.7%					32.3%	32.3%	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	
Lost Time Adjust (s)		0.0			0.0					0.0	0.0	
Total Lost Time (s)		4.5			4.5					4.5	4.5	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Recall Mode		None		None	Max					None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 64.9	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 48: I-5 SB Ramps & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	425	105	365	310	0	0	0	0	400	30	310
Future Volume (veh/h)	0	425	105	365	310	0	0	0	0	400	30	310
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1900	1900	1881	0				1827	1827	1900
Adj Flow Rate, veh/h	0	452	112	388	330	0				306	200	154
Adj No. of Lanes	0	2	0	0	1	0				1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	1	1	1	1	0				4	4	4
Cap, veh/h	0	1759	433	88	7	0				419	231	178
Arrive On Green	0.00	0.62	0.62	0.62	0.62	0.00				0.24	0.24	0.24
Sat Flow, veh/h	0	2939	700	3	11	0				1740	959	738
Grp Volume(v), veh/h	0	283	281	718	0	0				306	0	354
Grp Sat Flow(s),veh/h/ln	0	1787	1758	13	0	0				1740	0	1697
Q Serve(g_s), s	0.0	4.6	4.6	28.2	0.0	0.0				10.3	0.0	12.8
Cycle Q Clear(g_c), s	0.0	4.6	4.6	28.2	0.0	0.0				10.3	0.0	12.8
Prop In Lane	0.00		0.40	0.54		0.00				1.00		0.44
Lane Grp Cap(c), veh/h	0	1105	1086	0	0	0				419	0	409
V/C Ratio(X)	0.00	0.26	0.26	0.00	0.00	0.00				0.73	0.00	0.87
Avail Cap(c_a), veh/h	0	1105	1086	0	0	0				449	0	438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	0.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.5	5.5	0.0	0.0	0.0				22.3	0.0	23.3
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.0	0.0				5.5	0.0	15.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.2	2.2	0.0	0.0	0.0				5.6	0.0	7.8
LnGrp Delay(d),s/veh	0.0	5.7	5.7	0.0	0.0	0.0				27.9	0.0	39.0
LnGrp LOS		A	A							C		D
Approach Vol, veh/h		564			718						660	
Approach Delay, s/veh		5.7			0.0						33.8	
Approach LOS		A			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				44.0		19.9		44.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				30.5		16.5		39.5
Max Q Clear Time (g_c+I1), s				6.6		14.8		30.2
Green Ext Time (p_c), s				11.5		0.6		6.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	19.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	195	630	0	0	610	1205	65	5	150	0	0	0
Future Vol, veh/h	195	630	0	0	610	1205	65	5	150	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	150	-	-	-	-	0	-	-	150	-	-	-
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, %	3	3	3	1	1	1	3	3	3	0	0	0
Mvmt Flow	222	716	0	0	693	1369	74	6	170	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	693	0	-	-	-	0	1852	1852	358
Stage 1	-	-	-	-	-	-	1159	1159	-
Stage 2	-	-	-	-	-	-	693	693	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	895	-	0	0	-	0	~ 72	73	637
Stage 1	-	-	0	0	-	0	260	268	-
Stage 2	-	-	0	0	-	0	493	442	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	895	-	-	-	-	-	~ 54	0	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 54	0	-
Stage 1	-	-	-	-	-	-	196	0	-
Stage 2	-	-	-	-	-	-	493	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.4	0	140.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	54	637	895	-	-
HCM Lane V/C Ratio	1.473	0.268	0.248	-	-
HCM Control Delay (s)	$ 413.7	12.7	10.3	-	-
HCM Lane LOS	F	B	B	-	-
HCM 95th %tile Q(veh)	7.3	1.1	1	-	-

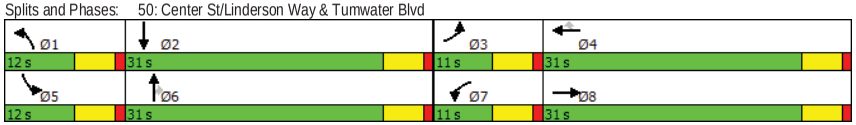
Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	595	150	105	755	30	170	105	55	185	185	875
Future Volume (vph)	130	595	150	105	755	30	170	105	55	185	185	875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		0	350		250	250		150	300		700
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		895			1275			1023			2073	
Travel Time (s)		20.3			29.0			23.3			47.1	
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 (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			Free
Detector Phase	3	8		7	4	4	1	6	6	5	2	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	31.0		11.0	31.0	31.0	11.0	31.0	31.0	11.0	31.0	
Total Split (s)	11.0	31.0		11.0	31.0	31.0	12.0	31.0	31.0	12.0	31.0	
Total Split (%)	12.9%	36.5%		12.9%	36.5%	36.5%	14.1%	36.5%	36.5%	14.1%	36.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 85	
Actuated Cycle Length: 71.8	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 50: Center St/Linderson Way & Tumwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	595	150	105	755	30	170	105	55	185	185	875
Future Volume (veh/h)	130	595	150	105	755	30	170	105	55	185	185	875
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1881	1881	1881	1881	1881	1881	1881
Adj Flow Rate, veh/h	138	633	160	112	803	32	181	112	59	197	197	0
Adj No. of Lanes	2	2	0	1	2	1	1	1	1	1	1	1
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
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	277	1055	266	143	1343	601	181	289	245	181	289	245
Arrive On Green	0.08	0.38	0.38	0.08	0.38	0.38	0.10	0.15	0.15	0.10	0.15	0.00
Sat Flow, veh/h	3442	2801	707	1792	3574	1599	1792	1881	1599	1792	1881	1599
Grp Volume(v), veh/h	138	400	393	112	803	32	181	112	59	197	197	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1738	1792	1787	1599	1792	1881	1599	1792	1881	1599
Q Serve(g_s), s	2.7	12.6	12.6	4.2	12.5	0.9	7.0	3.7	2.2	7.0	6.9	0.0
Cycle Q Clear(g_c), s	2.7	12.6	12.6	4.2	12.5	0.9	7.0	3.7	2.2	7.0	6.9	0.0
Prop In Lane	1.00		0.41	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	277	666	654	143	1343	601	181	289	245	181	289	245
V/C Ratio(X)	0.50	0.60	0.60	0.78	0.60	0.05	1.00	0.39	0.24	1.09	0.68	0.00
Avail Cap(c_a), veh/h	298	666	654	155	1343	601	181	707	601	181	707	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.5	17.4	17.4	31.3	17.4	13.8	31.1	26.4	25.7	31.1	27.7	0.0
Incr Delay (d2), s/veh	1.4	4.0	4.1	21.1	2.0	0.2	66.5	0.9	0.5	92.0	2.8	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	1.3	6.8	6.7	2.9	6.5	0.4	6.8	2.0	1.0	8.1	3.8	0.0
LnGrp Delay(d),s/veh	31.8	21.3	21.4	52.3	19.4	13.9	97.6	27.2	26.2	123.1	30.5	0.0
LnGrp LOS	C	C	C	D	B	B	F	C	C	F	C	
Approach Vol, veh/h		931			947			352			394	
Approach Delay, s/veh		22.9			23.1			63.2			76.8	
Approach LOS		C			C			E			E	

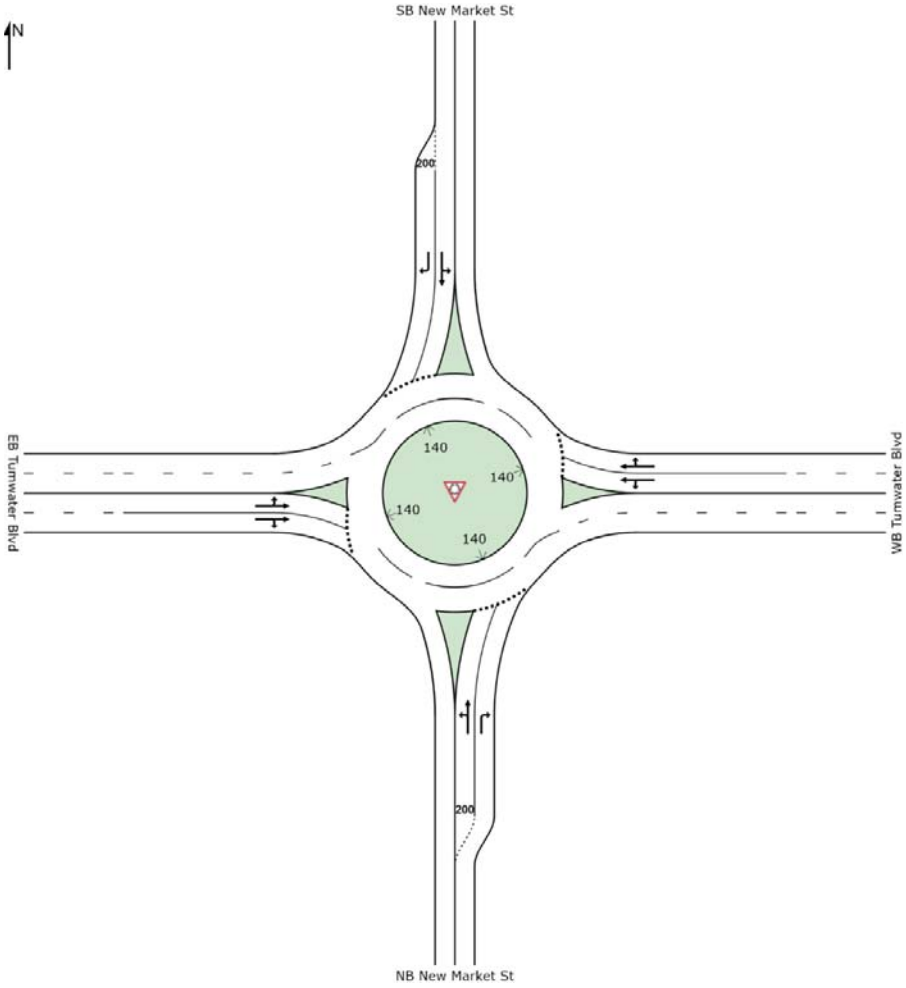
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	15.6	10.6	31.0	12.0	15.6	10.5	31.1
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	26.0	6.0	26.0	7.0	26.0	6.0	26.0
Max Q Clear Time (g_c+I1), s	9.0	8.9	4.7	14.5	9.0	5.7	6.2	14.6
Green Ext Time (p_c), s	0.0	1.8	0.0	7.6	0.0	1.9	0.0	7.5

Intersection Summary		
HCM 2010 Ctrl Delay		36.5
HCM 2010 LOS		D

SITE LAYOUT

Site: 51) New Market Rd at Tumwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout



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MOVEMENT SUMMARY

Site: 51) New Market Rd at Tumwater Blvd

Projected 2022 without improvements
PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB New Market St											
3	L2	22	0.0	0.043	13.5	LOS B	0.2	4.1	0.60	0.78	34.8
8	T1	5	0.0	0.043	6.4	LOS A	0.2	4.1	0.60	0.78	34.3
18	R2	65	0.0	0.073	5.8	LOS A	0.3	7.6	0.58	0.67	35.9
Approach		92	0.0	0.073	7.6	LOS A	0.3	7.6	0.59	0.71	35.5
East: WB Tumwater Blvd											
1	L2	65	2.0	0.316	10.7	LOS B	2.1	52.3	0.28	0.41	38.1
6	T1	815	2.0	0.316	3.5	LOS A	2.1	52.9	0.27	0.37	38.0
16	R2	27	2.0	0.316	3.9	LOS A	2.1	52.9	0.26	0.35	36.7
Approach		908	2.0	0.316	4.1	LOS A	2.1	52.9	0.27	0.38	38.0
North: SB New Market St											
7	L2	60	4.0	0.118	13.4	LOS B	0.4	11.4	0.58	0.80	34.9
4	T1	22	4.0	0.118	6.3	LOS A	0.4	11.4	0.58	0.80	34.6
14	R2	147	4.0	0.163	5.9	LOS A	0.7	17.0	0.57	0.69	35.8
Approach		228	4.0	0.163	7.9	LOS A	0.7	17.0	0.57	0.73	35.5
West: EB Tumwater Blvd											
5	L2	49	4.0	0.360	11.2	LOS B	2.4	62.6	0.41	0.44	37.7
2	T1	875	4.0	0.360	4.0	LOS A	2.5	63.9	0.40	0.41	37.5
12	R2	27	4.0	0.360	4.4	LOS A	2.5	63.9	0.39	0.39	36.1
Approach		951	4.0	0.360	4.4	LOS A	2.5	63.9	0.40	0.41	37.5
All Vehicles		2179	3.0	0.360	4.7	LOS A	2.5	63.9	0.37	0.44	37.4

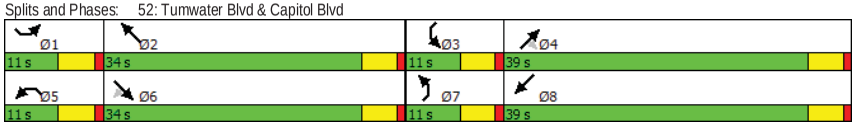
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N:\Projects\0625 City of Tumwater\0625.17 Tumwater Transportation Master Plan\Traffic\Operations\sidra\2022 Baseline\Existing 2022 PM.sip6

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	120	475	175	200	305	20	90	325	245	85	340	15
Future Volume (vph)	120	475	175	200	305	20	90	325	245	85	340	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	200		0	275		0	200		0
Storage Lanes	1		1	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		934			3620			2404			1729	
Travel Time (s)		12.7			49.4			54.6			39.3	
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 (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6						4			
Detector Phase	1	6	6	5	2		7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (s)	11.0	34.0	34.0	11.0	34.0		11.0	39.0	39.0	11.0	39.0	
Total Split (%)	11.6%	35.8%	35.8%	11.6%	35.8%		11.6%	41.1%	41.1%	11.6%	41.1%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max		None	None	None	None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 95	
Actuated Cycle Length: 83.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 52: Tumwater Blvd & Capitol Blvd



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	120	475	175	200	305	20	90	325	245	85	340	15
Future Volume (veh/h)	120	475	175	200	305	20	90	325	245	85	340	15
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	133	528	116	222	339	22	100	361	33	94	378	17
Adj No. of Lanes	1	1	1	2	2	0	1	1	1	1	2	0
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
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	130	658	559	257	1216	79	128	482	410	120	879	39
Arrive On Green	0.07	0.36	0.36	0.07	0.36	0.36	0.07	0.26	0.26	0.07	0.25	0.25
Sat Flow, veh/h	1757	1845	1568	3476	3409	220	1792	1881	1599	1792	3484	156
Grp Volume(v), veh/h	133	528	116	222	177	184	100	361	33	94	193	202
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1738	1787	1842	1792	1881	1599	1792	1787	1854
Q Serve(g_s), s	6.0	21.0	4.2	5.1	5.7	5.8	4.5	14.4	1.3	4.2	7.4	7.4
Cycle Q Clear(g_c), s	6.0	21.0	4.2	5.1	5.7	5.8	4.5	14.4	1.3	4.2	7.4	7.4
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	130	658	559	257	638	657	128	482	410	120	451	467
V/C Ratio(X)	1.03	0.80	0.21	0.87	0.28	0.28	0.78	0.75	0.08	0.78	0.43	0.43
Avail Cap(c_a), veh/h	130	658	559	257	638	657	132	787	669	132	748	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	23.6	18.2	37.2	18.7	18.7	37.1	27.8	23.0	37.3	25.5	25.5
Incr Delay (d2), s/veh	86.0	10.0	0.8	25.1	1.1	1.1	22.9	2.4	0.1	20.7	0.6	0.6
Initial Q Delay(d3),s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	12.4	1.9	3.4	3.0	3.1	3.0	7.7	0.6	2.8	3.7	3.9
LnGrp Delay(d),s/veh	124.0	33.5	19.0	62.4	19.7	19.7	60.0	30.2	23.0	58.0	26.1	26.1
LnGrp LOS	F	C	B	E	B	B	E	C	C	E	C	C
Approach Vol, veh/h		777			583			494			489	
Approach Delay, s/veh		46.8			36.0			35.7			32.3	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	34.0	10.5	25.8	11.0	34.0	10.8	25.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	29.0	6.0	34.0	6.0	29.0	6.0	34.0
Max Q Clear Time (g_c+I1), s	8.0	7.8	6.2	16.4	7.1	23.0	6.5	9.4
Green Ext Time (p_c), s	0.0	6.5	0.0	4.5	0.0	3.1	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	870	70	80	565	5	35	0	55	5	0	2
Future Volume (vph)	5	870	70	80	565	5	35	0	55	5	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2111			1760			704			354	
Travel Time (s)		48.0			40.0			16.0			8.0	
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 (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.5	27.5		27.5	27.5		12.5	12.5		27.5	27.5	
Total Split (s)	52.5	52.5		52.5	52.5		27.5	27.5		27.5	27.5	
Total Split (%)	65.6%	65.6%		65.6%	65.6%		34.4%	34.4%		34.4%	34.4%	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 71.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 53: 65th Ave & Henderson Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	870	70	80	565	5	35	0	55	5	0	2
Future Volume (veh/h)	5	870	70	80	565	5	35	0	55	5	0	2
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	5	956	77	88	621	5	38	0	60	5	0	2
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
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
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	619	1294	104	356	1403	11	128	15	102	205	16	50
Arrive On Green	0.75	0.75	0.75	0.75	0.75	0.75	0.11	0.00	0.11	0.11	0.00	0.11
Sat Flow, veh/h	804	1718	138	549	1864	15	469	143	966	1026	151	471
Grp Volume(v), veh/h	5	0	1033	88	0	626	98	0	0	7	0	0
Grp Sat Flow(s),veh/h/ln	804	0	1857	549	0	1879	1579	0	0	1647	0	0
Q Serve(g_s), s	0.1	0.0	19.8	6.8	0.0	7.9	2.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	19.8	26.5	0.0	7.9	3.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.01	0.39		0.61	0.71		0.29
Lane Grp Cap(c), veh/h	619	0	1398	356	0	1414	246	0	0	271	0	0
V/C Ratio(X)	0.01	0.00	0.74	0.25	0.00	0.44	0.40	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	619	0	1398	356	0	1414	638	0	0	635	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.4	0.0	4.4	11.8	0.0	2.9	27.1	0.0	0.0	25.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	3.5	1.6	0.0	1.0	1.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	11.1	1.2	0.0	4.4	1.7	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	4.4	0.0	7.9	13.4	0.0	3.9	28.4	0.0	0.0	25.6	0.0	0.0
LnGrp LOS	A		A	B		A	C			C		
Approach Vol, veh/h		1038			714			98			7	
Approach Delay, s/veh		7.9			5.1			28.4			25.6	
Approach LOS		A			A			C			C	

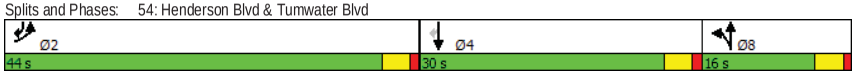
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		52.5		11.3		52.5		11.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		48.0		23.0		48.0		23.0
Max Q Clear Time (g_c+I1), s		21.8		2.2		28.5		5.7
Green Ext Time (p_c), s		18.7		0.6		14.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	685	30	25	170	215	355
Future Volume (vph)	685	30	25	170	215	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	3122			2394	2111	
Travel Time (s)	60.8			46.6	41.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot		Split	NA	NA	pm+ov
Protected Phases	2		8	8	4	2
Permitted Phases						4
Detector Phase	2		8	8	4	2
Switch Phase						
Minimum Initial (s)	6.0		6.0	6.0	6.0	6.0
Minimum Split (s)	20.5		10.5	10.5	30.0	20.5
Total Split (s)	44.0		16.0	16.0	30.0	44.0
Total Split (%)	48.9%		17.8%	17.8%	33.3%	48.9%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.0			4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max		None	None	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 54: Henderson Blvd & Tumwater Blvd



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	685	30	25	170	215	355
Future Volume (veh/h)	685	30	25	170	215	355
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1900	1881	1881	1881
Adj Flow Rate, veh/h	753	33	27	187	236	269
Adj No. of Lanes	0	0	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	758	33	31	218	543	1173
Arrive On Green	0.44	0.44	0.13	0.13	0.29	0.29
Sat Flow, veh/h	1706	75	236	1634	1881	1599
Grp Volume(v), veh/h	787	0	214	0	236	269
Grp Sat Flow(s),veh/h/ln	1783	0	1869	0	1881	1599
Q Serve(g_s), s	39.5	0.0	10.1	0.0	9.2	4.9
Cycle Q Clear(g_c), s	39.5	0.0	10.1	0.0	9.2	4.9
Prop In Lane	0.96	0.04	0.13			1.00
Lane Grp Cap(c), veh/h	792	0	249	0	543	1173
V/C Ratio(X)	0.99	0.00	0.86	0.00	0.43	0.23
Avail Cap(c_a), veh/h	792	0	249	0	543	1173
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	38.2	0.0	26.0	3.8
Incr Delay (d2), s/veh	30.4	0.0	24.9	0.0	2.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.9	0.0	6.9	0.0	5.2	5.8
LnGrp Delay(d),s/veh	55.3	0.0	63.1	0.0	28.5	4.3
LnGrp LOS	E		E		C	A
Approach Vol, veh/h	787			214	505	
Approach Delay, s/veh	55.3			63.1	15.6	
Approach LOS	E			E	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		44.0		30.0				16.0
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		40.0		26.0				12.0
Max Q Clear Time (g_c+I1), s		41.5		11.2				12.1
Green Ext Time (p_c), s		0.0		2.4				0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.1
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	4.3

Movement	NWL	NWR	NET	NER	SWL	SWT
Traffic Vol, veh/h	60	55	160	95	125	145
Future Vol, veh/h	60	55	160	95	125	145
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	87	87	87	87	87	87
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	69	63	184	109	144	167

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	693	239	0	0	293	0
Stage 1	239	-	-	-	-	-
Stage 2	454	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	412	805	-	-	1274	-
Stage 1	805	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	361	805	-	-	1274	-
Mov Cap-2 Maneuver	361	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	564	-	-	-	-	-

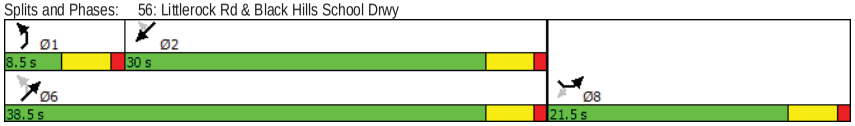
Approach	NW	NE	SW
HCM Control Delay, s	15	0	3.8
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	490	1274	-
HCM Lane V/C Ratio	-	-	0.27	0.113	-
HCM Control Delay (s)	-	-	15	8.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.4	-

Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	5	10	10	205	450	55
Future Volume (vph)	5	10	10	205	450	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0	175			350
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	1065			1067	3970	
Travel Time (s)	24.2			24.3	90.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8	6			2
Detector Phase	8	8	1	6	2	2
Switch Phase						
Minimum Initial (s)	7.0	7.0	4.0	7.0	7.0	7.0
Minimum Split (s)	21.5	21.5	8.5	24.5	27.5	27.5
Total Split (s)	21.5	21.5	8.5	38.5	30.0	30.0
Total Split (%)	35.8%	35.8%	14.2%	64.2%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 53.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 56: Littlerock Rd & Black Hills School Drwy



