



The city is conducting this public meeting using a hybrid model. The public is welcome to attend tonight's meeting in-person at City Hall (Council Chambers), or virtually by using the meeting access link below.

<https://sumnerwa-gov.zoom.us/j/82527384980>

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Or Telephone:

Dial(for higher quality, dial a number based on your current location):

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Webinar ID: 825 2738 4980

CALL TO ORDER

Roll Call: Bitetto, Bowman, Clerget, Cole, Elfers and Reinke

REGULAR BUSINESS

1. 2024 Comprehensive Plan - Transportation, Capital Facilities and Utilities Elements and Plans

CITY ADMINISTRATOR REPORT

AGENDA SETTING

1. Council Meeting Agenda Calendar
2. Council Committee Meeting Calendar

EXECUTIVE SESSION

ADJOURNMENT

This meeting is accessible to persons with disabilities. For individuals who may require special accommodations, please contact the City Clerk at (253) 299-5590, 24 hours in advance.

SUBJECT: 2024 Comprehensive Plan - Transportation, Capital Facilities and Utilities Elements and Plans

CATEGORY: Information Only

BUDGET IMPACT:

Expenditure Required: None

Within Budget Allocation: N/A

ATTACHMENTS:

1. Presentation
2. Staff Memo
3. Transportation Management Plan
4. Transportation Element
5. Capital Facilities Plan
6. Capital Facilities Element
7. Utilities Element
8. Staff Memo - Council Edits from 10-16 & 10-28

STAFF CONTACT: Ryan Windish, Community Development Director

SUMMARY BACKGROUND: The purpose of this meeting is to present the Planning Commission recommendations on the Comprehensive Plan's Transportation, Capital Facilities and Utilities Elements to the City Council. The review also includes supporting plans: Transportation Plan and Capital Facilities Plan. The Planning Commission's role is to review these elements as part of the Comprehensive Plan and other plans and development regulations, and make recommendations to the City Council. In April 2023, the Planning Commission started its review of the 2024 Comprehensive Plan Periodic Update. After multiple study sessions in 2023-2024 and a public hearing, the Commission made its final recommendations in September 2024.

The Council reviewed the first set of Comprehensive Plan updates on October 16, 2024 and a subsequent second set on October 28, 2024. City Council had some amendments to policies during the discussions which are presented in summary form. At the November 12, 2024 meeting staff will present updated Comp Plan Elements and plans as follows:

- Transportation Management Plan
 - Transportation Impact Fees Update
 - Transportation Element
 - Capital Facilities Plan
 - Capital Facilities Element
 - Utilities Element
 - Staff Memo - Council Edits from 10-16 & 10-28
-

COUNCIL COMMITTEE/STUDY SESSION: MEETING/STUDY SESSION DATE: 11/12/2024 COMMITTEE RECOMMENDATION:

STAFF RECOMMENDATIONS/MOTION:

Review the proposed Elements and Plans and provide edits/comments to staff and consultants.



Sumner Comprehensive Plan Periodic Update

City Council Study Session - 11/12/24

- *Transportation Element & Transportation Plan*
- *Capital Facilities Element & Capital Facilities Plan*
- *Utilities Element*

Overview

Transportation

- Objectives and Planning Process
- Transportation Plan
- Transportation Element

Capital Facilities & Utilities

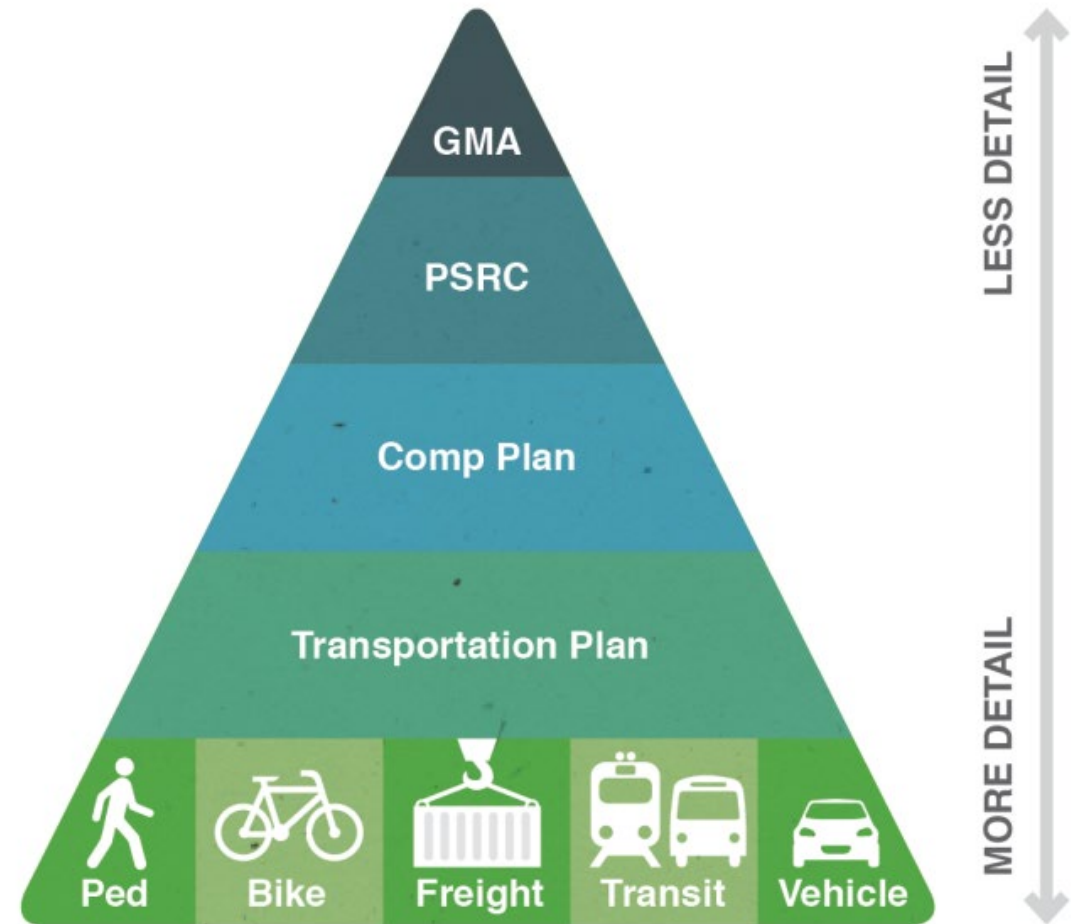
- Background on Capital Facilities Planning
- Capital Facilities Plan
- Park Impact fees
- Capital Facilities Element
- Utilities Element

Transportation

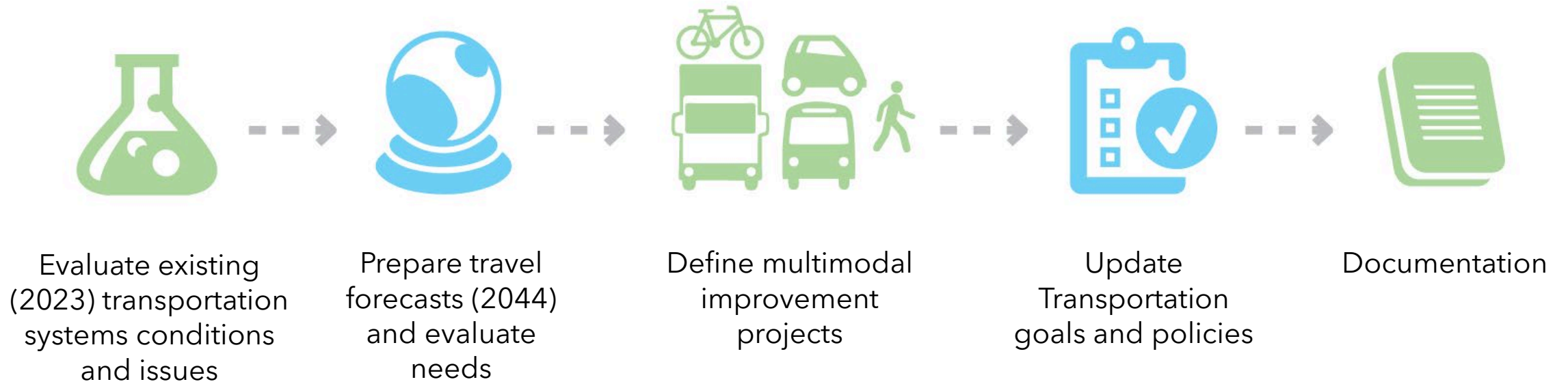


Transportation Element & Plan Objectives

1. Support overall Comprehensive Plan and City vision
2. Meet requirements of the Growth Management Act (GMA) and PSRC Vision 2050
3. Integrate and prioritize transportation improvements serving all modes
4. Review and update transportation policies
5. Establish multimodal level of service standards
6. Confirm sustainable transportation funding strategies



Planning Process



Balancing the Plan – Project Priorities

Multimodal Improvements

- Roadway widening & reconstruction
- Maintenance & preservation
- Pedestrian, bicycle, transit
- New corridors
- Safety

Concurrency/LOS

- Measures adequacy of facilities/services
- Timing of facilities/services

Funding Strategies

- Local Funding
- Transportation Impact Fees (TIF)
- Transportation Benefit District
- Grants
- Developer Mitigation

Transportation Plan

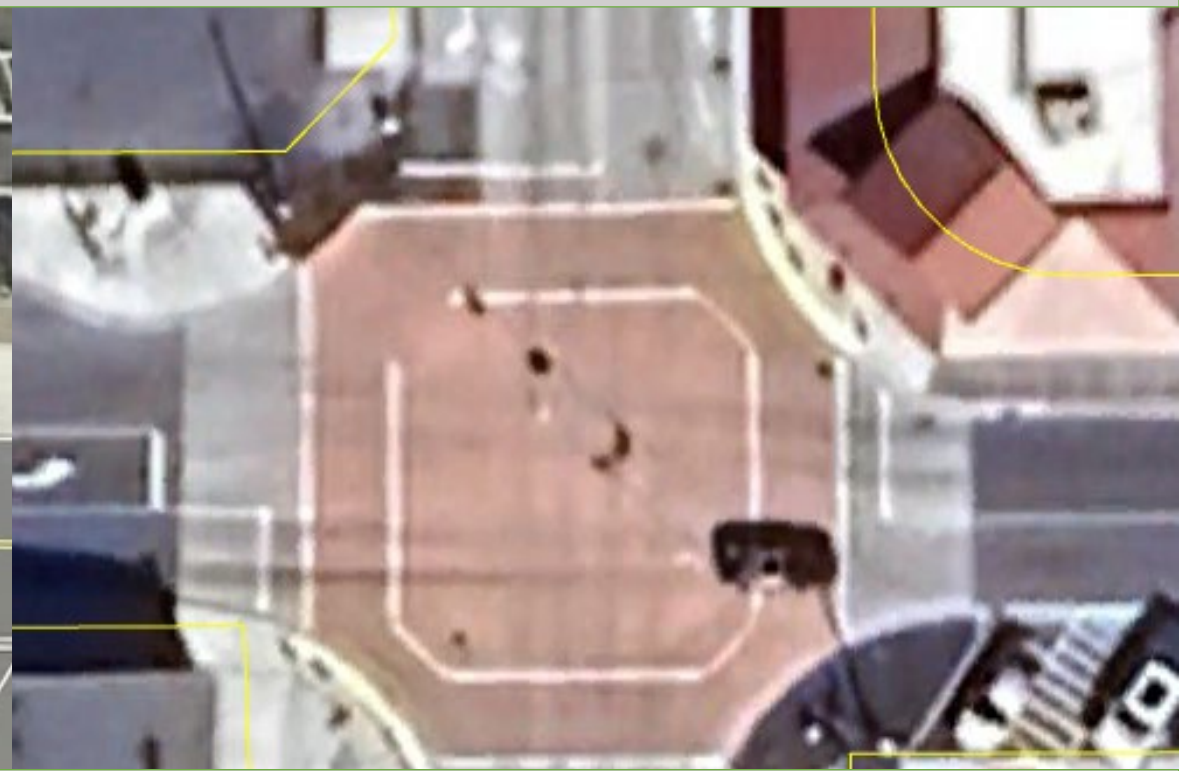
- New Level of Service (LOS) for pedestrian and bike infrastructure
- Updates to vehicle Level of Service (LOS) at various intersections
- Revised and new project costs/revenues for various transportation projects
- Revised Traffic Impact Fees (TIFs)

Transportation Element

New draft policies throughout the Transportation Element, for example:

- Pursuing the expansion of the Pierce Transit district to Sumner
- Prioritizing commuter connections to the Manufacturing Industrial Center (MIC)
- Support for bicycle and pedestrian modes
- Consistency with Town Center Plan and East Sumner Plan
- Stronger policies on environmental impacts and impacts to underserved populations

City of Sumner Traffic Impact Fees



Michael Kosa, P.E., Public Works Director

November 12, 2024

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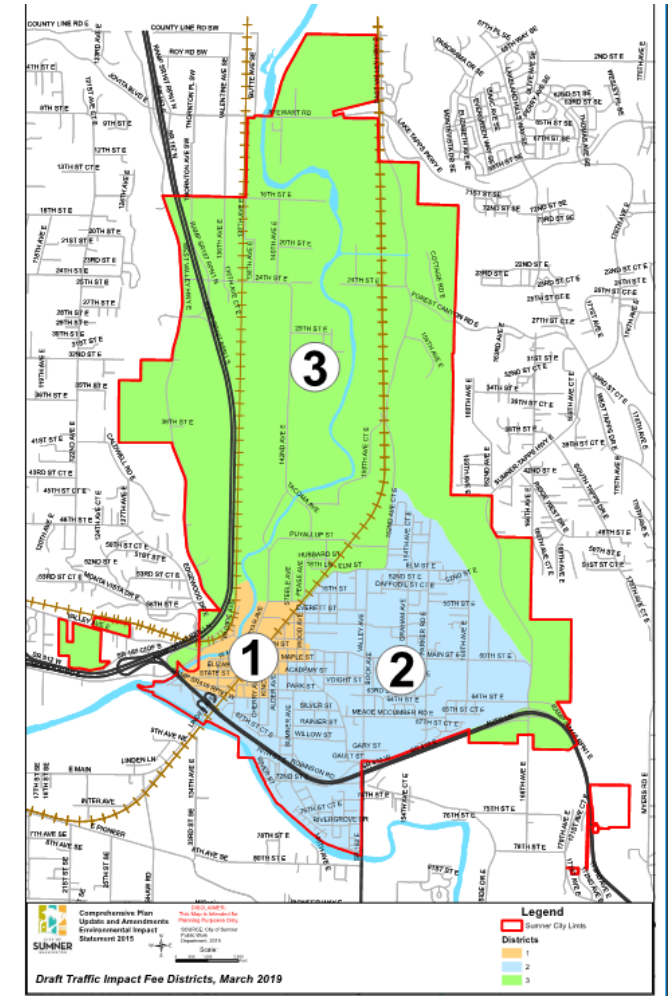
TIF Background - Fees

- What Are Transportation Impact Fees?
 - Fees paid by property developers
 - Residential, Commercial, Industrial
 - Offset the transportation impact of new development
- When Do We Update Them?
 - Periodically, 3-5 years
 - Comprehensive Plan update



Previous Ordinance Summary

- Adopts 11th ed. of Trip Generation Manual (was 10th)
- Eliminates 3-district model, adopts citywide district
- Updates Project List/Adds Multimodal Commute Projects
- Updates per trip fee per 2024 Comp / Transportation Plan
- *Effective Date: January 1, 2025*



What Occurred in the Past 6 Months

- Comprehensive Plan now scheduled for adoption January 6, 2025
- New trips were based on housing starts in the Draft Comprehensive Plan
- Housing starts were revised downward due to Dept of Commerce input, decreasing trips

	May 2024	Nov 2024
New Growth- Related Trips (housing units)	3,558 (3,000)	2,479 (1,985)

Recommended Revisions

1. Pass a Substitute Ordinance 2885:
 - Revise Effective Date to February 1, 2025

2. Adopt Revised Transportation Plan as Presented
 - Adjusted TIF projected allocations in Transportation Plan
 - Maintain TIF Vehicular project allocations “as-is”
 - Reduce Non-Motorized project allocations to match final New Growth-Related Trips

TIF Rate will remain as passed: \$7,452/new trip

Capital Facilities & Utilities

Background on Capital Facilities Planning

- The Washington State Growth Management Act (GMA) requires Comprehensive Plans to include a Capital Facilities element
 - Must include:
 - Inventory of capital facilities
 - Projected needs
 - Financing plan
 - The City must reassess the Land Use element if the projected needs cannot be financed
- Sumner fulfills these requirements through:
 - Policies in the Capital Facilities and Public Services Element (policy focus)
 - Capital Facilities Plan (analysis and documentation focus)



Capital Facilities Plan (CFP)

Proposed Changes

- Updated plan for consistency with other adopted plans (for example, school district capital facility plans and the 2020 General Water Plan)
- Updated inventory of capital facilities
- Updated levels of service for general government, police facilities, and parks to reflect current conditions and needs
- Updates to projected needs based on growth targets and levels of service
- Updated projects and financing

Findings: Deficits expected to occur by 2044 for general government square footage, police square footage, police officers, and parks

Capital facilities include:

- General government and police
- Water, sanitary sewer, stormwater
- Parks
- Fire and EMS
- Public schools
- Public streets and roads

CFP and Park Impact Fees

- CFP updates park levels of service based on the current rate of investment and amenities per capita
- As the city grows, the City needs to invest more in parks to maintain current levels of service
- The consultant team and staff are preparing an updated rate study for park impact fees
- Recent changes to case law and state law are also being considered in the analysis
 - Residential fees charged based on number of bedrooms (more bedrooms = higher fee)
 - Lower commercial and industrial charges (residents more likely to use parks than workers)
 - Accessory dwelling unit fees = half of single-family home fees



Capital Facilities Element

New draft policies throughout the Capital Facilities Element, for example:

- Updated policies to advance actions that reduce carbon emissions and promote climate resiliency
- New policy to protect Rivergrove neighborhood from flooding
- Updated policies on Police Level of Service (LOS) based on population demographics, number of calls for service, and other factors; Government Services LOS based on current conditions and needs; Parks LOS to continue serving the growing population at the current level of investment and amenities per capita
- Updated policies to match current Fire District LOS and Water and Sewer LOS from adopted plans
- New policies to address regional coordination and emergency response to utility issues
- Added policies to promote equitable access to utility services for underserved populations

Utilities Element

New draft policies throughout the Utilities Element, for example:

- Encouraging alternative energy options (while still accommodating natural gas)
- Encouraging undergrounding of utilities, particularly in Town Center
- Minimizing and requiring mitigation of impacts of telecommunications infrastructure to residential areas
- New policies to support equitable development and access to utilities, and connecting residents to State and other bill assistance and energy efficiency programs
- New policies in support of cooperative planning amongst providers
- New policies in support of implementing new technologies

Discussion

MEMORANDUM

DATE: November 12, 2024
TO: Mayor Hayden and City Council
FROM: Ryan Windish, Community & Economic Development Director
RE: **2024 Comprehensive Plan Update – Discussion of Transportation, Capital Facilities and Utilities**

I. BACKGROUND

The Comp Plan Update consists of the Comprehensive Plan with 18 Elements (chapters), an Environmental Impact Statement (Draft/Final EIS), updated Transportation Management Plan (TMP), Capital Facilities Plan (CFP), new regulations to implement the Comprehensive Plan, and a public outreach effort. City Council reviewed other elements at its October 16 and October 28 meetings. The purpose of this meeting is to present the remaining elements to the Council for discussion.

