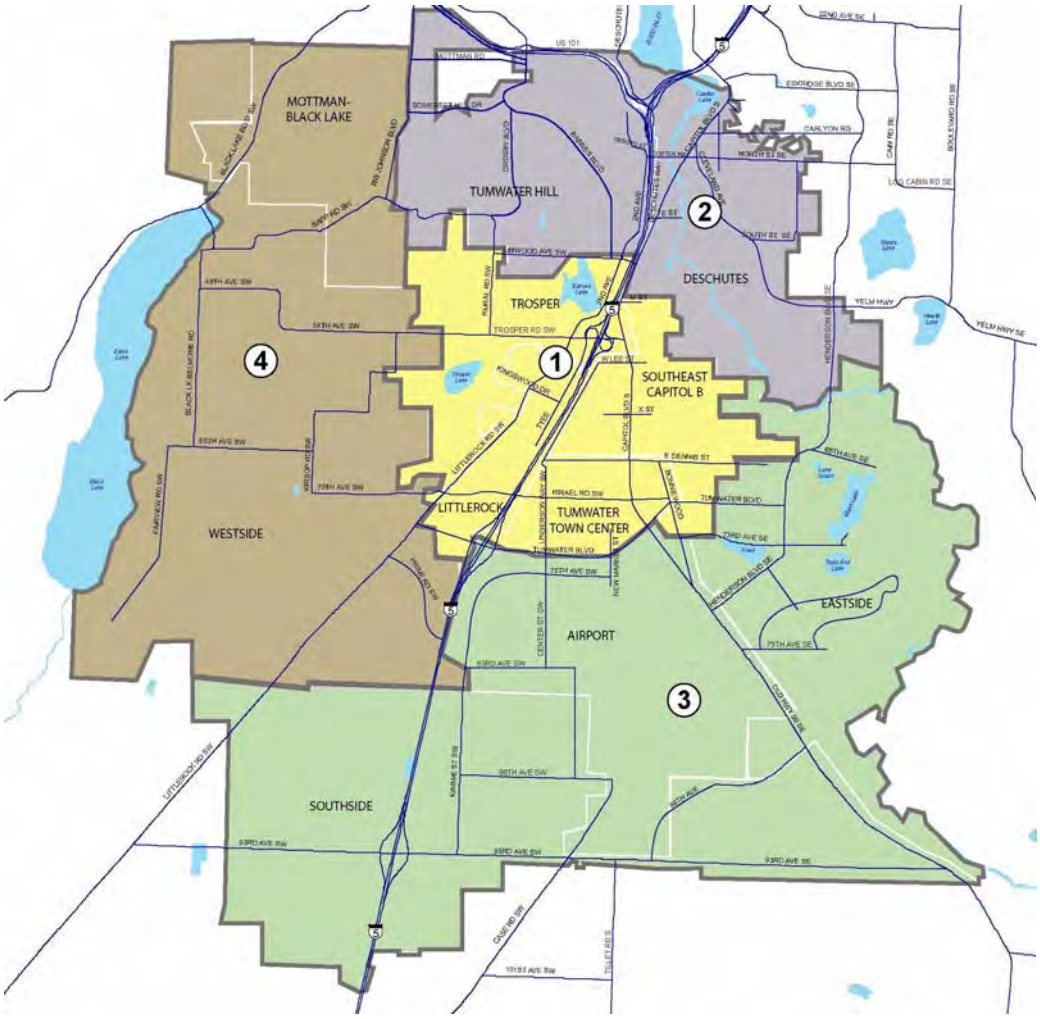
2025 Transportation Plan

City of Tumwater



Parametrix

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Chapter 1 Introduction

What is the purpose of the Transportation Plan?

The Tumwater Transportation Plan serves as the transportation element of the City's Comprehensive Plan, which is required to meet the requirements of the Growth Management Act (GMA). The Plan assesses existing and future conditions of the City's transportation network, which serves all modes, including vehicles, pedestrians, bicycles, and transit. The Plan identifies deficiencies in the system based on the City's land use plan, and includes potential funding strategies for needed improvements.

Planning for the Future

This Plan serves as the basis for the City's long-range capital improvement program, and provides the framework for City decisions pertaining to management of the transportation system, consistent with the GMA and County-wide planning policies.

What does the Plan include?

Transportation plans in Washington are required to be consistent with local, regional and statewide planning efforts, and must include:

- An inventory of local, regional and statewide transportation facilities and services (air, water, rail, and land – including roadways, transit, ferries, non-motorized, and freight);
- Level of Service standards;
- A minimum of ten-year traffic forecasts based on future growth identified in the Land Use Element;
- System management and expansion needs to meet current and future demands;

- Consistency with other elements of the Comprehensive Plan (particularly between the Land Use and Transportation elements), with other jurisdictions' comprehensive plans, and with regional transportation plans;
- A funding analysis of recommended transportation projects.

Transportation & Growth Management

The specific goal of GMA with regard to transportation is to "encourage efficient multi-modal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans".

How does this Plan relate to the Regional Transportation Plan?

The City of Tumwater is a member of the Thurston Regional Planning Council (TRPC), an intergovernmental board made up of local government jurisdictions within Thurston County. As a federally recognized Metropolitan Planning Organization and state-recognized Regional Transportation Planning Organization, TRPC develops the regional transportation plan and policies.

The 2025 Regional Transportation Plan (RTP) serves as a blueprint for the region's transportation system. TRPC uses population and employment forecasts to predict travel patterns during certain periods of the day. This information is analyzed in coordination with local transportation planning efforts, with the purpose of creating a list of "regionally significant" projects. These are projects that support major travel routes in the region. The actual projects, however, are implemented by the individual jurisdictions.

How is the Plan organized?

Transportation Planning Areas

The Tumwater Land Use Plan separates the City into eight distinct neighborhood planning areas. The Transportation Plan has simplified this somewhat, and has joined these neighborhoods into four distinct Transportation Planning Areas (TPAs). The Plan analyzes existing and future conditions for each planning area, and identifies specific deficiencies and improvement strategies.

Following is a brief description of the four TPAs, intended to provide context regarding location, significant roadways and land use characteristics for each:

TPA 1 – TPA 1 is made up of the Trosper, Southeast Capitol Boulevard, Littlerock and Tumwater Town Center Neighborhoods, as described in the Tumwater Land Use Plan. I-5 runs northeast/southwest through the Area, with accesses at the Trosper Road and Tumwater Boulevard interchanges. Major north-south corridors include Littlerock Road and Capitol Boulevard; major east-west links include Trosper Road and Tumwater Boulevard. A wide variety of land uses exist in TPA 1, including public institutional properties such as Tumwater Middle School, Tumwater High School, Tumwater City Hall and Timberland Regional Library, as well as the L&I Building and Point Plazas East and West, in which several State agencies are housed. Several properties owned by the Port of Olympia are developed with either light industrial or professional office uses. A mix of commercial, professional services and retail uses generally follows the alignment of Capitol Boulevard, with primarily retail clustered around/near the vicinity of Capitol Boulevard/Trosper Road and Trosper Road/Littlerock Road. The eastern and western edges of TPA 1, as well as the area around Israel Road and Dennis Street are primarily residential.

TPA 1 Primary Elements

Corridors:

- Interstate 5
- Tumwater Boulevard

Land Use Features:

- Government/Civic Centers
- Port of Olympia/Light Industrial
- Professional Offices
- Residential

TPA 2 – TPA 2 consists of the Tumwater Hill and Deschutes Neighborhoods. I-5 runs primarily north-south through this Area, and its junction with westbound State Highway 101 is located toward the northern boundary of the Area. Major roads in this area include Henderson Boulevard, Cleveland Avenue, Custer Way, North Street and Deschutes Way, which are classified as minor arterials. South Street and Hoadly Street are classified as major collectors. Capitol Boulevard, a major arterial, serves as the main north-south link and has a core mix of professional services, commercial and retail property uses along its alignment. Among those is the former Olympia Brewery complex, now empty, which creates major questions as to what effects its future redevelopment could have on the

TPA 2 Primary Elements

Corridors:

- Interstate 5
- Capitol Boulevard

Land Use Features:

- Mottman Industrial Park
- Low density commercial/institutional
- Residential

Area's transportation network. Custer Way's intersections with Capitol Boulevard and Cleveland Avenue provide important junctions for vehicles from residential neighborhoods to the east and west wishing to access Capitol Boulevard, I-5 or Highway 101. The geological makeup of this Area, including steep slopes and accompanying soil settlement hazards, as well as Deschutes River valley land that is prone to flooding and high water tables, presents challenges to anything more than low intensity development.

Circulation routes in the western portion of TPA 2 consist of Mottman Road, R.W. Johnson Boulevard, Sapp Road, Linwood Avenue, 7th Avenue, Barnes Boulevard, Ferry Street and Irving Street, which are all classified as major collectors. Second Avenue, which parallels Interstate 5, is classified as a minor-arterial. Residential use is dominant in this vicinity, with scattered small commercial and institutional areas and an industrial area that is part of the Mottman Industrial Park.

TPA 3 – TPA 3 is made up of the Airport Neighborhood as well as portions of the City's UGA designated as Eastside and Southside planning areas. Capitol Boulevard/Old Highway 99 provides the main north-south route through TPA 3; Henderson Boulevard provides a north-south link through the eastern portion. Tumwater Boulevard, at the north boundary of the TPA, provides the major east-west route; with 93rd Avenue providing an east-west link through the southern portion of the Area. I-5 runs north-south through the Area, accessed at the 93rd Avenue interchange.

Primary land use in the Area is the Olympia Regional Airport, along with industrial and office uses on other Port-managed properties. Commercial development generally follows the alignment of Capitol Boulevard/Old Highway 99 and continues in a sparse mix with residential uses along 93rd Avenue. Much of the land in TPA 3 is undeveloped. The southern portion has some low density residential development; the eastern portion contains a combination of higher density residential developments and industrial uses.

TPA 3 Primary Elements

Corridors:

- Interstate 5
- Capitol Boulevard/Old Highway 99
- Tumwater Boulevard

Land Use Features:

- Olympia Regional Airport
- Port of Olympia Industrial/Offices
- Residential
- Largely undeveloped

TPA 4 –TPA 4 includes the Mottman/Black Lake Neighborhood and a portion of Tumwater's UGA designated as the Westside planning area, and extends west from TPA's 1, 2, and 3 to Black Lake. Black Lake Boulevard functions as a minor arterial roadway and supports almost all of the north-south traffic connecting the Black Lake area to the City of Olympia and Highway 101. R.W. Johnson Boulevard forms the eastern boundary of TPA 4 and functions as a major north-south transportation route from Sapp Road. Black Lake-Belmore Road provides a north-south connection through the center portion of the TPA, and Littlerock Road is the major north-south route through the southern section. Significant east-west routes through the TPA include Sapp Road, 49th Avenue – 54th Avenue and 66th Avenue – 70th Avenue.

TPA 4 Primary Elements

Corridors:

- Littlerock Road
- Black Lake Boulevard

Land Use Features:

- Residential
- Mixed Commercial/Industrial
- Partially subject to Shoreline Master Program

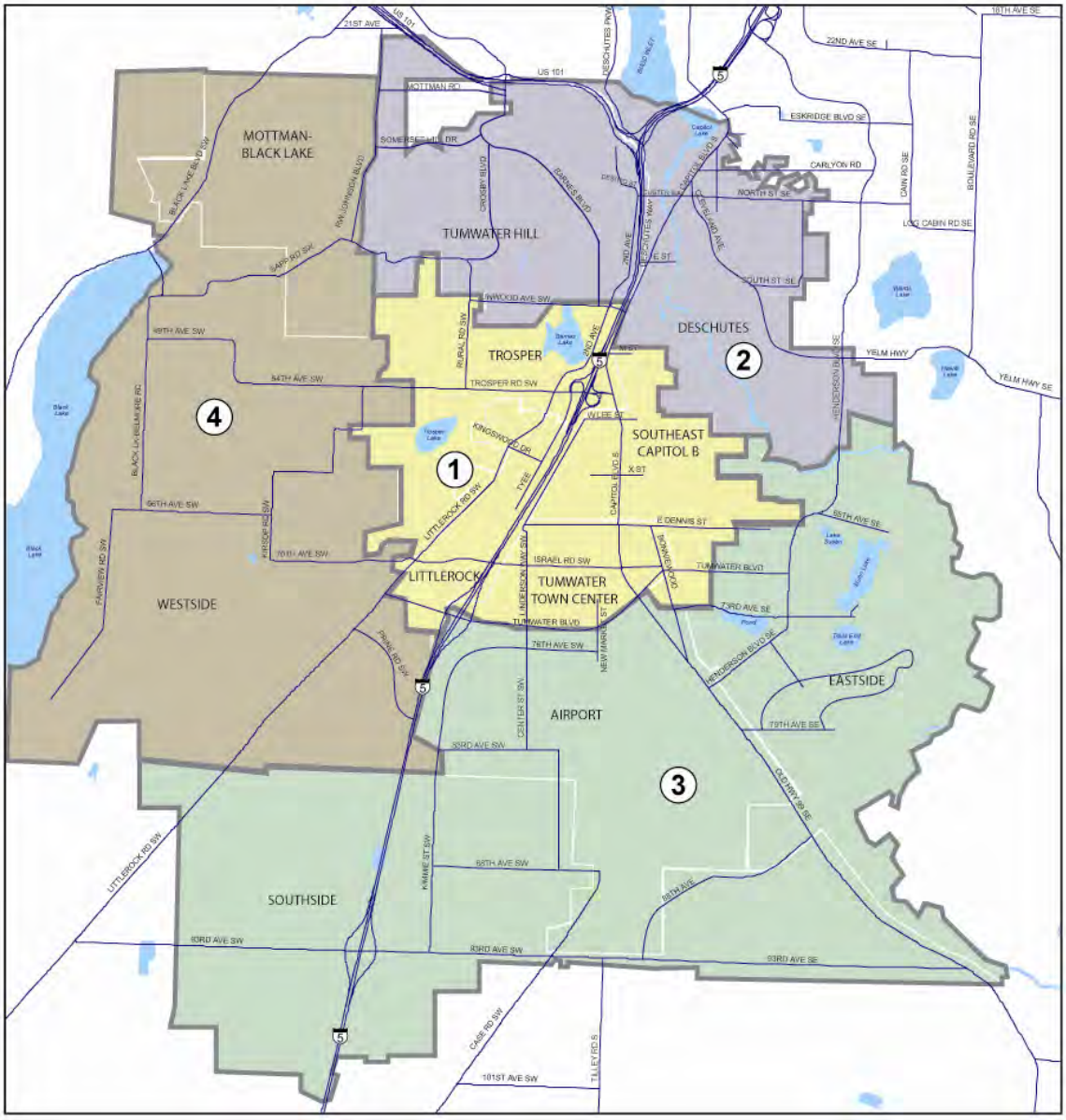
The Area is characterized primarily by low-density residential uses. The vicinity of R.W. Johnson Boulevard includes a mix of commercial and industrial uses, as well as County institutional facilities. Properties along Black Lake Boulevard are a mix of commercial, industrial and residential. Much of the northwestern area of TPA 4 is subject to the regulations of the Shoreline Master Program for the Thurston Region, which will permit very limited uses of land and water.

Recent development in the central and southern portion of the TPA includes higher density residential uses along with a planned urban village in the vicinity south of 70th Avenue and west of Littlerock Road, with the surrounding area expected to remain a combination of low-density residential mixed with some light industrial uses.

SubArea Plans

There are also several on-going SubArea Planning efforts (see *Chapter 5*). The City uses the subarea process to focus in on a smaller land area and address very specific issues related to development in those areas. This Transportation Plan also includes a summary of several of these smaller planning efforts, and provides a connection between the concurrent processes.

Exhibit 1-1
Tumwater Transportation Planning Areas



For purposes of this Plan, the City is divided into four Transportation Planning Areas (TPAs). The TPAs have distinct travel and land use characteristics; some are primarily residential, while others are centered around major commercial and office development. Their unique transportation network needs are addressed in this Plan, as are the interactions between the TPAs.

Chapter 2 Goals and Policies

Introduction

Effective transportation decisions result in a transportation system that provides safe, affordable and efficient travel choices for local residents and businesses.

The goal of this Plan is to look at the transportation and land use growth that is anticipated to occur in and around Tumwater over the coming twenty years, and create a framework that will allow the existing transportation system to evolve and meet the needs associated with that growth. Recommendations for changes and improvements will be based on careful consideration of community and environmental goals and constraints, cost-effectiveness, safety and mobility.

Regional Consistency

The Goals and Policies of the 2025 Regional Transportation Plan are included in their entirety in *Appendix A*. City-specific goals should fit within the greater regional context, and are summarized here.

Goals and Policies

The 2025 Regional Transportation Plan (RTP) contains twenty policy elements, created to address the issues of transportation relationships, system management, system components, and process. Each of those elements includes a stated goal, intended to guide transportation decision-makers at all jurisdictional levels. To ensure consistency with the RTP, this Plan addresses each of those goals as they relate to the City of Tumwater's transportation system. The RTP policies associated with each of the goals can be found in *Appendix A*.

Transportation and Land Use Consistency

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

Continuing to expand on existing safety enhancements is a top priority of the Tumwater Transportation Plan in order to maintain a system that provides quality service and security to local residents.

The relationship between transportation and land use is an easy one to understand. Planning ahead for growth is vital in order to manage what kind of community is built. Transportation facility needs are affected by land use. Length of trips, convenient connections and mode choices are all affected by growth; which is in turn controlled by land use plans. Tumwater's Land Use Plan divides the City into eight "neighborhood planning areas", each containing a variety of zoned uses. Serving those planning areas with adequate transportation facilities requires a Transportation Plan that is consistent with land uses allowed in each.

Connectivity of the streets within and between the different land uses is an important aspect of the overall transportation system. Multiple routes of ingress and egress to subdivisions and commercial areas help accomplish this connectivity. (TP 4.1)

Multimodal Transportation System

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

How do you get to work? To school? To the grocery store? The truth is, most of us drive an automobile to these places, however, a well designed transportation system has to meet other kinds of travel needs as well. Many people, due to age, disability or other life circumstances, are not able to drive a car; others look to different travel modes as a matter of personal choice. Compact development patterns can make alternate modes of travel such as walking, biking and riding the bus feasible and affordable.

Providing Options

People that live or work in Tumwater have commute options that include Intercity Transit, Amtrak and the Olympia Regional Airport. An important aspect of the multimodal element of Tumwater's Transportation Plan is consideration of these available services and how easily accessible they are to City residents and those traveling to work here.

Another concern addressed by the multimodal element is sharing of facilities. Sections of Tumwater's transportation system require roadways that safely accommodate not only

automobiles, but pedestrians, bicyclists and the movement of freight as well.

A successful multimodal transportation system can even offer users the choice to own fewer or no vehicles and save costs associated with operation and maintenance; put simply, it provides increased travel options.

An effective multimodal transportation system is highly dependent on land use. It is through the development of different land uses that many of the multimodal elements are implemented. Incentives, such as fee waivers, are an important tool that can be used to encourage projects to implement the multimodal objectives included in the "Land Use Element" of the City's Comprehensive Plan. (TP 1.1)

Multimodal transportation strategies are an important part of creating the vision Tumwater has for its Tumwater Town Center. The Town Center Plan includes several recommendations regarding transit, parking, pedestrian and bicycle facilities that are to be implemented as that area develops. (TP 1.2)

Barrier-Free Transportation

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

In keeping with the City of Tumwater's stated mission to be a "PEOPLE-friendly, PEOPLE-oriented community" the transportation system must support independent mobility for all users. Travel limitations that result from physical, economic or linguistic challenges can threaten dignity and self-reliance, and lead to an overall reduction in quality of living.

A goal of the Transportation Plan is to maintain a system that supports diverse travel options and community outreach, increasing accessibility for those that might otherwise have a difficult time getting from one place to another.

In support of this goal the City should continue to identify and install curb cuts that allow wheelchairs and walkers access to

Tumwater Believes in PEOPLE:

People
People-oriented neighborhoods.
Respect for our diverse citizenry.
Supporting the personal and professional growth of city staff.
Excellence
Excellence in service.
Enhancing public trust.
Employee empowerment to achieve excellence.
Opportunity
Opportunities in housing.
Opportunities for healthy, responsible economic growth.
Change is opportunity.
Partnership
Partnership for citizen participation and responsibility.
Partnerships for positive regional and local issues.
Partnerships for a safe city.
Learning
Learning, teaching and valuing our history and cultural heritage.
Environment
Respect and nurturance for all the environments in our lives, social, professional and natural.

sidewalks throughout the City. Barrier-free enhancements should also be considered and incorporated as an element of the City's design requirements for "on-site" access and connections to City infrastructure including pedestrian walkways and transit stops, especially in the developing commercial areas.(TP 7.1 and 7.2)

System Safety and Security

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

Travelers need to feel safe. Whether driving a car, waiting for a bus, walking or biking, the ability of people to feel safe and secure is essential to the successful operation of our transportation system.

When we discuss transportation safety measures, routine maintenance of existing roadways and enforcement of traffic laws easily spring to mind, but there's more to it than that. Examples of safety measures that can be readily spotted within the Tumwater system include well-lit and well-marked crosswalks, many of which have also been constructed using materials that provide a color contrast to the pavement, such as stamped concrete or pavers. Pedestrian refuge islands are also used as another method to enhance and encourage the pedestrian access across streets and primary corridors. Upcoming roadway improvement projects include safety enhancements such as new bike lanes, sidewalks and crosswalks utilizing in-pavement lighting systems. Intercity Transit shelters are well maintained and highly visible, providing a sense of security for waiting riders.

As traffic volumes grow, resulting in increased congestion, we experience increased traffic through our neighborhoods. To mitigate the adverse impacts that result, the City should consider development of a program that promotes traffic calming in these areas. (TP 5.1)

The safety and security of our children who walk or bike to school is a paramount concern. The City needs to continue to actively collaborate with the Tumwater School District to make

sure that improvements to school routes, designated by the district, are included in capital plans and programs undertaken by both the district and the City. (TP 5.2)

The addition of street lights on collector and arterial streets as an integral part of City and development projects is an important part of continuing to improve traffic and public safety, especially along school routes and in commercial and civic areas. (TP 5.3)

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.

The existing transportation system is an important asset of the Tumwater community. As the saying goes, "an ounce of prevention is worth a pound of cure." As with any investment, programs that support regular maintenance and repair of facilities are key in minimizing hazards and preventing the need for reconstruction, a much more costly undertaking, down the line.

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 at peak periods.

No one enjoys waiting in line. In fact, many people plan trips to the grocery store, bank, etc., at times when they are less likely to encounter crowded conditions. Put simply, that is the concept behind travel demand management (TDM). TDM involves research and implementation of programs aimed at reducing the effects of congestion by encouraging alternative modes or times of travel.

Transportation Technologies

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

On February 28, 2001, a 7.0 magnitude earthquake struck the Puget Sound region. During the hours that followed, local

Information When You Need It

Communication and inter-agency cooperation are invaluable elements of our local transportation system that have been greatly improved through technology. A commitment to continue to build on existing technology-based systems will help to ensure that travelers in Tumwater will enjoy increased levels of safety and information.

residents encountered congestion of various kinds; telephone lines were clogged with calls as people checked in with friends and relatives, and traffic in the region slowed to a crawl as parents scrambled to pick up their children from school and workers headed home to survey property damage. Vehicles seemed to pour onto the roadways from every direction, and no one was getting anywhere fast.

Technology plays a role in getting help to those that may be injured or trapped, in communication of changes in available public services such as transit or school bus routes, in warnings of hazardous conditions that result in detours from normal travel routes.

Freight Mobility

Goal: Promote efficient, cost-effective and safe movement of freight in and through the City and its UGA.

No community can survive without local business and industry. These enterprises provide employment and sell goods and services which in turn, contribute to the local tax base and a healthy economy. However, business and industry operations depend on movement of freight; receiving shipments of goods or raw materials, and/or sending shipments of finished products.

Sharing transportation facilities with freight movers, whether it's truck and trailer rigs, or trains, can lead to conflicts on local roadways. The City's goal is to minimize these potential conflicts, and to provide safe separations between modes as much as possible, including potential development of truck and freight routes to and through industrial and warehousing areas.

Creation of a transportation system that minimizes conflicts with passenger vehicles, pedestrians, bikes, transit and other public uses while addressing needs related to the safe and efficient movement of freight is an important component of the Tumwater Transportation Plan. To that end, the City's Commercial/Industrial street classification requires that these roadways include the same pedestrian, bicycle and transit amenities as the arterial and urban collector roadways. (TP 3.1)

As a regionally significant freight center, the Port of Olympia's New Market Industrial Campus plays an important part in the City's future. As this area develops it is important that the City, the Port of Olympia and the Tumwater School District work together as partners to meet the needs of all of our interests. (TP 3.2)

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.

For the most part, the framework that supports the community's mobility needs consists of our network of streets, roads and bridges. This framework connects residents to business, school, social activities and places of employment; and allows for the delivery of vital community services to residential neighborhoods.

Although congestion is a frustration to drivers, there are no simple solutions. While designing a transportation system that provides travel options, it is important to balance the need for increased connections against property rights and quality of life issues for Tumwater residents. Simply widening existing roadways will not solve the problem, but creation of new roads and streets can have negative affects on neighborhood livability. With these things in mind, the evaluation and development of a well connected pattern of streets to promote the connectivity of pedestrian, bicycle and vehicular travel options should be evaluated during the development and review of all projects and related planning efforts. (TP 2.3)

The City's street classification system reflects each roadway's role in the regional and local transportation network. The roadway classification serves as the basis for design standards for each component of our transportation system. The City of Tumwater regulates these design standards through the Tumwater Development Guide, which designates elements such as roadway widths, grade, sidewalks, bike lanes, street lighting and other amenities for the different classifications of roadways. (TP 2.1)

In addition to specifying the physical elements of our transportation system, the Development Guide also requires that projects incorporate these elements as an integral part of the project. (TP 2.2)

Public Transportation

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

Intercity Transit buses can be seen carrying passengers throughout Tumwater on a daily basis. When the words 'public transportation' are mentioned, the first thought that often comes to mind is those very buses. Public transportation plays more than one very important role in the Tumwater transportation network; not only does it serve a need for urban mobility both within Tumwater and between Tumwater and nearby communities, but also the need for connecting youth, elderly and disabled citizens to community services and activities.

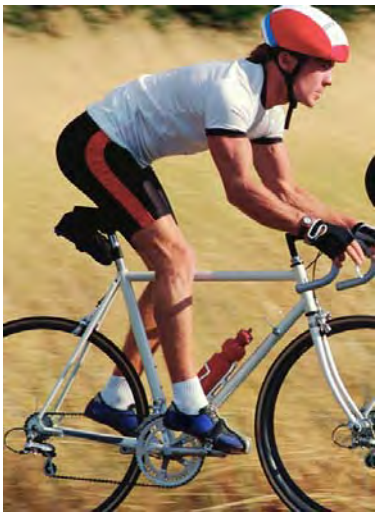
Finding ways to continue to increase the share of travelers who use public transportation is an ongoing effort; providing various options for reliable public transportation is critical to efficient and successful operation of our transportation system.

Detailed information and maps illustrating bus routes and van pools can be found at www.intercitytransit.com .

Public transportation in Tumwater, however, is not only provided by bus. Tumwater is surrounded by many isolated, low-density residential areas which would be a challenge to serve with traditional transit operations. Many local commuters rely on van pools as an alternative to driving alone, making park-and-ride facilities a valuable feature of our public transportation network. The Dial-a-Lift service is an example of individualized public transportation available for those unable to access more traditional transit services.

Bicycling

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



The Regional Bike Map, with routes and detailed information about sharing the road, can be found at www.trps.org .

Mention bikes on the road and you will likely stir some lively reaction. Bicycling is a subject that many people feel strongly about, whether they ride a bike or not. Those that ride often feel very passionate about the activity; as a source of healthy exercise as well as a clean source of transportation. Many that don't ride feel that bikes do not belong on the road with vehicles; that bikes slow traffic and their unpredictable movements create safety hazards.

Our State laws consider bikes to be vehicles, subject to traffic laws and roadway rights just as passenger vehicles are. The

Tumwater Transportation Plan addresses the need for safe bicycling facilities; including roadway shoulder enhancements where bike lanes are not provided and, in some areas, creating separate bike lanes on designated bicycle corridors and provisions for employers to offer and promote secure bicycle parking.

The Tumwater Development Guide includes a recommended system of bicycle routes. As projects develop, they are required to provide for bike lanes along those corridors that have been identified. As the Development Guide is updated, the system map should be expanded to include all of the arterial and collector roadways that have been recently annexed into the City. Bike lanes are also included as a component of Capital Facilities Plan projects undertaken by the City. (TP 6.1 & 6.2)

The identified system of on-street bike routes is complemented by the City's existing and proposed system of off-street multi-purpose trails. This trail system, included in the City's Parks and Recreation Plan, has been envisioned to link major environmental assets, park and recreational facilities, community centers, and historical features in Tumwater. As this plan is implemented, connections to transit systems and other multimodal systems allowing access to trail opportunities should be pursued. (TP 6.5)

Pedestrian facilities are an important component in providing commuters with a variety of options for getting to work.

Walking

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

The number of pedestrians in a downtown community is often seen as an indicator of economic health. Land use zoning calls for grouping various types of destinations in order that drivers can access a number of services and activities in a minimum number of trips. Once they reach the destination area, though, there must be adequate facilities to support safe pedestrian travel from one location to another.

Economic health is not the only factor to consider in building a walkable community. A network that provides safe routes to

local schools is a primary concern for local residents. Features that exhibit the City's commitment to this priority include well-maintained sidewalks and effective crosswalks – often marked by flashing beacons prior to the start and at the end of daily classes – near schools within the Tumwater district.

Each of the eight planning areas defined by the Tumwater Comprehensive Plan has its own groupings of land use zoning; some combine office space with public services while others combine retail and consumer services. One factor they share in common is the need to provide safe pedestrian travel opportunities such as well-maintained sidewalks, highly visible crosswalks and adequate lighting; as well as enforcement of vehicle speed zones and use of roadway features that serve as traffic calming devices.

In order to continue to provide and enhance pedestrian travel within the community the City's Development Guide requires that sidewalks and landscaped strips be constructed as elements of improvements to public street frontages. These improvements are also an integral part of the transportation improvements that the City completes as part of the Capital Facilities Plan. (TP 6.1 & 6.2)

A prime example of a pedestrian amenity built to control travel speed as well is located on Israel Road in front of Tumwater High School, where walkers are accommodated by a crosswalk that is constructed using materials that appear to be brick pavers, creating a contrast to the color of the roadway surface. The crosswalk is placed mid-block, which forces drivers to maintain lower speeds. The crosswalk connects to sidewalks on both sides of the roadway and also contains a pedestrian refuge in the center, surrounded by landscaping, allowing walkers to cross one lane of travel at a time.

Such facilities not only support the community of residents that choose walking as a healthy, cost-effective option; but also serve those that travel by vehicle as well, since each of those trips includes foot travel as the initial and final mode of travel.

Safe Routes to School

Near the main entrance to Tumwater High School, this crosswalk incorporates design features intended to control automobile speeds as well as promote pedestrian safety. Providing safe routes to school through sidewalks, bike lanes, and shoulders, is a key policy element for the City, and for the Region.

Rail

Goal: Ensure the long-term viability and continued use of existing rail lines in the region for freight and passenger rail travel.

The City supports this region goal. Although rail lines pass through Tumwater and serve industrial areas and a passenger station in nearby jurisdictions, no facilities of this nature are managed or maintained by the City of Tumwater.

Aviation

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

The Olympia Regional Airport provides a convenient alternative to highway travel for owners of private planes and helicopters. Business travelers have the option of commuting via small commercial planes. Some types of freight can be shipped more efficiently through use of airport facilities.

The airport's recently updated runway configuration is expected to serve airport operations through 2020.

Olympia Regional Airport

The Olympia Regional Airport is surrounded by Tumwater planning areas to the north, east and west. Although airport properties are managed by the Port of Olympia and it serves the entire region as a provider of passenger and freight transport, the Tumwater transportation system absorbs the ground transportation effects of its location such as inbound/outbound traffic and noise.

Marine Transportation

Goal: Provide an appropriate level of facilities and services to meet the region's marine transportation needs.

The City supports the regional goal; however there are no facilities of this nature in the City limits or its UGA.

Public Involvement

Goal: Convene on-going community discussions and public input into local transportation planning and decision-making processes.

Your opinion counts. That is a message that Tumwater city officials want you to hear. Your officials make every effort to invite your input on issues that affect you and your neighbors. Contact information for City staff is available on the City's website. Meeting notices are listed on the website, as well as in the local newspaper and, in some cases, they are also posted near a proposed project site and mailed to residents in the

vicinity. A well-designed and efficient transportation system must be a reflection of the needs of the people it serves.

Intergovernmental Coordination

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

No local transportation system functions independently; each provides connection to neighboring city, county or state systems. Travelers count on smooth transitions between these regional systems.

Our Regional Transportation Plan was prepared by TRPC, combining input from representatives of the cities of Tumwater, Lacey, Olympia, Rainier and Yelm, and the Town of Bucoda. Additional participants include Thurston County, Intercity Transit, Thurston County PUD No. 1, Confederated Tribes of the Chehalis Reservation, Nisqually Indian Tribe, WSDOT and local school districts.

Addressing Common Issues

Coordination among various agencies is paramount to creation of an efficient regional network that functions well for all. Identifying common issues and goals leads to a unified approach as well as cost savings when neighboring jurisdictions pool funds for improvements that will benefit more than one system.

Environmental and Human Health

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

When we mention environmental protection in connection with transportation, perhaps the most common thought that follows is,“vehicles cause pollution”. While this is true, and pollution has proven to have negative natural and human health effects, it is far from the only issue worth consideration. Additional considerations include mitigation of impacts on air and water quality, natural habitats and natural resources, as well as minimizing effects to local neighborhoods. Tumwater and the surrounding jurisdictions share a common feature in that large portions of their transportation systems extend into low density rural areas. This rural nature is not conducive to bike and pedestrian modes of travel – and that translates to a high reliance on automobiles.

Performance Measures

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

A major factor in any decision making process is determination of problems or issues. This goal refers to identifying which features of our transportation system, when monitored, can produce reliable and meaningful information regarding what works and what doesn't work with respect to the local system.

Indicators of System Function

-travel time

-vehicle miles traveled

-safety

-non-motorized mobility

Indicators of transportation system function could include counting how many vehicles have to wait to access I-5 from Tumwater Boulevard, to whether adequate funds are available for needed roadway repairs, to how familiar local residents are with Intercity Transit routes near their homes or places of employment. In order to provide a comprehensive view of the function of the Tumwater transportation system, a number of features need to be evaluated and tracked over time.

Transportation Funding

Goal: Ensure that transportation revenues provide maximum public benefit and support adopted land use strategies.

Building and maintaining a transportation system can't happen without adequate funding. Revenue sources for transportation projects in Tumwater include state and federal grants, utility taxes, gas tax, real estate excise tax, and collection of traffic impact (mitigation) fees.

Developers Make a Contribution

Traffic impact fees (TIF) are financial contributions that developers pay toward construction of system improvements. The amount of the developer's proportionate share is determined by the benefit they receive from the roadway and the amount of traffic they are anticipated to generate.

The projects identified in this plan are required in large part due to development growth in the City. It is important that the City's transportation impact fees are reviewed on a regular basis to ensure that development is contributing its proportionate share of funding these projects. (TP 8.2)

House Bill 1487 Compliance

In 1998 the Washington State Legislature passed House Bill (HB) 1487, to address transportation planning and growth management within the state. This "Level of Service Bill" supports the identification and coordinated planning efforts for

major transportation facilities that are recognized as "transportation facilities and services of statewide significance" (TFSSS).

The intent of the legislation is to ensure that existing planning processes effectively coordinate the overall transportation planning efforts of local, regional and state agencies. HB 1487 identifies specific Growth Management Act (GMA) planning requirements for local jurisdictions, declares that the State establishes level of service, and explicitly exempts Highways of Statewide Significance from concurrency requirements. Additional details regarding HB 1487 compliance are included in *Appendix A.*

The legislation recognized the importance of TFSSS from a State planning and programming perspective and requires local jurisdictions to reflect these facilities and services within their comprehensive plans.

The City of Tumwater will continue to collaborate with WSDOT, the Office of Community Development (OCD) and TRPC to enhance the consistency of statewide transportation planning at the local, regional and state level and will update the Tumwater Transportation Plan as necessary to comply with HB 1487.

Concurrency

The City of Tumwater requires that adequate levels of service on transportation facilities are ensured for existing land uses as well as new development, that transportation facilities achieve and maintain the City's level of service standards, and that the City's level of service standards are achieved concurrently with development as required by the Growth Management Act (GMA). Concurrent shall mean at the same time as the development impacts, or planned and funded for construction within six years.

The City will not make a finding of concurrency as a part of the issuance of a building permit if the proposed development

Concurrency and Transportation

Before new development is permitted, a project must pass a test of concurrency, ensuring one of the following to be true:

1) Adequate infrastructure to accommodate transportation impacts is already in place.

2) Infrastructure improvements to support transportation impacts will be constructed with the project.

3) Financial commitments are in place to build the needed improvements within a six-year timeframe.

will result in the transportation facilities declining below the adopted level of service standards. The City had previously adopted Level of Service (LOS) E for the intersection of Capitol Boulevard/Trosper Road and the Trosper Road/I-5 interchange. LOS D has been established for the remainder of the City and its Urban Growth Area.

House Bill 1487, which amended the Growth Management Act, states that WSDOT has the authority to designate the LOS for Highways of Statewide Significance (HSS). Because Interstate 5 is an HSS route, the City cannot specify the LOS at the Trosper Road/I-5 interchange. The current designation is an adopted LOS E for the intersection of Capitol Boulevard/Trosper Road and LOS D for the remainder of the City and its Urban Growth Area.

Projects shown to degrade the level of service below these adopted standards shall be required to provide appropriate mitigation to raise the level of service to the designated standard as a condition of permit approval. Methods for the City to monitor these commitments include:

- Review and update the Capital Facilities Plan transportation element annually to identify facilities necessary to achieve transportation concurrency;
- Make appropriate revisions to the Six-Year TIP;
- Review the Tumwater Comprehensive Plan and other related studies for necessary improvements;
- Update LOS standards as appropriate to reflect conditions and preferences from citizens, policy makers and TRPC.

"Level of Service" Defined

LOS ratings indicate how efficiently a particular roadway segment or intersection handles traffic conditions during peak travel times. As traffic volumes approach designed capacity, congestion increases, resulting in declining LOS. Tumwater rates LOS of transportation facilities using the letters "A" through "F"; a rating of LOS A denotes efficient operations while a rating of LOS F indicates failure to accommodate current or expected traffic volumes.

Six-Year TIP

The Six-Year TIP sets interim project priorities and establishes budgets. The TIP is updated annually in July.

Tumwater's current six-year TIP is included in the Capital Facilities Plan, and can be found on the City's website at www.ci.tumwater.wa.us .

Chapter 3 Existing Conditions (2005)

Existing Transportation System

Roadways

Functional Classification

Classification of streets and highways in the State of Washington is based upon guidelines prepared by the Federal Highway Administration (FHWA) and administered by the Washington State Department of Transportation (WSDOT). Streets are classified based on the degree to which they provide through movement and land access functions. Based upon the street function, certain land use policies and street standards apply. The design of roads depends upon their functional classification and usage. There are three highway functional classifications: arterial, collector, and local roads:

Major (Principal) Arterials are streets and highways that carry the greatest portion of through or long-distance travel. Such facilities serve the high-volume travel corridors that connect major generators of traffic. The selected routes provide an integrated system for complete circulation of traffic, including ties to the major rural highways entering urban areas.

Tumwater Boulevard - This principal arterial is a major east-west route through southern Tumwater, connecting drivers to I-5, industrial properties and the Olympia Regional Airport.

Minor (Secondary) Arterials are streets and highways that connect with remaining arterial and collector roads that extend into the urban area. Minor arterial streets and highways serve less concentrated traffic-generating areas, serve as boundaries to neighborhoods, and collect traffic from collector streets. Although the predominant function of minor arterials is the

movement of through traffic, they also provide for considerable local traffic that originates or is destined for points along the corridor.

Collectors are streets that provide direct services to residential areas, local parks, churches and areas with similar uses of the land. To preserve the amenities of neighborhoods, they are usually spaced at about half-mile intervals in order to collect traffic from local access streets and convey it to major and minor arterial streets and highways. Collector streets are typically one to two miles in length. Direct access to abutting land is essential. The City of Tumwater classifies collectors as Commercial/Industrial Collectors or Urban Collectors.

Israel Road SW - This urban collector connects minor and principal arterials, and provides access to Tumwater High School, a church, and local and state government facilities.

Local access roads allow access to individual homes, shops, and similar destinations. Because they provide direct access to adjacent land and to the higher classification of roadways, they are designed to discourage through traffic.

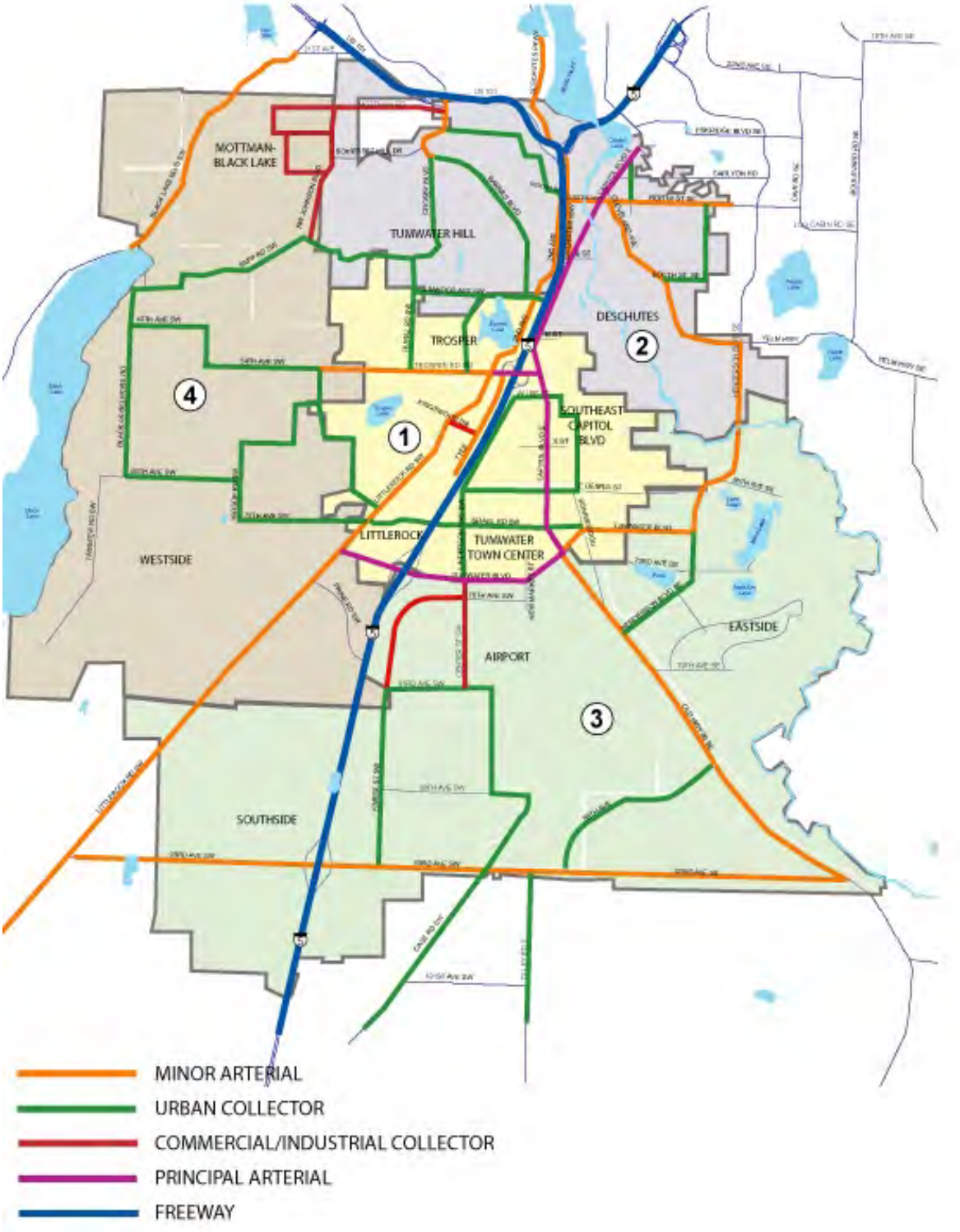
Exhibit 3-1 illustrates the functional classification of the major streets and highways within the City.

City Design Classification

In addition to primary transportation facilities being functionally classified within the Federal system, the City also specifies its own road design classifications and standards. The City uses the functional classification to meet Federal and State requirements while the design classifications are used to identify specific roadway components such as number of lanes, sidewalks, medians, bicycle lanes and lighting. Design standards enable the City to implement a network of arterials, collectors and local access roadways that is consistent with the goals and objectives of this Plan. These standards require multi-modal improvements such as illumination, sidewalks, landscape areas and bike lanes (on designated routes) on arterial, collector and local streets. Specific details for design standards are included in the City's Development Guide.

Exhibit 3-1

City of Tumwater Functional Classification



Air and Rail Service

The Olympia Regional Airport consists of 835 acres within the city limits of Tumwater. The Port of Olympia recently began relocating 750 feet of the main airport runway and other related improvements, which were mandated by the Federal Aviation Administration for safety reasons. 88th Avenue, Case Road and Tilley Road were realigned to accommodate the runway expansion.

Olympia Regional Airport, located within City limits, provides transportation services for people and goods to/from the region.

Uses at the airport include general and corporate aviation, commercial passenger/freight facilities, and aviation-related commercial and light industrial uses. The airport had approximately 170 based aircraft in 2004. The Port of Olympia completed its *Airport Layout Plan Update* in 2003 which provides for anticipated growth in airport activity.

The Burlington Northern Santa Fe Railroad (BNSF) serves the Mottman Industrial Area, and a Union Pacific branch line passes through Tumwater, connecting the Port of Olympia with the BNSF mainline.

Freight Mobility

Washington State's Freight and Goods Transportation System (FGTS) classifies state highways, county roads and city streets according to the tons of freight that are carried on them each year. No roadways within the City of Tumwater are listed as carrying significant volumes of freight, although Mottman Road and R.W. Johnson Boulevard are classified as T-3 within the City of Olympia, beginning at the Tumwater city limits. This classification means the roadway carries 300,000 to 4,000,000 tons annually.

Ongoing and potential future development at the Port of Olympia and surrounding light industrial properties will increase the freight traffic on City and State facilities in this area. Facilities accessing Interstate-5, including Tumwater Boulevard and 93rd Avenue, will be the most significantly impacted.

Both air travel and rail serve freight mobility. For certain freight needs these modes of shipment and delivery can reduce numbers of trucks on the road.

Non-Motorized Facilities

Tumwater previously developed a recommended system of bicycle routes. This system includes on-street routes designated as part of a "backbone" system, providing users recommended routes *through* the City. The system also includes routes designated as "distribution links" to provide users with recommendations to access areas *within* the City.

The Recommended System of Bicycle Routes is shown in *Exhibit 3-2*. Also included is a section of Capitol Boulevard between "M" Street and Tumwater Boulevard. This segment of roadway has been identified as an area where provisions for bicycles should be incorporated. These may not include full width bike lanes but could include such things as wide bike shoulders and other considerations. Tumwater is currently working with TRPC members to develop a Regional Trails Plan for communities in Thurston County. A Regional Citizens Trail Advisory Committee, comprised of trail users, has been established to provide input on the Plan. Priorities for Tumwater include the Deschutes River Trail, completing connections between Tumwater and the Chehalis-Western Trail, and the Williams Gas Pipeline Trail. Appendix C includes maps of the proposed trails in the urban area.

Bicycle Travel in Tumwater

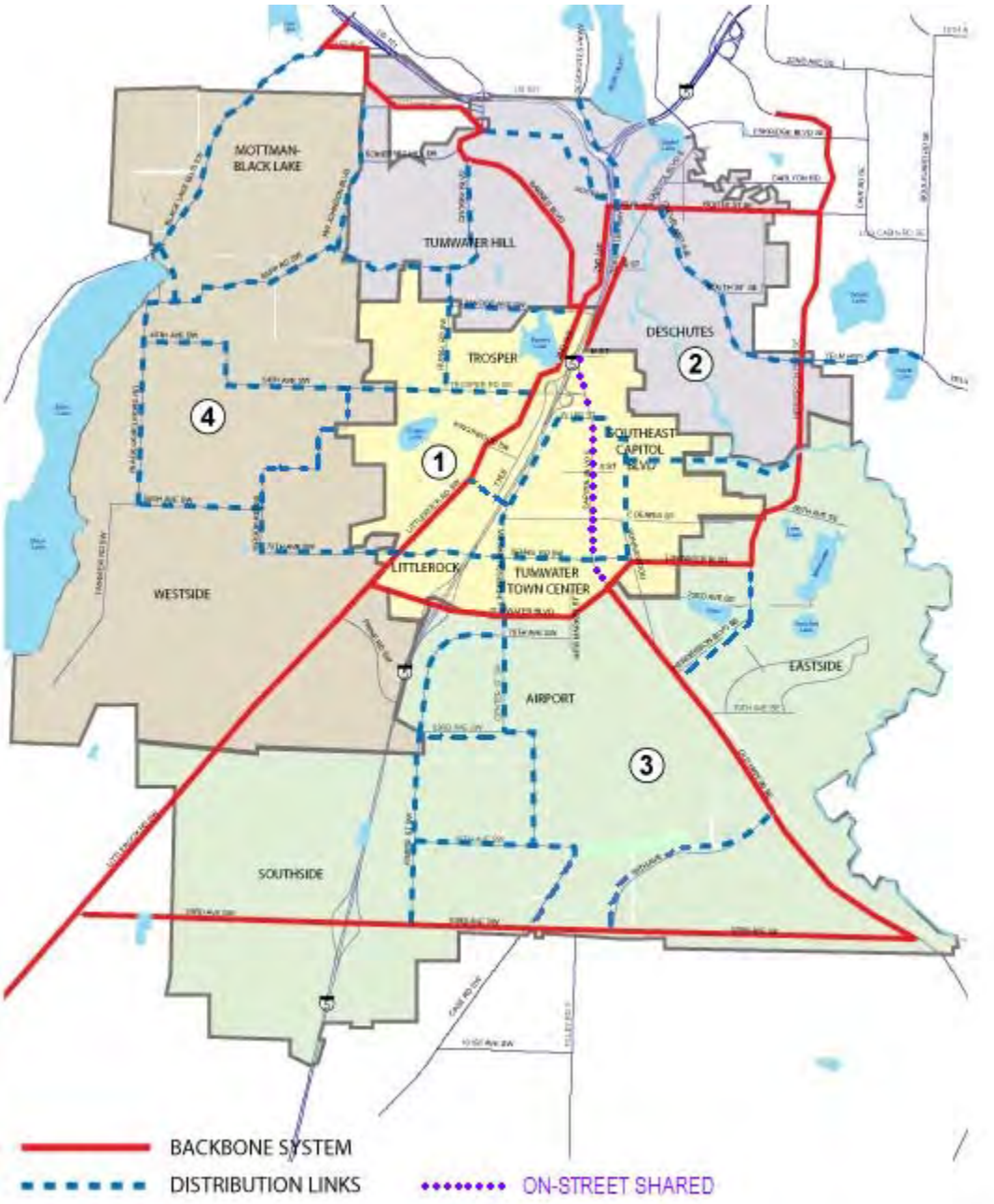
The City's recommended "on-street" bicycle route system works in conjunction with existing and planned "off-street" trails to provide non-motorized users both commute and recreational access throughout the City. These trail systems have been developed and planned as part of the City's 2007 Park, Recreation and Open Space Plan and is consistent with the Regional Trails Plan being developed by TRPC.

The Gate to Belmore railroad line was acquired in 1996 by Thurston County from Burlington Northern Railroad. This corridor links the urban trail system from Tumwater at Kenneydell County Park with the south county communities of Gate and Rochester. The future 12.5 mile trail (when developed) will offer access to the Black River and runs adjacent to the Black River-Mima Prairie Glacial Heritage Preserve and Black River Natural Area just south of Littlerock.

Many of the City's streets, from the local residential streets to our principal arterials, include sidewalks and other amenities for non-motorized use. Because these streets have developed over time and standards have changed, there are gaps in the

system. Current standards for both private development and City sponsored projects include non-motorized amenities on new and redeveloped portions of streets, to extend the system throughout the City and its growth area and infill gaps in current facilities. Non-motorized elements are identified as components of projects in the City's Transportation Improvement Program.

Exhibit 3-2
City of Tumwater Recommended System of Bicycle Routes



Public Transportation

Intercity Transit is the municipal corporation providing public transportation service within Thurston County. IT currently operates four routes serving the City.

Route 12 runs from the Olympia Transit Center along Capitol Boulevard to Tumwater Square, continuing south to Linwood Avenue and Littlerock Road to Israel Road to the Department of Labor & Industries (L&I). It provides 30-minute service during peak commute times and hourly service otherwise.

Route 13 travels from Olympia via Capitol Boulevard to Tumwater Square, Point Plaza, Tumwater High School and L&I. Buses run every 30 minutes, and hourly on Saturdays.

Routes 42 and 43 serve County facilities and South Puget Sound Community College (SPSCC) on weekdays only. Route 42 runs from SPSCC to Family Court, up R.W. Johnson Boulevard and circles back via Crosby Boulevard. Route 43 serves the County Courthouse via Deschutes Parkway and Evergreen Park Drive, continues to SPSCC, Crosby Boulevard and Barnes Boulevard to Tumwater Square. Route 42 provides 25-minute service during morning commute hours and afternoons, and Route 43 provides all-day 30-minute service.

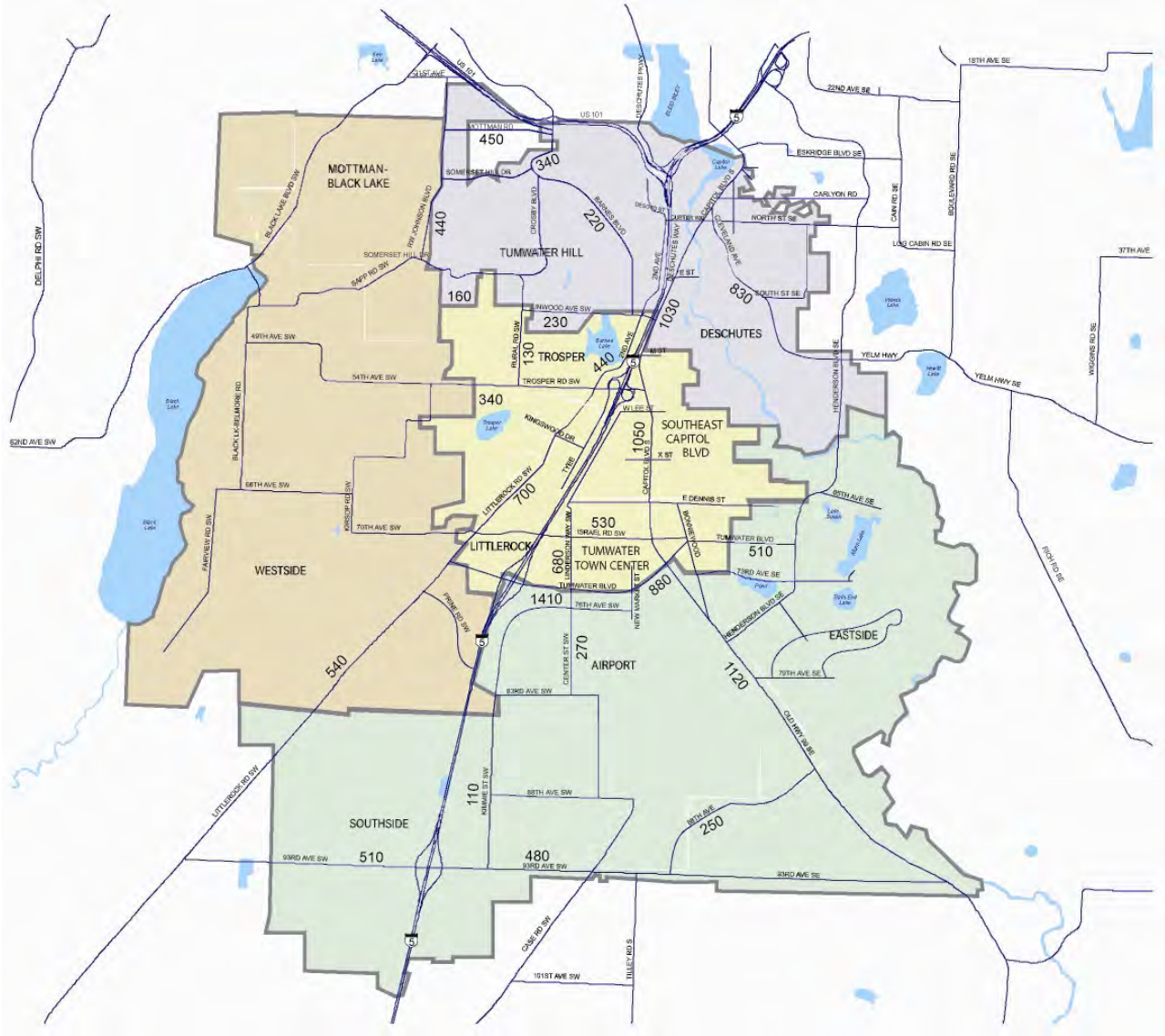
Route 68 runs between the Olympia and Lacey Transit Centers, by way of Tumwater Square on Cleveland Avenue and North Street. Thirty-minute service is provided during peak commute hours, with hourly service provided during off-peak times.

Intercity Transit

Intercity Transit is the public transportation service provider for Thurston County, including the City of Tumwater. Up-to-date information regarding routes that currently serve the Tumwater area can be obtained online at www.intercitytransit.com .

Exhibit 3-3

City of Tumwater Existing Traffic Volumes (2005)



This map illustrates evening peak hour volumes taken from 2005 traffic counts; a key component in analyzing how the existing network functions. Chapter 4 of this Plan provides more detail regarding current operations within the City's transportation network.

Chapter 4 Existing Operations (2005)

Overview

A key element of the Transportation Plan is to assess the operations of the major roadways and intersections in the City's transportation network under current conditions. In order to determine if a particular intersection or roadway is functioning within an acceptable level, the traffic volumes moving through the network are reviewed and analyzed.

The City of Tumwater has adopted a Level of Service (LOS) standard of "D" for transportation facilities within the City and its Urban Growth Area (UGA). The only exception to this is the intersection of Capitol Boulevard/Trosper Road, where LOS E is the standard. Transportation facilities, which include City arterials and transit routes, functioning below the adopted standards are determined to be "failing".

The methodology used to analyze Signalized Intersections, Unsignalized Intersections, and Roadway Segments is different for each type of facility. A detailed description of the analysis process, software, and best-practices policies for determining operational characteristics are included in *Appendix B* of this Plan.

The following tables and maps summarize the existing conditions (based on P.M. peak hour traffic volumes from April 2005) for each of the Transportation Planning Areas. Facilities meeting or exceeding the adopted LOS standard are illustrated in green (LOS A,B,C) and yellow (LOS D). Those intersections and roadways that are "failing" are indicated by orange (LOS E) and red (LOS F).

Summary

Based on the City's adopted LOS, a majority of roadways and intersections in the Tumwater system have sufficient capacity for current transportation needs.

Transportation Planning Area 1

Table 4.1. Existing Operations – Transportation Planning Area 1

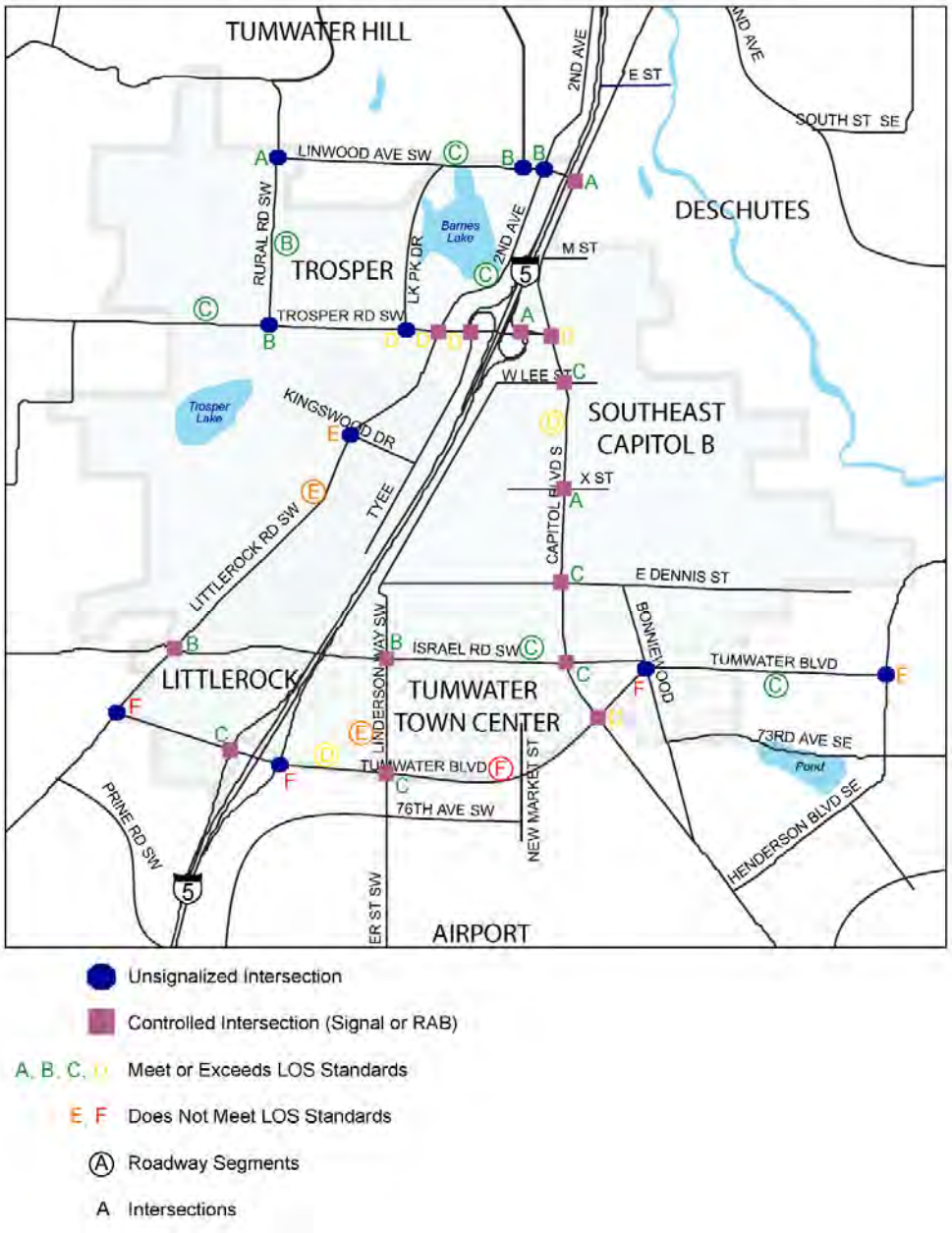
Intersections [1]	Facility		LOS
Signal / RAB Controlled	Capitol Blvd / Linwood Ave SW		A
	Littlerock Rd SW / Trosper Rd SW		D
	I-5 Southbound Ramps / Trosper Rd SW/Tyee Dr		D
	I-5 Northbound Ramps / Trosper Rd SW		A
	Capitol Blvd / Trosper Rd SW		D
	Capitol Blvd / Lee St		C
	Capitol Blvd / X St		A
	Capitol Blvd / Dennis St		C
	Littlerock Rd SW / Israel Rd		B
	Linderson Way SW / Israel Rd		B
	Capitol Blvd / Israel Rd		C
	I-5 Southbound Ramps / Tumwater Blvd		C
	Linderson Way SW / Tumwater Blvd		C
	Capitol Blvd / Tumwater Blvd		D
Unsignalized	Rural Rd SW / Linwood Ave SW		A
(LOS for unsignalized	S 7th Ave / Linwood Ave SW		B
intersections is based on	S 2nd Ave / Linwood Ave SW		B
worst movement)	Lake Park Dr / Trosper Rd SW		D
	Rural Rd SW / Trosper Rd SW		B
	Littlerock Rd SW / Kingswood Dr		E
	Littlerock Rd SW / Tumwater Blvd		F
	I-5 Northbound Ramps / Tumwater Blvd		F
	Bonniewood Dr / Tumwater Blvd		F
Roadway / Corridor [2]	**Segment**	**Peak Directional Volume**	**LOS**
Linwood Ave SW	Rural Rd SW to S 7th Ave	230	C
Capitol Blvd	E St to Linwood Ave SW	1,030	D
Rural Rd SW	Linwood Ave SW to Trosper Rd SW	130	B
2nd Ave SW	Linwood Ave SW to Trosper Rd SW	440	C
Trosper Rd SW	Kirsop Rd to Rural Rd SW	340	C
Capitol Blvd	Lee St to "X" St	1,050	D
Littlerock Rd SW	Kingswood Dr to Israel Rd	700	E
Israel Rd	Linderson Ave SW to Capitol Blvd	530	C
Linderson Ave SW	Israel Rd to Tumwater Blvd	680	E
Tumwater Blvd	I-5 Northbound Ramps to Linderson Ave SW	1,410	D
Tumwater Blvd	Linderson Ave SW to Capitol Blvd	880	F
Tumwater Blvd	Bonniewood Dr to Henderson Blvd	510	C

1 Intersection LOS determined using Highway Capacity Manual methodology

2 LOS assessments based on criteria described in 2002 Florida Department of Transportation (FDOT) Level of Service Handbook

Exhibit 4-1

TPA 1 - 2005 Operations and LOS



Addressing Existing Deficiencies

Current data shows the intersections of Littlerock Road SW with Kingswood Drive and Tumwater Boulevard, as well as the roadway segment between them, to be failing. Installation of modern roundabouts at both intersections, and also at Israel Road, will restore acceptable levels of service.