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	5	10	10	205	450	55
Future Volume (veh/h)	5	10	10	205	450	55
Number	3	18	1	6	2	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1881	1881	1881	1881
Adj Flow Rate, veh/h	5	11	11	216	474	58
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	51	46	656	1445	1233	1048
Arrive On Green	0.03	0.03	0.01	0.77	0.66	0.66
Sat Flow, veh/h	1810	1615	1792	1881	1881	1599
Grp Volume(v), veh/h	5	11	11	216	474	58
Grp Sat Flow(s),veh/h/ln	1810	1615	1792	1881	1881	1599
Q Serve(g_s), s	0.1	0.3	0.1	1.3	5.1	0.6
Cycle Q Clear(g_c), s	0.1	0.3	0.1	1.3	5.1	0.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	51	46	656	1445	1233	1048
V/C Ratio(X)	0.10	0.24	0.02	0.15	0.38	0.06
Avail Cap(c_a), veh/h	695	620	797	1445	1233	1048
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	21.0	2.4	1.3	3.5	2.7
Incr Delay (d2), s/veh	0.8	2.7	0.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.0	0.7	2.7	0.2
LnGrp Delay(d),s/veh	21.8	23.7	2.4	1.6	3.8	2.8
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	16			227	532	
Approach Delay, s/veh	23.1			1.6	3.6	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	33.5				38.5		5.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	4.0	25.5				34.0		17.0
Max Q Clear Time (g_c+I1), s	2.1	7.1				3.3		2.3
Green Ext Time (p_c), s	0.0	5.2				6.1		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	3.4	
HCM 2010 LOS	A	

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	60	10	1	10	10	20	1	265	0	10	335	85
Future Vol, veh/h	60	10	1	10	10	20	1	265	0	10	335	85
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	11	11	11	1	1	1	3	3	3
Mvmt Flow	65	11	1	11	11	22	1	288	0	11	364	92

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	739	722	410	728	768	288	457	0	0	288	0	0
Stage 1	432	432	-	290	290	-	-	-	-	-	-	-
Stage 2	307	290	-	438	478	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.21	6.61	6.31	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.21	5.61	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.599	4.099	3.399	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	332	352	639	328	322	730	1109	-	-	1268	-	-
Stage 1	600	581	-	699	656	-	-	-	-	-	-	-
Stage 2	701	670	-	580	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	311	347	639	316	318	730	1109	-	-	1268	-	-
Mov Cap-2 Maneuver	311	347	-	316	318	-	-	-	-	-	-	-
Stage 1	599	574	-	698	655	-	-	-	-	-	-	-
Stage 2	668	669	-	561	535	-	-	-	-	-	-	-

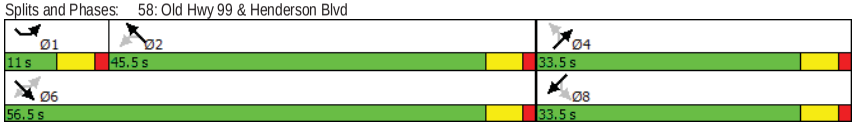
Approach	EB	WB	NB	SB
HCM Control Delay, s	19.9	14	0	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1109	-	-	318	442	1268	-	-
HCM Lane V/C Ratio	0.001	-	-	0.243	0.098	0.009	-	-
HCM Control Delay (s)	8.2	0	-	19.9	14	7.9	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0.3	0	-	-

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	110	865	10	2	540	115	15	5	5	150	5	60
Future Volume (vph)	110	865	10	2	540	115	15	5	5	150	5	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		50	50		0	0		0	150		0
Storage Lanes	1		1	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		3620			1652			415			2274	
Travel Time (s)		49.4			22.5			9.4			51.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			8	
Permitted Phases	6		6	2			4			8		
Detector Phase	1	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.5	25.5	25.5	26.5	26.5		33.5	33.5		33.5	33.5	
Total Split (s)	11.0	56.5	56.5	45.5	45.5		33.5	33.5		33.5	33.5	
Total Split (%)	12.2%	62.8%	62.8%	50.6%	50.6%		37.2%	37.2%		37.2%	37.2%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	Max	Max	Max	Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 76.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 58: Old Hwy 99 & Henderson Blvd



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	110	865	10	2	540	115	15	5	5	150	5	60
Future Volume (veh/h)	110	865	10	2	540	115	15	5	5	150	5	60
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1881	1863	1863	1900	1900	1845	1900	1881	1881	1900
Adj Flow Rate, veh/h	126	994	11	2	621	132	17	6	6	172	6	69
Adj No. of Lanes	1	1	1	1	1	0	0	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	2	2	2	3	3	3	1	1	1
Cap, veh/h	399	1332	1132	313	846	180	162	56	36	312	18	207
Arrive On Green	0.06	0.71	0.71	0.57	0.57	0.57	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1792	1881	1599	558	1490	317	592	405	260	1410	129	1489
Grp Volume(v), veh/h	126	994	11	2	0	753	29	0	0	172	0	75
Grp Sat Flow(s),veh/h/ln	1792	1881	1599	558	0	1807	1257	0	0	1410	0	1618
Q Serve(g_s), s	1.9	23.6	0.1	0.2	0.0	22.2	0.0	0.0	0.0	4.6	0.0	3.0
Cycle Q Clear(g_c), s	1.9	23.6	0.1	13.6	0.0	22.2	3.0	0.0	0.0	7.7	0.0	3.0
Prop In Lane	1.00		1.00	1.00		0.18	0.59		0.21	1.00		0.92
Lane Grp Cap(c), veh/h	399	1332	1132	313	0	1026	254	0	0	312	0	225
V/C Ratio(X)	0.32	0.75	0.01	0.01	0.00	0.73	0.11	0.00	0.00	0.55	0.00	0.33
Avail Cap(c_a), veh/h	422	1332	1132	313	0	1026	614	0	0	664	0	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.4	6.5	3.1	13.8	0.0	11.5	27.1	0.0	0.0	29.8	0.0	28.0
Incr Delay (d2), s/veh	0.2	3.8	0.0	0.0	0.0	4.7	0.1	0.0	0.0	0.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	13.3	0.1	0.0	0.0	12.2	0.5	0.0	0.0	3.3	0.0	1.4
LnGrp Delay(d),s/veh	9.6	10.3	3.1	13.9	0.0	16.2	27.2	0.0	0.0	30.3	0.0	28.3
LnGrp LOS	A	B	A	B		B	C			C		C
Approach Vol, veh/h		1131			755			29			247	
Approach Delay, s/veh		10.2			16.2			27.2			29.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.1	46.4		15.5		56.5		15.5
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5		5.5
Max Green Setting (Gmax), s	5.5	40.0		28.0		51.0		28.0
Max Q Clear Time (g_c+I1), s	3.9	24.2		5.0		25.6		9.7
Green Ext Time (p_c), s	0.0	10.2		0.4		13.9		0.4

Intersection Summary		
HCM 2010 Ctrl Delay		14.7
HCM 2010 LOS		B

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Traffic Vol, veh/h	1	1	10	15	0	115	115	915	0	1	460	15
Future Vol, veh/h	1	1	10	15	0	115	115	915	0	1	460	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	300	250	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	1	11	16	0	121	121	963	0	1	484	16

Major/Minor	Minor1			Minor2			Major1			Major2		
Conflicting Flow All	1699	1707	963	1705	1699	492	500	0	0	963	0	0
Stage 1	1205	1205	-	494	494	-	-	-	-	-	-	-
Stage 2	494	502	-	1211	1205	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	73	91	310	73	93	579	1069	-	-	719	-	-
Stage 1	225	257	-	559	548	-	-	-	-	-	-	-
Stage 2	557	542	-	224	258	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	53	81	310	64	82	579	1069	-	-	719	-	-
Mov Cap-2 Maneuver	53	81	-	64	82	-	-	-	-	-	-	-
Stage 1	200	228	-	496	547	-	-	-	-	-	-	-
Stage 2	440	541	-	191	229	-	-	-	-	-	-	-

Approach	EB	WB	SE	NW
HCM Control Delay, s	25.4	20.5	1	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NWL	NWT	NWR	EBLn1	WBLn1	WBLn2	SEL	SET	SER
Capacity (veh/h)	719	-	-	189	64	579	1069	-	-
HCM Lane V/C Ratio	0.001	-	-	0.067	0.247	0.209	0.113	-	-
HCM Control Delay (s)	10	0	-	25.4	78.8	12.9	8.8	-	-
HCM Lane LOS	B	A	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.9	0.8	0.4	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	45	15	40	15	5	115
Future Vol, veh/h	45	15	40	15	5	115
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	82	82	82	82	82	82
Heavy Vehicles, %	3	3	9	9	3	3
Mvmt Flow	55	18	49	18	6	140

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	210	58	0	0	67	0
Stage 1	58	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	776	1005	-	-	1528	-
Stage 1	962	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	773	1005	-	-	1528	-
Mov Cap-2 Maneuver	773	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	820	1528	-
HCM Lane V/C Ratio	-	-	0.089	0.004	-
HCM Control Delay (s)	-	-	9.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	70	20	10	110	200	75
Future Vol, veh/h	70	20	10	110	200	75
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	88	88	88	88	88	88
Heavy Vehicles, %	1	1	3	3	1	1
Mvmt Flow	80	23	11	125	227	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	136	0	-	0	256	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	182	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1454	-	-	-	735	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1454	-	-	-	694	990
Mov Cap-2 Maneuver	-	-	-	-	694	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	804	-

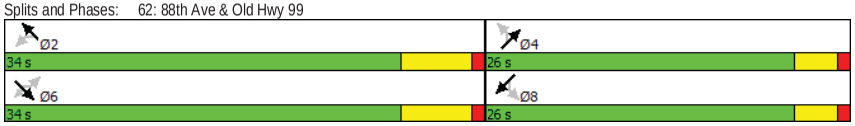
Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1454	-	-	-	756
HCM Lane V/C Ratio	0.055	-	-	-	0.413
HCM Control Delay (s)	7.6	0	-	-	13.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	2

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	785	220	10	310	0	205	10	25	2	5	1
Future Volume (vph)	0	785	220	10	310	0	205	10	25	2	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		150	150		0	150		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		50			50			30			30	
Link Distance (ft)		3849			1410			1160			265	
Travel Time (s)		52.5			19.2			26.4			6.0	
Peak Hour Factor	0.92	0.90	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	1%	1%	1%	2%	3%	2%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2			4			8		
Detector Phase	6	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0		24.0	24.0		26.0	26.0	
Total Split (s)	34.0	34.0	34.0	34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%	56.7%	56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		4.0	4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 62: 88th Ave & Old Hwy 99



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	0	785	220	10	310	0	205	10	25	2	5	1
Future Volume (veh/h)	0	785	220	10	310	0	205	10	25	2	5	1
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1881	1881	1881	1900	1845	1850	1900	1900	1863	1900
Adj Flow Rate, veh/h	0	872	244	11	344	0	228	11	28	2	5	1
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.90	0.90	0.90	0.90	0.92	0.90	0.92	0.90	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	1	1	1	3	2	2	2	2	2
Cap, veh/h	150	1100	935	265	1100	0	438	95	243	140	268	45
Arrive On Green	0.00	0.58	0.58	0.58	0.58	0.00	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1032	1881	1599	508	1881	0	1391	463	1179	225	1299	218
Grp Volume(v), veh/h	0	872	244	11	344	0	228	0	39	8	0	0
Grp Sat Flow(s),veh/h/ln	1032	1881	1599	508	1881	0	1391	0	1642	1742	0	0
Q Serve(g_s), s	0.0	17.2	3.6	0.8	4.4	0.0	7.2	0.0	0.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	17.2	3.6	18.0	4.4	0.0	7.4	0.0	0.9	0.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.72	0.25		0.12
Lane Grp Cap(c), veh/h	150	1100	935	265	1100	0	438	0	339	453	0	0
V/C Ratio(X)	0.00	0.79	0.26	0.04	0.31	0.00	0.52	0.00	0.12	0.02	0.00	0.00
Avail Cap(c_a), veh/h	150	1100	935	265	1100	0	791	0	754	877	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	7.7	4.9	14.7	5.0	0.0	18.0	0.0	15.4	15.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.9	0.7	0.3	0.7	0.0	1.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.5	1.7	0.1	2.5	0.0	3.0	0.0	0.4	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.6	5.5	14.9	5.8	0.0	19.0	0.0	15.6	15.2	0.0	0.0
LnGrp LOS		B	A	B	A		B		B	B		
Approach Vol, veh/h		1116			355			267			8	
Approach Delay, s/veh		11.8			6.1			18.5			15.2	
Approach LOS		B			A			B			B	

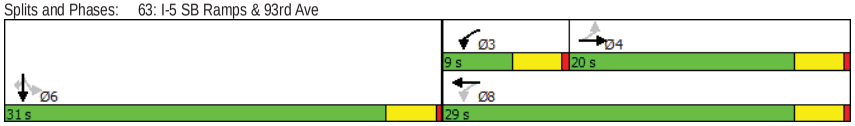
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		34.0		13.9		34.0		13.9
Change Period (Y+Rc), s		6.0		4.0		6.0		4.0
Max Green Setting (Gmax), s		28.0		22.0		28.0		22.0
Max Q Clear Time (g_c+I1), s		20.0		9.4		19.2		2.2
Green Ext Time (p_c), s		4.9		0.7		5.3		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	11.7
HCM 2010 LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	325	45	130	180	0	0	0	0	520	0	315
Future Volume (vph)	0	325	45	130	180	0	0	0	0	520	0	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		300
Storage Lanes	0		0	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			40			30			30	
Link Distance (ft)		1124			936			1099			1644	
Travel Time (s)		25.5			16.0			25.0			37.4	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	9%	9%	9%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)												
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		4		3	8						6	
Permitted Phases	4			8						6		6
Detector Phase	4	4		3	8					6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0					4.0	4.0	4.0
Minimum Split (s)	20.0	20.0		8.0	20.0					20.0	20.0	20.0
Total Split (s)	20.0	20.0		9.0	29.0					31.0	31.0	31.0
Total Split (%)	33.3%	33.3%		15.0%	48.3%					51.7%	51.7%	51.7%
Yellow Time (s)	3.5	3.5		3.5	3.5					3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5					0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		4.0		4.0	4.0						4.0	4.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None					Max	Max	Max

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 57.3	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 63: I-5 SB Ramps & 93rd Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	325	45	130	180	0	0	0	0	520	0	315
Future Volume (veh/h)	0	325	45	130	180	0	0	0	0	520	0	315
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1743	1743	0				1900	1827	1827
Adj Flow Rate, veh/h	0	369	51	148	205	0				591	0	165
Adj No. of Lanes	0	1	0	1	1	0				0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88				0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	9	9	0				4	4	4
Cap, veh/h	0	420	58	297	716	0				791	0	706
Arrive On Green	0.00	0.26	0.26	0.08	0.41	0.00				0.45	0.00	0.45
Sat Flow, veh/h	0	1618	224	1660	1743	0				1740	0	1553
Grp Volume(v), veh/h	0	0	420	148	205	0				591	0	165
Grp Sat Flow(s),veh/h/ln	0	0	1842	1660	1743	0				1740	0	1553
Q Serve(g_s), s	0.0	0.0	13.0	3.6	4.7	0.0				16.7	0.0	3.9
Cycle Q Clear(g_c), s	0.0	0.0	13.0	3.6	4.7	0.0				16.7	0.0	3.9
Prop In Lane	0.00		0.12	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	0	478	297	716	0				791	0	706
V/C Ratio(X)	0.00	0.00	0.88	0.50	0.29	0.00				0.75	0.00	0.23
Avail Cap(c_a), veh/h	0	0	496	297	734	0				791	0	706
HCM Platoon Ratio	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	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	21.1	14.9	11.7	0.0				13.4	0.0	9.9
Incr Delay (d2), s/veh	0.0	0.0	16.1	1.3	0.2	0.0				6.4	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
%ile BackOfQ(50%),veh/ln	0.0	0.0	8.7	1.8	2.3	0.0				9.3	0.0	1.8
LnGrp Delay(d),s/veh	0.0	0.0	37.2	16.2	11.9	0.0				19.8	0.0	10.7
LnGrp LOS			D	B	B					B		B
Approach Vol, veh/h		420			353						756	
Approach Delay, s/veh		37.2			13.7						17.8	
Approach LOS		D			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			9.0	19.4		31.0		28.4
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			5.0	16.0		27.0		25.0
Max Q Clear Time (g_c+I1), s			5.6	15.0		18.7		6.7
Green Ext Time (p_c), s			0.0	0.4		3.0		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	22.2
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	260	540	0	0	270	370	70	0	125	0	0	0
Future Vol, veh/h	260	540	0	0	270	370	70	0	125	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	125	-	-	-	-	300	-	-	-	-	-	-
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, %	3	3	3	8	8	8	14	14	14	0	0	0
Mvmt Flow	277	574	0	0	287	394	74	0	133	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	287	0	-	-	-	0	1415	1415	574
Stage 1	-	-	-	-	-	-	1128	1128	-
Stage 2	-	-	-	-	-	-	287	287	-
Critical Hdwy	4.13	-	-	-	-	-	6.54	6.64	6.34
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.64	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.626	4.126	3.426
Pot Cap-1 Maneuver	1269	-	0	0	-	-	142	130	496
Stage 1	-	-	0	0	-	-	293	266	-
Stage 2	-	-	0	0	-	-	735	653	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1269	-	-	-	-	-	111	0	496
Mov Cap-2 Maneuver	-	-	-	-	-	-	111	0	-
Stage 1	-	-	-	-	-	-	229	0	-
Stage 2	-	-	-	-	-	-	735	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.8	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	590	1269	-	-	-
HCM Lane V/C Ratio	0.352	0.218	-	-	-
HCM Control Delay (s)	14.4	8.6	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.6	0.8	-	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	35	500	15	5	435	10	15	2	10	20	5	70
Future Vol, veh/h	35	500	15	5	435	10	15	2	10	20	5	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	4	4	4	1	1	1	0	0	0	5	5	5
Mvmt Flow	37	532	16	5	463	11	16	2	11	21	5	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	473	0	0	548	0	0	1133	1098	540	1100	1101	468
Stage 1	-	-	-	-	-	-	614	614	-	479	479	-
Stage 2	-	-	-	-	-	-	519	484	-	621	622	-
Critical Hdwy	4.14	-	-	4.11	-	-	7.1	6.5	6.2	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.55	-
Follow-up Hdwy	2.236	-	-	2.209	-	-	3.5	4	3.3	3.545	4.045	3.345
Pot Cap-1 Maneuver	1079	-	-	1027	-	-	182	215	546	187	209	589
Stage 1	-	-	-	-	-	-	483	486	-	562	550	-
Stage 2	-	-	-	-	-	-	544	555	-	470	474	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1079	-	-	1027	-	-	149	203	546	174	197	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	149	203	-	174	197	-
Stage 1	-	-	-	-	-	-	459	462	-	534	546	-
Stage 2	-	-	-	-	-	-	467	551	-	436	451	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.1	24.8	18.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	210	1079	-	-	1027	-	-	367
HCM Lane V/C Ratio	0.137	0.035	-	-	0.005	-	-	0.275
HCM Control Delay (s)	24.8	8.5	0	-	8.5	0	-	18.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-	-	1.1

Intersection	
Intersection Delay, s/veh	42.9
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NEU	NEL	NET	NER
Traffic Vol, veh/h	0	2	370	165	0	105	320	45	0	85	20	35
Future Vol, veh/h	0	2	370	165	0	105	320	45	0	85	20	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	3	3	3	2	2	2	2	2	0	0	0
Mvmt Flow	0	2	402	179	0	114	348	49	0	92	22	38
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NE
Opposing Approach	WB	EB	SW
Opposing Lanes	2	1	1
Conflicting Approach Left	SW	NE	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NE	SW	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	61	39.1	14.7
HCM LOS	F	E	B

Lane	NELn1	EBLn1	WBLn1	WBLn2	SWLn1
Vol Left, %	61%	0%	25%	0%	65%
Vol Thru, %	14%	69%	75%	0%	34%
Vol Right, %	25%	31%	0%	100%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	537	425	45	146
LT Vol	85	2	105	0	95
Through Vol	20	370	320	0	50
RT Vol	35	165	0	45	1
Lane Flow Rate	152	584	462	49	159
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.331	0.995	0.883	0.082	0.351
Departure Headway (Hd)	7.824	6.139	6.98	6.137	7.952
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	461	584	522	587	454
Service Time	5.837	4.237	4.68	3.837	5.964
HCM Lane V/C Ratio	0.33	1	0.885	0.083	0.35
HCM Control Delay	14.7	61	42.2	9.4	15.2
HCM Lane LOS	B	F	E	A	C
HCM 95th-tile Q	1.4	14.5	9.8	0.3	1.6

HCM 2010 AWSC
66: Case Rd & 93rd Ave
Projected 2022 without improvements
PM Peak Hour

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SWU	SWL	SWT	SWR
Traffic Vol, veh/h	0	95	50	1
Future Vol, veh/h	0	95	50	1
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	103	54	1
Number of Lanes	0	0	1	0

Approach	SW
Opposing Approach	NE
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.2
HCM LOS	C

Lane

Tumwater Transportation Master Plan
SCJ Alliance
Synchro 9 Report
6/10/2016

Intersection	
Intersection Delay, s/veh	24.6
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	305	190	0	100	315	0	145	70
Future Vol, veh/h	0	305	190	0	100	315	0	145	70
Peak Hour Factor	0.92	0.87	0.87	0.92	0.87	0.87	0.92	0.87	0.87
Heavy Vehicles, %	2	3	3	2	2	2	2	1	1
Mvmt Flow	0	351	218	0	115	362	0	167	80
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	29.6	23.7	14.6
HCM LOS	D	C	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	67%	0%	24%
Vol Thru, %	0%	62%	76%
Vol Right, %	33%	38%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	215	495	415
LT Vol	145	0	100
Through Vol	0	305	315
RT Vol	70	190	0
Lane Flow Rate	247	569	477
Geometry Grp	1	1	1
Degree of Util (X)	0.442	0.836	0.748
Departure Headway (Hd)	6.442	5.289	5.642
Convergence, Y/N	Yes	Yes	Yes
Cap	556	683	639
Service Time	4.522	3.353	3.709
HCM Lane V/C Ratio	0.444	0.833	0.746
HCM Control Delay	14.6	29.6	23.7
HCM Lane LOS	B	D	C
HCM 95th-tile Q	2.2	9.2	6.7

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	110	260	175	20	35	240
Future Vol, veh/h	110	260	175	20	35	240
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	3	3	1	1
Mvmt Flow	128	302	203	23	41	279

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	227	0	-	0	773	215
Stage 1	-	-	-	-	215	-
Stage 2	-	-	-	-	558	-
Critical Hdwy	4.12	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.218	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1341	-	-	-	369	827
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1341	-	-	-	327	827
Mov Cap-2 Maneuver	-	-	-	-	327	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	509	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1341	-	-	-	327	827
HCM Lane V/C Ratio	0.095	-	-	-	0.124	0.337
HCM Control Delay (s)	8	0	-	-	17.6	11.6
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.4	1.5

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NEL	NER
Traffic Vol, veh/h	675	30	115	230	15	175
Future Vol, veh/h	675	30	115	230	15	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	450	300	-	300	0
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	734	33	125	250	16	190

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	734	0	1234	734
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	871	-	196	422
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	871	-	168	422
Mov Cap-2 Maneuver	-	-	-	-	368	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	523	-

Approach	EB	WB	NE
HCM Control Delay, s	0	3.3	19.9
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	368	422	-	-	871	-
HCM Lane V/C Ratio	0.044	0.451	-	-	0.144	-
HCM Control Delay (s)	15.2	20.3	-	-	9.8	-
HCM Lane LOS	C	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	2.3	-	-	0.5	-

B. Analysis of Non-Motorized Network

This was prepared as background for the non-motorized network

Tumwater Non-Motorized LOS Framework

The purpose of this white paper is to describe the draft Non-Motorized LOS Framework for the City of Tumwater as part of the Transportation Master Plan. This framework is intended to provide the structure, policies, and goals that would be associated with the Non-Motorized LOS standards. Specific details regarding non-motorized facility design standards are not the focus of this framework as those details should be identified in the City's street design standards or as part of a separate Non-Motorized Plan. However, examples of specific facility designs may be discussed to explain concepts. It is anticipated that text and concepts described in this white paper may be used in some manner in the Transportation Master Plan.