II. OVERVIEW OF PROPOSED UPDATES – Remaining Comprehensive Plan Elements

Included in the Council packet are updated elements of the Comprehensive Plan. These are: Transportation Element, Transportation Plan, Capital Facilities Element, Capital Facilities Plan, and Utilities Element. The City has hired BERK Consulting to assist in the major updates, with a subconsultant, Transpo Group, assisting in developing transportation policies and a new transportation management plan. The revisions are shown as underline/strikeout changes to the original adopted documents, and reflect the Planning Commission's recommendations. Below is a summary of the changes proposed to each element.

1. Transportation Element

- Extensive revisions to clean up redundancies and outdated info
- New policy stressing importance of maintenance
- New policy supporting food truck parking on streets where appropriate
- Added existing policies from Town Center Plan and East Sumner Plan to support the street design and circulation guidelines in those plans
- Update to the LOS standards for arterials and collectors
- New policy to pursue the expansion of the Pierce Transit district to Sumner
- Updated and new policies to support multimodal (ped and bike) modes
- New policy to prioritize commuter connections to MIC as primary employment center
- Added policies to consider transportation decision impacts on underserved populations
- Strengthen policies related to reducing environmental impacts and considering environmental justice in decisions about transportation/streets
- Updated existing and added new policies about improving air quality to emphasize reducing greenhouse gas emissions.
- Updated maps for various transportation modes.
- Added policy to consider in prioritizing projects based on the needs of underserved communities.
- New policy that supports charging a multimodal transportation impact fee (new State allowance).

2. Draft Transportation Management Plan

- Used to implement and fund the infrastructure that supports Sumner's transportation needs.
- Establishes level of service (LOS) standards for the various transportation modes.
- Update includes additional pedestrian/bicycle routes, updated project costs/revenues for various projects in the transportation system.
- Updated maps for various transportation modes.
- Update includes revised Traffic Impact Fees (TIFs), including a potential increase in TIFs, based on the Preferred Alternative decision and how impacts are distributed.
- Text added to reflect Preferred Alternative analysis in comparison to the DEIS alternatives
- Additional explanation of vehicle trips generated under the Preferred Alternative
- Updated Table of 20-Year Transportation Improvement Projects.

3. Capital Facilities Element

- New policies related to social equity in capital facilities planning and programs.
- Update policies to advance actions that reduce carbon footprint, greenhouse gases and promote climate resiliency.
- New policy to specifically address actions to protect the Rivergrove neighborhood from flooding.
- Updated policies to address more current Police Level of Service (LOS); new LOS is recommended based on new demographics of population, number of calls for service and other factors.
- Updated policies to match current Fire District LOS
- Updated policies related to Government Services LOS; new LOS is recommended to replace 2015 estimate based on current data.
- Updated policies to align current LOS for water and sewer with adopted plans.
- Updated data to reflect the recently adopted 2024 Parks and Trails Plan.
- New policies to address regional coordination and emergency response to utility issues.
- Added policies to promote equitable access to utility services for underserved populations.

4. Draft Capital Facilities Plan

- Updated policies to match current Fire District LOS
- Updated policies related to Government Services LOS; new LOS is recommended to replace 2015 estimate based on current data.
- Updated policies to align current LOS for water and sewer with adopted plans.
- Updated data to reflect the recently adopted 2024 Parks and Trails Plan.
- New policies to address regional coordination and emergency response to utility issues.
- Added policies to promote equitable access to utility services for underserved populations.

5. Utilities Element

- Extensive revisions to clean up redundancies and outdated info.
- New policies to support alternative energy and technology.
- New policy to encourage undergrounding of utilities, particularly in Town Center
- New policy to require telecommunications facilities to avoid impacts to residential areas.
- Added policies to support utility access to historically underserved communities.
- New policies to support cooperative planning amongst providers.

III. STAFF RECOMMENDATION

Staff requests that the City Council review the proposed updated Elements and suggest edits or comments to staff.

IV. EXHIBITS

- Transportation Management Plan
- Transportation Element
- Capital Facilities Plan
- Capital Facilities Element
- Utilities Element

EXHIBITS

DRAFT COMPREHENSIVE PLAN DOCUMENTS

November 12, 2024

1. Transportation Management Plan
2. Transportation Element
3. Capital Facilities Plan
4. Capital Facilities Element
5. Utilities Element

City of Sumner Final Transportation Plan

October 2024



Consultant Team
Transpo Group

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Executive Summary

The Transportation Plan provides the link between the Land Use Element and the transportation facilities and services needed to support growth during the next twenty years. This is accomplished by identifying capacity, operational, and safety improvements along City roadways and by addressing multimodal needs such as transit, pedestrian, and bicycle facilities.

The City has identified a range of goals and policies to implement the Transportation Plan efficiently and effectively. The goals and policies are outlined elsewhere, in the Transportation Element of the Comprehensive Plan. The Transportation Element strives to emphasize the importance of pedestrians and bicycles and prioritizes the creation of a network of multimodal transportation.

Inventory of Existing Transportation System

An inventory of the existing Sumner transportation system was conducted in Spring and Summer 2023. The inventory covers the street system, traffic volumes, traffic operations, traffic safety, transit and rail service, and pedestrian and bicycle facilities. The inventory is used in updating the City's travel demand model to determine the future traffic conditions for this 2024 Sumner Transportation Plan.

Street System. The street system inventory includes discussion of Sumner roadway functional classifications, which is the hierarchy of roadways in the city. The classifications act as a guide for future development of the street system. Sumner also has adopted a formal truck route plan to manage truck traffic within its city limits.

Daily and weekday PM peak hour traffic volumes were also reviewed to understand the amount of vehicle traffic carried on the city streets. Daily traffic volumes have grown; however, the City's weekday PM peak hour traffic volumes have changed less than 1 percent per year since the 2015 Transportation Plan was completed and along some roadways traffic volumes have decreased. Since the COVID-19 pandemic travel patterns have changed with more people working from home or having flexible work hours such that they may not commute during the evening period.

Traffic Volumes and Operations. Traffic volumes were used to evaluate traffic operations for Sumner's key intersections. Traffic operations analysis provides a quantitative method for evaluating existing and future transportation conditions. The nationally recognized Highway Capacity Manual (HCM) level of service (LOS) method is used to evaluate intersection operations of Sumner facilities. Five intersections do not meet the currently adopted LOS standard during the weekday PM peak hour operating at LOS E or F. The poor operations are known issues at the SR 162 and SR 410 WB Ramps and the East Valley Highway/Forest Canyon Road E intersection due regional traffic impacts. The existing traffic operations are considered in developing the transportation improvement program documented in Chapter 5 of this Plan.

Traffic Safety. Citywide collision records for the last 5-years (2018-2022) are used to identify potential safety issues for vehicles, pedestrians, and cyclists. Of the 21 serious injury and fatal crashes, over 20 percent involved pedestrians and about 5 percent involved bicyclists. The most frequently reported collision type was rear-end crashes, which often occur in congestion or stop-and-go traffic. The review of

traffic safety is used to inform decisions related to street and intersection improvements documented in Chapter 5 of this Plan.

Transit and Rail Service. Sumner is currently not served by Pierce Transit, which limits transit options and accessibility within the city. The only transit stop in the city is at the Sumner Sounder Train Station and is served by Sound Transit. Sound Transit's Sounder S line offers commuter rail service between Lakewood and downtown Seattle with stops in Tacoma, Puyallup, Sumner, Auburn, Kent, and Tukwila. The transportation improvement program documented in Chapter 5 of this Plan considers the need to collaborate with Pierce Transit on potential future transit service based on anticipated growth of the city.

Freight Train Traffic. Sumner has Burlington Northern Santa Fe (BNSF) and Union Pacific (UPRR) lines. There are currently 71 trains that run through Sumner on the BNSF tracks and 10 trains on the UPRR line daily. Based on a review of Washington State's Joint Transportation Committee Road-Rail Safety Study Crossing Analysis, additional trains are anticipated in the future along the BNSF and UPRR lines in Sumner.

Pedestrian and Bicycle Facilities. The city is striving to create a fully integrated transportation system and recognizes the need to prioritize locations where it expects heavy non-motorized use, such as routes connecting residential areas to recreational facilities and schools, and places of employment. Sidewalks are located intermittently around the city, mostly along arterial roadways located within Sumner's downtown and nearby neighborhoods. There are limited formal bicycle facilities in Sumner. To prioritize the pedestrian and bicycle system for Sumner, Chapter 4 describes recommended level of service (LOS) guidelines.

Transportation Demand Management. The City of Sumner has adopted a Commute Trip Reduction (CTR) program. The CTR program establishes goals consistent with State legislation.

Technology. Transportation System Management and Operations (TSMO) is an integrated approach to optimize the performance of existing infrastructure by implementing multimodal, intermodal, and often cross-jurisdictional systems, services, and projects. Most of the city's current transportation infrastructure is outdated and there are limited abilities to provide TSMO without future upgrades. In addition, electric vehicles are also considered transportation technology. There is no City-provided charging infrastructure in the right-of-way or on City-owned properties (e.g., public parking lots).

[Travel Forecasts and Alternatives Evaluation](#)

Sumner's Transportation Plan is developed based on the evaluation of the existing and future transportation system needs. Travel forecasts were developed by updating the Sumner's travel demand model based on the 20-Year land use plan. The model is a tool that converts existing and future land uses into trips. Four land use alternatives were evaluated to identify transportation needs for vehicles, bicycle, and pedestrian modes including updates to the transportation programs and improvement projects. Recommendations are made to update the vehicle LOS policy and adopt a new pedestrian and bicycle LOS policy. The future needs for the transportation system are identified by evaluating the level of service (LOS) for vehicles, pedestrians, and bicycles. The outcome of the analysis is a list of programs and projects to support the Sumner 20-Year growth plan.

Transportation Improvement Program

The alternatives analysis, financing, and goals and policies were used to develop a comprehensive transportation improvement program (TIP) for the City. The program addresses existing and forecast needs within the 20-year planning horizon. Key recommendations for the Sumner transportation improvement program are:

1. Monitor the transportation system against the Transportation Plan.
2. Add a signal replacement program to the maintenance and operations program.
3. Explore additional transit service for Sumner including getting involved in the Pierce Transit long-range planning efforts.
4. If public transit service is provided within Sumner in the future, the City should adopt a transit LOS.
5. Adopt the non-motorized system and LOS standards.
6. Adopt the list of multimodal transportation improvements and continue to monitor the establishment LOS by mode to ensure the improvements continue to support the goals and policies.

The list of 20-Year improvements is provided in Exhibit 5-5 beginning on page 50.

Finance and Implementation

The GMA requires the Transportation Plan to include a multi-year financing plan based on the identified needs in the transportation improvement program. The financing plan for the Transportation Plan provides a basis for the City's annual Six-Year Transportation Improvement Program (TIP).

Finance. Key funding sources for the city include fees and taxes, grants, partnerships with other agencies, developer funding improvements and transportation impact fees (TIFs).

Part of the finance strategy is to update the transportation impact fee. The update recommends eliminating the current TIF approach with three districts and having one fee schedule for the entire city to simplify the structure and make the fee equitable throughout the city. The fee update, including non-motorized transportation improvements, is \$7,452 per weekday PM peak hour vehicle trip. Staff will review and recommend options for the City Council to determine what fee is ultimately selected. The remaining funds not covered by the TIF, or other revenue sources would be made up with sources like grants.

Reassessment. The funding strategy is partially based on grants and other outside funding that the city does not control. The city may be able to shift revenues from other funding programs to address specific needs as yearly budgets are prepared or consider other revenue options such as increasing the vehicle license tab fee. The City is committed to reassessing their transportation needs and funding sources each year as part of their annual Six-Year Transportation Improvement Program (TIP). This allows the city to match the financing program with the shorter-term improvement projects and funding.

Implementation. Implementation includes coordination with developers and partnering with other agencies to construct the transportation improvement projects. Partnering with other agencies and use of grants will be especially critical in the implementation of safety, capacity, and operational improvements along SR 167 and SR 410. This may include re-prioritizing roadway projects as new

funding sources become available or by focusing on areas most impacted by new development. The City will also continue to review strategies for phasing improvements allowing funding to be spread over a longer period. In addition, the city will need to review, maintain, and update its Concurrency Management Program, Transportation Impact Fee, and other development review processes to account for the revised multimodal LOS standards and assure that the impacts of growth are mitigated, and transportation improvements are completed concurrent with new development.

Consistency with Other Agencies

The GMA works to increase coordination and compatibility between the various agencies that are responsible for the overall transportation system. As part of the Transportation Plan, consistency with nearby transportation agencies is reviewed including Washington State Department of Transportation (WSDOT), Pierce County Sound Transit, Auburn, Pacific, Edgewood, and Puyallup. The Plan is consistent with nearby agencies and the city is committed to continuing to partner with these agencies to improve transportation for the community.

1. Introduction

The City of Sumner adopted its first Transportation Plan in January 1993. In 1994, the City adopted a Comprehensive Plan consistent with the Growth Management Act (GMA) and the Transportation Plan was updated in 2002 and 2015. Amendments to the 2015 Transportation Plan were adopted in 2017, 2019, and 2020.

The Transportation Plan provides the link between the Land Use Element and the transportation facilities and services needed to support growth during the next twenty years. This is accomplished by identifying capacity, operational, and safety improvements along City roadways and by addressing multimodal needs such as transit, pedestrian, and bicycle facilities. The Transportation Plan reflects the interdependence of transportation and land use and is influenced by choices made as part of the Land Use Element. Conversely, land uses are similarly influenced by choices and policies made in the Transportation Plan.

The Transportation Plan implements the City's Transportation Element, which is a key component of the City's Comprehensive Plan which works hand-in-hand with other Comprehensive Plan Elements. The Transportation Element identifies the City of Sumner's goals and policies for transportation as well as the City's future transportation system and facilities, level-of-service (LOS) standards, and concurrency monitoring system. Future land uses proposed as part of the Land Use Element are used to develop transportation strategies and to identify necessary transportation facilities (roadways, sidewalks, trails, bike lanes, etc.). Similarly, the Capital Facilities Element and the City's ongoing Transportation Improvement Program (TIP) present specific facility recommendations based on the Transportation Plan and Transportation Element.

The Plan update includes an inventory of existing transportation facilities and services, development and analysis of 2044 travel forecasts, evaluation of needs and deficiencies, identification of transportation system improvements consistent with goals and policies, and financing strategies. The Plan update also addresses requirements for a concurrency program and the multimodal transportation impact fee (TIF) program.

Growth Management Act

The Transportation Element was developed in accordance with the Washington State Growth Management Act (GMA). The GMA requires that the following topics be addressed within the Transportation Plan:

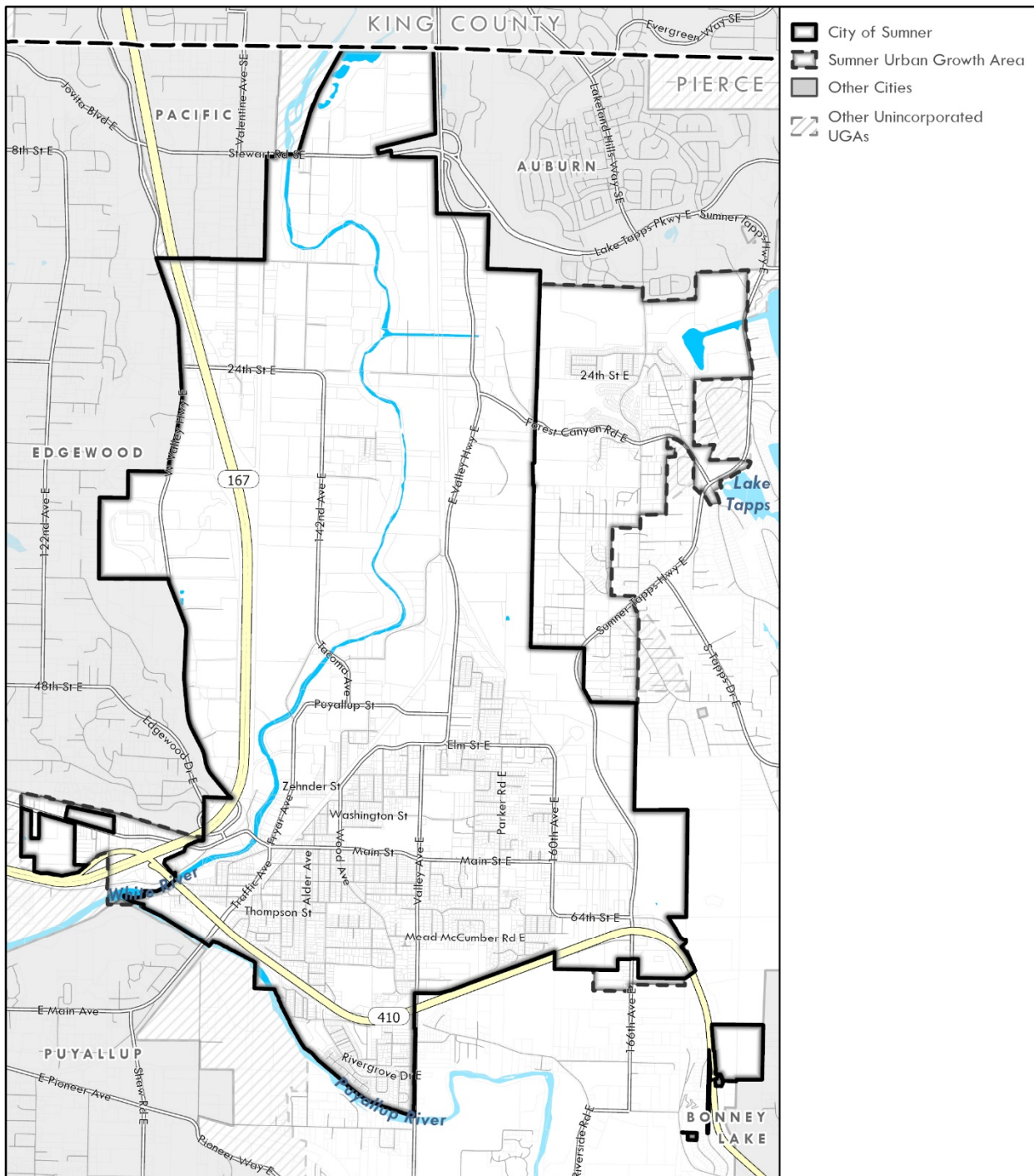
- Land use assumptions used in estimating travel demand.
- Facility and service needs, including an inventory of air, water, and ground transportation facilities and services, transit alignments, general aviation/ airport facilities, and state-owned transportation facilities within the city's jurisdictional boundaries.
- Level of service (LOS) standards to gauge the performance of the system.