The planned widening of Tumwater Boulevard between Linderson Way and Capitol Boulevard is underway and will support the high volumes between I-5 and Capitol Boulevard. Intersection channelization at Linderson Way/Tumwater Boulevard is designed to support volumes at that location.

A study currently underway will determine the best alternative to accommodate traffic volumes at the Tumwater Boulevard/I-5 interchange.

Thurston County's Six-Year TIP includes improvements to the Tumwater Boulevard/Henderson Boulevard SE intersection. Improvement options would be either a traffic signal or roundabout. This intersection was recently annexed into the City.

Transportation Planning Area 2

Table 4.2. Existing Operations - Transportation Planning Area 2

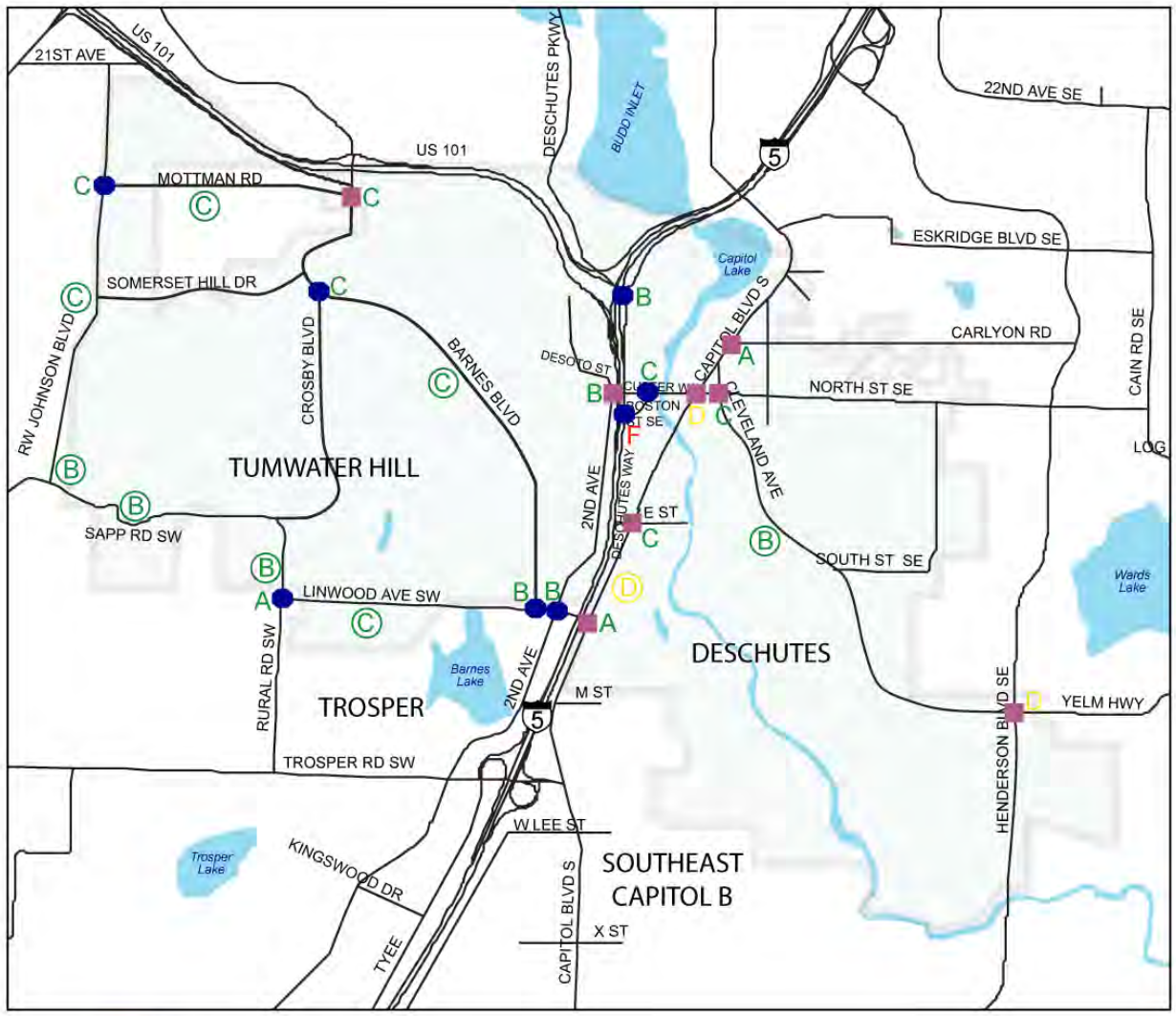
Intersections [1]	Facility		LOS
Signal / RAB Controlled	Crosby Blvd / Mottman Rd		C
	Capitol Blvd / Carlyon Ave SE		A
	S 2nd Ave / Custer Way		B
	Capitol Blvd / Custer Way		D
	Capitol Blvd / "E" St		C
	Capitol Blvd / Linwood Ave		A
	Cleveland Ave / Custer Way		C
	Yelm Hwy / Henderson Blvd		D
Unsignalized	R W Johnson Blvd / Mottman Rd		C
	Crosby Blvd / Barnes Blvd		C
	Capitol Blvd / Cleveland Ave		B
	Custer Way / Boston St SE		C
	Boston St SE / Deschutes Way		F
	Deschutes Pkwy / US 101 Ramp		B
	R W Johnson Blvd / Sapp Rd SW		B
	Rural Rd SW / Linwood Ave		A
	S 7th Ave / Linwood Ave		B
	S 2nd Ave / Linwood Ave		B
Roadway / Corridor [2]	**Segment**	**Peak Directional Volume**	**LOS**
Mottman Rd	R W Johnson Blvd to Crosby Blvd	450	C
Barnes Blvd	Crosby Blvd to Linwood Ave SW	220	C
R W Johnson Blvd	Mottman Rd to Sapp Rd SW	440	C
Sapp Rd SW	R W Johnson Blvd to Linwood Ave SW	160	B
Linwood Ave SW	Rural Rd SW to S 7th Ave	230	C
Capitol Blvd	"E" St to Linwood Ave SW	1,030	D
Cleveland Ave	Custer Way to Henderson Blvd	830	B

1 Intersection LOS determined using Highway Capacity Manual methodology

2 LOS assessments based on criteria described in 2002 Florida Department of Transportation (FDOT) Level of Service Handbook

Exhibit 4-2

TPA 2 - 2005 Operations and LOS



Addressing Existing Deficiencies

The Cleveland Avenue/Custer Way Strategy Area Transportation Plan identified improvements which would improve connectivity from Capitol Boulevard east to Yelm Highway. Such improvements would distribute volumes away from the vicinity and also decrease reliance on I-5 as a route through the Tumwater/Olympia/Lacey area. A result of this change would be an improvement in LOS at the Boston Street/Deschutes Way intersection.

Transportation Planning Area 3

Table 4.3. Existing Operations - Transportation Planning Area 3

Intersections [1]	Facility		LOS
Signal / RAB Controlled	I-5 Southbound Ramps / Tumwater Blvd		C
	Linderson Way / Tumwater Blvd		C
	Capitol Blvd / Tumwater Blvd		D
	Old Hwy 99 / 88th Ave SE		A
	Capitol Blvd / Henderson Blvd		A
Unsignalized	I-5 Northbound Ramps / Tumwater Blvd		F
	Henderson Blvd / Tumwater Blvd		E
	Center St SW / 76th Ave SW		C
	Capitol Blvd / 79th Ave SE		F
	Kimmie St SW / 83rd Ave SW		B
	Center St SW / 83rd Ave SW		B
	I-5 Southbound Ramps / 93rd Ave SW		F
	I-5 Northbound Ramps / 93rd Ave SW		F
	Kimmie St SW / 93rd Ave SW		D
	S Tilley Rd / 93rd Ave SE		B
	Old Hwy 99 / 93rd Ave SE		C
Roadway / Corridor [2]	**Segment**	**Peak Directional Volume**	**LOS**
Tumwater Blvd	I-5 Northbound Ramps to Linderson Ave SW	1,410	D
Tumwater Blvd	Linderson Ave SW to Capitol Blvd	880	F
Tumwater Blvd	Bonniewood Dr to Henderson blvd	510	C
Littlerock Rd SW	Tumwater Blvd to 93rd Ave SW	540	C
Center St SW	76th Ave SW to 83rd Ave SW	270	C
Old Hwy 99	Henderson Blvd to 79th Ave SE	1,120	F
Kimmie St SW	83rd Ave SW to 93rd Ave SW	110	B
93rd Ave SW	Littlerock Rd SW to I-5 Southbound Ramps	510	C
93rd Ave SW	Kimmie St SW to Case Rd SW	480	C
88th Ave SE	93rd Ave SE to Old Hwy 99	250	C

1 Intersection LOS determined using Highway Capacity Manual methodology

2 LOS assessments based on criteria described in 2002 Florida Department of Transportation (FDOT) Level of Service Handbook

Exhibit 4-3
TPA 3 - 2005 Operations and LOS

Addressing Existing Deficiencies

As mentioned in the summary for TPA 1, the Tumwater Boulevard/I-5 interchange is currently the subject of a study to determine the best alternatives for supporting high traffic volumes, and the intersection of Tumwater Boulevard and Henderson Boulevard SE will be improved with a signal or roundabout, improving levels of service at those locations.

The City's Six-Year TIP also identifies projects to widen Capitol Boulevard/Old Highway 99 between 73rd Avenue SE and 79th Avenue SE which will address the deficiencies in that vicinity. Signalization has recently been implemented at the Highway's intersection with Henderson Boulevard which has improved LOS at that location.

WSDOT is currently collecting fees for a project designed to improve conditions at the 93rd Avenue SW/I-5 southbound ramps; construction is expected to occur in 2009. Current private development plans include improvements to the I-5 northbound ramps at 93rd Avenue SW to provide an eastbound left-turn pocket.

Transportation Planning Area 4

Table 4.4. Existing Operations - Transportation Planning Area 4

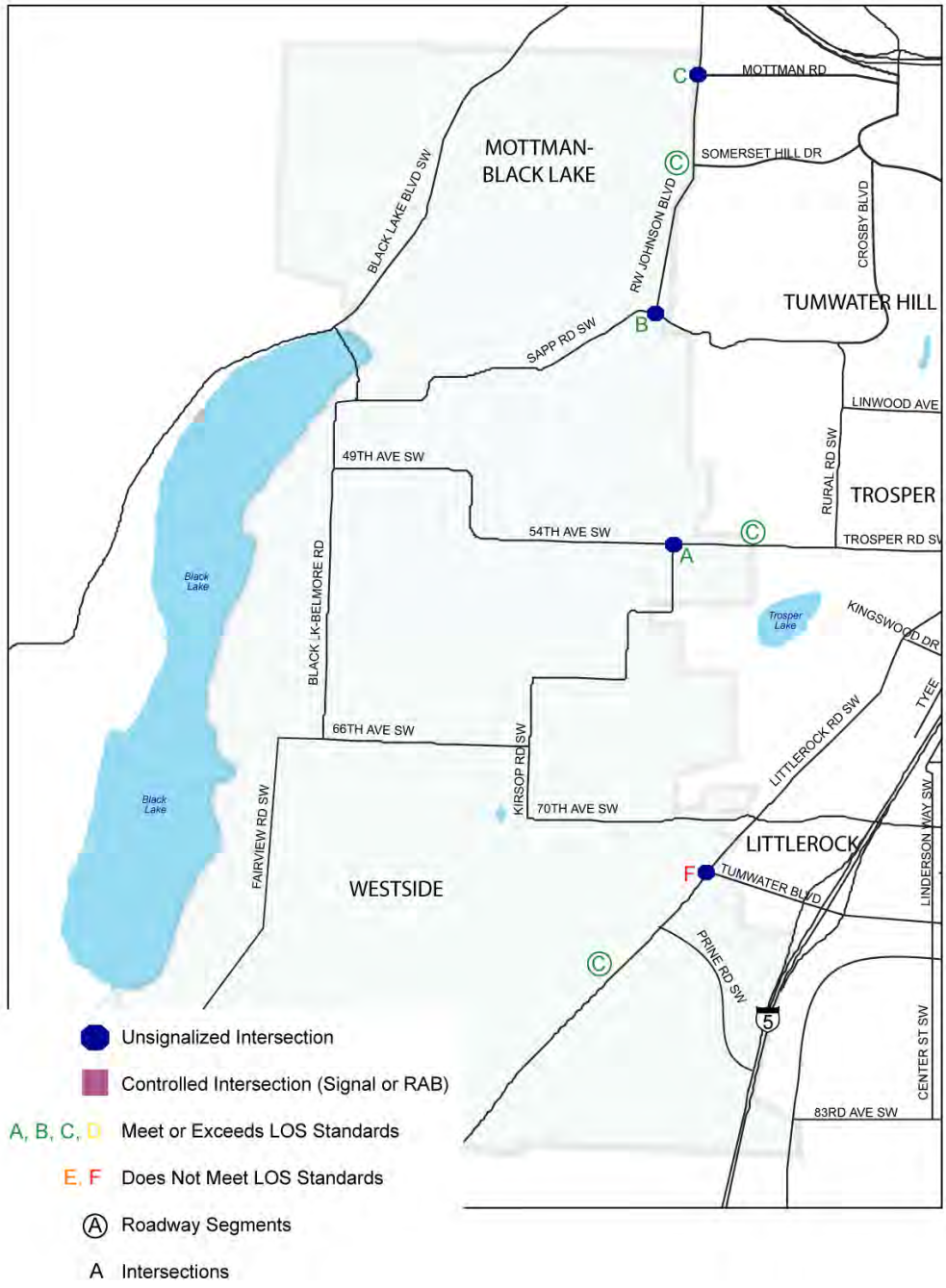
Intersections [1]	Facility		LOS
Unsignalized [2]	R W Johnson Blvd / Mottman Rd		C
	Sapp Rd SW / R W Johnson Blvd		B
	Kirsop Rd SW / Trosper Rd SW		A
	Littlerock Rd SW / Tumwater Blvd		F
Roadway / Corridor [3]	**Segment**	**Peak Directional Volume**	**LOS**
R W Johnson Blvd	Mottman Rd to Sapp Rd SW	440	C
Trosper Rd SW	Kirsop Rd SW to Rural Rd SW	340	C
Littlerock Rd SW	Tumwater Blvd to 93rd Ave SW	540	C

1 Intersection LOS determined using Highway Capacity Manual methodology

2 Currently no intersections within TPA 4 are signalized

3 LOS assessments for roadway segments based on criteria described in 2002 Florida Department of Transportation (FDOT) Level of Service Handbook

Exhibit 4-4
TPA 4 - 2005 Operations and LOS



Addressing Existing Deficiencies

The Black Hills SubArea Transportation Plan identified several strategies designed to deal with growth expected in TPA 4.

As noted in the summary of TPA 1, planned improvements on Littlerock Road SW include installation of a modern roundabout at its intersection with Tumwater Boulevard which will bring LOS in line with current standards.

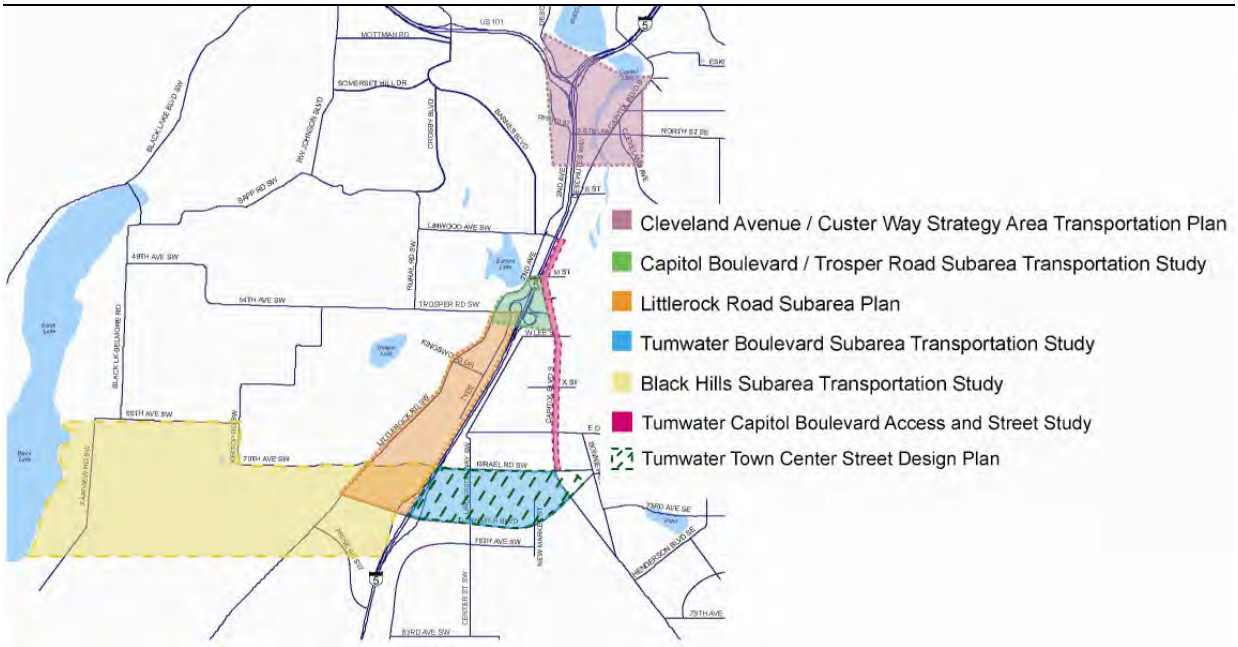
Chapter 5 SubArea Planning Recommendations

Introduction

The 1998 Transportation Plan identified particular areas that would require additional study in order to ensure that they would provide adequate service to the transportation system in the future. Study areas varied; some included portions of multiple planning areas, others included isolated sections of one planning area.

See *Appendix D* for additional information regarding SubArea Plan recommendations.

Exhibit 5-1
SubAreas / Strategy Areas



The results and recommendations from each of these studies have been incorporated into the development of this Transportation Plan. This chapter describes the study areas and the issues addressed in each. Detailed information regarding recommended improvements is located in *Appendix D*.

Tumwater Boulevard SubArea Transportation Study

The Tumwater Boulevard SubArea is bounded by Israel Road to the north, the Olympia Regional Airport to the south, I-5 to the west, and Capitol Boulevard/Old Highway 99 to the east. This area has since been described as the Tumwater Town Center

The 1998 Transportation Plan identified the Tumwater Boulevard/New Market vicinity as the City's highest potential growth area for the coming 20 years. Office and industrial development planned on Port properties, combined with plans for large office complexes on nearby properties, would mean more than one million square feet of new office space within the next six years, exceeding earlier 20-year growth projections. This type of land use generates high peak hour traffic levels.

The Tumwater Boulevard SubArea Study was conducted to address conditions expected to result from the rapid growth. A Stakeholders' Committee was formed in order that public input would be considered in shaping study goals and objectives. The committee included City and WSDOT staff; participants from the City Council, Intercity Transit, Port of Olympia and the Chamber of Commerce; and an area citizen.

Recommended Improvements

Several of the improvements identified in the Tumwater Boulevard Study have been completed, or are in process, including signal phasing to improve circulation, upgraded pedestrian safety features and other improvements included as part of the Tumwater Boulevard project.

Additional planned projects include widening Tumwater Boulevard and Linderson Way, construction of a roundabout at New Market Street and addition of designated turn lanes for improved circulation.

See *Appendix D, Table D-1* for additional details.

Capitol Boulevard/Trosper Road SubArea Transportation Study

The Capitol Boulevard/Trosper Road SubArea is the segment of Capitol Boulevard bounded by "M" Street to the north, Lee Street to the south, extending west to Littlerock Road and including the I-5 junction northbound and southbound ramp terminals.

Recommended Improvements

The Capitol Boulevard/Trosper Road SubArea Study identified several improvements to ease congestion. Completed projects include widening of the I-5 bridge, the addition of traffic signals and creation of exclusive turn lanes, as well as construction of Tyee Drive, a two-lane commercial collector.

Additional details are located in *Appendix D, Table D-2*.

The Capitol Boulevard/Trosper Road intersection was identified in the 1998 Transportation Plan as the primary transportation junction in the City, as it serves both the City's highest traffic corridor and the high demand of traffic waiting to enter the I-5 system. The proximity of the I-5 ramp terminals on Trosper Road held heavy influence over the traffic movements and signal operations at the intersection; drivers frequently had to wait through two or three signal cycles to get through the intersection. These conditions caused downstream congestion, often creating backups to and through the Lee Street intersection. Traffic levels were on the edge of acceptable LOS standards and were forecast to become worse.

The Capitol Boulevard/Trosper Road SubArea Study was conducted to identify feasible transportation solutions to improve current and future conditions, for both motorized and non-motorized travel.

Because public outreach was an important factor in the development of the study, a Stakeholders' Committee was formed comprised of City and WSDOT staff; representatives from the City Council, Port of Olympia, Intercity Transit and Chamber of Commerce; and an area citizen. Although study objectives reflected the interests of the City, all were reviewed and endorsed by the Stakeholders.

Littlerock Road SubArea Transportation Study

The Littlerock Road SubArea is bounded by Littlerock Road to the west, I-5 to the east, Trosper Road to the north, and Prine Road to the south.

The Littlerock Road SubArea Plan was adopted in 1997 following a series of public forums, stakeholder interviews, a visioning survey, environmental impact statement, public meetings, and public hearings before the Planning Commission and City Council.

The plan resulted in a series of zoning code changes in order to group commercial retail uses (large scale retail) in the northern part of the SubArea (south of Trosper Road) and place mixed-

Recommended Improvements

Key outcomes of the Littlerock Road Study included the construction of Kingswood Drive, as well as plans to construct roundabouts at intersections with Kingswood Drive, Odegard Road, Israel Road and Tumwater Boulevard.

Additional ugrades including bike lanes, crosswalks and landscaped medians will enhance safety for non-motorized travel.

See *Appendix D, Table D-3* for more detail.

use generally in the middle of the SubArea, with additional general commercial to the south surrounding Tumwater Boulevard. An important feature of the plan was the eventual development of what is now Tyee Drive, a frontage road generally paralleling Interstate 5, in order to reduce traffic and congestion on Littlerock Road. The use of this frontage road concept allowed the road network to accommodate expected traffic increases without using a four lane cross section on Littlerock Road; thereby meeting requests of local residents that the rural nature of Littlerock Road remain intact.

Recently another look was taken at this area. This update to the Littlerock Road SubArea Study again confirmed the importance of developing Tyee Drive to the south in order to maintain Littlerock Road as a boulevard-type roadway. The importance of east-west connections within the area was also highlighted.

Tyee Drive will continue to be an important component as the Littlerock SubArea network develops; allowing Littlerock Road to maintain its rural character.

Black Hills SubArea Transportation Study

The Black Hills SubArea is bounded by 66th Avenue/70th Avenue to the north, 81st Avenue to the south, I-5 to the east, and Black Lake to the west.

The Tumwater/Thurston County Joint Plan adopted in 1995 identified the area south of 70th Avenue and west of Littlerock Road as an area with high growth potential. During the past ten years, the creation of several residential subdivisions and opening of the Black Hills High School campus, combined with proposals for additional residential and commercial development, caused a need to evaluate transportation improvements and circulation in the area. The Black Hills SubArea Study was completed to provide a blueprint for the 2020 transportation system, so that potential new corridors or other options were precluded as development occurs; and to ensure the design of a roadway network that can accommodate both existing conditions and future development.

A Transportation Advisory Committee (TAC) was formed to guide the study process. TAC members included City and County staff; representatives of the Tumwater School District

Recommended Improvements

To accommodate anticipated rapid growth in the Black Hills SubArea, improvements identified in the Study include urban upgrades, such as the bike lanes and sidewalks recently constructed in conjunction with new development on 70th Avenue.

Additional improvements include construction of north-south connectors to create a network grid which will facilitate circulation in the SubArea. These improvements are expected to be constructed as development occurs.

Additional detail is located in *Appendix D, Table D-4*.

and the Doelman family (major landowner within the study area); and members of the local community.

Input from the general public was of vital importance to the final recommendations of the plan. Findings of the TAC were presented for review and comment by local citizens through a series of neighborhood association meetings and a public open house.

Cleveland Avenue/Custer Way Strategy Area Transportation Plan

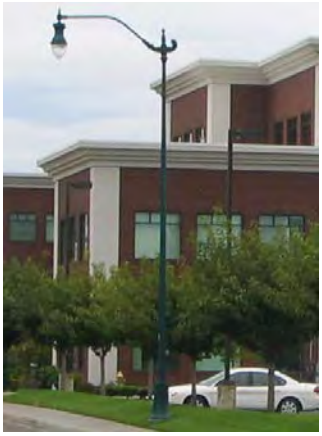
The Cleveland Avenue/Custer Way Strategy Area extends from the north City limits south to "E" Street, and from Cleveland Avenue west to 2nd Avenue.

Cleveland Avenue/Custer Way Strategy Area holds high growth potential although its geographical and land use characteristics create challenges for design of improvements.

The 1998 Transportation Plan identified Capitol Boulevard/Custer Way and 2nd Avenue/Boston Street as a "strategy area" due to its high growth potential accompanied by geographical and land use characteristics that create design challenges to accommodate higher levels of traffic. The closure of the Olympia Brewery operations created uncertainty as to how that site would redevelop and what the effects on area traffic might be. A distinct shortage of pedestrian facilities existed as well. Although never formally adopted, the study led to discussion of preferred alternatives for intersection improvements and options for new roadway alignments, to both serve current conditions and provide an alternative to Capitol Boulevard as a route for those traveling through the area.

Additional details of recommended improvements can be found in *Appendix D, Table D-5*, followed by documentation regarding the goals of this Plan as well as recommended improvement alternatives.

Tumwater Town Center Street Design Plan



A goal of the Tumwater Town Center Street design plan was to incorporate streetscape elements that reflect the traditional character of the community.

The Tumwater Town Center is bordered by Israel Road to the north, Tumwater Boulevard to the south, I-5 to the west, and Nikolas Street to the east.

The Town Center designation provides for a mix of public and privately-owned developments that will realize Tumwater's vision of a new city center that would include State and local government facilities; private commercial developments of office, retail and service businesses; residential development, educational and civic services; support facilities/services (i.e., child care); public assembly facilities; and outdoor spaces. The purpose of this plan was to identify locations, alignments and streetscape designs for multi-modal transportation connections into and through the area. The design standards described in the plan support the goal of a Town Center that evokes a sense of place and reflects the traditional character of the City.

Capitol Boulevard Access and Streetscape Study

New office complexes, such as this one at the intersection of Capitol Blvd/Israel Rd, generate high peak hour traffic volumes, as well as creating need for pedestrian safety amenities.

The focus of this study was the portion of Capitol Boulevard between Linwood Avenue and Israel Road, an area highly attractive to business and also heavily affected by high levels of commuter traffic that resulted from relocation of several State agencies to the Tumwater Boulevard/Israel Road vicinity.

The intention of the study was to address integration of traffic, business access, pedestrian and bicycle access, and streetscape features to identify a range of potential solutions to be evaluated for implementation. Parties involved in the study included City staff, members of the City Council and Planning Committee, County officials, Intercity Transit and WSDOT staff, as well as local business and community representatives.

Public involvement was a key component of this study; directly affected business owners were interviewed and community members were asked to review options and share opinions during a series of public open houses.

Preferred traffic options from this study included evaluation of three different alternatives: the "Jug Handle", 6-Lane; and

"M" Street Ramp. Both the "Jug Handle" and the "6-Lane" alternatives were dependent on the addition of a second northbound on-ramp lane. Subsequent study work indicated that the addition of this lane, at least in the near term, didn't appear feasible due to the high cost, impact on surrounding developed properties and businesses, and the access configuration onto Interstate-5. Similarly, the addition of a new on-ramp near "M" Street also seems unlikely. These options should still be considered in light of potential property redevelopment to provide some capacity and circulation benefits.

The study includes a number of recommendations for accommodating bicycles on Capitol Boulevard, north of "M" Street and south of Lee Street. The preferred option was to narrow existing lanes and eliminate the center turn lane. This would provide for four-foot wide bicycle shoulders and a narrow center median. Access control from adjacent properties is an integral component for implementation. Recommendations from the study need to be reviewed and incorporated into future improvements in this area.

Chapter 6 Planned Improvements

Introduction

Transportation planning is an ongoing process of evaluating and updating conditions as they evolve. Changes in expected growth patterns or land use affect the future of the transportation system. In some cases specific identified improvements are no longer needed, while other cases create a need for improvements that were not included in the initial plan. Planned improvements to the City's system involve short-term needs, included in the Six-Year Transportation Improvement Program (TIP), as well as long-term projections based on conditions expected to develop over the next 20 years.

"Closing the loop" on needed improvements

Many of the roadway and intersection deficiencies identified in the previous chapter are included in the TIP, with improvements planned for the near future or already underway.

Capital Facilities Plan

The City prepares a Capital Facilities Plan (CFP) in order to ensure that budget objectives are in alignment with transportation improvements.

Six-Year Transportation Improvement Program

The City of Tumwater's Six-Year Transportation Improvement Program (TIP) (2008 – 2013) provides detailed information regarding project locations, schedule and funding. Projects identified in the TIP include construction of sidewalks, paved shoulders, bicycle lanes, and mid-block crosswalks, as well as pavement overlays and installation of illumination. Intersection improvements and new roadway alignments are also included in the TIP.

Project Lists

Appendix C of this Plan includes complete listings of planned improvements as adopted in the Tumwater Six Year TIP, Thurston County TIP, and the 2025 Regional Transportation Plan.

The City is required to update its TIP annually, and it is adopted by reference as a portion of the Transportation

Element of the Comprehensive Plan. A copy of the current TIP can also be obtained from the Public Works Department.

Thurston County Six-Year Transportation Improvement Program

In addition to the City's TIP, Thurston County is also required to annually prepare its own Six-Year program. This TIP includes widening and upgrades of several roadways, new connections, and intersection improvements within and adjacent to the Tumwater UGA.

Thurston County TIP

Projects on the County's Six-Year TIP include upgrades to Henderson, 54th, Trosper and 70th; intersection improvements at Littlerock/93rd and 93rd/Lathrop; and widening of Yelm Highway to add additional lanes and urban improvements.

Thurston County 2025 Regional Transportation Plan

The RTP project list covers the upcoming 20-year period. These projects are usually large projects that add substantial capacity to the system, create major changes in access or add new programs or services and therefore have considerable impact on the function of the regional transportation network. Regionally significant projects must receive regional approval to be included in the RTP, and must be included in the RTP to be eligible to proceed. Maps illustrating RTP capacity improvements, new connections and specific study areas identified in the 2025 RTP are located in *Appendix C*.

Washington State Department of Transportation Highway Improvement Program

WSDOT has a limited number of projects identified that directly impact the City of Tumwater's transportation network.

A project of note includes improvements at the northbound Interstate-5 interchange at Tumwater Boulevard. WSDOT is currently delaying project implementation as they partner with the City in the development of an Interchange Justification Report (IJR). The IJR will identify and recommend alternatives to address projected traffic volumes at this location and ensure that WSDOT improvements are coordinated with the recommendations.

Improvements at the Interchanges

The City and WSDOT are currently working together to address operational deficiencies at the I-5/ Tumwater Boulevard interchange and the I-5/SR 121 (93rd Avenue) interchange.

While not currently included on their list of funded projects, WSDOT is working to secure funding for improvements to the

Interstate-5 southbound ramp intersection with SR 121 (93rd Avenue).

Other major WSDOT projects in the region include a widening project to add lanes in each direction on I-5 from Grand Mound to Maytown, and the SR101/West Olympia Access Study.

Chapter 7 Future Operations (2025)

Overview

Once existing conditions have been assessed, the next step of the transportation planning process is to forecast what traffic will be like in 20 years. There are several tools that help predict what traffic volumes will be like in 2025, and the process is described in detail of *Appendix E* of this Plan.

However, what it really means is that we look at what is planned in terms of land use, and how that relates to trip generation and travel patterns. The location and density of housing, retail shopping, and office, industrial, and manufacturing employment centers all impact the transportation system. Traffic volumes will reflect the interactions between those land uses; where we live, work, shop, attend school, and run errands determines which roads we'll use.

The Land Use plan is adopted by the City in our Comprehensive Plan, in accordance with the policies and regulations of the Growth Management Act (GMA). It is updated periodically, and goes through a public process to ensure that interested citizens have a chance to review and provide comment prior to formal adoption.

The Land Use Plan adopted in 1994 - and updated in 2005 - was used as the basis for traffic forecasting in this Transportation Plan. Current and anticipated high intensity growth in the Littlerock Road SubArea created a need for updated analysis of land use, traffic and employment projections. Analysis was performed in 2006 and the results have been incorporated in this Plan.

Growing Volumes

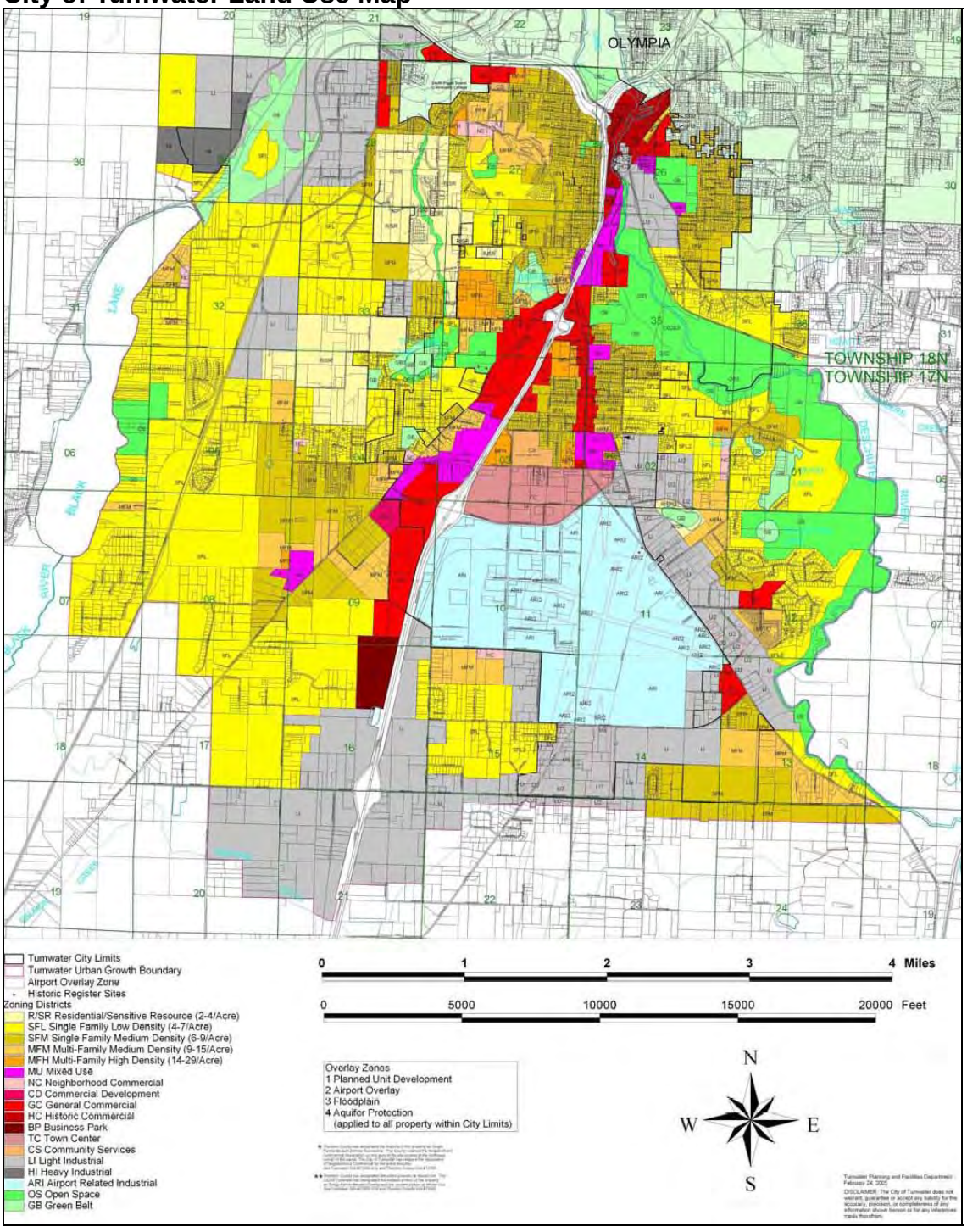
Between 2005 and 2025, traffic is expected to increase significantly, as indicated by the volume increases on the roads below:

Littlerock Road -	100%
Capitol Boulevard -	100%
Tumwater Boulevard -	55%
Israel Road -	40%
Trosper Road -	80%
Interstate 5 -	75%

Traffic volumes for the 2025 network are illustrated in *Exhibit 7-5.*

Exhibit 7-0

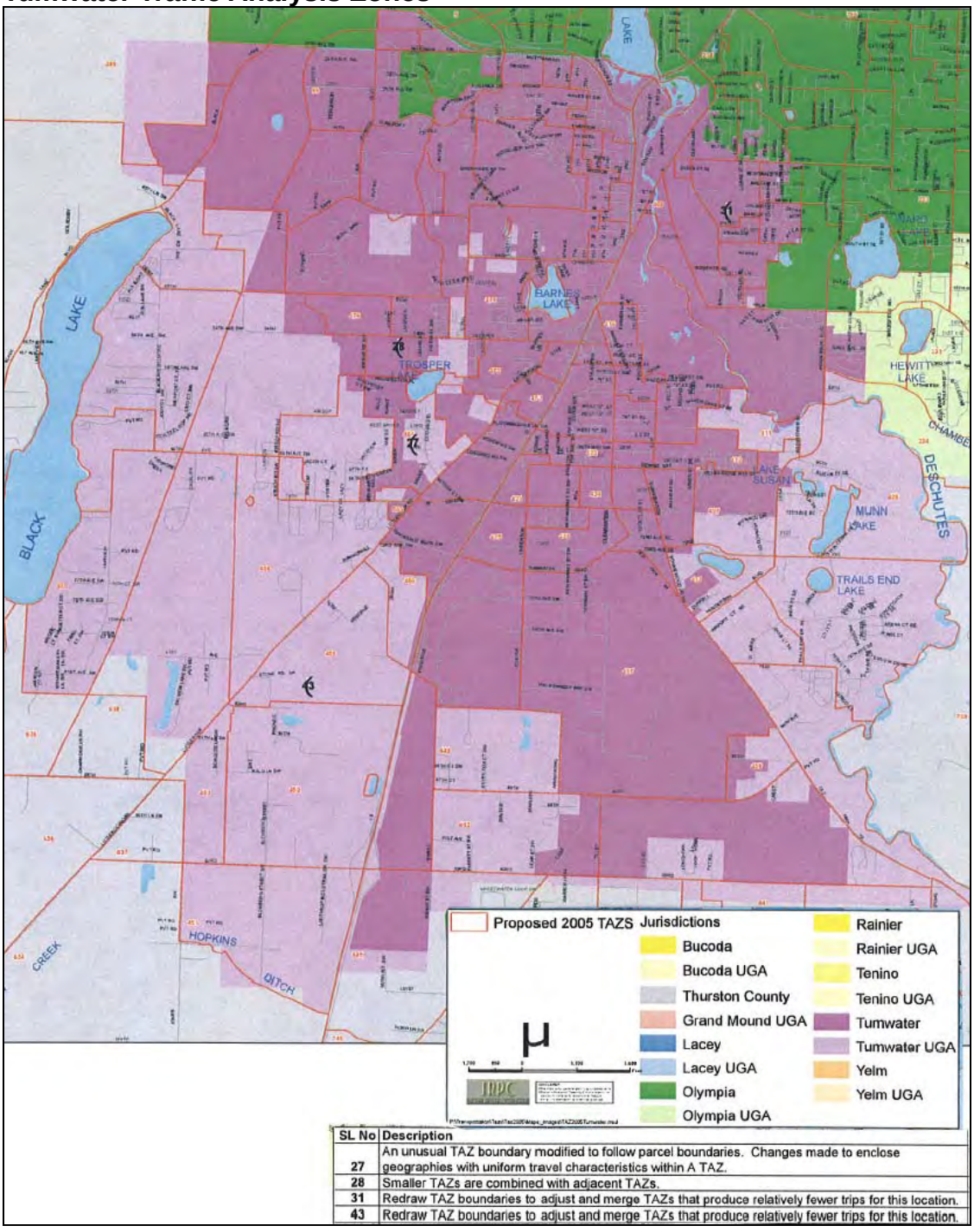
City of Tumwater Land Use Map



In order to function efficiently, Tumwater's transportation network must be designed to accommodate current and projected land use, and the resulting traffic patterns. This map, available electronically through the City's website at www.ci.tumwater.wa.us illustrates planned land use in Tumwater as identified in the City's Comprehensive Plan.

Exhibit 7-01

Tumwater Traffic Analysis Zones



SL No	Description
27	An unusual TAZ boundary modified to follow parcel boundaries. Changes made to enclose geographies with uniform travel characteristics within A TAZ.
28	Smaller TAZs are combined with adjacent TAZs.
31	Redraw TAZ boundaries to adjust and merge TAZs that produce relatively fewer trips for this location.
43	Redraw TAZ boundaries to adjust and merge TAZs that produce relatively fewer trips for this location.

In order to analyze traffic patterns and project future transportation system improvement needs, the network is divided into traffic analysis zones (TAZs), which can range in size from a few blocks to several square miles. Factors used to determine TAZ boundaries include population and employment. This map, adapted from TRPC's "Proposed 2005 Traffic Analysis Zones" map, illustrates TAZs within Tumwater and its UGA. The full-size version of this map is available through TRPC.

A Future Network

In order to accommodate land use projections and resulting traffic patterns for 2025, a transportation network must be developed. This network is developed at the regional level by the Thurston Regional Planning Council (TRPC), in conjunction with the Transportation Policy Board (TPB). The TPB includes representatives from each of the local agencies in Thurston County, as well as other interested parties. This group works together to ensure regional consistency in planning efforts and implementation.

The operational results presented in this chapter are based upon the "2025 Network" adopted and approved by the TPB. The regional network is then refined at the local level to provide the additional level of detail necessary to analyze citywide transportation issues.

The Tumwater 2025 network includes the local, County, Regional, and WSDOT planned projects referenced in *Chapter 6* and *Appendix C*, as well as the following additional improvements:

Things Will Change

It's important to remember that travel patterns in 2025 may be much different than they are today, and what we see on the ground may not be what is planned for the future. Consider that just 20 years ago, there was no Costco, Fred Meyer, Home Depot, L&I building, or other State office buildings on Israel Road.

Table 7.0. 2025 Assumed Network Improvements

Project ID #	Facility	TPA #	Improvements	Project Reference
1	Littlerock Rd	1, 4	Widen Littlerock Rd between Tumwater Blvd and 93rd, intersection control improvements at Tyee Dr or Black Hills High School access	Littlerock Rd SubArea
2	Tyee Dr	1, 4	Construct Tyee Dr Extension from Kingswood Dr to 81st Ave, including intersections at Israel, Tumwater Blvd, Prine, and Black Hills High School access	Littlerock Rd SubArea Plan Update
3	Linwood Ave	1, 2	Construct improvements from 7th Ave to Rural Rd, including intersection improvements at 2nd Ave	n/a
4	Trosper Rd	1	Widen (5 lanes) from Littlerock Rd to Lake Park, widen (3 lanes) Lake Park to Rural Road, including intersection improvements at Lake Park Dr and Rural Rd. May need to consider LOS policy change to "E"	n/a
5	Tumwater Blvd	1, 3	Widen from I-5 to Littlerock Rd, and from Capitol Blvd to Henderson Blvd. Improve intersection of Tumwater Blvd/Bonniewood	n/a
6	Tumwater Blvd Interchange	1, 3	Interchange improvements	n/a
7	Linderson Way/ Center St	1,3	Intersection improvements at 76th and 83rd	n/a
8	Capitol Blvd	1, 2	Install southbound right-turn lane at Israel Rd; consider urban upgrades (raised medians, access control, bike facilities) along designated segments to improve mobility. Modify signal at Trosper to eliminate westbound phase. Implement U-Turn modifications as needed. Consider LOS policy change to "E"	Tumwater Capitol Blvd Access/ Street Study
9	North St-Custer Way	2	Implement intersection strategies listed in SubArea Plan Summary, *Table D-5 (Appendix D)*	Cleveland Ave / Custer Way Strategy Area Trans Plan
10	"E" St Extension	2	Construct 4-lane extension between Cleveland Ave/Yelm Hwy and Capitol Blvd	Cleveland Ave / Custer Way Strategy Area Trans Plan
11	Old Hwy 99	3	Widen (4/5 lanes) from Tumwater Blvd to City limits, including intersection improvements at 79th, 93rd and Bonniewood (re-align)	n/a
12	Black Lake Blvd	4	Widen from Mottman Rd to Black Lake-Belmore Rd	n/a
13	Henderson Blvd	1,2,3	Widen from south of Deschutes River to Tumwater Blvd, from Tumwater Blvd to Old 99, including intersection improvements at Tumwater Blvd and 65th Ave	n/a
14	32nd St	4	Extend from Ferguson St to Black Lake Blvd	n/a
15	Black Hills Vicinity	4	Extend 73rd Ave, 70th Ave, and 66th Ave; create transportation system grid in vicinity of Black Hills HS and future residential development	Black Hills Subarea Transportation Study
16	93rd Avenue	3	Widen to 5 lanes from Lathrop Rd to Kimmie Rd; 3 lanes from Kimmie to 88th Ave; and 3 lanes from Lathrop to Littlerock Rd. Interchange improvements at I-5	n/a
17	Mottman Rd	2,4	Construct intersection improvements at RW Johnson (signal or RAB)	n/a
18	93rd Ave/Tilley Rd	3	Construct intersection improvements (signal or RAB)	n/a

2025 Operational Results

The operational analysis based upon the future network described in *Chapter 6* and above is summarized into the following tables and maps. The results are organized by Transportation Planning Area.

For 2025 conditions, the City continues to endorse a Level of Service (LOS) standard of "D" for transportation facilities within the City and its Urban Growth Area (UGA). The only exception to this is the intersection of Capitol Boulevard/Trosper Road where it is LOS E.

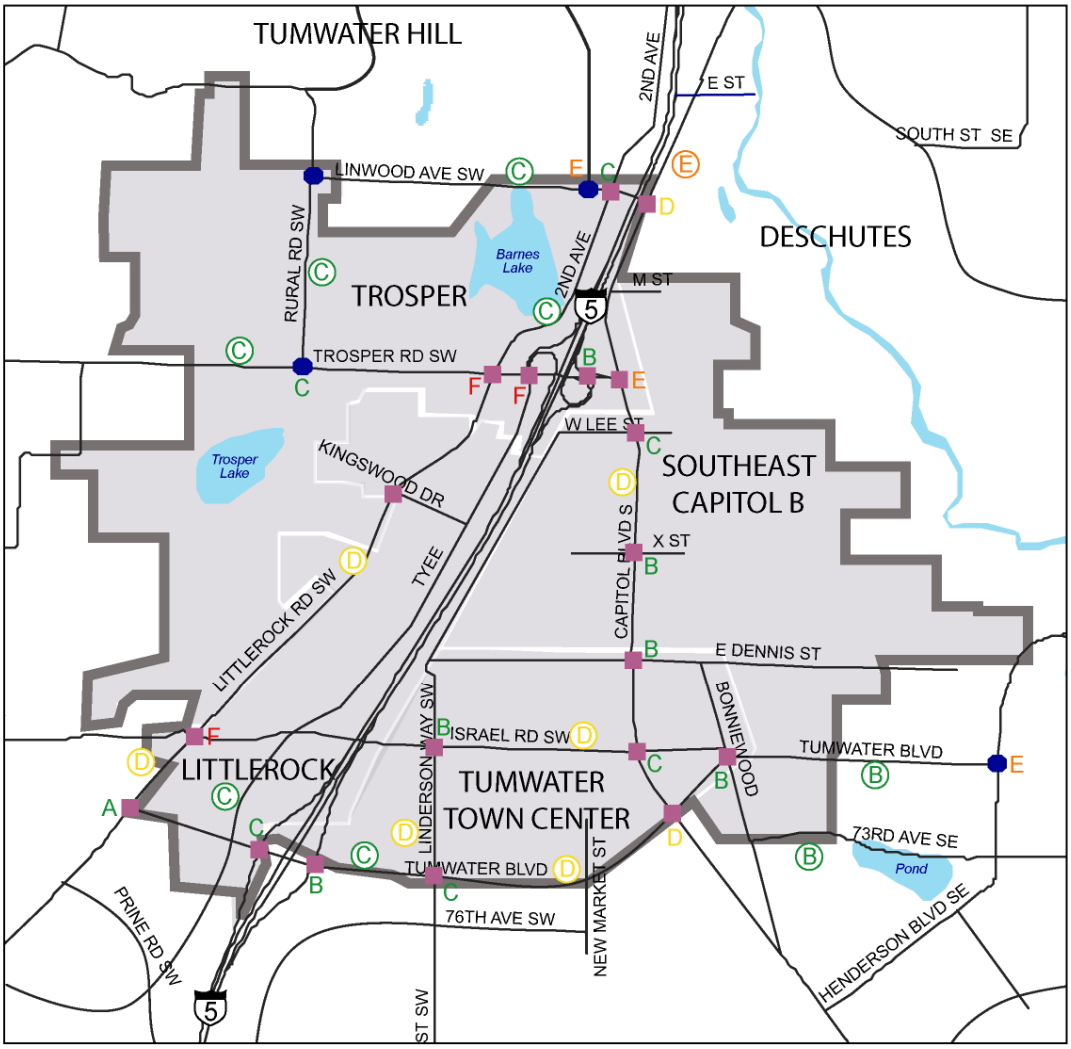
Facilities that meet or exceed the adopted LOS standard are illustrated in green (LOS A,B,C) and yellow (LOS D). Those intersections and roadways that are "failing" are indicated by orange (LOS E) and red (LOS F).

Table 7.1. 2025 Conditions (with assumed improvements) - TPA 1

Intersections	Facility		LOS
RAB/Signalized	Capitol Blvd / Linwood Ave SW		D
	Littlerock Rd SW / Trosper Rd SW		F[2,3]
	I-5 Southbound Ramps / Trosper Rd SW/Tyee Dr		F[3]
	I-5 Northbound Ramps / Trosper Rd SW		B
	Capitol Blvd / Trosper Rd SW		E[3]
	Capitol Blvd / Lee St		C
	Capitol Blvd / X St		B
	Capitol Blvd / Dennis St		B
	Littlerock Rd SW / Israel Rd		F[2]
	Linderson Way SW / Israel Rd		B
	Capitol Blvd / Israel Rd		C
	I-5 Southbound Ramps / Tumwater Blvd		C
	Linderson Way SW / Tumwater Blvd		C
	Littlerock Rd SW / Kingswood Dr		C
	Littlerock Rd SW / Tumwater Blvd		A
	Bonniewood Dr / Tumwater Blvd		B
	Capitol Blvd / Tumwater Blvd		D
	S 2nd Ave / Linwood Ave SW		C
	I-5 Northbound Ramps / Tumwater Blvd		B
Unsignalized	Rural Rd SW / Linwood Ave SW		B
	S 7th Ave / Linwood Ave SW		E[1]
	Rural Rd SW / Trosper Rd SW		C
Roadway	**Segment**	**Peak Directional Volume**	**LOS**
Linwood Ave SW	Rural Rd SW to S 7th Ave	480	C
Capitol Blvd	E St to Linwood Ave SW	2,050	E[1]
Rural Rd SW	Linwood Ave SW to Trosper Rd SW	250	C
2nd Ave SW	Linwood Ave SW to Trosper Rd SW	660	C
Trosper Rd SW	Kirsop Rd to Rural Rd SW	430	C
Capitol Blvd	Lee St to "X" St	1,490	D
Littlerock Rd SW	Kingswood Dr to Israel Rd	890	D
Littlerock Rd SW	Israel Rd to Tumwater Blvd	830	D
Israel Rd	Linderson Ave SW to Capitol Blvd	750	D
Linderson Ave SW	Israel Rd to Tumwater Blvd	790	D
Tumwater Blvd	I-5 Northbound Ramps to Linderson Ave SW	1,780	C
Tumwater Blvd	Linderson Ave SW to Capitol Blvd	1,400	D
Tumwater Blvd	Bonniewood Dr to Henderson Blvd	910	B
Tyee Dr	Israel Rd to Tumwater Blvd	580	C

1) *Capitol Blvd – May need to consider LOS E as standard.*
2) *Littlerock Rd –Used 75% saturation rates.*
3) *Trosper Rd –- No tight diamond assumed for 2025 network due to physical and financial constraints. May need to consider LOS E; additional analysis is being conducted in conjunction with Tumwater Blvd IJR.*

Exhibit 7-1
TPA 1 - 2025 Operations



Unsignalized Intersection

Controlled Intersection (Signal or RAB)

A, B, C, D Meet or Exceeds LOS Standards

E, F Does Not Meet LOS Standards

Ⓐ Roadway Segments

A Intersections

Table 7.2. 2025 Conditions (with assumed improvements) - TPA 2

Intersections	Facility		LOS
Signalized/RAB	Crosby Blvd / Mottman Rd		C
	Capitol Blvd / Carlyon Ave SE		C
	S 2nd Ave / Custer Way		D
	Capitol Blvd / Custer Way		E[2]
	Capitol Blvd / "E" St		E[2]
	Capitol Blvd / Linwood Ave		D
	R W Johnson Blvd / Mottman Rd		C
	Custer Way / Boston St SE		D
	Boston St SE / Deschutes Way		F
	S 2nd Ave / Linwood Ave		C
	Cleveland Ave / Custer Way		C
	Yelm Hwy / Henderson Blvd		E
Unsignalized	Crosby Blvd / Barnes Blvd		A[1]
	Capitol Blvd / Cleveland Ave		C
	Deschutes Pkwy / Simmons Ln SW / US 101 Ramp		C
	R W Johnson Blvd / Sapp Rd SW		C
	Rural Rd SW / Linwood Ave		B
	S 7th Ave / Linwood Ave		E
Roadways	**Segment**	**Peak Directional Volume**	**LOS**
Mottman Rd	R W Johnson Blvd to Crosby Blvd	630	C
Barnes Blvd	Crosby Blvd to Linwood Ave SW	460	C
R W Johnson Blvd	Mottman Rd to Sapp Rd SW	730	D
Sapp Rd SW	R W Johnson Blvd to Linwood Ave SW	270	C
Linwood Ave SW	Rural Rd SW to S 7th Ave	480	C
Capitol Blvd	"E" St to Linwood Ave SW	2,050	E[2]
Cleveland Ave	Custer Way to Henderson Blvd	1,580	C

1) *Crosby/Barnes – LOS A indicates average intersection delay, not worst movement.*

2) *Capitol Blvd – May need to consider LOS E as standard.*

Exhibit 7-2

TPA 2 - 2025 Operations

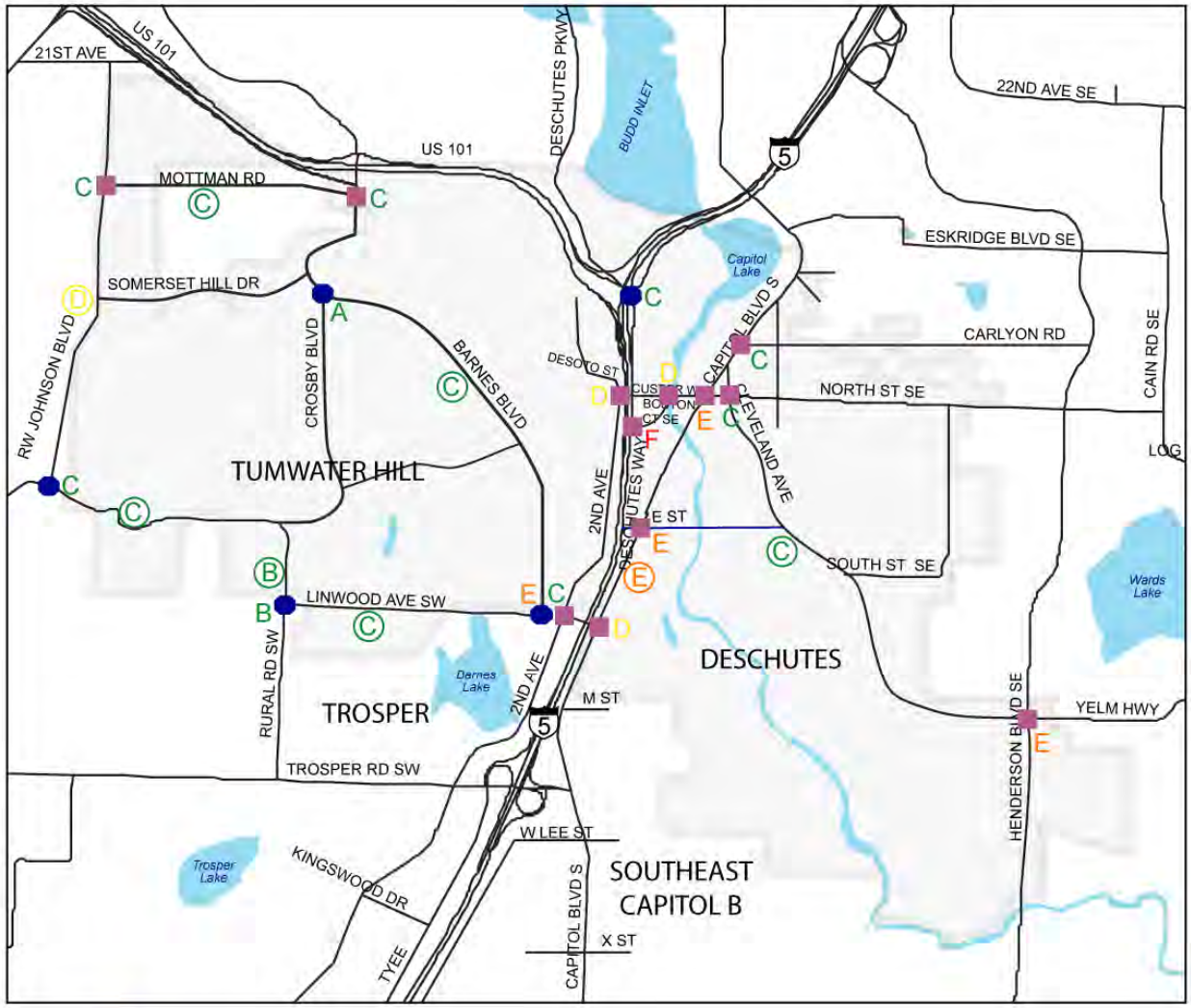


Table 7.3. 2025 Conditions (with assumed improvements) - TPA 3

Intersections	Facility		LOS
Signalized/RAB	I-5 Southbound Ramps / Tumwater Blvd		C
	Linderson Way / Tumwater Blvd		C
	Capitol Blvd / Tumwater Blvd		D
	Old Hwy 99 / 88th Ave SE		B
	I-5 Northbound Ramps / Tumwater Blvd		B
	Henderson Blvd / Tumwater Blvd		B
	Capitol Blvd / Henderson Blvd		A
	I-5 Southbound Ramps / 93rd Ave SW		B
	I-5 Northbound Ramps / 93rd Ave SW		A
	Old Hwy 99 / 93rd Ave SE		B
	S Tilley Rd / 93rd Ave SE		A[2]
Unsignalized	Center St SW / 76th Ave SW		D[2]
	Capitol Blvd / 79th Ave SE		A[1, 2]
	Kimmie St SW / 83rd Ave SW		B
	Center St SW / 83rd Ave SW		B
	Kimmie St SW / 93rd Ave SW		D[2]
Roadway	Facility	Peak Directional Volume	LOS
Tumwater Blvd	I-5 Northbound Ramps to Linderson Ave SW	1,780	C
Tumwater Blvd	Linderson Ave SW to Capitol Blvd	1,400	D
Tumwater Blvd	Bonniewood Dr to Henderson blvd	910	B
Littlerock Rd SW	Tumwater Blvd to 93rd Ave SW	855	D
Center St SW	76th Ave SW to 83rd Ave SW	620	D
Old Hwy 99	Henderson Blvd to 79th Ave SE	1,580	D
Kimmie St SW	83rd Ave SW to 93rd Ave SW	280	C
93rd Ave SW	Littlerock Rd SW to I-5 Southbound Ramps	470	C
93rd Ave SW	Kimmie St SW to Case Rd SW	760	D
88th Ave SE	93rd Ave SE to Old Hwy 99	520	C

1) LOS A indicates average intersection delay, not worst movement.