First the framework concepts and structure will be discussed, which define the terms being used in the Non-Motorized LOS Framework and highlight how different pieces of the policy fit together. Next the resulting framework for Non-Motorized LOS Standards is presented. Finally, a needs based assessment was conducted using the framework.

1. Concept and Structure for LOS Framework

The first important concepts are "Quality of Service" and "Level of Service" as defined below:

- **Quality of Service** (QOS) describes how well a facility operates from the traveler's perspective.
- **Level of Service** (LOS) is a quantitative stratification of one or more performance measures that represent quality of service.

For example, let us consider the traditional auto-based LOS framework. Drivers expect that a good transportation network means that they can *conveniently* get where they want to go. The QOS goal relates "convenience" to "congestion". A more technical performance metric for "congestion" is "vehicle delay". The traditional auto-based LOS system is stratified into six categories of "vehicle delay" ranging from A to F. Communities set LOS standards (A to F) according to what they consider an acceptable level of "congestion" (in other works, the LOS standard is meant to meet a QOS goal). If portions of the transportation network fall below acceptable LOS standards, then local agencies (and developers) build improvement projects to return the system to an acceptable level of "congestion" goal.

For non-motorized transportation systems, the QOS goals are broadened to capture different traveler expectations. Walkers and bicyclists expect that a good transportation network means that they can *comfortably* and *conveniently* get where they want to go. For vehicles the QOS goal relates to congestion, but for non-motorized transportation systems the QOS goal relates to the following:

- **Comfort**. Sense of safety, street conditions, or wayfinding
- **Completeness**. Continuity, extent, or duration
- **Connectivity**. Land use, route choice, or linkages
- **Convenience**. Distance, destinations, or choices

Transportation Master Plan Network

The City of Tumwater Transportation Master Plan (or similar document) identifies the ultimate network of pedestrian and bicycle facilities throughout the City. A hierarchy of pedestrian routes and bicycle routes are developed based on route continuity, connectivity to community destinations, and convenient locations. Table 1 defines the hierarchy of the Master Plan, which includes Primary Routes and Secondary Routes. This hierarchy and Master Plan network addresses the QOS goals related to completeness, connectivity, and convenience.

Table 1: Framework for the Transportation Master Plan Hierarchy of Pedestrian and Bicycle Routes

Hierarchy Level	Description	Relationship to Street Functional Classification
Primary Route	Primary routes provide the backbone of the non-motorized system. They provide network continuity throughout the city and link to major community destinations. On these routes, the pedestrian and bicycle modes are considered equal or higher priority than vehicle travel modes. Multi-use pathways are typically primary routes.	Primary routes are typically along city arterials and collector streets because the street corridors provide the continuity and connectivity. However, primary routes may be on parallel streets or pathways if the available, especially if the arterial street is prioritized for auto travel.
Secondary Route	Secondary routes support the primary route network, but are not considered as critical. On these routes, the pedestrian and bicycle modes are considered equal or lower priority than vehicle travel modes.	Secondary routes are typically along city arterials and collector streets because the street corridors provide the continuity and connectivity. These are routes where non-motorized activity is expected but the street is prioritized for auto traffic modes or where primary route facilities are not needed and/or feasible.
Other Streets or Paths	These are anything not classified primary or secondary routes. These are other routes not considered critical for citywide plans and projects. Non-motorized facilities would be provided based on the City's design standards.	These are typically on local streets but may also be on arterials and collectors where non-motorized travel is not expected or desired.

The Transportation Master Plan identifies the low-stress pedestrian and bicycle facilities for the streets and pathways in the non-motorized system. For transportation professionals, "low-stress" or "traveler stress" is the more technical performance metric for "comfortable". Traveler stress takes into account the facility design, vehicle volumes and speeds on adjacent streets, and topography. In addition, special

areas or districts may be identified for geographic areas to indicate where different levels of stress are acceptable.

The Non-Motorized LOS framework relies on a Transportation Master Plan that identifies the network, the facilities, and the areas to address the QOS goals.

Project-Focused Outcomes

In practice, LOS standards are used by local governments to understand where transportation projects are needed. LOS standards reflect community QOS goals, and when the standards are not met, the community expects that improvement be made over time to bring the facility within standards. Table 2 illustrates how QOS, traveler expectations, and project identification relate.

As shown in Table 2, projects are expected in areas where the QOS is considered "POOR" because people cannot get to desirable destinations in a safe or convenient manner. "POOR" facilities would be the highest priority for project improvements and "ACCEPTABLE" facilities would be lower priority. "GOOD" facilities match the Master Plan expectations for the area.

Table 2: Framework for Non-Motorized Quality of Service

Quality of Service	Traveler Expectations	Project Identification
"GOOD"	People can safely, comfortably, and conveniently get where they want to go	"GOOD" a realistic goal for every primary non-motorized facility. No project is needed if traveler stress is low.
"ACCEPTABLE"	People can safely get where they want to go, but may not be comfortable or convenient.	"ACCEPTABLE" are facilities that are transitioning from "POOR" to "GOOD" and are lower priority areas for new project, in general.
"POOR"	People cannot safely or conveniently get where they want to go.	"POOR" represent major gaps in the primary routes and highlight the highest priorities for non-motorized projects, in general.

2. Framework for LOS Standard

The framework for the LOS standards needs both a table of LOS definitions, and the LOS standards that would be applied. Table 3 shows the LOS definitions, the quantitative stratification of the non-motorized performance metric "traveler stress". The stratification of LOS can take a form of a letter grade (from A to F) but for Non-Motorized LOS it is can be simplified to Green, Yellow, or Red scale.

Table 3: Level of Service Definitions

Level of Service	Traveler Stress	Description
"GREEN"	Low	LOS GREEN reflects where traveler stress is low and meets community expectations for that area (complies with the Transportation Master Plan). Areas with higher traffic volumes and speeds typically require greater protection for the non-motorized modes.
"YELLOW"	Moderate	LOS YELLOW reflects where traveler stress is moderate and may or may not meet community expectations for that area. There are non-motorized facilities provided, but not enough to reach low-stress levels.
"RED"	High	LOS RED reflects where traveler stress is high and does not meet community expectations for that area. These are areas where non-motorized modes are not separated from higher volume and speed traffic.

The defined LOS Standards for the City of Tumwater would be segmented by geographic areas. The "Urban Corridor District" would have more rigid design standards, whereas the "Practical Design District" would have more flexible design standards.

The LOS Standards are set at:

- LOS GREEN for primary and secondary routes in the Urban Corridor District.
- LOS GREEN for primary routes in the Practical Design District
- LOS YELLOW for secondary routes in the Practical Design District

For facilities not classified as primary or secondary routes, there would be no set LOS Standard.

Implementation and Development Review

Implementation of this framework would require further specific details surrounding stress levels: What are the traffic volume thresholds? What are the traffic speed thresholds? How much does the city want to account for topology? What type and design of facilities does the City want? We have provided a draft set of recommendations in Section 3 that could be incorporated into the Transportation Master Plan.

For Development Reviews the Non-Motorized LOS standard would apply to site frontages. For SEPA analysis, the most direct route between the development site to the nearest transit stop, school, and community center (within a certain distance) would be disclosed. These points would be identified by the City on an official map. If the route includes sections that fail the City's LOS standard, the developer may be required to mitigate at the City's discretion according to SEPA guidelines.

City-Wide Monitoring and Concurrency

Concurrency may be monitored in a similar manner. Most communities use two types of concurrency programs. One is a planning-based program to understand if communities are progressing toward their goals and being concurrent with the associated growth. The other is a regulatory-based program that can limit future development if LOS standards along specific corridors are not being achieved. This framework follows a planning-based program approach that monitors completion of the non-motorized system citywide.

Regular monitoring of the Non-Motorized System on a City-wide basis would track metrics associated with percent complete as shown in Table 4. This could be tracked separately for pedestrian and bicycle systems, or combined. The "Existing Year" documents the current state of the network. The "Future Goal" is the Transportation Master Plan conditions that are constrained by the projects that are possible in the next 20 years. The "Study Year" would be the future year that would be evaluated to see if the Percent Complete results are on target to reach the "Future Goal."

Table 4: Monitoring the Non-Motorized System

Mode	Hierarchy Level	Percent Complete (Centerline Miles at LOS GREEN and YELLOW)		
		Existing Year	Study Year[1]	Future Goal[2]
Pedestrian	Primary Route	33%	TBD	TBD
	Secondary Route	36%	TBD	TBD
Bicycle	Primary Route	45%	TBD	TBD
	Secondary Route	27%	TBD	TBD

[1] Study Year percentages to completed with final Transportation Element project list.
[2] Future Goal to be set evaluated and set at a later date.

3. Needs Analysis

This section highlights how the Non-Motorized LOS Framework was applied to existing conditions. Because the framework would benefit from information contained in a Non-Motorized Master Plan, some specific details about the City non-motorized system have been developed that are for discussion purposes only or may be refined into formalized definitions at a later date. The pedestrian and bicycle facilities that are present in Tumwater are first described, followed by an analysis of existing and future non-motorized needs.

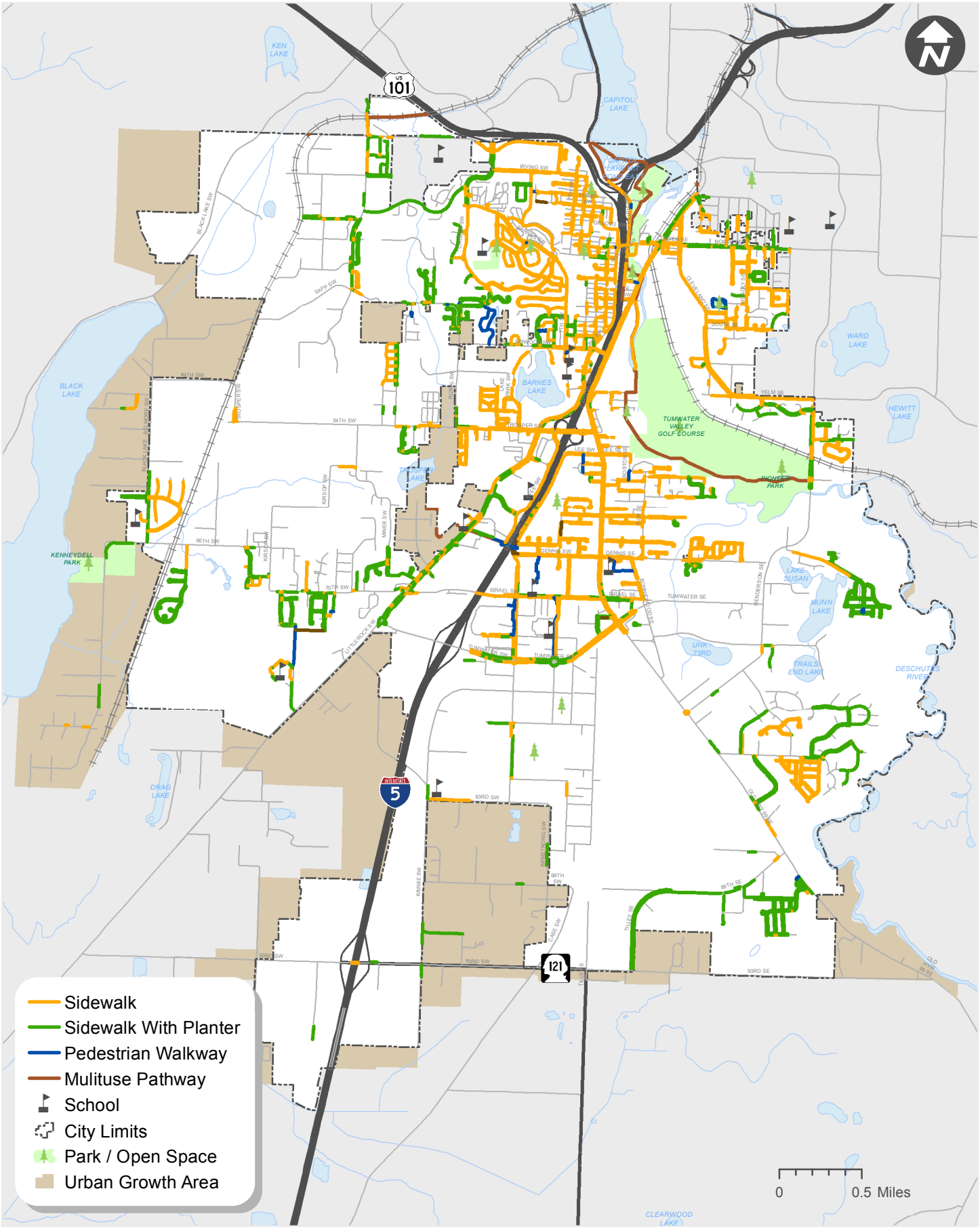
Pedestrian Facilities

Every trip begins or ends with walking. Walking promotes physical activity among residents and provides connections among destinations that include shopping areas, parking lots, and recreational trips within parks and open space. A combination of walkways, sidewalks, and off-street pathways provides the core network for pedestrians.

The following types of pedestrian facilities are present in the City of Tumwater:

- **Attached Sidewalks** are the primary pedestrian facility within downtowns and developed areas. Sidewalks are directly adjacent to the curb or roadway edge and vary in width and quality. They are generally 5 feet wide. There are currently over 65 miles of attached sidewalks in the City of Tumwater.
- **Buffered Sidewalks** (Sidewalks with Planters) include a landscaped area or buffer between the roadway and sidewalk. This buffer area may also include hardscape elements where landscape planters may not be feasible or desirable. These facilities provide additional separation from traveling or parked vehicles and are generally more comfortable for pedestrians. The sidewalks are generally 5 feet wide, with a buffer distance of 4 feet. There are approximately 37 miles of sidewalks with planters in the City limits.
- **Pedestrian Pathways** traverse open areas and are typically paved. Pedestrian walkways are short segments that are used to provide more direct connections between land uses and other types of pedestrian facilities. They are generally an 8-foot wide public space with 5-foot wide paved area. They are typically not designed for bicycle use. There are approximately 2.6 miles of pedestrian walkways in the City of Tumwater.
- **Multiuse Pathways** are longer connections that include paved and unpaved trails that are designed for both pedestrians and bicyclists. These facilities are generally used for recreational purposes, but may also serve commuter and utility travel between neighborhoods and to surrounding areas.

The existing pedestrian facilities in Tumwater are shown in Figure 1. Some cities consider wide shoulders to be pedestrian facilities as well.



Existing Pedestrian Facilities Map

DRAFT

FIGURE 1

City of Tumwater Transportation Element

transpogroup

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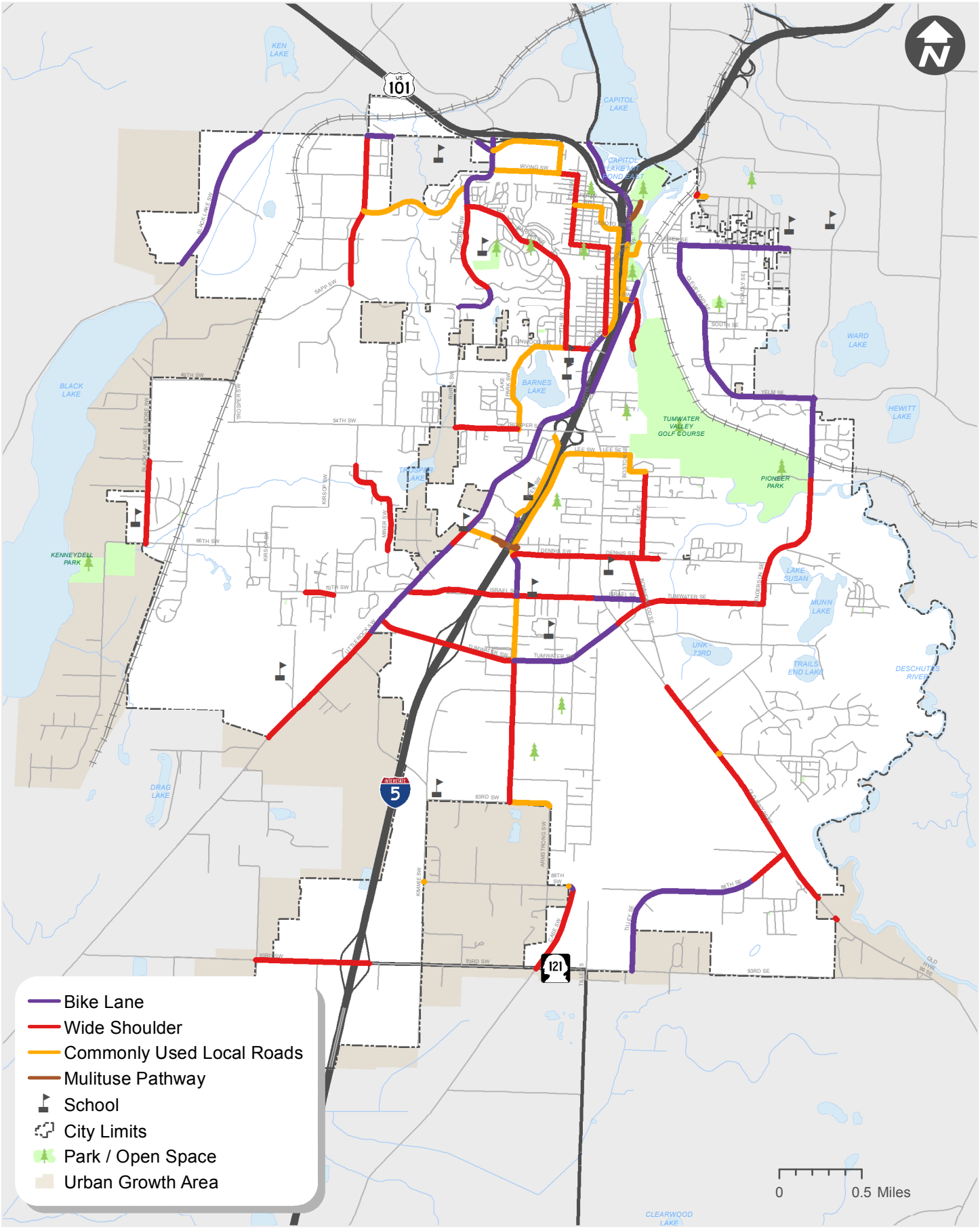
Bicycle Facilities

Bicycling is an important and growing mode of travel for people in cities across the country. When appropriately planned, bicycle facilities have a role in reducing congestion, improving air quality, providing travel choices, encouraging exercise and recreation, and providing greater mobility for those without access to a vehicle.

A combination of bicycle lanes, wide shoulders, quiet streets, and off-street pathways provide the core network for bicyclists to travel. The following types of bicycle facilities are present in the City of Tumwater:

- **Bicycle Lanes** are dedicated striped roadway space for cyclists that are typically in both directions on the edge of the traveled way. They are marked with a wide white stripe and range from 4 to 6 feet in width (widths are typically measured from the lane stripe to face of curb). The City has approximately 11 miles of bicycle lanes.
- **Wide Shoulders** are on the edge of the traveled way where there is a reasonable distance available for pedestrians and cyclists to travel with minor impact to motor vehicles. Wide shoulders mean striped shoulders with more than 4 feet width. Narrower shoulders often result in non-motorized users being forced into the vehicle travel lanes. Widths are typically measured from the lane stripe to face of curb, or if no curb to edge of pavement. There are approximately 15 miles of roadways with wide shoulders in the City limits.
- **Multiuse Pathways** are longer connections that include paved and unpaved trails that are designed for both pedestrians and bicyclists. These facilities are generally used for recreational purposes, but may also serve commuter and utility travel between neighborhoods and to surrounding areas.
- **Bike Routes** are low volume, low speed routes that may include shared lane markings or wayfinding signs for bicyclists, but are typically unmarked. These quiet streets that are commonly used by bicyclists comprise approximately 7 miles of the existing bicycle network.

The existing bicycle facilities in Tumwater are shown in Figure 2. Some cities are considering or have built the following bicycle facilities: bike boulevards (like bike routes, but with traffic calming elements); protected bike lanes (like bike lanes but physically separated from vehicle traffic); and specialized bicycle facilities at major intersections.



Existing Bicycle Facilities Map

City of Tumwater Transportation Element

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FIGURE **2**

transpogroup

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Non-Motorized Network Hierarchy

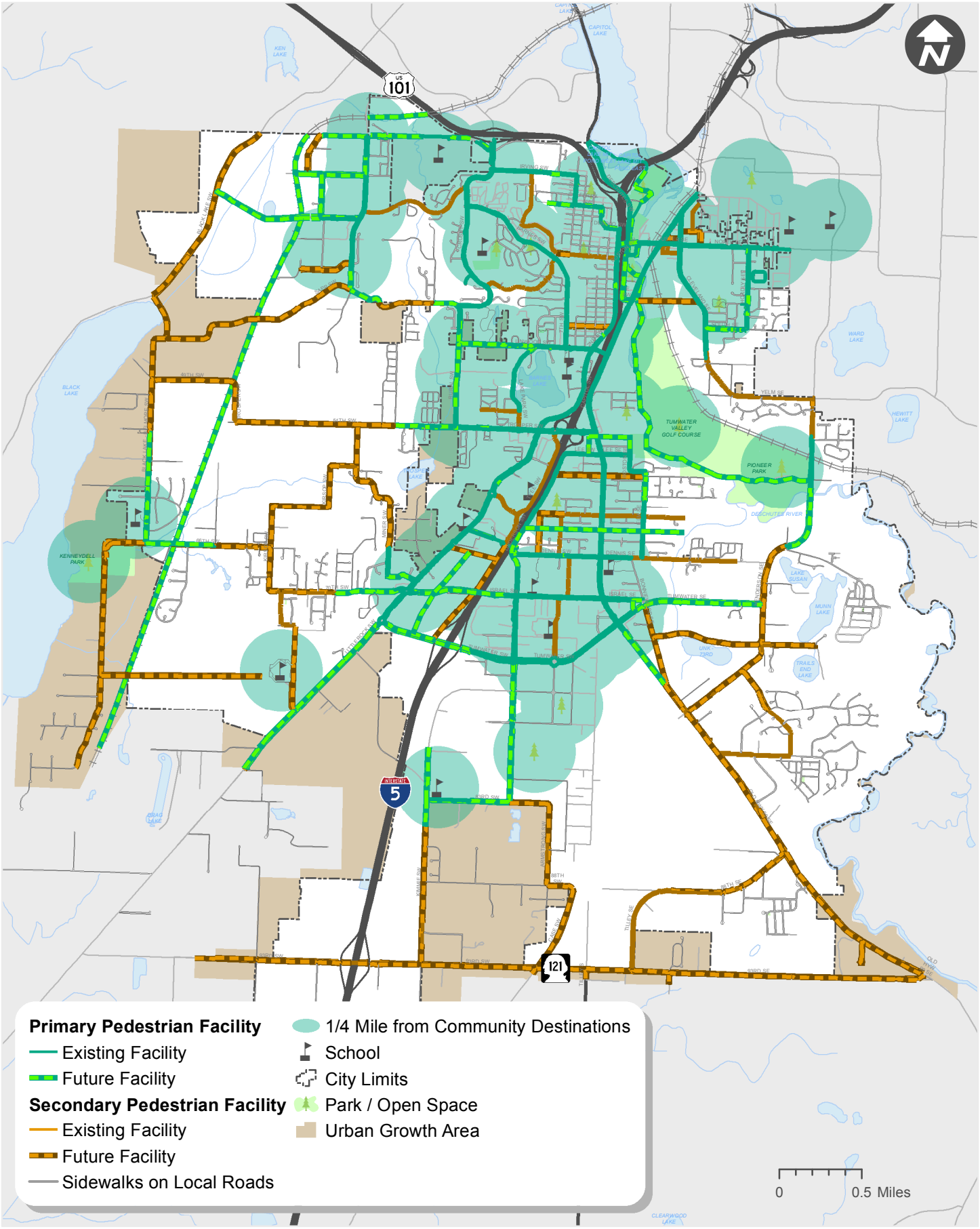
For the purposes of this sample existing analysis the primary and secondary routes were defined for the City of Tumwater network. They are defined separately for pedestrian and bicycle routes.