- Identification of actions and requirements needed to bring existing facilities and services up to standard.
- Forecasts of future traffic based on the land use plan.
- Identification of improvements and programs needed to address current and future transportation system deficiencies, including Transportation Demand Management strategies.
- A realistic multi-year financing plan that is balanced with the adopted level of service standards and the land use element.
- An explanation of intergovernmental coordination strategies and regional consistency.
- Local transportation elements must also include the following:
 - Estimated traffic impacts to State-owned transportation facilities resulting from land-use assumptions.
 - LOS for state-owned transportation facilities.
 - Identification and assessment of GMA concurrency and the applicability to highways of statewide significance.
 - A pedestrian and bicycle component that includes collaborative efforts to identify and designate planned improvements for pedestrian and bicycle facilities and corridors that address and encourage enhanced community access and promote healthy lifestyles.

Study Area

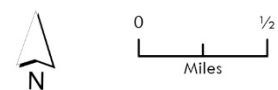
The study area includes all areas within Sumner City limits and Urban Growth Area (UGA). The UGA has been delineated with Pierce County, consistent with the requirements of the GMA. The transportation planning study area is shown in Exhibit 1-1. The city lies adjacent to the UGAs of the City of Pacific and City of Auburn (north) and the City of Edgewood (west). Unincorporated areas of Pierce County also surround portions of Sumner.

Exhibit 1-1. Study Area



CITY OF SUMNER

Transportation Plan Study Area



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

2. Goals and Policies

The City has identified a range of goals and policies to implement the Transportation Plan efficiently and effectively. The goals and policies are outlined elsewhere in the Transportation Element of the Comprehensive Plan. The Transportation Element strives to emphasize the importance of pedestrians and bicycles and prioritizing the creation a network of multimodal transportation-related improvements and policies to ensure that vehicle traffic can coexist with the community's need for a safe and comfortable active transportation environment. It also recognizes the need for the City to work with other transportation service providers to plan, design, fund, and implement transportation projects and programs to serve the community.

The goals and policies provide a framework for decision making related to transportation projects and programs. The transportation goals and policies cover the following elements:

7. Citywide Transportation Goal
8. Public Involvement
9. Agency Coordination
10. Transportation System Mobility and Efficiency
11. Subarea Plans Transportation and Circulation System
12. Pedestrians and Bicycles
13. Commuter Rail and Transit
14. Commute Trip Reduction and Transportation Demand Management (TMD)
15. Equity in Transportation-Related Decisions
16. Land Use and Environmental Considerations
17. Program Financing and Implementation

The transportation goals and policies will be used by the City in deciding how to secure and use funding, decisions related to new land use development applications, and coordination with other City planning objectives.

3. Inventory of Existing Transportation System

The transportation system within the City of Sumner includes streets and highways, pedestrian and bicycle facilities, and transit and rail service. An inventory of the existing transportation system was conducted in Spring and Summer 2023. This transportation system inventory and associated analyses provide a baseline for the existing transportation system and aid in identifying key transportation issues addressed in the update of the Plan. The inventory covers the street system, traffic control, traffic volumes, traffic operations, traffic safety, transit and rail service, and pedestrian and bicycle facilities. The inventory is used in updating the City's travel demand model to determine the future traffic volume forecasts for the 2023 Sumner Transportation Plan.

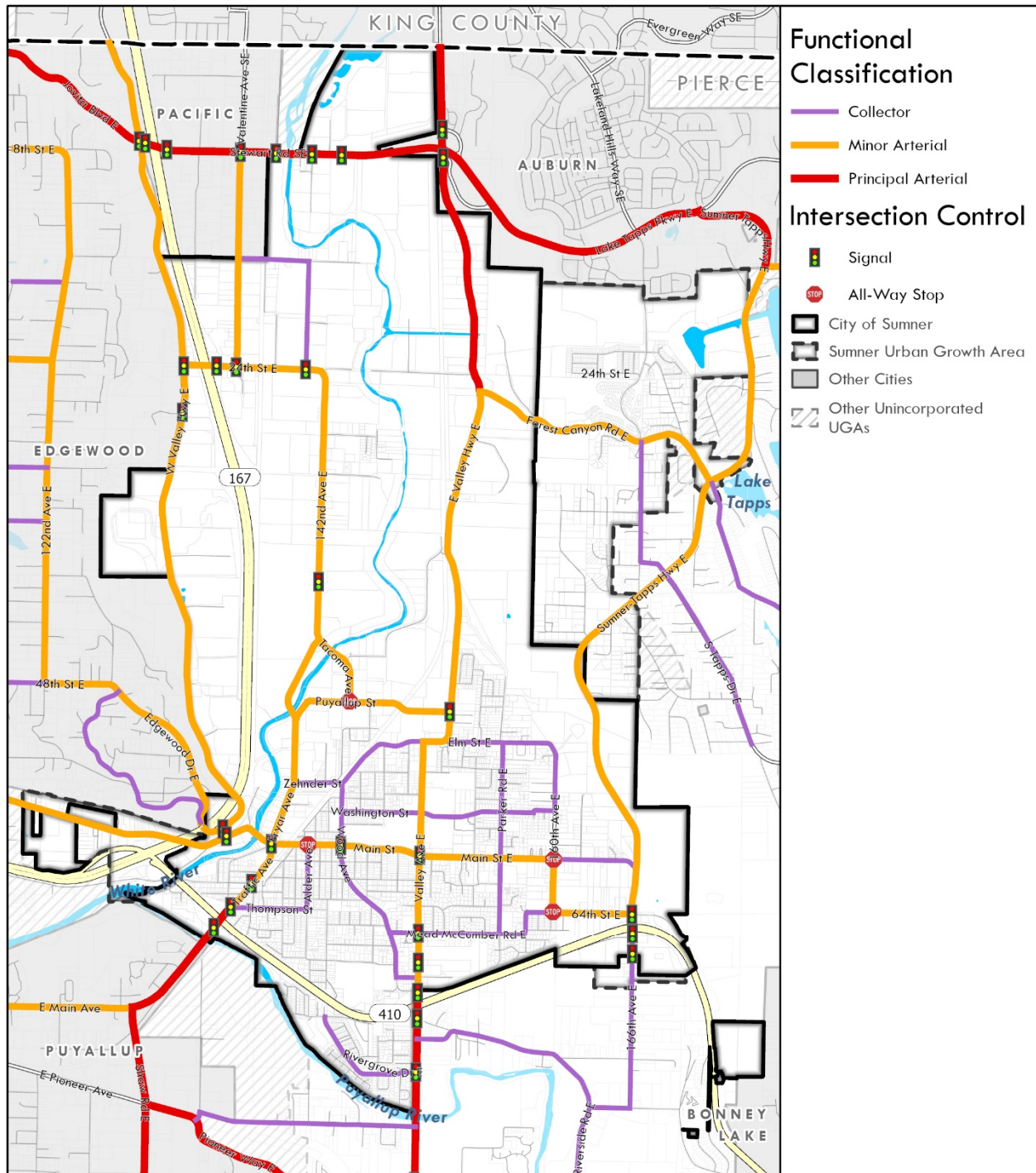
Freeways, Arterials, and Collectors

Exhibit 3-1 summarizes the existing traffic control and functional classification of the city street system. Roadway functional classification provides for a hierarchy of roadways. These classifications also act as a guide for future development of the overall street system. The city's functional classifications include principal arterials, minor arterials, collectors, and local streets. Arterial streets serve higher traffic volumes and may have few access points. Collector streets link arterials and local streets and may provide access to individual parcels. Collectors are also vital in connecting the residential areas to the central business district and are excellent candidates for multimodal facilities. Local streets provide neighborhood circulation and access to individual parcels.

The city also has two freeways, State Route (SR) 167 and 410 that run through it. The State has designated SR 167 as a Highway of Statewide Significance (HSS). HSS facilities provide and support transportation functions that promote and maintain significant statewide travel and economic linkages. Improvement plans for this HSS facility are developed from a statewide perspective. This planning includes policy development and accompanying funding support to represent a broad range of interests that depend on the facility. Because of its designation as an HSS facility, the State has the authority of setting the level of service (LOS) standards for SR 167. SR 410 is a State Highway of Regional Significance. LOS standards for SR 410 are established by the Puget Sound Regional Council (PSRC), in consultation with WSDOT.

Exhibit 3-2 provides a summary of the key characteristics of the roadway serving Sumner.

Exhibit 3-1. Existing Traffic Control and Functional Classification



CITY OF SUMNER

Existing Traffic Control and Functional Classification

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: February 2024

Exhibit 3-2. Characteristics of Key Roadways Serving Sumner

Roadway	Classification	Jurisdiction	Number of Travel Lanes	Posted Speed Limit	Parking?	Sidewalks?	Bicycle Facilities?
North-South Roadways							
SR 167	Freeway	WSDOT	4	60 mph	No	No	No
Valley Avenue	Minor/Principal Arterial ¹	Sumner	2 to 3	25 mph	No	Yes	Yes
Traffic Avenue	Minor Arterial ²	Sumner	4 to 5	25 mph	No	Yes	No
Fryar Avenue	Minor Arterial	Sumner	3	25 mph	No	Yes	Yes
142nd Avenue E	Minor Arterial	Sumner	5	35 mph	No	Yes	No
136th Avenue E	Minor Arterial	Sumner	3	30 mph	No	Yes	No
East Valley Highway	Minor Arterial ³	Sumner	2 to 3	25 mph	No	No	No
West Valley Highway	Minor Arterial	Sumner	2 to 4	35 mph	No	Yes	No
Sumner-Tapps Highway	Minor Arterial	Sumner	2	45 mph	No	No	No
Cannery Way (formerly Bridge Street)	Minor Arterial	Sumner	2	25 mph	No	Yes	No
Valley Avenue E	Minor Arterial	Sumner	2	25 mph	No	No	No
160th Avenue E	Minor Arterial ⁴	Sumner	2	25 mph	Yes	No	No
Sumner Heights Drive	Collector	Sumner	2	25 mph	No	Yes	No
Alder Avenue	Collector	Sumner	2	25 mph	Yes	Yes	No
Wood Avenue	Collector	Sumner	2	25 mph	Yes	Yes	No
158th Avenue E	Collector	Sumner	2	25 mph	No	Yes	No
Parker Road	Collector	Sumner	2	25 mph	No	Yes	No
East-West Roadways							
SR 410	Freeway	WSDOT	4	55 mph	No	No	no
24th Street E	Minor Arterial	Sumner	2 to 5	35 mph	No	Yes	No
Main Street	Minor Arterial	Sumner	2	25 mph	Yes	Yes	No
Stewart Road	Principal Arterial	Sumner	2-5	35 mph	No	Yes	No
Puyallup Street	Minor Arterial	Sumner	2	25 mph	No	Yes	No
Forest Canyon Road	Minor Arterial	Sumner	2	25 mph	No	No	No
64th Avenue E	Minor Arterial	Sumner	2	25 mph	Yes	Yes	No
Zehnder Street	Collector	Sumner	2	25 mph	No	Yes	No
Thompson Street	Collector	Sumner	2	25 mph	Yes	Yes	No
Elm Street	Minor Arterial Collector ⁵	Sumner	2 to 3	25 mph	No	Some ⁶	No

Roadway	Classification	Jurisdiction	Number of Travel Lanes	Posted Speed Limit	Parking?	Sidewalks?	Bicycle Facilities?
Meade-McCumber Road	Collector	Sumner	2	25 mph	Yes	Yes	No
Washington Street	Collector	Sumner	2	25 mph	No	Yes	No
Rivergrove Drive	Collector	Sumner	2	25 mph	Yes	Yes	No
Riverside Drive	Collector	Sumner	2	35 mph	No	No	No

Note: WSDOT = Washington State Department of Transportation; mph = miles per hour

1. Principal arterial south of SR 410
2. Principal arterial south of Thompson Street
3. Principal arterial north of Forest Canyon Road
4. Collector north of Main Street E
5. Minor Arterial between Valley Avenue and East Valley Highway and Collector Arterial from Valley Avenue and Wood Avenue and East Valley Highway and 160th Avenue E.
6. Elm Street does not have sidewalks on portions between Valley Avenue and Wood Avenue

Traffic Volumes

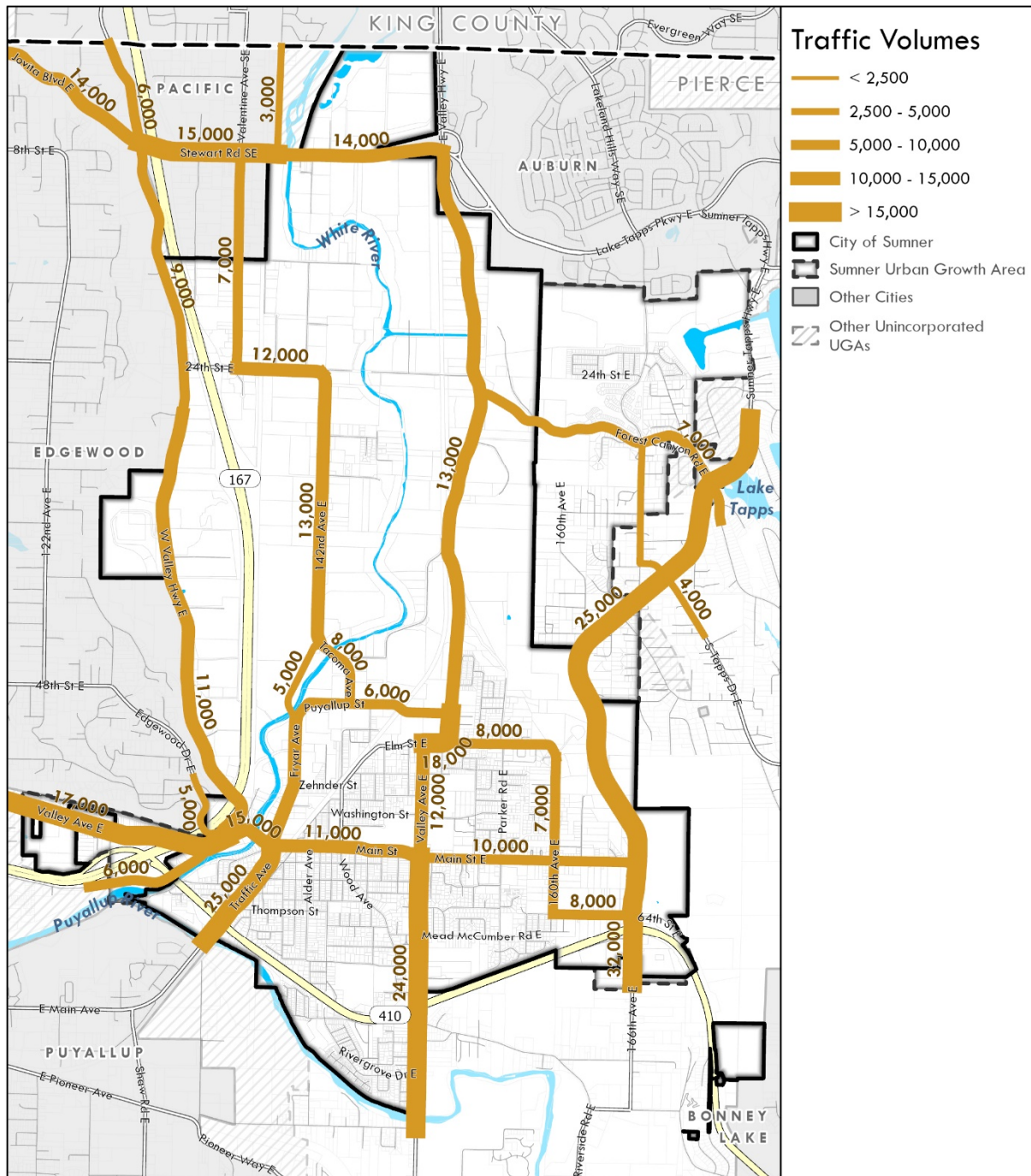
Daily traffic volumes were provided by the city and weekday PM peak hour traffic volumes were generally collected in February and November 2023 by IDAX at key intersections throughout the city. Exhibit 3-3 illustrates the average daily traffic volumes along key streets serving the city. Exhibit 3-3 shows daily traffic volumes along Valley Avenue E (SR 162) and Sumner-Tapps Highway within the City. Main Street in the Town Center area has about 11,000 vehicles per day while Stewart Road in the industrial area has about 14,000 vehicles per day.

Exhibit 3-4 summarizes the rates of growth along Sumners major corridors compared to 2014/2013 PM peak hour traffic volumes.