2) These intersections may require additional improvement as specific development proposals are submitted.

Exhibit 7-3

TPA 3 - 2025 Operations

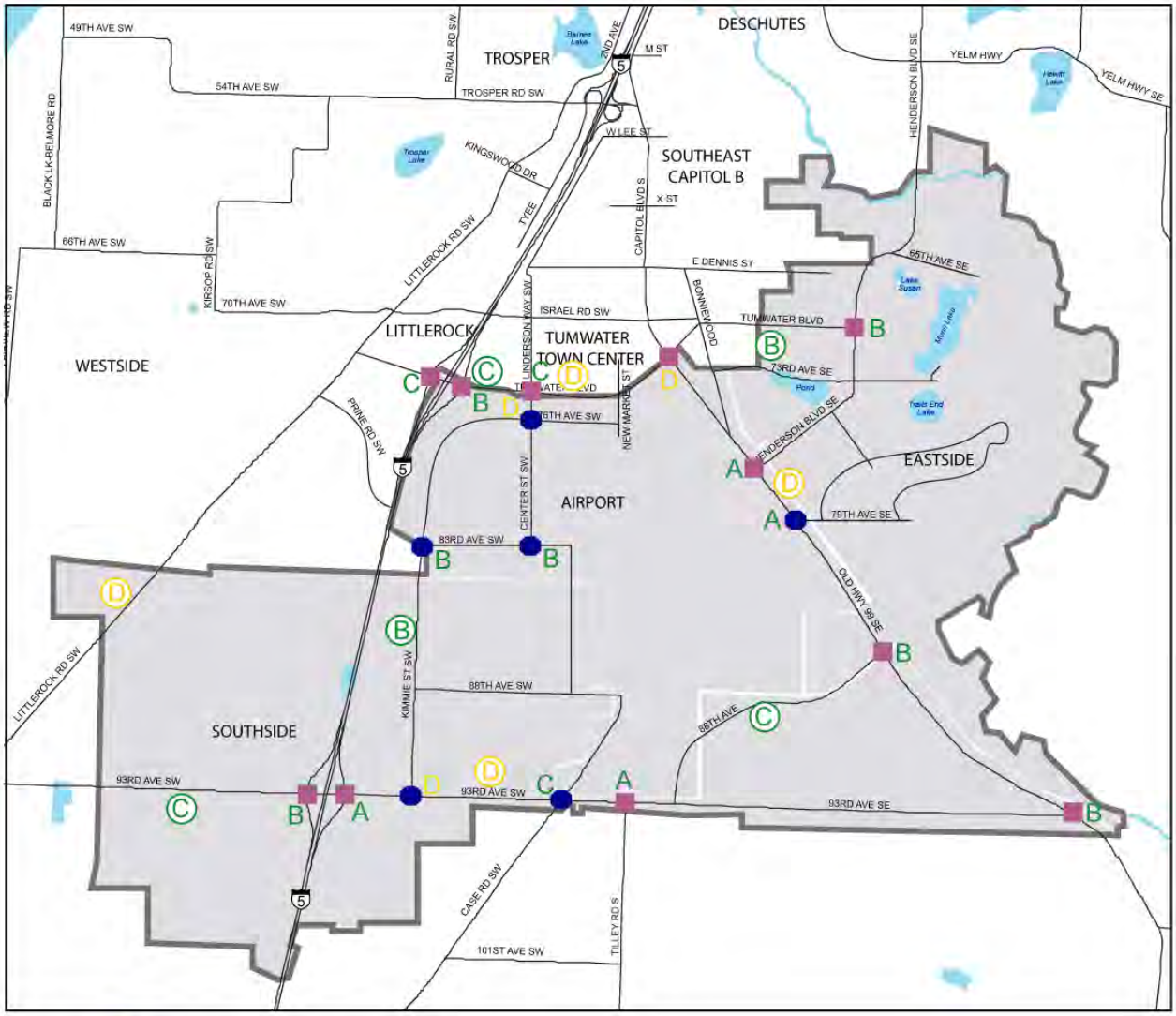
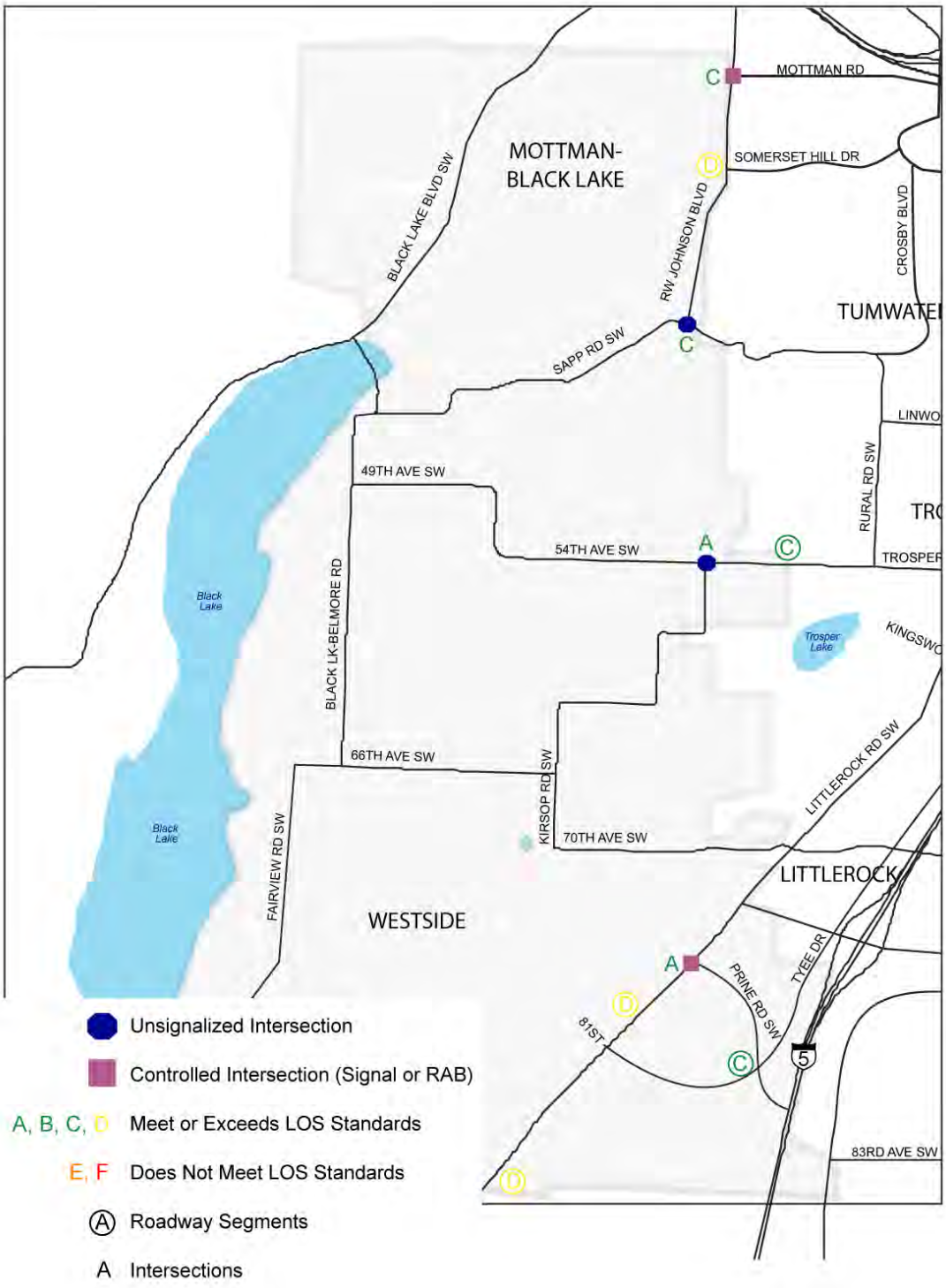


Table 7.4. 2025 Conditions (with assumed improvements) - TPA 4

Intersections	Facility		LOS
Signalized/RAB	R W Johnson Blvd / Mottman Rd		C
	Littlerock Rd SW / Tumwater Blvd		A
Unsignalized	Sapp Rd SW / R W Johnson Blvd		C
	Kirsop Rd SW / Trosper Rd SW		A
Roadway	**Facility**	**Peak Directional Volume**	**LOS**
R W Johnson Blvd	Mottman Rd to Sapp Rd SW	730	D
Trosper Rd SW	Kirsop Rd SW to Rural Rd SW	430	C
Littlerock Rd SW	Tumwater Blvd to 81st Ave SW	855	D
Littlerock Rd SW	81st Ave SW to 93rd Ave SW	875	D
Tyee Dr	Tumwater Blvd to 81st Ave SW	330	C

Exhibit 7-4
TPA 4 - 2025 Operations



Additional Action Required

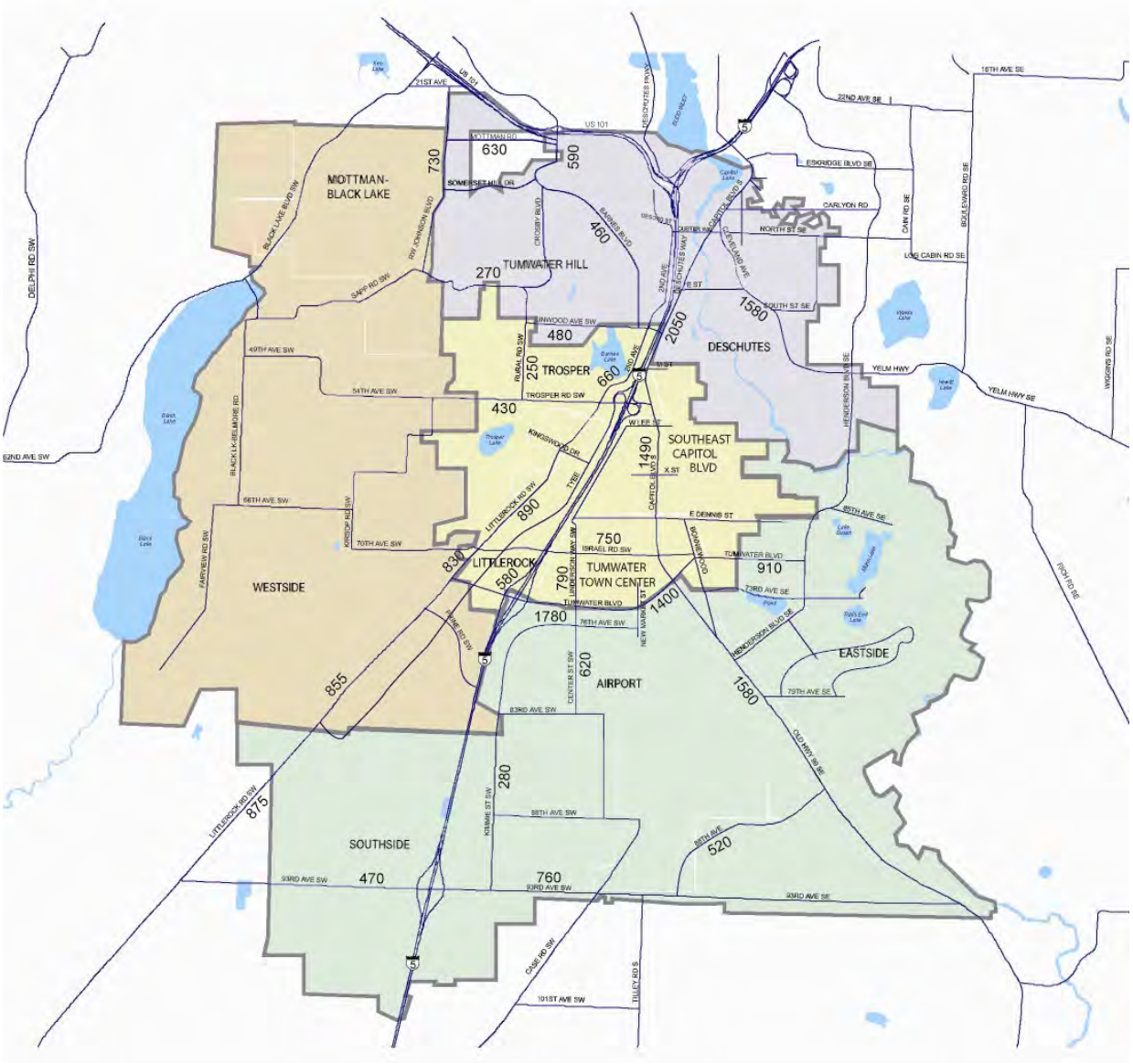
The table below identifies all roadway segments and intersections within the Tumwater transportation network where, after implementation of the previously defined improvements, projected 2025 LOS will remain at level "E" or "F".

Table 7.5. Unresolved LOS Issues: Recommendations for Action

Intersection	Facility	TPA	Projected LOS	Recommendation
RAB / Signalized	Littlerock Rd SW / Trosper Rd SW	1	F	LOS F condition will be experienced only if the 75% land use saturation rate is realized. This saturation rate is much higher than has been predicted, and is not expected to occur within the 20-year planning horizon
	I-5 Southbound Ramps / Trosper Rd SW / Tyee Dr	1	F	Work with WSDOT on this HSS facility to identify potential mitigations or modification to the WSDOT designated LOS D for this location, due to physical constraints and potential significant impact to adjacent commercial properties.
	Capitol Blvd / Trosper Rd SW	1	E	Condition due in part to operations of interchange intersection described above. Without improvements at that location, this intersection will continue to operate at less than desirable LOS. Physical constraints limit options for improvement at this intersection without significant impact to adjacent commercial properties
	Littlerock Rd SW / Israel Rd	1	F	LOS F condition will be experienced on if the 75% land use saturation rate is realized. This saturation rate is much higher than has been predicted, and is not expected to occur within the 20-year planning horizon
	Capitol Blvd / Custer Way	2	E	Proximity of commercial properties and area topography limit intersection improvement options; City may need to consider adopting LOS E as standard for Capitol Blvd
	Capitol Blvd / "E" St	2	E	Proximity of commercial properties and area topography limit intersection improvement options; City may need to consider adopting LOS E as standard for Capitol Blvd
	Boston St SE / Deschutes Way	2	F	Intersection improvement options limited by financial constraints and proximity to Deschutes River crossing, I-5 and established commercial property. Consideration of RAB designed to fit within physical restraints at this location might improve operations
	Yelm Hwy / Henderson Blvd	2	E	Improvements to this intersection would require participation of City of Olympia, Thurston County
Unsignalized	S 7th Ave / Linwood Ave SW	1, 2	E	The intersection average meets City LOS standards (LOS D). The worst movement is LOS E. The City could consider channelization improvements for specific movements
Roadway	**Segment**			
Capitol Blvd	"E" St to Linwood Ave SW	1, 2	E	City may need to consider adopting LOS E as standard for Capitol Blvd

Exhibit 7-5

City of Tumwater Future Traffic Volumes (2025)



The City's 2025 Transportation network includes all of the planned local, regional and state improvements. Operational results presented in this chapter assume that the 2025 network is in place; resulting projected volumes are illustrated on this map.

Chapter 8 2025 Transportation Program

Overview

The purpose of this chapter is to summarize the major roadway improvements necessary to support the City's 2025 Land Use Plan. The project list, as presented in *Table 8-1*, comprises the Tumwater 2025 Transportation Program (TP). Additional needed improvements may be identified as specific development proposals are submitted. The City will assess impacts and determine through the review process whether additional improvements are needed.

Improvements Summary

The City's 2025 Transportation Plan includes 18 projects. The project identification numbers assigned in Table 8-1 are not intended to imply prioritization or funding availability. The ranking and prioritization of projects will occur during development of the City's Six-Year TIP, an annual process which takes place in July.

The TP is organized by roadway facility, includes a brief description of the improvements, and indicates the various project components. These projects are depicted graphically on the map in *Exhibit 8-1*.

The needs for many of the projects listed in the TP were identified based on the need for added vehicle capacity. Because most of these projects are on streets that also provide important multi-modal connections and links, the projects also include urban, bicycle and pedestrian components as integral features of the project.

Project improvements may include a number of the following elements:

Roadway

Capacity – Capacity projects include widening the existing road to provide additional lanes to accommodate a higher volume of traffic. Depending on the roadway type and location, the widening may also include other improvements, such as bike lanes, landscaping and sidewalks.

New Alignments – Sometimes new roadways are needed to enhance circulation or provide improved access to areas of high growth potential. Other times, existing roads need to be

extended to close “gaps” in the system. Both types of projects are included in this category.

Intersections

Stop-Control – Sometimes, intersections that are stop-controlled will remain in “failing” conditions. This is due to the fact that it is not always desirable or feasible to correct these types of operational issues. There may be only one minor leg that fails, or insufficient traffic volumes to warrant adding a signal or roundabout. These situations are assessed at the project level, and decisions about whether to signalize or roundabout are evaluated at that time.

When is a roundabout right?

The City will typically analyze both signal and roundabout options, and make a decision on which is the best option for a specific location. Key factors in the decision process include traffic volumes on each intersecting roadway, proximity to other intersections, right-of-way impacts, and access.

Signal – Failing intersections at roads that are controlled by stop signs can be improved by the addition of a signal. Signalized intersections that fail often need additional lanes for specific movements, such as left-turn or right-turn lanes.

Roundabout – An option to a signalized intersection is the modern roundabout. Roundabouts improve vehicle operations at intersections, and also allow for significantly improved pedestrian and bicycle facilities. Sometimes, existing signalized intersections will operate better when converted to a roundabout, especially if there are other adjacent roundabouts.

Urban Improvements

Areas where land use designations create patterns of high density development call for features that provide a safe and inviting atmosphere for users of travel modes other than single occupancy vehicles. Urban improvements promote cooperation between motorized and non-motorized travel modes, creating options for those that choose not to drive. Examples of urban improvements include streetscape enhancements such as planter strips and street lights, and highly visible, well-lit transit shelters.

Trail System Planning

The City also adopts a Non Motorized Plan, which includes a more extensive list of proposed trail and pathway projects.

Bicycle Facilities

Improvement projects in this category include addition of striped bike lanes to a roadway project. Some Transportation

Planning Areas are more conducive to bike travel, and providing adequate facilities can promote cycling as a viable commute option. TPAs 1 and 2 are strongly “intermodal” due to their planned land use. This means that facilities are in place to support changes in travel modes, such as walking or biking to a transit center.

Pedestrian Facilities

Urban improvement projects in this category include the addition of sidewalks and crosswalks to roadway projects. Design elements such as placing a crosswalk mid-block, using colored surface materials, and providing a landscaped refuge at the center of the crossing are all examples of safety and visibility measures that promote safe pedestrian travel. Again, depending on the land use mix of a particular TPA, pedestrian facilities may be more concentrated in one area or another. Residential, office, and commercial areas in TPAs 1 and 2 are good candidates for a strong pedestrian system.

Transportation Demand Management (TDM)

When roadways or intersections become congested, building new roadways isn’t always the solution. Transportation demand management (TDM) is a term applied to a broad range of strategies intended to increase the efficiency of a transportation system by using measures that reduce or reshape use of the system. Plans for transportation projects that involve Federal or State funding, by law, must incorporate TDM strategies.

Examples of active TDM strategies in Tumwater include urban, bicycle and pedestrian facilities described above, as well as public transportation alternatives like buses and vanpools, and the shelters and park-and-ride lots associated with their use. Other TDM measures include employers that allow for condensed work weeks or allow employees to telecommute. These TDM efforts not only reduce numbers of vehicle trips, but also tend to spread commute times away from peak hours, reducing volumes during times of typically high travel demand.

While the City has worked collaboratively with our regional partners for several years as part of our Commute Trip Reduction (CTR) program, we are currently developing a CTR Plan specific to Tumwater in accordance with the Commute Trip Reduction Efficiency Act. Pending review by the State CTR Board, the CTR Plan would be considered for adoption by the Tumwater City Council in early 2008.

Long-term TDM strategies include planning efforts to condense land uses and encourage alternatives to driving alone. Identifying and adopting TDM strategies as part of our transportation plan can provide cost-effective alternatives to construction of new/expanded facilities, and by reducing road use, increase the life cycle of existing facilities as well.

Committed to Trip Reduction

The City of Tumwater is an active member of the regional Commute Trip Reduction committee. As such, the City helps affected employers achieve reductions in single occupancy vehicle rates. This group promotes cooperative efforts between Intercity Transit, employers, WSDOT, and TRPC to improve commute options available, such as biking, walking, transit, and carpools.

Other

Sometimes, the solution to a particular land use/transportation problem is not easily defined, and the City realizes that there is a need to do additional, more detailed analysis. These studies typically include an extensive public outreach program in addition to the technical work needed to support a decision. Study options include:

Strategy Areas – These may include policy decisions, such as changes in LOS standards or land use assumptions. These areas may include primary corridors (Capitol Boulevard, Littlerock Road, Tumwater Boulevard) where policies have been established to limit the roadways to 5-lanes.

SubArea Plans – These focus on the inter-relation of the land use and roadways within a defined area.

Corridor Studies – Study of a new or improved roadway, with a variety of potential alignment or widening options.

Truck Routes – Some areas, due to the mix of residential and commercial development require detailed analysis and public outreach to develop a transportation network that provides adequate and efficient truck access while maintaining the character of residential neighborhoods. An example of this would be the developing commercial areas, including the Port

of Olympia, between Tumwater Boulevard and 93rd Avenue, east of Interstate-5. Detailed truck route planning for this area, as well as other areas that have been or will be annexed into the City, will be important as area development continues.

Summary

The Tumwater 2025 Transportation Program (TP) is presented in *Table 8-1*. These projects are depicted graphically on the map in *Exhibit 8-1*.

Table 8.1. 2025 Transportation Improvements Program

Project ID #	Facility	TPA #	Recommendations	Elements: Roadway Capacity	Intersection Improvement	Non-Motorized (Bikes and Pedestrians)	Access/Circulation/Connectivity	Urban Improvements	Other (TDM, policy change, strategy area, etc)
1	Littlerock Rd	1, 4	Widen Littlerock Rd to 2/3 lane facility between Tumwater Blvd and western limits of City UGA, to include intersection control improvements at Tyee Dr or Black Hills HS access.	X	X	X	X		X
2A	Tyee Dr	1, 4	Construct 4/5 lane Tyee Dr extension from Kingswood Dr to Tumwater Blvd, including intersections at Israel and Tumwater Blvd. and bike lanes.	X	X	X	X		
2B	Tyee Dr	1, 4	Construct 2/3 lane Tyee Dr Extension from Tumwater Blvd to 81st Ave., including intersections at Prine Dr and 81st Ave. and bike lanes.	X	X	X	X		
3	Linwood Ave	1, 2	Construct improvements (2/3 lanes) from 7th Ave to Rural Road, including intersection improvements at 2nd Ave.		X	X			
4A	Trosper Rd	1	Widen one additional lane to create 5 lanes from Littlerock Rd to Lake Park, including intersection improvements at Lake Park.	X	X	X			

Table 8.1. 2025 Transportation Improvements Program

Project ID #	Facility	TPA #	Recommendations	Elements: Roadway Capacity	Intersection Improvement	Non-Motorized (Bikes and Pedestrians)	Access/Circulation/Connectivity	Urban Improvements	Other (TDM, policy change, strategy area, etc)
4B	Trosper Rd	1	Widen (3 lanes) from Lake Park to Rural Rd, including intersection improvements at Rural Rd.	X	X	X			
5A	Tumwater Blvd	1, 3	Widen Tumwater Blvd. to 4/5 lane facility from I-5 to Littlerock Rd.	X	X	X	X		
5B	Tumwater Blvd	1, 3	Widen Tumwater Blvd to 3 lanes from Capitol Blvd to Henderson Blvd. Improve intersection of Tumwater Blvd/Bonniewood.	X	X	X	X		
6	Tumwater Blvd Interchange	1, 3	Interchange improvements, including ramp and mainline auxiliary lanes.		X		X		
7	Linderson Way/ Center St	1,3	Intersection improvements at 76th and 83rd.	X	X	X	X		
8	Capitol Blvd	1, 2	Install southbound right-turn lane at Israel Rd, including signal modifications; consider urban upgrades. Modify signal at Trosper to eliminate westbound phase. Implement U-Turn modifications as needed.	X	X	X	X		X
9	North St-Custer Way	2	Implement intersection strategies listed in SubArea Plan Summary, *Table D-5* (*Appendix D*).		X	X	X		X
10	"E" St Extension	2	Construct 4-lane extension between Cleveland Ave/Yelm Hwy and Capitol Blvd, including intersection improvements at Capitol Blvd and Cleveland Ave. and bike lanes.	X	X	X	X		X
11A	Old Hwy 99	3	Widen (4/5 lanes) from Tumwater Blvd to 88th Ave including intersections at Bonniewood (re-align) and 79th.	X	X	X			X
11B	Old Hwy 99	3	Widen (4/5 lanes) from 88th Ave to south City limits (93rd Ave vicinity).	X	X	X			X
12	Black Lake Blvd	4	Widen 2/3 lanes from Mottman Rd to western limits of City UGA.	X	X	X	X		

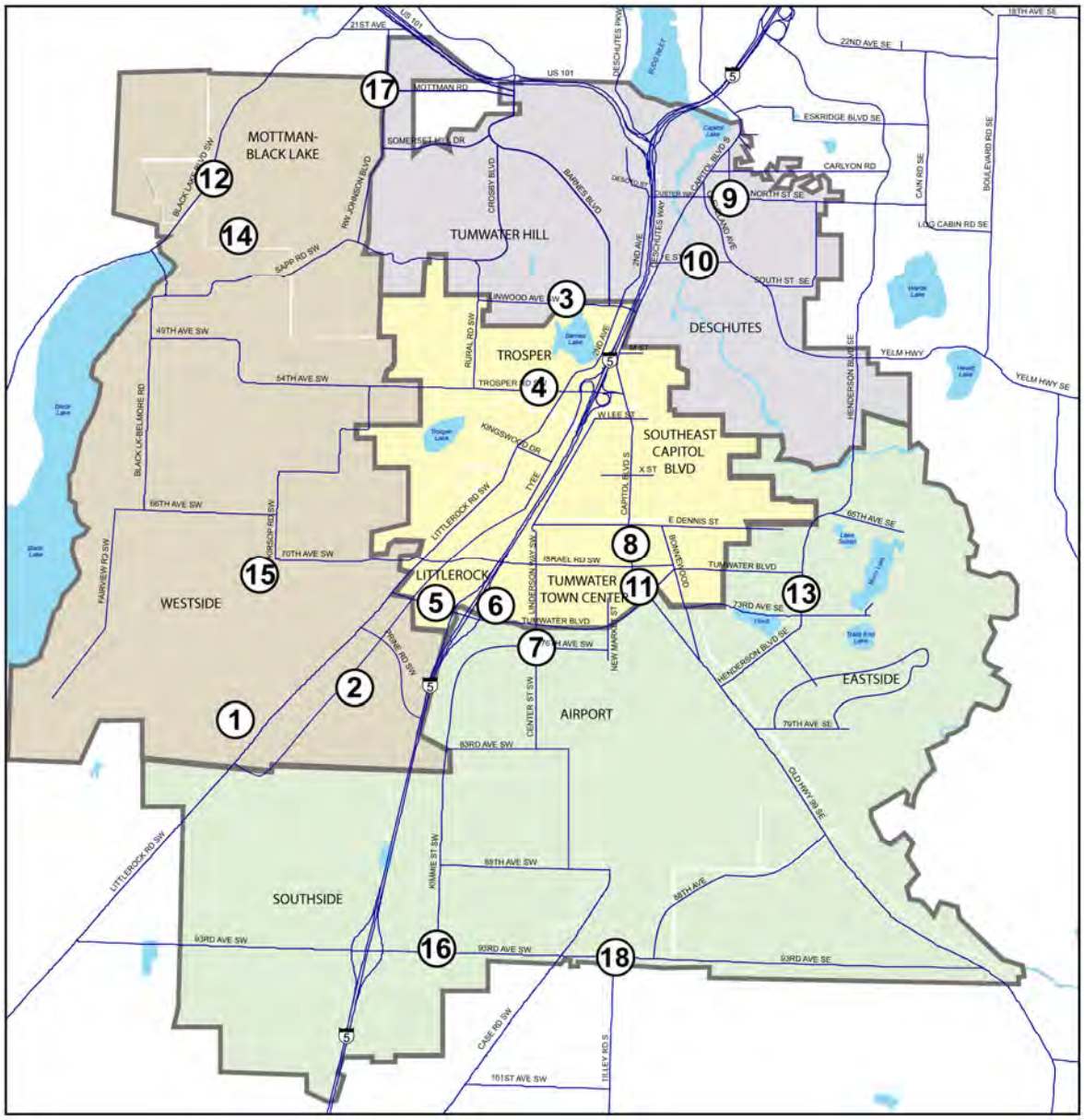
Table 8.1. 2025 Transportation Improvements Program

Project ID #	Facility	TPA #	Recommendations	Elements: Roadway Capacity	Intersection Improvement	Non-Motorized (Bikes and Pedestrians)	Access/Circulation/Connectivity	Urban Improvements	Other (TDM, policy change, strategy area, etc)
13A	Henderson Blvd	1, 2, 3	Widen (2/3 lanes) from south of Deschutes River to Tumwater Blvd, including intersection.	X	X	X	X		
13B	Henderson Blvd	1, 2, 3	Widen (2/3 lanes) from Tumwater Blvd to Old Hwy 99.	X	X	X	X		
14	32nd St	4	Extend from Ferguson St to Black Lake Blvd.			X	X		X
15	Black Hills Vicinity	4	Extend 73rd Ave, 70th Ave, and 66th Ave; create transportation grid in vicinity of BHHS and future residential development including bike and ped connections.		X	X	X		X
16A	93rd Ave (SR 121)	3	Widen to 5 lanes from Lathrop Rd to Kimmie Rd.	X	X	X			
16B	93rd Ave (SR 121)	3	Widen to 3 lanes from Kimmie Rd to Tilley Rd.	X	X	X			
16C	93rd Ave	3	Widen to 3 lanes from Lathrop to western limits of City UGA.	X	X	X			
16D	93rd Ave Interchange	3	Reconstruct interchange, including bridge widening, ramp modifications.		X		X		
17	Mottman Rd	2, 4	Construct intersection improvements at RW Johnson (signal or RAB).	X	X		X		
18	Tilley Rd S/93rd Ave	3	Construct intersection improvements (signal or RAB).		X				

Improvements listed for each corridor include multiple project segments and intersection upgrades. The Six-Year TIP and City's CFP will provide project details and components for each project predicted to be completed within a six-year time period. Several projects listed above may be divided into multiple project phases for purposes of funding and implementation.

Exhibit 8-1

2025 Transportation Improvement Program



This map indicates locations of the projects (by Project ID #) included in Table 8.1 2025 Transportation Improvements Program.

Chapter 9 Financial Analysis

Introduction

Once the 2025 Transportation Improvement Program has been established, the City needs to assess the financial viability of the plan. The analysis should cover funding needs and funding resources, and it should include a multi-year financing plan.

The purpose of this requirement is to ensure that each jurisdiction's transportation plan is affordable or achievable. If a funding analysis reveals that a plan is not affordable or achievable, the plan must discuss how additional funds will be raised, or how land use assumptions will be reassessed.

It is important to note that all cost estimates included in this chapter are based upon planning-level assumptions. These costs will need to be carefully reviewed and refined during the Six-Year Transportation Improvement Program (TIP) development. The TIP is updated and approved by the City Council annually in June.

The project costs will also be further evaluated during the preparation of the Traffic Impact Fee program update. This update is scheduled as Phase 2 of the Transportation Plan development.

An Implementable Plan

If a funding analysis reveals that a plan is not affordable or achievable, the plan must discuss how additional funds will be raised, or how land use assumptions will be reassessed.

Revenue Sources

Federal

The 1991 Federal Intermodal Surface Transportation Efficiency Act (ISTEA) reshaped transportation funding by integrating several mode- and category-specific programs into a more flexible system of multi-modal transportation financing. For highways, ISTEA combined the former four-part Federal Aid highway system (Interstate, Primary, Secondary, and Urban) into a two-part system consisting of the National Highway System (NHS) and the Interstate System. The National Highway System includes all roadways not functionally classified as local or rural minor collectors. The Interstate System, while a component of the NHS, receives funding separate from the NHS funds.

The ISTEA legislation was most recently re-authorized in 2005, under the name *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for User*, or "SAFETEA-LU." One of the major components of SAFETEA-LU is the Surface Transportation Program (STP), funded at almost $35 billion. Surface Transportation Program funds can be used for any project, and they are not limited to the federal-aid highway system.

STP funds come through the State DOT. The State maintains control of about 37 percent of these funds. Of the remainder, about 62 percent is allocated to large urbanized areas (population over 200,000), with funding decisions resting with the Metropolitan Planning Organizations (MPOs). The rest of the funds are distributed to smaller urbanized areas.

The City of Tumwater receives these federal funds through the Thurston Regional Planning Council (TRPC), which is the MPO for this region. The funds are then distributed on a competitive basis to the cities and transit agency. There are three regionally-managed federal funding programs: Surface Transportation Program (STP), Congestion Mitigation and Air Quality (CMAQ), and Federal Transit Administration (FTA). Funds are distributed based on selection criteria to ensure that

regional investments meet the goals and policies established in the 2025 Regional Transportation Plan.

State

The City also receives funds through the Washington State Department of Transportation (WSDOT). Funds are administered through the Transportation Improvement Board (TIB). Historically, the City has received several TIB grants. The Littlerock Road Corridor project is funded in part through TIB.

The Motor Vehicle Excise Tax (MVET) was a major source of funding prior to the repeal of the excise tax. Since that time, the funds have diminished, and the State has stepped in to provide "backfill" funding. This level of funding is not significant, but does contribute toward the total streets and roads revenue.

Private Development

In 1994 the City established a Traffic Impact Fee (TIF) program. This program created a mechanism to charge and collect fees such that new development bears its proportionate share of the capital costs of transportation improvements. The City has prepared a list of projects, project costs, and the developer/City proportionate share of the improvements. This equates to a per-trip fee that is collected upon issuance of building permits.

New development is also reviewed through the State Environmental Policy Act (SEPA). Through the SEPA process, the City can ensure that impacts created by new development are mitigated to ensure that concurrency is maintained.

The timing of a development project may not coincide with the timing of a transportation project proposed by the City. Depending on the impact of the development project on a particular facility (as determined through the SEPA process), developers may be required to complete all or a portion of a project on the list. Additional impacts to transportation facilities may identify necessary improvements that are not included on the 2025 project list.

2025 Transportation Improvement Program

Capital costs for the 2025 recommended improvement program are summarized in *Table 9.1* (see *Appendix F* for more detail).

All costs are provided as planning-level cost estimates only. Cost estimates will be more fully developed as projects move into the planning and design phase, and through the annual Six-Year TIP development and updated TIF program.

Table 9.1. 2025 Improvement Program

Project ID #	Facility	TPA #	Description	Planning Level Cost Estimate (2007 dollars)	Funding Source (G)rants (W)SDOT (C)ity (P)rivate Development
1	Littlerock Rd	1, 4	Widen Littlerock Rd to 2/3 lane facility between Tumwater Blvd and western limits of City UGA, to include intersection control improvements at Tyee Dr or Black Hills HS access.	$9,740,000	G, C, P
2A	Tyee Dr	1, 4	Construct 4/5 lane Tyee Dr extension from Kingswood Dr to Tumwater Blvd, including intersections at Israel and Tumwater Blvd.	$12,432,000	P
2B	Tyee Dr	1,4	Construct 2/3 lane Tyee Dr Extension from Tumwater Blvd. to 81st Ave, including intersections at Prine Dr and 81st Ave.	$7,379,000	P
3	Linwood Ave	1, 2	Construct improvements (2/3 lanes) from 7th Ave to Rural Rd, including intersection improvements at 2nd Ave.	$3,360,300	G, C, P
4A	Trosper Rd	1	Widen one additional lane to create 5 lanes from Littlerock Rd to Lake Park, including intersection improvements at Lake Park.	$877,500	C, P
4B	Trosper Rd	1	Widen (3 lanes) from Lake Park to Rural Rd, including intersection improvements at Rural Rd.	$2,332,000	G, C, P
5A	Tumwater Blvd	1, 3	Widen Tumwater Blvd to 4/5 lane facility from I-5 to Littlerock Rd.	$4,056,000	C, P

Table 9.1. 2025 Improvement Program

Project ID #	Facility	TPA #	Description	Planning Level Cost Estimate (2007 dollars)	Funding Source (G)rants (W)SDOT (C)ity (P)rivate Development
5B	Tumwater Blvd	1,3	Widen Tumwater Blvd to 3 lanes from Capitol Blvd to Henderson Blvd. Improve intersection of Tumwater Blvd/Bonniewood.	$5,445,000	C, P
6	Tumwater Blvd Interchange	1, 3	Interchange improvements, including ramp and mainline auxiliary lanes.	$23,750,000	G, C, P, W
7	Linderson Way/ Center Street	1, 3	Intersection improvements at 76th and 83rd.	$900,000	C, P
8	Capitol Blvd	1, 2	Install southbound right-turn lane at Israel Rd, including signal modifications; consider urban upgrades. Modify signal at Trosper to eliminate westbound phase. Implement U-turn modifications as needed.	$1,200,000	C, P
9	North St / Custer Way	2	Implement intersection strategies listed in SubArea Plan Summary, *Table D-5* (*Appendix D*).	$1,800,000	G, C, P
10	“E” St Extension	2	Construct 4-lane extension between Cleveland Ave/Yelm Hwy and Capitol Blvd, including intersection improvements at Capitol Blvd and Cleveland Ave.	$7,980,000	G, C, P
11A	Old Hwy 99	3	Widen (4/5 lanes) from Tumwater Blvd to 88th Ave including intersections at Bonniewood (re-align) and 79th.	$17,654,000	G, C, P
11B	Old Hwy 99	3	Widen (4/5 lanes) from 88th Ave to south City limits (93rd Ave vicinity).	$11,403,000	G, C, P
12	Black Lake Blvd	4	Widen 2/3 lanes from Mottman Rd to western limits of City UGA.	$6,336,000	G, C, P
13A	Henderson Blvd	1,2,3	Widen (2/3 lanes) from south of Deschutes River to Tumwater Blvd, including intersection.	$4,651,200	C, P
13B	Henderson Blvd	1,2,3	Widen (2/3 lanes) from Tumwater Blvd to Old Hwy 99.	$5,202,000	C, P
14	32nd St	4	Extend from Ferguson St to Black Lake Blvd.	$3,712,000	P
15	Black Hills Vicinity	4	Extend 73rd Ave, 70th Ave, and 66th Ave; create transportation grid in vicinity of BHHS and future residential development.	$1,920,000	P

Table 9.1. 2025 Improvement Program

Project ID #	Facility	TPA #	Description	Planning Level Cost Estimate (2007 dollars)	Funding Source (G)rants (W)SDOT (C)ity (P)rivate Development
16A	93rd Avenue (SR 121)	3	Widen to 5 lanes from Lathrop Rd to Kimmie Rd.	$6,402,000	C, P
16B	93rd Avenue (SR 121)	3	Widen to 3 lanes from Kimmie Rd to Tilley Rd.	$5,353,000	G, C, P, W
16C	93rd Avenue (SR 121)	3	Widen to 3 lanes from Lathrop to western limits of City UGA.	$4,455,000	G, C, P
16D	93rd Avenue (SR 121)	3	Reconstruct interchange, including bridge widening, ramp modifications.	$12,000,000	P, W
17	Mottman Road	2,4	Construct intersection improvements at RW Johnson (signal or RAB).	$850,000	C, P
18	93rd Ave/Tilley Rd	3	Construct intersection improvements (signal or RAB).	$850,000	C, P
		2025 Improvement Program Total Estimated Costs		**$162,040,000**	

Once total project costs have been identified, the project fair-share cost allocations can be assessed (*Table 9.2*). These funding sources include Federal and State grants, WSDOT, the private development community, and the City.

The specific allocations and project-level breakouts by funding source are included in more detail in *Appendix F.*

Table 9.2. 2025 Transportation Investment by Funding Source

	Funding Source				
	(G)rant	(W)SDOT	(C)ity	(P)rivate	Totals
Total Cost	$49,590,180	$21,370,600	$24,547,950	$66,531,270	**$162,040,000**
% Allocations	**31 %**	**13 %**	**15 %**	**41 %**	**100 %**

Project Costing and Funding Source Allocation Issues

There are several key issues associated with project costs and allocations:

Planning-Level Estimates - Costs provided are planning-level estimates only, using the Thurston Regional Planning Council methodology and assumptions for cost-estimating. These are reasonable methods for long-range planning purposes. However, cost estimates will need to be more fully developed as projects move into the design phase, through development of the annual Six-Year TIP and revised TIF program.

Historic Precedence – Dollar investments projected for each of these funding sources far exceeds historic contributions by each of the sources. This is especially true for State and Federal grants. The total projected in *Table 9.2* equates to over $2.7 million per year for each of the 18 years (2007-2025) in the planning period.

WSDOT Programming – The largest projects, which include improvements to the WSDOT interchanges at Tumwater Boulevard and Trosper Road, are not included in the ten-year program. The City would likely need a direct legislative action allocating funds for these improvements.

Growth Dependent – Cost sharing assumptions with the private sector assume that forecasted growth will occur. Specific project contributions will be defined during the update of the TIF program; this will further clarify specific fair-share cost distributions and appropriate per-trip fees.

Improvement vs. Enhancement – The project list includes many “urban upgrade” elements (sidewalks, bike lanes, landscape areas). These items enhance the overall transportation network, and encourage the use of other transportation modes, but do not specifically address roadway capacity for vehicles.

Estimating Project Costs

Although reasonable for long-range planning purposes, costs provided in this Transportation Plan are planning-level estimates only. More detailed project cost and phasing information will be developed during subsequent planning efforts, including updating of the City’s traffic impact fee program and development of the Six-Year TIP.

Revenue Forecast

In order to prepare a revenue forecast, the City reviewed historic trends and current budgets. These were then extrapolated out into two categories, 2007-2012, and 2013-2025; then combined to arrive at a total revenue forecast for the planning period.

Revenues are summarized in *Table 9.3*, with additional information and background data included in *Appendix F*.

Table 9.3. Transportation Revenue Summary

2006 Beginning CFP Balance: $ 2,832,000

2006 Beginning TIF Balance: $ 5,042,476

Existing Revenue Sources	**2007-2012 Budget**	**2013-2025 Budget**
Utility Tax 1% of 6%	$ 2,532,692	$ 6,574,781
Arterial Street Gas Tax	$ 504,000	$ 1,092,000
REET (.025% original + .025% additional)	$ 2,310,000	$ 5,005,000
Federal Grants [3]	$ 600,000	$ 1,200,000
TIB Grants [2]	$ 3,000,000	$ 6,000,000
Legislative Appropriations [4]	$ 2,000,000	
Transportation Impact Fees [1]	$ 3,840,000	$ 8,320,000
Mitigation Fees (SEPA) from Private Development		
Other (Interest)	$ 300,000	$ 650,000
SUB TOTAL	**$ 15,086,692**	**$ 28,841,781**
TOTAL 2007-2025 Revenues		**$43,928,473**

(1) Annual TIF revenues based on an average of the CURRENT TIF for years 2001-2005, excluding the single largest fee collected each year (average $250,000 per year)

(2) Assumes award of $1,500,000 every 3 years

(3) Assumes award of $300,000 every 3 years

(4) Assumes direct Legislative appropriation

Summary of Costs and Revenues

Based upon the financial review conducted as part of this Transportation Plan, investments for transportation improvement projects for which the City is responsible are anticipated at $24,547,950 for the period of 2007-2025. The City is anticipating collecting $43,928,473 in revenue during that same period.

While this indicates that there are sufficient revenues identified to fund the investments identified in the Plan, the key issues outlined earlier in this chapter remain, and the City will need to keep these in mind as the Plan is reviewed, adopted, and implemented.

Chapter 10 Summary

Overview

This 2025 Transportation Plan is a key component of the City of Tumwater's Comprehensive Plan. Previous chapters have provided an assessment of existing conditions of network facilities, street classification, level of service, transit service, pedestrian and bicycle needs, travel demand management, and facility improvements needed to support future travel needs and potential funding strategies. It also integrates the City's transportation improvements with those identified by the Regional Transportation Plan.

As required through GMA, the Plan provides a link between planned land use in Tumwater and the transportation facilities and services needed to accommodate expected growth over the coming 20 years.

The information compiled in this Plan is intended to provide the legislative framework for all City decisions pertaining to infrastructure and the management of the transportation system in a manner consistent with GMA and regional planning policies.

Resolving Remaining Challenges

As indicated in Chapter 7, even with the addition of the 18 long-range improvement projects, there will be remaining deficiencies in the system. The issues, and proposed resolutions, are summarized in *Table 10-1*.

Table 10.1 Recommendations for Operational Deficiencies

Facility	Projected 2025 LOS	Recommendation
Littlerock Rd SW / Trosper Rd SW intersection	F (at 75% saturation)	Accept LOS F condition only for assumption of 75% land use saturation rate, which is not expected to occur within the 20-year planning horizon. For concurrency purposes, accept LOS D.
Littlerock Rd SW / Israel Rd intersection	F (at 75% saturation)	Accept LOS F condition only for assumption of 75% land use saturation rate, which is not expected to occur within the 20-year planning horizon. For concurrency purposes, accept LOS D.
I-5 Southbound Ramps / Trosper Rd SW / Tyee Dr	F	Work with WSDOT on this HSS facility to identify potential mitigations or modification to the WSDOT designated LOS D for this location, due to physical constraints and potential significant impact to adjacent commercial properties.
Boston St SE / Deschutes Way intersection	F	Intersection improvement options limited by financial constraints and proximity to Deschutes River crossing, I-5 and established commercial property. Consider feasibility of RAB at this location.
Yelm Hwy / Henderson Blvd	E	Improvements to this intersection would require participation of City of Olympia, Thurston County. The project is included in Thurston County's Six-Year TIP.
S 7th Ave / Linwood Ave SW	E	The intersection average meets City LOS standards (LOS D); only the worst movement is LOS E. The City should consider channelization improvements for specific movements.
Capitol Blvd	E	Accept LOS E for Capitol Boulevard and intersections with Trosper, Lee, Custer and E Street. This is consistent with Regional Planning policies for other major corridors.

NOTE: Adoption of LOS standards below existing should only be considered following implementation of recommendations, improvements, and strategies identified in the Transportation Plan and/or CFP.

What happens next?

Public Process

Adoption of this Transportation Plan as an element of the City's Comprehensive Plan can only happen following a multiple-step public process. In May 2007 the City's Public Works Committee discussed the Plan and it was then submitted to the Planning Commission. The Planning Commission was briefed on the Plan in June and a public hearing was held in July. Following two subsequent work sessions where public and commission input were discussed and modifications to the plan were made, the Planning Commission recommended Council approval of the Plan.

Citizen Input

The process to achieve adoption of the 2025 Transportation Plan involves several steps during which public comment is sought. Presentations of the Plan before the Planning Commission, in Public Hearing format, and to the City Council are all public forums designed to facilitate input from members of the local community.

Comments received through the public process and associated responses can be found in *Appendix G.*

Since that time, the Plan has been presented before the City Council at a worksession where the Plan was referred to the Public Works Committee for additional review. Remaining steps in the process include a public presentation to the City Council at a public hearing with a request that the 2025 Transportation Plan be officially adopted.

APPENDIX A

2025 Regional Transportation Plan Goals & Policies
HB 1487 Information
1998 Tumwater Transportation Plan Goals & Policies

1. Transportation and Land Use Consistency

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

Policies:

1.a Commit to the development and implementation of land use plans, development patterns and design standards that encourage non-motorized travel and use of mass transit, yet recognize the unique needs of the urban, suburban and rural communities in Thurston County.

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

1.c Meet mobility, access, and economic goals in designated strategy corridors with an appropriate combination of investments, policies, and land use measures.

1.d Design and invest in transportation projects that have a lasting positive impact on the communities served, reflect the goals of the people who live and work in the area, and contribute to a sense of place.

1.e Support policies, programs, and procedures that promote urban infill.

2. Multimodal Transportation System

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

Policies:

2.a Provide for quality transportation choices appropriate to existing and future land uses, including walking, biking, public transportation, rail, and motor vehicles.

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

2.c Invest in individual travel modes in ways that meet mode-specific needs while contributing to the overall development of a seamless multimodal transportation system.

2.d Promote public education on the rights and responsibilities of drivers, bikers, and walkers, and ways to travel together efficiently and safely.

3. Barrier-Free Transportation

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

Policies:

3.a Ensure transportation facilities comply with the Americans with Disabilities Act of 1990.

3.b Construct public transportation stops and walkway approaches that are accessible to those with differing physical capabilities.

3.c Provide transportation services, facilities, and programs that minimize barriers to people who don't speak or read English.

3.d Present information and provide public participation opportunities for people who have limited literacy skills.

3.e Promote land use policies that provide a variety of housing types in core areas near employment and services.

4. System Safety and Security

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

Policies:

4.a Use a combination of education, enforcement, design features, and investments to mitigate existing hazards and avoid potential hazards.

4.b Add shoulders to narrow, high-volume rural roads.

4.c Use street designs that encourage safe driver behavior.

4.d Use compact urban and suburban development techniques to reduce the overall distance that people need to travel.

4.e Invest in projects that improve passenger safety and security on public transportation and at associated facilities like park-and-ride lots and transit centers.

4.f Provide for safe school walking routes.

4.g Retrofit key transportation facilities to improve their ability to withstand a major earthquake or other natural disaster.

4.h Build in system redundancy to support emergency response and reduce community disruption during natural or man-made disasters.

4.i 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:

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

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

5.c Use street restoration standards, and coordinate utility and street projects to minimize the destructive impact of utility projects on streets. Where possible, leverage investments for both project types to deliver more cost-effective public facilities.

5.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.

5.e Coordinate street and road projects with neighboring jurisdictions.

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 at peak periods.

Policies:

6.a Promote mixed-use urban developments that reduce the need for auto travel, including financial and other incentives to encourage transportation-efficient development and redevelopment.

6.b Improve access to public transportation, ridesharing, bicycling, and walking.

6.c Promote private and public sector transportation demand management 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.

6.d Develop park-and-ride lots throughout the region, including shared use of underutilized parking lots at businesses and other facilities.

6.e Encourage the use of technologies that enable people to participate in activities or meet their needs without having to travel.

6.f Use travel demand management techniques to provide alternatives during temporary congestion resulting from major construction projects

7. Transportation Technologies

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

Policies:

7.a Use transportation technologies to more effectively utilize the existing transportation system.

7.b Use transportation technologies to better integrate transportation modes.

7.c Make short-range technology investment decisions that support future technology implementation strategies.

7.d Look for opportunities to integrate transportation technology considerations into all projects.

7.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.

7.f Coordinate transportation technologies among jurisdictions and with other transportation planning regions.

8. Freight Mobility

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

Policies:

8.a Promote access among highways and other major freight corridors, and among the region's intermodal transportation facilities and industrial areas.

8.b Increase the amount of freight that is moved by rail to enhance efficiency, productivity, safety, and mobility.

8.c Reduce weather-induced weight restrictions on streets, roads, and bridges that are important freight routes.

8.d Review transportation and/or land use actions' potential conflicts with freight movement, and address outstanding issues as part of the action.

8.e Minimize conflict caused by the growth of freight movement into and out of industrial areas in highly urbanized settings.

8.f Promote policies and design standards that minimize congestion impacts on local streets caused by delivery trucks, while maintaining economic support to businesses and services.

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:

9.a Support design and construction of multimodal streets and roads.

9.b Encourage new regional connections for cross-town or cross-region travel that provide more direct routes and reduce vehicle miles traveled, where those connections do not promote sprawl or otherwise undermine adopted land use plans.

9.c Limit the addition of travel lanes to those areas that can demonstrate long-term benefit, and where an increase is determined to be the best alternative.

9.d Avoid widening any local arterial or collector to more than two through lanes in each direction and an auxiliary turn lane where warranted (five lanes, maximum) to preserve an acceptable community scale for the Thurston region, and minimize transportation impacts on adjacent land uses.

9.e Use roundabouts as a tool for safely and efficiently managing the flow of traffic at intersections when they are an appropriate alternative to traffic signals or stop signs.

9.f Consider the use of access management techniques to preserve roadway capacity, minimize operating inefficiencies resulting from land use and development pressures, and increase overall system safety.

9.g Develop an interconnected grid of local streets and roads to increase individual travel options and neighborhood connectivity while improving efficient use of the overall regional network.

9.h Ensure that street, road, and bridge projects adequately meet transportation needs, function in harmony with their surroundings, and add lasting value to the communities they serve.

10. Public Transportation

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

Policies:

10.a Support implementation of Intercity Transit's "The Route Ahead" long-range regional transit plan, which emphasizes trunk and primary routes serving core areas and designated strategy corridors.

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

10.c Invest in the commuter vanpool program to provide cost-effective, flexible alternatives to driving.

10.d Develop inter-regional transit partnerships for long-distance commute trips to and from destinations outside Thurston County.

10.e Provide safe, convenient, and cost-effective transportation service to youth, elders, people with disabilities, or other people with special needs.

10.f Increase awareness of public transportation and how to use it through expanded education and public information tailored for various age groups and interests.

10.g Consider a broad range of public transportation programs and services, including but not limited to local street trolleys, bus rapid transit, flex car programs, commuter rail, and high speed passenger rail to ensure a full mix of options for meeting transportation needs as they evolve.

11. Biking

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

Policies:

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

11.b Provide safe and convenient bicycle routes to all schools in the region.

11.c Invest in a regional network of contiguous and connected north-south and east-west dedicated corridors to serve as the backbone of the non-motorized system.

11.d Provide bicycle parking facilities at existing and future transit centers,park-and-ride locations, train stations, and other multimodal facilities.

11.e Encourage provision of short- and long-term bicycle parking and other supporting facilities at schools, employment sites, and major activity centers.

11.f Develop an education program for bicyclists to increase understanding of bicycling laws and encourage appropriate riding behavior.

11.g Consider long-term strategies for funding bicycle facilities and services.

12. Walking

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

Policies:

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

12.b Construct safe sidewalks and effective crosswalks within an appropriate radius of every school in the region.

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

12.d Develop direct, "cut-through" connections for pedestrian and bike travel within and among neighborhoods and destinations such as major transit routes, schools, activity centers, and other destinations where pedestrian travel is anticipated.

12.e Require pedestrian-friendly building design in areas where foot travel is likely and encouraged, such as city centers and regional activity centers.

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

13. Rail

Goal: Ensure the long-term viability and continued use of existing rail lines in the region for freight and passenger rail travel.

Policies:

13.a Support appropriate short- and long-term opportunities for the potential shared use of freight rail lines for commuter rail or other passenger rail opportunities.

13.b Facilitate the acquisition and continued operation of short-line railroads by local jurisdictions where needed to support current and future economic development needs.

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

13.d Prioritize the acquisition of rights-of-way threatened with abandonment in order to preserve these corridors for potential high capacity transportation use in the future.

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

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:

14.a Encourage coordination between the Port of Olympia, the cities of Olympia and Tumwater, and Thurston County to maintain consistency between adopted land use plans and long-range airport development strategies, and to encourage land use compatibility in affected areas adjacent to the air-port.

14.b Maintain and upgrade the Olympia Regional Airport for small jet and prop aircraft.

14.c Support efforts to maintain regional passenger air service at the Olympia airport.

14.d Develop a multimodal transportation system that better serves the needs of air travelers by including viable travel alternatives to the Olympia Regional Airport and to SeaTac International Airport.

15. Marine Transportation

Goal: Provide an appropriate level of facilities and services to meet the region's marine transportation needs.

Policies:

15.a Maintain a marine terminal for water-borne freight movement.

15.b Encourage coordination among the Port of Olympia, the City of Olympia and other stakeholders to maintain consistency between adopted land use plans and long-range marine terminal development strategies, including adequate truck and rail access.

15.c Consider long-term strategies for integrating maritime passenger service into the regional transportation system as alternatives develop.

16. Public Involvement

Goal: Convene on-going community discussions and public input into regional transportation planning and decision-making processes.

Policies:

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

16.b Ensure equal access to participation, including measures to ensure access to people and groups who have been traditionally underserved by the existing transportation system or public processes.

16.c Promote increased community understanding of the relationship between land use choices and transportation consequences facing communities at local, tribal, regional, and state levels.

16.d Engage in consultation with tribal governments within the region to ensure tribal participation.

16.e Explore innovative participation techniques to increase overall public involvement.

17. Intergovernmental Coordination

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

Policies:

17.a Encourage coordination among the local, regional, and state governments in the operation of the transportation system.

17.b Work with government agencies to coordinate land uses, implement county-wide planning policies, and refine the tools needed to accomplish land use plans.

17.c Coordinate the development and update of local, regional, and state transportation plans to ensure consistency.

17.d Serve as a regional forum for the exchange of ideas, information, and issues among local jurisdictions and tribal, state and federal transportation authorities, to facilitate informed, reasoned decision-making processes.

17.e Establish government-to-government relations with tribal governments within the region to encourage coordination of land use and transportation plans.

18. Environmental and Human Health

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

Policies:

18.a Protect water quality by minimizing impervious surface area and stormwater runoff where possible, and effectively treating and managing unavoidable runoff.

18.b Minimize road crossings through designated environmentally sensitive areas and habitat corridors to avoid fragmentation and degradation of the region's open spaces and wildlife habitats.

18.c Use transportation planning, design, and construction measures that minimize negative impacts on priority fish-bearing streams.

18.d Develop a transportation system and support compact, mixed-use development policies that curb the growth in miles of motor vehicle travel as a means of increasing regional energy efficiency and reducing environmental impacts.

18.e Promote use of alternative fuels and technologies that reduce pollution emissions and other environmental impacts from motorized vehicles.

18.f Use compact urban development and the non-motorized forms of transportation it supports as a means of encouraging overall physical activity and community health.

18.g Ensure that minority populations and people with low incomes do not incur disproportionately high and adverse human health or environmental effects from transportation programs, policies, and investments.

18.h Coordinate with the Olympic Region Clean Air Agency, the Washington State Department of Ecology, the U.S. Environmental Protection Agency, the Federal Highway Administration, and the Federal Transit Administration to ensure federal Clean Air Act transportation requirements are met.

18.i Support efforts to improve motor vehicle maintenance to reduce air and water pollution.

18.j Strive to balance appropriate levels of environmental protection with the costs of achieving it, recognizing that environmental and human health impacts of the transportation system cannot be completely eliminated.

19. Performance Measures

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

Policies:

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

19.b Use transportation performance measures that reflect priority regional objectives, such as consistency of transportation and land use decisions, improved mobility and access, adequate maintenance and repair of the existing system, environmental protection, and safety.

19.c Develop performance measures that reflect the contribution of all modes of travel.

20. Transportation Funding

Goal: Ensure that transportation revenues provide maximum public benefit and support adopted land use strategies.

Policies:

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

20.b Prioritize the maintenance and preservation of the existing transportation system to minimize life-cycle costs.

20.c Consider costs and benefits in the allocation of transportation funds to ensure best long-term investment decisions.

20.d Make strategic transportation investments that reinforce well-planned growth and redevelopment decisions.

20.e Ensure that transportation investments are equitable to all segments of the community – in terms of costs such as relocations, adverse health impacts, and land use disruptions – and in terms of benefits derived from the system, such as levels of service or travel choices.

20.f Support efforts to improve the availability, predictability, and flexibility of transportation revenues.

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

HB 1487

The 1998 legislation House Bill 1487, known as the "Level of Service" Bill, amended the Growth Management Act, Priority Programming for Highways, Statewide Transportation Planning, and Regional Planning Organizations. The bill was passed to enhance the identification and coordinated planning for major transportation facilities identified as "transportation facilities and services of statewide significance (TFSSS)". HB 1487 creates a strong tie between the local transportation plan requirements and the state's role in designating level of service on state-owned facilities, and recognizes the importance of these facilities from a state planning and programming perspective. It requires that local jurisdictions reflect these facilities and services within their comprehensive plan, and also that local plans be consistent with regional and state transportation plans; local, regional and state financial plans; and funding priorities identified by the Transportation Commission.

To assist in local compliance with HB 1487, the Washington State Department of Transportation (WSDOT), Transportation Planning Office, and the Washington State Department of Community, Trade and Economic Development promulgated implementation guidelines in the form of a publication entitled "Coordinating Transportation and Growth Management Planning".

The City of Tumwater will continue to collaborate with WSDOT, the Office of Community Development (OCD) and TRPC to enhance the consistency of statewide transportation planning at the local, regional and state level. In order to comply with HB 1487 the City has worked to compile the best available information to include in the comprehensive plan amendment process, and asserts that proposed improvements to state-owned facilities will be consistent with the Regional Transportation Plan and the State Highway System Plan.

State-managed facilities within the Tumwater transportation network include:

- I-5
- US Hwy 101
- SR 121

Two of these roadways, I-5 and US Hwy 101, are designated as Highways of Statewide Significance (HSS). The map on the following page illustrates the HSS within the Tumwater system and includes projected 2025 traffic volumes for various segments of these roadways throughout the Tumwater network.