Pedestrian System

Proximity to schools, transit stops, parks, and other destinations were used to identify priority areas for the pedestrian network. Primary and Secondary pedestrian routes were determined based on the following criteria:

- **Primary pedestrian routes** are sections of arterial and collector roadways that are within ¼ mile of community destinations (schools, parks, and transit stops) that are expected to serve a higher volume of pedestrians. Multiuse pathways are also primary pedestrian routes due to their importance for all non-motorized travelers. Other streets may be included to complete logical gaps in the system.
- **Secondary pedestrian routes** are sections of arterial and collector roadways that are within ¼ mile of community destinations (schools, parks, and transit stops) that are expected to serve a lower volume of pedestrians. Other streets may be included to complete logical gaps in the system.

Pedestrian facilities on Primary routes anticipate higher levels of pedestrian activity due to their proximity to community destinations that generate walking trips. Secondary routes do not have as much pedestrian activity but complete important gaps in the pedestrian network. The City of Tumwater pedestrian network map is shown in Figure 3.



Pedestrian Network Map

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City of Tumwater Transportation Element

FIGURE 3

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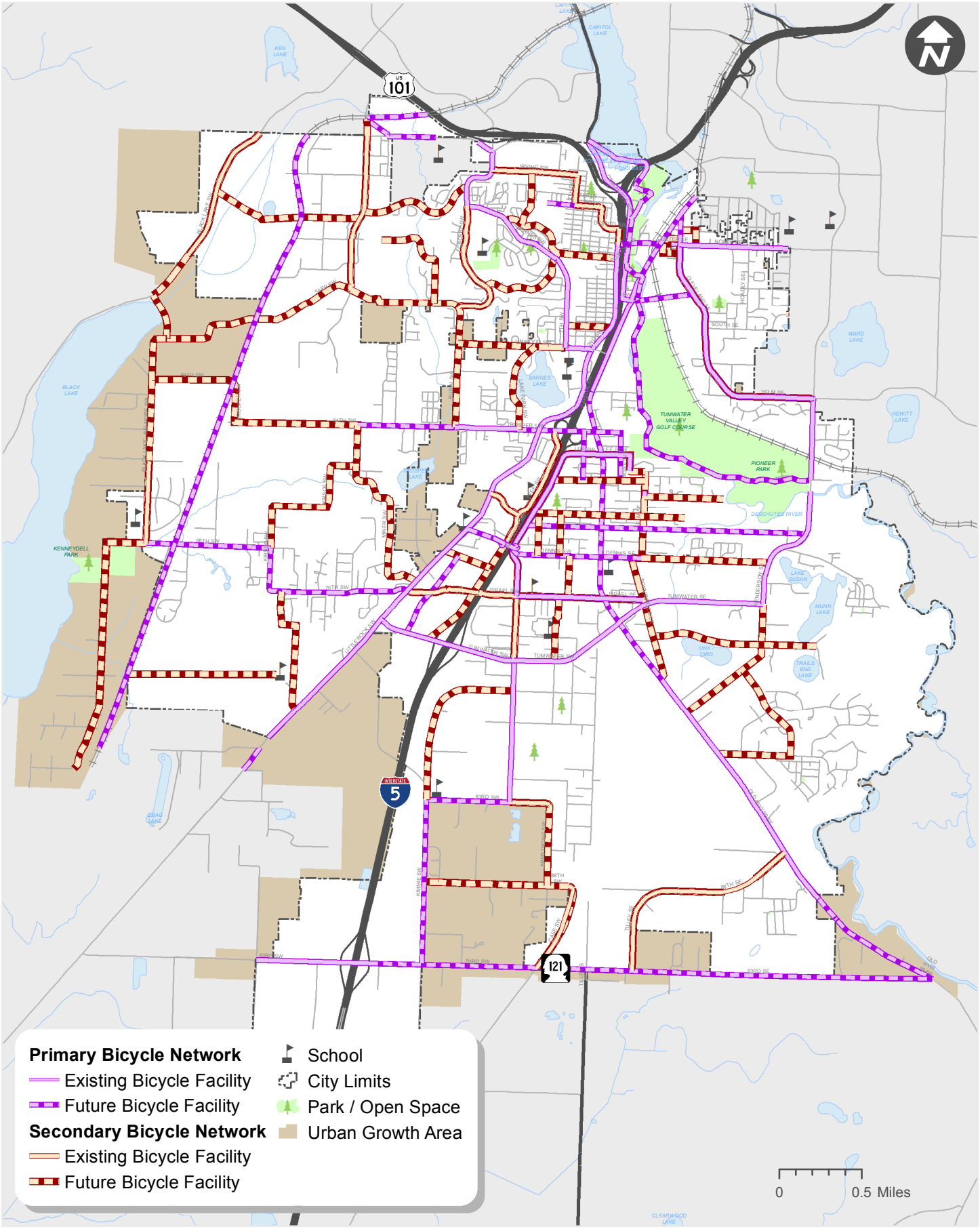
C:\Projects\15\15073.01 - Tumwater Transportation Element Update\GIS\Maps\MXD\Figures\Report Figures\Fig03 Pedestrian Network.mxd

Bicycle System

Bicycles are a network of primary and secondary bicycle streets that form a complete network, linking major bike destinations. The bicycle LOS includes look at the complete bike network considering both the bicycle corridors and the conflicts at major intersections and freeway interchanges.

- **Primary bicycle routes** connect community destinations through a backbone network of arterials, collector roadways, and local streets identified as bike routes. Multiuse pathways are also primary bicycle routes due to their importance for all non-motorized travelers.
- **Secondary bicycle routes** include other arterials, collector roadways, and local streets identified as bike routes that serve as connections between primary bicycle routes.

Primary and Secondary bicycle routes anticipate higher volumes and levels of bicycle activity. The City of Tumwater bicycle network map is shown in Figure 4.



Bicycle Network Map

City of Tumwater Transportation Element

DRAFT

FIGURE **4**

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C. Capitol Boulevard Corridor Plan – Transportation Summary

Following are excerpts from the Capitol Boulevard Corridor Plan with particular relevance to this Transportation Master Plan. The complete plan and its implementing regulations can be found at

Transportation-related Goals and Objectives from the Capitol Boulevard Plan

Improve mobility for pedestrian, bicycle, bus, and automobile transportation.

- Incorporate a multi-modal strategy to make transportation safe and enjoyable for a range of users.
- Develop a multi-modal street network and supporting land uses that diffuse the dependency on Capitol Boulevard to meet the needs of all users at all times.
- Balance regional transportation needs, business access, and non-motorized circulation.
- Address safety of all users.
- Refine multi-modal street design standards to guide new street development that supports walkable communities.
- Consider a variety of measures to reduce excessive traffic speed on existing streets.

Improve pedestrian and bicycle environments.

- Create safe, universally accessible and comfortable walking and bicycling routes throughout the community, especially to schools.
- Improve the safety of existing crosswalks and intersections.
- Utilize urban design, landscaping, sidewalk art, and creative streetscape treatments to encourage walking.
- Connect residential areas to the Boulevard.

Enhance transit experience and efficiency.

- Enhance the transit experience by improving bus stops and the connections to them.
- Increase transit ridership in the central zone.

Transportation Directives and Planning Principles

Directives:

- Reduce congestion growth
- Provide for pedestrian and bicycle connectivity
- Improve neighborhoods
- Beautify corridor
- Mitigate new development impacts

Principles:

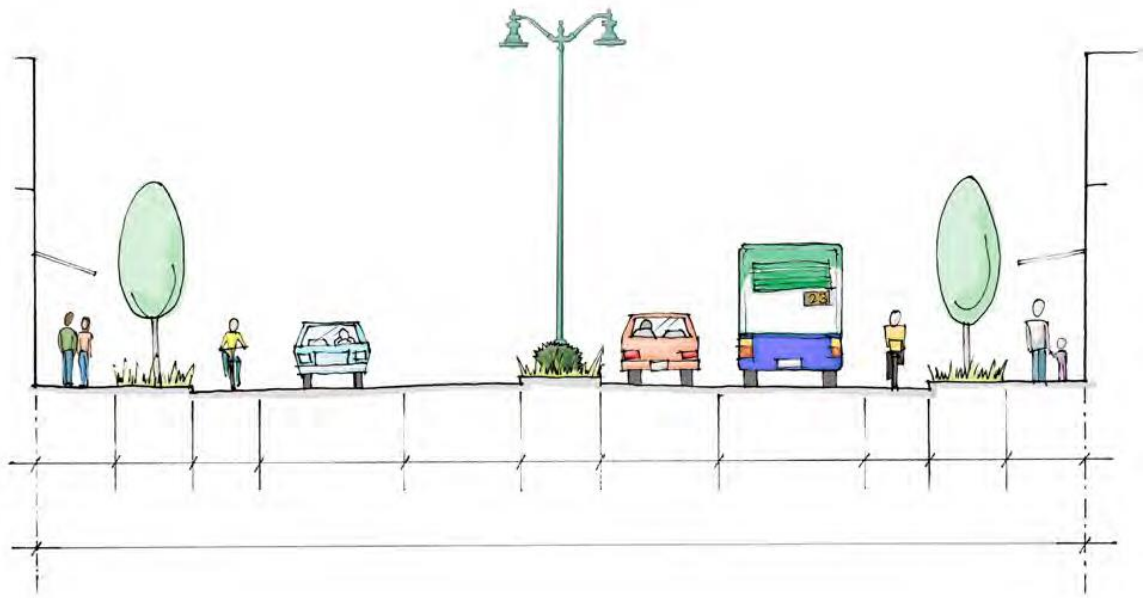
- Added travel lanes to quell congestion is neither feasible or desired
- A parallel street system should be pursued
- Ensure traffic operations help prioritize premium transit
- Enhance streetscape at major intersections and crossings
- Integrate and enhance bus stop facilities
- Establish parallel and intersecting bike network
- Establish parallel and intersecting walking routes

Transportation System Recommendations:

(T-7) Initiate Capitol Boulevard improvements, including:

- Rechannelize the street to remove the continuous center, left-turn lane and replace with a 4-6 foot raised median, re-designate travel lanes, and designate new bicycle lanes between T Street and Dennis Street.
- Remove U Street pedestrian crossing due to its proximity to the new T Street crossing; and
- Construct new roundabouts at T, X, and Dennis Streets.

By repurposing existing right-of-way Tumwater will add bike lanes to Capitol Boulevard without having to reconstruct the entire street, which would be cost prohibitive.



(T-8) Examine the design needs for vision- and mobility-impaired pedestrians, including the need for accessible and audible pedestrian signals, and install new pedestrian crosswalks and hybrid pedestrian beacons at or near:

- New roundabouts
- Gerth Street
  - BPA transmission line corridor
- Existing pedestrian crossing between Dennis Street and Israel Road

(T-9) Use the VE study findings to help determine whether similar median treatment, bike lane and roundabout installations are also suitable on Capitol Boulevard north through Lee Street and south to Israel Road, or whether existing signalized intersections (Lee and Israel) may require minor widening to accommodate greater u-turn traffic demand.

(T-10) Coordinate with property owners and purchase additional rights-of-way to construct a wider sidewalk corridor zone as feasible.

Connectivity Recommendations:

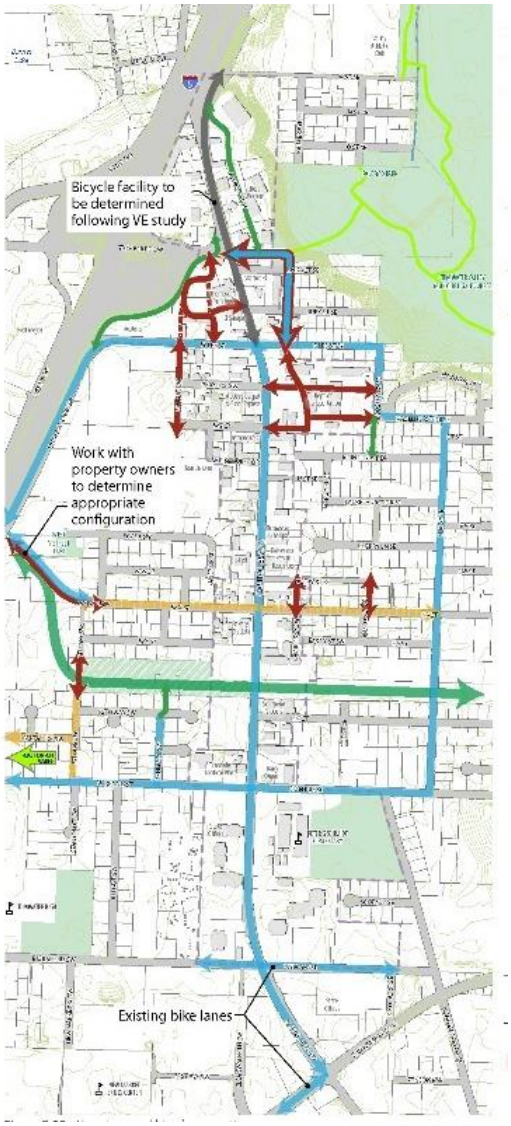
(T-3) Consider findings of Capitol Boulevard / Trosper Road Value-Engineering (VE) study and complete center median curbing along Capitol Boulevard from Trosper Road to Lee Street, in coordination with:

- New North-South Street – a low-speed local access street connection linking Ruby, Linda and Lee Streets with Trosper Road at the Capitol Boulevard intersection. *[Illustration to the right is a schematic of the proposed cross section for this new neighborhood connection.]*
- Westside Internal Connectors

(T-6) Construct local connectors facilitating circulation and access to businesses between Trosper Road and W Lee Street west of Capitol Boulevard



The mobility strategy for Capitol Boulevard includes roundabouts and medians and the addition of bike lanes and improved pedestrian facilities to help transform the old highway character of this street into a more urban, people-oriented place.



(T-13) Construct a narrow two-lane access street between W Lee Street and W T Street along the 6th Avenue SW right-of-way. *[This small roadway would allow residents on Gerth Street to access Capitol Boulevard at a signal or roundabout and would greatly facilitate local circulation.]*

(T-14) Extend X Street westward to Linderson Way SW. *[A connection here provides a much needed east-west route for emergency vehicles and local traffic. Implementation and alignment of this street connection depends on development of property near Linderson. Traffic calming will ensure that X Street provides local access but does not become a shortcut.]*

(T-16) Extend 7th Avenue SW to connect West Y Street with 65th Way SW.

(T-17) Extend Charles Street and Boston Street to connect East W Street and East X Street. *[Boston Street connection will be a narrow*
alley and Charles Street extension will require ROW so these improvements are lower priority than some others.]

(T-18) Establish a loop of bicycle lanes along Linderson Way, West and East Lee Streets, Boston Street, Hazelhurst Drive, Elm Street, and West and East Dennis Streets.

(T-19) Designate X Street, Dennis Place, and 7th Avenue as shared-lane bicycle routes, with signs and pavement markings for “sharrows.”

(T-21) Secure rights-of-way and construct a new shared-use pathway (a) along the BPA/Bonneville transmission lines between Elm Street and 6th Avenue, (b) from the transmission lines to the X Street extension, (c) from Lee Street to Trosper Road, (d) from the new North-South Street to Capitol Boulevard along Market Street, (e) along the 7th Street extension, (f) on the Boston Street easement between Pinehurst and Hazelhurst, and (g) two connections to the Deschutes Valley Trail.

(NL-15) Construct the Deschutes Valley Trail and associated trail spurs according to the Parks plan

Development-driven Transportation Policies:

(T-2) Install driveway modifications at Starbucks drive to prevent left turns. *[This will resolve current operational issues and safety concerns.]*

(T-5) Coordinate with local property owners to plan local street connectors providing local access alternatives to and from Capitol Boulevard via Lee Street.

(T-11) As properties redevelop, require (a) additional rights-of-way and construct a wider sidewalk corridor zone, and (b) parallel to Capitol Boulevard, external site vehicular connectivity.

(T-15) Construct internal streets within any WSDOT site redevelopment. *[These streets are needed for access but will also reduce congestion in this vicinity and enhance site's role as a community focus.*

(T-20) Coordinate with local property owners and/or developers to construct sidewalks and bicycle facilities as part of new street construction, especially those new street connections identified in recommendations T-13 to T-17.

(T-22) As redevelopment occurs, require internal pedestrian connectivity linking neighborhoods behind the commercial strip to Capitol Boulevard.

Transit Policy:

(T-23) As part of the Capitol Boulevard street improvements the City should coordinate with Intercity Transit to revise the current bus stop location and design, conforming with the following:

- Far-side (of intersection) bus stop location guidelines;
- Removal of bus pull-out bays; and
- Placement of stops and added arterial crossing to coincide with recommended corridor improvements.

Traffic Calming Policies:

(NL-2) Construct traffic calming devices – bulb-outs, traffic circles, or chicanes – along X Street (at 7th Avenue and at the commercial/residential zone boundary), Elm Street (at Dennis Street, BPA/Bonneville corridor, and X Street), and along the bike route loop (Lee Street, Boston Street, Hazelhurst Drive, Dennis Street, and Linderson Way) as appropriate to moderate traffic speed. Undertake measures necessary to prevent parking impacts on safety and residential quality.

(NL-3) Ensure that the new access streets near Trosper Road include traffic calming devices.

D. Brewery District Plan – Summary of Recommendations

Transportation-related Goals and Objectives from the Brewery District Plan

Brewery District Vision:

> *The Tumwater Brewery District is a vibrant, neighborly mixed-use urban community with abundant shopping and business services, safe and accessible transportation options and outstanding recreational amenities. At the heart of Washington State's "original city," the Brewery District continues to serve as an historic destination, even as it evolves to provide new homes and economic opportunity for a growing regional population. The District infuses the best of past and present urban development through the preservation of critical heritage sites, incorporation of modern urban design practices and emphasis on creating a unique sense of place.*

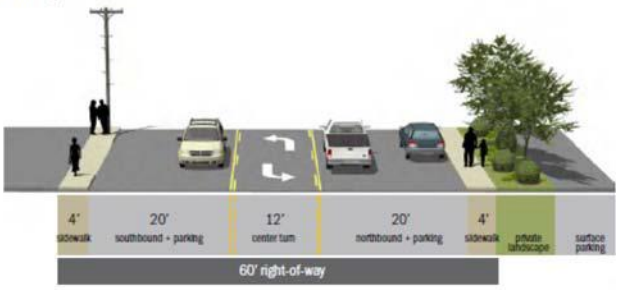
Create a strong sense of place by facilitating pedestrian access, establishing gathering places for residents and fostering a District identity.

a. Evaluate opportunities for a pedestrian-oriented "Main Street"
b. Consider opportunities for reducing/redistributing wide rights-of-way where appropriate
c. Facilitate opportunities for pedestrian-oriented, mixed-use and commercial development.