As shown on Exhibit 3-4, the weekday PM peak hour traffic growth was largest at intersections serving the northern part of the city industrial areas, where most of the growth has been concentrated over the past ten years. The largest increase in weekday PM peak hour traffic volumes occurred at the intersection of 142nd Avenue and 24th Street E, where traffic increased by 5 percent annually. At the access ramps to SR 167, traffic volumes have grown modestly between one tenth of a percent to 1.5 percent annually. The City's lowest growth in volumes occurred along the SR 162/Valley Avenue corridor. This pattern of little to no change in traffic volumes is thought to be a result of changing patterns in weekly commuter patterns. Since the COVID-19 pandemic travel patterns have changed with more people working from home or having more flexible hours when they may not commute daily or during the evening period.

Overall, the City's traffic volumes have changed less than 1 percent per year since the 2015 Transportation Plan was completed.

Exhibit 3-3. Existing Daily Traffic Volumes



CITY OF SUMNER

Daily Volume Bandwidth

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



0 1/2
Miles



CITY OF
SUMNER
WASHINGTON

Map Date: February 2024

Exhibit 3-4. Weekday PM Peak Hour Roadway Volumes and Annual Growth¹

Roadway	Cross-Street	2013/2014 PM Peak Volumes	2023 PM Peak Volumes	PM Peak Annual Growth Rate
W Valley Hwy E	Jovita Blvd	1,880	2,020	0.80%
SR 167 SB Ramps	Stewart Rd SE	1,550	1,770	1.50%
SR 167 NB Ramps	Stewart Rd SE	1,770	1,790	0.10%
140th Ct E2	Stewart Rd SE	1,250	1,550	2.40%
West Valley Hwy	24th St SE	1,160	1,350	1.70%
SR 167 NB Ramps	24th St SE	1,200	1,290	0.80%
136th Ave E2	24th St E	1,260	1,580	2.60%
142nd Ave E2	24th St E	790	1,230	5.00%
East Valley Hwy	Forest Canyon Rd	1,460	1,520	0.50%
West Valley Hwy	SR167 SB Ramps	1,060	1,240	1.80%
142nd Ave E	Costco Access	-	940	-
West Valley Hwy E	42nd St E	630	590	-0.70%
Tacoma Ave	Puyallup St	813	860	0.70%
East Valley Hwy	Puyallup St	1,500	1,490	-0.10%
East Valley Hwy	Elm St	1,430	1,430	-0.10%
Valley Ave	Elm St	1,140	1,120	-0.20%
Fryar Ave	Zehnder Ave	1,040	1,090	0.60%
West Valley Hwy	Sumner Heights Dr E	880	820	-0.80%
Valley Ave E	Sumner Heights Dr E	1,240	1,180	-0.60%
Traffic Ave	Main St	2,070	2,070	0.00%
Alder Ave	Main St	880	750	-1.90%
Wood Ave	Main St	1,170	980	-1.90%
Valley Ave	Main St	1,970	1,806	-1.00%
Parker Rd	Main St	1,070	970	-1.20%
160th Ave (Van Tassel Rd)	Main St (60th St E)	1,050	1,090	0.40%
Sumner-Tapps Hwy (166th Ave E)	Main St (60th St E)	1,650	1,550	-0.70%
Traffic Ave	Maple St	1,430	1,500	0.60%
Traffic Ave	SR 410 WB Ramps (Thompson St)	2,300	2,500	0.90%
Traffic Ave	SR 410 EB Ramps	2,160	2,690	2.50%
Valley Ave	Meade Mc Cumber Rd E	1,490	1,440	-0.40%

Roadway	Cross-Street	2013/2014 PM Peak Volumes	2023 PM Peak Volumes	PM Peak Annual Growth Rate
Parker Rd	Meade Mc Cumber Rd E	250	350	3.70%
160th Ave E	64th St E	500	630	2.50%
Sumner- Tapps Hwy (166th Ave E)	64th St E	1,900	2,060	0.90%
Sumner-Tapps Hwy E (166th Ave E)	SR 410 WB Ramps	1,960	2,010	0.30%
Sumner-Tapps Hwy (166th Ave E)	SR 410 EB Ramps	1,780	1,680	-0.60%
Valley Ave	Gary St	1,480	1,450	-0.20%
SR 162	SR 410 WB Ramp	1,920	1,770	-0.90%
SR 162	SR 410 EB Ramp	2,090	2,150	0.30%
SR 162	74th St E	1,770	1,920	0.90%
SR 162	Rivergrove Dr	1,590	1,530	-0.40%

Note:

1. PM Peak Volumes rounded to the nearest tenth.

Truck Traffic

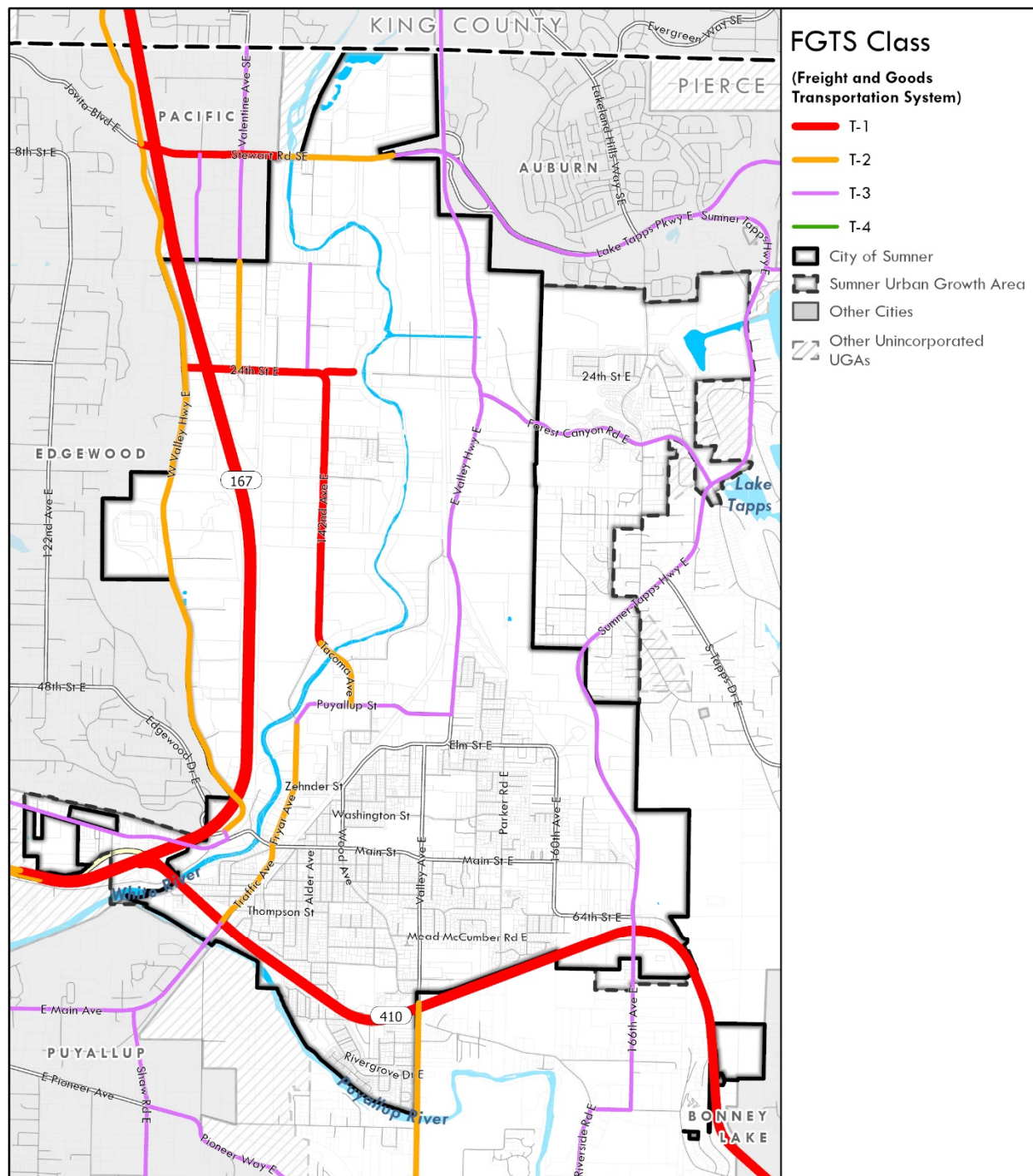
The availability of industrial land and its proximity to the SR 167, SR 410, I-5 freeway corridors has made Sumner an attractive place for trucking-related developments such as warehousing and distribution centers.

Sumner has adopted a formal truck route plan to manage truck traffic within its city limits. Exhibit 3-5 illustrates the existing truck routes. Existing truck traffic is routed around the perimeter of the residential and commercial sections of Sumner. Truck traffic entering and exiting Sumner from the industrial areas to the north is served by the two SR 167 interchanges at Stewart Road and 24th Street E.

Sumner's warehouse and industrial area generates heavy truck traffic volumes on 136th Avenue E and Stewart Road on movements to and from SR 167. Heavy truck traffic is significant not only because of its impact on traffic flow but because of the impact on parking and the structure of the roadways. There are limited places where truck parking is allowed and some areas along truck routes have not been designed sufficiently for trucks.

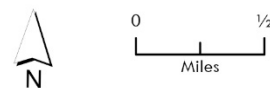
Several roadways within the city are classified as T-2 or T-1 level roadways in the Washington State Freight and Goods Transportation System (FGTS). These roadways carry between 4 and 10 million tons (T-2) or more than 10 million tons (T-1) per year, depending on their classification. Sumner roadways classified as T-1 include 142nd Avenue E from Tacoma Avenue to 24th Street E, and 24th Street E from West Valley Highway to 142nd Avenue E. The City's T-2 designated truck routes include Traffic Avenue from SR 410 to Main Street, Fryar Avenue from Main Street to Puyallup Street E, West Valley Highway from Sumner Heights Drive to 16th Street E, and Stewart Road from Butte Avenue SE to the City Limits.

Exhibit 3-5. Existing Truck Routes



CITY OF SUMNER

Existing Truck Routes



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

Traffic Operations

Traffic volumes were used to evaluate traffic operations in Sumner. Traffic operations analysis provides a quantitative method for evaluating existing and future transportation conditions. The City's operational standard is presented along with the analysis methodology. A discussion of existing traffic operations is also provided.

Analysis Methodology

Traffic operations were evaluated for the existing year (2023) based on the level of service (LOS) methodologies of the Highway Capacity Manual (HCM) (Transportation Research Board). The HCM is a nationally recognized and locally accepted method of measuring traffic flow and congestion. Criteria range from LOS A, indicating free-flowing conditions with minimal vehicle delays, to LOS F, indicating extreme congestion with long vehicle delays. At signalized intersections, LOS is measured in terms of average delay per vehicle. At unsignalized intersections, LOS is measured in terms of the average vehicle delay and is typically reported for the worst traffic movement instead of for the whole intersection. Appendix A includes an in-depth discussion of LOS.

Intersection LOS analysis was performed for major intersections within the study area based on 2023 conditions. Like the scope of the previous study in 2015, 43 intersections were selected for analysis, based on location and likelihood that they might be impacted by future growth. Turning movement counts collected in February and November 2023 were used in this analysis.

The study area current LOS standards are set by Sumner, Pacific, and WSDOT. The current adopted LOS standards set by each jurisdiction are summarized below:

- City of Sumner¹
 - LOS D all intersections except as specifically noted
 - Exception to the LOS D standard are:
 - Traffic Avenue/Main Street/Fryar Avenue (LOS F)
 - Main Street/Alder Avenue (LOS F)
 - Valley Avenue East/Main Street (LOS F)
 - West Valley Highway East/Valley Avenue/Sumner Heights Drive (LOS F)
- City of Pacific
 - LOS D (Butte Avenue SE/Stewart Road SE)
- WSDOT/PSRC²
 - LOS D for Highways of Statewide Significance (HSS) in urban areas
 - LOS C for Highways of Statewide Significance (HSS) in rural areas
 - LOS D for Regional Significance State Highways (RSSH), Tier 2

¹ 2015 Sumner Transportation Plan

² Level of Service Standards for Washington State Highways, 2010

Because SR 167 is a designated HSS, the State requires local jurisdictions to adopt this LOS standard for HSS facilities in their Comprehensive Plans. For non-HSS facilities, the State requires that an agency coordinate with WSDOT in establishing a LOS standard for those facilities. SR 410 and SR 162 are not HSS-designated facilities. Puget Sound Regional Council (PSRC) has adopted LOS standards for regionally significant state highways or state transportation facilities that are non-HSS such as SR 410 and SR 162. SR 162 and SR 410 both Tier 2 RSSH. Based on the PSRC tiered LOS system, both SR 410 and SR 162 have an adopted LOS D standard. SR 410 is also part of the National Highway System within the City.

Sumner has significant regional traffic that diverges onto the local roadway system due to congestion on the regional network. Exhibit 3-6 illustrates the existing weekday PM peak hour LOS at the study intersections. Existing traffic operations were analyzed based on the procedures documented in the Highway Capacity Manual 6th Edition or 2000 when the 6th Edition method is unable to evaluate the operations. The analysis uses Synchro 11.0 for signalized and stop controlled intersections. Detailed LOS and delay summary is provided in Appendix B.

Generally, traffic operations have remained consistent over the last 10 years. Four intersections do not meet the currently adopted LOS standard during the weekday PM peak hour operating at LOS E or F including:

- Stewart Rd SE/Butte Ave SE (LOS F) - unsignalized (signal being installed)
- E Valley Hwy E/Forest Canyon Rd E (LOS F) - unsignalized
- Sumner-Tapps Hwy E/SR 410 WB Ramps (LOS F) - unsignalized
- Valley Ave/74th St E (LOS F) - unsignalized

Stewart Road/Butte Avenue SE is in the City of Pacific and there is an improvement project to signalize this intersection that will be completed by the end of 2023.

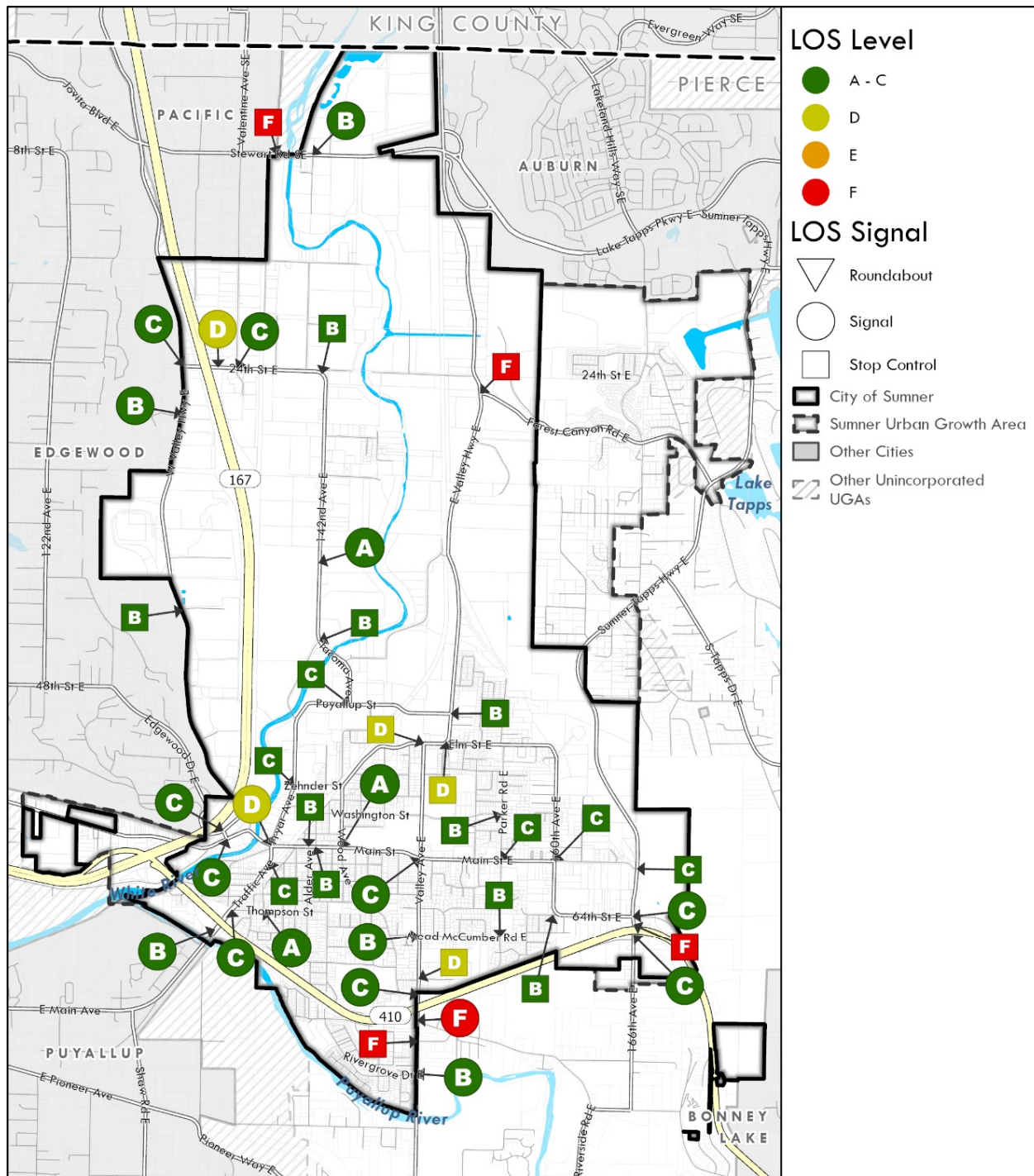
Exhibit 3-7 provides a comparison between 2015 and 2023 LOS, delay, and worst movements at the study intersections not meeting the adopted LOS standard or showing a trend towards increased delay. Poor operations are known issues at the SR 162 and SR 410 WB Ramps and the East Valley Highway/Forest Canyon Road E intersection. The City of Sumner's 6-Year Transportation Improvement Program 2024-2029 includes improving the Stewart Road SE/Butte Avenue SE intersection. The city is currently installing a new signal and adding turn lanes at the Stewart Road SE/Butte Avenue SE intersection.

In addition, two intersections currently meet adopted LOS standards yet show a trend (more than one LOS difference) toward increased delay and are included in the summary table. The intersections showing a negative trend in operation are:

- SR 167 NB Ramps/ 24th Street E - signalized
- Sumner-Tapps Highway E/64th Street E - signalized

The city has identified improvements at the Sumner-Tapps Highway E/64th Street E intersection as part of improvements at the SR 410/166th Avenue E/Sumner-Tapps Highway interchange.