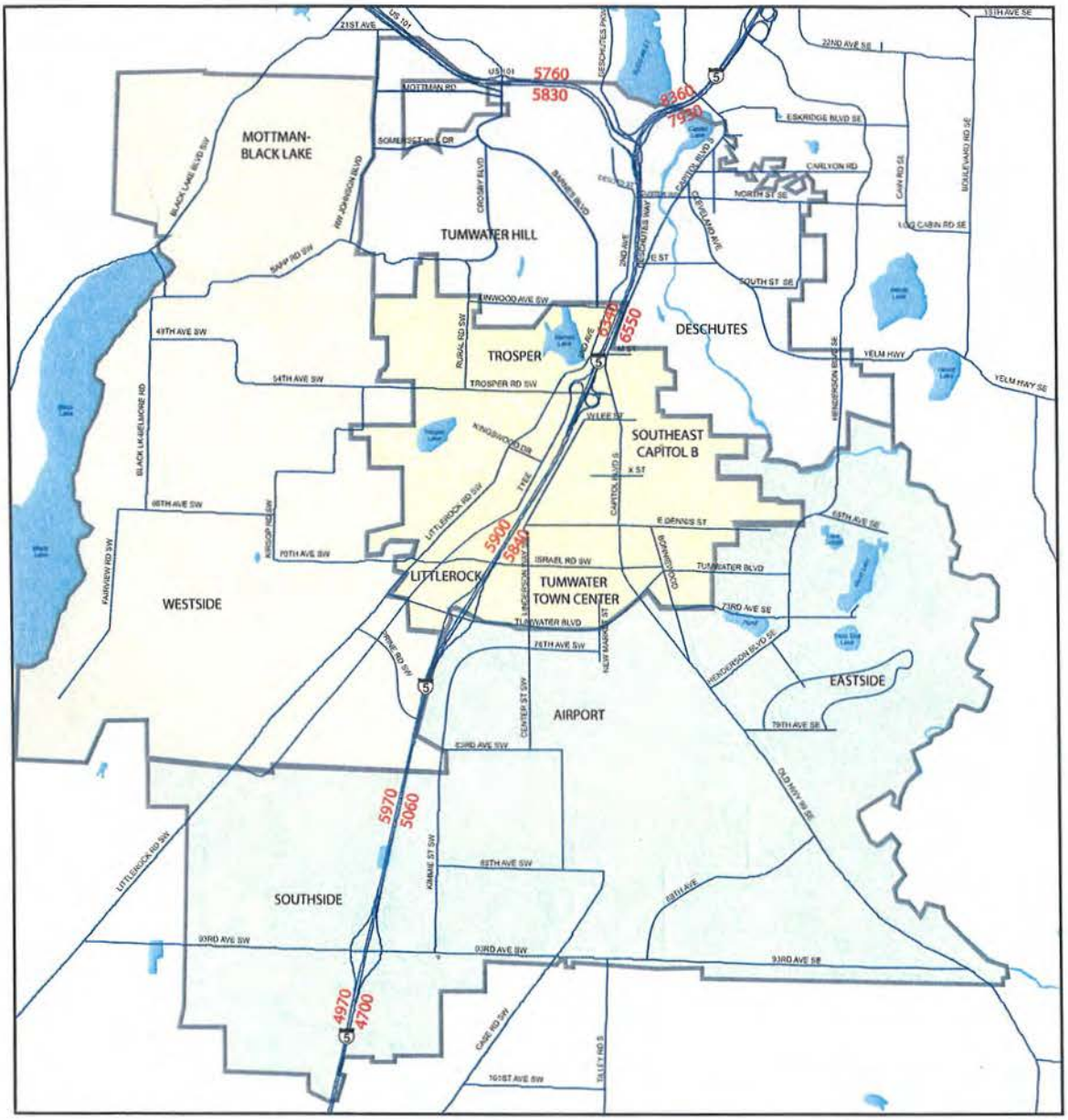
SR 121 has been identified as a Regionally Significant Highway (non-HSS).

The LOS for state-owned highways is as follows:

- Highways of Statewide Significance (HSS) – LOS D within urban areas and LOS C in rural areas as adopted by WSDOT in consultation with local governments.

- Regionally Significant Highways (non-HSS) – LOS D within city limits and urban growth areas as adopted by the Thurston Regional Planning Council (TRPC) jointly with WSDOT.

Transportation Facilities and Services of Statewide Significance (I-5, US 101)
Projected 2025 Volumes



II. TRANSPORTATION PLAN GOALS

This plan is consistent with the twelve transportation elements (goals) identified in the Regional Transportation Plan (RTP). Each element starts with a general goal statement, followed by policies which will help to achieve the goal. Since the RTP is a regional plan, its goals and policies will be implemented through the combined actions of state, regional and local jurisdictions. Implementation means include comprehensive plans, capital facilities plans, transportation improvement programs, development regulations, and service programs, as applicable. The policies will also be used by the Thurston Regional Planning Council in reviewing the transportation elements of local comprehensive plans for consistency with the RTP, and in guiding project selection for regional funding.

Long-range transportation planning at state, regional and local levels is a cyclical process. The policies and strategies in this plan are based on employment and population forecasts, including land use allocations, and other information available at the time of plan development. ISTEA requires that the Transportation Plan be reviewed and updated at least every three years in areas with poor air quality, and at least every five years in other areas. The State Growth Management Act requires that the plan be reviewed at least every two years to remain current. To ensure this plan is consistent with evolving land use patterns, it may need to be reviewed more frequently, and amended if warranted.

Each of the twelve goals are presented below:

1. Travel Demand Management

Effective implementation of travel demand management (TDM) policies and strategies will contribute to reducing the percentage of people who drive alone. Effective implementation is expected to reduce the work trip drive-alones during the afternoon peak two-hour period to 60% in urban core areas and high density corridors and 70% in the rest of the urban areas by 2020. If achieved, this trip reduction will result in about 6,000 fewer peak hour vehicle trips region-wide. Progress toward reducing drive-alone work trips will be measured consistently using data available from the U.S. census and future local travel surveys.

GOAL: **Reduce vehicle trips and vehicle miles traveled during peak periods to minimize the demand for constructing costly road improvements. In the short-term, establish education, incentives and services that encourage employees and students to use alternative transportation methods for work, school, and other trips. Over time, phase in disincentives, regulations and enforcement that discourage driving alone.**

1.1 Public Information & Education

The public needs to be aware of the benefits of a less car dependent community, and informed about alternatives to driving alone to work.

1.1.1 Develop information programs for the general public that promote alternatives to driving alone to work and school. These may include: written information; speakers bureau; interpretive displays; alternative transportation fairs; and multi-media presentations. The purpose is to inform people of available services and the economic, environmental and personal benefits that can be achieved by reducing driving alone.

1.1.2 Track the reduction in commute trips and other measures that help reduce vehicle trips and develop information about these in order to inform the public and celebrate achievements. As proposed TDM programs are funded and implemented, appropriate benchmarks and goals for urban and rural areas should be developed. Progress on these goals should be monitored and reported regularly.

1.1.3 Keep citizens informed about decisions that will be made that will affect the transportation network and transportation services so that they can participate in the decision making process.

1.1.4 Provide ongoing public education programs about safety, courtesy and the rights and responsibilities of motorists, pedestrians and bicyclists.

1.1.5 Work with school districts and colleges to develop transportation education programs that will make students aware of the costs and benefits of various transportation choices and promote available services and alternatives.

1.1.6 Support outreach and education that encourages the use of Location Efficient Mortgages that can act as an incentive for homebuyers to purchase homes in close-in urban areas.

1.2 Incentives and Services

1.2.1 Pursue incentive and services programs to attract people to alternative modes, such as:

- Ride matching services for carpools and vanpools;
- Preferential parking for carpools and vanpools;
- Employer subsidized bus passes, and other financial incentives;
- "Flex time" programs, telecommuting, tele-conferencing, four day work weeks;
- A guaranteed ride home in case of emergency;

- Facility support for high occupancy vehicle travel, such as park-and-ride lots and HOV lanes, if viable;
- Land use development standards that promote attractive, safe environments for bicycle and pedestrian activities;
- Facility support for non-motorized travel, such as bicycle lanes, bicycle parking, sidewalks, and shower facilities; and
- Encouraging commercial deliveries and shipping during off peak hours.

1.2.2 Recognize that single-occupancy vehicles will continue to be the primary mode of transportation for many people. Encourage the use of smaller, more fuel-efficient vehicles, such as compact cars, motorcycles, and motor scooters.

1.3 Commute Trip Reduction

Under the State Commute Trip Reduction (CTR) legislation, employers with 100 or more employees in the region are required to reduce solo commuting 20% by 1997, 25% by 1999, and 35% by 2005.

1.3.1 The CTR coordinating agency will work with affected employers to implement specific measures to achieve trip reduction targets. These measures include, but are not limited to, providing TDM support facilities such as showers; lockers; lunchrooms; covered transit stops; and paths connecting transit stops to building entrances. Local jurisdictions and the state will enforce state and local trip reduction laws.

1.3.2 Local CTR coordinators should coordinate with the state's public awareness campaign efforts. Inform employers and employees of travel demand management needs and encourage employees to use alternative travel modes. In making available services and expected results known:

- Use formal procedures to establish or change rules;
- Sustain the programs over time -- ongoing funding support for program coordination should be identified;
- Emphasize area-wide solutions -- economies of scale may be realized by programs undertaken throughout an area;
- Share costs where possible -- marketing strategies, printing costs and acquisition of vans can be shared by area participants; and
- The regional CTR coordinator should work with affected employers to form Transportation

Management Associations (TMAs) to jointly work toward achieving trip reduction goals.

1.3.3 Encourage smaller employers to participate in the trip reduction program by providing services and incentives.

1.3.4 School districts are encouraged to evaluate measures that might help address traffic congestion, such as staggered start times, parking management, more use of public transit, sharing of school bus fleets, and other measures as appropriate to reduce traffic demand during peak commute hours.

1.4 Parking Management

Parking policy is a critical element in travel demand management. Since parking is essential at some point for virtually all automobile trips, the price and availability of parking strongly influence whether people choose to make their trips by automobile.

1.4.1 Manage parking to decrease the percentage of drive-alone commuters. This can be done by developing parking management plans in all jurisdictions, especially in the Core Areas and along High Density Residential Corridors where transit runs most frequently. Parking management should acknowledge customer parking needs in commercial areas. Parking management strategies may include:

- Reducing free or subsidized long-term employee parking;
- Establishing appropriate maximum parking ratios for employee parking, especially for new non-residential development;
- Increasing the number of preferential parking spaces for carpools and vanpools;
- Encouraging employers to implement a "parking cash-out program" whereby employees have the choice of a parking space or a cash allowance;
- Encouraging the use of common parking facilities among adjacent land uses; and
- Monitoring potential impacts of parking management on adjacent neighborhoods and mitigating the impacts, where appropriate.

1.4.2 Local jurisdictions are encouraged to move from minimum parking standards to maximum parking standards, especially for employees, in areas where alternative transportation facilities are available.

1.4.3 As funding becomes available, develop area wide parking management plans for Core Areas (especially state and local government sites), other major business employment sites, and schools and colleges. These plans should consider how parking management can evolve over time as transit service and other demand management programs become available. In strategy areas (corridors with capacity deficiencies but too costly to be widened), parking management may be important.

1.4.4 Consider public provision of commercial parking in Core Areas that can be redeveloped as other transportation services become available and the densities of Core Areas increase. This can serve as an incentive for development to locate in Core Areas since parking requirements are met and controlled by a public entity and the development is able to fully utilize its site.

1.4.5 Maximize the use of existing parking lots, wherever possible, as park-and-ride lots, especially where services are available that will allow one stop shopping. Support local jurisdiction efforts to develop regulations requiring transportation management plans for new development, especially in Core Areas and along the High Density Residential Corridors.

1.4.6 School districts are encouraged to implement student parking management strategies while working with neighborhoods to minimize impacts on surrounding streets and roads.

1.5 Emerging Technologies

Emerging media and electronic technologies will facilitate participation in activities by people without having to drive from place to place.

1.5.1 Facilitate implementation of emerging technologies to reduce daily physical travels to work, stores, business meetings, banks, schools and other activities.

1.5.2 Local and regional government entities will continue to facilitate participation in their meetings and proceedings via electronic means to reduce the need for physical travel. This may be addressed by providing sufficient capacity when local governments renew their agreements with telecommunication and cable franchises.

1.5.3 Monitor the effect of emerging technologies in reducing physical travel in order to more realistically assess future travel demand, and incorporate the findings into future Transportation Plan updates as appropriate.

1.6 TDM Implementation

TDM is an important part of the transportation solution. Local jurisdictions will work together to determine the process and funding for implementing the proposed regional TDM programs.

2. Public Transportation

The federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) requires the Regional Transportation Plan to consider "methods to expand and enhance transit services and to increase the use of such service." The State Growth Management Act and local comprehensive plans seek to achieve compact urban development with increasing densities. Transit may, therefore, be an important alternative to automobiles, especially in high density areas with heavy traffic congestion, where adding road capacity would have significant negative impacts and be cost prohibitive. Long bus trips resulting from slow bus running speeds and long waiting times have been cited as major disincentives to transit use. This plan recognizes that reliable and frequent services are pivotal to making transit a viable alternative to driving. Such services may help reduce the need to construct costly roads and their associated impacts.

GOAL: **Provide effective public transportation services to help reduce car dependence in the region and serve the needs of people who rely on public transportation.**

2.1 Transit System Expansion

Support increased transit service over time in response to infill, higher density development and growth. Intercity Transit should maximize system productivity by emphasizing service in the Core Areas and High Density Residential Corridors. Use smaller buses to minimize impact on residential neighborhoods and roads. Continue to explore the feasibility of providing high capacity transit (HCT) services between Thurston County and the Central Puget Sound Region.

2.2 Transit System Reliability

Ensure the transit system is a viable alternative to the private automobile whenever possible. Encourage capital and Transportation System Management investments to improve the reliability, safety, and attractiveness of the transit system, especially in the Core Areas and along High Density Residential Corridors. Intercity Transit could include high occupancy vehicle (HOV) lanes, transit-only lanes near intersections for buses, priority signals, and park-and-ride lots in conjunction with city projects.

2.3 Transit Operating Speed

Intercity Transit should develop and work toward a transit operating speed goal in coordination with the City of Tumwater and other local jurisdictions. The goal will trigger discussion of strategies on how to maintain reliable transit services. In some cases system improvements may be necessary to give transit and carpools/vanpools a travel time advantage. These improvements should not unreasonably degrade the overall LOS for other transportation modes including freight movement.

2.4 Improve Service to Attract More Riders

Intercity Transit should develop a transit system that attracts more people, especially in urban areas, to use public transportation. Special care should be taken to meet the transit needs of elderly, disabled, young, and low-income citizens.

2.5 System Coordination

Intercity Transit should assess the need for expanded and coordinated service connections to other activity centers within the county and between Thurston County and activity centers of adjacent counties.

2.6 Intermodal Coordination

Integrate the regional public transit system with other modes of transportation including auto, bicycle, pedestrian, rail, and other modes as they develop. This might include secure bike racks at park-and-ride lots and on buses, and transit transfer points at rail stations.

2.7 Park-and-Ride Lots

Expand existing park-and-ride lots and develop new sites over time as needed. Implement appropriate measures to deter vandalism and theft and to ensure that sites are safe and conducive to effective use. Park-and-ride lots should be designed and located in a manner that compliments the surrounding land use.

2.8 Rail Service

Explore the options for operating short line rail in the region including tourist operations. Ideas for future freight and passenger rail operations should be examined by the Port, Intercity Transit, and private rail operation organizations to determine their viability.

2.9 Other Forms of Public Transportation

Explore high capacity transportation options as well as increased Amtrak and vintage streetcar/trolley operations wherever they

are viable. The successful creation of core areas as major destinations and increased densities in other parts of the urban area will set the scene for possible future rail. While these alternatives are more costly than bus transit now, they may prove to be a good option for some areas.

2.10 Private Participation

As funding becomes available, the City of Tumwater could work with IT to investigate possible funding mechanisms, including private participation and joint development of transit facilities and services such as transfer centers, park-and-ride sites, and private subscription bus service if viable.

2.11 Public Education

Look for opportunities to promote transit as part of on-going public education. For example, include transit and rideshare information in public meeting notices when meetings are held within service areas. Evaluate the cost benefit of all education projects.

3. Bicycle and Pedestrian Transportation

GOAL: **Encourage bicycle and pedestrian travel by providing inviting, safe, convenient and connected routes, education and incentive programs, and support services such as bike racks, showers and lockers.**

3.1 Improved Connections

Improve bike and pedestrian facility connections over time to provide a viable transportation alternative and enable continuous recreation routes consistent with the city's recommended bicycle and pedestrian route plans.

3.2 New Facilities

It is more cost effective to construct pedestrian and bicycle facilities in conjunction with other capital improvements (roadways, sewers, waterlines, stormlines) and new developments. The city will continue to evaluate coordination of these projects. On-street bicycle/pedestrian facilities will continue to be incorporated into road improvement projects in urban areas. Encourage employers to include bicycle and pedestrian supportive facilities at employment sites through appropriate guidelines for new development.

3.3 Inter-jurisdictional Coordination

Coordinate bicycle/pedestrian facility improvements among jurisdictions to complete connected routes.

3.4 Bicycle Parking

Require new developments to provide safe, convenient and secure bicycle parking at activity centers such as commercial areas, institutions, parking garages, park-and-ride facilities and transit stations.

3.5 Safe and Supportive Bicycle and Pedestrian Facilities

Encourage safe pedestrian and bicycle travel, especially in the core areas and high density corridors. Make sure development and redevelopment in these areas makes it as easy to get around by transit, walking or bicycling as by driving. Development guidelines should direct building placement in ways that do not interfere with efficient transit service or access by pedestrians and bicyclists in certain areas. Sidewalks should make good connections with bus stops and with the entrances to buildings and comply with the Americans with Disabilities Act.

Assign a high priority to improving the safety of sidewalks and bike lanes. This plan supports methods to provide safe crossings incorporated into roadway designs including: center roadway medians; pedestrian refuge islands; innovative traffic calming measures; narrow streets; and appropriate detectors for pedestrians and bicyclists.

4. Highway and Road Network

GOAL: Maintain and improve a network of highways, streets, and roads that moves people, goods, and services safely and efficiently throughout the region, minimizes social and environmental impacts, and supports various modes of travel.

4.1 System Maintenance

Assign a high priority to meeting the maintenance needs of the transportation system. The City of Tumwater will identify maintenance improvements which contribute to the efficient and safe movement of all transportation modes.

4.2 System Safety Improvement

Assign a high priority to improving roads with high accident rates. The investment in improving roads with hazardous conditions will be balanced with the investments in congestion management and meeting the level of service goals.

4.3 System Efficiency Improvement

Take advantage of new transportation technologies, where feasible, to improve the existing transportation system's operating efficiency. New technologies include intelligent transportation

systems, traffic signal coordination and incident management techniques. Local jurisdictions should identify intersection improvements that enhance system efficiency and incorporate these improvements into their capital facilities plans and transportation improvement programs.

4.4 Level of Service (LOS) Goals

LOS should be looked at in a broader context than volume-to-capacity (V/C) ratio. A V/C ratio, calculated using a peak period of two hours, should be used as a screening tool for identifying capacity deficiencies. Once a deficient corridor is identified, other factors such as road spacing and hierarchy, road connections and access, environmental, social and physical constraints should be considered in determining the need and feasibility for a road widening.

The City of Tumwater has adopted LOS "D" as the minimum acceptable standard for all intersections and roadways within the city and Urban Growth Area. One exception is currently allowed within the Tumwater UGA; the city allows a LOS "E" standard for the Capitol Boulevard/Trosper Road intersection.

4.5 Congestion Management and System Expansion

New roads, extensions of existing roads, and adding travel lanes to existing roads should be identified through local and regional transportation planning processes. Prioritize the maintenance and improvement of highways and roads based on cost-effectiveness.

New corridors should be identified and roads built to reduce future traffic congestion where appropriate. Long term strategies to address forecast congestion along I-5 and US-101 should be identified. Such strategies may include high occupancy vehicle lanes, bypass routes and intelligent vehicle highway systems.

4.6 Road Width and Community Scale

Generally, a road shall not be widened beyond two through lanes each direction with auxiliary turn lanes as appropriate. Roads with more than five lanes are perceived by the public as beyond the scale that is appropriate for this community.

4.7 Multi-Modal Approach to LOS Goals – Strategy Areas

In portions of the roadway network identified as "strategy areas" ideal LOS goals should be used as a framework to evaluate alternatives to road widening. Other alternatives for improving capacity include strict access control, center roadway medians, modern roundabouts, removal of traffic signals, restricting certain movements, one-way streets, and other innovative solutions. The multi-modal approach is a decision tree that would start by

considering tradeoffs between improving vehicle capacity and improving other travel modes. Actions to reduce vehicle trips, such as adding bike lanes and sidewalks, improving transit services, and implementing travel demand management measures should be considered to relieve traffic congestion in strategy areas. Local concurrency ordinances should be reviewed and updated as appropriate to implement multi-modal strategies identified for these areas.

4.8 Multi-Modal Integration

Road projects shall consider needs for transit, HOVs, pedestrians, bicycles, and freight movement during initial project development at the local and regional levels. Measures to consider may include the provision of, but are not limited to: bicycle and sidewalk facilities at the time of road construction; transit signal priority or queue jumper lanes in urban corridors; and facilities to expedite the movement of freight between road, rail, and marine transport.

4.9 Connections and Access

In the urban area an increased number of street connections should be built. This acknowledges that a network of connected streets reduces the distance to destinations or transit stops, gives several route options, reduces vehicle miles traveled, reduces the need for road widening, and makes freight delivery and emergency service more efficient. With more streets, fewer lanes are needed on each arterial. Fewer lanes on streets preserves easy and safe access for pedestrians.

4.10 Transportation and Land Use

Highway, street, and road projects shall be consistent with long range local land use plans and long range traffic forecasts, and should contribute to reaching the drive-alone reduction goals of this plan.

5. Freight Transportation

GOAL: Promote further development and coordination of facilities for the movement of freight to maintain Washington's strong trade-related economy. Ensure a system compatible with the movement of people and freight.

5.1 Maintain the efficiency and level of service of the freight movement network, and improve where needed. Give a high priority to improving congested roadways with high freight use.

5.2 Coordinate with the Port of Olympia, the Mottman Industrial Park, the northeast Lacey industrial area, as well as farm, timber

harvest, and other local manufacturers to ensure freight access routes are suitably designed and maintained for regular use by heavy trucks as well as for use by the other transportation modes.

5.3 Support continued rail freight transportation using existing rail facilities. Coordinate with the Port of Olympia and other local jurisdictions involved to ensure the rail access routes remain open for regular use.

6. Rail Corridor Preservation

GOAL: **Promote the continued use of freight rail and preserve threatened lines that have been identified for future passenger or freight rail transportation.**

6.1 Take action to preserve rail corridors and track where feasible, before official abandonment occurs, to avoid the breaking up of ownership along these corridors.

6.2 Explore opportunities for funding the use of rail corridors including:

- Local private and public sources (the Port of Olympia, the jurisdictions, utility companies, rails to trails organizations, voter approved rail or road system funds);
- State sources (Washington State Department of Transportation, State Parks, Interagency for Outdoor Recreation, Department of Natural Resources, Washington Department of Fish & Wildlife); and
- Federal funds.

6.3 Explore opportunities for joint use of rail corridors by transportation, recreation and utilities, where sufficient right-of-way is available. Preserved rail corridors can be used for trails in the short term and held for possible use as rail, (exclusive transit or some other high capacity transportation mode) in the future. Transportation should be recognized as the priority use in these corridors. Recreation use should not preclude conversion to a transportation use or the future sharing of the corridor. Short and long term uses are described in the 1992 Railroad Right of Way Preservation and Use Strategy for the Thurston County Region. The 1991 Urban Trails Plan describes possible recreation and bike path locations.

6.4 Continue cooperation between the Port, cities, towns and the County to acquire threatened rail corridors. Interest groups and partnerships for preservation are identified in the 1992 Railroad Right of Way Preservation and Use Strategy. Corridors are

identified for operations within Thurston County as well as future connections that can be made with outlying counties.

7. Air Transportation

GOAL: **Coordinate regional aviation system improvements that provide an adequate level of facilities and services to meet the needs of residents and businesses in the region.**

7.1 Support the Port of Olympia, the owner and operator of the Olympia Regional Airport, to maintain and improve the existing airport facilities consistent with guidelines and standards established by federal, state and local jurisdictions.

7.2 Support long term airport capital construction and operation programs designed to meet market demand in a manner that maximizes benefits for the local region while minimizing impact on surrounding neighborhoods.

7.3 Support development of an appropriate multi-modal transportation infrastructure to provide adequate access to the Olympia Regional Airport and to the SeaTac Airport in Central Puget Sound.

7.4 Support continued development of facilities for growing national/international air passenger and freight traffic close to the population centers of Central Puget Sound. Discourage efforts to site such facilities in Thurston County.

Make sure that land use near the Olympia Regional Airport is consistent with the airport development.

8. Intermodal Connections

GOAL: **Provide adequate connections and access among all transportation modes that function as an integrated regional transportation system. The coordinated multi-modal transportation system will enhance choice in serving the mobility and accessibility needs of people and goods within and through Thurston County and minimize transportation-related fuel consumption and air pollution.**

8.1 Highways, streets, and roads should be designed and constructed to accommodate cars, transit, HOVs, pedestrians, bicycles, as well as trucks as appropriate.

8.2 Provide appropriate intermodal connections at transit transfer centers, regional activity centers, regional employment centers,

the Port, the Olympia Airport, regional freight and passenger rail stations, and regional industrial areas.

8.3 Encourage the provision of intermodal supporting facilities at appropriate locations. Such facilities may include park-and-ride lots at appropriate interregional transit stations, bus shelters at transit transfer centers and bus stops, bike racks and shower facilities at major employment sites.

9. Land Use & Development

GOAL: **Attract the density, mix, type and concentration of development in Core Areas and identified corridors throughout the region to support and encourage the use of alternative transportation modes.**

9.1 Continue to increase density and mixed uses in High and Medium Density Residential Corridors and Core Areas. This will provide the population concentration necessary to support increased transit service, and enable some people to meet day-to-day needs without driving.

Land Use Definitions:

Core Areas: High density areas mixing residential, employment and commercial activities with small parks or green spaces. Core Areas create compact urban environments where people live, work, shop and play, and are able to satisfy day-to-day needs with fewer vehicle trips. Residential density goals should be 15+ units/acre and employment density goals should be 25+ employees/acre in order to create the necessary concentration of activity to support and maximize use of alternative transportation options.

High Density Residential Corridor: High density residential areas along the urban streets serving as primary links between Core Areas and major employment sites. Residential density goals should be 15+ units/acre in these corridors. This density should be encouraged within 1/4 mile of the main streets where appropriate. Where lower density neighborhoods already exist adjoining the High Density Residential Corridor, an average of 7+ units/acre should be encouraged in these adjacent neighborhoods. Neighborhood commercial and some transit compatible commercial and retail should be provided in these largely residential areas.

Medium Density Residential Corridor: Medium density residential areas within a five minute walk or 1/4 mile of an urban area street that is a logical connector to a High Density Corridor, Core Area or major employment site. Residential

density goals should be 7+ units/acre in these corridors. Small scale neighborhood commercial areas serving the day-to-day needs of the neighborhood are located at appropriate intervals. These neighborhood commercial areas are good locations for transit stops.

9.2 Create strong incentives to attract appropriate development in and around Core Areas and High Density Residential Corridors. Site public buildings and focus public investment in these areas in order to encourage the concentration and mix of uses that will help achieve transportation and land use goals. Development in these areas will support the use of alternative transportation modes and the substantial investment in TDM focused in these areas.

9.3 Locate and develop medium and high density residential and neighborhood scale in a way that respects abutting properties and minimizes the impacts on them. Join with the development community in pursuit of good urban design through information, education and prototype projects, to assure compatible development, protect abutting property, and encourage public acceptance of compact, dense development.

9.4 Encourage urban design standards for infill and redevelopment to assure compatibility with surrounding properties, and contribute to the creation of a sense of place. In Core Areas and along High Density Residential Corridors, urban design standards for streets and buildings will be especially important to assure the creation and maintenance of human scale areas that encourage and accommodate pedestrian activity.

9.5 Use development standards that encourage and accommodate pedestrian, bicycle and transit riders. Such standards include:

- The use of connected street grids, with alley access for garages and service and delivery vehicles, where practical, in new urban growth area development;
- Safe and accessible transit stops;
- Pleasant, safe and attractive streets and sidewalks;
- Convenient access to the fronts of buildings;
- Good pedestrian connections between buildings;
- New or redeveloped buildings placed close to the street edge of the planned right of way, with parking on the sides or behind the buildings or in a way that does not interfere with efficient transit service and easy access by bicycles and pedestrians;
- Park-and-ride lots that encourage the location of convenience stores and personal services for the day-to-day needs of commuters.

Encourage design standards and other requirements that support transit, bicycle and pedestrian movement in the local site plan development review process. Encourage the location of public buildings and facilities on existing transit routes if feasible.

For any "by-pass" road or "peripheral connector," land use control measures should be implemented to preclude development inconsistent with growth management goals and policies. These may include: limiting access; strong zoning controls; and purchase of development rights and adjacent property.

Encourage local jurisdictions to fine tune plans and work with the State Legislature and the development, finance, and other affected communities to identify barriers to urban infill development and redevelopment, and establish tools for achieving the land use density goals.

10. Energy & Environment

GOAL: **Work toward development of a transportation system that reduces dependence on fossil fuels, uses energy efficiently, promotes improved air and water quality, helps prevent sprawl, and lessens the region's contribution to climate change.**

10.1 Protect air quality by reducing vehicle exhaust emissions, especially carbon monoxide emissions, through:

- Promotion of alternatives to the single occupancy vehicle;
- Support of roadway operational efficiency improvements such as removing bottlenecks, adding intersection turn lanes and coordinating traffic signals;
- Development of a transportation system that works as efficiently as possible for all modes of travel; and
- Concentration of destinations to decrease the number of miles traveled and the number of times that a vehicle's engine must be started.

10.2 Continue to protect water quality by treating and filtering stormwater run-off from roads and parking lots as required by the local stormwater manuals.

10.3 Protect wetlands and wildlife by minimizing road crossings through wetlands and disturbance to other environmentally sensitive areas, such as fish bearing streams. If such crossings are made, mitigation measures will be taken to minimize their impact.

10.4 Protect the environment by promoting compact urban development to reduce vehicle miles traveled. This can occur by implementing comprehensive plans which emphasize concentrating growth, using existing roads and building new corridors where needed, and by creating attractive urban areas where people will want to live and where they will be close to services. Compact urban development will reduce urban sprawl and help conserve rural and natural areas.

10.5 Promote energy conservation and pollution reduction through commute trip reduction programs and the use of alternative fuels.

10.6 Coordinate with Washington State Department of Ecology and the Olympic Air Pollution Control Authority in air quality monitoring and modeling.

10.7 Local jurisdictions should actively pursue environmental retrofit of roadway infrastructure that damages sensitive habitat, such as culverts that interfere with salmon spawning areas.

11. Intergovernmental Coordination

GOAL: **Coordinate state, regional and local transportation plans to assure transportation facilities crossing jurisdiction boundaries are addressed in a consistent manner; and transportation and land use decisions contribute to increasing alternative travel.**

11.1 Review the Transportation Plan at least every two years as required by the Growth Management Act. Update the Transportation Plan, if necessary, to assure its compatibility with local comprehensive plans and state and federal laws.

11.2 Coordinate local, regional and state transportation plans to insure consistency.

11.3 Coordinate road projects and other system improvements through local, regional and state transportation improvement programs to ensure they are consistent with local, regional and state transportation plans.

11.4 Support efforts to coordinate public transit service with school district bus service where possible to reduce vehicle trips.

11.5 Coordinate local and regional transportation efforts with the requirements of the Americans with Disabilities Act.

11.6 Coordinate local and regional transportation plans with adjacent counties.

11.7 Ensure the early and on-going participation of state and local interests in the areas of recreation travel, commercial travel, and freight movement.

11.8 Coordinate regional Travel Demand Management efforts (including Commute Trip Reduction program) in order to maximize effectiveness and efficiency.

11.9 Actively pursue interlocal agreements to provide for mitigation of development impacts on transportation facilities of other jurisdictions.

12. Transportation Financing

This plan gives a high priority to maintenance and safety improvements. It also recommends a range of new transportation programs, services and facilities to meet current mobility needs and accommodate future growth. Yet, funding sources now in use are not adequate for maintaining and improving existing transportation facilities. Recommended transportation programs, services and improvements included in this plan are contingent upon increased taxes and fees.

GOAL: **Establish funding sufficient to implement planned transportation projects and services.**

12.1 Inform the public of the need for transportation maintenance, facility improvements and services, and the consequences of service and funding choices.

12.2 Ask the public to support new taxes and fees to implement this plan's local and regional projects, programs and services. This includes a local motor vehicle license fee and voter approval of a local option gas tax. Evaluate the potential impact of a motor vehicle license fee on low-income and fixed-income households. Determine if measures to reduce its impact on these households are necessary prior to its implementation.

12.3 Develop a regional funding mechanism to implement regional facilities that cross jurisdiction boundaries.

12.4 Set priorities for road and transit improvements through the state and regional funding allocation processes to assure that the highest priority regional projects receive regional funding.

12.5 Encourage public and private partnership to provide for continued funding of growth-related capacity needs through local improvement districts (LID's), SEPA mitigation fees, impact fees, and other developer-financed mechanisms as allowed under existing law.

12.6 Jurisdictions should work together to reassess the effectiveness of existing transportation-financing mechanisms, and to determine the appropriate contribution to the transportation network that new growth should make.

12.7 New capacity projects with private funding contributions, and new capacity projects which support the goals and policies contained in the Regional Transportation Plan - TransACTION 2020 - and the 1998 Tumwater Transportation Plan Update should be given high priority for regional funding.

12.8 Track changes in federal, state, and local funding sources and any other new source of funding. Include this information in future local and regional Transportation Plan updates.

12.9 Actively support efforts by the State of Washington and the United States government to increase transportation funding where appropriate. Include local participation and private organizations in this effort.

APPENDIX B

Existing Traffic Operations (2005)
Technical Information

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M E M O R A N D U M

Date: **November 7, 2006**

To: **Susan Graham**

From: **Erik Preston, EIT**

Subject: **Existing Traffic Operations (2005) Methodology and Assumptions**

cc:

Project Number: **254-1599-024**

Project Name: **Tumwater Transportation Plan**

The purpose of this memorandum is to document the analysis methodology and assumptions used in the preparation of the Tumwater Transportation Plan. Specifically how existing traffic volumes were found, the use of the regional traffic model prepared by the Thurston Regional Planning Council (TRPC), use of the Synchro outputs, and assembly of the improvement program. The year 2005 was used as the existing year for analysis. Only the afternoon (PM) peak hour was analyzed because this time period typically experiences the greatest traffic demand volumes and poorest traffic operations.

EXISTING TRAFFIC VOLUMES

Existing traffic volumes used in 2005 traffic operations analysis were taken from turning movement counts conducted throughout the City in 2004 and 2005. Traffic volumes at adjacent intersections counted at different times were balanced to show reasonably comparable traffic volumes on the connecting street. In general, 2004 traffic counts were increased by 2.0% to match 2005 traffic volumes. TRPC model volumes from the 2004 model were not used for existing conditions analysis.

SYNCHRO OUTPUTS

The output from the Synchro analysis software summarizes capacity, queuing, and delay calculations that follow Highway Capacity Manual (HCM) methodologies for signalized and unsignalized intersections. These outputs can be useful for determining if capacity of an intersection, approach, or particular movement has been exceeded or is causing significant delay to motorists. Synchro outputs can also indicate if a particular signal timing plan should be changed to minimize intersection delay. For unsignalized intersections, long delays may indicate the need for signalization, roundabout control, or other improvements.

IMPROVEMENT PROGRAM ASSEMBLY

Only improvements under construction before the analysis was completed were included in the existing year analysis. If capacity or delay deficiencies were found in the initial analysis of the existing year, these needs were identified. Often these needs would be met by currently programmed but unconstructed improvements. From the remaining needs, a list of improvement projects was created and the improvements included in the analysis scenario. This process was repeated as necessary until the major network deficiencies were solved. The final list of improvement projects was included in the improvement program.

TRAFFIC ANALYSIS – EXISTING CONDITIONS (2005)

Traffic analyses were conducted to determine any capacity deficiencies within the study area for the 2004 P.M. peak hour. Following is a description of the level of service analysis for the study intersections.

Signalized Intersections

Crosby Boulevard/Mottman Road

This signalized intersection is situated next to the eastbound ramps of US 101. As such, it provides a primary access to US 101 for the Tumwater Hill neighborhood. The westbound approach on Mottman Rd has a single shared lane while the eastbound approach has an exclusive left-turn and shared through-right lane. The northbound approach has exclusive left-turn, through, and right-turn lanes while the southbound approach has an exclusive left-turn lane, dual through lanes, and an exclusive right-turn lane. This intersection currently operates at LOS C during the evening peak hour.

Crosby Boulevard/Irving Street SW

This four-legged intersection operates under traffic signal control. The northbound Crosby Boulevard approach has an exclusive left-turn lane and a shared through-right lane while the southbound approach has exclusive left-turn, through, and right-turn lanes. This intersection currently operates at LOS A.

Capitol Boulevard/Carlyon Avenue SE/Sunset Way

This five-legged intersection is traffic signal controlled. The westbound Carlyon Avenue SE approach and the northwest-bound Sunset Way approach both have shared single-lane approaches. The northbound Capitol Boulevard approach has exclusive through and right-turn lanes. The northbound right-turn onto Sunset Way is channelized by a pedestrian island. The intersection operates at LOS A under existing conditions.

S 2nd Avenue/Custer Way

This tee intersection is controlled by a traffic signal with a single northbound lane and exclusive through and left-turn lanes southbound. The westbound approach has exclusive left and right-turn lanes. The intersection currently operates at LOS B during the evening peak hour.

Capitol Boulevard/Custer Way

This intersection is controlled by a traffic signal. The northbound and southbound Capitol Boulevard approaches each have exclusive left-turn lanes, an exclusive through lane, and a shared through-right lane. The eastbound Custer Way approach has an exclusive left-turn, shared through-left, and shared through-right turn lanes. The westbound approach has an exclusive left-turn lane and shared left-through-right turn lane. The intersection currently operates at LOS D during the PM peak hour.

Cleveland Avenue/Custer Way

The northbound approach no Cleveland Avenue operates with an exclusive left-turn lane, shared through-left, and shared through-right lane. The southbound approach has exclusive left-turn, through, and right-turn lanes. Traffic on the westbound approach of Custer Way is served by an exclusive left-turn lane and shared through-right turn lane. Exclusive left-turn, through, and right-turn lanes are designated on the eastbound approach. The intersection currently operates at LOS C.

Capitol Boulevard/E Street

This study intersection has single-lane east- and westbound E Street approaches with yield controlled channelized right-turns. The north- and southbound Capitol Boulevard approaches each have an exclusive left-turn lane, through lane, and shared through-right lane. This intersection currently operates at LOS C during the evening peak hour.

Capitol Boulevard/Linwood Avenue

This signalized tee intersection has exclusive left- and right-turn lanes on the eastbound approach. The northbound Capitol Boulevard approach has an exclusive left-turn lane and two through lanes. The southbound approach has a through and shared through-right turn lane. The intersection currently operates at LOS A during the weekday PM peak hour.

S 2nd Avenue/Littlerock Road SW/Trosper Road SW

This intersection has exclusive left-turn, through, and shared through-right turn lanes on both the east- and westbound Trosper Road SW approaches. The southbound S 2nd Avenue approach has an exclusive left-turn and shared through-right turn lane. The northbound Littlerock Road SW approach has exclusive left-, through, and right-turn lanes. The intersection is coordinated with other Trosper Road intersections to the east and operates at LOS D during the evening peak hour.

I-5 SB Ramps/Tyee Drive/Trosper Road SW

This signalized intersection is coordinated with other Trosper Road SW intersections to the east and west. The eastbound approach has an exclusive left-turn lane, two through lanes, and one right-turn lane. The westbound approach has an exclusive left-turn lane, a through lane, and a shared through-right lane. There is a shared through-left lanes and exclusive right-turn lane on the northbound Tyee Drive approach. The southbound I-5 off-ramp approach has an exclusive left-turn lane, a shared through-left turn lane, and an exclusive right-turn lane. The intersection currently operates at LOS D during the evening peak hour.

I-5 NB Ramps/Trosper Road SW

This signalized tee intersection is coordinated with neighboring intersections on Trosper Road SW. Two through lanes and one shared through-right turn lane serves the eastbound Trosper Road SW approach. The westbound approach has two through lanes. The

northbound I-5 off-ramp approach is served an exclusive left-turn lane and an exclusive right turn lane. The intersection operates at LOS A during the evening peak hour.

Capitol Boulevard/Trosper Road SW

This intersection is coordinated with other Trosper Road SW intersections to the west. Eastbound traffic is served by an exclusive left-turn lane, shared through-left lane, and exclusive right-turn lane. The westbound approach has an exclusive left-turn lane and shared through-right turn lane. The northbound approach has an exclusive left-turn lane, shared through-left lane, and shared through-right lane. The southbound lane has an exclusive left-turn lane, two through lanes, and a right-turn lane. The intersection currently operates at LOS D during the evening peak hour.

Littlerock Road SW/Fred Meyer-Costco Driveway

This intersection serves several retail stores and has a single-lane eastbound approach. The westbound approach has a shared through-left lane and a right-turn lane. The northbound Littlerock Road SW approach has a left-turn lane, two through lanes, and a right-turn lane. The southbound approach has a left-turn lane, through lane, and shared through-right lane. The intersection currently operates at LOS A in the evening peak hour.

Capitol Boulevard/Lee Street

This four-legged signalized intersection has a shared through-left and exclusive right-turn lanes on both the east- and westbound approaches. The north- and southbound approaches each have a left-turn lane, through lane, and shared through-right lane. The intersection currently operates at LOS C during the evening peak hour.

Capitol Boulevard/X Street

This four-legged signalized intersection has exclusive left-turn lanes and shared through-right lanes on the east- and westbound approaches. The north- and southbound approaches each have a left-turn lane, through lane and a shared through-right lane. The intersection currently operates at LOS A during the evening peak hour.

Capitol Boulevard/Dennis Street

This intersection is under traffic signal control. The east- and westbound Dennis Street approaches each have a shared through-left lane and exclusive right-turn lanes. The north- and southbound approaches each have a left-turn lane, through lane and a shared through-right lane. The intersection currently operates at LOS C during the evening peak hour.

Littlerock Road SW/70th Avenue SW/W Israel Road

Each approach to this intersection is served by an exclusive left-turn lane and a shared through-right lane. The east- and westbound right-turns are channelized with yield control. This intersection currently operates at LOS B during the evening peak hour.

Linderson Way SW/E Israel Road

This signalized intersection operates at LOS B during the evening peak hour with protected/permitted left-turn phasing on all approaches. Each approach has an exclusive left-turn lane and shared through-right lane.

Capitol Boulevard/E Israel Road

This four-legged intersection has an exclusive left-turn lane and a shared through-right lane on each E Israel Road (70th Ave SW) approach. The Capitol Boulevard approaches each have a left-turn lane, through lane, and shared through-right lane. The intersection currently has protected/permitted left-turn phasing on all approaches and currently operates at LOS C during the evening peak hour.

I-5 SB Ramps/Tumwater Boulevard

The east- and westbound Tumwater Boulevard approaches are both served by a single shared lane. The southbound off-ramp has an exclusive left-turn lane and a shared left, through, and right lane. The intersection operates at LOS C during the evening peak hour.

Linderson Way/Tumwater Boulevard

The westbound approach to this intersection has an exclusive left-turn lane and shared through-right lane. All other approaches have exclusive lanes for left-turn, through, and right-turn movements. The intersection currently operates at LOS C with protected left-turn phasing east-west and permitted phasing north-south.

Capitol Boulevard/Tumwater Boulevard

This four-legged intersection operates with protected left-turn phasing for exclusive left-turn lanes on all approaches. The northbound Capitol Boulevard approach has a through lane and shared through-right lane. All other approaches have exclusive through and right-turn lanes. The intersection currently operates at LOS D during the weekday PM peak hour.

Old Highway 99/88th Avenue SE

This four-legged signalized intersection has a single shared lane on the westbound approach from a business access. Traffic on the eastbound 88th Avenue approach is served by an exclusive left-turn lane and shared through-right lane. The northbound Old Highway 99 approach also has an exclusive left-turn lane and shared through-right lane while the southbound approach has exclusive left-turn, through, and right-turn lanes. The signal uses permitted left-turn phasing for all approaches and operates at LOS A during the weekday PM peak hour.

Table 1. 2005 Existing Signalized Intersection Level of Service

Intersection	LOS[1]	Delay[2]	V/C[3]
Crosby Blvd/Mottman Rd	C	23.6	0.53
Corsby Blvd/Irving St SW	A	9.1	0.38
Capitol Blvd/Carlyon Ave SE	A	9.9	0.41
2nd Ave S/Custer Way	B	15.7	0.64
Capitol Blvd/Custer Way	D	51.9	0.94
Cleveland Ave/Custer Way	C	25.4	0.62
Capitol Blvd/E St	C	28.8	0.70
Capitol Blvd/Linwood Ave	A	9.4	0.46
Littlerock Rd SW/Trosper Rd SW	D	45.3	0.68
I-5 SB Ramps/Tyee Dr/Trosper Rd SW	D	54.4	0.77
I-5 NB Ramps/Trosper Rd SW	A	6.7	0.43
Capitol Blvd/Trosper Rd SW	D	42.6	0.71
Littlerock Rd SW/FM – Costco D/W	A	9.8	0.40
Capitol Blvd/Lee St	C	20.3	0.63
Capitol Blvd/X St	A	5.1	0.34
Capitol Blvd/Dennis St	C	24.1	0.49
Littlerock Rd SW/Israel Rd	B	16.9	0.77
LInderson Way SW/Israel Rd	B	15.8	0.58
Capitol Blvd/Israel Rd	C	25.1	0.65
I-5 SB Ramps/Tumwater Blvd	C	27.4	0.90
LInderson Way/Tumwater Blvd	C	29.5	0.93
Capitol Blvd/Tumwater Blvd	D	46.1	0.81
Old Hwy 99/88th Ave SE	A	7.9	0.62

1. Intersection LOS based on Highway Capacity Manual – 2000 methodology

2. Average delay per vehicle in seconds

3. Volume-to-capacity ratio for signalized intersections

Unsignalized intersections

R.W. Johnson Boulevard/Mottman Rd

This intersection operates under all-way stop control. The northbound approach on R.W. Johnson Boulevard has an exclusive left-turn lane and shared through-right lane. The northbound right-turn is channelized by a pork-chop island and is stop-controlled. All other intersection approaches have an exclusive left-turn lane and shared through-right lane. The intersection operates at a LOS C during the evening peak hour.

Crosby Boulevard/Barnes Boulevard

This intersection operates under stop sign control for the Barnes Boulevard approaches. The eastbound approach has a shared single lane while the westbound approach has a

through-left lane and an exclusive right-turn lane. The northbound and southbound Crosby Boulevard approaches both have exclusive left-turn lanes and a shared through-right lane. The intersection currently operates at a LOS C.

Capitol Boulevard/Cleveland Avenue

This tee intersection operates under stop control for the northbound Cleveland Avenue approach. The southwest-bound Capitol Boulevard approach has two through lanes and an exclusive left-turn lane while the northeast-bound approach has a through and shared through-right turn lane. No left-turns are allowed from the northbound Cleveland Avenue approach, the northbound right currently operates at LOS B.

Deschutes Parkway/US 101 On-Ramp/Simmons Lane SW

This four-legged intersection is stop-controlled on the westbound Simmons Lane SW approach. The northbound and southbound Deschutes Parkway approaches each have exclusive left-turn and shared through-right turn lanes. The low volume westbound approach currently operates at LOS F during the evening peak hour.

Boston Street/Custer Way

This tee intersection is stop-controlled on the northbound Boston Street approach. Northbound left-turns are restricted from Boston Street, the approach has a single northbound left-turn lane. The westbound Custer Way approach has an exclusive left-turn lane and a through lane. The eastbound approach has a through and shared through-right turn lane. The minor approach currently operates at LOS B, while the westbound left-turn operates at LOS C during the evening peak hour.

Deschutes Parkway/Boston Street

This all-way stop-controlled tee intersection has single-lane traffic on all approaches. The intersection currently operates at LOS F during the PM peak hour due to the high westbound approach volume.R.W. Johnson Boulevard/Bush Mountain Drive SW/Sapp Road SW

This four-legged intersection is stop-controlled on the north and south legs. All intersection approaches have a single shared lane. The intersection operates at LOS B during the weekday evening peak hour.

Rural Road SW/Linwood Avenue

This tee intersection is stop-controlled on all approaches. Each approach consists of a single shared lane. The intersection operates at LOS A during the weekday evening peak hour.

S 7th Avenue/Linwood Avenue

This tee intersection is stop-controlled on the southbound S 7th Avenue approach. The intersection operates at LOS B during the evening peak hour.

S 2nd Avenue/Linwood Avenue

This all-way stop-controlled intersection has an exclusive left-turn and shared through-right turn lane on each approach. The east- and westbound Linwood Avenue approaches each have channelized right-turns. The eastbound right-turn is yield-controlled, the westbound right-turn is stop-controlled. The intersection currently operates at LOS B during the evening peak hour.

Kirsop Road SW/Trosper Road SW

This tee intersection is stop-controlled on the northbound Kirsop Road SW approach. The east- and westbound Trosper Road SW approaches are uncontrolled single shared lanes. The single lane Kirsop Road SW approach operates at LOS A during the evening peak hour.

Rural Road SW/ Trosper Road SW

This tee intersection is stop-controlled on the single lane southbound Rural Road SW approach. The east- and westbound Trosper Road SW approaches are uncontrolled single lane facilities. The intersection operates at LOS B under existing conditions.

Littlerock Road SW/Kingswood Drive

This unsignalized tee intersection is stop-controlled on the westbound approach. Westbound traffic is served by exclusive left- and right-turn lanes. The southbound approach has a left-turn lane and through lane while the northbound approach is served by a single shared through-right lane. The intersection currently operates at LOS E during the evening peak hour.

Littlerock Road SW/Tumwater Boulevard

This tee intersection is stop-controlled on the westbound approach which has exclusive left- and right-turn lanes. The northbound approach has a single shared through-right lane and the southbound approach has an exclusive left-turn lane and through lane. The intersection operates at LOS F during the evening peak hour.

I-5 NB Ramps/Tumwater Boulevard

This unsignalized intersection is stop-controlled on the northbound off-ramp approach which operates at LOS F during the weekday PM peak hour. Although the delay is high, a v/c ratio of 0.73 indicates that capacity is still available to the northbound approach. The Tumwater Boulevard eastbound approach has a through-left lane and through lane. The westbound approach has a channelized right-turn lane with yield control and a through lane.

Bonniewood Drive/Tumwater Boulevard

This intersection is stop-controlled on the north- and southbound Bonniewood Drive approaches. All intersection approaches have a single shared lane. The intersection currently operates near capacity at LOS F during the weekday PM peak hour.

Henderson Boulevard/Tumwater Boulevard

This tee intersection is stop controlled on the eastbound Tumwater Boulevard approach. This approach has exclusive left- and right-turn lanes and operates near capacity at LOS E during the weekday PM peak hour. The northbound approach has a single shared lane and the southbound approach has exclusive through and right-turn lanes.

Center Street SW/76th Avenue SW

This four-legged intersection is stop controlled on the east and west legs. All intersection approaches have a single shared lane. The intersection currently operates at LOS C during the weekday PM peak hour.

Capitol Boulevard/Henderson Boulevard

This intersection is currently stop controlled on the east- and westbound Henderson Boulevard approaches. A traffic signal is currently under construction at this location, but no operating. As a stop-controlled intersection, it operates at LOS F during the evening peak hour. Operations at this intersection will improve to an acceptable LOS once the traffic signal construction is complete.

Capitol Boulevard/79th Avenue SE

This intersection is stop-controlled on the eastbound and westbound approaches. The eastbound airport parking lot approach has a single shared lane, and the westbound 79th Avenue approach has a shared through-left lane and exclusive right-turn lane. The northbound approach has a single shared lane and the southbound approach has an exclusive left-turn lane and shared through-right lane. The intersection currently operates at LOS F during the weekday PM peak hour.

Kimmie Street SW/83rd Avenue SW

This intersection is stop-controlled on the east and west legs. All intersection approaches have a single shared traffic lane. The intersection currently operates at LOS B during the evening peak hour.

Center Street SW/83rd Avenue SW

This tee intersection is stop-controlled on the southbound Center Street SW approach. All approaches have a single shared lane. The intersection currently operates at LOS B during the PM peak hour.

Littlerock Road SW/93rd Avenue SW

This tee intersection is stop-controlled on the westbound 93rd Avenue SW approach which has exclusive left- and right-turn lanes. The north-and southbound approaches on Littlerock Road SW are shared single-lane approaches. The intersection currently operates at LOS C during the evening peak hour.

I-5 SB Ramps/93rd Avenue SW

This intersection is stop-controlled on the southbound off-ramp approach with an exclusive right-turn lane and a shared through-left lane. The east- and westbound

movements share a single lane. The intersection currently operates at LOS F during the evening peak hour.

I-5 NB Ramps/93rd Avenue SW

This intersection is stop-controlled on the northbound off-ramp approach which has a shared through-left lane and an exclusive right-turn lane. The 93rd Avenue SW approaches each share a single lane. The intersection currently operates at LOS F during the week day PM peak hour.

Kimmie Street SW/93rd Avenue SW

This four-legged intersection is stop-controlled on the north and south legs. All intersection approaches have a single shared traffic lane. The intersection currently operates at LOS D during the weekday PM peak hour.

Case Road SW/93rd Avenue SW

This four-legged intersection is stop-controlled on all four legs with shared single-lane facility on the east-, north- and southbound approaches. The westbound approach has a shared through-left lane and a channelized right-turn lane with yield control. The intersection currently operates at LOS C during the evening peak hour.

S Tilley Road (West)/93rd Avenue SE

This tee intersection is stop-controlled on all three intersection approaches which have single shared lanes. The intersection currently operates at LOS B during the evening peak hour.

S Tilley Road (East)/93rd Avenue SE

This intersection is stop-controlled on the southbound approach and the northbound access. The 93rd Avenue SE approaches are single shared lanes. The northbound parking access is a single shared-lane approach. The southbound approach has exclusive left- and right-turn lanes; those traveling through to the parking lot aligned to the south would likely use the left-turn lane. The intersection currently operates at LOS C during the evening peak hour.

Old Highway 99/93rd Avenue SE

This tee intersection is stop-controlled on the eastbound approach. All intersection approaches have a shared single travel lane. The intersection currently operates at LOS C during the weekday PM peak hour.

Table 2. 2005 Existing Unsignalized Intersection Level of Service

Intersection	LOS[1]	Delay[2]	WM[3]
R W Johnson Blvd/Mottman Rd	C	15.8	-
Crosby Blvd/Barnes Blvd	C	19.7	EB
Capitol Blvd/Cleveland Ave	B	11.4	WB
Deschutes Pkwy/Simmons Lane SW/US 101 Ramp	F	91.0	WB
Boston St/Custer Way	C	23.3	WBL
Deschutes Pkwy/Boston St	F	54.5	-
R W Johnson Blvd/Sapp Rd SW	B	10.5	SB
Rural Rd SW/Linwood Ave	A	8.3	-
7th Ave S/Linwood Ave	B	13.9	SB
2nd Ave S/Linwood Ave	B	11.9	-
Kirsop Rd SW/Trosper Rd SW	A	9.5	NB
Rural Rd SW/Trosper Rd SW	B	14.5	SB
Littlerock Rd SW/Kingswood Dr	E	36.3	WBL
Littlerock Rd SW/Tumwater Blvd	F	168.2	WBL
I-5 NB Ramps/Tumwater Blvd	F	145.2	NBTL
Bonniewood Dr/Tumwater Blvd	F	89.9	SB
Henderson Blvd/Tumwater Blvd	E	37.1	EBL
Center St SW/76th Ave SW	C	16.1	EB
Capitol Blvd/Henderson blvd	F	473.3	WB
Capitol Blvd/79th Ave SE	F	130.7	WBL
Kimmie St SW/83rd Ave SW	B	10.0	EB
Center St SW/83rd Ave SW	B	11.0	SB
Littlerock Rd SW/93rd Ave SW	C	22.7	WBL
I-5 SB Ramps/93rd Ave SW	F	126.8	SBTL
I-5 NB Ramps/93rd Ave SW	F	64.5	NBTL
Kimmie St SW/93rd Ave SW	D	26.3	NB
Case Rd SW/93rd Ave SW	C	19.9	-
Tilley Rd S (West)/93rd Ave SE	B	13.9	-
Tilley Rd S (East)/93rd Ave SE	C	18.5	NB
Old Hwy 99/93rd Ave SE	C	20.7	EB

1. Intersection LOS based on Highway Capacity Manual – 2000 methodology

2. Average delay per vehicle in seconds

3. WM = Worst movement for unsignalized intersections. Not Applicable for all-way-stop-controlled intersections.

Roadway Segment Level of Service

The roadway segment levels of service for key roadways in the area are shown in the table below.

Table 3. Existing 2005 Roadway Segment Levels of Service - PM Peak Hour

Roadway	Section (NE) Start	Section (SW) End	Capacity at LOS D	Peak Directional Volume	LOS
Mottman Rd	R W Johnson Blvd	Crosby Blvd	860	450	C
Crosby Blvd	Irving St SW	Barnes Blvd	810	340	C
Barnes Blvd	Crosby Blvd	Linwood Ave	690	220	C
R W Johnson Blvd	Mottman Rd	Sapp Rd SW	860	440	C
Sapp Rd SW	R W Johnson Blvd	Linwood Ave	690	160	B
Linwood Ave	Rural Rd SW	7th Ave S	690	230	C
Capitol Blvd	E St	Linwood Ave	1510	1,030	D
Rural Rd SW	Linwood Ave	Trosper Rd SW	690	130	B
2nd Ave SE	Linwood Ave	Trosper Rd SW	860	440	C
Cleveland Ave	Custer Way	Henderson Blvd SE	1770	830	B
Trosper Rd SW	Kirsop Rd	Rural Rd SW	690	340	C
Capitol Blvd	Lee St	"X" St	1430	1,050	D
Littlerock Rd SW	Kingswood Dr	Israel Rd SW	690	700	E
Israel Rd SW	Linderson Ave SW	Capitol Blvd	810	530	C
Linderson Ave SW	Israel Rd	Tumwater Blvd	660	680	E
Tumwater Blvd	I-5 NB Ramps	Linderson Ave SW	1620	1,410	D
Tumwater Blvd	Linderson Ave SW	Capitol Blvd	810	880	F
Tumwater Blvd	Bonniewood Dr	Henderson Blvd SE	690	510	C
Littlerock Rd SW	Tumwater Blvd	93rd Ave SW	690	540	C
Center St SW	76th Ave SW	83rd Ave SW	690	270	C
Old Hwy 99	Henderson Blvd SE	79th Ave SE	860	1,120	F
Kimmie St SW	83rd Ave SW	93rd Ave SW	690	110	B
93rd Ave SW	Littlerock Rd SW	I-5 SB Ramps	690	510	C
93rd Ave SW	Kimmie St SW	Case Rd SW	690	480	C
88th Ave/Tilley Rd S	93rd Ave SW	Old Hwy 99	860	250	C

#	Arterial Roadway	Section		Total Lanes	Median	Left-Turn Lanes?	Length (ft.)	Signals	Signals/ Mile	Class	2005	
		(N/E) Start	*(S/W)* End								Volume	LOS
1	Mottman Rd	R.W. Johnson Blvd	Crosby Blvd	2	U	Yes	4,158	1	1.270	1	453	C
2	Crosby Blvd	Irving St SW	Barnes Blvd	2	U	Yes	1,502	1	3.515	2	342	C
3	Barnes Blvd	Crosby Blvd	Linwood Ave	2	U	No	5,856	0	0.000	1	217	C
4	R.W. Johnson Blvd	Mottman Rd	Sapp Rd SW	2	U	Yes	4,340	0	0.000	1	440	C
5	Sapp Rd SW	R.W. Johnson Blvd	Linwood Ave	2	U	No	4,691	0	0.000	1	156	B
6	Linwood Ave	Rural Rd SW	S 7th Ave	2	U	No	3,460	0	0.000	1	227	C
7	Capitol Blvd	E St	Linwood Ave	4	D	Yes	1,943	2	5.435	3	1,025	D
8	Rural Rd SW	Linwood Ave	Trosper Rd SW	2	U	No	2,363	0	0.000	1	130	B
9	2nd Ave SW	Linwood Ave	Trosper Rd SW	2	U	Yes	3,186	1	1.657	1	442	C
10	Yelm Highway	Custer Way	Henderson Blvd SE	4	U	Yes	7,380	2	1.431	1	834	B
11	Trosper Rd SW	Kirsop Rd	Rural Rd SW	2	U	No	3,178	0	0.000	1	338	C
12	Capitol Blvd	Lee St	X St	4	U	Yes	1,760	2	6.000	3	1,051	D
13	Littlerock Rd SW	Kingswood Dr	Israel Rd SW	2	U	No	3,898	1	1.355	1	700	E
14	Israel Rd SW	Linderson Ave SW	Capitol Blvd	2	U	Yes	2,758	2	3.829	2	528	C
15	Linderson Ave SW	Israel Rd	Tumwater Blvd	2	U	Yes	1,854	2	5.696	3	682	E
16	Tumwater Blvd	I-5 NB Ramps	Linderson Ave SW	4	U	Yes	1,836	1	2.876	2	1,409	D
17	Tumwater Blvd	Linderson Ave SW	Capitol Blvd	2	U	Yes	3,674	2	2.874	2	881	F
18	Tumwater Blvd	Bonniewood Dr	Henderson Blvd SE	2	U	No	3,660	0	0.000	1	512	C
19	Littlerock Rd SW	Tumwater Blvd	93rd Ave SW	2	U	No	13,534	0	0.000	1	535	C
20	Center St SW	76th Ave SW	83rd Ave SW	2	U	No	3,050	0	0.000	1	270	C
21	Old Hwy 99	Henderson Blvd SE	79th Ave SE	2	U	Yes	1,561	0	0.000	1	1,119	F
22	Kimme St SW	83rd Ave SW	93rd Ave SW	2	U	No	4,646	0	0.000	1	114	B
23	93rd Ave SW	Littlerock Rd SW	I-5 SB Ramps	2	U	No	8,470	0	0.000	1	507	C
24	93rd Ave SW	Kimmie St SW	Case Rd SW	2	U	No	3,700	0	0.000	1	480	C
25	88th Ave/Tilley Rd	93rd Ave SW	Old Hwy 99	2	U	Yes	5,905	1	0.894	1	254	C

APPENDIX C

Planned Improvement Programs

Washington State Department of Transportation

Six Year Transportation Improvement Program

From 2008 to 2013

Agency: Tumwater

Co. No.: 34 **Co. Name:** Thurston Co.

City No.: 1325 **MPO/RTPO:** TRPC

Hearing Date: _____ **Adoption Date:** _____

Amend Date: _____ **Resolution No.:** _____

Functional Class	Priority Number	Project Identification A. PIN/Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or Road - Ending MP or Road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (mm/dd/yyyy)	Fund Source Information Federal Funding Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency) 1st	2nd	3rd	4th Thru 6th	Federally Funded Projects Only Envir. Type	R/W Required Date (MM/YY)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	1	*Littlerock Road - Trosper Road to South City Limits* Littlerock Road from: Trosper Road to: 73rd Avenue Provide 3 lanes with bicycle lanes and sidewalk.	05 06 07	P	1.2	C G O P S T W	CN	10/1/2008			AIP	2154	4046	6200	3400	2800			EA	Yes 1/1/2008
							Totals					2154	4046	6200	3400	2800				
17	2	*North Street Reconstruction* North Street from: Hawthorne Place to: Cleveland Avenue Reconstruction of the roadway and replacement of the sidewalks on both sides of the roadway.	03 06 07 32	S	.5		CN	4/1/2008	STP(U)	440			910	1350	1350				CE	
							Totals			440			910	1350	1350					
16	3	*Annual Overlay* Various City Street Locations from: to: Structural modification of city roadways by asphalt overlays.	07	P			ALL	1/1/2008					500	500		100	100	300		
							Totals						500	500		100	100	300		
16	4	*Deschutes Parkway - Boston Street to Interstate 5* Deschutes Parkway from: Boston Street to: Interstate 5 Bicycle paths on both sides and sidewalks on one side of the roadway.	32	P	.4		CN	6/1/2008	STP(U)	310			229	539	539					No
							Totals			310			229	539	539					

City of Tumwater
Resolution No. R2007-006
Exhibit "A"

Washington State Department of Transportation

Six Year Transportation Improvement Program

Agency: Tumwater

From 2008 to 2013

Co. No.: 34 Co. Name: Thurston Co.