Improve transportation options, safety, and access within and across the District.

a. Reduce pressure on over-burdened intersections
b. Improve transit, bicycle and pedestrian access into the District
c. Prioritize and implement safety and comfort enhancements for non-motorized users
d. Update current parking and access management framework

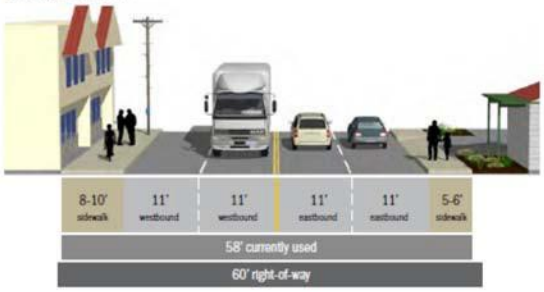
Cleveland Avenue - Custer Way to Capitol Boulevard
Existing Condition



Cleveland Avenue - Custer Way to Capitol Boulevard: Proposed Cross Section



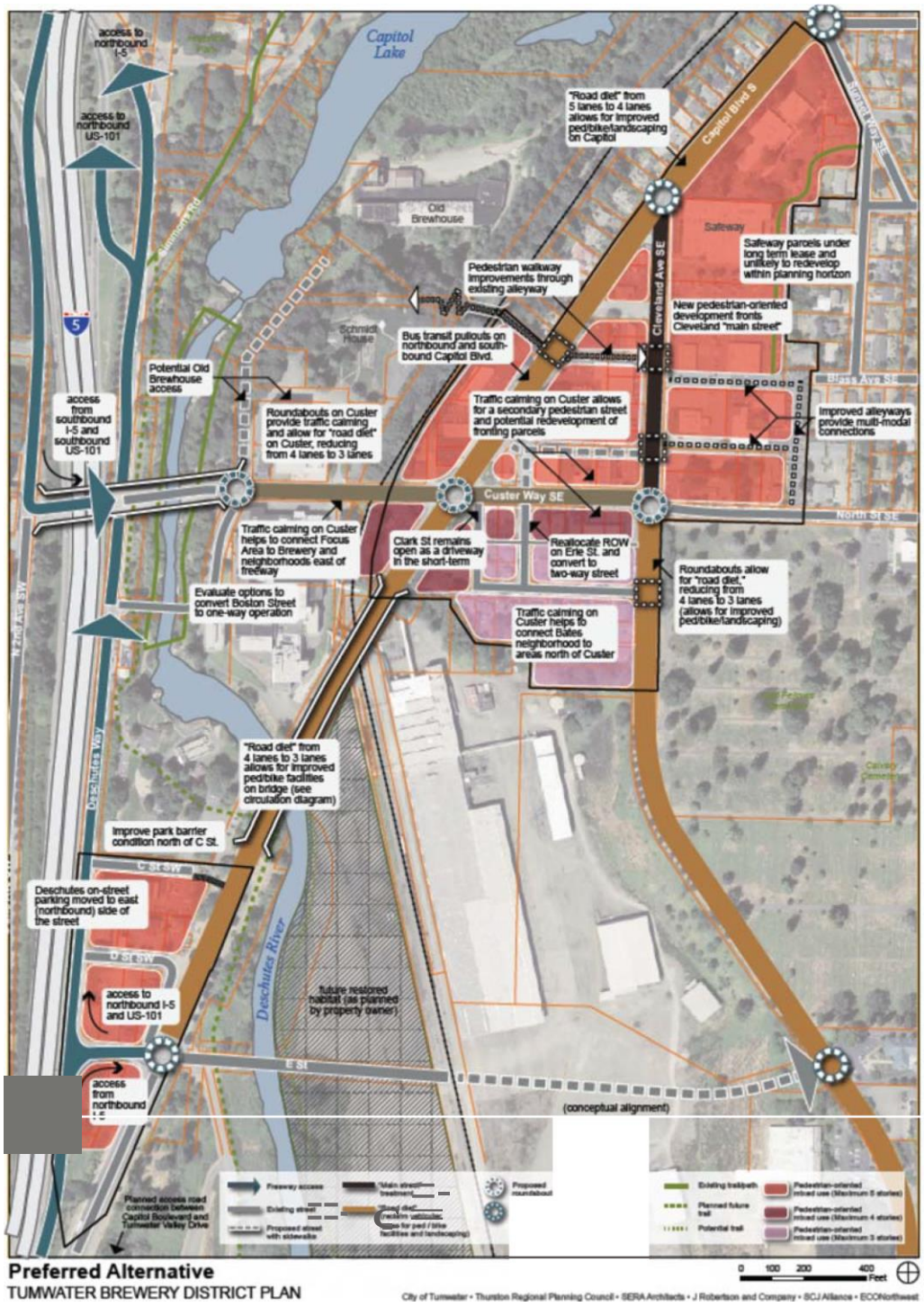
Custer Way - Custer Bridge to Cleveland Avenue
Existing Condition:



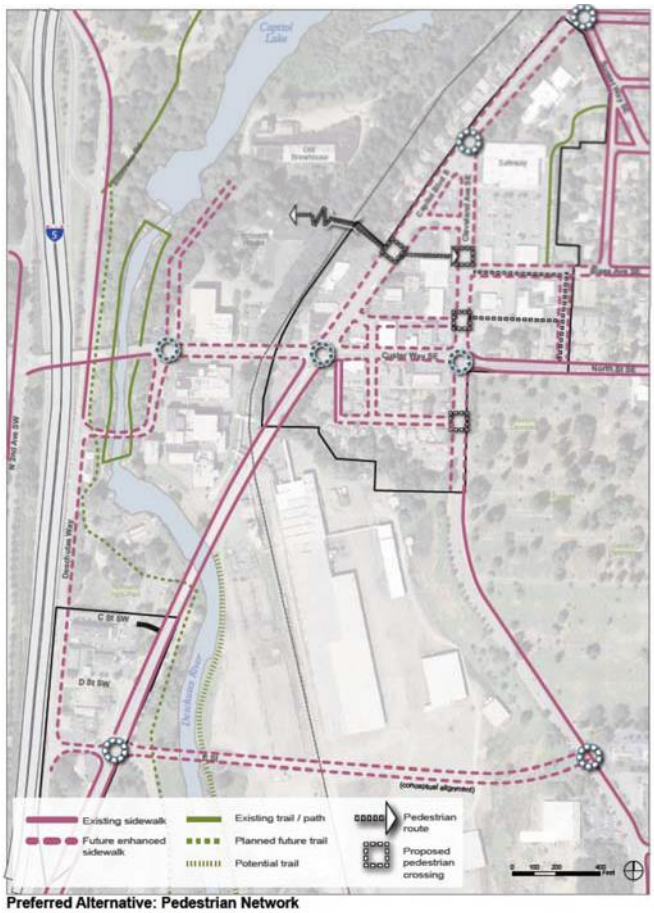
Custer Way - Custer Bridge to Cleveland Avenue
Proposed Cross Section:



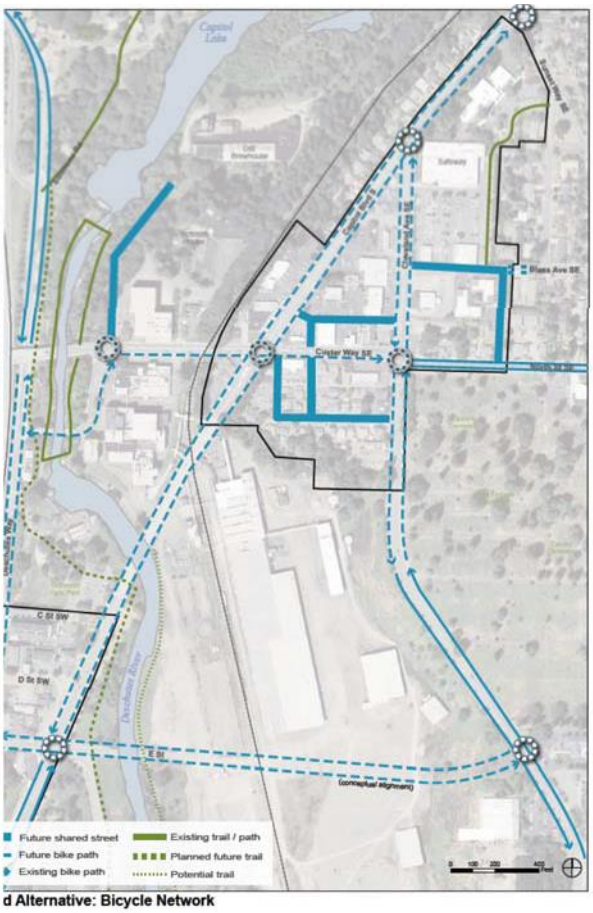
The illustrations demonstrate how repurposing existing right-of-way can be used to create or enhance non-motorized facilities and contribute to the overall livability of a place. Cleveland Avenue, top, and Custer Way, bottom, will be reconfigured so that there is better balance between motorized and non-motorized uses in this area



The land use and transportation strategies for the Brewery District are completely integrated, each relying on the other to be most effective



Preferred Alternative: Pedestrian Network



d Alternative: Bicycle Network

Clearly defined strategies for addressing bike and pedestrian mobility will help ensure the successful transition of the Brewery District into a vibrant, people-oriented place.



Figure 3.4: A road diet on Cleveland Avenue will include adding bicycle facilities, widening sidewalks, and installing street trees and stormwater facilities. The calmed streetscape allows easier pedestrian crossings and creates a more welcoming environment for mixed-use (re)development along the "main street".



Another example of how repurposing valuable right-of-way can be used to transform the character of a place. This planned treatment of Cleveland Avenue will take advantage of a vast space that is greatly under-utilized today.

TO: General Government Committee

FROM: Brad Medrud, Planning Manager

DATE: January 10, 2024

SUBJECT: 2024 Long Range Planning Work Program

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1) Recommended Action:

Schedule the annual work program for approval on consent at the January 16, 2024 City Council meeting.

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2) Background:

The City Council approves an annual long range planning work program at the beginning of each year. The City Council and the Planning Commission discussed the draft 2024 long range planning work program and the 2025 Comprehensive Plan periodic update at a joint work session on December 12, 2023. City Council will then be asked to approve the annual work program in January 2024.

The City Council, Planning Commission, residents, property owners, and City staff typically propose annual work program items. The major focus of the draft 2024 long range planning work program will be on the City's 2025 Comprehensive Plan periodic update.

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3) Policy Support:

Land Use Element Policy LU-1.9 Ensure consistency between the Land Use Element and the Tumwater Zoning Code.

Land Use Element Action LU-1.9.1 Implement the Land Use Element by revising the Zoning Code and other municipal Codes to reflect the goals, policies, actions, and designations outlined in the Land Use Element.

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4) Alternatives:

- ❑ None.

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5) Fiscal Notes:

The annual work program includes items that are internally funded as well funded through outside state and federal grants.

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6) Attachments:

A. Staff Report
B. Draft 2024 Long Range Planning Work Program (B1 – B3)
C. 2025 Comprehensive Plan and Development Code Update Schedule

STAFF REPORT

Date: January 10, 2024
To: General Government Committee
From: Brad Medrud, Planning Manager

2024 Long Range Planning Work Program

The City Council approves an annual long range planning work program at the beginning of every year. The annual work program will guide all long range planning projects during 2024. The City Council and Planning Commission discussed the draft 2024 work program at a joint work session on December 12, 2023 as well as general topics related to their roles on a range of community development issues. The City Council is expected to approve the 2024 work program on January 16, 2024.

The City Council, Planning Commission, community members, and City staff can propose projects for the annual work program.

The draft 2024 work program consists of projects budgeted for 3.10 FTEs.

Almost half of the staff time budgeted for the proposed 2024 work program will be spent on the City's 2025 Comprehensive Plan and Development Code periodic update, which is discussed in more detail below. Ongoing work on the Bush Prairie Habitat Conservation Plan and with the Regional Housing Council on homelessness and affordable housing issues will take more than one quarter of long range planning staff time in 2024.

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2023 Accomplishments

The Community Development Department was able to bring on Erika Smith-Erickson as our new Land Use and Housing Planner.

The following items were completed from the 2023 long range work program:

- Housing Action Plan – Rental Registration (Ordinance No. O2022-014) – Adopted February 2023.

The following items are still ongoing from the 2023 long range work program:

- 2023 Comprehensive Plan Amendments (Ordinance No. O2023-002) – Expected approval February 2024.
- General Development Code Housekeeping Amendments (Ordinance No. O2023-012) – Expected approval February 2024.
- 2025 Comprehensive Plan and Development Code Periodic Update – Expected approval June 2025.
- Bush Prairie Habitat Conservation Plan – Work is ongoing.
- Regional Housing Council – Work is ongoing.
- Hazard Mitigation Plan for the Thurston Region Update – Expected approval March 2024.

- Urban Forestry Management Plan – Landscaping and Buffering Requirements Update – Expected to be able to restart work on the project in March 2024.
- Urban Forestry Management Plan – Street Tree Standards Update – Expected to be able to restart work on the project in March 2024.
- Urban Forestry Management Plan – Tree and Vegetation Preservation Regulation Update – Expected to be able to restart work on the project in March 2024.
- Thurston County Code Title 22 – Tumwater Urban Growth Area Zoning Update – Schedule is dependent on County work program.
- Equity Toolbox – Expected to be complete in 2024.

Proposed 2024 Long Range Work Program

Attachments B1 – B3 are the draft 2024 long range planning work program. The 2024 work program is divided into five parts:

1. Comprehensive Plan Amendment Docket
2. Development Regulation Amendment Docket
3. Other Planning Projects
4. General Management and Coordination
5. Below the Line Projects – Projects that would be considered if the projects in the first four parts are completed and staff time is available.

Under each of the five parts, individual projects are identified with an estimate of staff time needed to complete, who proposed the project, how they address City Council strategic priorities, and detail on the work required. For more details on individual projects, please see Attachments B1 – B3 *Draft 2024 Long Range Planning Work Program*.

1. **Comprehensive Plan Amendment Docket** – Discussed further below.

   Approximately 33% of all budgeted staff time.

   a. 2025 Comprehensive Plan Periodic Update (Continued from 2022-23)

2. **Development Regulation Amendment Docket**

   Approximately 22% of all budgeted staff time. 2025 Development Code Periodic Update is approximately 10% of all budgeted staff time.

   a. 2025 Development Code Periodic Update – Discussed further below (Continued from 2022-23)

   b. Urban Forestry Management Plan Amendments – Landscaping, Street Tree Standards, and Tree and Vegetation Preservation (Continued from 2022-23)

c. Other Amendments – 2024 Development Code Housekeeping Amendments and Thurston County Code Title 22 – Tumwater Urban Growth Area Zoning (Continued from 2022)

3. Other Planning Projects

Approximately 25% of all budgeted staff time. The Habitat Conservation Plan is approximately 11% of all budgeted staff time.

a. Bush Prairie Habitat Conservation Plan (Continued from 2016)

b. Equity Toolbox (Continued from 2022-23)

c. Food System Plan (New in 2024)

d. Hazard Mitigation Plan Update (Continued from 2022-23)

e. Managing Multifamily Tax Exemption Program (Ongoing)

f. Code Enforcement (Ongoing)

g. As well as Permit Review Support, Public Inquiries, and other items (Ongoing)

4. General Management and Coordination

Approximately 20% of all budgeted staff time. Regional Housing Council is approximately 10% of all budgeted staff time.

a. General Coordination with Other Departments – Code Compliance Team, Traffic Team, Green Team, Stormwater Team, GIS Team, and other items (Ongoing)

b. General Coordination with Other Jurisdictions

1) Regional Housing Council (minimum 0.25 FTE per Memorandum of Understanding) (Ongoing)

2) Work with the Port of Olympia, other cities, County, State, Tribes, Thurston Regional Planning Council, and Intercity Transit among others (Ongoing)

3) Department Management (Ongoing)

4) Training (Ongoing)

Growth Management Act and the Periodic Update

In Washington State, the Growth Management Act requires fast-growing cities and counties to manage their population growth by developing a comprehensive plan and keeping it updated.

Every ten years under the Growth Management Act, the City must conduct a periodic update of its Comprehensive Plan and related development regulations to ensure they comply with the

Growth Management Act and respond to changes in the City since the last periodic update in 2016.

Tumwater Comprehensive Plan

The Comprehensive Plan establishes the outline for managing the City's policymaking and investment decisions for the next 20 years from 2025 to 2045.

The Comprehensive Plan's goals, policies, and implementation actions are the foundation for how the City addresses future public and private development, directs spending for capital facilities improvements, and collects development impact fees and other development charges.

The Comprehensive Plan addresses where development will occur, at what intensities, and concurrent with required infrastructure improvements.

Tumwater Development Regulations

The City's development regulations translate the goals and policies of the Comprehensive Plan into the zoning, land division, and environmental codes that private and public landowners must follow to develop property in the City. Zoning is a planning practice of classifying land as regulated zones for designated purposes to create suitable land use patterns, by various types of similar uses, or by design standards, e.g., form-based codes, to meet the goals and vision identified in the City's Comprehensive Plan.

The City's development regulations adopt the City's Zoning Map which establishes the location and boundaries of the zoning districts that allow for specific uses and intensities. The City's Zoning Map is based in turn on the land uses and intensities identified in the Citywide Future Land Use Map in the Comprehensive Plan.

2025 Periodic Update

On a ten-year cycle, the City is required by the state to conduct a Growth Management Act periodic update of its Comprehensive Plan and development regulations. For the current cycle, the City is required to complete the periodic update by June 30, 2025.

The updated Comprehensive Plan will address diversity, equity, and inclusion throughout the Plan and incorporate many state-required changes addressing affordable housing, climate change, transportation, and other topics.

The City is expected to grow in population from 27,100 in 2023 to 37,380 by 2045 with an additional 6,000 people in the City's urban growth area. Note that these numbers may be an undercount of likely growth based on projected and actual growth since the last Comprehensive Plan periodic update in 2016. The projected housing need from 2025-45 is 6,664 new dwelling units with the majority being multifamily. The Comprehensive Plan is required to show how and where the new population and housing will be accommodated.

The addition of more people, housing, and jobs will result in a greater need for public services maintained by the City from roads, sidewalks, and bike lanes, to police and fire services, to water, sanitary sewer, and stormwater facilities, parks and recreation facilities, as well as the staff required to maintain those services.

It is expected that the periodic update will result in increased density throughout the City to meet state requirements for housing, climate mitigation, and conservation of state and federally protected species. In turn, this will require revisions to how transportation, public utilities, and park and recreation facilities will be funded through impact fees and Capital Facilities Plan projects to meet state concurrency requirements.

Under state law, the periodic update process is the time where the City Council and the community have the greatest ability to provide input on how and where development of the City occurs.

Periodic Update Schedule and Action Items

The periodic update process will require resources from all City departments to complete. Attachment C *Schedule* identifies the lead and supporting departments for each Element and Plan in the Comprehensive Plan, funding, and the likelihood of consultant support. Funding for the periodic update will be a mixture of general government and state grant funds.

Phase 1 – Project Start (Summer 2023 – Winter 2024)

City staff is completing review of the visions, goals, and policies in the existing Comprehensive Plan and preparing gap analyses for the Comprehensive Plan and Development Code. The community and stakeholders will be introduced to the periodic update process through a series of communications and asked to prioritize the Comprehensive Plan's vision, goals, and policies through a variety of media outreach methods, including surveys, utility inserts, open houses, informal meetings, presentations, and social media.

A community survey is available now on the Comprehensive Plan periodic update website. Postcards were mailed to residents on December 4, 2023 to let them know about the survey.

Phase 2 – Plan Development (Winter 2024 – Spring 2024)

Feedback gathered through the community outreach process will be incorporated into the draft Comprehensive Plan and Development Code. City staff will present the drafts of the Elements and Plan to the Planning Commission and General Government Committee as well as external and internal stakeholders and focus groups comprised of subject-area experts for review and comment.

Phase 3 – Legislative Process (Summer 2024 – June 30, 2025)

City staff will complete a draft version of the Comprehensive Plan and the Development Code amendments during Phase III. City staff will present the drafts to the Planning Commission and General Government Committee as well as external and internal stakeholders for review.

The Planning Commission will hold several work sessions to discuss the Comprehensive Plan and the Development Code amendments and then conduct a public hearing or hearings to gather formal public comment on the draft Comprehensive Plan before developing findings of fact, conclusions, and recommendations that will be forwarded to City Council.

The City Council will consider the recommendation forwarded by the Planning Commission and will hold several work sessions to discuss the Comprehensive Plan and the Development Code amendments.

The process will culminate in the adoption of an updated Comprehensive Plan and amended Development Code by the Growth Management Act deadline of June 30, 2025.

Periodic Update Process and Schedule

Comprehensive Plan Periodic Update

Phase I –Community Engagement – *Fall 2022 – Summer 2025*

1) Community Engagement Process – *Through June 30, 2025*
2) Consultant Selection and Contracting – Develop and issue request for proposals for consultant and consultant selection and contracting – *Winter and Spring 2024*
3) Data Gathering – Staff and consultants gather data and start review of the Elements, Plans, and maps – *Spring and Summer 2024*

Phase II – Plan Development – Winter 2024 – Fall 2024

1) Periodic Update Drafts – Staff and consultants start work on the draft Comprehensive Plan Elements, Plans, and maps and the Development Code – *Winter 2024*
2) Individual Comprehensive Plan Element and Plan Discussions and Work Sessions – *Winter – Fall 2024*
    a) Community Stakeholders
    b) Planning Commission
    c) General Government Committee and City Council
3) Complete Draft of Periodic Update – Staff and consultants complete draft of the Comprehensive Plan Elements, Plans, and maps and the Development Code – *Fall 2024*

Phase III – Legislative Process – Fall 2024 – June 30, 2025

1) SEPA and Commerce Review – *Fall 2024*
2) Public Adoption Meetings – *Fall 2024 and Winter 2025*
    a) Community Stakeholders
    b) Planning Commission
    c) City Council
3) Submit Notice of Adoption to Commerce – *Spring 2025*

Capital Facilities Plan Update – 2025

1) Preliminary Docket Process – *Winter 2025*
2) Develop Capital Facilities Plan – *Spring and Summer 2025*
3) SEPA and Commerce Review – *Summer 2025*
4) Final Docket Process – *Fall 2025*

Development Code Periodic Update Process – 2024/2025

1) Discussions of Amendments to Development Code Regulations (Titles 16, 17, and 18) and Title 3 – *Spring, Summer and Fall 2024*
2) Draft Ordinance – Staff and consultants complete draft ordinance – *Winter 2025*
3) SEPA and Commerce Review – *Winter 2025*
4) Public Adoption Meetings – *Winter 2025 and Spring 2025*
5) Submit Notice of Adoption to Commerce – *June 30, 2025*

Resources Needed

Staff

The periodic update is expected to require the following staff resources:

1) Community Development Department
    a) Planning – The periodic update process is expected to require 1.5 FTE in 2024 and 2025.
    b) Economic Development – The minor periodic update of the goals and strategies in the Economic Development Plan and coordination with the Economic Development Manager and a consultant to update the data workbook is expected to require 5% of one FTE in 2024 and 2025.

2) Executive Department

   a) Executive – The periodic update will require staff time from the Executive Team to support the periodic update.

   b) Communications Team – The periodic update will require staff time from the Communications Team to support the actions identified in the Public Engagement Plan.

3) Transportation & Engineering Department

   a) Transportation – The major periodic update of the Transportation Plan will require staff time from the Transportation & Engineering Department Director and Transportation Manager and coordination with a consultant to update the Transportation Plan and prepare the Climate Element.

   b) GIS Team – The periodic update will require staff time from the GIS Team to support the periodic update.

4) Water Resources & Sustainability Department – The preparation of the new Climate Element and the periodic update of the Lands for Public Purposes and Conservation Elements will require staff time from the Water Resources & Sustainability Department Director and from the Water Resources & Sustainability staff, including the Sustainability Coordinator.

5) Parks & Recreation Department – Work on a major periodic update of the Parks, Recreation, and Open Space Plan was not funded as part of this periodic update process.

Consultants

The periodic update is expected to require the following consultant resources for the following:

1) Economic Development Plan – Minor update of Plan was completed in 2019.

2) Transportation Plan – Major update of Plan was completed in 2016.

3) Middle Housing Development Code Amendments – Amendments will require consultant assistance.

4) Climate Element – New plan will require consultant assistance to develop required subelements.

Funding

The periodic update is primarily an internally funded annual work program task. The City has filed an application for a Washington State Department of Commerce grant for $125,000 to update the Transportation Plan and Economic Development Plan and is waiting to hear back edits to our proposed scope and budget. The City has been awarded a Washington State Department of Commerce grant for $75,000 to address the new state middle housing requirements. The City

has filed an application for a Washington State Department of Commerce grant application for $500,000 to support the development of a Climate Element and supporting implementation actions and is waiting to hear back edits to our proposed scope and budget.

Comments and Contact information

Written comments are welcome at any time during the periodic update process and staff will address and publish all formal comments

City of Tumwater contacts:

- The periodic update email is compplan@ci.tumwater.wa.us.
- All documents related to the periodic update will be located on the City's periodic update webpage.