Exhibit 3-6. Existing Weekday PM Peak Hour Level of Service



CITY OF SUMNER

Existing Weekday PM Peak Hour Level of Service

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: February 2024

Exhibit 3-7. 2015 and 2023 Weekday PM Peak Hour Level of Service Comparison

Intersection		2015 PM Peak Hour			2023 PM Peak Hour		
Major Rd	Minor Rd	LOS ¹	Delay ²	WM ³	LOS ¹	Delay ²	WM ³
Stewart Rd	Butte Ave SE	Not Studied in 2015			F	186	SB
East Valley Hwy E	Forest Canyon Rd	D	29	WB	F	327	WB
Sumner-Tapps Hwy E	SR 410 WB Ramps	F	>50	WB	F	61	WB
Valley Ave	74th St E	C	19	WB	F	110	EB
SR 167 NB Ramps	24th St E	A	7	-	D	36	-
Sumner Tapps Hwy E	64th St E	A	9	-	C	22	-

Notes:

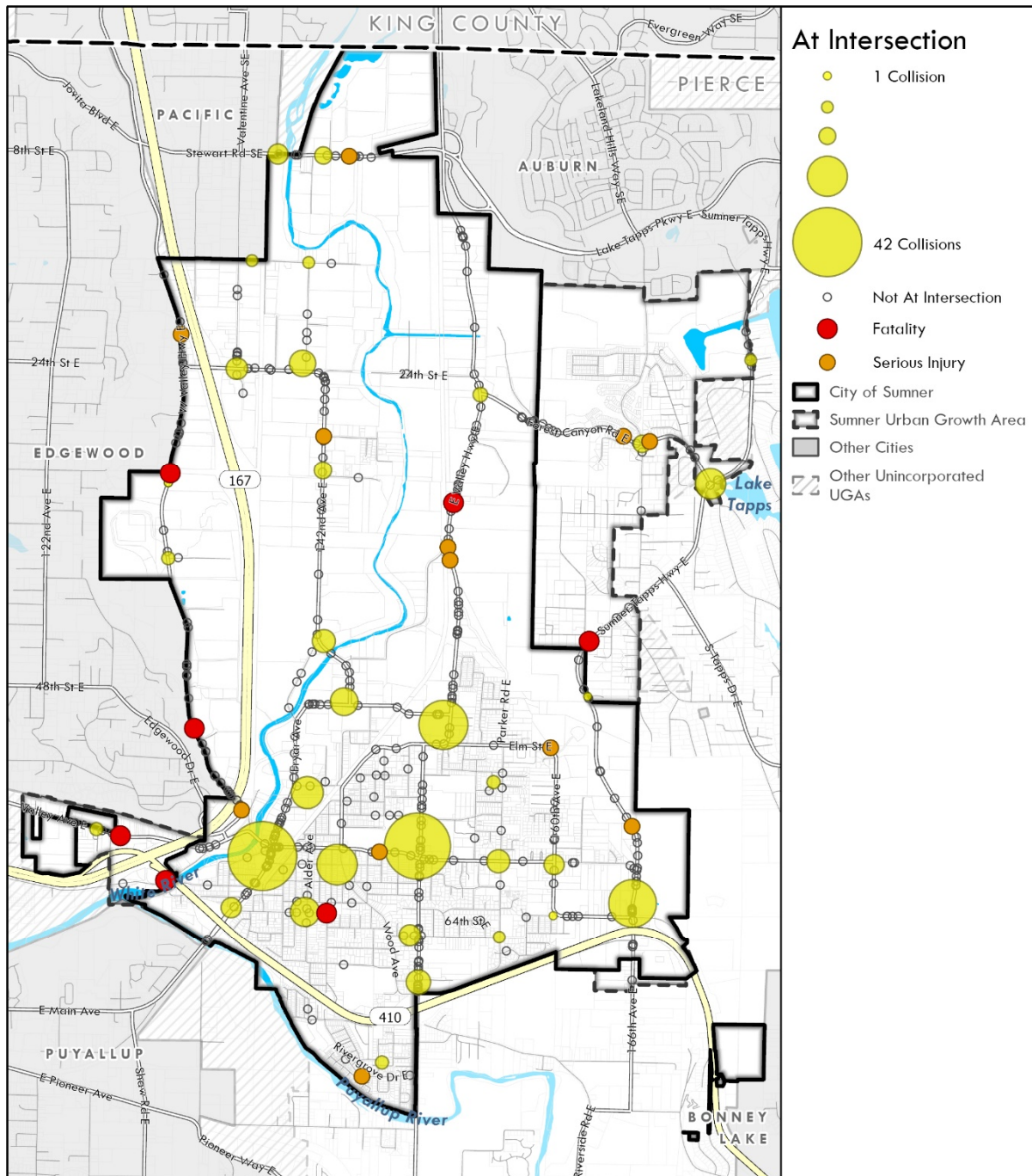
1. LOS = level of service based on the Highway Capacity Manual (HCM)
2. Average delay in seconds per vehicle.
3. WM means worst movement and SB means southbound, WB means westbound, NB means northbound, EB means eastbound.

Traffic Safety

A review of citywide collision records was completed to identify potential safety issues for vehicles, pedestrians, and cyclists. The traffic safety analysis included collision data for a five-year period from January 1, 2018 through December 31, 2022. This information was provided by WSDOT for SR 162, SR 167, SR 410, and all roadways within City limits. A map of Sumner's Collision History is shown on Exhibit 3-8.

Four (4) fatalities and 17 serious injury crashes occurred over the 5-year period. The number of collisions occurring at locations in the city are generally low to moderate with a moderate concentration of collisions occurring along Main Street, Traffic Avenue and 166th Avenue E/Sumner Tapps Highway.

Exhibit 3-8. Sumner 5-Year (2018-2022) Collision History



CITY OF SUMNER

Sumner 5-Year (2018-2022) Collision History

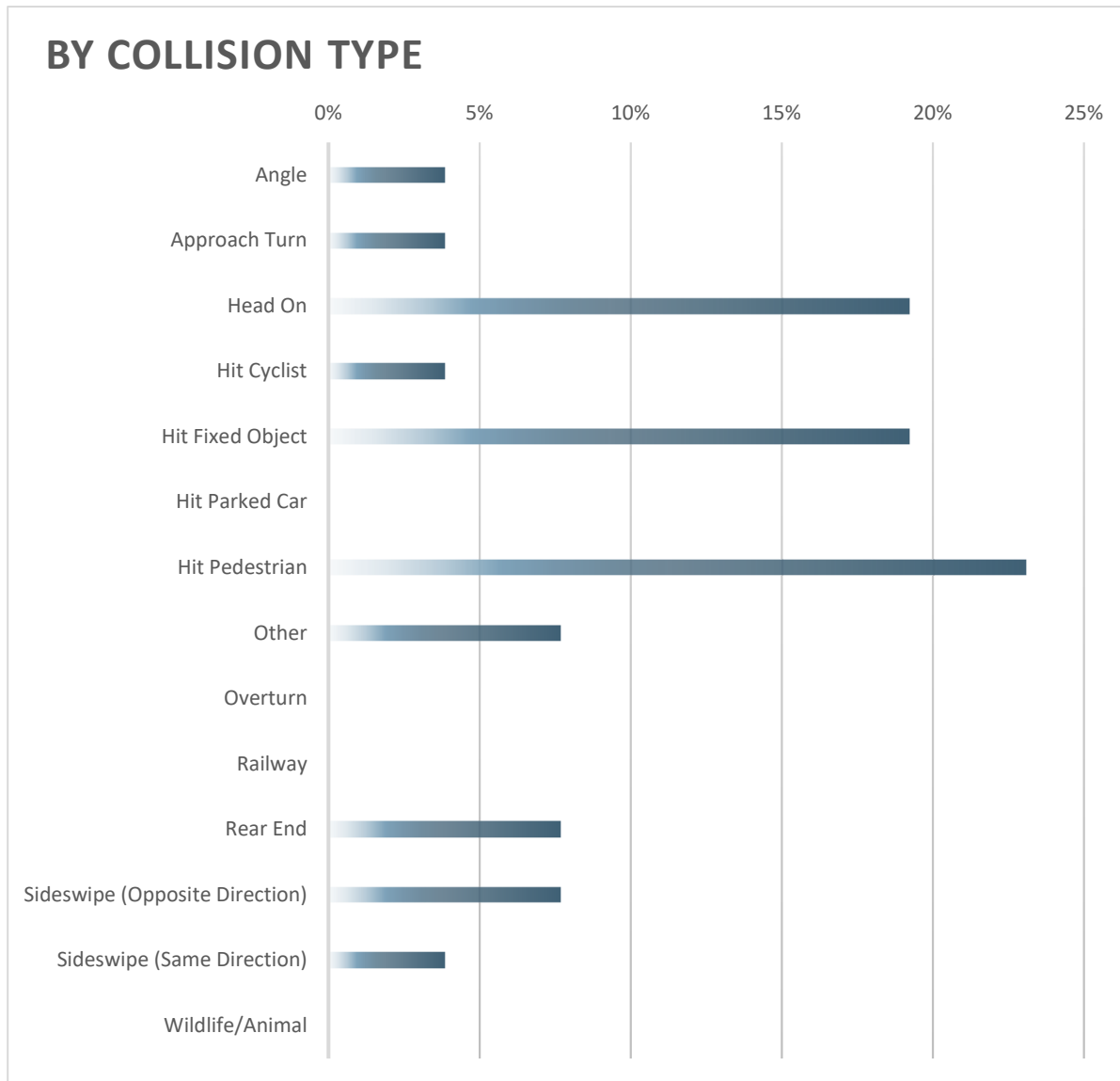
Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: February 2024

A total of 1,603 collisions over the five-year period were recorded. Of these, 21 crashes resulted in a serious injury or fatal (SIF) outcome. Exhibit 3-9 shows the collision types for fatal and serious injury collisions. Of the serious injury and fatal crashes, over 20 percent involved pedestrians and about 5 percent involved bicyclists. Intersection improvements identified to address operations or safety are identified in Chapter 5.

Exhibit 3-9. Fatal and Serious Injury Collision Types



The most frequently reported collision type was rear-end crashes, which often occur in congestion or stop-and-go traffic. Rear-end crashes accounted for approximately 40 percent of all the crashes in the five-year period.

Transit Service and Rail Service

Transit Service

Sumner is currently not served by Pierce Transit, which limits transit options and accessibility within the city. The only transit stop in the city is at the Sumner Sounder Train Station and is served by Sound Transit. Exhibit 3-10 illustrates the bus Sound Transit bus routes, which are described below.

Sound Transit Route 578 provides service between Seattle to Puyallup. This service is intended to be a Sounder train shadow and currently runs with one stop at the Sumner train station, stops in Puyallup, and Federal Way, and three stops in Seattle. Service is provided between 6 a.m. and 12 a.m. on weekdays. The route operates on 60-minute headways on weekdays and weekends.

Route 596 provides shuttle service between Bonney Lake Park and Ride and the Sumner Sounder Station. The route operates on 25-minute headways on weekdays and there is no weekend service. This route is scheduled in coordination with the train schedule to shuttle commuters to and from the Bonney Lake Park and Ride. Service is provided between 5 a.m. and 8 p.m. on weekdays.

The City of Sumner is currently operating a "last mile" shuttle service pilot project from the Sumner Sounder Station to businesses in the Manufacturing/Industrial Center (MIC) that operates during the commuter train service times. The single 14-passenger shuttle offers service for a paid fare of \$3 per ride and is often partially subsidized by the employer.

Pierce County also provides Beyond the Borders Connector, a local on-demand bus service, which helps eligible residents access public transportation, medical services, employment, shopping, and social activities. There is no cost to riders. Use of the service is unlimited, and riders can get on and off at all stops throughout the community and ride multiple times each day.

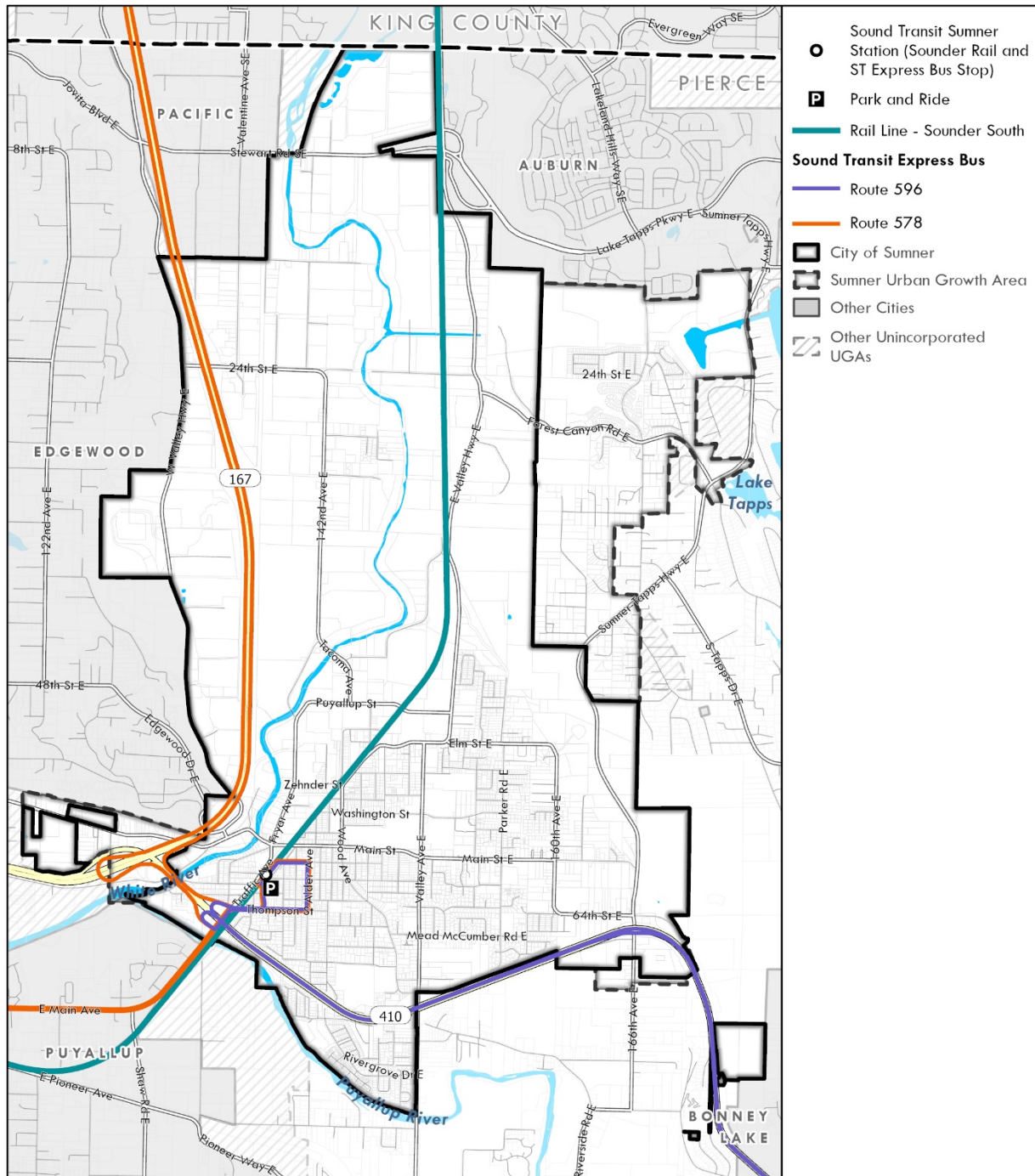
Commuter Rail Service

Sound Transit's Sounder S line offers commuter rail service between Lakewood and downtown Seattle with stops in Tacoma, Puyallup, Sumner, Auburn, Kent, and Tukwila. The Sounder service shares the Burlington Northern Santa Fe (BNSF) tracks. The Sumner Station is located south of Maple Street between Narrow and Traffic Streets in downtown Sumner. There are currently three morning and ten afternoon trains southbound and ten morning trains and three afternoon trains northbound serving the Sumner Station during the commute hours. According to Sound Transit, 130 total parking spaces are available near the Sumner commuter rail station with an additional 500 parking spaces proposed as part of Sound Transit's Sumner Access Improvement Project parking garage.

Sound Transit's ridership dramatically decreased during the pandemic in 2020 and continues to slowly recover. Although the Sounder ridership is over 3 million riders less per year compared to 2019, the Sound Transit's Transit Transportation Development Plan 2023-2028 indicates service saw nearly double the ridership in 2022 compared to 2021. Daily boardings continue to increase with the S Line, which serves Sumner, having an average of 6,500 daily boardings as of June 2023³.