City No.: 1325 MPO/RTPO: TRPC

Hearing Date: Adoption Date:

Amend Date: Resolution No.:

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	5	*New Sidewalk Program* Various City Street Locations from: to: Install new and replace damaged sidewalks city-wide.	06	P			ALL	1/1/2008					150	150	25	25	25	75	EA	
							Totals						150	150	25	25	25	75		
14	6	*Captiol Boulevard "M" Street to "X" Street* Capitol Boulevard from: "M" Street to: "X" Street Grind and overlay the roadway surface and install street lighting.	06 07	S	.7		PE CN	1/1/2008 1/1/2009	STP(U) STP(U)	39 501			25 1205	64 1706		64 1706			EA	No
							Totals			540			1230	1770		1770				
17	7	*Tumwater Valley Trail* from: Pioneer Park to: Olympia/Tumwater Park Urban Trail for non-motorized traffic.	32	P	1.25		PE CN	1/1/2008 6/1/2009					100 600	100 600	100	600			EA	No
							Totals						700	700	100	600				
14	8	*Highway 99 - Tumwater Boulevard to 88th Avenue* Highway 99 from: Tumwater Boulevard to: 88th Avenue Provide 5 lanes with bicycle lanes and sidewalks.	01 03 04 07 32	P	1.8	G P T	PE RW	1/1/2009 1/1/2010					200 1800	200 1800		200	1800		EA	Yes 12/1/2010
							Totals						2000	2000		200	1800			

Washington State Department of Transportation

Six Year Transportation Improvement Program

Agency: Tumwater

From 2008 to 2013

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City No.: 1325 MPO/RTPO: TRPC

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
14	9	*Capitol Boulevard - Lee Street Intersection* Capitol Boulevard from: Capitol Boulevard to: Lee Street Minor realignment of a signalized intersection.	06 12	P	.1		ALL	6/1/2009					49	49		49			CE	Yes 1/1/2009
							Totals						49	49		49				
16	10	*Trosper Road Widening near Skipper Lane* Trosper Road from: Skipper Lane to: Installation of sidewalk and street patch.	05 32	P	.1		ALL	1/1/2008					50	50		50				
							Totals						50	50		50				
14	11	*Old Highway 99 - 73rd Avenue to Henderson Boulevard* Old Highway 99 from: 73rd Avenue to: Henderson Boulevard Provide four traffic lanes, bicycle lanes and sidewalks.	04 06 07 32	P	.4	C P T	ALL	1/1/2010				2000	1500	3500			3500		EA	Yes 1/1/2009
							Totals					2000	1500	3500			3500			
16	12	*Tyee Drive* Tyee Drive from: Kingswood Drive to: Israel Road Construct new roadway	01 06	P	.8		PE	1/1/2009			TPP	50	27	77			77		EA	Yes 1/1/2008
							RW	1/1/2010			TPP	305	181	486			486			
							CN	1/1/2011			TPP	450	307	757			757			
							Totals					805	515	1320			1320			

Washington State Department of Transportation

Six Year Transportation Improvement Program

From 2008 to 2013

Agency: Tumwater

Co. No.: 34 Co. Name: Thurston Co.

City No.: 1325 MPO/RTPO: TRPC

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Amend Date: Resolution No.:

Functional Class	Priority Number	Project Identification A. PIN/Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or Road - Ending MP or Road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars								Expenditure Schedule (*Local Agency*)				Federally Funded Projects Only	
									Fund Source Information										Envir. Type	R/W Required Date (*MM/YY*)
							Project Phase	Phase Start (*mm/dd/yyyy*)	Federal Funding: Federal Fund Code	Federal Funding: Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	1st	2nd	3rd	4th Thru 6th		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
14	13	*Trosper Road - Lakepark Drive to Rural Road* Trosper Road from: Lakepark Drive to: Rural Road Provide paved shoulders along both sides of the roadway.	05	P	.5		ALL	1/1/2010					150	150			150		EA	
							Totals						150	150			150			
02	14	*"E" Street Extension* "E" Street from: Deschutes River to: Cleveland Avenue Build new roadway on new alignment.	01	P	.5		ALL	1/1/2010					5700	5700			3000	2700	EA	Yes 1/1/2010
							Totals						5700	5700			3000	2700		
14	15	*Town Center Road* Town Center Road from: Tumwater Boulevard to: Israel Road Build new road on new alignment.	01	P	.1		ALL	1/1/2010					585	585				585	EA	No
							Totals						585	585				585		
	16	*Mid-block Crosswalks/Capitol Boulevard Median/U Turns* Capitol Boulevard from: to: Mid block crosswalks at various locations.		P	1.		ALL	1/1/2010					200	200				200	EA	
							Totals						200	200				200		

Washington State Department of Transportation

Six Year Transportation Improvement Program

From 2008 to 2013

Agency: Tumwater

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City No.: 1325 MPO/RTPO: TRPC

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	17	*Tumwater Boulevard / I-5 Bridge Widening* Tumwater Boulevard from: North I-5 On-Ramp to: South I-5 On-Ramp	10	P	.1		ALL	1/1/2010				4000	5400	9400				9400	EA	
							Totals					4000	5400	9400				9400		
16	18	*Custer Way - Capitol Boulevard to Cleveland Avenue* Custer Way from: Capitol Boulevard to: Cleveland Avenue Widen Custer Way between Capitol Boulevard and Cleveland Avenue.	05 06 07	P	.2	C P T	ALL	1/1/2010					700	700				700	EA	Yes 1/1/2010
							Totals						700	700				700		
14	19	*Trosper Road - On-Ramp to Interstate 5* Trosper Road from: Interstate 5 to: "M" Street Provide another traffic access to Interstate 5 to relieve congestion.	01 03 06	P	.2	C G P T W	ALL	1/1/2010			AIP	3000	2500	5500				5500	EA	
							Totals					3000	2500	5500				5500		
16	20	*Rural Road - Linwood Avenue to Trosper Road* Rural Road from: Linwood Avenue to: Trosper Road Provide paved shoulders along both sides of the roadway.	07 32	P	.75	C P T	ALL	1/1/2010					300	300				300	EA	No
							Totals						300	300				300		

Washington State Department of Transportation

Six Year Transportation Improvement Program

From 2008 to 2013

Agency: Tumwater

Co. No.: 34 Co. Name: Thurston Co.

City No.: 1325 MPO/RTPO: TRPC

Hearing Date: Adoption Date:

Amend Date: Resolution No.:

Functional Class	Priority Number	Project Identification A. PIN/Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or Road - Ending MP or Road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (mm/dd/yyyy)	Fund Source Information Federal Funding Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency) 1st	2nd	3rd	4th Thru 6th	Federally Funded Projects Only Envir. Type	R/W Required Date (MM/YY)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	21	*Rural Road - Linwood Avenue to Antsen Road* Rural Road from: Linwood Avenue to: Antsen Road Provide paved shoulders on both sides of the roadway.	07 32	P	.75	C P T	ALL	1/1/2010					300	300				300	EA	No
							Totals						300	300				300		
16	22	*Second Avenue - Linwood Signal* Second Avenue from: Second Avenue to: Linwood Avenue Signalization of the intersection.	12	P	.1		ALL	1/1/2009					250	250				250	EA	No
							Totals						250	250				250		
14	23	*Old Highway 99 - Henderson Boulevard to 79th Avenue* Old Highway 99 from: Henderson Boulevard to: 79th Avenue Provide four traffic lanes, bicycle lanes and sidewalks.	04 06 07 32	P	.3	C P T	ALL	1/1/2009			AIP	1500	2000	3500				3500	EA	Yes 1/1/2007
							Totals					1500	2000	3500				3500		
16	24	*Arterial Street Illumination* Various City Street Locations from: to: Install city owned luminaires along arterial streets.	06	P			ALL	1/1/2008					210	210	35	35	35	105	EA	
							Totals						210	210	35	35	35	105		

Washington State Department of Transportation

Six Year Transportation Improvement Program

Agency: Tumwater

From 2008 to 2013

Co. No.: 34 Co. Name: Thurston Co.

City No.: 1325 MPO/RTPO: TRPC

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	25	*Trosper Road - Lakepark Drive Signal* Trosper Road from: Trosper Road to: Lakepark Drive Signalization of intersection.	12	P	.1		ALL	1/1/2010					350	350				350	EA	
							Totals						350	350				350		
16	26	*Tumwater Boulevard / Henderson Boulevard Roundabout* Tumwater Boulevard from: Tumwater Boulevard to: Henderson Boulevard Intersection treatment.	01 03	P	.2	G P T	ALL	12/1/2012					500	500				500	EA	Yes 1/1/2012
							Totals						500	500				500		
				Grand Totals for Tumwater						**1,290**		**13,459**	**31,024**	**45,773**	**5,449**	**5629**	**9,930**	**24,765**		

Washington State Department of Transportation

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Six Year Transportation Improvement Program

Agency: Thurston Co.

Co. No.: 34 **Co. Name:** Thurston Co.

City No.: 0000 **MPO/RTPO:** TRPC

From 2008 **to** 2013

Hearing Date: _____ **Adoption Date:** _____

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
00		*Chehalis Western Trail Ph. 2 (Bridging the Gap) 12th Ave to I-5* Chehalis Western Trail (Pacific Ave Section) from: 12th Ave SE to: I-5 Trail construction including street crossings.	32	S			PE RW	1/1/2008 6/1/2008	Discretionary Discretionary	518 1036				518 1036					EA	
							Totals			1554				1554							
14	1	*Mud Bay Rd/Kaiser Rd Intersection* Mud Bay Rd NW/Kaiser Rd NW from: At Intersection to: Widen to 4/5 Lanes & Signalization	03	S	0.0	C P T W	CN	1/1/2008					149	149	149				CE	
							Totals						149	149	149						
14	2	*Yelm Highway Capacity Project* Yelm Highway SE from: Henderson Blvd to: Rich Rd Widen to 4/5 Lanes	04	S	0.90	C G P S T W	RW CN	1/1/2008 10/1/2008	STP(U) STP(U)	1000 645	AIP AIP	400 3908	3660	1400 8213	453	2000	6760		CE	
							Totals			1645		4308	3660	9613	453	2000	6760				
00	3	*Chehalis Western Trail Ph. I (Bridging the Gap) - I-5 to Martin Wy* Chehalis Western Trail from: I-5 to: Martin Way Trail Construction Including Street Crossings	32	S	0.6	C G P S T W	PE RW CN CN	1/1/2008 1/1/2008 6/1/2008 6/1/2008	Discretionary Discretionary Discretionary STP(U)	20 500 1430 500				20 500 1430 500	20 500 980	 950			EA	
							Totals			2450				2450	1500	950					
17	4	*26th Ave Upgrade Intersection (West Leg)* 26th Ave NE from: At South Bay Rd to: Improve Grade & Alignment of Intersection	06	P	1.20	C P T	PE RW CN	1/1/2011 1/1/2012 1/1/2013	 STP(S) STP(S)	 18 207			20 2 23	20 20 230	 	 	 	20 20 230	CE	
							Totals			225			45	270				270			
17	5	*Ellis Creek Fish Passage* Gull Harbor Road from: At Gull Harbor Road to: Fish Passage	13	P	0.2	C P T	PE	1/1/2013					10	10				10	CE	
							Totals						10	10				10			
14	6	*Martin Way Sidewalk* Martin Way from: River Ridge Drive to: Duterrow Road Sidewalk	06	S	0.42	C P G T W	PE CN	1/1/2008 6/1/2008			TPP TPP	5 130	5 123	10 253	10 253				CE	
							Totals					135	128	263	263						

Washington State Department of Transportation

Six Year Transportation Improvement Program

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Co. No.: 34 **Co. Name:** Thurston Co.

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From 2008 **to** 2013

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
16	7	*Carpenter Rd Capacity Project* Carpenter Rd SE from: Pacific Ave to: Martin Way (Except City) Widen to 4/5 Lanes (Joint Project with Lacey)	04	P	0.70	C P T	PE RW CN	1/1/2008 1/1/2008 6/1/2009					190 350 1850	190 350 1850	190	350 750	1100		EA	
							Totals						2390	2390	190	1100	1100			
17	8	*15th Ave Upgrade* 15th Ave NE from: Sleater Kinney Rd to: Carpenter Rd Road Upgrade	03	P	1.70	C P T W	PE	1/1/2011	STP(U)	180			150	330				330	EA	
							Totals			180			150	330				330		
17	9	*Meridian Rd Upgrade* Meridian Rd from: Martin Way to: Lacey City Limits Road Upgrade	03	P	0.50	C G P T	PE	1/1/2013			AIP	20	10	30				30	EA	
							Totals					20	10	30				30		
16	10	*Carpenter/Shady Ln/ 20th Ave Intersection* Carpenter/Shady Ln/20th Ave from: At Intersection to: Left Turn Channelization	12	P	0.00	C P T	CN	5/1/2013	STP(S)	22			3	25				25	CE	
							Totals			22			3	25				25		
06	11	*Yelm Highway Bridge (O-12) Replacement* Yelm Highway SE from: At BNRR Crossing to: Bridge Replacement	09	P	0.00	C P T	PE RW CN	1/1/2011 1/1/2012 1/1/2013	BR BR BR	197 20 1672				197 20 1672				197 20 1672	CE	
							Totals			1889				1889				1889		
16	12	*Henderson Blvd Upgrade* Henderson Blvd SW from: Old Hwy 99 to: Airdustrial Extension Road Upgrade	05	P	0.89	C P T	PE RW	5/1/2012 1/1/2013			TPP TPP	50 80	13 20	63 100				63 100	CE	
							Totals					130	33	163				163		
16	13	*54th Ave Upgrade* 54th Ave SW from: Trosper Rd to: Tumwater City Limits Road Upgrade	05	P	0.80	C O P T	PE RW	5/1/2012 1/1/2013			TPP TPP	10 10	5 5	15 15				15 15	CE	
							Totals					20	10	30				30		

Washington State Department of Transportation

Six Year Transportation Improvement Program

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Agency: Thurston Co.

Co. No.: 34 **Co. Name:** Thurston Co.

City No.: 0000 **MPO/RTPO:** TRPC

From 2008 **to** 2013

Hearing Date: _____ **Adoption Date:** _____

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Functional Class	Priority Number	Project Identification A. Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or Road - Ending MP or Road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (mm/dd/yyyy)	Fund Source Information Federal Funding Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency) 1st	2nd	3rd	4th Thru 6th	Federally Funded Projects Only Envir. Type	R/W Required Date (MM/YY)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
17	14	*70th Ave Upgrade* 70th Ave SW from: Kirsop to: Tumwater City Limits Road Upgrade	03	P	1.10	C P T	PE	1/1/2013	STP(U)	45			15	60				60	EA	
							Totals			45			15	60				60		
17	15	*Trosper Rd Upgrade* Trosper Rd SW from: 49th Ave to: 54th Ave Road Upgrade	03	P	0.10	C P T	PE	6/1/2013	STP(U)	8			2	10				10	CE	
							Totals			8			2	10				10		
16	16	*Black Lake-Belmore Rd Upgrade* Black Lake-Belmore Rd SW from: 66th to: Sapp Rd Road Upgrade	03	P	0.41	C O P T	PE	5/1/2013			TPP	20	10	30				30	CE	
							Totals					20	10	30				30		
17	17	*New Primary Connectors* Black Hills Sub Area Plan from: 66th Ave SW to: Littlerock Road SW New Road	01	P	1.30		PE	1/1/2013					30	30				30	EA	
							Totals						30	30				30		
16	19	*93rd/Lathrop Industrial Drive Intersection* 93rd Ave/Lathrop Industrial Drive from: At Intersection to: Intersection Upgrade	03	S	0.00	C T	PE RW CN	1/1/2008 6/1/2008 1/1/2009	 STP(U)	 255			5 15 140	5 15 395	5 15	 395			CE	
							Totals			255			160	415	20	395				
16	20	*Henderson/Tumwater Blvd Intersection* Henderson Blvd/Tumwater Blvd from: At Intersection to: Construct Traffic Signal	12	P	0.00	C P T W	CN	9/1/2010					100	100			100		CE	
							Totals						100	100			100			
16	21	*Henderson Blvd Bridge (H-2) Widening* Henderson Blvd SW from: At Deschutes River to: Widen Bridge	10	P	0.00	C P T	PE RW CN	1/1/2011 12/1/2012 1/1/2013	BR BR BR	74 10 1500				74 10 1500				74 10 1500	CE	
							Totals			1584				1584				1584		

Washington State Department of Transportation

Six Year Transportation Improvement Program

DRAFT

Agency: Thurston Co.

Co. No.: 34 **Co. Name:** Thurston Co.

City No.: 0000 **MPO/RTPO:** NON/TRPC

From 2008 **to** 2013

Hearing Date: _____ **Adoption Date:** _____

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Functional Class	Priority Number	Project Identification A. Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or Road - Ending MP or Road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars								Expenditure Schedule (*Local Agency*)				Federally Funded Projects Only	
									Fund Source Information										Envir. Type	R/W Required Date (*MM/YY*)
									Federal Funding											
							Project Phase	Phase Start (*mm/dd/yyyy*)	Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	1st	2nd	3rd	4th Thru 6th		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
07	22	*Old Hwy 99 Upgrade* Old Hwy 99 from: 201st to: SR 12 Road Upgrade	04	P	0.27	C G P S T W	PE	1/1/2011	STP(R)	72			48	120				120	EA	
							RW	1/1/2012	STP(R)	92			60	152				152		
							CN	1/1/2013	STP(R)	1470			908	2378				2378		
							Totals			1634			1016	2650				2650		
07	23	*Old Hwy 99 Upgrade* Old Hwy 99 from: 203rd to: 201st Road Upgrade	04	P	0.25	C G P S T W	PE	1/1/2011	STP(R)	156			39	195				195	EA	
							RW	1/1/2012	STP(R)	572			143	715				715		
							CN	1/1/2013	STP(R)	832			223	1055				1055		
							Totals			1560			405	1965				1965		
07	24	*Elderberry Rd Upgrade* Elderberry Rd from: SR 12 to: 196th Ave Road Widening	04	P	0.14	C G P S T W	PE	1/1/2011	STP(R)	55			14	69				69	EA	
							RW	1/1/2012	STP(R)	95			23	118				118		
							CN	1/1/2013	STP(R)	425			107	532				532		
							Totals			575			144	719				719		
07	25	*Old Hwy 99 Upgrade* Old Hwy 99 from: Grand Mound S. UGA to: Great Wolf S. Boundary Road Widening	04	P	0.46	C G P S T W	PE	1/1/2011	STP(R)	200			50	250				250	EA	
							RW	4/1/2012	STP(R)	800			200	1000				1000		
							CN	6/1/2013	STP(R)	1110			108	1218				1218		
							Totals			2110			358	2468				2468		
07	26	*Old Hwy 99 Bridge (O-6) Replacement* Old Highway 99 SW from: At Prairie Creek to: Bridge Replacement	09	P	0.00	P T	PE	1/1/2008					100	100	100				CE	
							RW	3/1/2008					100	100	100					
							CN	6/1/2008	BR	350			700	1050	250	800				
							Totals			350			900	1250	450	800				
07	27	*SR 12/Sargent Road Intersection* SR 12/Sargent Road from: At Intersection to:	01	P	0.00	C G P T	PE	1/1/2011	STP(S)	92			23	115				115	EA	
							RW	1/1/2012	STP(S)	138			35	173				173		
							CN	1/1/2013	STP(S)	920			229	1149				1149		
							Totals			1150			287	1437				1437		
07	28	*SR 12/New Road at Urban Growth Boundary* Grand Mound West Urban Growth Boundary from: 196th Ave SW to: 198th Ave SW	01	P	0.30		PE	1/1/2010	STP(S)	184			46	230				230	EA	
							RW	1/1/2011	STP(S)	828			207	1035				1035		
							CN	1/1/2012	STP(S)	1564			391	1955				1955		
							Totals			2576			644	3220				3220		

Washington State Department of Transportation

Six Year Transportation Improvement Program

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Agency: Thurston Co.

Co. No.: 34 Co. Name: Thurston Co.

City No.: 0000 MPO/RTPO: NON/TRPC

From 2008 to 2013

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									Fund Source Information										Envir. Type	R/W Required Date (*MM/YY*)
							Project Phase	Phase Start (*mm/dd/yyyy*)	Federal Funding: Federal Fund Code	Federal Funding: Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	1st	2nd	3rd	4th Thru 6th		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
07	29	*Old Hwy 99 Turn Lane* Old Hwy 99 SW from: 203rd to: 201st	05	P	0.25	C G P T	PE	1/1/2008					50	50	50				CE	
							CN	6/1/2008					450	450	450					
							Totals						500	500	500					
	30	*Old Hwy 99 Turn Lane Great Wolf S. Boundary to 203rd* Old Hwy 99 SW from: Great Wolf S. Boundary to: 203rd	05	P	0.40	C G P T	CN	1/1/2008					10	10	10				CE	
							Totals						10	10	10					
07	31	*Old Hwy 99 Upgrade Great Wolf S Boundary* Old Hwy 99 SW from: Great Wolf S. Boundary to: 203rd	04	P	0.40	C G P T	PE	1/1/2011	STP(S)	227			152	379					379	CE	
							RW	1/1/2012	STP(S)	720			480	1200				1200		
							CN	1/1/2013	STP(S)	1665			1090	2755				2755		
							Totals			2612			1722	4334				4334		
07	32	*Old Hwy 99 Turn Lane S. UGA* Old Hwy 99 SW from: S. UGA to: Great Wolf S. Boundary	05	P	0.46	C G P T	PE	1/1/2009					50	50		50			CE	
							CN	6/1/2009					450	450		450				
							Totals						500	500		500				
07	33	*Old Hwy 99/US 12 Intersection* Old Hwy 99 SW from: Old Hwy 99/US 12 Intersect to:	12	P		C G P T	PE	1/1/2009	STP(S)	30			20	50		50			CE	
							CN	6/1/2009	STP(S)	270			180	450		450				
							Totals			300			200	500		500				
07	34	*Wilkenson Rd Upgrade* Wilkenson Rd SE from: Yelm City Limits to: Ordway Rd Road Upgrade	06	S	0.25	P W T	PE	1/1/2008					5	5	5				CE	
							RW	6/1/2008					55	55	55					
							CN	1/1/2009			RAP	306	34	340		340				
							Totals					306	94	400	60	340				
07	35	*Bald Hills Rd Upgrade* Bald Hills Rd SE from: Four Corners to: Smith Prairie Road Upgrade	03	S	3.50	C P T	CN	1/1/2008	STP(R)	1700			1097	2797	1276				EA	
							Totals			1700			1097	2797	1276					

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
08	36	*Skookumchuck Rd Upgrade* Skookumchuck Rd from: Coal St to: Whitefish St Road Upgrade	03	S	3.00	C P T	RW CN	1/1/2008 1/1/2009			RAP	1646	315 693	315 2339	315	2339			EA	
							Totals					1646	1008	2654	315	2339				
07	37	*Hawks Prairie Rd Upgrade* Hawks Praire Rd NE from: Carpenter Road to: Johnson Point Road Upgrade	03	S	1.09	C P T W	CN	1/1/2008	STP(R)	898			77	975	975				EA	
							Totals			898			77	975	975					
08	38	*Zangle Rd Upgrade* Zangle Rd NE from: Boston Harbor Rd to: Elementary School Road Upgrade	05	P	1.00	P T W	PE	1/1/2013					40	40				40	CE	
							Totals						40	40				40		
09	39	*Carper Rd Upgrade* Carper Rd SW from: James Rd to: Old Hwy 9 Road Upgrade	05	P	0.60	C P T	PE	1/1/2013					70	70				70	CE	
							Totals						70	70				70		
07	40	*Vail Road Upgrade* Vail Road from: 153rd to: Bald Hill Rd Road Widening	05	S	2.815	C P T	RW CN	1/1/2008 1/1/2009	STP(R) STP(R)	30 1534			200 1446	230 2980	230	1580	1400		CE	
							Totals			1564			1646	3210	230	1580	1400			
07	41	*Delphi Road Upgrade* Delphi Road from: 62nd to: McLane Creek Road Widening (Most Construction in 2009 - $3566)	05	P	3.18	C P T	PE	1/1/2013	STP(S)	7			3	10				10	CE	
							Totals			7			3	10				10		
07	42	*Rich Road Upgrade* Rich Road from: Deschutes River to: 87th Road Widening	05	S	1.89	C P T	RW CN	1/1/2008 1/1/2010	STP(R) STP(R)	158 140	RAP	1799	167 283	325 2222	75	100	140	2222	CE	
							Totals			298		1799	450	2547	75	100	140	2222		

Washington State Department of Transportation

Six Year Transportation Improvement Program

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Hearing Date: _____ **Adoption Date:** _____

Amend Date: _____ **Resolution No.:** _____

Functional Class	Priority Number	Project Identification A. Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or Road - Ending MP or Road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars Project Phase	Phase Start (mm/dd/yyyy)	Fund Source Information Federal Funding Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency) 1st	2nd	3rd	4th Thru 6th	Federally Funded Projects Only Envir. Type	R/W Required Date (MM/YY)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
07	43	*Vail Road Upgrade* Vail Road from: Bald Hill Rd to: SR 507 Road Widening	05	S	.93	C P T	RW CN	1/1/2008 6/1/2008	STP(R) STP(R)	7 413			3 348	10 761	10 761				CE	
							Totals			420			351	771	771					
07	44	*Delphi Rd Upgrade* Delphi Road SW from: McLane Creek to: SR101 Road Widening	05	P	0.95	C P T	PE RW CN	1/1/2008 6/1/2008 1/1/2009			RAP	810	10 190 90	10 190 900	10 190	900			CE	
							Totals					810	290	1100	200	900				
16	45	*Old Hwy 99/Tilley Rd Intersection* Old Hwy 99/Tilley Rd S from: At Intersection to: Channelization Improvements	12	P	0.00	C P T	PE RW CN	1/1/2008 5/1/2008 10/1/2008					20 20 267	20 20 267	20 20 267				CE	
							Totals						307	307	307					
16	46	*Yelm Hwy/Meridian Intersection* Yelm Hwy SE/Meridian from: At Intersection to: Intersection Improvements	12	P	0.10	C P T	PE	1/1/2013	STP(S)	34			11	45				45	CE	
							Totals			34			11	45				45		
07	47	*Johnson Pt Rd Turn Lane* Johnson Pt Rd/Hawks Prairie Rd from: At Intersection to: Left Turn Lane	12	P	0.00	C P T	RW CN	1/1/2011 1/1/2012	STP(S) STP(S)	15 300			5 60	20 360				20 360	CE	
							Totals			315			65	380				380		
07	48	*Littlerock Rd/113th Intersection* Littlerock Rd SW/113th Ave from: At Intersection to: Intersection Improvements	12	P	0.10	C P T	RW CN	1/1/2011 1/1/2012	STP(S)	100	OTHER OTHER	10 27	38	10 165				10 165	EA	
							Totals			100		37	38	175				175		
17	49	*Mullen Road Safety Project* Mullen Rd SE from: Near 46th Ave SE to: Safety Improvement	12	P	0.10	C P T	PE	1/1/2013	STP(S)	8			2	10				10	CE	
							Totals			8			2	10				10		

Washington State Department of Transportation

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Six Year Transportation Improvement Program

From 2008 to 2013

Agency: Thurston Co.

Co. No.: 34 Co. Name: Thurston Co.

City No.: 0000 MPO/RTPO: NON/TRPC

Hearing Date: Adoption Date:

Amend Date: Resolution No.:

Functional Class	Priority Number	Project Identification A. Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or Road - Ending MP or Road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars								Expenditure Schedule (Local Agency)				Federally Funded Projects Only	
									Fund Source Information											
									Federal Funding											
							Project Phase	Phase Start (mm/dd/yyyy)	Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	1st	2nd	3rd	4th Thru 6th	Envir. Type	R/W Required Date (MM/YY)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
07	50	*Old Hwy 99 From McCorkle Road to Rich Road* Old Hwy 99 from: McCorkle Rd to: Rich Rd Safety Improvement	12	S	0.91	C G P T	PE	1/1/2008	STP(S)	10				10	10				EA	
							RW	2/1/2008	STP(S)	40				40	40					
							CN	5/1/2008	STP(S)	670			241	911		911				
							Totals			720			241	961	50	911				
07	51	*Littlerock Rd/93rd Ave Intersection* Littlerock Rd SW/93rd Ave SW from: Intersection to: Safety Improvement	12	S	0.00	C G P T	RW	1/1/2008	STP(S)	10				10	10				EA	
							CN	1/1/2009	STP(S)	209			72	281		281				
							Totals			219			72	291	10	281				
16	52	*Meridian Road/Mullen Road Intersection* Meridian Rd/Mullen Rd Intersection from: Intersection to: Safety Improvement	12	S		C G P T	PE	1/1/2008	STP(S)	10				10	10				EA	
							RW	1/1/2008	STP(S)	10				10	10					
							CN	5/1/2008	STP(S)	367			125	492		492				
							Totals			387			125	512	20	492				
06	53	*Old Hwy 99 Bridge (O-7) Replacement* Old Highway 99 SE from: At Scatter Creek to: Bridge Replacement	09	P	0.00	C P T	PE	1/1/2013	BR	46			11	57				57	CE	
							Totals			46			11	57				57		
07	54	*Hawks Prairie Rd Bridge (H-1) Widening* Hawks Prairie Rd NE from: At Woodland Creek to: Bridge Rehabilitation	10	P	0.00	C P T	CN	1/1/2012	BR	220			55	275				275	CE	
							Totals			220			55	275				275		
07	55	*Littlerock Rd Bridge (L-5) Replacement* Littlerock Rd SW from: At Bloom's Ditch to: Bridge Replacement	09	P	0.00	C T	CN	1/1/2012	BR	292			118	410				410	CE	
							Totals			292			118	410				410		
06	56	*Old Hwy 99 Bridge (O-8) Replacement* Old Highway 99 SE from: At Scatter Cr W of Tenino to: Bridge Replacement	09	P	0.00	C P T	PE	1/1/2013	BR	10				10				10	CE	
							Totals			10				10				10		

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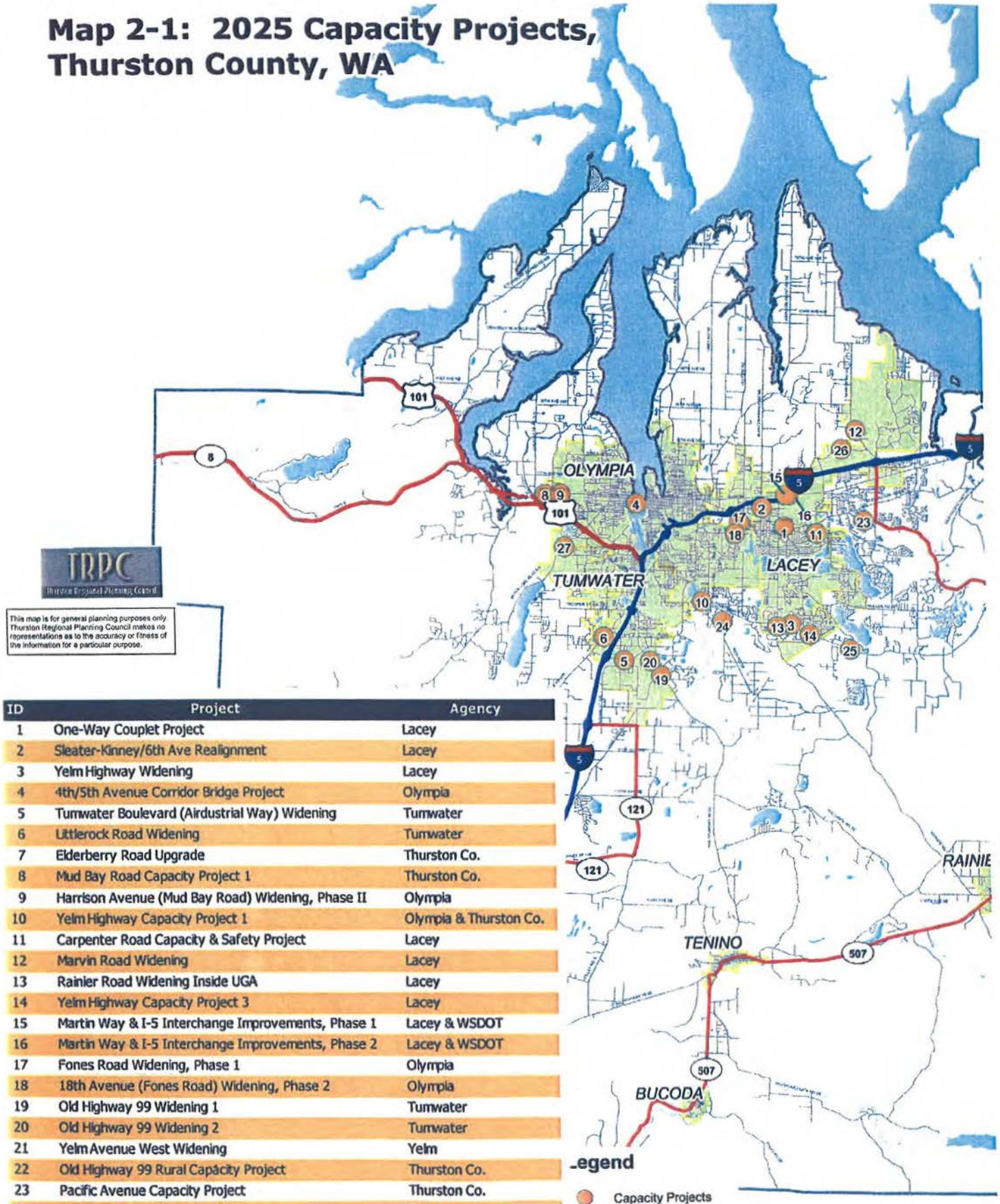
									Fund Source Information											
									Federal Funding											
							Project Phase	Phase Start (*mm/dd/yyyy*)	Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	1st	2nd	3rd	4th Thru 6th	Envir. Type	R/W Required Date (*MM/YY*)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
08	57	*Independence River Bank Protection + Bridge* Independence Road from: Independence Road to: NE of 201st Chehalis Riverbank Stabilization + Bridge	13	P	0.0	P T	PE	1/1/2008			OTHER	17	6	23	23				CE	
							RW	2/1/2008			OTHER	57	20	77	77					
							CN	10/1/2008			OTHER	965	803	1768	200	1568				
							Totals					1039	829	1868	300	1568				
	58	*Case Road Extension Fish Passage* Case Road Extension from: At Scott Creek to: Fish Passage. Uses US Fisheries funds reflected as local per WSDOT instructions.	13	S	0.00	C P T	CN	1/1/2008					5	5	5				CE	
							Totals						5	5	5					
07	59	*128th Ave SW Fish Passage* 128th Ave SW just east of La Franc St from: At Unnamed Creek to: Fish Passage/Drainage	13	S	0.00	C P T	CN	1/1/2008					5	5	5				CE	
							Totals						5	5	5					
00	60	*Traffic Safety and Enhancements* Various from: to:	12 32	P			CN	1/1/2008	STP(E)	240	PSMP	300	60	600	100	100	100	300	CE	
							Totals			240		300	60	600	100	100	100	300		
07	61	*Waddell Creek Road Fish Passage* Waddell Creek Road SW from: Waddell Creek Rd at to: Fish Passage	13	P	0.00	C P T	PE	1/1/2013					10	10				10	CE	
							Totals						10	10				10		

Map 2-1: 2025 Capacity Projects, Thurston County, WA



ID	Project	Agency
1	One-Way Couplet Project	Lacey
2	Sleater-Kinney/6th Ave Realignment	Lacey
3	Yelm Highway Widening	Lacey
4	4th/5th Avenue Corridor Bridge Project	Olympia
5	Tumwater Boulevard (Airdustrial Way) Widening	Tumwater
6	Littlerock Road Widening	Tumwater
7	Elderberry Road Upgrade	Thurston Co.
8	Mud Bay Road Capacity Project 1	Thurston Co.
9	Harrison Avenue (Mud Bay Road) Widening, Phase II	Olympia
10	Yelm Highway Capacity Project 1	Olympia & Thurston Co.
11	Carpenter Road Capacity & Safety Project	Lacey
12	Marvin Road Widening	Lacey
13	Rainier Road Widening Inside UGA	Lacey
14	Yelm Highway Capacity Project 3	Lacey
15	Martin Way & I-5 Interchange Improvements, Phase 1	Lacey & WSDOT
16	Martin Way & I-5 Interchange Improvements, Phase 2	Lacey & WSDOT
17	Fones Road Widening, Phase 1	Olympia
18	18th Avenue (Fones Road) Widening, Phase 2	Olympia
19	Old Highway 99 Widening 1	Tumwater
20	Old Highway 99 Widening 2	Tumwater
21	Yelm Avenue West Widening	Yelm
22	Old Highway 99 Rural Capacity Project	Thurston Co.
23	Pacific Avenue Capacity Project	Thurston Co.
24	Rich Road Capacity Project	Thurston Co.
25	Yelm Highway Capacity Project 4	Thurston Co.
26	Britton Parkway, Phase 2	Lacey
27	Black Lake Boulevard Widening	Tumwater & Olympia

Note: For more project details see Table 2-2

Map 2-3: 2025 Corridor Studies and Sub-Area Plans, Thurston County, WA

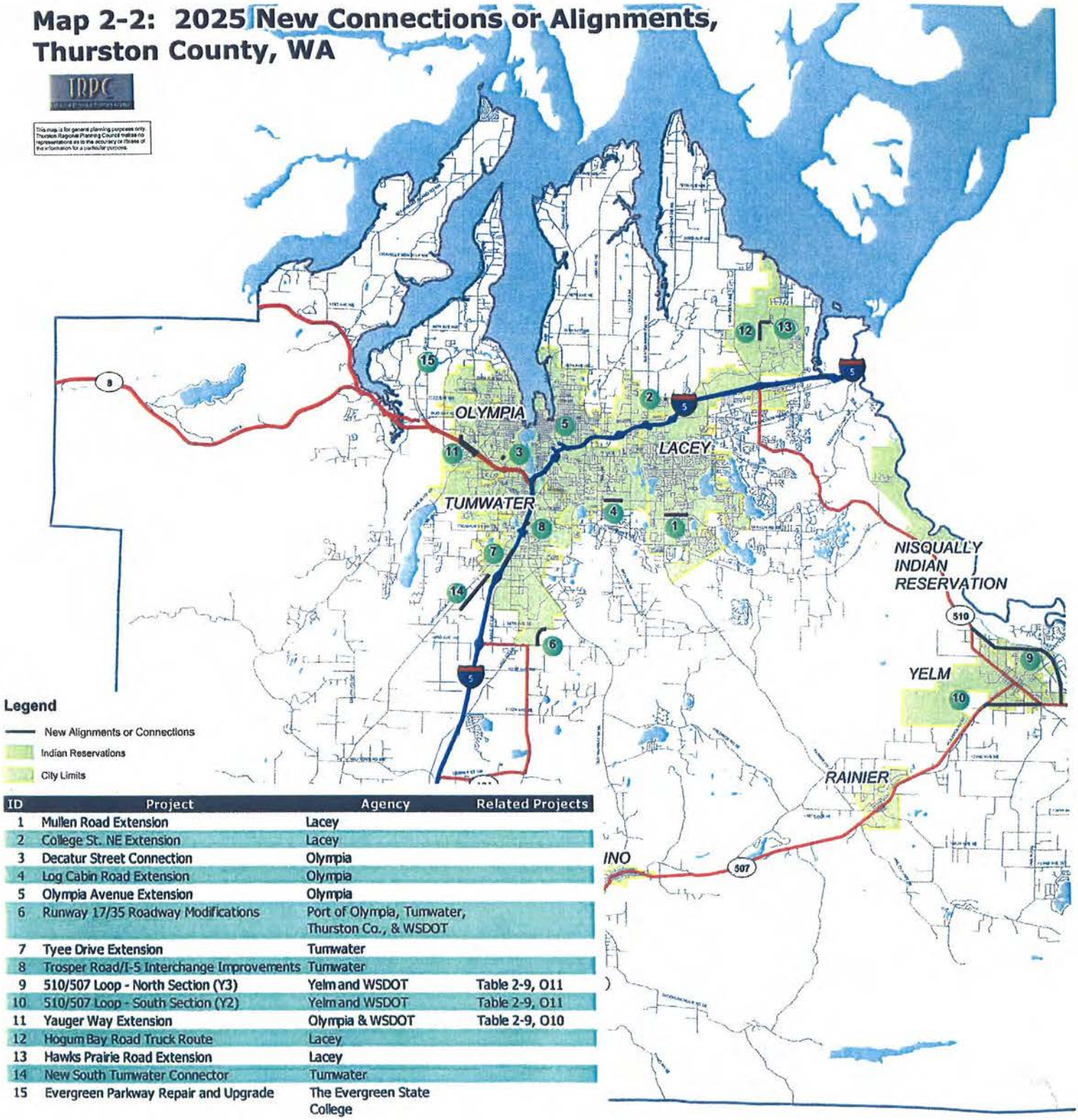
ID	Study Areas	Agency	Related Project
1	Carpenter Road Corridor Study	Lacey	
2	Boulevard Road Corridor Study	Olympia	
3	Carpenter Road Interchange Feasibility Study	Lacey & WSDOT	Table 2-9, O12
4	West Olympia Access Study (Yauger Way Extension, Phase 2)	Olympia & WSDOT	Table 2-9, O10
5	Grand Mound Transportation Study	Thurston Co.	
6	Custer Way Strategy Area Plan	Tumwater	
7	26th Avenue/31st Avenue Extension - Connection Study	Lacey & Thurston Co.	
8	Marvin Road Extension - Connection Study	Lacey & Thurston Co.	
9	Draham/15th Ave/12th Ave Extension Feasibility Study	Lacey, Olympia, & Thurston Co.	
10	12th/15th Avenue Corridor Study	Olympia & Thurston Co.	
11	Rainier Road Extension - Connection Study	Rainier & Thurston Co.	
12	Ensign Connector/Hospital Access Study	Olympia	
13	Southwest Urban Area Sub-Area Plan	Tumwater, Olympia, & Thurston Co.	
14	Airport South Sub-Area Plan	Tumwater, Port of Olympia, & Thurston Co.	

Note: for more project details see Table 2-4

Legend

- Corridor Studies and Sub-Area Plans
- Indian Reservations
- City Limits

Map 2-2: 2025 New Connections or Alignments, Thurston County, WA

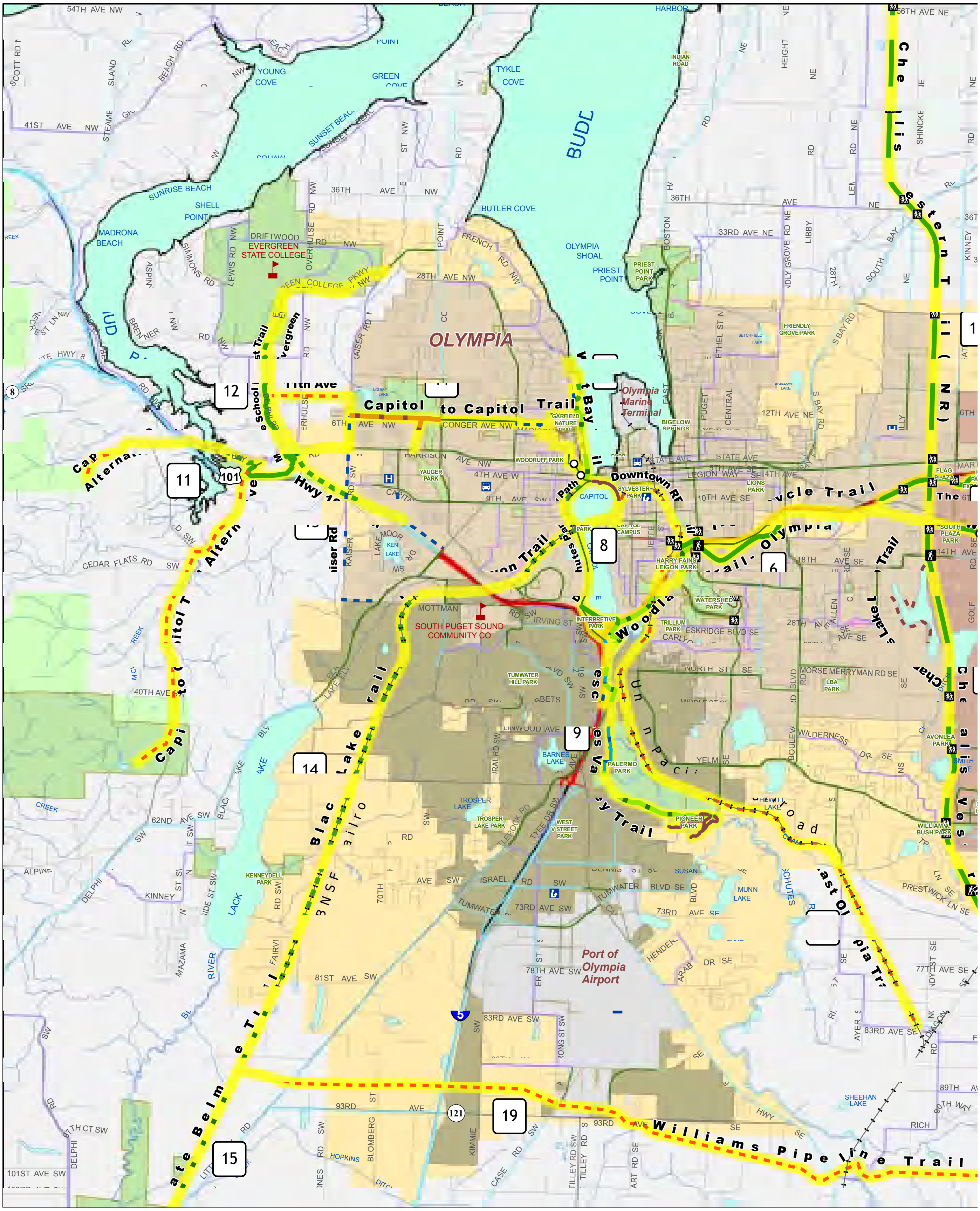


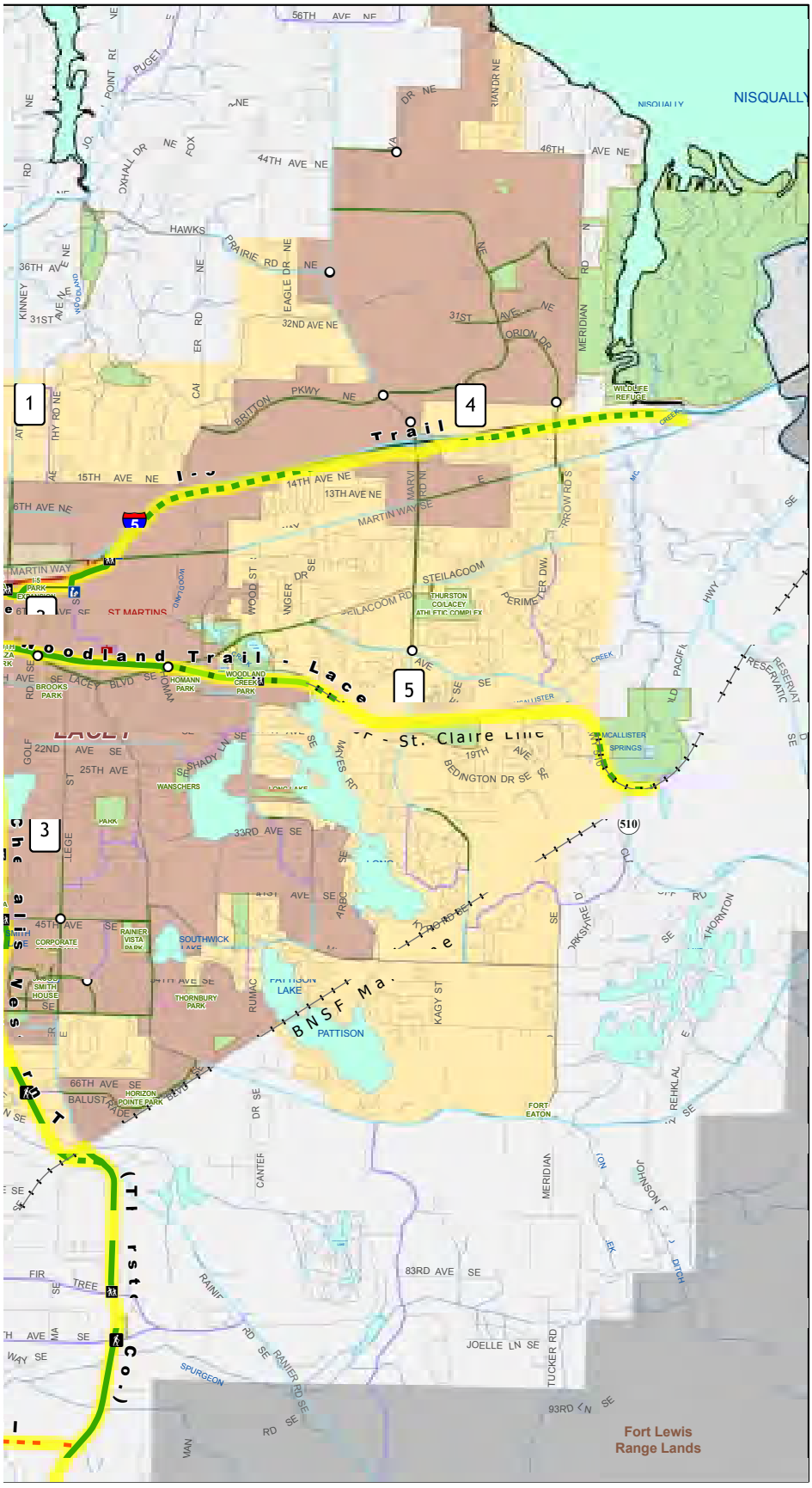
Legend

- New Alignments or Connections
- Indian Reservations
- City Limits

ID	Project	Agency	Related Projects
1	Mullen Road Extension	Lacey	
2	College St. NE Extension	Lacey	
3	Decatur Street Connection	Olympia	
4	Log Cabin Road Extension	Olympia	
5	Olympia Avenue Extension	Olympia	
6	Runway 17/35 Roadway Modifications	Port of Olympia, Tumwater, Thurston Co., & WSDOT	
7	Tyee Drive Extension	Tumwater	
8	Trosper Road/I-5 Interchange Improvements	Tumwater	
9	510/507 Loop - North Section (Y3)	Yelm and WSDOT	Table 2-9, O11
10	510/507 Loop - South Section (Y2)	Yelm and WSDOT	Table 2-9, O11
11	Yauger Way Extension	Olympia & WSDOT	Table 2-9, O10
12	Hogum Bay Road Truck Route	Lacey	
13	Hawks Prairie Road Extension	Lacey	
14	New South Tumwater Connector	Tumwater	
15	Evergreen Parkway Repair and Upgrade	The Evergreen State College	

Note: For more project details see Table 2-3


OLYMPIA
BUDD
EVERGREEN
STATE COLLEGE
SOUTH PUGET SOUND
COMMUNITY CO
Port of
Olympia
Airport
Olympia
Marine
Terminal
Capitol to Capitol Trail
Downtown
CAPITOL
CAPITOL CAMPUS
Williams Pipe Line Trail
YOUNG COVE
GREEN COVE
TYKLE COVE
BUTLER COVE
SUNRISE BEACH
SHELL POINT
MADRONA BEACH
OLYMPIA SHOAL
PRIEST POINT
PRIEST POINT PARK
FRIENDLY GROVE PARK
YAUGER PARK
WOODRUFF PARK
GARFIELD NATURE TRAIL
BIGELOW SPRINGS
SYLVESTER PARK
LIONS PARK
FLAG PLAZA
SOUTH PLAZA PARK
HARRY FAINS LEIGON PARK
WATERSHED PARK
TRILLIUM PARK
INTERPRETIVE PARK
TUMWATER HILL PARK
BARNES LAKE
PALERMO PARK
TROSPER LAKE
TROSPER LAKE PARK
WEST V STREET PARK
PIONEER PARK
KENNEYDELL PARK
MUNN LAKE
AVONLEA PARK
WILLIAMS BUSH PARK
LBA PARK
SHEEHAN LAKE
54TH AVE NW
41ST AVE NW
36TH AVE NW
28TH AVE NW
33RD AVE NE
12TH AVE NE
18TH AVE SE
14TH AVE
10TH AVE SE
4TH AVE W
9TH AVE SW
CONGER AVE NW
6TH AVE NW
HARRISON AVE NW
CEDAR FLATS RD SW
40TH AVE
62ND AVE SW
73RD AVE SW
78TH AVE SW
81ST AVE SW
83RD AVE SW
93RD AVE
101ST AVE SW
ESKRIDGE BLVD SE
MORSE MERRYMAN RD SE
TUMWATER BLVD SE
YELM
MOTTMAN
IRVING ST
ISRAEL RD SW
PRESTWICK LN SE
BSNF Railroad
Black Lake Trail
Capitol Trail Alternate
Hwy 101
Woodland Trail
Deschutes Valley Trail
Chehalis Western Trail (NR)
Olympia Bicycle Trail
Union Pacific Railroad
East Olympia Trail
Belmore Trail
11
12
14
15
19
6
8
9
101
121
5



Thurston Region Trail Network

Urban View

Use this map as an Index:

The numbered boxes refer to maps with more detailed information about the trails in this section of the plan. Refer to the 'County View' and 'Regional View' maps for other trails outside of this urban view.

- Trail, Shared Use, Existing
- Trail, Shared Use, Planned
- Trail, Shared Use, Proposed
- Trail, Shared Use, Potential
- Route, On Street, Planned
- Route, On Street, Proposed
- Trail, Recreational, Existing
- Trail, Recreational, Planned
- Trail, Recreational, Proposed
- Proposed Regional Trail Network

Existing Bike Routes

- Bike Lane
- Wide Shoulder
- Commonly Used Local Roads
- Bicycle/Pedestrian Connection
- Bicycles Forbidden
- Active Railroad
- Local Streets
- Roundabouts
- Schools
- Bus Transit Centers
- Hospitals
- Libraries
- Olympia Regional Airport
- Park & Ride Lots
- Trail Access Point
- Trail Heads
- Train Station
- Urban Growth Areas
- Port of Olympia
- DNR Managed Lands
- Unincorporated Thurston County

5 Miles
4
3
2
1
0.5
0

5 miles can be bicycled in about 20 minutes

3 miles can be walked in about 1 hour

Disclaimer

This map is for general planning purposes only. Thurston Regional Planning Council makes no representations as to the accuracy or fitness of the information for a particular purpose.