2024 DRAFT CITY OF TUMWATER LONG RANGE PLANNING WORK PROGRAM

	PROJECT	STAFF HOURS	PROPOSED BY	CITY COUNCIL STRATEGIC PRIORITIES	PROJECT DESCRIPTION/COMMENTS
	COMPREHENSIVE PLAN AMENDMENT DOCKET				
1	2025 Comprehensive Plan Periodic Update	1,800	City Staff	1, 2, 3, 5	Starting in Fall 2022 through June 30, 2025, prepare state required ten-year periodic update to the City's Comprehensive Plan, including updates to the Conservation, Housing, Land Use, Lands for Public Purposes, and Utilities Elements as well as the Transportation Plan and the creation of a Climate Element. Manage community engagement process and project website. Work in 2024 will primarily be focused on community engagement and working with other City departments and consultants on preparing the draft elements and plans. Work will be coordinated with concurrent updates to development regulations. Consultant and grant management. Work with the community, internal and external stakeholders, other agencies, Planning Commission, Public Works Committee, General Government Committee, and City Council.
	Subtotal	**1,800**			
	DEVELOPMENT REGULATION AMENDMENT DOCKET				
1.	**Development Regulation Periodic Update**				
a	*2025 Development Regulation Periodic Update*	*560*	*City Staff*	*1, 2*	*Starting in Fall 2022 through June 30, 2025, review and update development regulations to address the required state periodic update. Review Commerce checklist and Ecology checklist for critical areas. Will involve updates to Titles 3, 14, 15, 16, 17, and 18. Work will be coordinated with concurrent updates to the Comprehensive Plan. Consultant and grant management. Briefings, work sessions, and hearing would occur in 2024-25, as well as preparing the staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.*
		560			
2.	**Urban Forestry Management Plan Amendments**				
a	*Landscaping and Buffering Requirements (O2023-004)*	*100*	*City Staff*	*2*	*Ongoing from 2022. After completion of the Urban Forestry Management Plan update in 2021, work with consultant to complete update to landscape buffering and screening regulations (TMC 18.47). Work was paused to address issues with the Washington State Wildland-Urban Interface Code. Consultant management. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Tree Board, Planning Commission, General Government Committee, and City Council.*
b	*Street Tree Standards Update (O2023-005)*	*120*	*City Staff*	*2*	*Ongoing from 2021. After completion of the Urban Forestry Management Plan update in 2021, work with a consultant to prepare update to street tree regulations (TMC 12.24), a Street Tree Plan, and guidelines throughout the code. Work was paused to address issues with the Washington State Wildland-Urban Interface Code. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Tree Board, Planning Commission, General Government Committee, and City Council.*
c	*Tree Preservation Regulation Update (O2023-006)*	*160*	*City Staff*	*2*	*Ongoing from 2022. After completion of the Urban Forestry Management Plan update in 2021, work with consultant to complete update to tree preservation regulations (TMC 16.08). Work was paused to address issues with the Washington State Wildland-Urban Interface Code. Consultant management. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Tree Board, Planning Commission, General Government Committee, and City Council. Work includes resolving issues with the adoption of the Washington State Wildland-Urban Interface Code.*
		380			
3.	**Other Amendments**				
a	*FP Floodplain Regulations Amendments*	*80*	*City Staff*	*1*	*Update TMC 18.38 FP Floodplain Overlay to address FEMA update requirements before May 8, 2024 deadline following the guidance from the State Department of Ecology's Community Assistance Visit in the spring of 2023. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.*
b	*General Development Code Housekeeping Amendments*	*80*	*City Staff*	*1*	*Address minor housekeeping amendments from 2023 and 2024, including updating code that addresses signs. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.*
c	*Thurston County Code Title 22 - Tumwater Urban Growth Area Zoning*	*160*	*City Staff*	*1, 2*	*After completion of the Joint Plan update in 2021, start work with County staff to revise Thurston County Code Title 22 and City development codes as needed to be consistent in the Urban Growth Areas. Schedule will depend on County work plan. Briefings, work sessions, and hearing. Prepare staff report, ordinance, and other materials and work with City and County Planning Commissions, General Government Committee, and City Council.*
		240			
	Subtotal	**1,180**			

	OTHER PLANNING PROJECTS				
1	Annexations	0	City Staff	1	Briefings, work sessions, and hearings. Prepare staff reports, ordinances, and other materials and work with County, Office of Financial Management, Boundary Review Board, General Government Committee and City Council.
2	Code Enforcement Process	20	City Staff	4	Code Enforcement process improvements. Staff meetings and discussion.
3	Current Planning Projects	48	City Staff	1	Advise permit staff on permitting projects.
4	Deschutes Flood Reduction Study/Thurston and Olympia Lakes Flood Map Study	4	City Staff	2	Support Deschutes Flood Reduction Study and Thurston and Olympia Lakes Flood Map Study work.
5	Equity Toolbox	80	City Staff	6	Ongoing from 2021. Complete work with consultant to prepare equity toolbox. Meetings with City staff and research.
6	Food System Plan	80	City Council	1	Prepare a City Food System Plan to address community concerns with food insecurity on the local level. Work with a consultant to prepare a Plan that focuses on supporting ways to access food more effectively and consider the role of local and community based agriculture activities, such as community gardens and local producers and processers to build a more resilient food system. The Plan would focus on how to provide healthy food to the community, reduce food waste, support local food processing, eliminate barriers, address gaps in the current system, produce solutions to implement at appropriate scale, and identify how to maintain and update resource materials through jurisdictional and community partners. Briefings, work sessions, and hearing. Prepare staff report, plan, resolution, and other materials and work with Planning Commissions, General Government Committee, and City Council.
7	Grant Funding/2024 CDGB	60	City Staff	1, 2	Research grant funding opportunities that support long range planning goals. Senior housing support is one potential grant area. Will be addressing the City of Tumwater 2024 CDBG grant application process.
8	Habitat Conservation Plan	600	City Council	2	Ongoing from 2016. Phase II and III work and potential Phase IV. Includes consultant management and coordination with Port and USFWS. NEPA/SEPA EIS support as state SEPA lead agency. Complete public draft of the HCP. Development implementation tools. Briefings, work sessions, stakeholder meetings, and community meetings. Work with other City departments, internal stakeholder team, Port staff, USFWS, WDFW, Planning Commission, General Government Committee, and City Council. Includes consultant management and grant management.
9	Hazard Mitigation Plan for the Thurston Region	40	City Staff	2, 4	Ongoing from 2021. Complete the update the City of Tumwater chapter of the Hazard Mitigation Plan for the Thurston Region. The current plan is due for an update in 2023. Thurston County Emergency Management and Thurston Regional Planning Council (TRPC) secured a FEMA Pre-Disaster Mitigation grant to update our region's plan. The plan update process is expected to launch in November 2021 and take approximately 18 months to complete. Participation in a multi-agency planning workgroup. Briefings, work sessions, stakeholder meetings, and community meetings. Work with other City departments, internal stakeholder team, Planning Commission, General Government Committee, and City Council.
10	Housing – Affordability and Homeless	40	City Staff	1	Work outside of Comprehensive Plan and development regulation periodic update above above and specific Regional Housing Council management and coordination meetings below on other housing affordability and homelessness strategies.
11	Long Range Planning Website Updates	12	City Staff	1	Ongoing.
12	Managing Multifamily Tax Exemption Program	80	City Staff	1	Manage new applications and annual reporting to the State for the City's TMC 3.30 Multifamily Housing Tax Exemptions programs. Briefings, work sessions, and hearings. Prepare staff reports, contracts, and other materials and work with General Government Committee and City Council.
13	Public Inquiries and General City Council and Interdepartmental Support	280	Various	1	Support on unspecified projects, inquiries, and requests.
	Subtotal	**1,344**			
	GENERAL MANAGEMENT AND COORDINATION				
1	General Coordination with Other City Departments	**72**	City Staff		Various
a	*All City Staff Meetings*	*8*	*City Staff*	*6*	*Quarterly meetings*
b	*Code Compliance Team*	*0*	*City Staff*	*2, 4*	*Ongoing monthly meetings*
c	*GIS Team*	*8*	*City Staff*	*6*	*Ongoing meetings*
d	*Green Team*	*16*	*City Staff*	*2*	*Ongoing meetings*
e	*Stormwater Interdisciplinary Team*	*12*	*City Staff*	*2*	*Ongoing meetings*
f	*Traffic Team*	*20*	*City Staff*	*3*	*Ongoing meetings*
g	*Web Team*	*8*	*City Staff*	*1*	*Ongoing meetings*
2	General Coordination with Other Jurisdictions	**669**	City Staff		Various
a	*Port of Olympia*	*24*	*City Staff*	*1*	*Quarterly Meetings and other coordination*
b	*City of Olympia*	*8*	*City Staff*	*1*	*Review proposed Comprehensive amendments and other coordination outside of housing*
c	*Intercity Transit*	*8*	*City Staff*	*3*	*Coordination with staff*
d	*Olympia School District*	*1*	*City Staff*	*1*	*Coordination with staff*
e	*Regional Housing Council*	*520*	*City Staff*	*1*	*Ongoing from 2020. Bimonthly RHC meetings, monthly City Staff RHC prep meetings, weekly technical team meetings, and other workgroup meetings. 0.25 FTE annual commitment per MOU.*
f	*State of Washington*	*4*	*City Staff*	*1*	*Coordination with staff*
g	*Thurston County*	*24*	*City Staff*	*1*	*Ongoing coordination not associated with a specific project, includes long range planning coordination with four jurisdictions*
h	*Thurston County TDR Program*	*24*	*City Staff*	*1*	*Coordination with Council and other City staffs on updating TDR program*
i	*Thurston Regional Planning Council*	*28*	*City Staff*	*1*	*Regional planner meetings/jurisdiction meetings*
j	*Thurston Thrives - Housing Action Team*	*20*	*City Staff*	*1*	*Attend monthly regional coordination meetings*
k	*Tribal Governments*	*4*	*City Staff*	*1*	*Coordination with staff*
l	*Tumwater School District*	*4*	*City Staff*	*1*	*Review Capital Facilities Plan and other coordination*
3	Department Management	**268**	City Staff		Various
a	*General Management*	*48*	*City Staff*	*1*	*Staff review and development. Managing staff.*
b	*Management Team Meetings*	*160*	*City Staff*	*1*	*Ongoing Weekly Meetings*
c	*Planning Commission Support*	*60*	*City Staff*	*1*	*Ongoing coordination with chair. Zoom meeting management. Interviews and training.*
4	Training	**60**	City Staff	1	AICP certificate maintenance. Conferences.
	Subtotal	**1,069**			
	TOTAL HOURS:	**5,393**			
	TOTAL REQUIRED PLANNERS (FTEs):	**3.00**			Approved by the City Council on January _____, 2024
	TOTAL AVAILABLE PLANNERS (FTEs):	**3.10**			
	TOTAL AVAILABLE PLANNER TIME (Hours X FTEs):	**5,395**			Note: Staff hours for items that include briefings, work sessions, and ordinances include a minimum
	PLANNER TIME DIFFERENCE (Hours X FTEs):	**2**			number of public meetings (5) and hours for the public meeting process (40).

	PROJECT	STAFF HOURS	PROPOSED BY	CITY COUNCIL STRATEGIC PRIORITIES	PROJECT DESCRIPTION/COMMENTS
BELOW THE LINE PROJECTS (To be considered as projects above are completed and staff time is available)					
→	Aquifer Protection Standards Amendments	80	City Staff	2	Update TMC 16.24 Aquifer Protection Standards and TMC 18.39 AQP Aquifer Protection Overlay to consider extending protections offered by the City system to other water systems in the City per Planning Commission recommendation on April 9, 2019. Briefings, work sessions, hearing, and ordinance.
→	Autonomous Vehicles	80	City Staff	3	See TVW series on transportation 2019 per John Doan. Prepare update to regulations. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.
→	Basin Plans – Deschutes and Black Lake (Subdivision Code/Housing Types	120	City Staff	2	Thurston County and TRPC led basin planning efforts for Black Lake and Deschutes basins. Black Lake Basin Water Resource Protection Study, Final Report was issued June 2015. Study recommended considering removal of portion of UGA on south Black Lake. Consider fire service (Black Lake) and conversion of septic systems to sewer. Appendix E of Study included suggested amendments to the City's Subdivision code for new subdivisions near wetlands and high groundwater flooding. Deschutes Basin Watershed Land Use Analysis, Scenario Development Report issued November 2016.
→	Citywide Design Standards Update	80	City Staff	1	Review how the Citywide Design Guidelines (TMC 18.43) have been working since adoption in 2016. Includes addressing corner setbacks for industrial zone district in the Citywide Design Guidelines do not match the standards found in the municipal code (TMC 18.24 and TMC 18.43) and addressing materials of new mini-storage uses (TMC 18.43). Briefings, work sessions, hearing, and ordinance.
→	Code Enforcement Amendments	60	City Staff		Ongoing from 2020. Substantive code revisions to reconcile International Property Maintenance Code (TMC 15.18) and Nuisances Code (TMC 8.04). Briefings, work sessions, and hearing. Prepare staff report, ordinance, and other materials and work with General Government Committee and City Council.
→	Electric Vehicle Infrastructure	80	City Staff	3	Work with Building Official on electric vehicle charging infrastructure requirements for new commercial buildings per WAC 51-50-0427. Prepare update to regulations. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.
→	Essential Public Facilities	120	City Staff		Separate essential public facilities from the Conditional Use Permit chapter (TMC 18.56) and establish conditions for each of the individual essential public facilities. Briefings, work sessions, hearing, and ordinance.
→	Housing - Affordability and Homelessness	48	City Council	1	Ongoing from 2020. Work outside of development regulation amendments above and specific Regional Housing Council management and coordination meetings below on other housing affordability and homelessness strategies. Marketing.
→	Housing Action Plan - Infrastructure (Housing Affordability Fee Work Plan Ordinance #9/Housing Action Plan Action 1.m.)	60	City Council	1, 3	Part of Housing Affordability Fee Work Plan approved May 28, 2019 and Housing Action Plan approved 2021. Work with the Public Works Department to make infrastructure investments for infill areas needing upgrades with follow-up by City staff to develop potential scenarios with emphasis on areas where housing affordability is most likely to occur. Public meetings, briefings, work sessions, hearing, and ordinance.
→	Multifamily Tax Exemption Update	160	City Staff	1	Review and update TMC 3.30 Multifamily Housing Tax Exemptions in response to 2021 updates to state law. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.
→	Pipeline - Land Use Review	80	City Staff	2	Review proposed land use and zoning along the Olympic fuel pipeline and Williams natural gas pipeline and propose amendments as needed. Coordinate with County for Urban Growth Area issues as needed. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.
→	Thurston Climate Mitigation Plan - Related Development Code Amendments	120	City Council	2	After acceptance of Thurston Climate Mitigation Plan in 2021 and the start of Phase 4 implementation, work on associated updates to development regulations. Briefings, work sessions, and hearing. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.
→	Zero Effect Drainage Discharges	120	City Staff	2	Review TMC 13.22 - Zero Effect Drainage Discharge after a new Drainage and Erosion Control Manual is adopted to see if it is appropriate to revise or remove. From the LID update, look at how TMC 13.22 works with the new City of Tumwater Drainage and Erosion Control Manual and what projects have been built using the code. Briefings, work sessions, and hearings. Prepare staff report, ordinance, and other materials and work with Planning Commission, General Government Committee, and City Council.
	TOTAL HOURS:	**1,208**			

Working Days Calculation - 2024

	Weekend Days		Weekday Days	
	5.00	4.00	Total	Working
January	1.00	1.00	31.00	22.00
February	0.00	2.00	28.00	20.00
March	2.00	0.00	31.00	21.00
April	0.00	2.00	30.00	22.00
May	0.00	2.00	31.00	23.00
June	2.00	0.00	30.00	20.00
July	0.00	2.00	31.00	23.00
August	1.00	1.00	31.00	22.00
September	1.00	1.00	30.00	21.00
October	0.00	2.00	31.00	23.00
November	1.00	1.00	30.00	21.00
December	1.00	1.00	31.00	22.00
	9.00	15.00		
	45.00	60.00		
Total Days Per Year Per FTE		**105.00**		**260.00**
Total Hours Per Year per FTE				**2,080.00**

FTE Calculations - 2024

Brad Medrud	1.00
Erika Smith-Erickson	0.80
Alex Baruch	0.20
Austin Ramirez	0.10
Senior Planner	0.70
Intern	0.00
Permit Tech/Administrative Assistant	0.10
Mike Matlock	0.20
Total FTEs	**3.10**

Productive Hours Calculation - 2024

	Hours
Total Hours Per Year (X Total FTEs)	**6,448**
Less	
Holidays (11 days X Total FTEs)	*273*
Vacations (12 days X Total FTEs)	*298*
Sick Leave (5 days X Total FTEs)	*198*
Subtotal	**769**

1. Build a Community Recognized for Quality, Compassion, and Humanity

Adopt and implement Tenant Protections
Build and enhance Tribal Relations
Explore alternative building materials for Housing
Implement Metropolitan Park District
Implement the Affordable Housing & Houselessness Action Plan
Implement the Arts & Cultural Heritage Program
Plan and site new Community Center
Raise the Minimum Wage for everyone in Tumwater
Streamline Permitting for Housing Projects
Support and advance Intergenerational Housing Opportunities
Support Housing Stability Policies and Programs

2. Be a Leader in Environmental Sustainability

Complete and Implement Habitat Conservation Plan
Continue Septic to Sewer Conversion
Continue to update and advance the Climate Action Plan
Ensure ample water supply
Implement Urban Forestry Plan
Include environmental protection in City projects
Integrate Code Enforcement and Tree Protection
Recruit Green Employers and Jobs
Remove Obstructions to Fish Passage
Require new City buildings be all-electric
Streamline permitting for Green Projects
Update the Tree Protection Ordinance

3. Create and Maintain a Transportation System Safe for All Modes of Travel

Bike and Pedestrian System
Implement Capitol Boulevard Plan
Implement Sidewalk Plan
Update the Transportation Impact Fee System

4. Provide and Sustain Quality Public Safety Services

“FD Cares” a Social and Human Services Response
Complete RFA Planning Work
Expand the Community Risk Reduction Program
Implement City Emergency Management Program
Law Enforcement Master Plan
Study BLS Transport in Fire Department

5. Pursue Targeted Community Development Opportunities

Continue to build the Craft Beverage Legacy
Find a Permanent Home for Farmer’s Market
Hire an Economic Development staff person
Implement the City’s Economic Development Plan

6. Refine and Sustain a Great Organization

Construct the new O&M Facility
Create a Continuous Learning Organization

Ensure a Safe and Healthy Workforce
Explore Trades Training with LOTT, SPSCC and Olympia
Implement the ERP
Promote a talented DEI Workforce
Update Employee Compensation Plan

Attachment C

	Community Outreach and Plan Adoption	Climate Element	Conservation Element	Economic Development Plan	Housing Element	Land Use Element	Lands for Public Purposes Element	Parks, Recreation, and Open Space Plan	Transportation Plan	Utilities Element	Development Code Update
Includes			Resource Lands and Critical Areas	Data workbook update			Sewer, Stormwater, and Water				Impact Fees and 2026-27 CFP
Lead	*CDD*	*WRS*	*CDD*	*CDD – Economic*	*CDD*	*CDD*	*WRS*	*CDD*	*TED*	*CDD*	*CDD*
Support	*Communications*	*CDD, TED*					*CDD*	*PRD*	*CDD, WRS*		*TED, WRS, PRD*
Consultant Support	*Potentially City $*	*State Grant $500 K*	*No*	*State Grant ~$30 K*	*Potentially City $*	*Potentially City $*	*No*	*No*	*State Grant ~$90 K*	*No*	*State Grant $75 K*
Jul 23	PC/GGC Community Outreach Plan										
Aug 23	GGC Work Program				PC Introduction	PC Introduction					
Sept 23	Project Website				GGC Introduction PC State Law	GGC Introduction PC Policies & Actions					GGC Introduction
Oct 23		PC Introduction	PC Introduction								PC Introduction
Nov 23		GGC Introduction	GGC Introduction	PC Introduction	GGC Allocation		PC Introduction			PC Introduction	
Dec 23	CC-PC Joint Work Session			GGC Introduction			GGC Introduction			GGC Introduction	
Jan 24		PC Plan Drafting							PC Introduction GGC Introduction		
Feb 24		GGC Plan Drafting	PC Plan Drafting			PC Plan Drafting					
Mar 24			GGC Plan Drafting		PC Plan Drafting						PC Code Drafting
Apr 24					PC Plan Drafting	PC Plan Drafting GGC Plan Drafting					GGC Code Drafting
May 24				PC Plan Drafting	GGC Plan Drafting		PC Plan Drafting			PC Plan Drafting	
Jun 24		PC Plan Drafting GGC Plan Drafting							PC Plan Drafting		
Jul 24				PC Plan Drafting GGC Plan Drafting							PC Code Drafting
Aug 24							PC Plan Drafting GGC Plan Drafting		PC Plan Drafting GGC Plan Drafting	PC Plan Drafting GGC Plan Drafting	GGC Code Drafting
Sep 24					PC Plan Drafting	PC Plan Drafting					
Oct 24						GGC Plan Drafting					PC Code Drafting
Nov 24	PC CPU Ordinance PC DCU Ordinance				GGC Plan Drafting						GGC Code Drafting
Dec 24	CC-PC Joint CPU Ordinance CC-PC Joint DCU Ordinance										
Jan 25	PC CPU Ordinance PC DCU Ordinance										
Feb 25	PC CPU Ordinance PC DCU Ordinance										
Mar 25	GGC CPU Ordinance GGC DCU Ordinance										
Apr 25	CC CPU Ordinance CC DCU Ordinance										
May 25	CC CPU Ordinance CC DCU Ordinance										
Jun 25	CC CPU Ordinance CC DCU Ordinance										
State Deadline	June 30, 2023										

Legend
CC – City Council
CDD – Community Development Department

CPU – Comprehensive Plan Update
DCU – Development Code Update
GGC – General Government Committee
PC – Planning Commission
PRD – Parks & Recreation Department
TED – Transportation & Engineering Department
WRS – Water Resources Department

TO: General Government Committee

FROM: Brad Medrud, Planning Manager

DATE: January 10, 2024

SUBJECT: Contract with the State Department of Commerce for the 2025 Comprehensive Plan Periodic Update Middle Housing Planning Grant

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1) Recommended Action:

Place contract on the January 16, 2024, City Council consent calendar to authorize the Mayor to sign the contract with the State Department of Commerce for the 2025 Comprehensive Plan Periodic Update Middle Housing Planning Grant.

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2) Background:

On a ten-year cycle, the City is required to conduct a Growth Management Act periodic update of its Comprehensive Plan and related development regulations. For the current cycle, the City is required to complete work on the periodic update by June 30, 2025. Work on the periodic update started last fall.

The State Department of Commerce Middle Housing Planning Grant allocation is $75,000. The grant would allow the City to hire consultants to assist with the state requirement to prepare amendments to the City's development code to support middle housing as part of the 2025 Comprehensive Plan and Development Code periodic update.

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3) Policy Support:

Goal LU-1: Ensure the Land Use Element is implementable and coordinated with all applicable City plans and the plans of other jurisdictions in the Thurston region.

Policy LU-1.14 Coordinate the Land Use Element with the strategies in the most recent version of the Thurston Climate Mitigation Plan.

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4) Alternatives:

- ❑ None.

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5) Fiscal Notes:

The State Department of Commerce grant is for $75,000 and will support work as part of the 2025 Comprehensive Plan and Development Code periodic update. There is no City match for this grant.