³ Sound Transit Ridership Report accessed June 2023 <https://www.soundtransit.org/ride-with-us/system-performance-tracker/ridership>

Exhibit 3-10. Existing Transit Service



CITY OF SUMNER

Existing Transit Service

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: February 2024

Freight Train Traffic

The BNSF railroad lines run north-south through the City of Sumner. The Union Pacific (UPRR) line is located on the west side of the White (Stuck) River, paralleling SR 167. The BNSF rail line is located on the east side of the White (Stuck) River and runs through downtown Sumner paralleling Traffic Avenue. Sound Transit's Sounder Service uses BNSF tracks. There are currently 71 trains that run through Sumner on the BNSF tracks and 10 trains on the UPRR line daily. The projected rail use by 2035 is 102 on the BNSF tracks and 27 on the UPRR tracks.⁴

Pedestrian and Bicycle Facilities

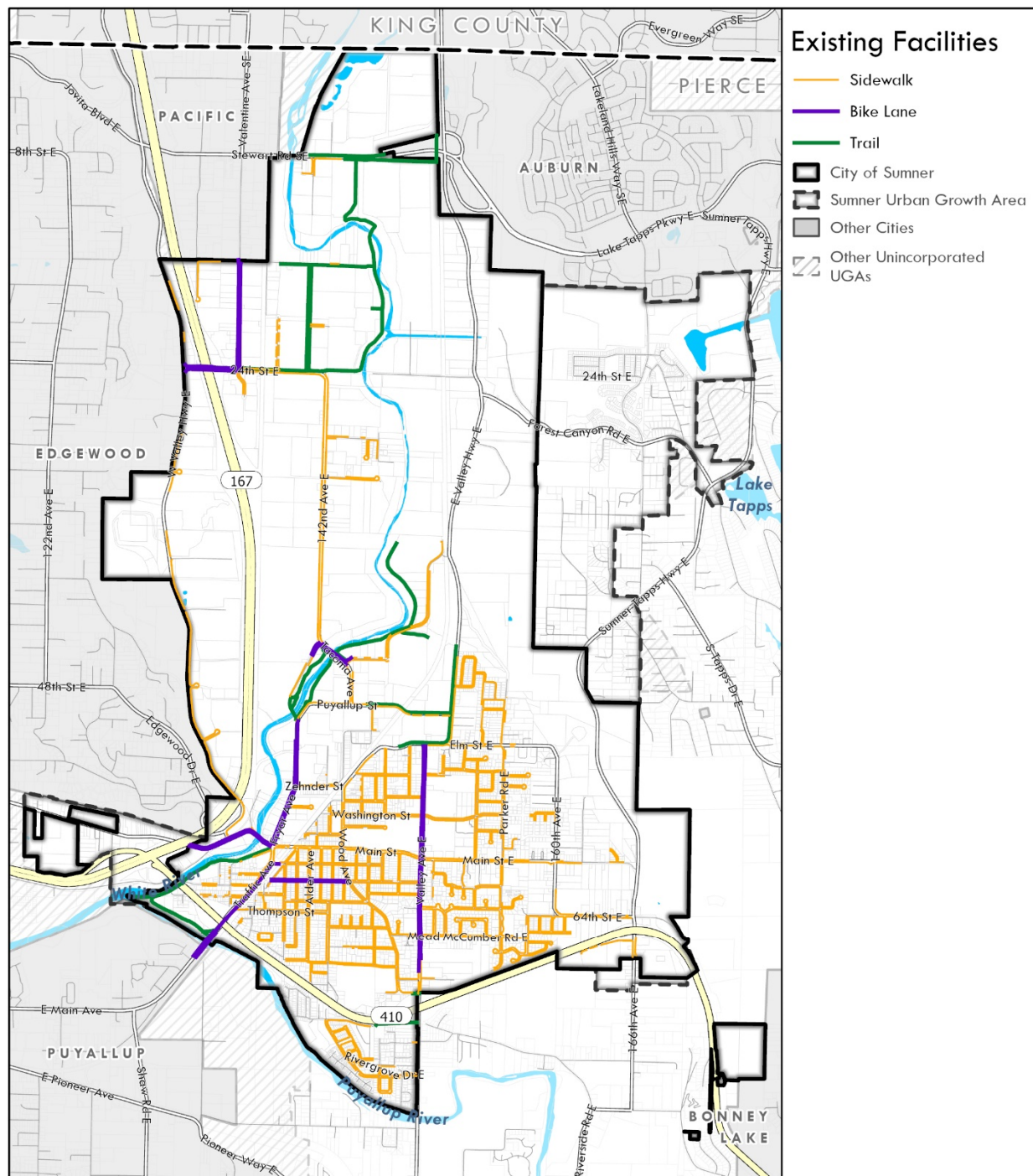
Continuity in pedestrian and bicycle access within the city provides for increased safety, comfort, and ease for residents and recreational users. The city is striving to create a fully integrated system for these modes of transportation and recognizes the need to prioritize locations where it expects heavy non-motorized use, such as routes connecting residential areas to recreational facilities and schools, and places of employment.

Exhibit 3-11 illustrates the current non-motorized system within the city. The city's existing transportation system was historically designed and constructed for vehicular traffic. The existing system provides access for people on foot, bike, or other modes primarily with sidewalks, bike lanes, and off-street trails. Sidewalks are located intermittently around the city, mostly along arterial roadways located within Sumner's downtown and nearby neighborhoods.

There are limited formal bicycle facilities in Sumner. For the most part, bicyclists share the road with motorized traffic or use paved roadway shoulders, where available. Formal bike lanes are present along Valley Avenue, Fryar Avenue and Academy Street.

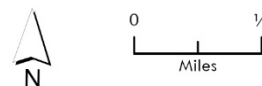
⁴ State of Washington Joint Transportation Committee Road-Rail Safety Study Crossing Analysis ([Joint Transportation Committee Road-Rail Study Crossing Analysis \(transpogroup.com\)](https://transpogroup.com)) accessed November 2023.

Exhibit 3-11. Existing Non-Motorized Facilities



CITY OF SUMNER

Existing Non-Motorized Facilities



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

Transportation Demand Management

The City of Sumner has adopted a Commute Trip Reduction (CTR) program. The CTR program establishes goals consistent with State legislation. The individual demand management strategies that are typical elements of the CTR and Transportation Demand Management (TDM) programs are different for employment and residential developments.

Manufacturing and Industrial Center (MIC) and Town Center Subarea Plans described TDM strategies to reduce employment and residential drive-alone trips, including shuttles and transit options, improving bicycle and pedestrian connectivity and incentive programs led by employers. In 2023 the City of Sumner began a shuttle pilot program, BusUp, in partnership with employers in the MIC to provide a “last mile” service from the downtown transit station to the MIC.

Technology

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

Most of the city’s current transportation infrastructure is outdated and there are limited abilities to provide TSMO without future upgrades. The city is currently looking into investments in fiber optic systems and will be considering what upgrades are needed and to leverage the fiber project to allow for TSMO.

In addition, as the use of electric vehicles (EVs) continues to grow within transportation systems, it becomes essential to establish an accessible EV charging infrastructure. Currently, there is no City-provided charging infrastructure in the right-of-way or on City-owned properties (e.g., public parking lots).

4. Travel Forecasts and Alternatives Evaluation

Sumner's Transportation Plan is developed based on the evaluation of the existing transportation system and future transportation system needs based on planned future growth. GMA requires that the transportation planning horizon be at least ten years in the future. The City of Sumner selected a 2044 horizon year. Year 2044 provides a long-range look at the transportation system needed to support anticipated growth in the city and other communities in northern Pierce County. Travel forecasts have been developed and analysis has been conducted for average weekday conditions during the PM peak hour. The weekday PM peak hour generally has the highest overall traffic volumes in the community and thus provides the basis for identifying capacity related improvement needs.

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

- Committed Improvement projects in Sumner's current Transportation Improvement Program (TIP)
- Improvement projects in available transportation plans from adjacent jurisdictions
- Puget Sound Regional Council's (PSRC) Transportation Vision 2050 Update Regional Capacity Projects List (as of May 2022)
- WSDOT's 2023-2026 Statewide Transportation Improvement Program
- Sumner's forecast land use data (for four alternatives)
- PSRC 2050 Land Use Targets forecasts and regional trip end data from the 2050 regional travel demand model.

Based on these assumptions, travel forecasts were developed using Sumner's travel demand model. The model is a tool that is used to convert existing and future land uses into trips. The following provides an overview of the land use assumptions, travel demand model, and the alternatives analysis. The travel forecasts provide a technical basis for identifying the transportation improvement projects in the transportation systems plan.

Land Use Data

A strong relationship exists between land use and the transportation facilities necessary to provide mobility within the community. Future transportation improvements recommended in the Transportation Plan have been defined to support the Land Use Element of the Comprehensive Plan.

2044 forecasts of land use growth throughout the city and its Urban Growth Area (UGA) were developed for four land use alternatives. The alternatives were prepared to evaluate different levels, types, and allocation of growth in the city. Alternative 1 is consistent with development levels evaluated as part of the 2015 Comprehensive Plan and serves as a baseline or benchmark for understanding the other alternatives. Alternatives 2 and 3 have the same levels of development but allocated differently

throughout the city. Alternatives 2 and 3 represent growth beyond what was planned for in 2015. The Preferred Alternative is similar to Alternative 1 in terms of land use development levels.

Exhibit 4-1 summarizes 2044 additional growth land use data by alternative as allocated to the:

- Town Center
- Manufacturing and Industrial Center (MIC)
- Other Areas inclusive of East Sumner, South Sumner, and the Urban Growth Area (UGA)

Exhibit 4-1. 2044 Land Use Growth Allocation by Alternative

Land Use by Subarea	Alternative 1	Alternative 2	Alternative 3	Preferred Alternative
Housing Units				
Town center	1,245	1,245	1,309	1,245
MIC	0	0	0	0
Other	740	1,755	1,691	740
Total	1,985	3,000	3,000	1,985
Jobs				
Town center	330	330	330	330
MIC	3,900	3,900	3,900	3,900
Other	1,083	1,083	1,083	1,083
Total	5,313	5,313	5,313	5,313

Source: BERK Consulting, 2024

As shown in Exhibit 4-1, the number of jobs is the same across the four alternatives. Alternatives 2 and 3 would both increase the number of housing units by 1,015 units, but those would be allocated the growth to different areas of the city.

Exhibit 4-2 provides a summary of the total anticipated housings units and jobs under existing conditions and each Alternative.

Exhibit 4-2. Total Land Use by Alternative

Land Use by Subarea	Existing	Alternative 1	Alternative 2	Alternative 3	Preferred Alternative
Housing Units	5,272	6,356	7,371	7,371	6,356
Jobs	23,262	24,919	24,919	24,919	24,919

Source: BERK Consulting, 2024

As shown in Exhibit 4-2, Alternative 1 and the Preferred Alternative would have the same level of development with an increase of 1,084 housing units and 1,657 jobs. The difference between the two Alternatives is the allocation of the jobs and housing throughout the City.

In addition to Alternative 1 and the Preferred Alternative two Alternatives were evaluated which represent more of an increase in housing and jobs. Alternative 2 and 3 show over 7,300 housing units and 24,900 jobs within the city and surrounding study area by 2044. Representing an increase of 2,099 housing units and 1,657 jobs over the current condition. The primary difference between Alternative 2 and 3 is the concentration of housing units located east of E Valley Highway E south of Forest Canyon Road E under Alternative 2.

Travel Forecasting Model

A travel demand forecasting model was developed to assist in defining future transportation system needs. The model uses the VISUM software package and forecasts weekday PM peak hour traffic volumes based on the 2044 land use alternatives. The model study area includes a portion of the City of Pacific and parts of Pierce County just beyond the city limits.

The model was calibrated to match existing base year traffic volumes (2023) and then used to develop a baseline 2044 traffic forecast. City, County, and State transportation improvement projects likely to be funded and built by 2044 were included in the future baseline model and are described below. The 2044 baseline model only included city projects that are in design, construction, or recently built. The 2044 travel forecasts were used to identify future transportation needs.

Transportation Network Assumptions Used in the Model

Exhibit 4-3 summarizes the future baseline transportation improvement projects that were assumed to be completed as part of the baseline 2044 transportation system modeling. The projects listed in the exhibit are planned improvements with either full or partial funding and would be completed before 2044 by Sumner or other agencies. It is noted that the Butte Avenue SE/Stewart Road SW and Main Street/Wood Avenue intersection improvements have already been completed but were under construction during the period of the existing inventory data gathering. Projects that are not fully funded are also identified in the transportation improvement plan (Chapter 5) and included in the strategy for finance and implementation (Chapter 6).

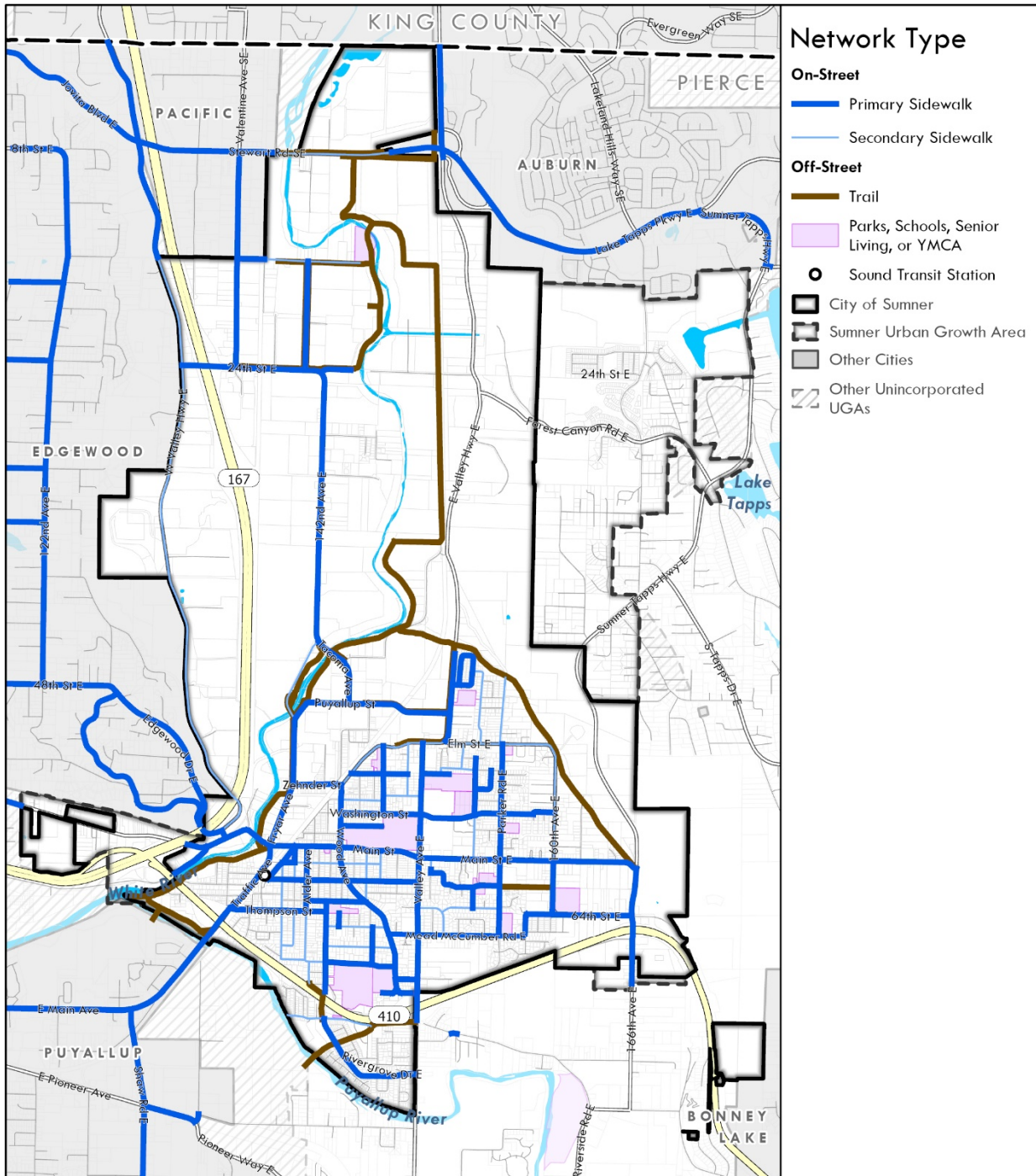
Exhibit 4-3. 2044 Baseline Transportation Improvements

Location	Project Description
SR 167: SR 410 to City of Auburn	Add southbound high occupancy or toll (HOT) lane
Butte Avenue SE/Stewart Road SW	Construct a traffic signal with additional capacity including: -Northbound and southbound left-turn lanes -Eastbound left-turn lane and right-turn lane
Stewart Road SW: Butte Avenue SE to 140th Avenue Court E	Widen to 5 lanes including a center two-way left-turn lane

Location	Project Description
Main Street/Wood Avenue	Pedestrian and signal improvements
SR 410 WB Ramps/166th Avenue E	Construct roundabout
SR 410/SR 162 Interchange	Construct roundabouts
64th Street/164th Avenue E	Construct roundabout
Sumner Tapps Highway/60th Street E	Construct signal. Remove eastbound left-turning movement restrictions
166th Avenue E: SR 410 Ramps to 64th Street E	Widen to 4 to 5 lanes
SR 167/I-5 Connection: Puyallup to Fife	Construct remaining 4 miles of SR 167 between Meridian and I-5

As part of the Baseline Transportation Improvements, the city also defined a desired future 2044 pedestrian and bike network as shown on Exhibits 4-4 and 4-5. This desired non-motorized network follows locations where heavy non-motorized use is expected, such as routes connecting residential areas to recreational facilities and schools, and places of employment. Trails are included in both the pedestrian and bike network since these are used by both pedestrians and bicyclists, and these trails help complete the network.

Exhibit 4-4. Future Pedestrian Network



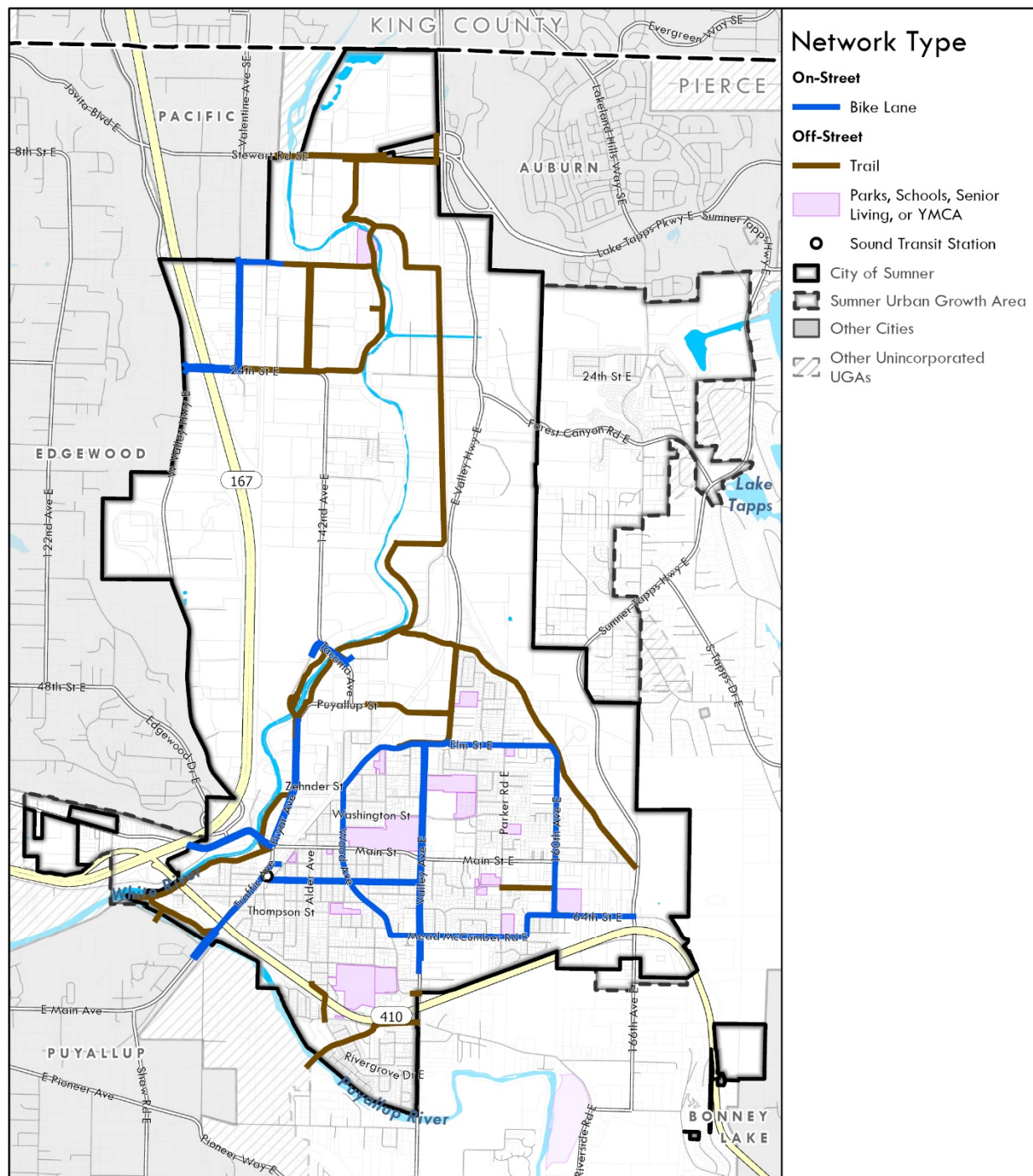
CITY OF SUMNER Future Pedestrian Network



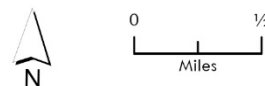
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Map Date: February 2024

Exhibit 4-5. Future Bike Network



CITY OF SUMNER Future Bike Network



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

Alternatives Analysis

The alternative analysis is based on the four alternatives described in the EIS and Land Use Element of the Comprehensive Plan. It is used to identify transportation needs for Sumner and develop the framework for the transportation network and ultimately the transportation improvement plan. The evaluation is completed using the City's travel demand model to forecast transportation demands as well as the identified future pedestrian and bike networks and then applying the level of service (LOS) standards to determine transportation needs for vehicle, bicycle, and pedestrian modes. The results of the alternatives analyses are used to develop a recommended 2044 transportation network with improvements.