TRPC

APPENDIX D

SubArea Plan Recommendations

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Table D-1. Tumwater Boulevard SubArea Transportation Study

Issues						Recommendations	Accomplishments Completed / To Be Addressed
Capacity	Pedestrian	Bicycle	Access	Circulation	Connectivity/Livability		
X	X	X	X			▪ Widen roadway to accommodate 2nd eastbound lane from Linderson Way to New Market St	Completed
X						▪ Widen Linderson Way to provide exclusive northbound right-turn lane	Completed
X	X	X	X	X	X	▪ Install modern roundabout at New Market St	Completed
			X	X	X	▪ Provide access control at Tumwater Blvd/Cleanwater Ln intersection	Completed
X			X			▪ Provide 2nd eastbound left-turn lane to allow "dual" left-turn operation at Tumwater Blvd/Linderson Way intersection	Completed
X				X		▪ Maintain free-flow southbound right-turn movement at Tumwater Blvd/Linderson Way for vehicles bound for I-5	Completed
X				X		▪ Provide 2nd northbound left-turn lane at Tumwater Blvd/Capitol Blvd to allow "dual" left-turn operation	Completed
	X	X	X			▪ Ensure Point Plaza East/Point Plaza West developments provide refuge areas to allow for safe, convenient pedestrian connections between office buildings	Completed
	X	X	X		X	▪ Require future development projects to provide pedestrian connections and walkways between uses and within close proximity to transit connections	Ongoing
X			X			▪ Install southbound right-turn lane on Capitol Blvd at Tumwater Blvd	Completed
X			X			▪ Provide 2nd eastbound left-turn lane to allow "dual" left-turn operation at Capitol Blvd/Israel Rd intersection	See Planning Area 1
X			X			▪ Install southbound right-turn lane on Capitol Blvd at Israel Rd	See Planning Area 1
X			X			▪ Provide protected left-turn signal phasing for the east/west approaches to Capitol Blvd/Israel Rd	Completed
	X	X	X			▪ Provide raised median along Capitol Blvd between Tumwater Blvd and Israel Rd to separate vehicular/pedestrian modes and increase crossing safety	See Planning Area 1
		X		X		▪ Shared lanes/outside lane width improvements on Capitol Blvd from Tumwater Blvd to Dennis St for bicycle mobility	
X		X			X	▪ Add designated bike lanes to Tumwater Blvd from Linderson Way to the I-5 interchange and continuing to Littlerock Rd	Linderson to I-5 Completed
X		X			X	▪ Designated bike lanes in paved shoulders on Israel Rd and New Market St; continue designated bike lane as roadway improvements occur on New Market St	See Planning Area 1
	X	X			X	▪ Install traffic calming devices on 6th Avenue to reduce cut-through traffic	Completed

Tumwater Boulevard SubArea

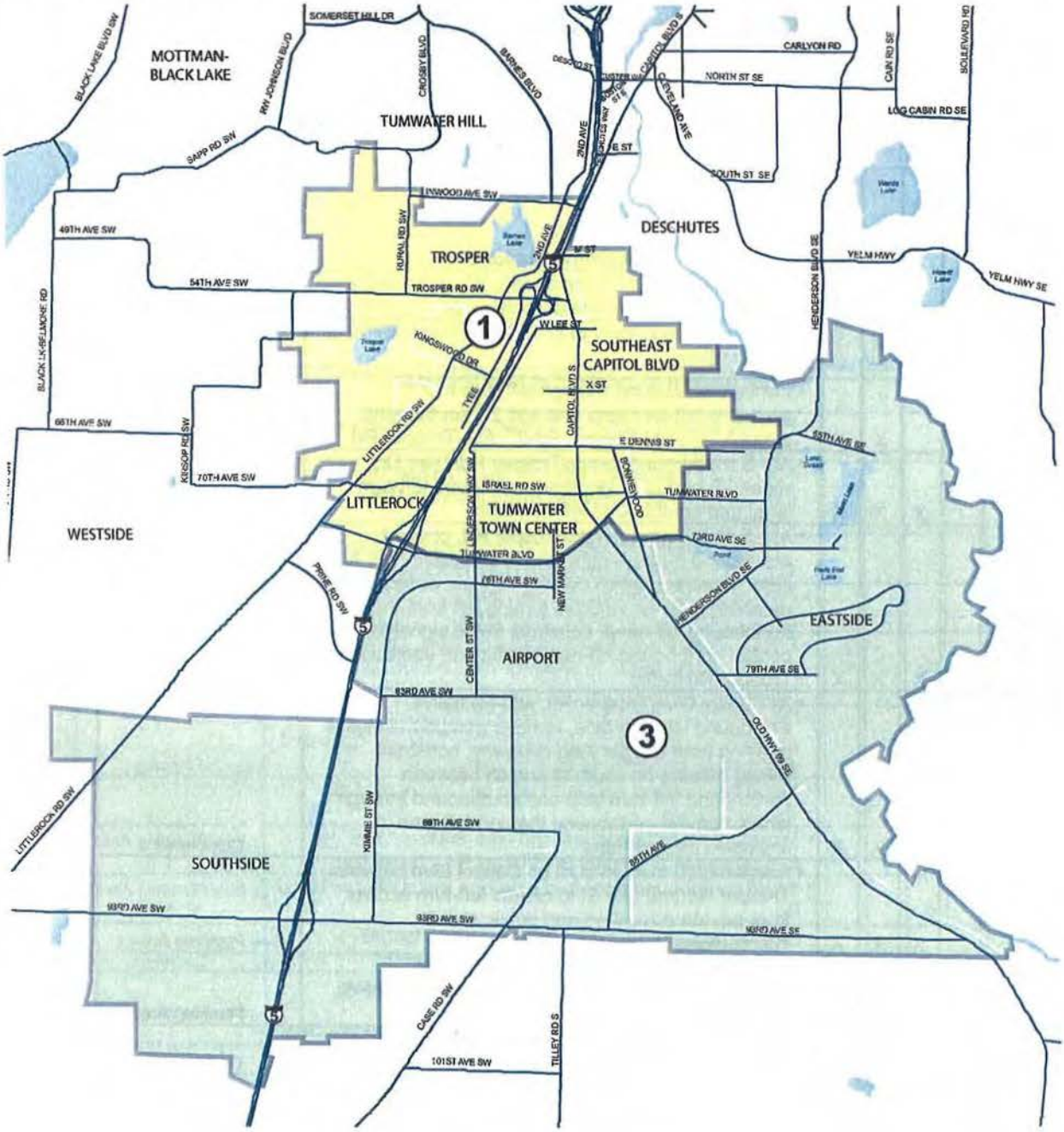


Table D-2. Capitol Boulevard/Trosper Road SubArea Transportation Study

Issues						Recommendations	Accomplishments Completed / To be Addressed
Capacity	Pedestrian	Bicycle	Access	Circulation	Connectivity/Livability		
X				X	X	▪ Convert westbound through-left lane to 2nd exclusive left-turn lane and add 2nd southbound through lane at Littlerock Rd-2nd Ave/Trosper Rd	See Planning Area 1
X			X	X	X	▪ At I-5 southbound ramps/Trosper Rd/Tyee Dr, widen I-5 bridge to lengthen westbound left-turn lane, add southbound left-turn lane	Completed
X			X	X	X	▪ At I-5 northbound ramps/Trosper Rd, convert westbound through-right lane to exclusive right-turn lane, construct raised curbing to allow westbound receiving lane for vehicles turning left from the northbound off-ramp, construct traffic signal to control northbound off-ramp traffic and eastbound Trosper Rd traffic	Completed
X			X	X	X	▪ At Capitol Blvd/Trosper Rd, add exclusive eastbound left-turn lane, remove westbound signal phasing from Burger King driveway, construct raised curbing on south approach between northbound left-turn lane and southbound through lanes, convert northbound through-left lane to exclusive through-lane	Completed
X			X	X	X	▪ Install raised median curb on Capitol Blvd between Trosper Rd and Lee St to restrict left-turn access from private driveways and public street intersections	See Planning Area 1
			X	X	X	▪ Construct raised curbing to limit length of southbound left-turn pocket at Capitol Blvd/Lee St intersection	See Planning Area 1
X			X	X	X	▪ Construct two-lane commercial collector from Trosper Rd/I-5 to Costco south property line	Completed
	X				X	▪ Provide raised medians along designated segments of Capitol Blvd between Dennis St and "M" St	Capitol M to X Project See Planning Area 1
	X				X	▪ Provide a pedestrian crossing on Trosper Rd near Olympics West (west of Littlerock Rd)	
	X				X	▪ Consider pedestrian crossing with refuge island at Capitol Blvd/Ruby St intersection	
	X		X		X	▪ Require that future development projects provide pedestrian connections and walkways between uses and within close proximity to transit connections	Ongoing
		X		X	X	▪ Consider adding full bike lanes or narrowing inside travel lanes on Capitol Blvd to incorporate wider curb lanes for shared vehicle/bicycle access	See Planning Area 1
	X	X	X	X	X	▪ Work with business owners in vicinity of Capitol Blvd/Trosper Rd to develop internal shared accesses	

Capitol Boulevard/Trosper Road SubArea

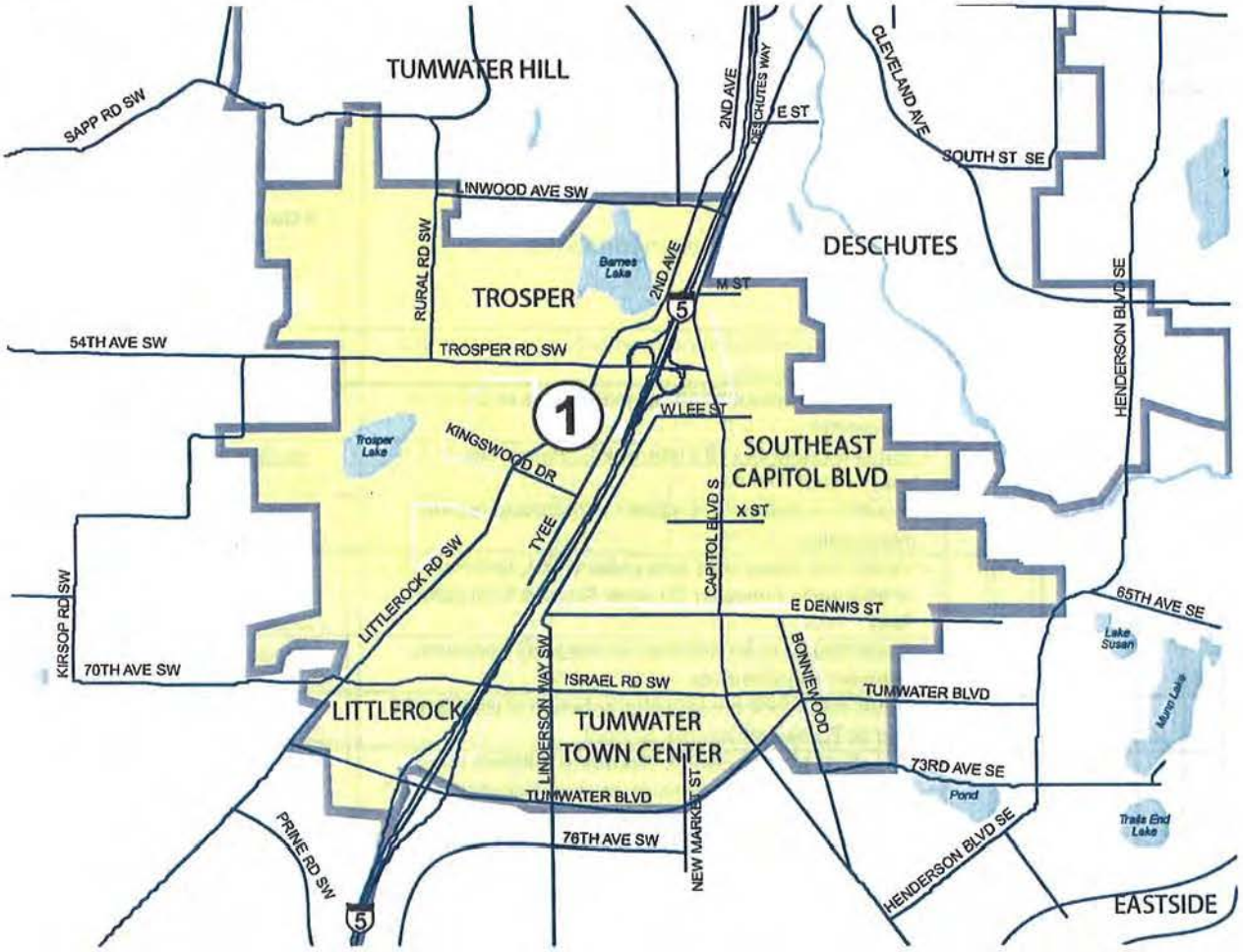


Table D-3. Littlerock Road SubArea Transportation Study

Issues						Recommendations	Accomplishments Completed / To be Addressed
Capacity	Pedestrian	Bicycle	Access	Circulation	Connectivity/Livability		
X			X	X		▪ Add second northbound lane between Trosper Rd and Costco access	Littlerock Project; Construction 2008-09
X	X	X	X	X		▪ Install roundabout at Littlerock Rd/Tumwater Blvd intersection	Littlerock Project; Construction 2008-09
X	X	X	X	X		▪ Install roundabout at Littlerock Rd/Israel Rd intersection	Littlerock Project; Construction 2008-09
X	X	X	X	X		▪ Install roundabout at Littlerock Rd/Odegaard Rd intersection	Littlerock Project; Construction 2008-09
	X	X			X	▪ Install bike lanes and sidewalks with planter strips or tree wells between Trosper Rd and Tumwater Blvd	Littlerock Project; Construction 2008-09
X			X			▪ Install landscaped median on roadway segments between roundabouts	Littlerock Project; Construction 2008-09
	X				X	▪ Install mid-block crosswalks between roundabouts and at Tumwater Middle School	Littlerock Project; Construction 2008-09
X	X		X	X	X	▪ Construct Kingswood Dr (formerly referred to as BPA Access Rd) to provide access as commercial development occurs south of Costco	Completed
			X			▪ Install roundabout at Kingswood Dr/Littlerock Rd	Littlerock Project; Construction 2008
X			X		X	▪ Install landscaped median from Kingswood Dr south to Tumwater Middle School access	Littlerock Project; Construction 2008
X	X	X	X	X	X	▪ Extend Tyee Dr south to Israel Rd	
X	X	X	X	X	X	▪ Construct grid system of connector roadways to provide access as development occurs	

Littlerock Road SubArea

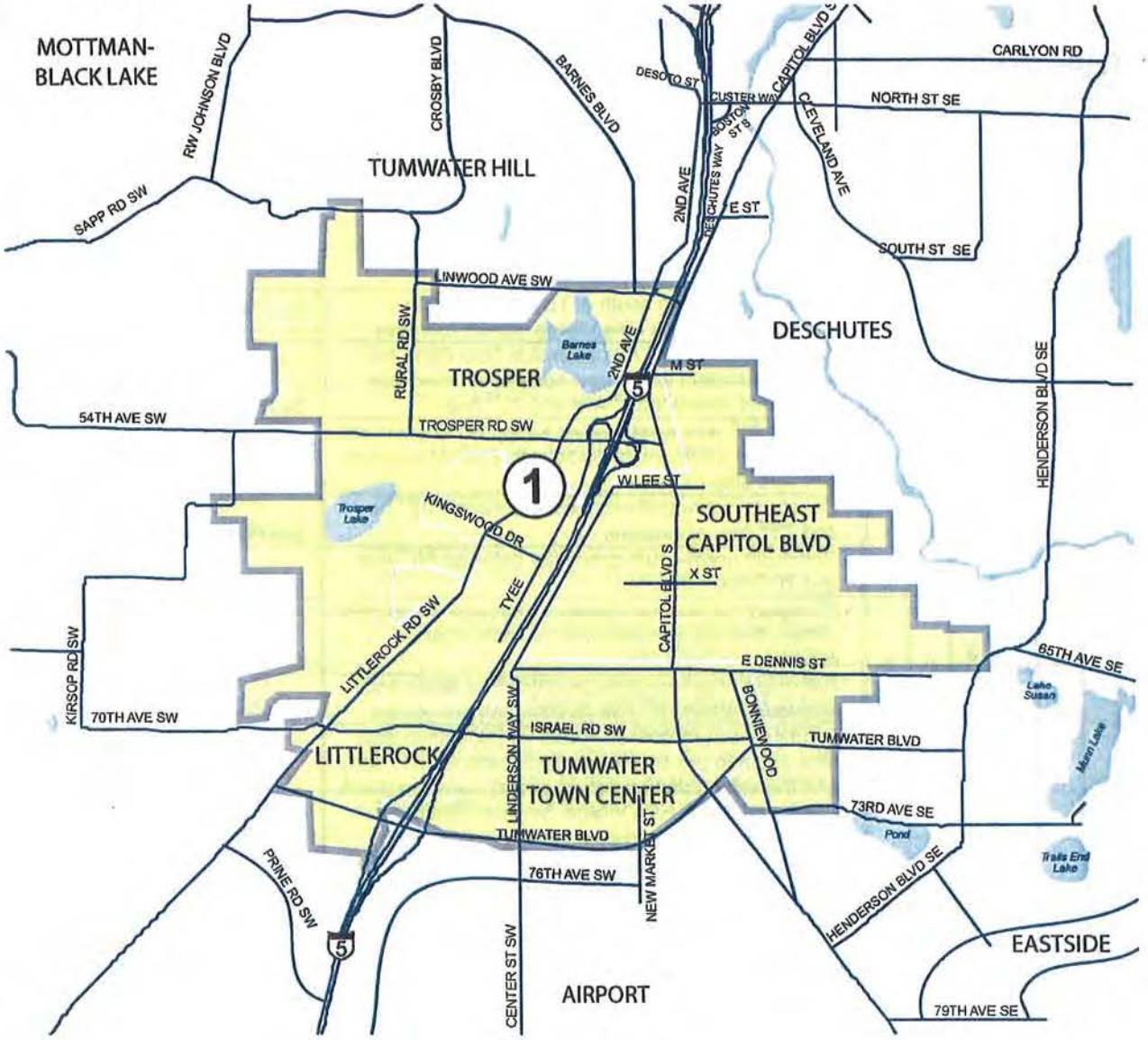


Table D-4. Black Hills SubArea Transportation Study

Issues						Recommendations	Accomplishments Completed / To be Addressed
Capacity	Pedestrian	Bicycle	Access	Circulation	Connectivity/Livability		
X	X	X	X	X	X	▪ Extend Tyee Drive south of Tumwater Blvd to intersect with Black Hills Village access roadway	See Planning Areas 1 & 4
X	X	X	X	X	X	▪ Construction of 73rd Ave extension from Prine Rd west to intersect with a new north-south roadway that would connect 66th Ave and 73rd Ave	See Planning Area 4
	X	X	X	X	X	▪ Extend 70th Ave west beyond Kirsop Rd to intersect with a new north-south roadway that would connect 66th Ave and 73rd Ave	Currently in development approval process. See Planning Area 4
	X	X	X	X	X	▪ Construct north-south connector between 70th Ave and 73rd Ave extensions	See Planning Area 4
	X	X	X	X	X	▪ Construct north-south connector between 66th Ave and 70th Ave extension	Currently in development approval process. See Planning Area 4
	X	X	X	X	X	▪ Construct north-south connector through Black Hills Village that will intersect with the main access roadway	See Planning Area 4
	X	X			X	▪ Full urban improvements including bike lanes and sidewalks along 70th Ave as development occurs	ongoing
	X	X			X	▪ Establish non-motorized routes for pedestrian and bike travel to provide connections between 81st Ave and the existing/future school site(s), between Black Hawk and Black Hills Village, between Black Hawk and Littlerock Rd; and from the future Gate-to-Belmore Trail west to Kenneydell Park and east to Black Hills Village, the school site(s) and Littlerock Rd	See Planning Area 4

Black Hills SubArea

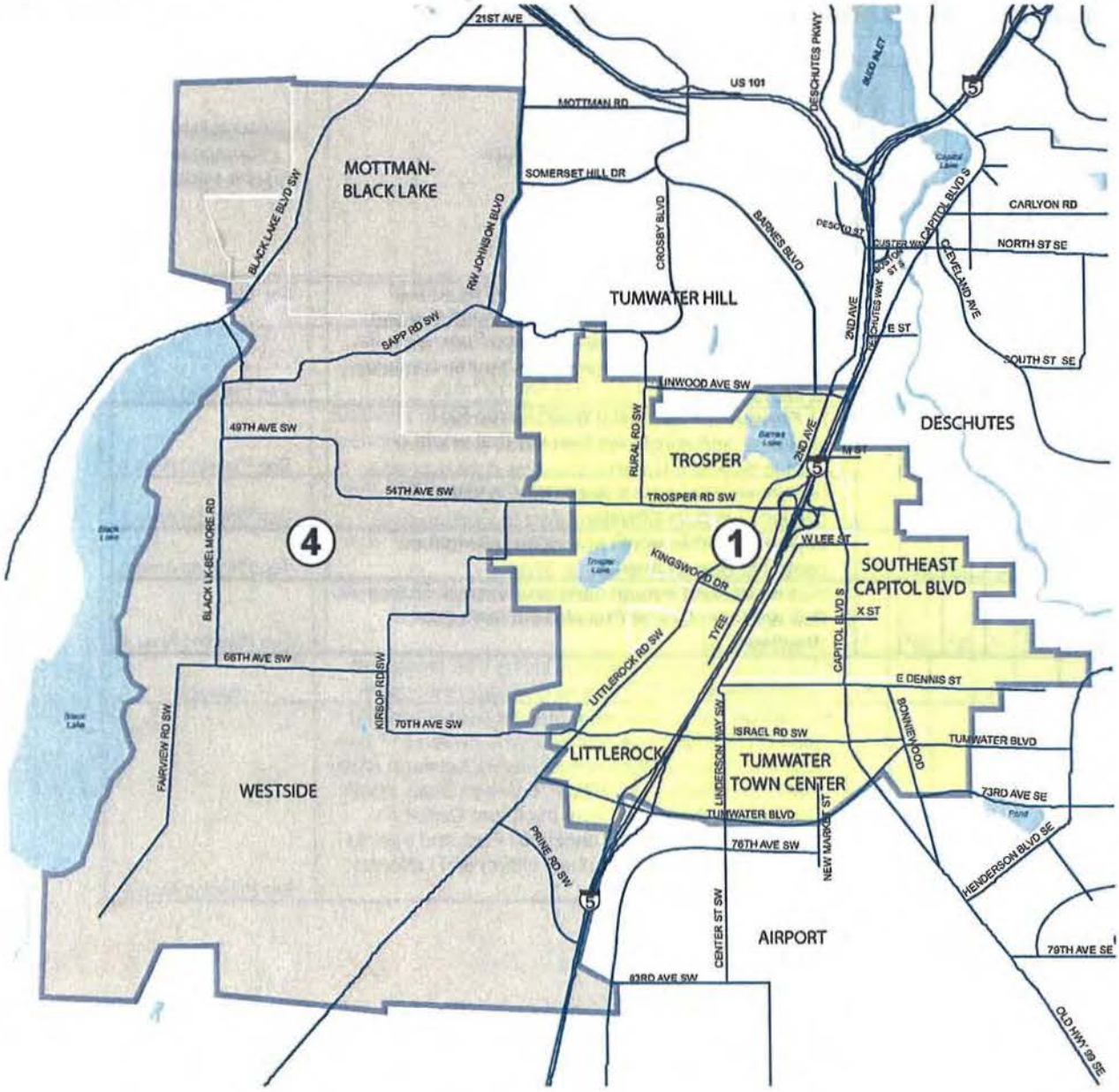
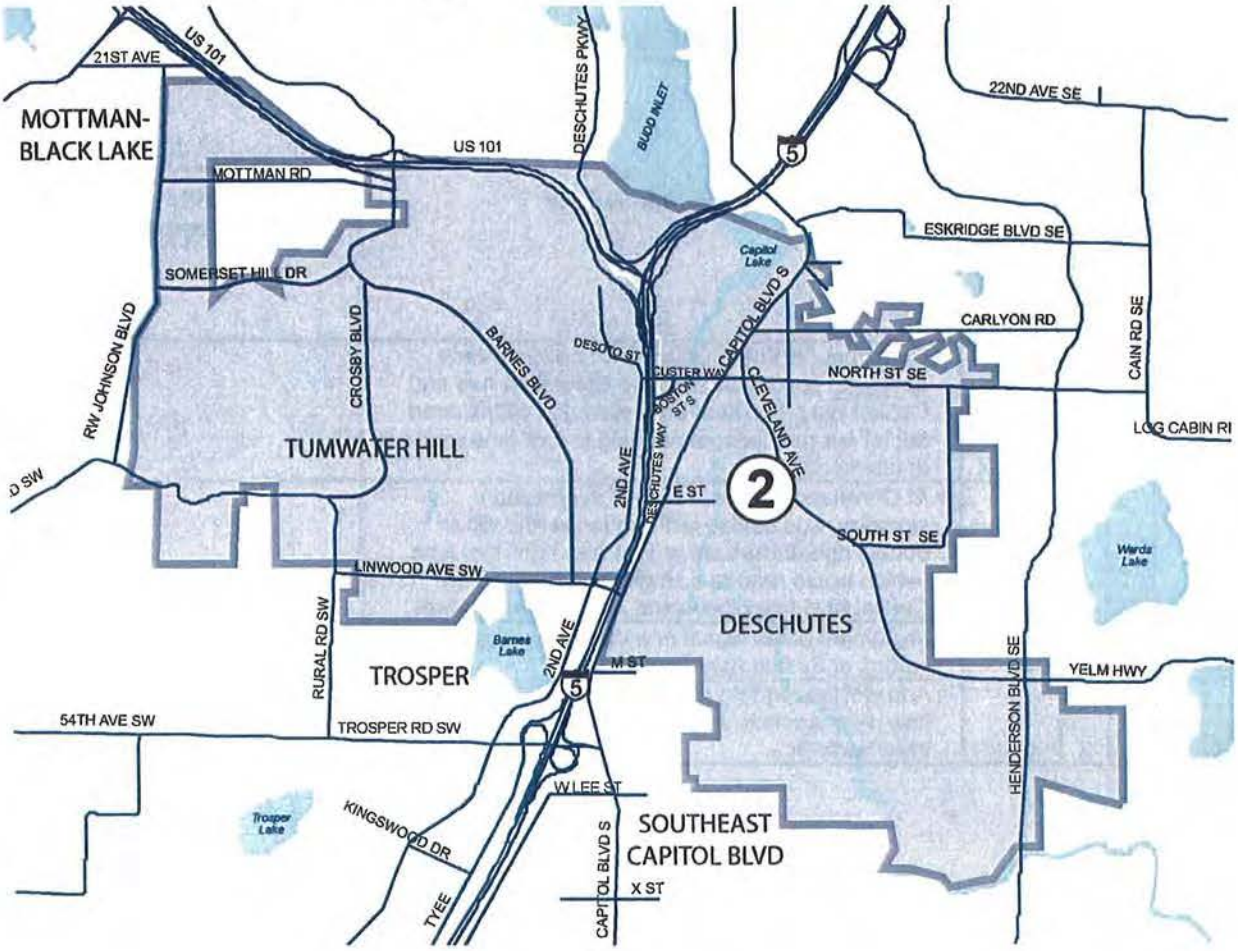


Table D-5. Cleveland Avenue/Custer Way Strategy Area Transportation Plan

Issues						Recommendations	Accomplishments Completed / To be Addressed
Capacity	Pedestrian	Bicycle	Access	Circulation	Connectivity/Livability		
X	X	X	X	X	X	▪ Construct "E Street Extension"; new four-lane east/west connector between Cleveland Ave and Capitol Blvd; one lane each direction with shared center left-turn lane, expanding to four-lane roadway at intersections (Alt 4)	Included in CFP/TIP
X	X	X	X	X	X	▪ At Cleveland Ave/Capitol Blvd intersection; signalize, add double left-turn lanes and either double right-turn lanes or free-flow right-turn lane (which would require a single lane addition on Capitol Blvd from Cleveland Ave to Carlyon Ave)	
	X	X	X	X	X	▪ Implement either signal or modern roundabout control at Boston Ave/Custer Way	
	X	X	X	X	X	▪ Add westbound through-lane and eastbound free-flow right-turn lane at Cleveland Ave/Custer Way/North St	

Cleveland Avenue/Custer Way Strategy Area



Custer Way Strategy Area
Contextual Parameters

Issues Specific to the Study Area:

- Is served by a combined I-5/SR 101 freeway off-ramp onto 2nd Avenue and on-ramps onto I-5 and SR 101 from Deschutes Parkway
- Oldest developed area of Tumwater
- Historical features must be considered in planning for future traffic needs
- Limited space available for new transportation facilities
- Relatively high amount of pedestrian traffic from historical parks and community center
- Brewery site/redevelopment
- Environmental and topographic constraints
- Parking conflicts between residential and commercial uses

SubArea Plan
Goals & Objectives

- Provide system expansion to meet future travel demand
- Develop short-term (2010) and long term (2025) action plan
- Improve safety by reducing congestion and accidents
- Improve regional and local traffic circulation for commercial and residential uses
- Improve and enhance safety and accessibility for pedestrians and bicyclists
- Improve and enhance access to businesses
- Improve and enhance public transportation access
- Aesthetics/streetscape frontage

Mobility

Motorized Modes:
Maintain and improve a network of roads and public transportation services that move people and goods and services safely

- New corridors should be identified to reduce future traffic congestion where appropriate
- LOS goals (system or corridor) should be used to evaluate alternatives to road widening. Consider trade-offs between improving vehicle capacity and improving other travel modes
- Road projects shall consider commercial uses and long-range local land use plans
- Road projects shall consider needs for transit, HOVs, pedestrians and bicycles
- Transportation projects shall be constructed to accommodate freight and rail movement
- Provide coordinated transit service connections and explore high-capacity transportation options

Mobility

Nonmotorized
Place emphasis on safe, convenient and connected routes.

- Identify opportunities to incorporate bike and pedestrian facilities into road improvement projects where feasible
- Improve bicycle and pedestrian facility connections
- Coordinate improvements among jurisdictions
- Assign high priority to improving safety of pedestrian movements (sidewalks, crosswalks, bike lanes)

Connectivity & Circulation

Maximize the efficiency and safety of the transportation network.

- Encourage connected parking facilities
- Provide appropriate intermodal connections
- Consider building additional street connections and/or one-way circulation opportunities

- Access management techniques should be developed/applied as appropriate to the subarea
    - Driveway/Access Spacing
    - Shared Driveways
    - Left/Right Turn Restrictions

- Consider Traffic Management Zones to deal with land use transitional areas

Corridor and Urban Design Development

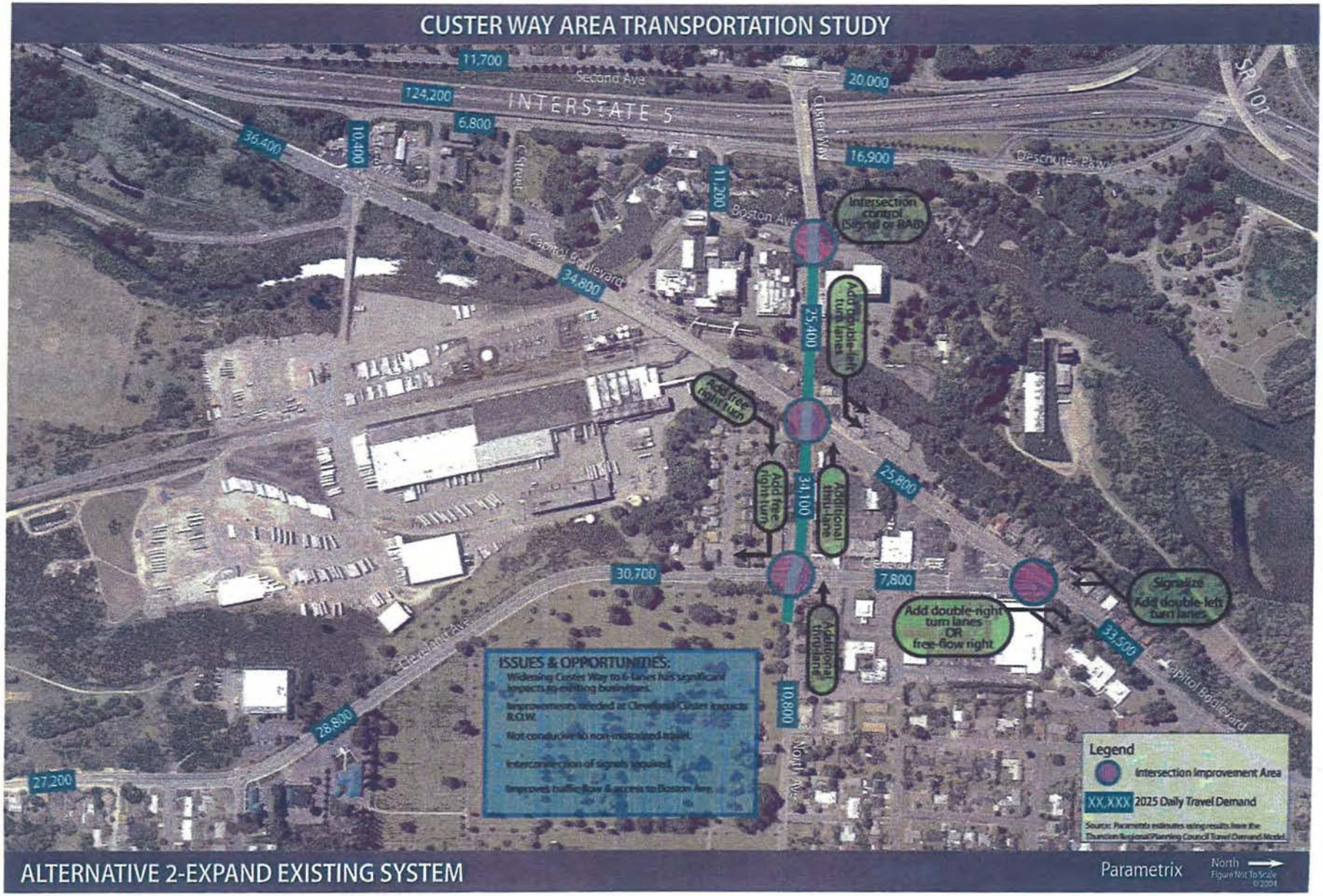
Attract the density, mix, type and concentration of development in core areas and identified corridors to support and encourage the use of alternative transportation modes.

- Encourage urban design standards for infill and redevelopment to assure compatibility

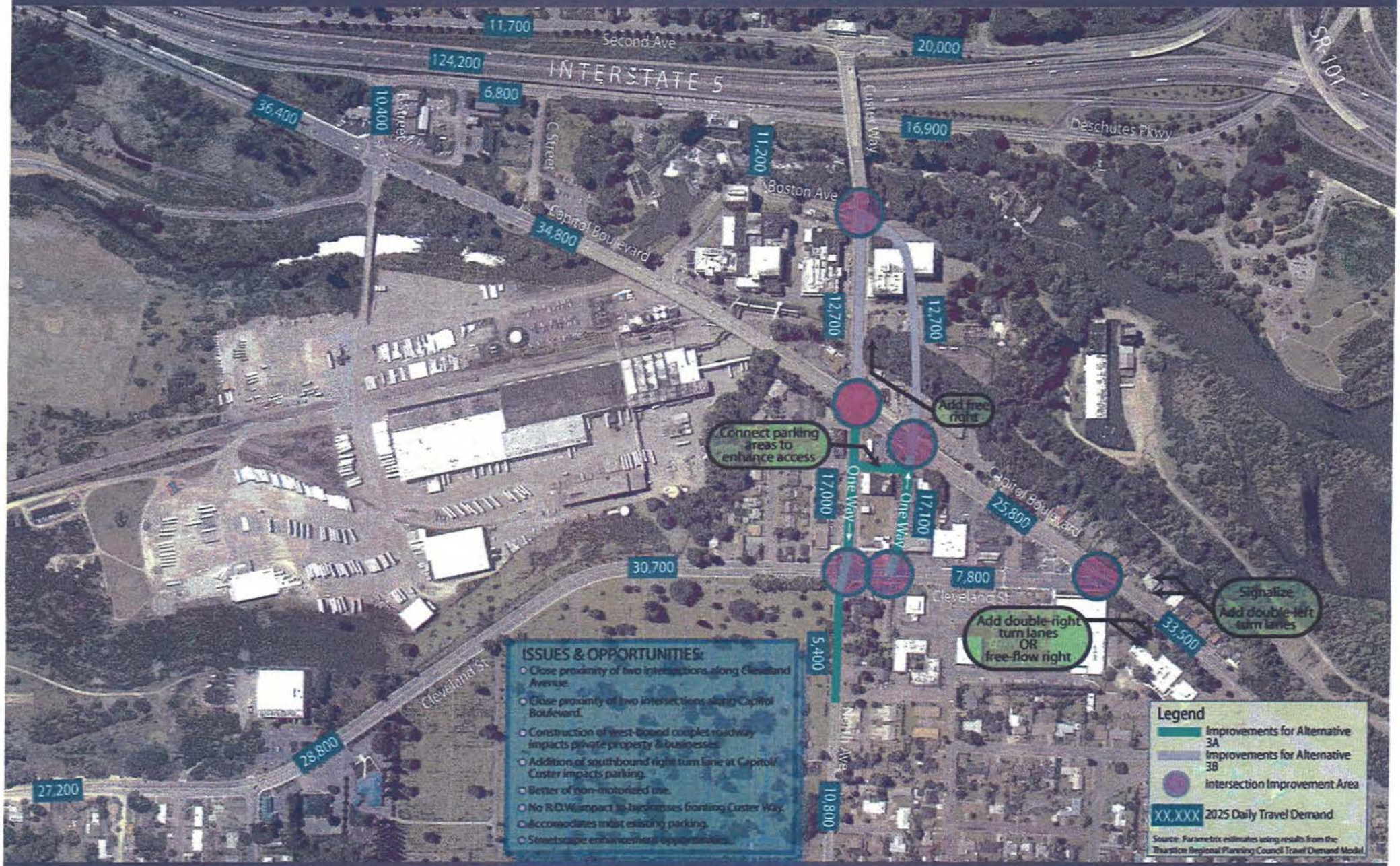
- Create design guidelines that encourage and accommodate pedestrian, bicycle and transit riders

- Evaluate redevelopment of brewery site and its impacts on the transportation system

    - Land use scenario development and testing/associated traffic impacts


CUSTER WAY AREA TRANSPORTATION STUDY
11,700
Second Ave
124,200
INTERSTATE 5
6,800
36,400
10,400
C Street
11,200
Boston Ave
Capitol Boulevard
34,800
20,000
Custer Way
16,900
Bressonte Pkwy
SR 101
Intersection control (Signal or RAB)
Add double-left turn lanes
25,400
Add free right turn
Add free right turn
34,100
Additional thru-lane
25,800
30,700
7,800
Additional thru-lane
Add double-right turn lanes OR free-flow right
Signalize Add double-left turn lanes
33,500
Capitol Boulevard
ISSUES & OPPORTUNITIES:
Widening Custer Way to 6-lanes has significant impacts to existing businesses.
Improvements needed at Cleveland/Custer to provide R.C.I.W.
Not conducive to non-motorized travel.
Interconnection of signals required.
Improves traffic flow & access to Boston Ave.
10,800
North Ave
28,800
Cleveland Ave
27,200
Legend
Intersection Improvement Area
XX,XXX 2025 Daily Travel Demand
Source: Parametrix estimates using results from the Thurston Regional Planning Council Travel Demand Model
ALTERNATIVE 2-EXPAND EXISTING SYSTEM
Parametrix
North
Figure Not To Scale
©2004

CUSTER WAY AREA TRANSPORTATION STUDY



ALTERNATIVE 3A-ONE-WAY COUPLET SYSTEM/CUSTER & NEW CONNECTOR

Parametrix

North

Figure Not To Scale

CUSTER WAY AREA TRANSPORTATION STUDY

ALTERNATIVE 3B-ONE-WAY COUPLET SYSTEM/CUSTER & NEW CONNECTOR

Parametrix

North

Figure Not To Scale

CUSTER WAY AREA TRANSPORTATION STUDY

ALTERNATIVE 4-NEW EAST/WEST CONNECTOR (CAPITOL-CLEVELAND)

Parametrix

North

Figure Not To Scale

APPENDIX E

Future Traffic Operations (2025)
Technical Information

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

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M E M O R A N D U M

Date: **November 7, 2006**

To: **Susan Graham**

From: **Erik Preston, EIT**

Subject: **Future Traffic Operations (2025) Methodology and Assumptions**

cc:

Project Number: **254-1599-024**

Project Name: **Tumwater Transportation Plan**

The purpose of this memorandum is to document the analysis methodology and assumptions used in the preparation of the Tumwater Transportation Plan. Specifically how 2025 volumes were projected, the use of the regional traffic forecasting model prepared by the Thurston Regional Planning Council (TRPC), use of the Synchro outputs, and assembly of the improvement program. A planning horizon year of 2025 was selected as the 20-year planning horizon from the 2005 base year. Only the afternoon (PM) peak hour was analyzed because this time period typically experiences the greatest traffic demand volumes and poorest traffic operations.

FORECASTING METHODOLOGY AND TRPC MODEL

The existing (2004) and future (2025) Emme2 traffic demand models were used as the basis for future volume projections in the study area. The Emme2 traffic model is maintained by the TRPC and incorporates many existing and projected land-use, employment, and residence assumptions in Thurston County. Recently, the City of Tumwater has experienced unexpectedly rapid and traffic intensive development in the Littlerock and Town Center Subareas.

In general, future traffic volumes for intersections and roadway sections outside the two subareas were projected using the following methodology.

1. Existing traffic volumes from turning movement counts in 2004 and 2005 formed existing year base volumes.
2. A 21-year growth increment was found by subtracting the existing year (2004) model volumes from the horizon year (2025) model volumes.
3. This 21-year growth increment was reduced (linearly) to reflect only 20 years of growth.
4. The adjusted growth increment was then added to the existing traffic volumes, resulting in the 2025 horizon year traffic volumes.

The Littlerock Road Subarea in particular has great potential for development of traffic intensive land-uses based on the current zoning. The non-critical land in the subarea that is undeveloped or redevelopable was assumed to be available for development as allowed by zoning. The total development potential was reduced by 25% to reflect what is considered a more realistic projection of growth in the subarea that could be achieved by the year 2025. Base year (existing) traffic volumes in the subarea were grown by two-percent per year to reflect non-specific growth and generate 2025 baseline volumes. Development traffic was then assigned to the network based on the most intensive land-uses

allowed by zoning in the subarea. These development trips were then distributed based on distributions for similar developments in the subarea or TRPC model distributions for the specific traffic analysis zone (TAZ) and added to the future baseline volumes. The resulting traffic volumes were used for 2025 horizon year analysis in the subarea.

SYNCHRO OUTPUTS

The output from the Synchro analysis software summarizes capacity, queuing, and delay calculations that follow Highway Capacity Manual (HCM) methodologies for signalized and unsignalized intersections. These outputs can be useful for determining if capacity of an intersection, approach, or particular movement has been exceeded or is causing significant delay to motorists. Synchro outputs can also indicate if a particular signal timing plan should be changed to minimize intersection delay. For unsignalized intersections, long delays may indicate the need for signalization, roundabout control, or other improvements.

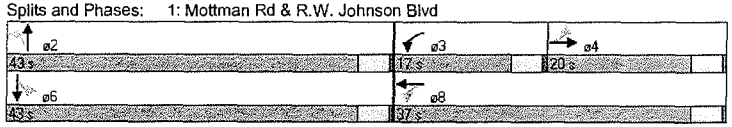
IMPROVEMENT PROGRAM ASSEMBLY

Improvements included in the existing conditions analysis, and those improvements programmed for construction before the 2025 horizon year were included in the 2025 analysis. If capacity or delay deficiencies were found in the initial analysis of the horizon year, these needs were identified. From these needs, a list of improvement projects was created and the improvements included in the analysis scenario. This process was repeated as necessary until the major network deficiencies were solved. The final list of improvement projects was included in the improvement program.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	65	170	395	75	5	280	135	285
Lane Group Flow (vph)	68	195	416	221	5	684	142	326
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	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	20.0
Total Split (s)	20.0	20.0	17.0	37.0	43.0	43.0	43.0	43.0
Total Split (%)	25.0%	25.0%	21.3%	46.3%	53.8%	53.8%	53.8%	53.8%
Yellow Time (s)	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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Min	Min	Min	Min
v/c Ratio	0.36	0.64	0.91	0.32	0.01	0.77	0.88	0.38
Control Delay	33.8	38.6	47.4	8.0	10.6	19.7	69.1	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	38.6	47.4	8.0	10.6	19.7	69.1	13.2
Queue Length 50th (ft)	29	86	158	25	1	206	56	87
Queue Length 95th (ft)	66	151	#354	69	7	374	#176	155
Internal Link Dist (ft)		1494		4078		4260		1081
Turn Bay Length (ft)								
Base Capacity (vph)	243	390	458	778	480	951	174	927
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.50	0.91	0.28	0.01	0.72	0.82	0.35

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 70.2
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Mottman Rd & R.W. Johnson Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.90		1.00	0.91		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1804		1671	1590		1752	1687		1671	1738	
Flt Permitted	0.62	1.00		0.30	1.00		0.50	1.00		0.19	1.00	
Satd. Flow (perm)	1133	1804		530	1590		921	1687		343	1738	
Volume (vph)	65	170	15	395	75	135	5	280	370	135	285	25
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)	68	179	16	416	79	142	5	295	389	142	300	26
RTOR Reduction (vph)	0	4	0	0	83	0	0	59	0	0	4	0
Lane Group Flow (vph)	68	191	0	416	138	0	5	625	0	142	322	0
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	3%	3%	3%	8%	8%	8%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	10.0	10.0		27.9	27.9		34.7	34.7		34.7	34.7	
Effective Green, g (s)	10.0	10.0		27.9	27.9		34.7	34.7		34.7	34.7	
Actuated g/C Ratio	0.14	0.14		0.40	0.40		0.49	0.49		0.49	0.49	
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)	160	256		434	628		453	829		169	854	
v/s Ratio Prot		0.11		c0.19	0.09			0.37			0.19	
v/s Ratio Perm	0.06			c0.19			0.01			c0.41		
v/c Ratio	0.42	0.74		0.96	0.22		0.01	0.75		0.84	0.38	
Uniform Delay, d1	27.7	29.1		17.9	14.1		9.2	14.5		15.5	11.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	11.2		32.3	0.2		0.0	3.9		29.5	0.3	
Delay (s)	29.5	40.2		50.2	14.3		9.2	18.4		45.1	11.5	
Level of Service	C	D		D	B		A	B		D	B	
Approach Delay (s)		37.5			37.8			18.4			21.7	
Approach LOS		D			D			B			C	

Intersection Summary

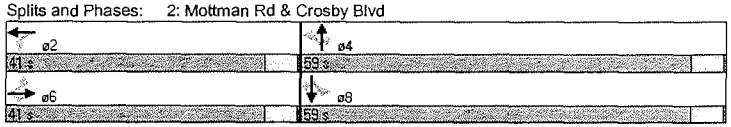
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	260	400	30	15	40	75	650	290	185	895	560
Lane Group Flow (vph)	274	421	32	0	316	79	684	305	195	942	589
Turn Type	Perm		Perm	Perm		Perm		Perm	Perm		Perm
Protected Phases		6			2		4			8	
Permitted Phases	6		6	2		4		4	8		8
Detector Phases	6	6	6	2	2	4	4	4	8	8	8
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)	27.0	27.0	27.0	27.0	27.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	59.0	59.0	59.0	59.0	59.0	59.0
Total Split (%)	41.0%	41.0%	41.0%	41.0%	41.0%	59.0%	59.0%	59.0%	59.0%	59.0%	59.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.94	0.67	0.06		0.44	0.32	0.63	0.30	0.78	0.46	0.50
Control Delay	72.7	32.7	7.3		9.1	16.3	18.1	3.1	43.3	14.4	3.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.8	0.0	1.1	2.1	0.8
Total Delay	72.7	32.7	7.3		9.1	16.3	18.8	3.1	44.4	16.5	3.9
Queue Length 50th (ft)	162	228	0		39	26	285	13	102	204	17
Queue Length 95th (ft)	#322	342	20		106	61	410	51	#241	211	31
Internal Link Dist (ft)		4078			534		555			157	
Turn Bay Length (ft)											
Base Capacity (vph)	303	653	575		748	247	1078	1025	250	2049	1167
Starvation Cap Reductn	0	0	0		0	0	153	0	7	921	292
Spillback Cap Reductn	0	0	0		4	0	39	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.64	0.06		0.42	0.32	0.74	0.30	0.80	0.84	0.67

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Mottman Rd & Crosby Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			2%			-3%			-5%	
Total Lost time (s)	3.0	3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00		1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1718	1718	1460		1653		1779	1872	1591	1779	3558	1592
Flt Permitted	0.43	1.00	1.00		0.96		0.23	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	775	1718	1460		1598		439	1872	1591	456	3558	1592
Volume (vph)	260	400	30	15	40	245	75	650	290	185	895	560
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)	274	421	32	16	42	258	79	684	305	195	942	589
RTOR Reduction (vph)	0	0	20	0	141	0	0	0	109	0	0	250
Lane Group Flow (vph)	274	421	12	0	175	0	79	684	196	195	942	339
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2			4		4	8		8
Actuated Green, G (s)	34.4	34.4	34.4		34.4		55.6	55.6	55.6	55.6	55.6	55.6
Effective Green, g (s)	36.4	36.4	36.4		36.4		57.6	57.6	57.6	57.6	57.6	57.6
Actuated g/C Ratio	0.36	0.36	0.36		0.36		0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)	5.0	5.0	5.0		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5		2.5		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	282	625	531		582		253	1078	916	263	2049	917
v/s Ratio Prot		0.25						0.37			0.26	
v/s Ratio Perm	c0.35		0.01		0.11		0.18		0.12	c0.43		0.21
v/c Ratio	0.97	0.67	0.02		0.30		0.31	0.63	0.21	0.74	0.46	0.37
Uniform Delay, d1	31.3	26.8	20.4		22.7		11.0	14.2	10.2	15.7	12.2	11.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.08	1.07	1.54
Incremental Delay, d2	45.6	2.6	0.0		0.2		3.2	2.8	0.5	17.1	0.7	1.1
Delay (s)	76.8	29.4	20.4		22.9		14.2	17.0	10.8	34.0	13.8	18.7
Level of Service	E	C	C		C		B	B	B	C	B	B
Approach Delay (s)		46.9			22.9			15.0			17.8	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		2%			-2%			-2%			2%	
Volume (veh/h)	20	5	0	25	10	310	5	40	5	400	85	30
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
Hourly flow rate (vph)	21	5	0	26	11	326	5	42	5	421	89	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1332	1005	105	989	1018	45	121			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1332	1005	105	989	1018	45	121			47		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	97	100	85	94	68	100			73		
cM capacity (veh/h)	68	177	955	175	173	1025	1460			1566		

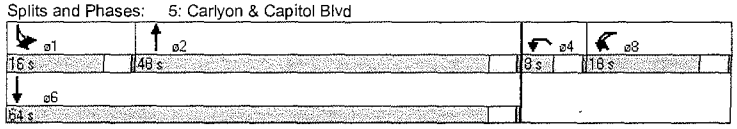
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	26	37	326	5	47	421	121
Volume Left	21	26	0	5	0	421	0
Volume Right	0	0	326	0	5	0	32
cSH	78	174	1025	1460	1700	1566	1700
Volume to Capacity	0.34	0.21	0.32	0.00	0.03	0.27	0.07
Queue Length 95th (ft)	32	19	34	0	0	27	0
Control Delay (s)	73.3	31.1	10.1	7.5	0.0	8.1	0.0
Lane LOS	F	D	B	A		A	
Approach Delay (s)	73.3	12.3		0.7		6.3	
Approach LOS	F	B					

Intersection Summary			
Average Delay	10.0		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	NBT	SBL	SBT	NWL
Lane Configurations					
Volume (vph)	105	1150	35	1565	10
Lane Group Flow (vph)	280	1574	216	1647	38
Turn Type			Prot		
Protected Phases	8	2	1	6	4
Permitted Phases					
Detector Phases	8	2	1	6	4
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0
Total Split (s)	18.0	48.0	16.0	64.0	8.0
Total Split (%)	20.0%	53.3%	17.8%	71.1%	8.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag		Lag	Lead		
Lead-Lag Optimize?		Yes	Yes		
Recall Mode	None	Min	None	Min	None
v/c Ratio	0.88	0.92	0.84	0.66	0.53
Control Delay	58.7	30.7	66.1	9.7	69.6
Queue Delay	0.0	1.6	0.0	0.0	0.0
Total Delay	58.7	32.3	66.1	9.7	69.6
Queue Length 50th (ft)	128	423	123	265	22
Queue Length 95th (ft)	#279	#594	#253	337	#69
Internal Link Dist (ft)	657	499		1440	450
Turn Bay Length (ft)					
Base Capacity (vph)	328	1773	264	2520	72
Starvation Cap Reductn	0	84	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.93	0.82	0.65	0.53

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 83
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Carlyon & Capitol Blvd



Movement	WBL2	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2
Lane Configurations												
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		
Lane Util. Factor		1.00		0.95				1.00	0.95	1.00		
Frt		0.93		0.97				1.00	1.00	0.90		
Flt Protected		0.98		1.00				0.95	1.00	0.99		
Satd. Flow (prot)		1655		3451				1805	3610	1525		
Flt Permitted		0.98		1.00				0.95	1.00	0.99		
Satd. Flow (perm)		1655		3451				1805	3610	1525		
Volume (vph)	15	105	145	1150	280	65	170	35	1565	10	15	10
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)	16	111	153	1211	295	68	179	37	1647	11	16	11
RTOR Reduction (vph)	0	48	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	232	0	1574	0	0	0	216	1647	38	0	0
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	0%	0%	0%	11%	11%	11%
Turn Type	Split						Prot	Prot				
Protected Phases	8	8		2			1	1	6	4		
Permitted Phases												
Actuated Green, G (s)		13.5		41.1				11.8	56.9	2.2		
Effective Green, g (s)		13.5		41.1				11.8	56.9	2.2		
Actuated g/C Ratio		0.16		0.49				0.14	0.67	0.03		
Clearance Time (s)		4.0		4.0				4.0	4.0	4.0		
Vehicle Extension (s)		3.0		3.0				3.0	3.0	3.0		
Lane Grp Cap (vph)		264		1677				252	2428	40		
v/s Ratio Prot		c0.14		c0.46				c0.12	0.46	c0.02		
v/s Ratio Perm												
v/c Ratio		0.88		0.94				0.86	0.68	0.95		
Uniform Delay, d1		34.8		20.6				35.6	8.3	41.1		
Progression Factor		1.00		1.00				1.00	1.00	1.00		
Incremental Delay, d2		26.4		10.5				23.8	0.8	122.3		
Delay (s)		61.2		31.1				59.4	9.1	163.4		
Level of Service		E		C				E	A	F		
Approach Delay (s)		61.2		31.1					14.9	163.4		
Approach LOS		E		C					B	F		

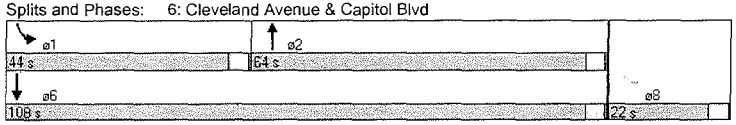
Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBR	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	285	1170	730	1120
Lane Group Flow (vph)	300	1274	768	1179
Turn Type	custom		Prot	
Protected Phases		2	1	6
Permitted Phases	8			
Detector Phases	8	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	22.0	64.0	44.0	108.0
Total Split (%)	16.9%	49.2%	33.8%	83.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	C-Min	None	C-Min
v/c Ratio	0.60	0.59	0.85	0.37
Control Delay	5.2	25.8	54.9	1.4
Queue Delay	0.7	0.8	0.0	0.5
Total Delay	5.9	26.6	54.9	1.9
Queue Length 50th (ft)	0	537	318	48
Queue Length 95th (ft)	0	m646	357	58
Internal Link Dist (ft)		992		499
Turn Bay Length (ft)				
Base Capacity (vph)	610	2144	1072	3171
Starvation Cap Reductn	0	0	0	1366
Spillback Cap Reductn	106	509	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.78	0.72	0.65

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Cleveland Avenue & Capitol Blvd



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	0.95		0.97	0.95
Frt		0.86	1.00		1.00	1.00
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1580	3557		3433	3539
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1580	3557		3433	3539
Volume (vph)	0	285	1170	40	730	1120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	300	1232	42	768	1179
RTOR Reduction (vph)	0	287	1	0	0	0
Lane Group Flow (vph)	0	13	1273	0	768	1179
Heavy Vehicles (%)	4%	4%	1%	1%	2%	2%
Turn Type		custom			Prot	
Protected Phases			2		1	6
Permitted Phases		8				
Actuated Green, G (s)		5.5	78.3		34.2	116.5
Effective Green, g (s)		5.5	78.3		34.2	116.5
Actuated g/C Ratio		0.04	0.60		0.26	0.90
Clearance Time (s)		4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		67	2142		903	3171
v/s Ratio Prot			c0.36		c0.22	0.33
v/s Ratio Perm		c0.01				
v/c Ratio		0.19	0.59		0.85	0.37
Uniform Delay, d1		60.1	16.0		45.5	1.1
Progression Factor		1.00	1.46		1.00	1.00
Incremental Delay, d2		1.4	0.9		7.7	0.3
Delay (s)		61.5	24.3		53.2	1.4
Level of Service		E	C		D	A
Approach Delay (s)	61.5		24.3			21.8
Approach LOS	E		C			C

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	5	0	700	495	0	0	560	30
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
Hourly flow rate (vph)	0	0	0	0	5	0	737	521	0	0	589	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								678				
pX, platoon unblocked												
vC, conflicting volume	2603	2600	605	2584	2616	521	621			521		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2603	2600	605	2584	2616	521	621			521		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	9	100	24			100		
cM capacity (veh/h)	2	6	501	6	6	559	965			1050		

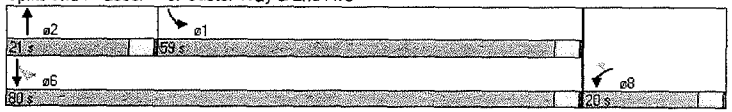
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	5	737	521	0	621
Volume Left	0	737	0	0	0
Volume Right	0	0	0	0	32
cSH	6	965	1700	1700	1700
Volume to Capacity	0.91	0.76	0.31	0.00	0.37
Queue Length 95th (ft)	34	191	0	0	0
Control Delay (s)	1107.5	19.7	0.0	0.0	0.0
Lane LOS	F	C			
Approach Delay (s)	1107.5	11.5		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	10.8		
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	235	415	40	960	265
Lane Group Flow (vph)	247	437	426	1011	279
Turn Type		Perm		pm+pt	
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phases	8	8	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	21.0	59.0	80.0
Total Split (%)	20.0%	20.0%	21.0%	59.0%	80.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.89	0.71	0.75	0.96	0.20
Control Delay	73.4	10.8	18.9	39.9	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	10.8	18.9	39.9	3.7
Queue Length 50th (ft)	155	0	52	520	41
Queue Length 95th (ft)	#292	92	#169	#845	64
Internal Link Dist (ft)	663		944		855
Turn Bay Length (ft)		300			
Base Capacity (vph)	286	623	566	1052	1421
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.86	0.70	0.75	0.96	0.20

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 99.6
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Custer Way & 2nd Ave



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		-5%			2%
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.88		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1599	1694		1769	1862
Flt Permitted	0.95	1.00	1.00		0.19	1.00
Satd. Flow (perm)	1787	1599	1694		355	1862
Volume (vph)	235	415	40	365	960	265
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	437	42	384	1011	279
RTOR Reduction (vph)	0	369	277	0	0	0
Lane Group Flow (vph)	247	68	149	0	1011	279
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type		Perm			pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	15.6	15.6	17.0		76.0	76.0
Effective Green, g (s)	15.6	15.6	17.0		76.0	76.0
Actuated g/C Ratio	0.16	0.16	0.17		0.76	0.76
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	280	250	289		1052	1421
v/s Ratio Prot	c0.14		0.09		c0.53	0.15
v/s Ratio Perm		0.04			c0.20	
v/c Ratio	0.88	0.27	0.52		0.96	0.20
Uniform Delay, d1	41.1	37.0	37.6		18.4	3.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	26.1	0.6	6.4		19.0	0.3
Delay (s)	67.2	37.6	44.0		37.4	3.6
Level of Service	E	D	D		D	A
Approach Delay (s)	48.3		44.0			30.1
Approach LOS	D		D			C

Intersection Summary

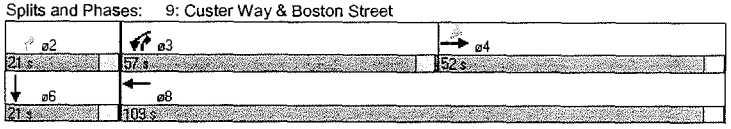
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	99.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBR	SBT	ø2
Lane Configurations							
Volume (vph)	5	1185	745	490	310	0	
Lane Group Flow (vph)	5	1400	784	516	326	5	
Turn Type	Perm		Prot		custom		
Protected Phases		4	3	8	3	6	2
Permitted Phases	4				2		
Detector Phases	4	4	3	8	3	6	
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	8.0	20.0	20.0
Total Split (s)	52.0	52.0	57.0	109.0	57.0	21.0	21.0
Total Split (%)	40.0%	40.0%	43.8%	83.8%	43.8%	16.2%	16%
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
Lead/Lag	Lag	Lag	Lead		Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		
Recall Mode	None	None	None	None	None	C-Min	C-Min
v/c Ratio	0.02	1.07	0.88	0.31	0.35	0.01	
Control Delay	26.4	85.7	22.6	0.2	15.7	0.0	
Queue Delay	0.0	0.0	22.3	0.0	0.0	0.0	
Total Delay	26.4	85.7	45.0	0.2	15.7	0.0	
Queue Length 50th (ft)	3	~685	654	0	136	0	
Queue Length 95th (ft)	12	#828	m728	m0	199	0	
Internal Link Dist (ft)		663		663		88	
Turn Bay Length (ft)			100				
Base Capacity (vph)	325	1306	887	1686	941	628	
Starvation Cap Reductn	0	0	127	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.02	1.07	1.03	0.31	0.35	0.01	

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBR and 6:SBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Custer Way & Boston Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	
Lane Util. Factor	1.00	0.95		1.00	1.00				1.00		1.00	
Frt	1.00	0.98		1.00	1.00				0.86		0.86	
Flt Protected	0.95	1.00		0.95	1.00				1.00		1.00	
Satd. Flow (prot)	1770	3516		1787	1881				1644		1611	
Flt Permitted	0.47	1.00		0.95	1.00				1.00		1.00	
Satd. Flow (perm)	881	3516		1787	1881				1644		1611	
Volume (vph)	5	1185	145	745	490	0	0	0	310	0	0	5
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)	5	1247	153	784	516	0	0	0	326	0	0	5
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	5	0	5	0
Lane Group Flow (vph)	5	1392	0	784	516	0	0	0	321	0	0	0
Heavy Vehicles (%)	2%	1%	1%	1%	1%	2%	0%	2%	0%	2%	2%	2%
Turn Type	Perm			Prot					custom			
Protected Phases		4		3	8				3		6	
Permitted Phases	4								2			
Actuated Green, G (s)	48.0	48.0		64.5	116.5				70.0		5.5	
Effective Green, g (s)	48.0	48.0		64.5	116.5				70.0		5.5	
Actuated g/C Ratio	0.37	0.37		0.50	0.90				0.54		0.04	
Clearance Time (s)	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	
Lane Grp Cap (vph)	325	1298		887	1686				936		68	
v/s Ratio Prot		c0.40		c0.44	0.27				c0.17		0.00	
v/s Ratio Perm	0.01								0.03			
v/c Ratio	0.02	1.07		0.88	0.31				0.34		0.00	
Uniform Delay, d1	26.0	41.0		29.4	1.0				17.0		59.6	
Progression Factor	1.00	1.00		0.56	0.01				1.00		1.00	
Incremental Delay, d2	0.0	47.0		4.1	0.0				0.2		0.1	
Delay (s)	26.0	88.0		20.7	0.0				17.2		59.7	
Level of Service	C	F		C	A				B		E	
Approach Delay (s)		87.8			12.5			17.2			59.7	
Approach LOS		F			B			B			E	

Intersection Summary

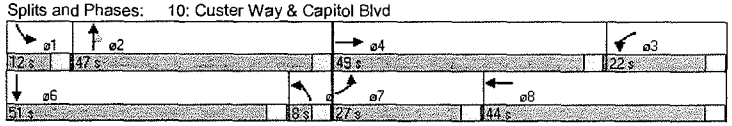
HCM Average Control Delay	47.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	285	1035	270	880	55	795	365	40	1025
Lane Group Flow (vph)	300	1310	284	942	58	837	384	42	1437
Turn Type	Prot		Prot		Prot		Perm	Prot	
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phases	7	4	3	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	27.0	49.0	22.0	44.0	8.0	47.0	47.0	12.0	51.0
Total Split (%)	20.8%	37.7%	16.9%	33.8%	6.2%	36.2%	36.2%	9.2%	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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	C-Max	None	Max	Max	None	Max
v/c Ratio	0.96	1.09	1.14	0.85	1.07	0.68	0.50	0.41	1.12
Control Delay	76.2	68.7	149.7	51.1	202.4	40.0	8.8	69.8	103.8
Queue Delay	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0
Total Delay	76.2	68.7	149.7	54.5	202.4	40.0	8.8	69.8	103.8
Queue Length 50th (ft)	224	~645	~280	392	~54	325	35	35	~688
Queue Length 95th (ft)	m234	m#614	#460	478	#149	401	124	75	#881
Internal Link Dist (ft)		663		571		1778			992
Turn Bay Length (ft)	200				100		200	100	
Base Capacity (vph)	311	1201	249	1103	54	1235	763	112	1288
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	94	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.09	1.14	0.93	1.07	0.68	0.50	0.38	1.12

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Custer Way & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-3%			3%			-3%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1760	3432		1796	3583		1760	3521	1575	1814	3492	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1760	3432		1796	3583		1760	3521	1575	1814	3492	
Volume (vph)	285	1035	210	270	880	15	55	795	365	40	1025	340
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)	300	1089	221	284	926	16	58	837	384	42	1079	358
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	210	0	25	0
Lane Group Flow (vph)	300	1297	0	284	941	0	58	837	174	42	1412	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	23.0	44.2		18.0	39.2		4.8	45.6	45.6	6.2	47.0	
Effective Green, g (s)	23.0	44.2		18.0	39.2		4.8	45.6	45.6	6.2	47.0	
Actuated g/C Ratio	0.18	0.34		0.14	0.30		0.04	0.35	0.35	0.05	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	311	1167		249	1080		65	1235	552	87	1262	
v/s Ratio Prot	0.17	c0.38		c0.16	0.26		0.03	c0.24		0.02	c0.40	
v/s Ratio Perm									0.11			
v/c Ratio	0.96	1.11		1.14	0.87		0.89	0.68	0.31	0.48	1.12	
Uniform Delay, d1	53.1	42.9		56.0	43.0		62.3	35.9	30.8	60.3	41.5	
Progression Factor	0.95	0.46		1.00	1.00		1.00	1.00	1.00	0.98	1.10	
Incremental Delay, d2	24.2	55.8		100.3	9.7		74.5	3.0	1.5	4.1	64.3	
Delay (s)	74.9	75.7		156.3	52.7		136.9	38.9	32.3	63.4	109.8	
Level of Service	E	E		F	D		F	D	C	E	F	
Approach Delay (s)		75.5			76.7			41.4			108.5	
Approach LOS		E			E			D			F	

Intersection Summary

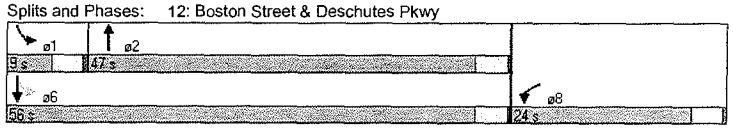
HCM Average Control Delay	76.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	110	525	260	405
Lane Group Flow (vph)	763	611	0	700
Turn Type			custom	
Protected Phases	8	2	1	6
Permitted Phases			1 6	
Detector Phases	8	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	24.0	47.0	9.0	56.0
Total Split (%)	30.0%	58.8%	11.3%	70.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	Min	None	Min
v/c Ratio	1.15	0.50		1.55
Control Delay	102.0	8.9		278.8
Queue Delay	0.0	0.0		0.0
Total Delay	102.0	8.9		278.8
Queue Length 50th (ft)	~318	137		~276
Queue Length 95th (ft)	#533	210		#486
Internal Link Dist (ft)	225	1154		598
Turn Bay Length (ft)				
Base Capacity (vph)	665	1211		451
Starvation Cap Reductn	0	0		0
Spillback Cap Reductn	0	0		0
Storage Cap Reductn	0	0		0
Reduced v/c Ratio	1.15	0.50		1.55

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Boston Street & Deschutes Pkwy



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0			4.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.89		0.99			1.00
Flt Protected	0.99		1.00			0.98
Satd. Flow (prot)	1653		1857			1845
Flt Permitted	0.99		1.00			0.50
Satd. Flow (perm)	1653		1857			934
Volume (vph)	110	615	525	55	260	405
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	116	647	553	58	274	426
RTOR Reduction (vph)	251	0	4	0	0	0
Lane Group Flow (vph)	512	0	608	0	0	700
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type					custom	
Protected Phases	8		2		1	6
Permitted Phases					1 6	
Actuated Green, G (s)	20.0		52.0			52.0
Effective Green, g (s)	20.0		52.0			52.0
Actuated g/C Ratio	0.25		0.65			0.65
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	413		1207			607
v/s Ratio Prot	c0.31		0.33			
v/s Ratio Perm						c0.75
v/c Ratio	1.24		0.50			1.15
Uniform Delay, d1	30.0		7.3			14.0
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	126.8		0.3			86.7
Delay (s)	156.8		7.6			100.7
Level of Service	F		A			F
Approach Delay (s)	156.8		7.6			100.7
Approach LOS	F		A			F

Intersection Summary

HCM Average Control Delay	93.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	120.7%	ICU Level of Service	H
Analysis Period (min)	15		