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6) Attachments:

A. Contract – Middle Housing Planning Grant

Attachment A



Interagency Agreement with

City of Tumwater

through

Growth Management Services

Contract Number:

24-63326-146

For

Middle Housing Grant

Dated:

Date of Execution

Washington State Department of Commerce

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Face Sheet

Contract Number: 24-63326-146

Local Government Division Growth Management Services
Middle Housing Grants

1. Contractor City of Tumwater 555 Israel Road SW Tumwater, WA-98501		**2. Regional Planner** Carol Holman Carol.Holman@commerce.wa.gov	
3. Contractor Representative Brad Medrud Planning Manager 360-754-4180 bmedrud@ci.tumwater.wa.us		**4. COMMERCE Representative** Anne Aurelia Fritzel Housing Planning Manager 360-259-5216 Anne.Fritzel@commerce.wa.gov	1011 Plum Street SE Olympia, WA 98504
5. Contract Amount $75000	**6. Funding Source** **Federal:** ☐ **State:** ☒ **Other:** ☐ **N/A:** ☐	**7. Start Date** Date of Execution	**8. End Date** June 15, 2025
9. Federal Funds (as applicable) N/A	**Federal Agency:** N/A	**ALN** N/A	
10. Tax ID # N/A	**11. SWV #** 0007172-00	**12. UBI #** 344-000-001-001-0001	**13. UEI #** N/A

14. Contract Purpose

For activities that support the preparation and adoption of policies and/or codes and other measures specific to implement middle housing (RCW 36.70A.030(26)) by applicable statutory deadlines.

COMMERCE, defined as the Department of Commerce, and the Contractor, as defined above, acknowledge and accept the terms of this Contract and Attachments and have executed this Contract on the date below and warrant they are authorized to bind their respective agencies. The rights and obligations of both parties to this Contract are governed by this Contract and the following documents incorporated by reference: Contractor Terms and Conditions including Attachment "A" – Scope of Work, and Attachment "B" – Budget.

FOR CONTRACTOR	**FOR COMMERCE**
_____ Debbie Sullivan, Mayor	_____ Mark K. Barkley, Assistant Director Local Government Division
_____ Signature	_____ Date
_____ Date	**APPROVED AS TO FORM ONLY** **BY ASSISTANT ATTORNEY GENERAL** **APPROVAL ON FILE**

Washington State Department of Commerce

Special Terms and Conditions

1. AUTHORITY

COMMERCE and Contractor enter into this Contract pursuant to the authority granted by Chapter 39.34 RCW.

2. CONTRACT MANAGEMENT

The Representative for each of the parties shall be responsible for and shall be the contact person for all communications and billings regarding the performance of this Contract.

The Representative for COMMERCE and their contact information are identified on the Face Sheet of this Contract.
The Representative for the Contractor and their contact information are identified on the Face Sheet of this Contract.

3. COMPENSATION

COMMERCE shall pay an amount not to exceed $75000 (seventy-five thousand dollars), for the performance of all things necessary for or incidental to the performance of work under this Contract as set forth in the Scope of Work.

4. BILLING PROCEDURES AND PAYMENT

COMMERCE will pay Contractor upon acceptance of deliverables provided and receipt of properly completed invoices, which shall be submitted to the Representative for COMMERCE not more often than monthly nor less than quarterly.

The invoices shall describe and document, to COMMERCE's satisfaction, a description of the work performed, the progress of the project, and fees. The invoice shall include the Contract Number 24-63326-146.

Payment shall be considered timely if made by COMMERCE within thirty (30) calendar days after receipt of properly completed invoices. Payment shall be sent to the address designated by the Contractor.

COMMERCE may, in its sole discretion, terminate the Contract or withhold payments claimed by the Contractor for services rendered if the Contractor fails to satisfactorily comply with any term or condition of this Contract.

No payments in advance or in anticipation of services or supplies to be provided under this Agreement shall be made by COMMERCE.

Invoices and End of Fiscal Year

Invoices are due on the 20th of the month following the provision of services.

Final invoices for a state fiscal year may be due sooner than the 20th and Commerce will provide notification of the end of fiscal year due date.

The Contractor must invoice for all expenses from the beginning of the contract through June 30, regardless of the contract start and end date.

Duplication of Billed Costs

The Contractor shall not bill COMMERCE for services performed under this Agreement, and COMMERCE shall not pay the Contractor, if the Contractor is entitled to payment or has been or will be paid by any other source, including grants, for that service. Any payment made by COMMERCE for costs that are determined to be duplicate, in Commerce's sole determination, shall be subject to recapture and may result in suspension or termination of this Contract.

Disallowed Costs

The Contractor is responsible for any audit exceptions or disallowed costs incurred by its own organization or that of its subcontractors.

COMMERCE may, in its sole discretion, withhold ten percent (10%) from each payment until acceptance by COMMERCE of the final report (or completion of the project, etc.).

5. SUBCONTRACTOR DATA COLLECTION

Contractor will submit reports, in a form and format to be provided by Commerce and at intervals as agreed by the parties, regarding work under this Contract performed by subcontractors and the portion of Contract funds expended for work performed by subcontractors, including but not necessarily limited to minority-owned, woman-owned, and veteran-owned business subcontractors. "Subcontractors" shall mean subcontractors of any tier.

6. INSURANCE

Each party certifies that it is self-insured under the State's or local government self-insurance liability program, and shall be responsible for losses for which it is found liable.

7. FRAUD AND OTHER LOSS REPORTING

Contractor shall report in writing all known or suspected fraud or other loss of any funds or other property furnished under this Contract immediately or as soon as practicable to the Commerce Representative identified on the Face Sheet.

8. ORDER OF PRECEDENCE

In the event of an inconsistency in this Contract, the inconsistency shall be resolved by giving precedence in the following order:

- Applicable federal and state of Washington statutes and regulations
- Special Terms and Conditions
- General Terms and Conditions
- Attachment A – Scope of Work
- Attachment B – Budget

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General Terms and Conditions

1. DEFINITIONS

As used throughout this Contract, the following terms shall have the meaning set forth below:

A. "Authorized Representative" shall mean the Director and/or the designee authorized in writing to act on the Director's behalf.

B. "COMMERCE" shall mean the Washington Department of Commerce.

C. "Contract" or "Agreement" or "Grant" means the entire written agreement between COMMERCE and the Contractor, including any Attachments, documents, or materials incorporated by reference. E-mail or Facsimile transmission of a signed copy of this contract shall be the same as delivery of an original.

D. "Contractor" or "Grantee" shall mean the entity identified on the face sheet performing service(s) under this Contract, and shall include all employees and agents of the Contractor.

E. "Personal Information" shall mean information identifiable to any person, including, but not limited to, information that relates to a person's name, health, finances, education, business, use or receipt of governmental services or other activities, addresses, telephone numbers, social security numbers, driver license numbers, other identifying numbers, and any financial identifiers, and "Protected Health Information" under the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA).

F. "State" shall mean the state of Washington.

G. "Subcontractor" shall mean one not in the employment of the Contractor, who is performing all or part of those services under this Contract under a separate contract with the Contractor. The terms "subcontractor" and "subcontractors" mean subcontractor(s) in any tier.

2. ALL WRITINGS CONTAINED HEREIN

This Contract contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Contract shall be deemed to exist or to bind any of the parties hereto.

3. AMENDMENTS

This Contract may be amended by mutual agreement of the parties. Such amendments shall not be binding unless they are in writing and signed by personnel authorized to bind each of the parties.

4. ASSIGNMENT

Neither this Contract, work thereunder, nor any claim arising under this Contract, shall be transferred or assigned by the Contractor without prior written consent of COMMERCE.

5. CONFIDENTIALITY AND SAFEGUARDING OF INFORMATION

A. "Confidential Information" as used in this section includes:

i. All material provided to the Contractor by COMMERCE that is designated as "confidential" by COMMERCE;

ii. All material produced by the Contractor that is designated as "confidential" by COMMERCE; and

Washington State Department of Commerce

iii. All Personal Information in the possession of the Contractor that may not be disclosed under state or federal law.

B. The Contractor shall comply with all state and federal laws related to the use, sharing, transfer, sale, or disclosure of Confidential Information. The Contractor shall use Confidential Information solely for the purposes of this Contract and shall not use, share, transfer, sell or disclose any Confidential Information to any third party except with the prior written consent of COMMERCE or as may be required by law. The Contractor shall take all necessary steps to assure that Confidential Information is safeguarded to prevent unauthorized use, sharing, transfer, sale or disclosure of Confidential Information or violation of any state or federal laws related thereto. Upon request, the Contractor shall provide COMMERCE with its policies and procedures on confidentiality. COMMERCE may require changes to such policies and procedures as they apply to this Contract whenever COMMERCE reasonably determines that changes are necessary to prevent unauthorized disclosures. The Contractor shall make the changes within the time period specified by COMMERCE. Upon request, the Contractor shall immediately return to COMMERCE any Confidential Information that COMMERCE reasonably determines has not been adequately protected by the Contractor against unauthorized disclosure.

C. Unauthorized Use or Disclosure. The Contractor shall notify COMMERCE within five (5) working days of any unauthorized use or disclosure of any confidential information, and shall take necessary steps to mitigate the harmful effects of such use or disclosure.

6. COPYRIGHT

Unless otherwise provided, all Materials produced under this Contract shall be considered "works for hire" as defined by the U.S. Copyright Act and shall be owned by COMMERCE. COMMERCE shall be considered the author of such Materials. In the event the Materials are not considered “works for hire” under the U.S. Copyright laws, the Contractor hereby irrevocably assigns all right, title, and interest in all Materials, including all intellectual property rights, moral rights, and rights of publicity to COMMERCE effective from the moment of creation of such Materials.

“Materials” means all items in any format and includes, but is not limited to, data, reports, documents, pamphlets, advertisements, books, magazines, surveys, studies, computer programs, films, tapes, and/or sound reproductions. “Ownership” includes the right to copyright, patent, register and the ability to transfer these rights.

For Materials that are delivered under the Contract, but that incorporate pre-existing materials not produced under the Contract, the Contractor hereby grants to COMMERCE a nonexclusive, royalty-free, irrevocable license (with rights to sublicense to others) in such Materials to translate, reproduce, distribute, prepare derivative works, publicly perform, and publicly display. The Contractor warrants and represents that the Contractor has all rights and permissions, including intellectual property rights, moral rights and rights of publicity, necessary to grant such a license to COMMERCE.

The Contractor shall exert all reasonable effort to advise COMMERCE, at the time of delivery of Materials furnished under this Contract, of all known or potential invasions of privacy contained therein and of any portion of such document which was not produced in the performance of this Contract. The Contractor shall provide COMMERCE with prompt written notice of each notice or claim of infringement received by the Contractor with respect to any Materials delivered under this Contract. COMMERCE shall have the right to modify or remove any restrictive markings placed upon the Materials by the Contractor.

7. DISPUTES

In the event that a dispute arises under this Agreement, it shall be determined by a Dispute Board in the following manner: Each party to this Agreement shall appoint one member to the Dispute Board. The members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, Agreement terms and applicable statutes and rules and make

Washington State Department of Commerce

a determination of the dispute. The Dispute Board shall thereafter decide the dispute with the majority prevailing. The determination of the Dispute Board shall be final and binding on the parties hereto. As an alternative to this process, either of the parties may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control.

8. GOVERNING LAW AND VENUE

This Contract shall be construed and interpreted in accordance with the laws of the state of Washington, and the venue of any action brought hereunder shall be in the Superior Court for Thurston County.

9. INDEMNIFICATION

Each party shall be solely responsible for the acts of its employees, officers, and agents.

10. LICENSING, ACCREDITATION AND REGISTRATION

The Contractor shall comply with all applicable local, state, and federal licensing, accreditation and registration requirements or standards necessary for the performance of this Contract.

11. RECAPTURE

In the event that the Contractor fails to perform this Contract in accordance with state laws, federal laws, and/or the provisions of this Contract, COMMERCE reserves the right to recapture funds in an amount to compensate COMMERCE for the noncompliance in addition to any other remedies available at law or in equity.

Repayment by the Contractor of funds under this recapture provision shall occur within the time period specified by COMMERCE. In the alternative, COMMERCE may recapture such funds from payments due under this Contract.

12. RECORDS MAINTENANCE

The Contractor shall maintain books, records, documents, data and other evidence relating to this contract and performance of the services described herein, including but not limited to accounting procedures and practices that sufficiently and properly reflect all direct and indirect costs of any nature expended in the performance of this contract.

The Contractor shall retain such records for a period of six years following the date of final payment. At no additional cost, these records, including materials generated under the contract, shall be subject at all reasonable times to inspection, review or audit by COMMERCE, personnel duly authorized by COMMERCE, the Office of the State Auditor, and federal and state officials so authorized by law, regulation or agreement.

If any litigation, claim or audit is started before the expiration of the six (6) year period, the records shall be retained until all litigation, claims, or audit findings involving the records have been resolved.

13. SAVINGS

In the event funding from state, federal, or other sources is withdrawn, reduced, or limited in any way after the effective date of this Contract and prior to normal completion, COMMERCE may suspend or terminate the Contract under the "Termination for Convenience" clause, without the ten calendar day notice requirement. In lieu of termination, the Contract may be amended to reflect the new funding limitations and conditions.

14. SEVERABILITY

The provisions of this contract are intended to be severable. If any term or provision is illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the validity of the remainder of the contract.

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15. SUBCONTRACTING

The Contractor may only subcontract work contemplated under this Contract if it obtains the prior written approval of COMMERCE.

If COMMERCE approves subcontracting, the Contractor shall maintain written procedures related to subcontracting, as well as copies of all subcontracts and records related to subcontracts. For cause, COMMERCE in writing may: (a) require the Contractor to amend its subcontracting procedures as they relate to this Contract; (b) prohibit the Contractor from subcontracting with a particular person or entity; or (c) require the Contractor to rescind or amend a subcontract.

Every subcontract shall bind the Subcontractor to follow all applicable terms of this Contract. The Contractor is responsible to COMMERCE if the Subcontractor fails to comply with any applicable term or condition of this Contract. The Contractor shall appropriately monitor the activities of the Subcontractor to assure fiscal conditions of this Contract. In no event shall the existence of a subcontract operate to release or reduce the liability of the Contractor to COMMERCE for any breach in the performance of the Contractor's duties.

Every subcontract shall include a term that COMMERCE and the State of Washington are not liable for claims or damages arising from a Subcontractor's performance of the subcontract.

16. SURVIVAL

The terms, conditions, and warranties contained in this Contract that by their sense and context are intended to survive the completion of the performance, cancellation or termination of this Contract shall so survive.

17. TERMINATION FOR CAUSE

In the event COMMERCE determines the Contractor has failed to comply with the conditions of this contract in a timely manner, COMMERCE has the right to suspend or terminate this contract. Before suspending or terminating the contract, COMMERCE shall notify the Contractor in writing of the need to take corrective action. If corrective action is not taken within 30 calendar days, the contract may be terminated or suspended.

In the event of termination or suspension, the Contractor shall be liable for damages as authorized by law including, but not limited to, any cost difference between the original contract and the replacement or cover contract and all administrative costs directly related to the replacement contract, e.g., cost of the competitive bidding, mailing, advertising and staff time.

COMMERCE reserves the right to suspend all or part of the contract, withhold further payments, or prohibit the Contractor from incurring additional obligations of funds during investigation of the alleged compliance breach and pending corrective action by the Contractor or a decision by COMMERCE to terminate the contract. A termination shall be deemed a "Termination for Convenience" if it is determined that the Contractor: (1) was not in default; or (2) failure to perform was outside of his or her control, fault or negligence.

The rights and remedies of COMMERCE provided in this contract are not exclusive and are, in addition to any other rights and remedies, provided by law.

18. TERMINATION FOR CONVENIENCE

Except as otherwise provided in this Contract, COMMERCE may, by ten (10) business days' written notice, beginning on the second day after the mailing, terminate this Contract, in whole or in part. If this Contract is so terminated, COMMERCE shall be liable only for payment required under the terms of this Contract for services rendered or goods delivered prior to the effective date of termination.

19. TERMINATION PROCEDURES

Upon termination of this contract, COMMERCE, in addition to any other rights provided in this contract, may require the Contractor to deliver to COMMERCE any property specifically produced or

acquired for the performance of such part of this contract as has been terminated. The provisions of the "Treatment of Assets" clause shall apply in such property transfer.

COMMERCE shall pay to the Contractor the agreed upon price, if separately stated, for completed work and services accepted by COMMERCE, and the amount agreed upon by the Contractor and COMMERCE for (i) completed work and services for which no separate price is stated, (ii) partially completed work and services, (iii) other property or services that are accepted by COMMERCE, and (iv) the protection and preservation of property, unless the termination is for default, in which case the Authorized Representative shall determine the extent of the liability of COMMERCE. Failure to agree with such determination shall be a dispute within the meaning of the "Disputes" clause of this contract. COMMERCE may withhold from any amounts due the Contractor such sum as the Authorized Representative determines to be necessary to protect COMMERCE against potential loss or liability.

The rights and remedies of COMMERCE provided in this section shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

After receipt of a notice of termination, and except as otherwise directed by the Authorized Representative, the Contractor shall:

A. Stop work under the contract on the date, and to the extent specified, in the notice;

B. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the work under the contract that is not terminated;

C. Assign to COMMERCE, in the manner, at the times, and to the extent directed by the Authorized Representative, all of the rights, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case COMMERCE has the right, at its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

D. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Authorized Representative to the extent the Authorized Representative may require, which approval or ratification shall be final for all the purposes of this clause;

E. Transfer title to COMMERCE and deliver in the manner, at the times, and to the extent directed by the Authorized Representative any property which, if the contract had been completed, would have been required to be furnished to COMMERCE;

F. Complete performance of such part of the work as shall not have been terminated by the Authorized Representative; and

G. Take such action as may be necessary, or as the Authorized Representative may direct, for the protection and preservation of the property related to this contract, which is in the possession of the Contractor and in which COMMERCE has or may acquire an interest.

20. TREATMENT OF ASSETS

Title to all property furnished by COMMERCE shall remain in COMMERCE. Title to all property furnished by the Contractor, for the cost of which the Contractor is entitled to be reimbursed as a direct item of cost under this contract, shall pass to and vest in COMMERCE upon delivery of such property by the Contractor. Title to other property, the cost of which is reimbursable to the Contractor under this contract, shall pass to and vest in COMMERCE upon (i) issuance for use of such property in the performance of this contract, or (ii) commencement of use of such property in the performance of this contract, or (iii) reimbursement of the cost thereof by COMMERCE in whole or in part, whichever first occurs.

Washington State Department of Commerce

A. Any property of COMMERCE furnished to the Contractor shall, unless otherwise provided herein or approved by COMMERCE, be used only for the performance of this contract.

B. The Contractor shall be responsible for any loss or damage to property of COMMERCE that results from the negligence of the Contractor or which results from the failure on the part of the Contractor to maintain and administer that property in accordance with sound management practices.

C. If any COMMERCE property is lost, destroyed or damaged, the Contractor shall immediately notify COMMERCE and shall take all reasonable steps to protect the property from further damage.

D. The Contractor shall surrender to COMMERCE all property of COMMERCE prior to settlement upon completion, termination or cancellation of this contract.

E. All reference to the Contractor under this clause shall also include Contractor's employees, agents or Subcontractors.

21. WAIVER

Waiver of any default or breach shall not be deemed to be a waiver of any subsequent default or breach. Any waiver shall not be construed to be a modification of the terms of this Contract unless stated to be such in writing and signed by Authorized Representative of COMMERCE.

Washington State Department of Commerce

Attachment A: Scope of Work

Grant Objective: Supported by public engagement activities, research, prepare, and adopt an ordinance that includes Middle Housing amendments as part of the 2025 Development Code update process.

Actions/Steps/ Deliverables	Description	Start Date	End Date
Action 1	**Prepare and Distribute Community Engagement Informational Materials related to Middle Housing.**	**November 2023**	**June 2025**
Step 1.1	Prepare informational materials for the community and stakeholders related to middle housing.	November 2023	June 2025
Step 1.2	Hold community and stakeholder meetings, outreach events, identify and conduct outreach to vulnerable populations, inform and solicit feedback from the community and stakeholders, develop and update social media materials related to Middle Housing.	November 2023	June 2025
Deliverable 1	**Public Engagement informational materials for the community and stakeholders related to middle housing.**		**June 15, 2024**
Action 2	**Middle Housing Gap Analysis**	**November 2023**	**June 2024**
Step 2.1	Conduct gap analysis	November 2023	June 2024
Deliverable 2	**Gap analysis of current development code regulations and summary of required amendments to make as part of the 2025 Development Code Update Ordinance.**		**June 15, 2024**
Action 3	**Public Engagement Results Report**	**November 2023**	**June 15, 2025**
Step 3.1	Draft public engagement results report.	**November 2023**	**June 2025**

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Deliverable 3	**Public Engagement Results Report addressing Middle Housing, with final informational materials used to engage the public.**		**June 15, 2025**
Action 4	**Prepare Draft Middle Housing Development Regulation Amendments.**	**November 2023**	**November 2024**
Step 4.1	Review and evaluate existing development regulations for needed middle housing related amendments.	November 2023	February 2024
Step 4.2	Review State Department of Commerce Middle Housing Guidance materials, Middle Housing Model Ordinance, and other resources.	November 2023	February 2024
Step 4.3	Develop design guidelines that are in line with state regulations that make infill development easier.	March 2024	October 2024
Step 4.4	Briefing and work sessions with the Planning Commission on draft development regulation amendments related to Middle Housing.	November 2023	October 2024
Step 4.5	Prepare draft Middle Housing development regulation amendments.	July 2024	November 2024
Deliverable 4	**Draft Middle Housing amendments as part of 2025 Development Code Update Ordinance.**		**November 2024**
Action 5	**Adopt Middle Housing development regulation amendments.**	**November 2024**	**June 3, 2025**
Step 5.1	Transmit draft 2025 Development Code Update Ordinance, which will include the Middle Housing development regulation amendment to the State for State agency review (RCW 36.70A.106).	November 2024	December 2024
Step 5.2	Planning Commission public hearing.	February 25, 2025	February 25, 2025

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Step 5.3	City Council consideration and adoption of Middle Housing development regulation amendments as part of 2025 Development Code Update Ordinance.	June 3, 2025	June 3, 2025
Deliverable 5	**Adopted 2025 Development Code Update Ordinance with Middle Housing amendments.**		**June 3, 2025**

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Attachment B: Budget

Grant Objective: Supported by public engagement activities, research, prepare, and adopt an ordinance that includes Middle Housing amendments as part of the 2025 Development Code update process.	Fiscal Year	Commerce Funds
Deliverable 1. Public Engagement informational materials for the community and stakeholders related to middle housing.	FY1 – June 15, 2024	$10,000
Deliverable 2. Gap analysis of current development code regulations and summary of required amendments to make as part of the 2025 Development Code Update Ordinance.	FY1 – June 15, 2024	$5,000
Deliverable 3. Public Engagement Results Report addressing Middle Housing, with final informational materials used to engage the public.	FY2 – June 15, 2025	$22,500
Deliverable 4. Draft Middle Housing amendments as part of 2025 Development Code Update Ordinance.	FY2 – November 2024	$17,500
Deliverable 5. Adopted 2025 Development Code Update Ordinance with Middle Housing amendments	FY2 – June 3, 2025	$20,000
Total:		75,000

TO: General Government Committee

FROM: Brad Medrud, Planning Manager

DATE: January 10, 2024

SUBJECT: Contract with the State Department of Commerce for the 2025 Comprehensive Plan Periodic Update Planning Grant

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1) Recommended Action:

Place contract on the January 16, 2024, City Council consent calendar to authorize the Mayor to sign the contract with the State Department of Commerce for the 2025 Comprehensive Plan Periodic Update Periodic Planning Grant.

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2) Background:

On a ten-year cycle, the City is required to conduct a Growth Management Act periodic update of its Comprehensive Plan and related development regulations. For the current cycle, the City is required to complete work on the periodic update by June 30, 2025. Work on the periodic update started last fall.