Traffic Forecasts

Trip generation was developed through the modeling process, which converts estimates of housing and employment (by category) into daily person trips by trip purpose for each Traffic Analysis Zone (TAZ). The daily person trips are then converted into weekday PM peak hour vehicle trips based on factors from the PSRC regional travel demand model. Exhibit 4-6 summarizes the weekday PM peak hour trip generation for the alternatives.

Exhibit 4-6. Weekday PM Peak Hour Vehicle Trips by Alternative

Alternative 1	Alternative 2	Alternative 3	Preferred Alternative
12,544	13,626	13,542	12,550

Source: Transpo Group, 2023

The additional housing and employment under Alternatives 2 and 3 result in 8 to 9 percent more weekday PM peak hour trips generated compared to Alternative 1 (no action). Alternative 3 trip generation is slightly less than Alternative 2 (i.e., 0.6 percent or 84 vehicle trips less). As described previously, Alternatives 2 and 3 represent the same level of development but differ slightly in the allocation of the development.

Similarly, Alternatives 1 and the Preferred Alternative represent the same level of development but in the allocation of the development within the City. The Preferred Alternative is anticipated to result in a similar number of trips as Alternative 1.

The remainder of the alternatives analysis related to the assessment of vehicle needs focusses on Alternatives 1 and 2 representing the no action/Preferred Alternative and action conditions. Because Alternative 2 trip generation is only 84 weekday PM peak hour vehicle trips higher than Alternative 3 and this difference is very small considering it is distributed throughout the entire city transportation system, the resulting analysis of transportation needs is essentially the same for the two action alternatives. Similarly, the Preferred Alternative is 6 weekday PM peak hour vehicle trips higher than Alternative 1. As such, the findings and recommendations for Alternative 3 are anticipated to be the same as Alternative 2, and Alternative 1 the same as the Preferred Alternative.

The weekday PM peak hour traffic forecasts and average annual growth rate for the 2044 alternatives are summarized in Exhibit 4-7 for key intersections.

Exhibit 4-7. Alternative 1 and 2 Weekday PM Peak Hour Traffic Volumes

Intersection	2023 Existing	2044 Alternative 1		2044 Alternative 2	
	PM Peak Volumes	PM Peak Volumes	Average Annual Growth	PM Peak Volumes	Average Annual Growth
Stewart Road SE/Butte Avenue SE	1,675	2,315	2%	2,375	2%
E Valley Highway E/Forest Canyon Road E	1,525	1,860	1%	1,970	1%
Puyallup Street/Tacoma Avenue	860	1,090	1%	1,155	1%
E Valley Highway E/Elm Street E	1,425	1,710	1%	1,795	1%
Valley Avenue/Elm Street E	1,120	1,280	1%	1,330	1%
Sumner Heights Drive E/W Valley Highway E	820	1,085	1%	1,110	1%
Traffic Avenue/Main Street	2,080	2,520	1%	2,610	1%
Alter Avenue/Main Street	750	910	1%	955	1%
Valley Avenue/Main Street	1,810	2,235	1%	2,340	1%
Parker Road E/Main Street E	960	1,270	1%	1,310	1%
160th Avenue E/Main Street (60th Street E)	1,085	1,540	2%	1,605	2%
Sumner-Tapps Highway E/SR 410 WB Ramp	1,675	1,985	1%	2,025	1%
Valley Avenue/SR 410 EB Ramp	2,150	2,965	2%	3,025	2%
Valley Avenue/74th Street E	1,915	2,545	1%	2,590	1%

Source: Transpo Group, 2023

As shown in Exhibit 4-7, the average annual growth rate at the studies intersections is approximately 1 to 2 percent per year with both Alternatives 1 and 2. The growth overall represents an increase over existing traffic volumes at key study intersections of between 160 to 815 weekday PM peak hour trips under Alternative 1 and 205 to 875 PM peak hour trips under Alternative 2 by 2044. Alternative 2 results in approximately 25 to 100 more weekday PM peak hour trips at the study intersections compared to Alternative 1.

The growth in traffic volumes anticipated with both the alternatives will result in additional traffic congestion along city streets assuming similar driving behaviors as today. As traffic volumes increase, the number of hours during the day when congestion is experienced may also increase. A review of the roadway system capacity for Sumner shows that the existing streets are designed to handle this increase

in traffic volumes and maintain adopted LOS. Additional analysis is completed in the subsequent section to determine if improvements are needed to intersections with the growth in vehicle traffic projected with the Alternatives.

Level of Service Standards and Analysis

Multimodal level of service standards are required for non-motorized transportation facilities, locally owned arterials, and transit routes that serve urban growth areas, to serve as a gauge to judge system performance, and to help achieve the statewide goal of environmental justice. LOS standards establish the basis for the concurrency requirements in the GMA and are used to evaluate impacts as part of the State Environmental Protection Act (SEPA). Agencies are required to show concurrency—i.e., to “adopt and enforce ordinances which prohibit development approval if the development causes the level of service on a transportation facility to decline below the standards adopted in the transportation element of the comprehensive plan, unless transportation improvements or strategies to accommodate the impacts of development are made concurrent with development” (RCW 36.70A.070(6)(b)). Setting the LOS standard is an essential component of regulating development and identifying planned improvements for inclusion in the Transportation Plan.

The following sections describe the methodology for determining LOS by mode and provide an analysis of the 2044 forecasts for Sumner.

Vehicle

Level of service is both a qualitative and quantitative measure of roadway and intersection operations. Vehicle level of service uses an “A” to “F” scale to define the operation of roadways and intersections as follows:

LOS A: Primarily free flow traffic operations at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delays at intersections are minimal.

LOS B: Reasonably unimpeded traffic flow operations at average travel speeds.

LOS C: Stable traffic flow operations. However, ability to maneuver and change lanes may be more restricted than in

LOS B, and longer queues may contribute to lower-than-average travel speeds.

LOS D: Small increases in traffic flow may cause substantial increases in approach delays and decreases in speed.

LOS E: Significant delays in traffic flow operations and lower operating speeds.

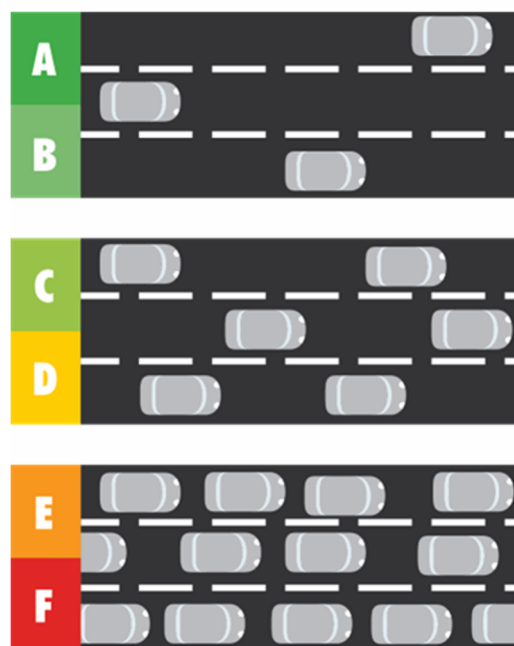


Exhibit 4-8. Illustration of Vehicle LOS

LOS F: Traffic flows at extremely low speeds. Intersection congestion is likely, with high delays and extensive vehicle queuing.

As described in Chapter 3, there are adopted LOS standards for the facilities serving Sumner.

Sumner LOS Standards

Sumner has established intersection LOS standards. The standards are applied to the weekday PM peak hour and to other time periods as appropriate based on the type and location of development. The LOS standards are:

- **Signalized, Roundabout, and All-way Stop Controlled Intersections**
 - LOS D based on average performance of all movements consistent with the current HCM method
 - Exception is LOS F at Traffic Avenue/Main Street/Fryar Avenue, Main Street/Alder Avenue, Valley Avenue East/Main Street, West Valley Highway East/Valley Avenue/Sumner Heights Drive
- **Two-way, Stop Controlled, Unsignalized Intersections**
 - LOS D or better based on the average delay per vehicle for each approach or separate traffic movement at the intersection using the latest HCM method
 - Exception allows left turns and through movements on side streets intersecting with arterials to operate below the adopted LOS D standard when the LOS affects relatively low traffic volumes and may not meet warrants for traffic signals.

State Highway LOS Standards

The City of Sumner is served by SR 167 and SR 410. SR 167 is classified as a Highway of Statewide Significance (HSS). Per WSDOT's Highway Systems Plan, the LOS standards for HSS facilities are set forth by State law. State law sets LOS D for HSS facilities in urban areas and LOS C for HSS facilities in rural areas. Since SR 167 is located within the Sumner urban area, the LOS D standard applies. GMA concurrency requirements do not apply to HSS facilities, per State legislation.

SR 410 is a State Highway of Regional Significance, Tier 2. The level of service standard for regionally significant state highways in the central Puget Sound region is set by PSRC in consultation with WSDOT and the region's cities and counties. PSRC established LOS D for SR 410 in Sumner. PSRC notes that it will measure the level of service for regionally significant state highways on a one-hour PM peak period basis. Furthermore, PSRC notes that local agencies will need to decide whether to apply concurrency to state highways of regional significance.

Traffic Operations

Traffic operations were evaluated based on intersection operations and the HCM methodology consistent with the existing conditions analysis. Intersection improvements were assumed based on the transportation improvement list outlined at the beginning of this. Traffic signal timing was optimized for each alternative in consideration of changes that would occur with intersection maintenance to address growth in traffic volumes.

Overall, the analysis finds that most of the study intersections operate at LOS D or better during the weekday PM peak hour with the projected growth under the alternatives. Exhibit 4-9 summarizes the existing, Alternative 1, and Alternative 2 operations at intersections where further review and potential improvements may be needed. The key finding of the analysis is that the city should consider potentially changing the adopted LOS standards. The 2015 Comprehensive Plan LOS policy changed the LOS standard to F at several intersections where operations were forecast to be LOS F with little or no feasible improvement projects. Due to shifts in traffic patterns and decreases in traffic volumes, operations at some intersections have improved. In addition, feasible improvements can be identified at intersections that are projected to operate at LOS E or F. A summary table of all the study intersection LOS and delay for Alternatives 1 and 2 is provided in Appendix B. As described previously, the trip generation for Alternatives 2 and 3 is similar with Alternative 2 being slightly higher. Similarly, Alternative 1 and the Preferred Alternative are similar. As such, intersection operations between Alternatives 2 and 3 and Alternative 1 and the Preferred Alternative are anticipated to be the same and would in the same recommended improvements.

Exhibit 4-9. Weekday PM Peak Hour LOS Summary

Intersection	Current LOS Standard	2023 Existing			2044 Alternative 1			2044 Alternative 2		
		LOS ¹	Delay ²	V/C ³ or WM ⁴	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
Stewart Road SE/Butte Avenue SE	D	F	186	SB	C	33	-	D	36	-
E Valley Highway E/Forest Canyon Road E	D	F	>180	WB	F	>180	WB	F	>180	WB
Puyallup Street/Tacoma Avenue	D	C	19	-	F	84	-	F	106	-
E Valley Highway E/Elm Street E	D	D	30	NBL	F	57	NBL	F	64	NBL
Valley Avenue/Elm Street E	D	D	31	NBL	E	43	NBL	E	45	NBL
Sumner Heights Drive E/W Valley Highway E	F	C	29	-	D	41	-	D	43	-
Traffic Avenue/Main Street	F	D	43	-	E	58	-	E	60	-
Alder Avenue/Main Street	F	B	11	-	B	14	-	B	15	-
Valley Avenue/Main Street	F	C	23	-	C	32	-	D	37	-
Parker Road E/Main Street E	D	C	24	SB	F	56	SB	F	66	SB
160th Avenue E/Main Street (60th Street E)	D	C	16	-	E	47	-	F	56	-
Sumner-Tapps Highway E/SR 410 WB Ramp	D	F	61	WB	A	7	0.54	A	8	0.55
Valley Avenue/SR 410 EB Ramp	D	F	80	-	B	12	0.87	B	13	0.88
Valley Avenue/74th Street E	D	F	110	EB	F	>180	EB	F	>180	WB

Notes:

1. Level of service, based on 2010 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. Volume-to-capacity ratio reported for signalized intersections.
4. Worst movement reported for unsignalized intersections.

As shown in Exhibit 4-9, the following intersections are anticipated to improve with the action Alternatives compared to existing conditions during weekday PM peak hour with the planned and funded improvements:

- **Stewart Road SE/Butte Avenue SE** - Completion of the traffic signal is anticipated to improve operations to LOS D
- **Sumner-Tapps Highway E/SR 410 WB Ramp** - The planned roundabout results in LOS A conditions
- **Valley Avenue/SR 410 EB Ramp** - The planned roundabout results in LOS B conditions

There are currently three intersections (Sumner Heights Drive E/W Valley Highway E, Alder Avenue/Main Street, and Valley Avenue/Main Street) that have a LOS F standard but are forecast to operate at LOS D or better with the alternatives during the weekday PM peak hour. One intersection, Traffic Avenue/Main Street, has a LOS F standard but is forecast to operate at LOS E.

The remaining intersections summarized in Exhibit 4-9 are forecast to degrade below LOS D during the weekday PM peak hour with the alternatives. Most of the poor intersection operations during the weekday PM peak hour under the Alternatives is projected along E Valley Highway and Valley Avenue. This is consistent with the observed regional cut-through traffic, which avoids congestion along SR 167 and uses routes through Sumner. Other intersections impacted by shifts in traffic and growth in the City of Sumner are the Parker Road E/Main Street E and 160th Avenue E/Main Street E intersections. Potential improvements at these intersections and the Traffic Avenue/Main Street intersection are discussed in Chapter 5.

Pedestrian

Non-motorized transportation LOS standards were developed based on the future network presented previously on Exhibit 4-4. The pedestrian network has been identified through a series of Primary or Secondary Routes. Corridors identified as Primary or Secondary Routes are not indicative of a hierarchy or priority for future non-motorized transportation sidewalk facility development, rather they are used to make a distinction between routes that are more regional or that extend completely through the community (primary), and those that serve to make the second leg of the journey to connect to destinations, extend into neighborhoods, or complete a loop (secondary).

The sidewalk LOS standards shown in Exhibit 4-10 emphasize system completion of sidewalks, pathways, or multi-use trails on arterial and collector roadways. The LOS designations are shown in green, orange, and red.

A green LOS indicates a facility meets adopted roadway standards. An orange LOS indicates a facility has sidewalks on only one side of the roadway, when both sides are the standard. A red LOS indicates no designated facilities are provided for sidewalk users and is considered unacceptable.

Exhibit 4-10. Pedestrian LOS Standard

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

Source: Transpo Group, 2023

The City has established level of service standards for its pedestrian network based on the methodology in Exhibit 4-10 and the future network identified on Exhibit 4-4. A green LOS is the standard for secondary routes, while an orange LOS is the standard for primary routes. The city utilizes these standards to prioritize investments in the non-motorized transportation network and identify where significant gaps in the system need to be addressed to serve the Sumner land use plan.