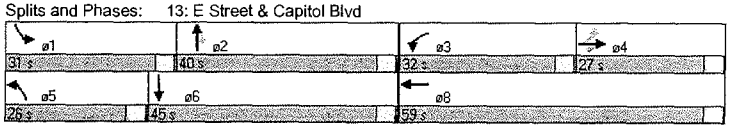
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	125	120	355	775	100	320	845	605	340	1020
Lane Group Flow (vph)	0	258	374	816	237	337	889	637	358	1142
Turn Type	Perm		Perm	Prot		Prot		Perm	Prot	
Protected Phases		4		3	8	5	2		1	6
Permitted Phases	4		4					2		
Detector Phases	4	4	4	3	8	5	2	2	1	6
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	8.0	20.0	20.0	8.0	20.0
Total Split (s)	27.0	27.0	27.0	32.0	59.0	26.0	40.0	40.0	31.0	45.0
Total Split (%)	20.8%	20.8%	20.8%	24.6%	45.4%	20.0%	30.8%	30.8%	23.8%	34.6%
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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
v/c Ratio		1.07	0.72	1.08	0.31	1.10	0.89	0.74	0.98	1.04
Control Delay		126.9	21.8	104.9	19.5	132.0	57.1	11.2	94.5	81.3
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		126.9	21.8	104.9	19.5	132.0	57.1	11.2	94.5	81.3
Queue Length 50th (ft)		~240	69	~395	95	~323	379	41	303	~545
Queue Length 95th (ft)		#413	189	#523	159	#513	#490	185	#505	#685
Internal Link Dist (ft)		110			677		1863			1778
Turn Bay Length (ft)				100		100			100	
Base Capacity (vph)		242	518	754	771	305	1000	862	364	1098
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		1.07	0.72	1.08	0.31	1.10	0.89	0.74	0.98	1.04

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Natural Cycle: 110
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: E Street & Capitol Blvd

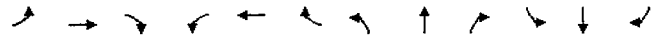


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			-2%			4%	
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.95	1.00	1.00	0.95	
Frt		1.00	0.85	1.00	0.92		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1853	1615	3502	1741		1805	3610	1615	1751	3471	
Flt Permitted		0.72	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1366	1615	3502	1741		1805	3610	1615	1751	3471	
Volume (vph)	125	120	355	775	100	125	320	845	605	340	1020	65
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)	132	126	374	816	105	132	337	889	637	358	1074	68
RTOR Reduction (vph)	0	0	232	0	35	0	0	0	414	0	3	0
Lane Group Flow (vph)	0	258	142	816	202	0	337	889	223	358	1139	0
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Prot			Prot		Perm	Prot		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		23.0	23.0	28.0	55.0		22.0	36.0	36.0	27.0	41.0	
Effective Green, g (s)		23.0	23.0	28.0	55.0		22.0	36.0	36.0	27.0	41.0	
Actuated g/C Ratio		0.18	0.18	0.22	0.42		0.17	0.28	0.28	0.21	0.32	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		242	286	754	737		305	1000	447	364	1095	
v/s Ratio Prot				c0.23	0.12		c0.19	0.25		c0.20	c0.33	
v/s Ratio Perm		c0.19	0.09						0.14			
v/c Ratio		1.07	0.50	1.08	0.27		1.10	0.89	0.50	0.98	1.04	
Uniform Delay, d1		53.5	48.3	51.0	24.5		54.0	45.1	39.4	51.3	44.5	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		76.4	1.4	57.3	0.2		82.7	11.7	3.9	42.5	38.1	
Delay (s)		129.9	49.6	108.3	24.7		136.7	56.8	43.4	93.7	82.6	
Level of Service		F	D	F	C		F	E	D	F	F	
Approach Delay (s)		82.4			89.5			66.6			85.3	
Approach LOS		F			F			E			F	

Intersection Summary

HCM Average Control Delay	78.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		4%			0%			-2%			-2%	
Volume (veh/h)	30	30	5	5	75	175	15	35	5	320	30	110
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
Hourly flow rate (vph)	32	32	5	5	79	184	16	37	5	337	32	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263			37			411	371	34	303	282	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			37			411	371	34	303	282	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	93	99	44	95	87
cM capacity (veh/h)	1313			1587			454	547	1045	604	613	878

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	268	58	484
Volume Left	32	5	16	337
Volume Right	5	184	5	116
cSH	1313	1587	540	654
Volume to Capacity	0.02	0.00	0.11	0.74
Queue Length 95th (ft)	2	0	9	164
Control Delay (s)	3.7	0.2	12.5	24.5
Lane LOS	A	A	B	C
Approach Delay (s)	3.7	0.2	12.5	24.5
Approach LOS			B	C

Intersection Summary				
Average Delay	14.7			
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	75	110	150	70	160	130
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	79	116	158	74	168	137

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	195	232	305
Volume Left (vph)	79	0	168
Volume Right (vph)	116	74	0
Hadj (s)	-0.26	-0.14	0.14
Departure Headway (s)	4.9	4.7	4.8
Degree Utilization, x	0.27	0.30	0.41
Capacity (veh/h)	672	735	712
Control Delay (s)	9.7	9.6	11.2
Approach Delay (s)	9.7	9.6	11.2
Approach LOS	A	A	B

Intersection Summary			
Delay	10.3		
HCM Level of Service	B		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	40	160	320	255	300	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	42	168	337	268	316	95

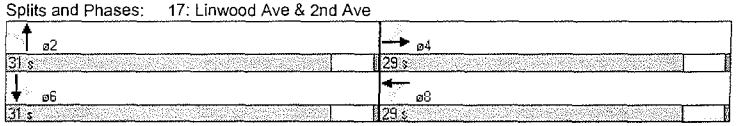
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total (vph)	42	168	605	411
Volume Left (vph)	42	0	0	316
Volume Right (vph)	0	0	268	95
Hadj (s)	0.52	0.02	-0.25	0.03
Departure Headway (s)	7.4	6.9	5.6	6.2
Degree Utilization, x	0.09	0.32	0.94	0.71
Capacity (veh/h)	467	503	630	564
Control Delay (s)	9.9	12.0	45.2	22.7
Approach Delay (s)	11.5		45.2	22.7
Approach LOS	B		E	C

Intersection Summary			
Delay	31.9		
HCM Level of Service	D		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	30	225	170	290	140	205	145	350
Lane Group Flow (vph)	32	358	179	358	147	321	153	494
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	6	6
Minimum Initial (s)	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
Total Split (s)	29.0	29.0	29.0	29.0	31.0	31.0	31.0	31.0
Total Split (%)	48.3%	48.3%	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
Yellow Time (s)	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
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio	0.13	0.66	0.75	0.67	0.41	0.31	0.28	0.47
Control Delay	14.3	20.8	37.9	23.3	23.7	13.0	10.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	20.8	37.9	23.3	23.7	13.0	10.3	10.1
Queue Length 50th (ft)	9	96	59	108	92	187	24	81
Queue Length 95th (ft)	21	138	102	148	m120	m245	75	201
Internal Link Dist (ft)		770		460		1743		461
Turn Bay Length (ft)	100		100		100		100	
Base Capacity (vph)	345	768	345	770	358	1049	540	1055
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.47	0.52	0.46	0.41	0.31	0.28	0.47

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Linwood Ave & 2nd Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1768		1770	1821		1770	1771		1770	1791	
Flt Permitted	0.34	1.00		0.34	1.00		0.41	1.00		0.54	1.00	
Satd. Flow (perm)	627	1768		627	1821		756	1771		1010	1791	
Volume (vph)	30	225	115	170	290	50	140	205	100	145	350	120
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)	32	237	121	179	305	53	147	216	105	153	368	126
RTOR Reduction (vph)	0	38	0	0	13	0	0	22	0	0	16	0
Lane Group Flow (vph)	32	320	0	179	345	0	147	299	0	153	478	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.2	17.2		17.2	17.2		34.8	34.8		34.8	34.8	
Effective Green, g (s)	17.2	17.2		17.2	17.2		34.8	34.8		34.8	34.8	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.58	0.58		0.58	0.58	
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)	180	507		180	522		438	1027		586	1039	
v/s Ratio Prot		0.18			0.19			0.17			c0.27	
v/s Ratio Perm	0.05			c0.29			0.19			0.15		
v/c Ratio	0.18	0.63		0.99	0.66		0.34	0.29		0.26	0.46	
Uniform Delay, d1	16.1	18.6		21.4	18.8		6.6	6.4		6.2	7.2	
Progression Factor	1.00	1.00		1.00	1.00		2.36	1.96		1.00	1.00	
Incremental Delay, d2	0.5	2.6		65.1	3.1		0.9	0.3		1.1	1.5	
Delay (s)	16.6	21.2		86.5	22.0		16.4	12.8		7.3	8.7	
Level of Service	B	C		F	C		B	B		A	A	
Approach Delay (s)		20.8			43.5			13.9			8.4	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	240	270	310	1645	1655
Lane Group Flow (vph)	253	284	326	1732	2095
Turn Type		pm+ov	pm+pt		
Protected Phases	4	5	5	2	6
Permitted Phases		4	2		
Detector Phases	4	5	5	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	8.0	20.0	20.0
Total Split (s)	21.0	22.0	22.0	99.0	77.0
Total Split (%)	17.5%	18.3%	18.3%	82.5%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag		Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes		Yes
Recall Mode	None	None	None	Max	Max
v/c Ratio	1.01	0.54	0.99	0.62	0.99
Control Delay	110.4	34.9	85.7	6.3	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	110.4	34.9	85.7	6.3	40.9
Queue Length 50th (ft)	~201	165	203	235	783
Queue Length 95th (ft)	#372	255	#396	284	#1013
Internal Link Dist (ft)	460			2014	1863
Turn Bay Length (ft)	150		100		
Base Capacity (vph)	251	529	328	2802	2113
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.01	0.54	0.99	0.62	0.99

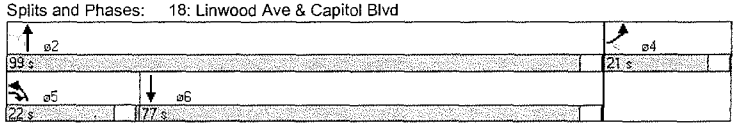
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Semi Act-Uncoord

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Linwood Ave & Capitol Blvd



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3450	
Flt Permitted	0.95	1.00	0.05	1.00	1.00	
Satd. Flow (perm)	1770	1583	97	3539	3450	
Volume (vph)	240	270	310	1645	1655	335
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	284	326	1732	1742	353
RTOR Reduction (vph)	0	16	0	0	14	0
Lane Group Flow (vph)	253	268	326	1732	2081	0
Turn Type		pm+ov	pm+pt			
Protected Phases	4	5	5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	17.0	35.0	95.0	95.0	73.0	
Effective Green, g (s)	17.0	35.0	95.0	95.0	73.0	
Actuated g/C Ratio	0.14	0.29	0.79	0.79	0.61	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	251	514	328	2802	2099	
v/s Ratio Prot	c0.14	0.08	c0.15	0.49	0.60	
v/s Ratio Perm		0.09	c0.64			
v/c Ratio	1.01	0.52	0.99	0.62	0.99	
Uniform Delay, d1	51.5	35.5	44.2	5.1	23.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	58.9	1.0	47.8	1.0	17.7	
Delay (s)	110.4	36.5	92.0	6.1	40.9	
Level of Service	F	D	F	A	D	
Approach Delay (s)	71.3			19.7	40.9	
Approach LOS	E			B	D	

Intersection Summary

HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	25	1390	360	1220	70	270	590	240	285
Lane Group Flow (vph)	26	1668	379	1484	74	284	621	253	316
Turn Type	Prot		Prot		pm+pt		pm+ov	pm+pt	
Protected Phases	7	4	3	8	5	2	3	1	6
Permitted Phases					2		2	6	
Detector Phases	7	4	3	8	5	2	3	1	6
Minimum Initial (s)	4.0	4.0	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	8.0	20.0	20.0	8.0	20.0
Total Split (s)	10.0	60.0	30.0	80.0	8.0	23.0	30.0	17.0	32.0
Total Split (%)	7.7%	46.2%	23.1%	61.5%	6.2%	17.7%	23.1%	13.1%	24.6%
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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	None	Max
v/c Ratio	0.33	1.11	1.07	0.69	0.54	1.04	1.02	1.08	0.75
Control Delay	72.0	93.7	116.8	19.3	55.1	119.7	80.0	121.5	59.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.0	93.7	116.8	19.3	55.1	119.7	80.0	121.5	59.2
Queue Length 50th (ft)	22	~841	~354	447	47	~259	~542	~186	253
Queue Length 95th (ft)	54	#983	#553	534	88	#439	#777	#363	#390
Internal Link Dist (ft)		3734		1968		4998			1605
Turn Bay Length (ft)									
Base Capacity (vph)	80	1506	354	2143	136	272	610	234	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	1.11	1.07	0.69	0.54	1.04	1.02	1.08	0.75

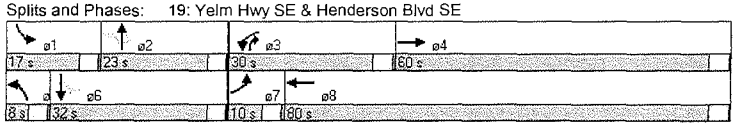
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Natural Cycle: 130
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: Yelm Hwy SE & Henderson Blvd SE



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3474		1770	3468		1770	1863	1583	1770	1849	
Flt Permitted	0.95	1.00		0.95	1.00		0.34	1.00	1.00	0.17	1.00	
Satd. Flow (perm)	1770	3474		1770	3468		626	1863	1583	313	1849	
Volume (vph)	25	1390	195	360	1220	190	70	270	590	240	285	15
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)	26	1463	205	379	1284	200	74	284	621	253	300	16
RTOR Reduction (vph)	0	8	0	0	9	0	0	0	14	0	2	0
Lane Group Flow (vph)	26	1660	0	379	1475	0	74	284	607	253	314	0
Turn Type	Prot			Prot			pm+pt		pm+ov	pm+pt		
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	3.6	57.6		26.0	80.0		23.0	19.8	45.8	36.8	29.6	
Effective Green, g (s)	3.6	57.6		26.0	80.0		23.0	19.8	45.8	36.8	29.6	
Actuated g/C Ratio	0.03	0.44		0.20	0.60		0.17	0.15	0.35	0.28	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	48	1511		348	2095		136	279	595	230	413	
v/s Ratio Prot	0.01	c0.48		c0.21	0.43		0.01	0.15	c0.20	c0.11	0.17	
v/s Ratio Perm							0.08		0.18	c0.20		
v/c Ratio	0.54	1.10		1.09	0.70		0.54	1.02	1.02	1.10	0.76	
Uniform Delay, d1	63.6	37.4		53.2	18.0		50.0	56.3	43.3	43.0	48.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.9	54.9		74.2	1.1		4.4	58.5	42.2	88.7	12.5	
Delay (s)	75.5	92.3		127.4	19.1		54.4	114.8	85.5	131.7	60.6	
Level of Service	E	F		F	B		D	F	F	F	E	
Approach Delay (s)		92.1			41.2			91.7			92.2	
Approach LOS		F			D			F			F	

Intersection Summary				
HCM Average Control Delay	73.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	132.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	105.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	150	15	120	235	5	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	16	126	247	5	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			174		666	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			174		666	166
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		99	93
cM capacity (veh/h)			1409		387	879

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	174	374	68
Volume Left	0	126	5
Volume Right	16	0	63
cSH	1700	1409	800
Volume to Capacity	0.10	0.09	0.09
Queue Length 95th (ft)	0	7	7
Control Delay (s)	0.0	3.2	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	3.2	9.9
Approach LOS			A

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	30	285	460	100	150	120
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	300	484	105	158	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					TWLTL	
Median storage veh)					1	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	589				900	537
vC1, stage 1 conf vol					537	
vC2, stage 2 conf vol					363	
vCu, unblocked vol	589				900	537
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				63	77
cM capacity (veh/h)	991				423	544

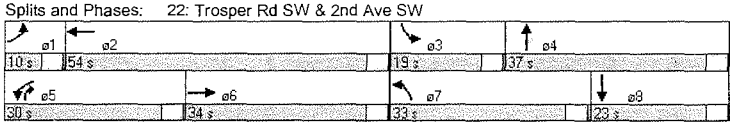
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	332	589	284
Volume Left	32	0	158
Volume Right	0	105	126
cSH	991	1700	469
Volume to Capacity	0.03	0.35	0.61
Queue Length 95th (ft)	2	0	98
Control Delay (s)	1.1	0.0	23.8
Lane LOS	A		C
Approach Delay (s)	1.1	0.0	23.8
Approach LOS			C

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	75	480	810	565	465	415	665	205	560
Lane Group Flow (vph)	79	1000	853	663	489	437	700	216	636
Turn Type	Prot		Prot		Prot		pm+ov	Prot	
Protected Phases	1	6	5	2	7	4	5	3	8
Permitted Phases							4		
Detector Phases	1	6	5	2	7	4	5	3	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	10.0	34.0	30.0	54.0	33.0	37.0	30.0	19.0	23.0
Total Split (%)	8.3%	28.3%	25.0%	45.0%	27.5%	30.8%	25.0%	15.8%	19.2%
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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Max	C-Max	None	Max	Max	None	Max
v/c Ratio	0.89	1.03	1.14	0.85	1.13	0.89	0.84	0.96	1.12
Control Delay	125.2	71.4	101.4	47.3	126.3	63.4	31.6	98.9	116.9
Queue Delay	0.0	105.8	0.0	180.8	0.0	0.0	0.3	396.4	0.0
Total Delay	125.2	177.1	101.4	228.1	126.3	63.4	31.9	495.2	116.9
Queue Length 50th (ft)	62	~371	~403	523	~440	342	417	163	~287
Queue Length 95th (ft)	#159	#506	m#387	m510	#650	#537	#640	m#318	#418
Internal Link Dist (ft)		1209		361		671			1283
Turn Bay Length (ft)									
Base Capacity (vph)	89	975	751	776	432	491	838	226	570
Starvation Cap Reductn	0	0	0	303	0	0	9	0	0
Spillback Cap Reductn	0	193	0	0	0	0	12	113	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	1.28	1.14	1.40	1.13	0.89	0.85	1.91	1.12

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: Trosper Rd SW & 2nd Ave SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		0.97	1.00		1.00	0.95	0.95	1.00	0.95	
Frt	1.00	0.93		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3309		3467	1852		1787	1787	1519	1805	3570	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3309		3467	1852		1787	1787	1519	1805	3570	
Volume (vph)	75	480	470	810	565	65	465	415	665	205	560	45
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)	79	505	495	853	595	68	489	437	700	216	589	47
RTOR Reduction (vph)	0	147	0	0	4	0	0	0	44	0	5	0
Lane Group Flow (vph)	79	853	0	853	660	0	489	437	656	216	631	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	1	6		5	2		7	4	5	3	8	
Permitted Phases									4			
Actuated Green, G (s)	6.0	30.0		26.0	50.0		29.0	33.0	59.0	15.0	19.0	
Effective Green, g (s)	6.0	30.0		26.0	50.0		29.0	33.0	59.0	15.0	19.0	
Actuated g/C Ratio	0.05	0.25		0.22	0.42		0.24	0.28	0.49	0.12	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	89	827		751	772		432	491	797	226	565	
v/s Ratio Prot	0.04	c0.26		c0.25	0.36		c0.27	0.24	0.18	0.12	c0.18	
v/s Ratio Perm									0.25			
v/c Ratio	0.89	1.03		1.14	0.85		1.13	0.89	0.82	0.96	1.12	
Uniform Delay, d1	56.7	45.0		47.0	31.7		45.5	41.8	26.1	52.2	50.5	
Progression Factor	1.00	1.00		0.88	1.45		1.00	1.00	1.00	0.99	0.98	
Incremental Delay, d2	59.4	39.6		62.9	1.2		84.5	20.9	9.4	44.4	72.5	
Delay (s)	116.0	84.6		104.2	47.0		130.0	62.6	35.5	96.1	121.9	
Level of Service	F	F		F	D		F	E	D	F	F	
Approach Delay (s)		86.9			79.2			71.2			115.3	
Approach LOS		F			E			E			F	

Intersection Summary				
HCM Average Control Delay	84.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	111.5%	ICU Level of Service	H	
Analysis Period (min)	15			

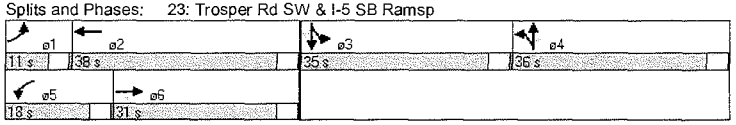
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	155	1085	5	355	660	135	850	735	615	770
Lane Group Flow (vph)	163	1142	5	374	1006	153	895	692	729	811
Turn Type	Prot		Perm	Prot			Perm	Split		Perm
Protected Phases	1	6		5	2	4		3	3	
Permitted Phases			6				4			3
Detector Phases	1	6	6	5	2	4	4	3	3	3
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)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	11.0	31.0	31.0	18.0	38.0	36.0	36.0	35.0	35.0	35.0
Total Split (%)	9.2%	25.8%	25.8%	15.0%	31.7%	30.0%	30.0%	29.2%	29.2%	29.2%
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
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	None	None	None	None	None
v/c Ratio	1.57	1.42	0.01	1.81	1.01	0.30	1.61	1.58	1.59	1.04
Control Delay	310.4	226.4	22.8	412.7	63.4	37.1	309.9	301.9	306.5	60.7
Queue Delay	0.0	0.0	0.0	0.0	5.6	0.2	0.0	0.0	0.0	100.4
Total Delay	310.4	226.4	22.8	412.7	69.1	37.4	309.9	301.9	306.5	161.1
Queue Length 50th (ft)	~179	~629	0	~449	~395	95	~902	~802	~847	~373
Queue Length 95th (ft)	m#204	m#692	m1	#646	#355	155	#1154	#1046	#1095	#619
Internal Link Dist (ft)		361			834	511			526	
Turn Bay Length (ft)										
Base Capacity (vph)	104	804	363	207	1000	505	555	439	459	780
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	19	80	0	0	0	146
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.57	1.42	0.01	1.81	1.03	0.36	1.61	1.58	1.59	1.28

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 47 (39%), Referenced to phase 2:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Trosper Rd SW & I-5 SB Ramsp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.95			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)	1787	3574	1599	1770	3375			1893	1615	1698	1777	1599
Flt Permitted	0.95	1.00	1.00	0.95	1.00			1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)	1787	3574	1599	1770	3375			1893	1615	1698	1777	1599
Volume (vph)	155	1085	5	355	660	295	10	135	850	735	615	770
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)	163	1142	5	374	695	311	11	142	895	774	647	811
RTOR Reduction (vph)	0	0	3	0	43	0	0	0	124	0	0	367
Lane Group Flow (vph)	163	1142	2	374	963	0	0	153	771	692	729	444
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type	Prot		Perm	Prot			Split		Perm	Split		Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.0	27.0	27.0	14.0	34.0			32.0	32.0	31.0	31.0	31.0
Effective Green, g (s)	7.0	27.0	27.0	14.0	34.0			32.0	32.0	31.0	31.0	31.0
Actuated g/C Ratio	0.06	0.22	0.22	0.12	0.28			0.27	0.27	0.26	0.26	0.26
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	804	360	207	956			505	431	439	459	413
v/s Ratio Prot	0.09	c0.32		c0.21	0.29			0.08		0.41	c0.41	
v/s Ratio Perm			0.00						c0.48			0.28
v/c Ratio	1.57	1.42	0.01	1.81	1.01			0.30	1.79	1.58	1.59	1.07
Uniform Delay, d1	56.5	46.5	36.1	53.0	43.0			35.1	44.0	44.5	44.5	44.5
Progression Factor	1.06	0.95	0.93	1.13	0.85			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	272.2	192.0	0.0	379.6	29.2			0.3	364.3	270.1	274.9	65.7
Delay (s)	332.2	236.2	33.6	439.3	65.9			35.4	408.3	314.6	319.4	110.2
Level of Service	F	F	C	F	E			D	F	F	F	F
Approach Delay (s)		247.4			167.1			353.9			241.9	
Approach LOS		F			F			F			F	

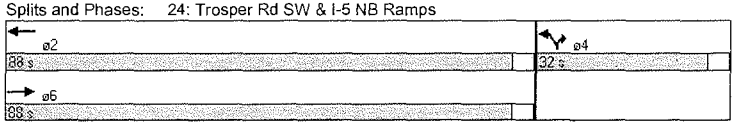
Intersection Summary				
HCM Average Control Delay	245.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	129.1%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBR
Lane Configurations				
Volume (vph)	1525	1190	185	165
Lane Group Flow (vph)	2821	1253	195	174
Turn Type				Prot
Protected Phases	6	2	4	4
Permitted Phases				
Detector Phases	6	2	4	4
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)	88.0	88.0	32.0	32.0
Total Split (%)	73.3%	73.3%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	C-Max	None	None
v/c Ratio	0.89dr	0.45	0.74	0.62
Control Delay	7.0	5.2	65.0	43.2
Queue Delay	0.3	0.8	0.0	0.1
Total Delay	7.4	6.0	65.0	43.3
Queue Length 50th (ft)	215	138	146	91
Queue Length 95th (ft)	m100	222	216	158
Internal Link Dist (ft)	834	424	670	
Turn Bay Length (ft)				
Base Capacity (vph)	3854	2808	417	411
Starvation Cap Reductn	416	1122	0	0
Spillback Cap Reductn	123	0	0	10
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	0.74	0.47	0.43

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 35 (29%), Referenced to phase 2:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 24: Trosper Rd SW & I-5 NB Ramps



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.91			0.95	1.00	1.00
Frt	0.94			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	4804			3574	1787	1599
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	4804			3574	1787	1599
Volume (vph)	1525	1155	0	1190	185	165
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1605	1216	0	1253	195	174
RTOR Reduction (vph)	81	0	0	0	0	43
Lane Group Flow (vph)	2740	0	0	1253	195	131
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type						Prot
Protected Phases	6			2	4	4
Permitted Phases						
Actuated Green, G (s)	94.3			94.3	17.7	17.7
Effective Green, g (s)	94.3			94.3	17.7	17.7
Actuated g/C Ratio	0.79			0.79	0.15	0.15
Clearance Time (s)	4.0			4.0	4.0	4.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	3775			2809	264	236
v/s Ratio Prot	c0.57			0.35	c0.11	0.08
v/s Ratio Perm						
v/c Ratio	0.89dr			0.45	0.74	0.56
Uniform Delay, d1	6.4			4.2	48.9	47.5
Progression Factor	1.14			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.5	10.3	2.8
Delay (s)	7.4			4.8	59.2	50.3
Level of Service	A			A	E	D
Approach Delay (s)	7.4			4.8	55.0	
Approach LOS	A			A	E	

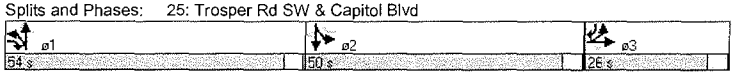
Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	510	80	660	180	770	1095	40	1275	710
Lane Group Flow (vph)	303	318	695	189	644	1352	42	1342	747
Turn Type	Split		pm+ov	custom	Split		Split		pm+ov
Protected Phases	3	3	1		1	1	2	2	3
Permitted Phases			3	1 2					2
Detector Phases	3	3	1	1 2	1	1	2	2	3
Minimum Initial (s)	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
Total Split (s)	26.0	26.0	54.0	104.0	54.0	54.0	50.0	50.0	26.0
Total Split (%)	20.0%	20.0%	41.5%	80.0%	41.5%	41.5%	38.5%	38.5%	20.0%
Yellow Time (s)	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
Lead/Lag			Lead		Lead	Lead	Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None	C-Max		C-Max	C-Max	None	None	None
v/c Ratio	1.06	1.09	0.74	0.15	1.03	1.04	0.07	1.06	0.82
Control Delay	119.9	128.5	25.7	3.9	83.5	73.9	28.3	83.7	30.3
Queue Delay	0.0	0.0	24.0	0.0	0.0	0.0	0.0	6.5	0.0
Total Delay	119.9	128.5	49.7	3.9	83.5	73.9	28.3	90.1	30.3
Queue Length 50th (ft)	~293	~316	406	33	~637	~673	23	~653	457
Queue Length 95th (ft)	#489	#514	573	52	#895	#820	50	#793	659
Internal Link Dist (ft)		424				614		2014	
Turn Bay Length (ft)									
Base Capacity (vph)	287	292	937	1268	625	1305	632	1265	915
Starvation Cap Reductn	0	0	259	0	0	0	0	0	0
Spillback Cap Reductn	0	0	82	0	0	0	0	19	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.09	1.03	0.15	1.03	1.04	0.07	1.08	0.82

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: Trosper Rd SW & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	1.00			1.00	0.91	0.91		1.00	0.95	1.00
Frt	1.00	1.00	0.85			0.86	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.96	1.00			1.00	0.95	0.99		0.95	1.00	1.00
Satd. Flow (prot)	1698	1724	1599			1644	1626	3391		1787	3574	1599
Flt Permitted	0.95	0.96	1.00			1.00	0.95	0.99		0.95	1.00	1.00
Satd. Flow (perm)	1698	1724	1599			1644	1626	3391		1787	3574	1599
Volume (vph)	510	80	660	0	0	180	770	1095	30	40	1275	710
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)	537	84	695	0	0	189	811	1153	32	42	1342	747
RTOR Reduction (vph)	0	0	3	0	0	3	0	1	0	0	0	31
Lane Group Flow (vph)	303	318	692	0	0	186	644	1351	0	42	1342	716
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split		pm+ov			custom	Split			Split		pm+ov
Protected Phases	3	3	1				1	1		2	2	3
Permitted Phases			3			1 2						2
Actuated Green, G (s)	22.0	22.0	72.0			100.0	50.0	50.0		46.0	46.0	68.0
Effective Green, g (s)	22.0	22.0	72.0			100.0	50.0	50.0		46.0	46.0	68.0
Actuated g/C Ratio	0.17	0.17	0.55			0.77	0.38	0.38		0.35	0.35	0.52
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)	287	292	935			1265	625	1304		632	1265	886
v/s Ratio Prot	0.18	c0.18	0.28				0.40	c0.40		0.02	c0.38	0.14
v/s Ratio Perm			0.15			0.11						0.31
v/c Ratio	1.06	1.09	0.74			0.15	1.03	1.04		0.07	1.06	0.81
Uniform Delay, d1	54.0	54.0	21.9			3.9	40.0	40.0		27.8	42.0	25.6
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	68.6	78.5	3.2			0.1	44.0	34.7		0.0	43.1	5.5
Delay (s)	122.6	132.5	25.1			4.0	84.0	74.7		27.8	85.1	31.1
Level of Service	F	F	C			A	F	E		C	F	C
Approach Delay (s)		73.5			4.0			77.7			65.1	
Approach LOS		E			A			E			E	

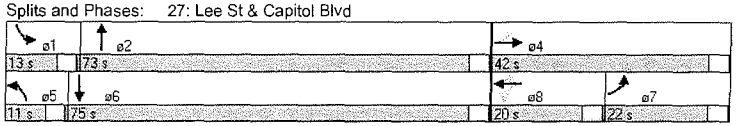
Intersection Summary				
HCM Average Control Delay	69.5	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	97.2%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	295	5	50	25	50	60	1490	90	1455
Lane Group Flow (vph)	311	47	0	79	53	63	1615	95	1795
Turn Type	pm+pt		Perm		Perm	Prot		Prot	
Protected Phases	7	4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phases	7	4	8	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	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	8.0	20.0	8.0	20.0
Total Split (s)	22.0	42.0	20.0	20.0	20.0	11.0	73.0	13.0	75.0
Total Split (%)	17.2%	32.8%	15.6%	15.6%	15.6%	8.6%	57.0%	10.2%	58.6%
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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.73	0.10		0.59	0.27	0.62	0.82	0.74	0.87
Control Delay	54.0	11.6		72.5	16.6	85.5	28.0	89.3	29.2
Queue Delay	1.8	0.0		0.0	0.1	0.0	0.5	0.0	10.5
Total Delay	55.7	11.6		72.5	16.7	85.5	28.4	89.3	39.6
Queue Length 50th (ft)	220	3		64	0	52	571	79	678
Queue Length 95th (ft)	321	33		115	40	#121	680	#171	809
Internal Link Dist (ft)		893		739			1680		614
Turn Bay Length (ft)									
Base Capacity (vph)	428	508		181	244	103	1978	132	2062
Starvation Cap Reductn	0	0		0	0	0	0	0	271
Spillback Cap Reductn	36	0		0	19	0	93	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.09		0.44	0.24	0.61	0.86	0.72	1.00

Intersection Summary
Cycle Length: 128
Actuated Cycle Length: 128
Offset: 8 (6%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 27: Lee St & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	0.87			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)	1770	1613			1802	1583	1787	3559		1787	3496	
Flt Permitted	0.65	1.00			0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1205	1613			1434	1583	1787	3559		1787	3496	
Volume (vph)	295	5	40	50	25	50	60	1490	45	90	1455	250
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)	311	5	42	53	26	53	63	1568	47	95	1532	263
RTOR Reduction (vph)	0	30	0	0	0	48	0	2	0	0	10	0
Lane Group Flow (vph)	311	17	0	0	79	5	63	1613	0	95	1785	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt			Perm		Perm	Prot			Prot		
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	35.7	35.7			11.9	11.9	5.9	71.1		9.2	74.4	
Effective Green, g (s)	35.7	35.7			11.9	11.9	5.9	71.1		9.2	74.4	
Actuated g/C Ratio	0.28	0.28			0.09	0.09	0.05	0.56		0.07	0.58	
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)	423	450			133	147	82	1977		128	2032	
v/s Ratio Prot	c0.11	0.01					0.04	0.45		c0.05	c0.51	
v/s Ratio Perm	c0.09				0.06	0.00						
v/c Ratio	0.74	0.04			0.59	0.03	0.77	0.82		0.74	0.88	
Uniform Delay, d1	41.4	33.6			55.7	52.8	60.4	23.1		58.2	22.9	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.5	0.0			6.9	0.1	34.2	3.9		20.5	5.8	
Delay (s)	48.0	33.7			62.7	52.9	94.6	27.0		78.7	28.7	
Level of Service	D	C			E	D	F	C		E	C	
Approach Delay (s)		46.1			58.8			29.5			31.2	
Approach LOS		D			E			C			C	

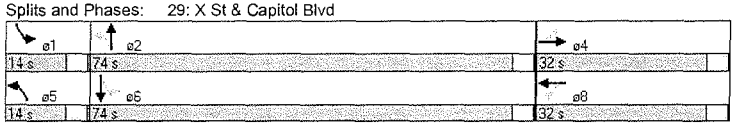
Intersection Summary				
HCM Average Control Delay	32.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	84.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	155	5	50	15	40	1495	50	1415
Lane Group Flow (vph)	163	137	53	69	42	1600	53	1557
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	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	8.0	20.0	8.0	20.0
Total Split (s)	32.0	32.0	32.0	32.0	14.0	74.0	14.0	74.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	11.7%	61.7%	11.7%	61.7%
Yellow Time (s)	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
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.75	0.37	0.30	0.22	0.22	0.64	0.29	0.62
Control Delay	68.6	10.3	46.9	16.5	7.7	6.2	8.3	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	10.3	46.9	16.5	7.7	6.2	8.3	12.1
Queue Length 50th (ft)	122	3	37	11	4	136	8	313
Queue Length 95th (ft)	185	55	72	49	m9	171	23	488
Internal Link Dist (ft)		775		665		1040		1680
Turn Bay Length (ft)								
Base Capacity (vph)	316	480	254	425	246	2507	236	2507
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.29	0.21	0.16	0.17	0.64	0.22	0.62

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 29: X St & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	0.86		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1625		1770	1648		1787	3566		1787	3551	
Flt Permitted	0.71	1.00		0.52	1.00		0.11	1.00		0.10	1.00	
Satd. Flow (perm)	1352	1625		968	1648		213	3566		195	3551	
Volume (vph)	155	5	125	50	15	50	40	1495	25	50	1415	65
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)	163	5	132	53	16	53	42	1574	26	53	1489	68
RTOR Reduction (vph)	0	111	0	0	45	0	0	1	0	0	2	0
Lane Group Flow (vph)	163	26	0	53	24	0	42	1599	0	53	1555	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.2	19.2		19.2	19.2		88.4	83.5		89.2	83.9	
Effective Green, g (s)	19.2	19.2		19.2	19.2		88.4	83.5		89.2	83.9	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.74	0.70		0.74	0.70	
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)	216	260		155	264		221	2481		215	2483	
v/s Ratio Prot		0.02			0.01		0.01	c0.45		c0.01	0.44	
v/s Ratio Perm	c0.12			0.05			0.13			0.17		
v/c Ratio	0.75	0.10		0.34	0.09		0.19	0.64		0.25	0.63	
Uniform Delay, d1	48.1	43.0		44.8	43.0		7.5	10.1		8.2	9.7	
Progression Factor	1.00	1.00		1.00	1.00		1.22	0.45		1.00	1.00	
Incremental Delay, d2	13.9	0.2		1.3	0.2		0.4	1.1		0.6	1.2	
Delay (s)	62.0	43.2		46.1	43.1		9.4	5.6		8.8	10.9	
Level of Service	E	D		D	D		A	A		A	B	
Approach Delay (s)		53.4			44.4			5.7			10.8	
Approach LOS		D			D			A			B	

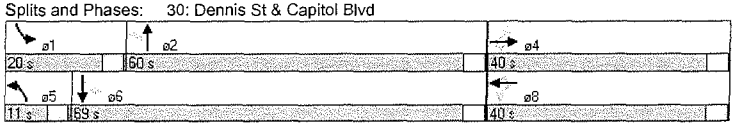
Intersection Summary				
HCM Average Control Delay	13.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Volume (vph)	150	35	20	65	65	95	25	1195	120	1185
Lane Group Flow (vph)	0	195	21	0	136	100	26	1300	126	1389
Turn Type	Perm		Perm	Perm		Perm	pm+pt		pm+pt	
Protected Phases		4			8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phases	4	4	4	8	8	8	5	2	1	6
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	8.0	20.0	8.0	20.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	11.0	60.0	20.0	69.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	9.2%	50.0%	16.7%	57.5%
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
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
v/c Ratio		0.83	0.06		0.48	0.25	0.12	0.59	0.52	0.58
Control Delay		71.8	13.0		46.7	8.1	7.8	17.5	30.0	10.9
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		71.8	13.0		46.7	8.1	7.8	17.5	30.0	10.9
Queue Length 50th (ft)		146	0		94	0	5	295	44	198
Queue Length 95th (ft)		213	20		143	41	17	507	m127	292
Internal Link Dist (ft)		1204			1450			1038		1040
Turn Bay Length (ft)										
Base Capacity (vph)		355	499		423	555	230	2188	321	2406
Starvation Cap Reductn		0	0		0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.55	0.04		0.32	0.18	0.11	0.59	0.39	0.58

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 30: Dennis St & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1.00		1.00	0.98	
Flt Protected		0.96	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1826	1615		1854	1615	1787	3557		1787	3519	
Flt Permitted		0.57	1.00		0.57	1.00	0.15	1.00		0.13	1.00	
Satd. Flow (perm)		1079	1615		1092	1615	283	3557		254	3519	
Volume (vph)	150	35	20	65	65	95	25	1195	40	120	1185	135
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)	158	37	21	68	68	100	26	1258	42	126	1247	142
RTOR Reduction (vph)	0	0	17	0	0	80	0	2	0	0	5	0
Lane Group Flow (vph)	0	195	4	0	136	20	26	1298	0	126	1384	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm		Perm	Perm		Perm	pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		23.9	23.9		23.9	23.9	77.6	73.8		88.1	80.3	
Effective Green, g (s)		23.9	23.9		23.9	23.9	77.6	73.8		88.1	80.3	
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.65	0.62		0.73	0.67	
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)		215	322		217	322	231	2188		318	2355	
v/s Ratio Prot							0.00	0.37		c0.03	c0.39	
v/s Ratio Perm		c0.18	0.00		0.12	0.01	0.07			0.26		
v/c Ratio		0.91	0.01		0.63	0.06	0.11	0.59		0.40	0.59	
Uniform Delay, d1		47.0	38.6		44.0	39.0	8.8	14.0		9.4	10.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		2.02	0.82	
Incremental Delay, d2		36.6	0.0		5.6	0.1	0.2	1.2		0.7	0.9	
Delay (s)		83.6	38.6		49.5	39.0	9.1	15.2		19.8	9.8	
Level of Service		F	D		D	D	A	B		B	A	
Approach Delay (s)		79.2			45.1			15.1			10.6	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service		B
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	67.8%	ICU Level of Service		C
Analysis Period (min)	15			

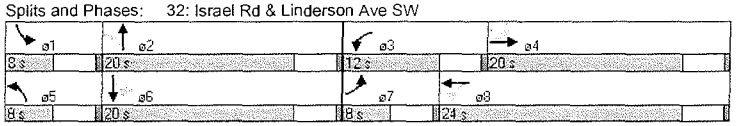
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	80	285	285	440	190	130	25	125
Lane Group Flow (vph)	84	347	300	516	200	305	26	258
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	8.0	20.0	12.0	24.0	8.0	20.0	8.0	20.0
Total Split (%)	13.3%	33.3%	20.0%	40.0%	13.3%	33.3%	13.3%	33.3%
Yellow Time (s)	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
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
v/c Ratio	0.34	0.71	0.66	0.66	0.60	0.56	0.10	0.60
Control Delay	13.1	27.0	19.0	21.1	22.6	16.1	13.0	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	27.0	19.0	21.1	22.6	16.1	13.0	19.7
Queue Length 50th (ft)	13	94	53	141	47	49	6	53
Queue Length 95th (ft)	36	#211	#139	#321	88	131	18	114
Internal Link Dist (ft)		1944		2678		1774		800
Turn Bay Length (ft)								
Base Capacity (vph)	250	573	459	794	331	614	261	561
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.61	0.65	0.65	0.60	0.50	0.10	0.46

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 50.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 32: Israel Rd & Linderson Ave SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1843		1787	1852		1770	1709		1770	1726	
Flt Permitted	0.37	1.00		0.28	1.00		0.40	1.00		0.44	1.00	
Satd. Flow (perm)	688	1843		533	1852		753	1709		828	1726	
Volume (vph)	80	285	45	285	440	50	190	130	160	25	125	120
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	300	47	300	463	53	200	137	168	26	132	126
RTOR Reduction (vph)	0	9	0	0	6	0	0	74	0	0	60	0
Lane Group Flow (vph)	84	338	0	300	510	0	200	231	0	26	198	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.5	15.4		27.5	21.4		17.0	14.1		14.0	12.6	
Effective Green, g (s)	17.5	15.4		27.5	21.4		17.0	14.1		14.0	12.6	
Actuated g/C Ratio	0.32	0.28		0.50	0.39		0.31	0.26		0.25	0.23	
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)	261	516		451	721		286	438		235	395	
v/s Ratio Prot	0.01	0.18		c0.10	c0.28		c0.04	0.13		0.00	0.11	
v/s Ratio Perm	0.09			0.23			c0.18			0.03		
v/c Ratio	0.32	0.65		0.67	0.71		0.70	0.53		0.11	0.50	
Uniform Delay, d1	13.5	17.5		9.4	14.2		16.8	17.6		15.6	18.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	3.0		3.7	3.2		7.3	1.1		0.2	1.0	
Delay (s)	14.3	20.4		13.1	17.3		24.1	18.7		15.8	19.5	
Level of Service	B	C		B	B		C	B		B	B	
Approach Delay (s)		19.2			15.8			20.8			19.1	
Approach LOS		B			B			C			B	

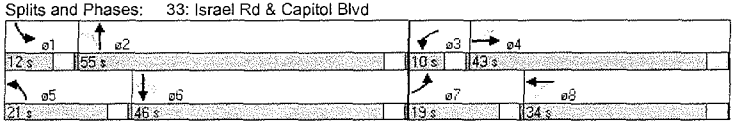
Intersection Summary				
HCM Average Control Delay	18.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	195	170	85	190	205	840	90	955	255
Lane Group Flow (vph)	205	395	89	353	216	963	95	1005	268
Turn Type	pm+pt		pm+pt		pm+pt		pm+pt		Perm
Protected Phases	7	4	3	8	5	2	1	6	
Permitted Phases	4		8		2		6		6
Detector Phases	7	4	3	8	5	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0	20.0
Total Split (s)	19.0	43.0	10.0	34.0	21.0	55.0	12.0	46.0	46.0
Total Split (%)	15.8%	35.8%	8.3%	28.3%	17.5%	45.8%	10.0%	38.3%	38.3%
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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
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	None	None	None	None	Max	None	Max	Max
v/c Ratio	0.66	0.69	0.37	0.86	0.77	0.58	0.37	0.72	0.34
Control Delay	35.2	37.1	28.5	59.4	42.8	25.2	18.6	34.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	37.1	28.5	59.4	42.8	25.2	18.6	34.0	5.2
Queue Length 50th (ft)	105	227	42	234	103	288	34	343	5
Queue Length 95th (ft)	163	341	78	#356	#194	375	64	455	63
Internal Link Dist (ft)		2678		920		790		1038	
Turn Bay Length (ft)									
Base Capacity (vph)	326	619	240	477	326	1649	266	1397	781
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.64	0.37	0.74	0.66	0.58	0.36	0.72	0.34

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 111.3
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 33: Israel Rd & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1727		1787	1759		1770	3496		1770	3539	1583
Flt Permitted	0.15	1.00		0.33	1.00		0.12	1.00		0.21	1.00	1.00
Satd. Flow (perm)	278	1727		630	1759		224	3496		400	3539	1583
Volume (vph)	195	170	205	85	190	145	205	840	75	90	955	255
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)	205	179	216	89	200	153	216	884	79	95	1005	268
RTOR Reduction (vph)	0	38	0	0	24	0	0	5	0	0	0	155
Lane Group Flow (vph)	205	357	0	89	329	0	216	958	0	95	1005	113
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	42.8	34.2		29.9	25.3		62.3	52.3		51.0	45.0	45.0
Effective Green, g (s)	42.8	34.2		29.9	25.3		62.3	52.3		51.0	45.0	45.0
Actuated g/C Ratio	0.38	0.30		0.26	0.22		0.55	0.46		0.45	0.40	0.40
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	285	522		214	393		305	1617		253	1408	630
v/s Ratio Prot	c0.09	0.21		0.02	c0.19		c0.08	0.27		0.02	0.28	
v/s Ratio Perm	0.19			0.09			c0.31			0.15		0.07
v/c Ratio	0.72	0.68		0.42	0.84		0.71	0.59		0.38	0.71	0.18
Uniform Delay, d1	27.2	34.7		32.6	41.9		19.0	22.5		18.9	28.6	22.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	3.7		1.3	14.3		7.3	1.6		0.9	3.1	0.6
Delay (s)	35.6	38.4		33.9	56.3		26.3	24.1		19.8	31.7	22.7
Level of Service	D	D		C	E		C	C		B	C	C
Approach Delay (s)		37.5			51.8			24.5			29.1	
Approach LOS		D			D			C			C	

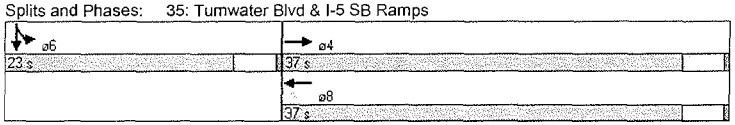
Intersection Summary					
HCM Average Control Delay	31.8	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	113.1	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	80.7%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	630	505	365	595	5
Lane Group Flow (vph)	800	532	384	435	459
Turn Type		Perm		Split	
Protected Phases	4		8	6	6
Permitted Phases		8			
Detector Phases	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	37.0	23.0	23.0
Total Split (%)	61.7%	61.7%	61.7%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Max	Max
v/c Ratio	0.44	0.93	0.21	0.80	0.78
Control Delay	8.3	39.1	7.4	32.7	25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	39.1	7.4	32.7	25.2
Queue Length 50th (ft)	72	77	33	152	117
Queue Length 95th (ft)	106	#176	52	#307	#276
Internal Link Dist (ft)	655		750		1208
Turn Bay Length (ft)					
Base Capacity (vph)	1925	604	1946	545	592
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.88	0.20	0.80	0.78

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 57
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 35: Tumwater Blvd & I-5 SB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	
Lane Util. Factor		0.95		0.97	0.95					0.95	0.95	
Frt		0.97		1.00	1.00					1.00	0.91	
Flt Protected		1.00		0.95	1.00					0.95	0.98	
Satd. Flow (prot)		3448		3433	3539					1618	1525	
Flt Permitted		1.00		0.30	1.00					0.95	0.98	
Satd. Flow (perm)		3448		1079	3539					1618	1525	
Volume (vph)	0	630	130	505	365	0	0	0	0	595	5	250
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)	0	663	137	532	384	0	0	0	0	626	5	263
RTOR Reduction (vph)	0	31	0	0	0	0	0	0	0	0	78	0
Lane Group Flow (vph)	0	769	0	532	384	0	0	0	0	435	381	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	6%	6%	6%
Turn Type				Perm						Split		
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		29.7		29.7	29.7					19.2	19.2	
Effective Green, g (s)		29.7		29.7	29.7					19.2	19.2	
Actuated g/C Ratio		0.52		0.52	0.52					0.34	0.34	
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1800		563	1847					546	515	
v/s Ratio Prot		0.22			0.11					c0.27	0.25	
v/s Ratio Perm				c0.49								
v/c Ratio		0.43		0.94	0.21					0.80	0.74	
Uniform Delay, d1		8.4		12.8	7.3					17.1	16.6	
Progression Factor		1.00		1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.2		24.8	0.1					11.5	9.2	
Delay (s)		8.5		37.6	7.3					28.6	25.8	
Level of Service		A		D	A					C	C	
Approach Delay (s)		8.5			24.9			0.0			27.2	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

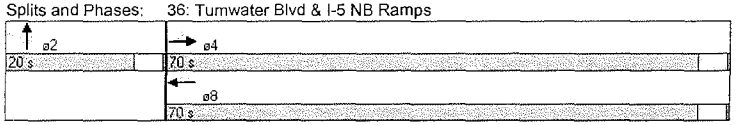
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	205	1015	480	1305	20	175
Lane Group Flow (vph)	216	1068	1192	687	84	184
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		2	
Permitted Phases	4			8		2
Detector Phases	4	4	8	8	2	2
Minimum Initial (s)	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
Total Split (s)	70.0	70.0	70.0	70.0	20.0	20.0
Total Split (%)	77.8%	77.8%	77.8%	77.8%	22.2%	22.2%
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
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.93	0.46	0.51	0.57	0.21	0.39
Control Delay	55.9	7.4	2.9	2.3	35.7	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	7.4	2.9	2.3	35.7	11.2
Queue Length 50th (ft)	47	65	26	0	46	12
Queue Length 95th (ft)	#242	115	55	24	87	71
Internal Link Dist (ft)		750	1756		1066	
Turn Bay Length (ft)						
Base Capacity (vph)	262	2602	2530	1263	449	515
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.41	0.47	0.54	0.19	0.36

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 36: Tumwater Blvd & I-5 NB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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			
Lane Util. Factor	1.00	0.95			0.91	0.91		1.00	1.00			
Frt	1.00	1.00			0.91	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	1703	3406			3097	1441		1728	1524			
Flt Permitted	0.18	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	321	3406			3097	1441		1728	1524			
Volume (vph)	205	1015	0	0	480	1305	60	20	175	0	0	0
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)	216	1068	0	0	505	1374	63	21	184	0	0	0
RTOR Reduction (vph)	0	0	0	0	218	218	0	0	124	0	0	0
Lane Group Flow (vph)	216	1068	0	0	974	469	0	84	60	0	0	0
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	6%	6%	6%	0%	0%	0%
Turn Type	Perm					Perm	Perm		Perm			
Protected Phases		4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	61.4	61.4			61.4	61.4		20.6	20.6			
Effective Green, g (s)	61.4	61.4			61.4	61.4		20.6	20.6			
Actuated g/C Ratio	0.68	0.68			0.68	0.68		0.23	0.23			
Clearance Time (s)	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			
Lane Grp Cap (vph)	219	2324			2113	983		396	349			
v/s Ratio Prot		0.31			0.31							
v/s Ratio Perm	c0.67					0.33		0.05	0.04			
v/c Ratio	0.99	0.46			0.46	0.48		0.21	0.17			
Uniform Delay, d1	13.9	6.6			6.6	6.7		28.1	27.9			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	56.4	0.1			0.2	0.4		1.2	1.1			
Delay (s)	70.3	6.8			6.8	7.1		29.3	28.9			
Level of Service	E	A			A	A		C	C			
Approach Delay (s)		17.5			6.9			29.0			0.0	
Approach LOS		B			A			C			A	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	79.6%	ICU Level of Service	D	
Analysis Period (min)	15			

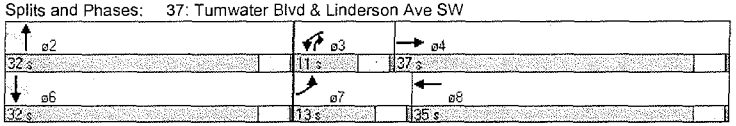
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	140	785	90	1100	265	120	70	115	100	575
Lane Group Flow (vph)	147	1021	95	1237	279	126	74	121	105	605
Turn Type	Prot		Prot		Perm		pm+ov	Perm		Perm
Protected Phases	7	4	3	8		2	3		6	
Permitted Phases					2		2	6		6
Detector Phases	7	4	3	8	2	2	3	6	6	6
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)	8.0	20.0	8.0	20.0	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	13.0	37.0	11.0	35.0	32.0	32.0	11.0	32.0	32.0	32.0
Total Split (%)	16.3%	46.3%	13.8%	43.8%	40.0%	40.0%	13.8%	40.0%	40.0%	40.0%
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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			Lead			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes			
Recall Mode	None	None	None	None	Max	Max	None	Max	Max	Max
v/c Ratio	0.77	0.70	0.64	0.92	0.64	0.20	0.10	0.27	0.16	0.86
Control Delay	62.4	21.2	56.0	35.5	29.6	19.2	3.3	20.7	18.7	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	21.2	56.0	35.5	29.6	19.2	3.3	20.7	18.7	29.4
Queue Length 50th (ft)	73	210	47	297	115	43	0	43	36	186
Queue Length 95th (ft)	#166	283	#112	#433	201	82	20	84	70	#387
Internal Link Dist (ft)		1756		3619		810			1774	
Turn Bay Length (ft)										
Base Capacity (vph)	194	1462	153	1367	437	635	771	450	666	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.70	0.62	0.90	0.64	0.20	0.10	0.27	0.16	0.86

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 79.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 37: Tumwater Blvd & Linderson Ave SW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	3308		1770	3505		1703	1792	1524	1787	1881	1599
Flt Permitted	0.95	1.00		0.95	1.00		0.69	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	1703	3308		1770	3505		1235	1792	1524	1272	1881	1599
Volume (vph)	140	785	185	90	1100	75	265	120	70	115	100	575
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)	147	826	195	95	1158	79	279	126	74	121	105	605
RTOR Reduction (vph)	0	25	0	0	6	0	0	0	43	0	0	140
Lane Group Flow (vph)	147	996	0	95	1231	0	279	126	31	121	105	465
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	6%	6%	6%	1%	1%	1%
Turn Type	Prot			Prot			Perm		pm+ov	Perm		Perm
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	8.8	34.4		5.5	31.1		28.0	28.0	33.5	28.0	28.0	28.0
Effective Green, g (s)	8.8	34.4		5.5	31.1		28.0	28.0	33.5	28.0	28.0	28.0
Actuated g/C Ratio	0.11	0.43		0.07	0.39		0.35	0.35	0.42	0.35	0.35	0.35
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	1424		122	1364		433	628	715	446	659	560
v/s Ratio Prot	c0.09	c0.30		0.05	c0.35			0.07	0.00		0.06	
v/s Ratio Perm							0.23		0.02	0.10		c0.29
v/c Ratio	0.78	0.70		0.78	0.90		0.64	0.20	0.04	0.27	0.16	0.83
Uniform Delay, d1	34.6	18.5		36.6	23.0		21.8	18.1	13.7	18.6	17.9	23.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.8	1.5		26.2	8.6		7.2	0.7	0.0	1.5	0.5	13.3
Delay (s)	53.4	20.1		62.8	31.5		29.0	18.8	13.7	20.1	18.4	37.1
Level of Service	D	C		E	C		C	B	B	C	B	D
Approach Delay (s)		24.3			33.8			24.0			32.3	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	29.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	79.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	93.1%	ICU Level of Service	F	
Analysis Period (min)	15			

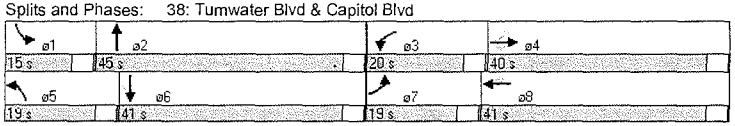
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	275	495	765	200	375	80	375	475	110	970	300
Lane Group Flow (vph)	289	521	805	211	395	84	395	516	116	1021	316
Turn Type	pm+pt		Perm	Prot		Perm	Prot		Prot		Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4			8					6
Detector Phases	7	4	4	3	8	8	5	2	1	6	6
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)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	8.0	20.0	20.0
Total Split (s)	19.0	40.0	40.0	20.0	41.0	41.0	19.0	45.0	15.0	41.0	41.0
Total Split (%)	15.8%	33.3%	33.3%	16.7%	34.2%	34.2%	15.8%	37.5%	12.5%	34.2%	34.2%
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)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	Min
v/c Ratio	0.81	0.95	0.73	0.91	0.69	0.15	0.90	0.81	0.73	0.93	0.46
Control Delay	39.9	68.5	22.2	89.9	43.7	7.0	76.2	46.7	79.5	55.7	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	68.5	22.2	89.9	43.7	7.0	76.2	46.7	79.5	55.7	7.9
Queue Length 50th (ft)	139	394	160	163	269	0	158	362	89	402	19
Queue Length 95th (ft)	#229	#608	244	#308	384	37	#251	#535	#178	#532	91
Internal Link Dist (ft)		3619			1058			3304		790	
Turn Bay Length (ft)											
Base Capacity (vph)	365	560	1119	238	576	548	437	644	166	1114	691
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.93	0.72	0.89	0.69	0.15	0.90	0.80	0.70	0.92	0.46

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 38: Tumwater Blvd & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.97	1.00		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	2760	1752	1845	1568	3433	1854		1787	3574	1599
Flt Permitted	0.26	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	483	1845	2760	1752	1845	1568	3433	1854		1787	3574	1599
Volume (vph)	275	495	765	200	375	80	375	475	15	110	970	300
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)	289	521	805	211	395	84	395	500	16	116	1021	316
RTOR Reduction (vph)	0	0	284	0	0	58	0	1	0	0	0	195
Lane Group Flow (vph)	289	521	521	211	395	26	395	515	0	116	1021	121
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	pm+pt		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8						6
Actuated Green, G (s)	49.6	35.1	35.1	15.7	36.3	36.3	15.0	40.6		10.4	36.0	36.0
Effective Green, g (s)	49.6	35.1	35.1	15.7	36.3	36.3	15.0	40.6		10.4	36.0	36.0
Actuated g/C Ratio	0.42	0.30	0.30	0.13	0.31	0.31	0.13	0.34		0.09	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	360	550	822	234	569	483	437	639		158	1092	489
v/s Ratio Prot	0.10	c0.28		c0.12	0.21		c0.12	0.28		0.06	c0.29	
v/s Ratio Perm	0.24		0.19			0.02						0.08
v/c Ratio	0.80	0.95	0.63	0.90	0.69	0.05	0.90	0.81		0.73	0.93	0.25
Uniform Delay, d1	25.5	40.4	35.8	50.3	35.9	28.7	50.7	35.0		52.4	39.8	30.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.2	25.6	1.6	33.7	3.7	0.0	21.7	7.4		16.1	14.2	0.3
Delay (s)	37.7	66.0	37.4	84.0	39.5	28.7	72.4	42.4		68.5	53.9	31.0
Level of Service	D	E	D	F	D	C	E	D		E	D	C
Approach Delay (s)		46.7			51.8			55.4			50.1	
Approach LOS		D			D			E			D	

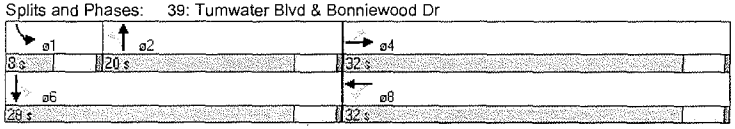
Intersection Summary				
HCM Average Control Delay	50.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	117.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	540	10	545	10	20	320	50
Lane Group Flow (vph)	26	600	11	769	0	43	337	127
Turn Type	Perm		Perm		Perm		pm+pt	
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	2	2	1	6
Minimum Initial (s)	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	8.0	20.0
Total Split (s)	32.0	32.0	32.0	32.0	20.0	20.0	8.0	28.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	33.3%	33.3%	13.3%	46.7%
Yellow Time (s)	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
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
v/c Ratio	0.19	0.63	0.05	0.82		0.18	0.74	0.21
Control Delay	10.2	11.6	6.3	18.8		17.7	28.1	8.0
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	10.2	11.6	6.3	18.8		17.7	28.1	8.0
Queue Length 50th (ft)	3	100	1	144		9	86	11
Queue Length 95th (ft)	16	198	7	#367		31	#188	41
Internal Link Dist (ft)		1058		3580		910		580
Turn Bay Length (ft)								
Base Capacity (vph)	147	1025	255	999		468	456	783
Starvation Cap Reductn	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0		0	0	0
Reduced v/c Ratio	0.18	0.59	0.04	0.77		0.09	0.74	0.16

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 47.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 39: Tumwater Blvd & Bonniewood Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96			0.97		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	1848		1752	1774			1709		1805	1734	
Flt Permitted	0.17	1.00		0.30	1.00			0.89		0.67	1.00	
Satd. Flow (perm)	325	1848		563	1774			1549		1275	1734	
Volume (vph)	25	540	30	10	545	185	10	20	10	320	50	70
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)	26	568	32	11	574	195	11	21	11	337	53	74
RTOR Reduction (vph)	0	3	0	0	18	0	0	9	0	0	51	0
Lane Group Flow (vph)	26	597	0	11	751	0	0	34	0	337	76	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	6%	6%	6%	0%	0%	0%
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.4	24.4		24.4	24.4			6.7		14.8	14.8	
Effective Green, g (s)	24.4	24.4		24.4	24.4			6.7		14.8	14.8	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.14		0.31	0.31	
Clearance Time (s)	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	
Lane Grp Cap (vph)	168	955		291	917			220		446	544	
v/s Ratio Prot		0.32			c0.42					c0.07	0.04	
v/s Ratio Perm	0.08			0.02				0.02		c0.17		
v/c Ratio	0.15	0.63		0.04	0.82			0.15		0.76	0.14	
Uniform Delay, d1	6.0	8.1		5.6	9.5			17.8		15.3	11.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.3		0.1	5.8			0.3		7.1	0.1	
Delay (s)	6.4	9.4		5.7	15.3			18.1		22.4	11.7	
Level of Service	A	A		A	B			B		C	B	
Approach Delay (s)		9.3			15.2			18.1			19.5	
Approach LOS		A			B			B			B	