The State Department of Commerce Periodic Update Planning Grant allocation is $125,000. The grant would allow the City to hire consultants to assist with the state requirement to prepare amendments to the City's Transportation Plan and Economic Development Plan as part of the 2025 Comprehensive Plan periodic update.

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3) Policy Support:

Goal LU-1: Ensure the Land Use Element is implementable and coordinated with all applicable City plans and the plans of other jurisdictions in the Thurston region.

Policy LU-1.14 Coordinate the Land Use Element with the strategies in the most recent version of the Thurston Climate Mitigation Plan.

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4) Alternatives:

- ❑ None.

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5) Fiscal Notes:

The State Department of Commerce grant is for $125,000 and will support work as part of the 2025 Comprehensive Plan periodic update. There is no City match for this grant.

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6) Attachments:

A. Contract – Periodic Update Planning Grant

Attachment A

Interagency Agreement with

City of Tumwater

through

Growth Management Services

Contract Number:
24-63210-049

For

GMA Periodic Update Grant – FY2024

Dated: Date of Execution

Washington State Department of Commerce

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Face Sheet

Contract Number: 23-63210-049

Local Government Division
Growth Management Services
GMA Periodic Update Grant (PUG)

1. Contractor City of Tumwater Community Development Department 555 Israel Road SW Tumwater, WA 98501		**2. Contractor Doing Business As (as applicable)** N/A	
3. Contractor Representative Brad Medrud Planning Manager (360) 754-4180 bmedrud@ci.tumwater.wa.us		**4. COMMERCE Representative** Carol Holman Senior Planner (360) 742-1504 carol.holman@commerce.wa.gov	PO Box 42525 1011 Plum St. SE Olympia, WA 98504
5. Contract Amount $125,000	**6. Funding Source** **Federal:** ☐ **State:** ☒ **Other:** ☐ **N/A:** ☐	**7. Start Date** Date of Execution	**8. End Date** June 30, 2025~~4~~
9. Federal Funds (as applicable) N/A	**Federal Agency:** N/A	**ALN** **N/A**	
10. Tax ID # N/A	**11. SWV #** SWV0007172-00	**12. UBI #** 344 000 001	**13. UEI #** N/A

14. Contract Purpose
Grant funding to assist the City of Tumwater with planning work for the completion the Growth Management Act (GMA) requirement to review and revise the comprehensive plan and development regulations under RCW 36.70A.130(5).

COMMERCE, defined as the Department of Commerce, and the Contractor, as defined above, acknowledge and accept the terms of this Contract and Attachments and have executed this Contract on the date below and warrant they are authorized to bind their respective agencies. The rights and obligations of both parties to this Contract are governed by this Contract and the following documents incorporated by reference: Contractor Terms and Conditions including Attachment "A" – Scope of Work & Budget.

FOR CONTRACTOR	**FOR COMMERCE**
Debbie Sullivan, Mayor City of Tumwater	Mark K. Barkley, Assistant Director Local Government Division
Date	Date
	APPROVED AS TO FORM ONLY **BY ASSISTANT ATTORNEY GENERAL** **APPROVAL ON FILE**

Washington State Department of Commerce

Special Terms and Conditions

1. AUTHORITY

COMMERCE and Contractor enter into this Contract pursuant to the authority granted by Chapter 39.34 RCW.

2. CONTRACT MANAGEMENT

The Representative for each of the parties shall be responsible for and shall be the contact person for all communications and billings regarding the performance of this Contract.

The Representative for COMMERCE and their contact information are identified on the Face Sheet of this Contract.

The Representative for the Contractor and their contact information are identified on the Face Sheet of this Contract.

3. COMPENSATION

COMMERCE shall pay an amount not to exceed **one hundred twenty-five thousand dollars ($125,000)**, for the performance of all things necessary for or incidental to the performance of work under this Contract as set forth in the Scope of Work.

4. BILLING PROCEDURES AND PAYMENT

COMMERCE will pay Contractor upon acceptance of services provided and receipt of properly completed invoices, which shall be submitted to the Representative for COMMERCE not more often than monthly nor less than quarterly.

The invoices shall describe and document, to COMMERCE's satisfaction, a description of the work performed, the progress of the project, and fees. The invoice shall include the Contract Number 24-63335-049. If expenses are invoiced, provide a detailed breakdown of each type. A receipt must accompany any single expenses in the amount of $50.00 or more in order to receive reimbursement. Payment shall be considered timely if made by COMMERCE within thirty (30) calendar days after receipt of properly completed invoices. Payment shall be sent to the address designated by the Contractor.

COMMERCE may, in its sole discretion, terminate the Contract or withhold payments claimed by the Contractor for services rendered if the Contractor fails to satisfactorily comply with any term or condition of this Contract.

No payments in advance or in anticipation of services or supplies to be provided under this Agreement shall be made by COMMERCE.

Grant Start Date
COMMERCE will pay the Contractor for costs incurred beginning July 1, 2023, for services and deliverables described under this Agreement.

State Fiscal Year Payments
COMMERCE will reimburse Contractor a maximum of $62,500 for State Fiscal Year 2024 (July 1, 2023-June 30, 2024), and a maximum of $62,500 for State Fiscal Year 2025 (July 1, 2024–June 30, 2025), based on the expenses incurred under this Contract.

Duplication of Billed Costs
The Contractor shall not bill COMMERCE for services performed under this Agreement, and COMMERCE shall not pay the Contractor, if the Contractor is entitled to payment or has been or will

be paid by any other source, including grants, for that service.

Disallowed Costs

The Contractor is responsible for any audit exceptions or disallowed costs incurred by its own organization or that of its subcontractors.

COMMERCE may, in its sole discretion, withhold ten percent (10%) from each payment until acceptance by COMMERCE of the final report (or completion of the project, etc.).

Line Item Modification of Budget

A. Notwithstanding any other provision of this contract, the Contractor may, at its discretion, make modifications to line items in the Scope of Work and Budget (Attachment A) that will not increase the line item by more than fifteen percent (15%).
B. The Contractor shall notify COMMERCE in writing (by email or regular mail) when proposing any budget modification or modifications to a line item of the Scope of Work and Budget (Attachment A) that would increase the line item by more than fifteen percent (15%). Conversely, COMMERCE may initiate the budget modification approval process if presented with a request for payment under this contract that would cause one or more budget line items to exceed the 15 percent (15%) threshold increase described above.
C. Any such budget modification or modifications as described above shall require the written approval of COMMERCE (by email or regular mail), and such written approval shall amend the Budget. Each party to this contract will retain and make any and all documents related to such budget modifications a part of their respective contract file.

5. SUBCONTRACTOR DATA COLLECTION

Contractor will submit reports, in a form and format to be provided by Commerce and at intervals as agreed by the parties, regarding work under this Contract performed by subcontractors and the portion of Contract funds expended for work performed by subcontractors, including but not necessarily limited to minority-owned, woman-owned, and veteran-owned business subcontractors. "Subcontractors" shall mean subcontractors of any tier.

6. INSURANCE

Each party certifies that it is self-insured under the State's or local government self-insurance liability program, and shall be responsible for losses for which it is found liable.

7. FRAUD AND OTHER LOSS REPORTING

Contractor shall report in writing all known or suspected fraud or other loss of any funds or other property furnished under this Contract immediately or as soon as practicable to the Commerce Representative identified on the Face Sheet.

8. ORDER OF PRECEDENCE

In the event of an inconsistency in this Contract, the inconsistency shall be resolved by giving precedence in the following order:

- Applicable federal and state of Washington statutes and regulations
- Special Terms and Conditions
- General Terms and Conditions
- Attachment A – Scope of Work and Budget

Washington State Department of Commerce

General Terms and Conditions

1. DEFINITIONS

As used throughout this Contract, the following terms shall have the meaning set forth below:

A. "Authorized Representative" shall mean the Director and/or the designee authorized in writing to act on the Director's behalf.

B. "COMMERCE" shall mean the Washington Department of Commerce.

C. "Contract" or "Agreement" or "Grant" means the entire written agreement between COMMERCE and the Contractor, including any Attachments, documents, or materials incorporated by reference. E-mail or Facsimile transmission of a signed copy of this contract shall be the same as delivery of an original.

D. "Contractor" or "Grantee" shall mean the entity identified on the face sheet performing service(s) under this Contract, and shall include all employees and agents of the Contractor.

E. "Personal Information" shall mean information identifiable to any person, including, but not limited to, information that relates to a person's name, health, finances, education, business, use or receipt of governmental services or other activities, addresses, telephone numbers, social security numbers, driver license numbers, other identifying numbers, and any financial identifiers, and "Protected Health Information" under the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA).

F. "State" shall mean the state of Washington.

G. "Subcontractor" shall mean one not in the employment of the Contractor, who is performing all or part of those services under this Contract under a separate contract with the Contractor. The terms "subcontractor" and "subcontractors" mean subcontractor(s) in any tier.

2. ALL WRITINGS CONTAINED HEREIN

This Contract contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Contract shall be deemed to exist or to bind any of the parties hereto.

3. AMENDMENTS

This Contract may be amended by mutual agreement of the parties. Such amendments shall not be binding unless they are in writing and signed by personnel authorized to bind each of the parties.

4. ASSIGNMENT

Neither this Contract, work thereunder, nor any claim arising under this Contract, shall be transferred or assigned by the Contractor without prior written consent of COMMERCE.

5. CONFIDENTIALITY AND SAFEGUARDING OF INFORMATION

A. "Confidential Information" as used in this section includes:

i. All material provided to the Contractor by COMMERCE that is designated as "confidential" by COMMERCE;

ii. All material produced by the Contractor that is designated as "confidential" by COMMERCE; and

iii. All Personal Information in the possession of the Contractor that may not be disclosed under state or federal law.

B. The Contractor shall comply with all state and federal laws related to the use, sharing, transfer, sale, or disclosure of Confidential Information. The Contractor shall use Confidential Information solely for the purposes of this Contract and shall not use, share, transfer, sell or disclose any Confidential Information to any third party except with the prior written consent of COMMERCE or as may be required by law. The Contractor shall take all necessary steps to assure that Confidential Information is safeguarded to prevent unauthorized use, sharing, transfer, sale or disclosure of Confidential Information or violation of any state or federal laws related thereto. Upon request, the Contractor shall provide COMMERCE with its policies and procedures on confidentiality. COMMERCE may require changes to such policies and procedures as they apply to this Contract whenever COMMERCE reasonably determines that changes are necessary to prevent unauthorized disclosures. The Contractor shall make the changes within the time period specified by COMMERCE. Upon request, the Contractor shall immediately return to COMMERCE any Confidential Information that COMMERCE reasonably determines has not been adequately protected by the Contractor against unauthorized disclosure.

C. Unauthorized Use or Disclosure. The Contractor shall notify COMMERCE within five (5) working days of any unauthorized use or disclosure of any confidential information, and shall take necessary steps to mitigate the harmful effects of such use or disclosure.

6. COPYRIGHT

Unless otherwise provided, all Materials produced under this Contract shall be considered "works for hire" as defined by the U.S. Copyright Act and shall be owned by COMMERCE. COMMERCE shall be considered the author of such Materials. In the event the Materials are not considered “works for hire” under the U.S. Copyright laws, the Contractor hereby irrevocably assigns all right, title, and interest in all Materials, including all intellectual property rights, moral rights, and rights of publicity to COMMERCE effective from the moment of creation of such Materials.

“Materials” means all items in any format and includes, but is not limited to, data, reports, documents, pamphlets, advertisements, books, magazines, surveys, studies, computer programs, films, tapes, and/or sound reproductions. “Ownership” includes the right to copyright, patent, register and the ability to transfer these rights.

For Materials that are delivered under the Contract, but that incorporate pre-existing materials not produced under the Contract, the Contractor hereby grants to COMMERCE a nonexclusive, royalty-free, irrevocable license (with rights to sublicense to others) in such Materials to translate, reproduce, distribute, prepare derivative works, publicly perform, and publicly display. The Contractor warrants and represents that the Contractor has all rights and permissions, including intellectual property rights, moral rights and rights of publicity, necessary to grant such a license to COMMERCE.

The Contractor shall exert all reasonable effort to advise COMMERCE, at the time of delivery of Materials furnished under this Contract, of all known or potential invasions of privacy contained therein and of any portion of such document which was not produced in the performance of this Contract. The Contractor shall provide COMMERCE with prompt written notice of each notice or claim of infringement received by the Contractor with respect to any Materials delivered under this Contract. COMMERCE shall have the right to modify or remove any restrictive markings placed upon the Materials by the Contractor.

7. DISPUTES

In the event that a dispute arises under this Agreement, it shall be determined by a Dispute Board in the following manner: Each party to this Agreement shall appoint one member to the Dispute Board. The members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, Agreement terms and applicable statutes and rules and make a determination of the dispute. The Dispute Board shall thereafter decide the dispute with the majority

prevailing. The determination of the Dispute Board shall be final and binding on the parties hereto. As an alternative to this process, either of the parties may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control.

8. GOVERNING LAW AND VENUE

This Contract shall be construed and interpreted in accordance with the laws of the state of Washington, and the venue of any action brought hereunder shall be in the Superior Court for Thurston County.

9. INDEMNIFICATION

Each party shall be solely responsible for the acts of its employees, officers, and agents.

10. LICENSING, ACCREDITATION AND REGISTRATION

The Contractor shall comply with all applicable local, state, and federal licensing, accreditation and registration requirements or standards necessary for the performance of this Contract.

11. RECAPTURE

In the event that the Contractor fails to perform this Contract in accordance with state laws, federal laws, and/or the provisions of this Contract, COMMERCE reserves the right to recapture funds in an amount to compensate COMMERCE for the noncompliance in addition to any other remedies available at law or in equity.

Repayment by the Contractor of funds under this recapture provision shall occur within the time period specified by COMMERCE. In the alternative, COMMERCE may recapture such funds from payments due under this Contract.

12. RECORDS MAINTENANCE

The Contractor shall maintain books, records, documents, data and other evidence relating to this contract and performance of the services described herein, including but not limited to accounting procedures and practices that sufficiently and properly reflect all direct and indirect costs of any nature expended in the performance of this contract.

The Contractor shall retain such records for a period of six years following the date of final payment. At no additional cost, these records, including materials generated under the contract, shall be subject at all reasonable times to inspection, review or audit by COMMERCE, personnel duly authorized by COMMERCE, the Office of the State Auditor, and federal and state officials so authorized by law, regulation or agreement.

If any litigation, claim or audit is started before the expiration of the six (6) year period, the records shall be retained until all litigation, claims, or audit findings involving the records have been resolved.

13. SAVINGS

In the event funding from state, federal, or other sources is withdrawn, reduced, or limited in any way after the effective date of this Contract and prior to normal completion, COMMERCE may suspend or terminate the Contract under the "Termination for Convenience" clause, without the ten calendar day notice requirement. In lieu of termination, the Contract may be amended to reflect the new funding limitations and conditions.

14. SEVERABILITY

The provisions of this contract are intended to be severable. If any term or provision is illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the validity of the remainder of the contract.

Washington State Department of Commerce

15. SUBCONTRACTING

The Contractor may only subcontract work contemplated under this Contract if it obtains the prior written approval of COMMERCE.

If COMMERCE approves subcontracting, the Contractor shall maintain written procedures related to subcontracting, as well as copies of all subcontracts and records related to subcontracts. For cause, COMMERCE in writing may: (a) require the Contractor to amend its subcontracting procedures as they relate to this Contract; (b) prohibit the Contractor from subcontracting with a particular person or entity; or (c) require the Contractor to rescind or amend a subcontract.

Every subcontract shall bind the Subcontractor to follow all applicable terms of this Contract. The Contractor is responsible to COMMERCE if the Subcontractor fails to comply with any applicable term or condition of this Contract. The Contractor shall appropriately monitor the activities of the Subcontractor to assure fiscal conditions of this Contract. In no event shall the existence of a subcontract operate to release or reduce the liability of the Contractor to COMMERCE for any breach in the performance of the Contractor's duties.

Every subcontract shall include a term that COMMERCE and the State of Washington are not liable for claims or damages arising from a Subcontractor's performance of the subcontract.

16. SURVIVAL

The terms, conditions, and warranties contained in this Contract that by their sense and context are intended to survive the completion of the performance, cancellation or termination of this Contract shall so survive.

17. TERMINATION FOR CAUSE

In the event COMMERCE determines the Contractor has failed to comply with the conditions of this contract in a timely manner, COMMERCE has the right to suspend or terminate this contract. Before suspending or terminating the contract, COMMERCE shall notify the Contractor in writing of the need to take corrective action. If corrective action is not taken within 30 calendar days, the contract may be terminated or suspended.

In the event of termination or suspension, the Contractor shall be liable for damages as authorized by law including, but not limited to, any cost difference between the original contract and the replacement or cover contract and all administrative costs directly related to the replacement contract, e.g., cost of the competitive bidding, mailing, advertising and staff time.

COMMERCE reserves the right to suspend all or part of the contract, withhold further payments, or prohibit the Contractor from incurring additional obligations of funds during investigation of the alleged compliance breach and pending corrective action by the Contractor or a decision by COMMERCE to terminate the contract. A termination shall be deemed a "Termination for Convenience" if it is determined that the Contractor: (1) was not in default; or (2) failure to perform was outside of his or her control, fault or negligence.

The rights and remedies of COMMERCE provided in this contract are not exclusive and are, in addition to any other rights and remedies, provided by law.

18. TERMINATION FOR CONVENIENCE

Except as otherwise provided in this Contract, COMMERCE may, by ten (10) business days' written notice, beginning on the second day after the mailing, terminate this Contract, in whole or in part. If this Contract is so terminated, COMMERCE shall be liable only for payment required under the terms of this Contract for services rendered or goods delivered prior to the effective date of termination.

19. TERMINATION PROCEDURES

Upon termination of this contract, COMMERCE, in addition to any other rights provided in this contract, may require the Contractor to deliver to COMMERCE any property specifically produced or acquired for the performance of such part of this contract as has been terminated. The provisions of the "Treatment of Assets" clause shall apply in such property transfer.

Washington State Department of Commerce

COMMERCE shall pay to the Contractor the agreed upon price, if separately stated, for completed work and services accepted by COMMERCE, and the amount agreed upon by the Contractor and COMMERCE for (i) completed work and services for which no separate price is stated, (ii) partially completed work and services, (iii) other property or services that are accepted by COMMERCE, and (iv) the protection and preservation of property, unless the termination is for default, in which case the Authorized Representative shall determine the extent of the liability of COMMERCE. Failure to agree with such determination shall be a dispute within the meaning of the "Disputes" clause of this contract. COMMERCE may withhold from any amounts due the Contractor such sum as the Authorized Representative determines to be necessary to protect COMMERCE against potential loss or liability.

The rights and remedies of COMMERCE provided in this section shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

After receipt of a notice of termination, and except as otherwise directed by the Authorized Representative, the Contractor shall:

A. Stop work under the contract on the date, and to the extent specified, in the notice;

B. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the work under the contract that is not terminated;

C. Assign to COMMERCE, in the manner, at the times, and to the extent directed by the Authorized Representative, all of the rights, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case COMMERCE has the right, at its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

D. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Authorized Representative to the extent the Authorized Representative may require, which approval or ratification shall be final for all the purposes of this clause;

E. Transfer title to COMMERCE and deliver in the manner, at the times, and to the extent directed by the Authorized Representative any property which, if the contract had been completed, would have been required to be furnished to COMMERCE;

F. Complete performance of such part of the work as shall not have been terminated by the Authorized Representative; and

G. Take such action as may be necessary, or as the Authorized Representative may direct, for the protection and preservation of the property related to this contract, which is in the possession of the Contractor and in which COMMERCE has or may acquire an interest.

20. TREATMENT OF ASSETS

Title to all property furnished by COMMERCE shall remain in COMMERCE. Title to all property furnished by the Contractor, for the cost of which the Contractor is entitled to be reimbursed as a direct item of cost under this contract, shall pass to and vest in COMMERCE upon delivery of such property by the Contractor. Title to other property, the cost of which is reimbursable to the Contractor under this contract, shall pass to and vest in COMMERCE upon (i) issuance for use of such property in the performance of this contract, or (ii) commencement of use of such property in the performance of this contract, or (iii) reimbursement of the cost thereof by COMMERCE in whole or in part, whichever first occurs.

A. Any property of COMMERCE furnished to the Contractor shall, unless otherwise provided herein or approved by COMMERCE, be used only for the performance of this contract.

B. The Contractor shall be responsible for any loss or damage to property of COMMERCE that results from the negligence of the Contractor or which results from the failure on the part of the Contractor to maintain and administer that property in accordance with sound management

practices.

C. If any COMMERCE property is lost, destroyed or damaged, the Contractor shall immediately notify COMMERCE and shall take all reasonable steps to protect the property from further damage.

D. The Contractor shall surrender to COMMERCE all property of COMMERCE prior to settlement upon completion, termination or cancellation of this contract.

E. All reference to the Contractor under this clause shall also include Contractor's employees, agents or Subcontractors.

21. WAIVER

Waiver of any default or breach shall not be deemed to be a waiver of any subsequent default or breach. Any waiver shall not be construed to be a modification of the terms of this Contract unless stated to be such in writing and signed by Authorized Representative of COMMERCE.

Washington State Department of Commerce

Attachment A: Scope of Work and Budget

Task/Work Item	SFY 2024 Funds	SFY 2025 Funds	Deliverable
Periodic Update Checklist Anticipated completion date: _____	$	$	Commerce Periodic Update Checklist for Comprehensive Plan and Development Regulations
Draft Transportation Plan Anticipated completion date: *June 30, 2025*	*$80,000*	*$30,000*	Draft Transportation Plan
Updated Economic Development Plan Data Set Anticipated completion date: *June 30, 2025*	*$12,000*	*$3,000*	Draft updated Economic Development Plan Data Set
Adopted Final Comprehensive plan and Development Regulations Ordinance amendment including but not limited to: Anticipated completion date: _____			Adopted Periodic Update Notification email from Commerce that adopted ordinance was received
Finding that the periodic update required by RCW 36.70A.130(b) is complete Anticipated completion date: _____			Resolution Finding the periodic update required by RCW 36.70A.130(b) is complete Notification email from Commerce that adopted ordinance was received
Total Budget	*$92,000*	*$33,000*	
Control Number	~~*$92,000*~~*$62,500*	~~*$33,000*~~*$62,500*	

Commented [JP(1]: Added – Required Deliverable. They do not need to charge Grant funds for this.

Commented [JP(2]: Reminders GMA 60-day notice needs to be provided for any drafts prior to adoption)

Commented [JP(3]: Are they planning for a Draft completed by June 30, 2025 or Final Adoption?

Commented [JP(4]: Or Letter form the Jurisdiction summarizing completion of the update?

Commented [HC(5]: The totals in this row cannot exceed the control number/figure in the row below. "Total Budget" is referring to the total proposed grant funding to be used for each fiscal year, not the overall project budget. Apologies for any confusion.

Commented [JP(6]: These need to be equal due to restriction with funding provided by the Legislature (See reminder below in the grant application)

Washington State Department of Commerce

(Total Grant Available)			

Reminder: The grant breakdown includes 50% of your total grant award, for SFY 2024 (July 1, 2023 – June 30, 2024), and 50% of the total award for SFY 2025 (July 1, 2024-June 30, 2025).