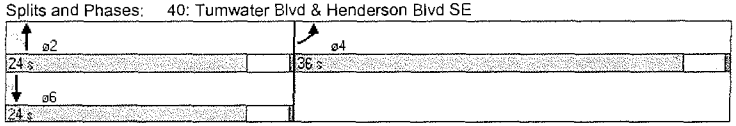
Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	750	75	350	230	765
Lane Group Flow (vph)	821	0	447	242	805
Turn Type		Perm			Perm
Protected Phases	4		2	6	
Permitted Phases		2			6
Detector Phases	4	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	36.0	24.0	24.0	24.0	24.0
Total Split (%)	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	Min	Min	Min	Min
v/c Ratio	0.89		0.81	0.40	0.76
Control Delay	26.1		31.3	17.3	7.3
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	26.1		31.3	17.3	7.3
Queue Length 50th (ft)	231		143	66	0
Queue Length 95th (ft)	#461		#280	119	74
Internal Link Dist (ft)	3580		1386	1414	
Turn Bay Length (ft)					
Base Capacity (vph)	1009		628	686	1091
Starvation Cap Reductn	0		0	0	0
Spillback Cap Reductn	0		0	0	0
Storage Cap Reductn	0		0	0	0
Reduced v/c Ratio	0.81		0.71	0.35	0.74

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 52.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 40: Tumwater Blvd & Henderson Blvd SE



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	0.95			0.99	1.00	1.00
Satd. Flow (prot)	1785			1883	1863	1583
Flt Permitted	0.95			0.90	1.00	1.00
Satd. Flow (perm)	1785			1707	1863	1583
Volume (vph)	750	30	75	350	230	765
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	32	79	368	242	805
RTOR Reduction (vph)	2	0	0	0	0	543
Lane Group Flow (vph)	819	0	0	447	242	262
Heavy Vehicles (%)	1%	1%	0%	0%	2%	2%
Turn Type			Perm			Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Actuated Green, G (s)	27.0			16.9	16.9	16.9
Effective Green, g (s)	27.0			16.9	16.9	16.9
Actuated g/C Ratio	0.52			0.33	0.33	0.33
Clearance Time (s)	4.0			4.0	4.0	4.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	929			556	607	515
v/s Ratio Prot	c0.46				0.13	
v/s Ratio Perm				c0.26		0.17
v/c Ratio	0.88			0.80	0.40	0.51
Uniform Delay, d1	11.0			16.0	13.6	14.1
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	9.8			8.3	0.4	0.8
Delay (s)	20.8			24.2	14.0	14.9
Level of Service	C			C	B	B
Approach Delay (s)	20.8			24.2	14.7	
Approach LOS	C			C	B	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	145	20	20	5	5	65	5	280	5	35	480	115
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
Hourly flow rate (vph)	153	21	21	5	5	68	5	295	5	37	505	121
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											890	
pX, platoon unblocked												
vC, conflicting volume	1018	950	566	979	1008	297	626			300		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1018	950	566	979	1008	297	626			300		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.4	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.3		
p0 queue free %	18	92	96	97	98	90	99			97		
cM capacity (veh/h)	186	251	524	190	220	712	965			1228		

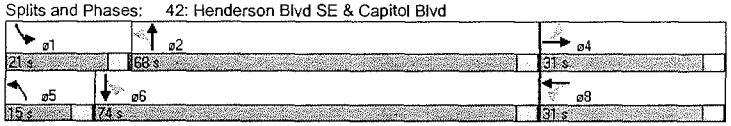
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	195	79	305	663
Volume Left	153	5	5	37
Volume Right	21	68	5	121
cSH	206	535	965	1228
Volume to Capacity	0.94	0.15	0.01	0.03
Queue Length 95th (ft)	196	13	0	2
Control Delay (s)	96.8	12.9	0.2	0.8
Lane LOS	F	B	A	A
Approach Delay (s)	96.8	12.9	0.2	0.8
Approach LOS	F	B		

Intersection Summary			
Average Delay	16.5		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	5	5	120	5	15	825	120	1430
Lane Group Flow (vph)	0	15	126	84	16	1010	126	1521
Turn Type	Perm		Perm		pm+pt		pm+pt	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	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	8.0	20.0	8.0	20.0
Total Split (s)	31.0	31.0	31.0	31.0	15.0	68.0	21.0	74.0
Total Split (%)	25.8%	25.8%	25.8%	25.8%	12.5%	56.7%	17.5%	61.7%
Yellow Time (s)	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
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
v/c Ratio		0.05	0.53	0.25	0.07	0.52	0.32	0.62
Control Delay		21.4	32.6	9.9	6.3	11.4	5.9	8.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		21.4	32.6	9.9	6.3	11.4	5.9	8.7
Queue Length 50th (ft)		2	32	1	1	114	11	116
Queue Length 95th (ft)		22	127	42	8	234	38	413
Internal Link Dist (ft)		386		2831		1481		3304
Turn Bay Length (ft)								
Base Capacity (vph)		583	467	589	324	2505	533	2794
Starvation Cap Reductn		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0
Reduced v/c Ratio		0.03	0.27	0.14	0.05	0.40	0.24	0.54

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 68.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 42: Henderson Blvd SE & Capitol Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.86		1.00	0.98		1.00	1.00	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1785		1752	1584		1736	3398		1736	3466	
Flt Permitted		0.92		0.75	1.00		0.13	1.00		0.21	1.00	
Satd. Flow (perm)		1671		1379	1584		242	3398		375	3466	
Volume (vph)	5	5	5	120	5	75	15	825	135	120	1430	15
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)	5	5	5	126	5	79	16	868	142	126	1505	16
RTOR Reduction (vph)	0	4	0	0	67	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	11	0	126	17	0	16	1000	0	126	1521	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			pm+pt			pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.9		10.9	10.9		42.4	41.4		52.5	47.5	
Effective Green, g (s)		10.9		10.9	10.9		42.4	41.4		52.5	47.5	
Actuated g/C Ratio		0.15		0.15	0.15		0.59	0.58		0.74	0.67	
Clearance Time (s)		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	
Lane Grp Cap (vph)		255		211	242		165	1970		411	2306	
v/s Ratio Prot					0.01		0.00	0.29		c0.03	c0.44	
v/s Ratio Perm		0.01		c0.09			0.06			0.19		
v/c Ratio		0.04		0.60	0.07		0.10	0.51		0.31	0.66	
Uniform Delay, d1		25.8		28.2	25.9		6.5	8.9		4.2	7.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		4.5	0.1		0.3	0.2		0.4	0.7	
Delay (s)		25.9		32.7	26.0		6.8	9.1		4.6	7.8	
Level of Service		C		C	C		A	A		A	A	
Approach Delay (s)		25.9			30.0			9.1			7.6	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	5	30	0	130	0	750	25	215	1260	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
Hourly flow rate (vph)	0	0	5	32	0	137	0	789	26	226	1326	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2313	2597	666	1924	2587	408	1332			816		
vC1, stage 1 conf vol				803	803							
vC2, stage 2 conf vol				1121	1784							
vCu, unblocked vol	2313	2597	666	1924	2587	408	1332			816		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.2			4.1		
tC, 2 stage (s)				6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	72	100	77	100			72		
cM capacity (veh/h)	13	18	407	112	77	598	509			808		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	5	32	137	526	289	226	884	447
Volume Left	0	32	0	0	0	226	0	0
Volume Right	5	0	137	0	26	0	0	5
cSH	407	112	598	1700	1700	808	1700	1700
Volume to Capacity	0.01	0.28	0.23	0.31	0.17	0.28	0.52	0.26
Queue Length 95th (ft)	1	27	22	0	0	29	0	0
Control Delay (s)	14.0	49.5	12.8	0.0	0.0	11.2	0.0	0.0
Lane LOS	B	E	B			B		
Approach Delay (s)	14.0	19.7		0.0		1.6		
Approach LOS	B	C						

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	15	0	45	5	10	0	60	50	25	175	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
Hourly flow rate (vph)	0	16	0	47	5	11	0	63	53	26	184	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	339	353	184	334	326	89	184			116		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	339	353	184	334	326	89	184			116		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.4			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.4			2.3		
p0 queue free %	100	97	100	92	99	99	100			98		
cM capacity (veh/h)	599	565	863	585	570	949	1264			1442		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	63	116	211
Volume Left	0	47	0	26
Volume Right	0	11	53	0
cSH	565	624	1264	1442
Volume to Capacity	0.03	0.10	0.00	0.02
Queue Length 95th (ft)	2	8	0	1
Control Delay (s)	11.6	11.4	0.0	1.1
Lane LOS	B	B		A
Approach Delay (s)	11.6	11.4	0.0	1.1
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	65	25	10	95	200	150
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	68	26	11	100	211	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	111				224	61
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	111				224	61
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				71	84
cM capacity (veh/h)	1461				724	999

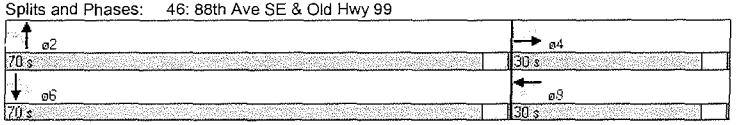
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	95	111	368
Volume Left	68	0	211
Volume Right	0	100	158
cSH	1461	1700	821
Volume to Capacity	0.05	0.07	0.45
Queue Length 95th (ft)	4	0	59
Control Delay (s)	5.6	0.0	12.9
Lane LOS	A		B
Approach Delay (s)	5.6	0.0	12.9
Approach LOS			B

Intersection Summary			
Average Delay		9.2	
Intersection Capacity Utilization		38.5%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBT	NBL	NBT	SBT	SBR
Lane Configurations							
Volume (vph)	275	0	5	15	370	1020	340
Lane Group Flow (vph)	289	42	10	16	394	1074	358
Turn Type	Perm			Perm			Perm
Protected Phases		4	8		2	6	
Permitted Phases	4			2			6
Detector Phases	4	4	8	2	2	6	6
Minimum Initial (s)	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
Total Split (s)	30.0	30.0	30.0	70.0	70.0	70.0	70.0
Total Split (%)	30.0%	30.0%	30.0%	70.0%	70.0%	70.0%	70.0%
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
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	Min	Min	Min	Min
v/c Ratio	0.85	0.09	0.02	0.17	0.35	0.89	0.31
Control Delay	55.2	0.4	21.2	11.5	8.1	23.8	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	0.4	21.2	11.5	8.1	23.8	1.5
Queue Length 50th (ft)	166	0	2	4	104	494	0
Queue Length 95th (ft)	#313	0	15	15	155	#857	28
Internal Link Dist (ft)		3981	287		6015	3369	
Turn Bay Length (ft)							
Base Capacity (vph)	406	549	533	102	1215	1294	1209
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.08	0.02	0.16	0.32	0.83	0.30

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 84.3
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 46: 88th Ave SE & Old Hwy 99



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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
Lane Util. Factor	1.00	1.00			1.00		0.95	0.95			1.00	1.00
Frt	1.00	0.85			0.93		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1719	1538			1772		1665	1749			1863	1583
Flt Permitted	0.75	1.00			1.00		0.08	1.00			1.00	1.00
Satd. Flow (perm)	1359	1538			1772		141	1749			1863	1583
Volume (vph)	275	0	40	0	5	5	15	370	5	0	1020	340
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)	289	0	42	0	5	5	16	389	5	0	1074	358
RTOR Reduction (vph)	0	31	0	0	4	0	0	0	0	0	0	124
Lane Group Flow (vph)	289	11	0	0	6	0	16	394	0	0	1074	234
Heavy Vehicles (%)	5%	5%	5%	0%	0%	0%	3%	3%	3%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.1	21.1			21.1		54.8	54.8			54.8	54.8
Effective Green, g (s)	21.1	21.1			21.1		54.8	54.8			54.8	54.8
Actuated g/C Ratio	0.25	0.25			0.25		0.65	0.65			0.65	0.65
Clearance Time (s)	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
Lane Grp Cap (vph)	342	387			446		92	1142			1217	1034
v/s Ratio Prot		0.01			0.00						c0.58	
v/s Ratio Perm	c0.21						0.11	0.23				0.15
v/c Ratio	0.85	0.03			0.01		0.17	0.34			0.88	0.23
Uniform Delay, d1	29.8	23.7			23.6		5.7	6.5			11.9	5.9
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	17.1	0.0			0.0		0.9	0.2			7.8	0.1
Delay (s)	47.0	23.7			23.6		6.6	6.7			19.7	6.0
Level of Service	D	C			C		A	A			B	A
Approach Delay (s)		44.0			23.6			6.7			16.3	
Approach LOS		D			C			A			B	

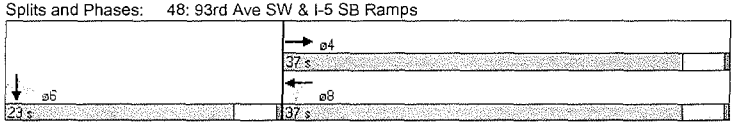
Intersection Summary				
HCM Average Control Delay	18.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	83.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	82.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Volume (vph)	615	90	235	5	385
Lane Group Flow (vph)	758	95	247	363	405
Turn Type		Perm			Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phases	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	37.0	23.0	23.0
Total Split (%)	61.7%	61.7%	61.7%	38.3%	38.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
v/c Ratio	0.86	0.53	0.27	0.72	0.55
Control Delay	22.5	21.2	7.8	26.2	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	21.2	7.8	26.2	5.4
Queue Length 50th (ft)	189	19	41	108	0
Queue Length 95th (ft)	#410	#70	76	#208	53
Internal Link Dist (ft)	8390		950	831	
Turn Bay Length (ft)					
Base Capacity (vph)	1006	207	1038	614	803
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.75	0.46	0.24	0.59	0.50

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 49
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 48: 93rd Ave SW & I-5 SB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-3%			0%			0%	
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.98		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		1683		1666	1753						1661	1482
Flt Permitted		1.00		0.19	1.00						0.95	1.00
Satd. Flow (perm)		1683		331	1753						1661	1482
Volume (vph)	0	615	105	90	235	0	0	0	0	340	5	385
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)	0	647	111	95	247	0	0	0	0	358	5	405
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	0	0	0	280
Lane Group Flow (vph)	0	747	0	95	247	0	0	0	0	0	363	125
Heavy Vehicles (%)	9%	9%	9%	10%	10%	10%	0%	0%	0%	9%	9%	9%
Turn Type				Perm						Perm		Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Actuated Green, G (s)		25.3		25.3	25.3						14.9	14.9
Effective Green, g (s)		25.3		25.3	25.3						14.9	14.9
Actuated g/C Ratio		0.52		0.52	0.52						0.31	0.31
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		883		174	920						513	458
v/s Ratio Prot		c0.44			0.14							
v/s Ratio Perm				0.29							0.22	0.08
v/c Ratio		0.85		0.55	0.27						0.71	0.27
Uniform Delay, d1		9.8		7.6	6.3						14.7	12.6
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		7.5		3.5	0.2						4.4	0.3
Delay (s)		17.3		11.1	6.5						19.2	12.9
Level of Service		B		B	A						B	B
Approach Delay (s)		17.3			7.8			0.0			15.9	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

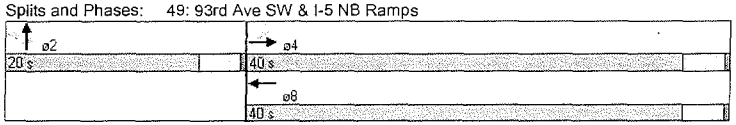
c Critical Lane Group

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	295	615	220	15	115
Lane Group Flow (vph)	311	647	553	100	121
Turn Type	Perm				Perm
Protected Phases		4	8	2	
Permitted Phases	4				2
Detector Phases	4	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
v/c Ratio	0.78	0.60	0.52	0.30	0.31
Control Delay	22.2	7.9	4.7	19.9	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	7.9	4.7	19.9	7.1
Queue Length 50th (ft)	38	68	30	20	0
Queue Length 95th (ft)	#192	164	87	63	34
Internal Link Dist (ft)		950	1490	899	
Turn Bay Length (ft)					
Base Capacity (vph)	481	1290	1236	558	573
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.50	0.45	0.18	0.21

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 41
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 49: 93rd Ave SW & I-5 NB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			2%			0%			0%	
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.92			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.96	1.00			
Satd. Flow (prot)	1779	1872			1700			1614	1429			
Flt Permitted	0.39	1.00			1.00			0.96	1.00			
Satd. Flow (perm)	736	1872			1700			1614	1429			
Volume (vph)	295	615	0	0	220	305	80	15	115	0	0	0
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)	311	647	0	0	232	321	84	16	121	0	0	0
RTOR Reduction (vph)	0	0	0	0	86	0	0	0	95	0	0	0
Lane Group Flow (vph)	311	647	0	0	467	0	0	100	26	0	0	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	13%	13%	13%	0%	0%	0%
Turn Type	Perm						Perm		Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	23.6	23.6			23.6			8.5	8.5			
Effective Green, g (s)	23.6	23.6			23.6			8.5	8.5			
Actuated g/C Ratio	0.59	0.59			0.59			0.21	0.21			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	433	1102			1000			342	303			
v/s Ratio Prot		0.35			0.28							
v/s Ratio Perm	c0.42							0.06	0.02			
v/c Ratio	0.72	0.59			0.47			0.29	0.08			
Uniform Delay, d1	5.9	5.2			4.7			13.3	12.7			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	5.6	0.8			0.3			0.5	0.1			
Delay (s)	11.5	6.0			5.0			13.8	12.8			
Level of Service	B	A			A			B	B			
Approach Delay (s)		7.8			5.0			13.2			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	710	25	10	375	5	20	5	10	15	0	230
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
Hourly flow rate (vph)	84	747	26	11	395	5	21	5	11	16	0	242
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								1			1	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	400			774			1587	1350	761	1347	1361	397
vC1, stage 1 conf vol							929	929		418	418	
vC2, stage 2 conf vol							658	421		929	942	
vCu, unblocked vol	400			774			1587	1350	761	1347	1361	397
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			84	98	97	93	100	63
cM capacity (veh/h)	1143			833			130	235	404	214	235	650

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	84	774	11	400	37	258
Volume Left	84	0	11	0	21	16
Volume Right	0	26	0	5	11	242
cSH	1143	1700	833	1700	175	578
Volume to Capacity	0.07	0.46	0.01	0.24	0.21	0.45
Queue Length 95th (ft)	6	0	1	0	19	57
Control Delay (s)	8.4	0.0	9.4	0.0	31.0	16.2
Lane LOS	A		A		D	C
Approach Delay (s)	0.8		0.2		31.0	16.2
Approach LOS					D	C

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	605	370	180	430	210	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	637	389	189	453	221	95

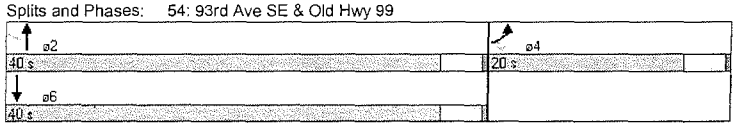
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total (vph)	637	389	189	453	316
Volume Left (vph)	0	0	189	0	221
Volume Right (vph)	0	389	0	0	95
Hadj (s)	0.00	-0.70	0.55	0.05	0.01
Departure Headway (s)	6.8	6.1	7.5	7.0	6.8
Degree Utilization, x	1.21	0.66	0.40	0.88	0.60
Capacity (veh/h)	522	576	472	508	509
Control Delay (s)	131.1	18.9	14.1	41.3	19.6
Approach Delay (s)	88.5		33.3		19.6
Approach LOS	F		D		C

Intersection Summary				
Delay		59.7		
HCM Level of Service		F		
Intersection Capacity Utilization	68.9%		ICU Level of Service	C
Analysis Period (min)		15		

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	10	335	145	475	765
Lane Group Flow (vph)	11	353	153	500	810
Turn Type		Perm	Perm		
Protected Phases	4			2	6
Permitted Phases		4	2		
Detector Phases	4	4	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	40.0	40.0	40.0
Total Split (%)	33.3%	33.3%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
v/c Ratio	0.03	0.70	0.69	0.46	0.74
Control Delay	16.1	16.9	28.6	7.4	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	16.9	28.6	7.4	12.4
Queue Length 50th (ft)	2	33	22	57	119
Queue Length 95th (ft)	13	126	#129	143	301
Internal Link Dist (ft)	9459			1805	6015
Turn Bay Length (ft)					
Base Capacity (vph)	564	632	251	1232	1243
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.56	0.61	0.41	0.65

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 45.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 54: 93rd Ave SE & Old Hwy 99



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1752	1568	1770	1863	1880	
Flt Permitted	0.95	1.00	0.21	1.00	1.00	
Satd. Flow (perm)	1752	1568	393	1863	1880	
Volume (vph)	10	335	145	475	765	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	353	153	500	805	5
RTOR Reduction (vph)	0	145	0	0	0	0
Lane Group Flow (vph)	11	208	153	500	810	0
Heavy Vehicles (%)	3%	3%	2%	2%	1%	1%
Turn Type		Perm	Perm			
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	10.4	10.4	26.7	26.7	26.7	
Effective Green, g (s)	10.4	10.4	26.7	26.7	26.7	
Actuated g/C Ratio	0.23	0.23	0.59	0.59	0.59	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	404	362	233	1103	1113	
v/s Ratio Prot	0.01			0.27	c0.43	
v/s Ratio Perm		c0.13	0.39			
v/c Ratio	0.03	0.58	0.66	0.45	0.73	
Uniform Delay, d1	13.4	15.4	6.1	5.1	6.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	2.2	6.5	0.3	2.4	
Delay (s)	13.5	17.6	12.7	5.4	9.0	
Level of Service	B	B	B	A	A	
Approach Delay (s)	17.5			7.1	9.0	
Approach LOS	B			A	A	

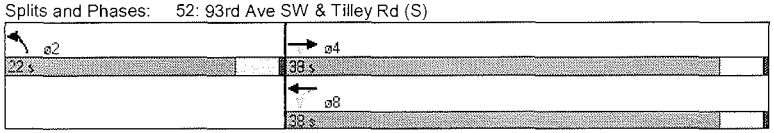
Intersection Summary				
HCM Average Control Delay	10.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Volume (vph)	605	370	180	430	210
Lane Group Flow (vph)	637	389	189	453	316
Turn Type		Perm	Perm		
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phases	4	4	8	8	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	38.0	38.0	38.0	38.0	22.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
v/c Ratio	0.68	0.39	0.71	0.50	0.60
Control Delay	12.4	2.1	25.4	9.2	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	2.1	25.4	9.2	18.5
Queue Length 50th (ft)	89	0	27	56	48
Queue Length 95th (ft)	220	29	#135	140	156
Internal Link Dist (ft)	1463			1585	1119
Turn Bay Length (ft)					
Base Capacity (vph)	1202	1165	345	1167	704
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.33	0.55	0.39	0.45

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 41.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 52: 93rd Ave SW & Tilley Rd (S)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	1900	1615	1752	1845	1710	
Flt Permitted	1.00	1.00	0.28	1.00	0.97	
Satd. Flow (perm)	1900	1615	512	1845	1710	
Volume (vph)	605	370	180	430	210	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	637	389	189	453	221	95
RTOR Reduction (vph)	0	194	0	0	26	0
Lane Group Flow (vph)	637	195	189	453	290	0
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	20.2	20.2	20.2	20.2	12.0	
Effective Green, g (s)	20.2	20.2	20.2	20.2	12.0	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	955	812	257	927	510	
v/s Ratio Prot	0.34			0.25	c0.17	
v/s Ratio Perm		0.12	c0.37			
v/c Ratio	0.67	0.24	0.74	0.49	0.57	
Uniform Delay, d1	7.5	5.7	7.9	6.6	11.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.8	0.2	10.4	0.4	1.5	
Delay (s)	9.3	5.8	18.3	7.0	13.4	
Level of Service	A	A	B	A	B	
Approach Delay (s)	8.0			10.3	13.4	
Approach LOS	A			B	B	

Intersection Summary

HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement Summary

LRR/Kingswood

20[illegible] PM Peak Hour

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
South Approach										
32	T	700	2.0	1.098	75.4	LOS E	1242	1.00	2.54	12.4
32	R	137	2.0	1.098	75.4	LOS E	1242	1.00	2.54	12.4
Approach		**837**	**2.0**	**1.099**	**75.4**	**LOS E**	**1242**	**1.00**	**2.54**	**12.4**
East Approach										
22	L	137	2.0	0.982	40.2	LOS D	714	1.00	1.71	17.8
22	R	574	2.0	0.982	40.2	LOS D	714	1.00	1.71	17.8
Approach		**710**	**2.0**	**0.982**	**40.2**	**LOS D**	**714**	**1.00**	**1.71**	**17.8**
North Approach										
42	L	705	2.0	0.559	11.2	LOS B	142	0.47	0.65	27.2
[illegible]	T	879	2.0	0.615	4.9	LOS A	174	0.49	0.47	29.8
Ap[illegible]ch		**1584**	**2.0**	**0.615**	**7.7**	**LOS A**	**174**	**0.48**	**0.55**	**28.5**
All Vehicles		**3131**	**2.0**	**1.098**	**33.2**	**LOS C**	**1242**	**0.74**	**1.34**	**19.3**

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Movement Summary

2025 PM Peak Hour 75% Saturation with shift

Littlerock Rd / Isreal Rd - 1 Lane NB

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Littlerock Rd										
32	L	353	2.1	0.882	23.1	LOS C	499	1.00	1.30	22.6
32	T	379	2.1	0.882	23.1	LOS C	499	1.00	1.30	22.6
32	R	37	2.1	0.882	23.1	LOS C	499	1.00	1.30	22.6
Approach		**769**	**2.1**	**0.882**	**23.1**	**LOS C**	**499**	**1.00**	**1.30**	**22.6**
WB Israel Rd										
22	L	121	1.9	1.007	56.4	LOS E	734	1.00	1.86	14.9
22	T	453	1.9	1.007	56.4	LOS E	734	1.00	1.86	14.9
23	R	79	2.5	0.042	6.4	LOS A#	2#	0.00	0.52	34.2
Approach		**653**	**2.0**	**1.008**	**50.4**	**LOS D**	**734**	**0.88**	**1.70**	**16.0**
SB Littlerock Rd										
	L	179	2.0	1.651	319.6	LOS F	3373	1.00	4.57	4.0
42	T	553	2.0	1.651	319.6	LOS F	3373	1.00	4.57	4.0
42	R	174	2.0	1.651	319.6	LOS F	3373	1.00	4.57	4.0
Approach		**905**	**2.0**	**1.652**	**319.6**	**LOS F**	**3373**	**1.00**	**4.57**	**4.0**
EB Israel Rd										
12	L	79	3.0	0.504	10.2	LOS B	135	0.85	0.87	27.9
12	T	326	3.0	0.504	10.2	LOS B	135	0.85	0.87	27.9
13	R	263	3.0	0.138	4.9	LOS A#	8#	0.00	0.45	31.3
Approach		**669**	**3.0**	**0.505**	**8.1**	**LOS A**	**135**	**0.51**	**0.71**	**29.2**
All Vehicles		**2996**	**2.2**	**1.651**	**115.3**	**LOS F**	**3373**	**0.87**	**2.24**	**9.3**

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Movement Summary

Littlerock Rd / Tumwater Blvd

20[illegible] PM Peak Hour (75% Sat.)

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Littlerock Rd										
32	L	5	16.7	0.222	11.7	LOS B	40	0.47	0.71	27.2
31	T	395	2.0	0.225	4.7	LOS A	42	0.47	0.47	30.2
33	R	168	1.8	0.225	6.2	LOS A	42	0.45	0.57	29.5
Approach		**569**	**2.1**	**0.225**	**5.3**	**LOS A**	**42**	**0.46**	**0.50**	**29.9**
WB Tumwater Blvd										
22	L	242	2.1	0.248	11.6	LOS B	30	0.39	0.74	27.4
21	T	5	16.7	0.250	4.8	LOS A	30	0.39	0.47	30.5
23	R	474	1.9	0.379	6.0	LOS A	53	0.41	0.56	29.7
Approach		**721**	**2.1**	**0.379**	**7.9**	**LOS A**	**53**	**0.41**	**0.62**	**28.9**
SB [illegible]lerock Rd										
	L	311	1.9	0.274	11.6	LOS B	51	0.45	0.68	27.3
41	T	658	2.0	0.454	4.6	LOS A	107	0.50	0.45	30.1
43	R	5	16.7	0.462	6.3	LOS A	107	0.50	0.58	29.3
Approach		**974**	**2.1**	**0.454**	**6.9**	**LOS A**	**107**	**0.48**	**0.53**	**29.1**
West Approach										
12	L	5	16.7	0.031	10.4	LOS B	5	0.66	0.73	28.1
12	T	5	16.7	0.031	10.4	LOS B	5	0.66	0.73	28.1
12	R	5	16.7	0.031	10.4	LOS B	5	0.66	0.73	28.1
Approach		**18**	**16.7**	**0.031**	**10.4**	**LOS B**	**5**	**0.66**	**0.73**	**28.1**
All Vehicles		**2282**	**2.2**	**0.462**	**6.8**	**LOS A**	**107**	**0.45**	**0.55**	**29.2**

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APPENDIX F

Assumptions for Cost Estimating
Revenue Sources

Tumwater Transportation Plan – Planning Level Cost Estimate Assumptions

(Based on information developed by TRPC for the 2025 RTP for Regionally-Significant Projects)

Updated: March 12, 2007

This cost estimation tool is being used as the basis for developing planning level cost estimates for the Tumwater Transportation Plan. The cost estimation tool was developed for the 2025 RTP by the Thurston Regional Planning Council (TRPC) Technical Advisory Committee (TAC) in 2003. The TAC members recommended the use of this tool for projects that had not yet been estimated through a local TIP process or through a previous RTP. However, given the significant level of cost increase over the past 3-4 years for transportation infrastructure improvements, we applied this estimation tool to all projects listed in the 2007 Transportation Plan Update. This will ensure that all projects are measured on the same basis and will reflect a more reasonable cost expectation.

Methodology

The following methodology was developed by the TAC and has been updated and amended to align with the assumptions and methods used to estimate planning level costs for the Tumwater projects.

Types of Facilities

Estimates were developed for 2-to-3 lane facilities (new connections or in some instances, addition of center turn lane) and for 4-to-5 lane facilities. Boulevard corridors are not included as a specific road type, believing that in those infrequent instances where a project may specifically identify a boulevard, it can be sufficiently accommodated within the other two facility types. These estimates were determined to have good application within urban areas (city and UGAs) and should not be used for rural corridors or interstate highway facilities.

For these facilities, the planning estimates assume the following:

- All "soft costs" including PE, and CN phases are assumed to be included in the generalized segment cost.
- Right-of-way (ROW) estimates were developed based on the following parameters:
    - Separate estimate for each specific project based on recent property values for residential and commercial properties. These values do not constitute a property appraisal or fair market value of real estate.
    - ROW estimates are only used to assess the potential cost of land required to construct the corridor or intersection.
    - ROW areas calculated for each project are based upon current parcel maps and data contained in either Geodata records or Kroll Maps and future ROW requirements contained in the city's Development Guidelines.
    - The ROW values used for estimation purposes include a $6/sf and $15/sf for residential and commercial zoned properties, respectively.
    - For corridors that have both residential and commercial frontages, a blended ROW value was used to account for the change in land-use.

  - Business impacts, relocations and acquisition of residential dwelling units are not included.
  - Costs do not account for legal processes, acquisitions, condemnation proceedings, etc
- Costs include all features of the full urban cross-section – travel lanes, turn lanes, intersection treatments as appropriate, curb and gutter, bike lanes, sidewalks, planter strips, illumination, utilities, storm water, and medians as appropriate.

Project Difficulty

In developing a per mile estimate, a few factors really influence cost by the degree of difficulty they impose on doing the project. The estimation process includes three general kinds of factors that influence project difficulty and thus, cost.

- **Earthwork** includes things like retaining walls, hill cuts, grade separation, and other similar kinds of costs that may have to be incurred;
- **Right-of-way** (ROW costs have been estimated on a project basis and included in the total project cost reflected on a separate table)
- **Environmental** refers to those additional costs that may be incurred because of significant adjacent wetlands, water crossings, or unstable soils (ex: Deschutes Parkway).

The estimation process necessitated local agency review of the proposed project in light of these three factors. A score of 1, 3, or 5 would be awarded to each of these factors for each project, with one being the "easiest" or most straightforward kind of project, and five being the "hardest" or most complex kind of project. This system acknowledges that some aspects of a project may be straightforward while others may be more difficult. An average of the three scores would be taken to reflect the overall project difficulty for long-range planning purposes.

High-Low Cost Range

Cost ranges were developed for each of the two facility types, reflecting the planning-level degree of project complexity. Figures are provided in cost per linear foot as well as cost per mile, and reflect current 2007 dollars. Previous cost ranges were increased by 25-30% to reflect changes in material and labor cost over the past four years. In addition, separate ROW estimates were developed for each project and those costs have been combined in a separate table illustrating the total probable planning level estimate. The cost ranges shown below do not include ROW costs.

Two-to-Three Lane Facility in Urban Growth Area

Average degree of difficulty ➲	1	3	5
Planning-level cost per l.f. ➲	$650	$950	$1,200
Planning-level cost per mile ➲	$3.5 m	$5.0 m	$6.3 m

Four-to-Five Lane Facility in Urban Growth Area

Average degree of difficulty ➲	1	3	5
Planning-level cost per l.f. ➲	$1,300	$1,550	$1,800
Planning-level cost per mile ➲	$6.8 m	$8.1 m	$9.5 m

The TAC approved this process for use in estimating the cost of long-range, regionally-significant capacity projects within the urban area. An update to this methodology and cost range parameters is expected to be developed by the TAC in 2007. Until then, the above estimates will reflect a reasonable estimation of probable costs for developing urban corridors.

Tumwater 2025 Improvement Program

Planning Level Estimate

Project ID	Facility	TPA#	Description	Segment			Right-of-Way			Total Project Cost (2007 dollars)	Funding Source			
											Poojected Funding Allocation (G) Grants, (C) City, (P) Private, (W) WSDOT			
				Length of Improvement (lineal feet)	Cost per Lineal Foot	Segment Cost,	Add'l ROW Width Req'd	ROW Area SF	ROW Cost		(G)	(C)	(P)	(W)
1	Littlerock Road	1,4	Widen Littlerock Road to 2/3 lane facility between Tumwater Blvd. and western limits of City UGA, to include intersection control improvements at Tyee Drive or Black Hills HS access	10,000	$950	$9,500,000	4	40000	$240,000	$9,740,000	60% $5,844,000	20% $1,948,000	20% $1,948,000	
2A	Tyee Drive	1,4	Construct 4/5 lane Tyee Drive extension from Kingswood Drive to Tumwater Blvd., including intersections at Israel and Tumwater Blvd.	4,800	$1,300	$6,240,000	86	412800	$6,192,000	$12,432,000			100% $12,432,000	
2B	Tyee Drive	1,4	Construct 2/3 lane Tyee Drive Extension from Tumwater Blvd. to 81st Ave., including intersections at Prine Drive and 81st Ave.	4,700	$950	$4,465,000	62	291400	$2,914,000	$7,379,000			100% $7,379,000	
3	Linwood Avenue	1,2	Construct improvements (2/3 lanes) from 7th Ave to Rural Road, including intersection improvements at 2nd Ave.	3,450	$950	$3,277,500	4	13800	$82,800	$3,360,300	60% $2,016,180	20% $672,060	20% $672,060	
4A	Trosper Road	1	Widen one additional lane to create 5 lanes from Littlerock Road to Lake Park, including intersection improvements at Lake Park	650	$1,200	$780,000	10	6500	$97,500	$877,500		50% $438,750	50% $438,750	
4B	Trosper Road	1	Widen (3 lanes) from Lake Park to Rural Road, including intersection improvements at Rural.	2,000	$950	$1,900,000	36	72000	$432,000	$2,332,000	60% $1,399,200	20% $466,400	20% $466,400	
5A	Tumwater Blvd.	1,3	Widen Tumwater Blvd. to 4/5 lane facility from I-5 to Littlerock Road	2,400	$1,300	$3,120,000	26	62400	$936,000	$4,056,000		20% $811,200	80% $3,244,800	
5B	Tumwater Blvd.	1,3	Widen Tumwater Blvd. to 3 lanes from Capitol Blvd to Henderson Blvd. Improve intersection of Tumwater Blvd./Bonniewood	5,500	$950	$5,225,000	4	22000	$220,000	$5,445,000		20% $1,089,000	80% $4,356,000	
6	Tumwater Blvd. Interchange*	1,3	Interchange improvements, including ramp and mainline auxiliary lanes			$23,000,000		0	$750,000	$23,750,000	40% $9,500,000	10% $2,375,000	10% $2,375,000	40% $9,500,000
7	Linderson Way/ Center Street	1,3	Intersection improvements at 76th and 83rd			$750,000		0	$150,000	$900,000		20% $180,000	80% $720,000	
8	Capitol Blvd.**	1,2	Install southbound right-turn lane at Israel Road, iknсluding signal modifications; consider urban upgrades			$1,200,000		0	N/A	$1,200,000		20% $240,000	80% $960,000	
9	North Street-Custer Way***	2	Implement intersection strategies listed in SubArea Plan Summary, Table D-5 (Appendix D)			$1,500,000		0	$300,000	$1,800,000	70% $1,260,000	20% $360,000	10% $180,000	
10	"E" St Extension	2	Construct 4-lane extension between Cleveland Ave/Yelm Hwy and Capitol Blvd., including intersection improvements at Capitol Blvd and Cleveland Ave.	3,000	$1,550	$4,650,000	74	222000	$3,330,000	$7,980,000	60% $4,788,000	20% $1,596,000	20% $1,596,000	
11A	Old Hwy 99	3	Widen (4/5 lanes) from Tumwater Blvd. to 88th Ave. including intersections at Bonniewood (re-align) and 79th.	9,100	$1,550	$14,105,000	26	236600	$3,549,000	$17,654,000	60% $10,592,400	20% $3,530,800	20% $3,530,800	

Project ID	Facility	TPA#	Description	Length of Improvement (lineal feet)	Cost per Lineal Foot	Segment Cost,	Add'l ROW Width Req'd	ROW Area SF	ROW Cost	Total Project Cost (2007 dollars)	(G)	(C)	(P)	(W)
11B	Old Hwy 99	3	Widen (4/5 lanes) from 88th Ave. to south City limits (93rd Ave. vicinity)	6,300	$1,550	$9,765,000	26	163800	$1,638,000	$11,403,000	60% $6,841,800	20% $2,280,600	20% $2,280,600	
12	Black Lake Blvd.	4	Widen 2/3 lanes from Mottman Road to western limits of City UGA	6,400	$950	$6,080,000	4	25600	$256,000	$6,336,000	40% $2,534,400	20% $1,267,200	40% $2,534,400	
13A	Henderson Blvd.	1,2,3	Widen (2/3 lanes) from south of Deschutes River to Tumwater Blvd., including intersection	3,800	$1,200	$4,560,000	4	15200	$91,200	$4,651,200		20% $930,240	80% $3,720,960	
13B	Henderson Blvd.	1,2,3	Widen (2/3 lanes) from Tumwater Blvd. to Old Hwy 99	4,250	$1,200	$5,100,000	4	17000	$102,000	$5,202,000		40% $2,080,800	60% $3,121,200	
14	32nd Street	4	Extend from Ferguson St to Black Lake Blvd.	2,900	$950	$2,755,000	55	159500	$957,000	$3,712,000			100% $3,712,000	
15	Black Hills vicinity	4	Extend 73rd Ave., 70th Ave., and 66th Ave; create transportation grid in vicinity of BHHS and future residential development	1500	$950	$1,425,000	55	82500	$495,000	$1,920,000			100% $1,920,000	
16A	93rd Ave (SR 121)	3	Widen to 5 lanes from Lathrop Road to Kimmie Road	3,300	$1,550	$5,115,000	26	85800	$1,287,000	$6,402,000		30% $1,920,600	70% $4,481,400	
16B	93rd Ave (SR 121)	3	Widen to 3 lanes from Kimmie Road to Tilley Road	5,300	$950	$5,035,000	4	21200	$318,000	$5,353,000	40% $2,141,200	10% $535,300	30% $1,605,900	20% $1,070,600
16C	93rd Avenue	3	Widen to 3 lanes from Lathrop to western limits of City UGA	4,500	$950	$4,275,000	4	18000	$180,000	$4,455,000	60% $2,673,000	20% $891,000	20% $891,000	
16D	93rd Avenue interchange	3	Reconstruct interchange, including bridge widening, ramp modifications			$12,000,000		0	N/A	$12,000,000			10% 1,200,000	90% $10,800,000
17	Mottman Road	2,4	Construct intersection improvements at RW Johnson (signal or RAB)			$750,000		0	$100,000	$850,000		90% $765,000	10% $85,000	
18	93rd/Tilley	3	Construct intersection improvements (signal or RAB)			$750,000			$100,000	$850,000		20% $170,000	80% $680,000	
					Totals:	**$137,322,500**			**$24,717,500**	**$162,040,000**	31% **$49,590,180**	15% **$24,547,950**	41% **$66,531,270**	13% **$21,370,600**

* Tumwater Blvd/I-5 interchange includes $8m for the bridge structure, ramp improvements and $15m for the I-5 mainline widening, auxiliary lanes, drainage, etc. Costs will be refined during the current IJR planning process underway by the city.

** Project cost does not include purchase of the Point Tavern site. ROW estimate and business impact costs will need to be developed.

*** North Street/Custer Way strategy improvements include a variety of intersection upgrades, including turn pockets, signal revisions, potential roundabout, access revisions. The planning level estimate assumed $500k each for three intersection projects and $300k for minor ROW needs.

		2007	2008	2009	2010	2011	2012	2007-2012	2013-2025	2007-2025	
2006 Beginning CFP Balance	$ 2,832,000										
2006 Beginning TIF Balance	$ 5,042,476										
EXISTING REVENUE SOURCES											
Utility Tax 1% of 6%		$ 395,000	$ 402,505	$ 410,153	$ 417,945	$ 425,886	$ 433,978	$ 442,224	**$ 2,532,692**	$ 6,574,781	$ 9,107,472	
Arterial Street Gas Tax		$ 84,000	$ 84,000	$ 84,000	$ 84,000	$ 84,000	$ 84,000	$ 84,000	**$ 504,000**	$ 1,092,000	$ 1,596,000	
REET (.025% original + .025% addt'l.)		$ 385,000	$ 385,000	$ 385,000	$ 385,000	$ 385,000	$ 385,000	$ 385,000	**$ 2,310,000**	$ 5,005,000	$ 7,315,000	
Federal Grants (3)				$ 300,000				$ 300,000	**$ 600,000**	$ 1,200,000	$ 1,800,000	
TIB Grants (2)				$ 1,500,000				$ 1,500,000	**$ 3,000,000**	$ 6,000,000	$ 9,000,000	
Transportation Impact Fees (1)		$ 640,000	$ 640,000	$ 640,000	$ 640,000	$ 640,000	$ 640,000	$ 640,000	**$ 3,840,000**	$ 8,320,000	$ 12,160,000	
Mitigation Fees									**$ -**	$ -	$ -	
Other (Interest)		$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	**$ 300,000**	$ 650,000	$ 950,000	$41,928,472
	$ 1,554,000								**$13,086,692**	**$28,841,781**	**$41,928,472**	

(1) Annual TIF revenues based on an average of the **CURRENT TIF** for years 2001 thru 2005, excluding the single largest fee collected each year (avg. $250,000/yr)
(2) Assumes award of $1,500,000 every 3 years.
(3) Assumes award of $300,000 every 3 years.

NEW REVENUE SOURCES

TIF Increase
Developer Contributions

TRANSPORTATION IMPACT FEE - ANNUAL REVENUES

YEAR	Total	Largest Fee	Annual less Largest (1)
2001	$ 458,536	$ 48,000	$ 410,536
2002	$ 1,035,265	$ 232,000	$ 803,265
2003	$ 614,359	$ 323,000	$ 291,359
2004	$ 1,378,055	$ 444,000	$ 934,055
2005	$ 995,634	$ 243,000	$ 752,634
	$ 4,481,849		$ 3,191,849
ANNUAL AVERAGE	$ 896,370		$ 638,370

(1) Subtracted the largest project fee for each year to provide a financially conservative estimate of revenues.

NOTE: Amounts include accrued interest thru Dec. 2005.

APPENDIX G

Public Comment and Response

STATE OF WASHINGTON

DEPARTMENT OF COMMUNITY, TRADE AND ECONOMIC DEVELOPMENT

128 - 10th Avenue SW • PO Box 42525 • Olympia, Washington 98504-2525 • (360) 725-4000

September 21, 2007

The Honorable Ralph Osgood
Mayor of Tumwater
555 Israel Road Southwest
Tumwater, Washington 98501-6558

RE: Proposed annual comprehensive plan amendments for 2007

Dear Mayor Osgood:

Thank you for sending the Washington State Department of Community, Trade and Economic Development (CTED) the proposed amendments to Tumwater's comprehensive plan that we received on July 17, 2007. We recognize the substantial investment of time, energy, and resources that these documents represent, and we appreciate the opportunity to comment.

We especially like the following:

- The Park, Recreation, and Open Space Element provides a comprehensive review of all public and private, existing and potential park, recreation and open space opportunities and assets. This provides an excellent background to understand what assets Tumwater currently has, and what opportunities may be available in the future. This plan includes a focus on identifying and protecting natural and historic assets which is an excellent basis for a thoughtful plan. You have identified trails and corridors that provide recreational facilities and places for wildlife to live and travel within your community. The implementation section of the plan includes the concept for a Web site to disseminate information about these opportunities available from public, private and non-profit agencies. This is an excellent way to help citizens of Tumwater and the surrounding area to identify and participate in a wide variety of recreational activities.

- The adoption of an updated Transportation Element will complete the update to Tumwater's comprehensive plan. While the Growth Management Act (GMA) requires a minimum of a 10-year forecast for travel and park and recreation demands, these plans go further. The transportation uses a full 20-year outlook for estimating levels of service (LOS) at key intersections and road segments. As you adopt the Transportation and Park and Recreation Elements together, we encourage you to take advantage of the opportunity to integrate planning for walking and bicycling on facilities that could be for recreation, for transportation, or for both.

We have some suggestions for strengthening the proposed plans that we encourage you to address before you adopt them:

- The Transportation Element contains a great deal of detail regarding motor vehicle LOS far into the future, however, it could include more detail in other areas. Goal 3 of the GMA is to encourage an efficient multimodal transportation system, and recent amendments to the GMA require that the Transportation Element include a bicycle and pedestrian component.[1] We suggest that maps or summaries of existing and proposed bicycle and pedestrian facilities be included in this element to provide a balanced transportation system for all modes of transportation and abilities. This element could also include a map of existing and potential trails within the community so that an interconnected bicycle and pedestrian network can be planned and priorities set for its implementation. One area of focus to consider is safe routes to school for elementary school children, for which Washington State Department of Transportation's Safe Routes to School program provides a good source of funding.

- The GMA [RCW 36.70A.(6)(a)(vi)] requires that the Transportation Element describe existing and planning transportation demand management strategies, such as reduced or preferential parking policies and high occupancy vehicle subsidy programs. Since Tumwater is required to plan for commute trip reduction under the Clear Air Act, a discussion of affected work sites and planning activities should be included in the plan.

- Page 3-2 of the Final Draft 2025 Transportation Plan states that the city specifies its own road design classifications and standards. It would be helpful to provide an overview of these standards to more clearly demonstrate the vision of transportation in Tumwater.

- The transportation plan discusses the current services at the Olympia Airport, but does not discuss what the Port's plans are for the airport within the planning period. Any significant changes in service may affect traffic levels, and should be considered in the plan update.

- The Parks, Recreation, and Open Space Element provides a comprehensive review of all existing and potential facilities for every type of facility and provides a good list to review as development occurs. However, it is not clear what the priorities of the community are. We suggest that goals or policies be developed to guide decisions regarding facility acquisition, development, or improvement. We suggest that the plan clearly indicate which kinds of facilities are currently adequate, which are sorely needed, and that a clear prioritized list of acquisitions/improvements be developed. If Tumwater wishes to fund such facilities by impact fees, they need to be included in the capital facilities plan. This is also needed if you plan to apply for funding from the Resource and Conservation Funding Office [RCFO, formerly the InterAgency Committee for Outdoor Recreation (AIC)]. We suggest that you work with your local representative to ensure that this plan is consistent with the requirements of this agency. Information is available on the Web at *www.rco.wa.gov/rcfb/* along with our guidebook *Planning for Parks, Recreation and Open Space in Your Community* jointly produced by CTED and RCFO.

- A final consideration is to encourage you to make greater use of your Web site as a way to publish proposed amendments. Many jurisdictions use their Web site as a primary way to increase public participation in comprehensive plan and development regulation amendments. Providing a full copy of these materials on a Web site, is a cost effective way to provide full information to the public about proposed amendments, and to encourage wider public participation.

[1] The complete text is "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" [RCW 36.70A.070(6)(a)(7)].

Congratulations to you and your staff for the good work these amendments embody. According to your Ordinance No. 02004-037, the adoption of the update to the Transportation Element will complete the comprehensive plan portion of the review and update requirement of RCW 36.70A.130. We recommend that the adopting ordinance for these elements include a complete record of the action taken to review and update Tumwater's comprehensive plan and development regulations, along with a record of public participation opportunities. The adopting ordinance should clearly state that the update requirement has been met. If you have any questions or concerns about our comments or any other growth management issues, please call me at (360) 725-3064. We extend our continued support to the City of Tumwater in achieving the goals of growth management.

Sincerely,

Anne Aurelia Fritzel, AICP
Growth Management Planner
Growth Management Services

AAF:lw

cc: Mike Matlock, Planning and Facilities Director, City of Tumwater
Chuck Denney, Parks and Recreation Director, City of Tumwater
Jay Eaton, Public Works Director, City of Tumwater
Tim Smith, Senior Planner, City of Tumwater
Michael Welter, Development Services Director, Thurston County
Thera Black, Thurston Regional Planning Council
Leonard Bauer, AICP, Managing Director, Growth Management Services, CTED
David Andersen, AICP, Plan Review and Technical Assistance Manager, Growth Management Services, CTED

Washington State Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

Olympic Region Headquarters
5720 Capitol Boulevard, Tumwater
P.O. Box 47440
Olympia, WA 98504-7440
360-357-2600
Fax 360-357-2601
TTY: 1-800-833-6388
www.wsdot.wa.gov

September 18, 2007

Tim Smith
City of Tumwater
Planning and Facilities Department
555 Israel Road SW
Tumwater, WA 98501

RE: 2007 Proposed City of Tumwater's 2025 Transportation Plan

Dear Mr. Smith:

Thank you for allowing the Washington State Department of Transportation (WSDOT) the opportunity to review and comment on the proposed 2007 City of Tumwater's 2025 Transportation Plan. We recognize the substantial investment of time, energy, and resources that this document represents and we appreciate the opportunity to comment.

Page 2-10, House Bill 1487 Compliance: Besides identifying state-owned facilities within local jurisdiction boundaries and estimating traffic impacts to state highways resulting from land use assumptions, the Growth Management Act (GMA) stipulates that local agencies must include the adopted Level of Service (LOS) standards for state-owned highways in their local plans. We suggest that the LOS for those highways designated as Highways of Statewide Significance (HSS) and Highways of Regionally Significance (non-HSS) within Tumwater boundaries be included in this section or within Appendix A. The LOS for state-owned highways is as follows:

- Highways of Statewide Significance (HSS) - LOS D within urban areas and LOS C in rural area as adopted by WSDOT in consultation with local governments.
- Regionally Significant Highways (non-HSS) - LOS D within city limits and Urban Growth Areas (UGA) as adopted by the Thurston Regional Planning Council (TRPC) jointly with WSDOT.

Page 2-11, Concurrency: The plan notes that the city has adopted a LOS E for the Trosper Road/I-5 Interchange. We question the city's ability to set a LOS E for concurrency at this location. Per the Level of Service Bill (HB 1487) which amended the Growth Management Act (GMA), WSDOT has the authority to make final decisions on the LOS standards for HSS routes. I-5, to include the associated

interchange ramps, is recognized as a HSS route and as such a LOS of D has been established by WSDOT for I-5 within urban areas. In addition the amended GMA explicitly exempts HSS routes from concurrency requirements except those counties consisting of islands whose only connection to the mainland are state highways and ferry routes (RCW 36,70A.70(6)(a)(iii)(C)). We therefore do not believe that the city has the authority to set a LOS E for the Trosper Road/I-5 Interchange.

Page 4-2, Table 4.1: WSDOT would like the opportunity to review the traffic data and assumptions used to develop Table 4.1 as they relate to the state-owned facilities, specifically for the I-5 southbound ramps at Tumwater Blvd and at Trosper Rd SW/Tyee Dr. We believe that the LOS at these locations is lower than depicted in Table 4.1.

Appendix A, HB1487: Last paragraph, change "TFSS" to read "Highway of Statewide Significance (HSS)". Recommend that SR 121 be identified as a Regionally Significant Highway (non-HSS).

General Comment: Recent amendments to the GMA in 2005 require that the comprehensive plan transportation element include a bicycle and pedestrian component to identify and designate planned improvements for pedestrian and bicycle facilities (RCW 36.70A.070(6)(a)(vii)). We suggest consideration be given to implementing such a component in the plan to include existing facilities and identify any gaps or needed facilities.

Again, thank you for the opportunity to review and comment on the proposed comprehensive plan amendments. If you have any questions related to this letter, please contact George Kovich of my office at (360) 704-3207.

Sincerely,

Robert E. Jones
Transportation Planning Manager
WSDOT, Olympic Region

REJ:dlm
gk

cc: Tom Washington (WSDOT) TB55-130
Bill Wiebe (WSDOT) 47370
David Anderson (CTED) 48350

City of Tumwater 2025 Transportation Plan
Final Draft Comments
George Spencer
July 10, 2007

There is a lot to like about this plan. It addresses many needed system enhancement issues in the City and the UGA. Continued recognition of non-motorized facilities is much appreciated.

- Connection between Tumwater and the Chehalis-Western Trail.
- Integrating the Capitol Campus to Capitol Forest Trail into the Regional Trails Plan.
- Development of the Gate to Belmore RR trail.
- West Lee Street pedestrian/bicycle bridge across Interstate 5.
- Various improvement projects to develop pedestrian and bicycle facilities.

Some areas for improvement:

1. Concurrency, Page 2-11:

   Level of Service ratings may be adequate for measuring the capacity of roadway segments and intersections to handle traffic. LOS is not adequate for measuring the capacity of non-improved roadway segments to handle vehicular and non-motorized traffic. In this case non-improved means lack of bike lanes and/or pedestrian facilities. Improvement: Add a statement that makes a commitment to incorporate a qualitative consideration for non-motorized travel when addressing concurrency. Improvement: Add a performance measure to quantify the ability of a roadway segment to accommodate both vehicular and non-motorized traffic while accounting for the added impact of heavy trucks.

2. City of Tumwater Functional Classification, Page 3-3:

   Kimmie Street is shown with a classification of "commercial/industrial collector". Kimmie Street is not designated as a "truck route" by TMC 10.20.050, Truck Routes. Such designation would seem to be a pre-requisite for a "commercial/industrial collector". Improvement: Reclassify Kimmie Street to "urban collector" to be consistent with the TMC and with the designation of 83rd Avenue.

3. Existing Conditions, Page 3-5:

   "The City recently identified links and facility improvements necessary to create an interconnected network of bicycle and walking trails." Improvement: Identify the links and improvements. Include a map or maps of the bicycle and walking trails such as Figure 8, Recommended System of Bicycle Trails, shown in the existing (1998) Transportation Plan.

4. 2025 Conditions (with assumed improvements) – TPA 3, Page 7-8:

   The Kimmie Street Peak Directional Volume is shown as 280. This area is expected to experience development of warehouse distribution centers. Given the existing volume is shown as 110 (page 4-6) and the potential contribution of up to 2000 trips per day by the proposed ProLogis development alone the projected count seem low. Improvement: Confirm that current and immediate future warehouse distribution center and other

commercial/industrial developments that would use Kimmie Street are included in the projections.

5. 2025 Transportation Improvements Program, Table 8.1, Page 8-5:

   Improvement: There is no description of the "Elements" columns on the table. If the Elements are meant to be described on pages 8-1 through 8-4, there should be a correspondence with the columns on the table. That correspondence is not readily apparent.

6. 2025 Transportation Improvements Program, Table 8.1, Page 8-5, Project 5A and 5B, Tumwater Boulevard widening:

   The "Non Motorized" Element column does not have an X. Appendix D, Table D-1, Tumwater Boulevard Sub Area Transportation Study recommends "add designated bike lanes to Tumwater Blvd from Linderson Way to the I-5 interchange and continuing to Littlerock Road. Improvement: "X" the Non Motorized Element for Projects 5A and 5B in Table 8.1.

7. Omitted: Truck Route for the Port of Olympia New Market Industrial Campus:

   The location of a truck route to serve the New Market campus is an issue in discussion of the proposed amendment to Ordinance O206-037 regarding warehouse distribution centers Improvement: Add a project for a SubArea Study to address commercial and industrial traffic to serve the New Market Industrial Campus. The SubArea Study should consider the "future bridge over I-5 connecting Prine Road to Kimmie Road on the east side of the Interstate thus improving access to this area and providing a connection to the Port of Olympia New Market Industrial Campus". See Thurston Joint Plan, page 3-91. The plan should address the RTP policies of safe and convenient bicycle routes to schools, and safe sidewalks and effective crosswalks within an appropriate radius of every school in the region relative to Bush Middle School on Kimmie Street.

8. The 1998 Transportation Plan has several strong statements in the goals and policies related to non-motorized modes. No specific recommendation other that to review whether the draft plan also accommodates these concepts. From the 1998 Plan:
   a. Page 10: Encourage bicycle and pedestrian travel by providing inviting, safe, convenient and connected routes, education and incentive programs, and support services such as bike racks, shower and lockers.
   b. Page 11: Encourage safe pedestrian and bicycle travel, especially in the core areas and high density corridors. Make sure development and redevelopment in these areas makes it as easy to get around by transit, walking or bicycling as by driving. Assign a high priority to improving the safety of sidewalks and bike lanes.
   c. Page 11: Maintain and improve a network of highways, streets, and roads that moves people, goods, and services safely and efficiently through out the region, minimizes social and environmental impacts, and supports various modes of travel.

d. Page 12: Actions to reduce vehicle trips, such as adding bike lanes and sidewalks, …should be considered to relive traffic congestion in strategy areas.
e. Page 12: Multi-modal integration: Road projects shall consider needs for transit, HOVs, pedestrians, bicycles, and freight movement during initial project development … Measures to consider may include the provision of, but are not limited to: bicycle and sidewalk facilities at the time of road construction …
f. Page 13: Highway, street, and road projects shall be consistent with long range local land use plans and long range traffic forecasts, and should contribute to reaching the drive-alone reduction goals of this plan.
g. Page 13: Promote further development and coordination of facilities for the movement of freight to maintain Washington's strong trade-related economy. Ensure a system compatible with the movement of people and freight.
h. Page 13: Coordinate with the Port of Olympia, … to ensure freight access routes are suitably designed and maintained for regular use by heavy trucks as well as for use by the other transportation modes.
i. Page 14: Ensure freight access routes are suitably designed and maintained for regular use by heavy trucks as well as for use by the other transportation modes.
j. Page 15: Provide adequate connections and access among all transportation modes that function as an integrated regional transportation system. The coordinate multi-modal transportation system will enhance choice in serving the mobility and accessibility needs of people and goods within and through Thurston County and minimize transportation-related fuel consumption and air pollution.
k. Page 15: Highways, streets, and roads should be designed and constructed to accommodate cars, transit, HOVs, pedestrians, bicycles, as well as trucks as appropriate.
l. Page 63: It is the City of Tumwater's goal to encourage bicycle and pedestrian travel by providing inviting, safe, convenient and connected routes, and to promote non-motorized travel as a viable transportation alternative.

Appendix H

Council Final Order

CITY OF TUMWATER
PLANNING COMMISSION RECOMMENDATION
AND
CITY COUNCIL FINAL ORDER

Application Number: Comprehensive Plan Amendment Application CPA #3-07: City of Tumwater 2025 Transportation Plan (Legislative Amendment Proposal)

I. PLANNING COMMISSION RECOMMENDATION

The City of Tumwater Planning Commission, having reviewed proposed changes to the Transportation Plan and all information and evidence presented at its July 10, 2007 public hearing, hereby adopts the following findings of fact and conclusions, to be forwarded to the City Council for consideration and final order. The relevant minutes of the Planning Commission public hearing are available at the Tumwater Planning and Facilities Department.

FINDINGS OF FACT

1. The City of Tumwater adopted a comprehensive plan in 1994 in accordance with the State Growth Management Act (GMA), RCW 36.70A.

2. RCW 36.70A.130 requires the City of Tumwater to update its comprehensive plan to ensure the plan complies with the GMA.

3. RCW 36.70A.130(2)(a) requires that amendments to an adopted comprehensive plan be considered concurrently and no more frequently than once every year.

4. The GMA requires the City of Tumwater to include a transportation element in its comprehensive plan. The City of Tumwater 2025 Transportation Plan will serve as the City's transportation element.

5. The proposed amendments were prepared in accordance with the State Environmental Policy Act and public participation/involvement procedures and requirements of the City of Tumwater and the GMA.

6. A notice of the Planning Commission public hearing was published and advertised in The Olympian newspaper on June 30, 2007.

7. A press release identifying the date, time, place and subject of the Planning

Commission public hearing was distributed to local news media on July 5, 2007.

8. The Planning Commission held a public hearing on the amendment proposal on July 10, 2007.

9. Any Conclusion that should be a Finding is hereby adopted as a Finding.

CONCLUSIONS OF LAW

1. The amendments have been processed in accordance with the State Growth Management Act Ch. 36.70A RCW.

2. The proposed amendments meet GMA requirements for consistency with the comprehensive plan and Countywide planning policies.

3. The City of Tumwater 2025 Transportation Plan promotes health, safety and welfare of the general public.

4. Any Finding that should be a Conclusion is hereby adopted as a Conclusion.

Recommendation:

The Tumwater Planning Commission takes action on this 28th day of August 2007, to recommend to the City Council that the 2025 City of Tumwater Transportation Plan be approved by ordinance, as a part of the City's annual Comprehensive Plan update.

PLANNING COMMISSION
CITY OF TUMWATER
STATE OF WASHINGTON

Debbie Sullivan

Debbie Sullivan, Chair

ATTEST:

Michael Matlock
Planning and Facilities Director

II. CITY COUNCIL FINAL ORDER

The Tumwater City Council, after review of the information, evidence, testimony and recommendation of the Tumwater Planning Commission, and having reviewed all additional evidence presented at its February 5, 2008 public hearing, hereby makes this final order to approve the City of Tumwater 2025 Transportation Plan, based upon the findings of fact recommended by the Planning Commission.

Order given this 5th day of Feb, 2008.

CITY COUNCIL
CITY OF TUMWATER
STATE OF WASHINGTON

Ralph C. Osgood, Mayor

ATTEST:

James Hendrickson, Acting Finance Director

APPROVED AS TO FORM:

Karen Kirkpatrick, City Attorney