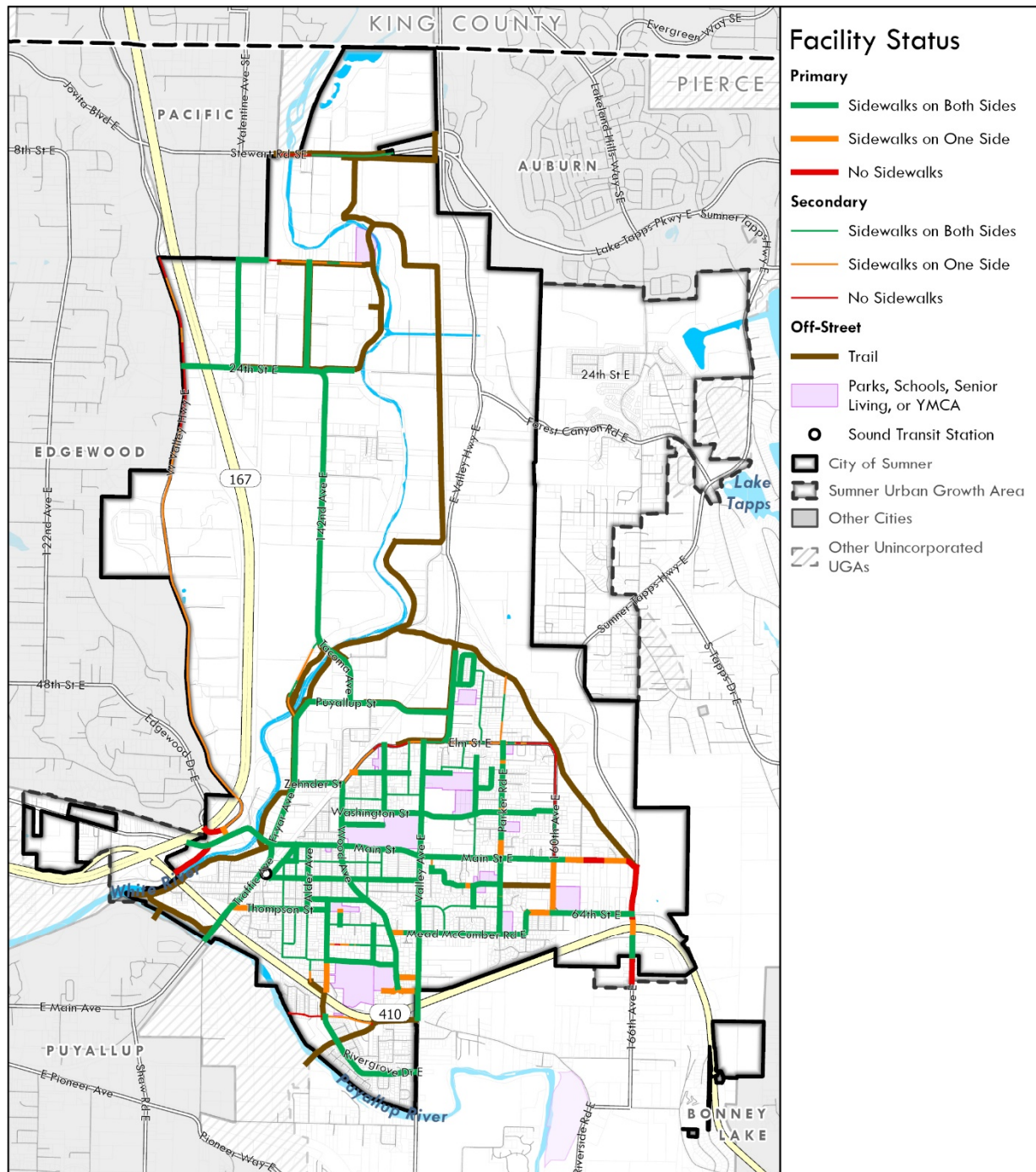
Applying the standards described above, the pedestrian LOS analysis is shown on Exhibit 4-11. The LOS is determined by comparing the 2044 future pedestrian network to the existing, planned, and funded pedestrian network. The pedestrian LOS analysis shows most of the future pedestrian network meets standard. There are some key connections to trails south of SR 410 that are missing as well as corridors such as Elm Street and 160th Avenue E that have missing sidewalks. The long-term project list identified in the Transportation Plan Chapter 5 would implement the orange LOS for primary routes and green LOS for secondary routes.

Bike

A future bike network was identified and is shown on Exhibit 4-5, presented previously. The bike LOS identified through an understanding of the availability of bike facilities along designated routes. Bike facilities could include sharrows, dedicated bike lanes, or protected bike lanes. A green LOS is the standard for the bike routes. Like the pedestrian LOS, Sumner utilizes these bike standards to prioritize investments in the non-motorized transportation network and identify where significant gaps in the system need to be addressed to serve the City's land use plan.

The LOS analysis for the bike network is shown on Exhibit 4-12. The LOS is determined by comparing the 2044 future bike network to the existing, planned, and funded bike network. The bike LOS analysis shows that bike connectivity east-west is limited and there is a lack of facilities within the east part of Sumner. The East Sumner Subarea Plan envisioned additional bike connectivity in this area as development occurred. The long-term project list identified in the Transportation Plan Chapter 5 would implement the green LOS for bike routes.

Exhibit 4-11. Future Pedestrian Level of Service



CITY OF SUMNER

Future Pedestrian Level of Service

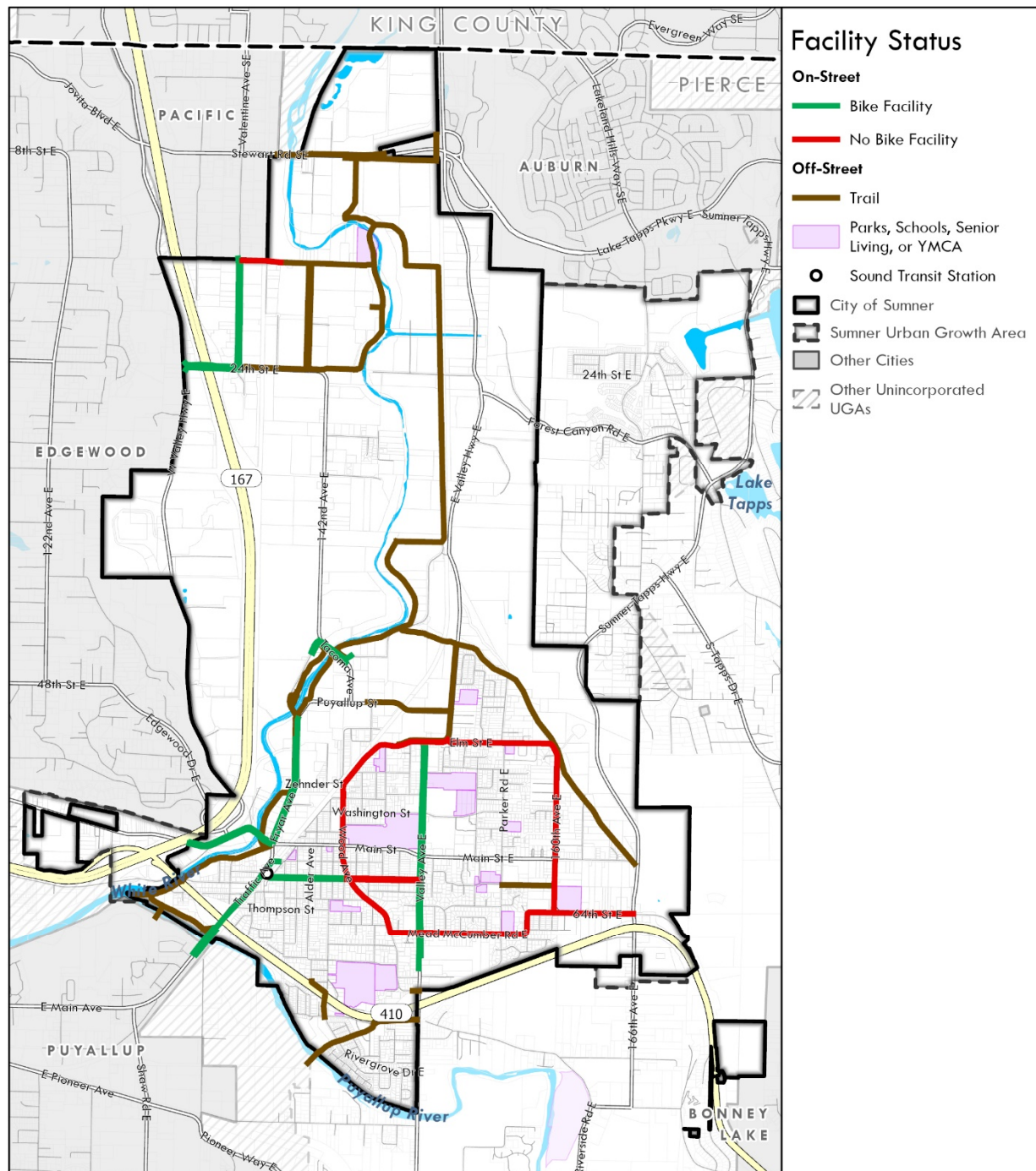


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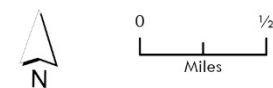
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Map Date: February 2024

Exhibit 4-12. Future Bike Level of Service



CITY OF SUMNER Future Bike Level of Service



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Map Date: February 2024

5. Transportation Improvement Program

The alternatives analysis, financing, and goals and policies were used to develop a comprehensive transportation improvement program (TIP) for the City. The program addresses existing and forecast needs through 2044 based on the projected growth in and around the City of Sumner. The transportation improvement program is organized by travel mode, although the improvement projects and programs may overlap between modes (e.g., sidewalks are included as part of a roadway widening project).

The Plan focuses on recommendations for five components of the transportation system:

- Streets and Highways
- Public Transit and Travel Demand Management
- Pedestrians and Bicycles
- Rail Service
- Air Transportation

Based on the plans/programs, goals, and policies for the five components, an overall multimodal long-range list of transportation projects is recommended to support the transportation needs within the 20-year horizon.

Recommendation 1: Monitor the transportation system against the Transportation Plan to track land use development against the progress of improvements to the transportation system as well as assist in updating the Transportation Improvement Program (TIP) and identifying budget needs.

Streets and Highways

Streets and highways serving the City of Sumner provide for the general movement of people and goods. They also serve other travel modes, including pedestrians and bicyclists. The street and highway element provides the core system of the Sumner Transportation Improvement Program. The key components of the street and highway element and recommendations are:

- Functional classification
- Design standards
- Truck routes
- Local Street
- Maintenance and operations - **Recommendation 2:** Add a signal replacement program to the maintenance and operations program.
- Neighborhood traffic control

Functional Classification

Roadway functional classification provides for a hierarchy of roadways. These classifications also act as a guide for future development of the overall street system. The classifications range from limited access freeways that support regional through traffic movements to local streets that primarily serve access to individual properties. The system is used to identify the desired function of each roadway regarding the type and level of traffic it would carry, design standards, and eligibility for a range of funding programs.

Exhibit 5-1 provides guidelines for the classifications used in the City of Sumner. There are no proposed changes to the guidelines from the 2015 Transportation Plan.

Exhibit 5-1. Functional Classification Guidelines

Classification	Definition	Typical Range of Daily Traffic Volumes ¹
Freeway/ Limited Access	Inter-regional divided highways connecting major activity centers. Typically, freeways have two or more lanes for traffic in each direction; access is limited to interchanges designed for higher speed merging/diverging traffic.	>30,000
Principal Arterial	Inter-community roadways connecting community centers or major facilities. Principal arterials are generally intended to serve predominantly "through" traffic with minimum direct service to abutting land uses. Spacing between parallel principal arterials is generally 2 miles or greater.	5,000 - 40,000
Minor Arterial	Provides intra-community travel for areas bound by the principal arterial system. Minor arterials serve trips of moderate length and provide more direct access to abutting properties than principal arterials. Spacing of minor arterials is typically less than 2 miles.	3,000 - 15,000
Collector	Provides for movement within a community, including connecting neighborhoods with smaller community centers. Collector arterials also provide connections to minor and principal arterials. Property access is generally a higher priority for collector arterials with a lower priority for through traffic movements. Spacing of collector arterials is generally 1 mile or less.	1,000 - 5,000
Local Access	The primary function of local/access streets is access to abutting properties. Local streets include a variety of designs and spacing depending on access needs.	0 - 1,000
Alley	Provide direct property access to residential or commercial properties. Also provide for service vehicles.	0 - 300

Notes:

1. Average daily traffic volumes.

Source: 2015 Sumner Transportation Plan

Washington State has also classified some highways that provide transportation functions that promote and maintain statewide travel and economic linkages as being of statewide significance or Highways of

Statewide Significance (HSS). In the Sumner planning area, SR 167 is designated as an HSS. Because of its designation as an HSS, the State is responsible for setting the level of service standard for the SR 167 freeway. Furthermore, the city cannot include SR 167 in its concurrency program.

Similarly, SR 410 is a State Highway of Regional Significance. Level of service standards for SR 410 are established by the Puget Sound Regional Council (PSRC), in consultation with WSDOT. The city also cannot include SR 410 in its concurrency program.

Exhibit 5-2 summarizes the functional classification plan for Sumner.

Design Standards

The City of Sumner continues to update Development Specifications and Standard Details (DSSD), which sets specific and consistent road design elements. To accommodate the different design needs in different parts of the City, the DSSD includes conceptual street standards. The design standards cover right-of-way needs, pavement width, type and width of pedestrian and bicycle facilities, and roadway and intersection radii.

The City has determined that one size and/or design does not fit all situations. For example, minor arterial needs in the industrial area require specific standards to accommodate trucks, while minor arterials serving the Town Center commercial district may require wider sidewalks to accommodate higher levels of pedestrian activity.

The standards support the City's goals in providing adequate facilities to meet the mobility and safety needs of the community, as well as complying with storm water management, sensitive areas, and other regulations. The standards are intended to assist design professionals and developers for all new and reconstructed roadways and right-of-way facilities, both public and private, within the City.

The City will continue to maintain and update the conceptual street design standards. The Development Specifications are refined periodically by the City to adhere to the guidelines, goals, and policies of the 2024 Transportation Plan and to meet current design practices.

Functional Classification

- Collector
- Minor Arterial
- Principal Arterial

City of Sumner

Sumner Urban Growth Area

Other Cities

Other Unincorporated UGAs

Functional Classification Plan



Map Date: February 2024

Truck Routes

A significant amount of trucking activity occurs in the City consisting of distribution centers, warehousing, and light industrial activity located primarily in the northern part the city. Trucks have a significant impact on traffic operations, safety, and roadway maintenance. They also impact air quality and noise levels in the City. The City has designated only principal arterials and minor arterials as truck routes. The design standards addressed in the previous section are defined to support truck use along freight routes and in industrial areas.

Exhibit 5-3 shows the truck routes for Sumner. The truck routes are the same as the 2015 Transportation Plan and would continue to support future transportation needs. The primary routes for trucks traveling through the city are the two state highways: SR 167 and SR 410. Secondary (T-2) truck routes include 142nd Avenue E, Puyallup Street, Fryar Avenue, Traffic Avenue. Other truck routes are E Valley Highway E, Forest Canyon Road, and Sumner-Tapps Highway E, which are classified as T-3. These routes provide connections from the surrounding land uses to the regional transportation system. Collectors and local streets are not to be used by freight trucks unless essential for access to a local origin/destination and travel is limited to the shortest practical travel route.

Collector and Local Streets

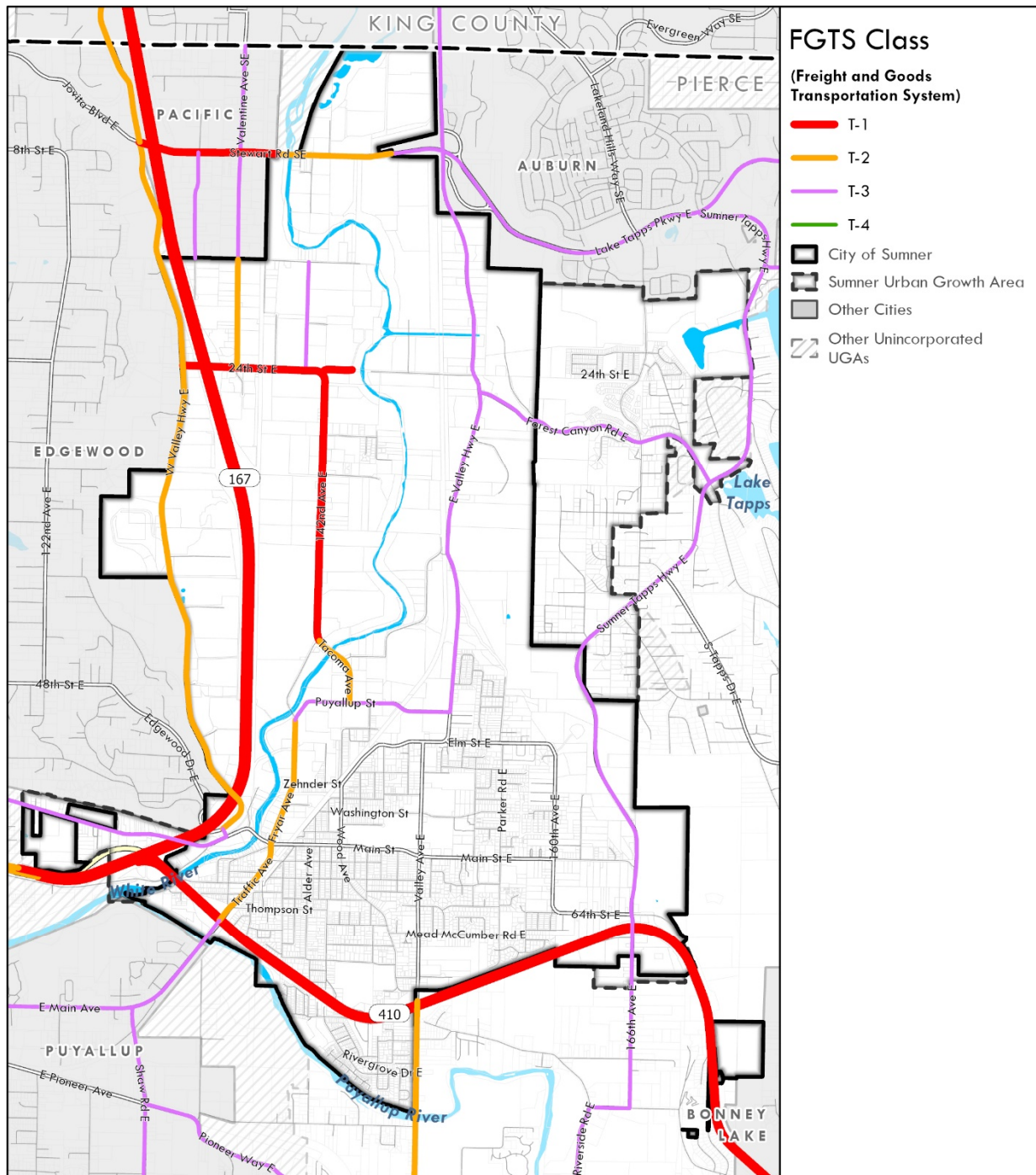
The goals and policies of the 2024 Transportation Plan emphasize expansion of the City's roadway network as a flexible grid. A grid is the most efficient arrangement of arterials and secondary access streets, and is intended to provide travel options for drivers, bicyclists, and pedestrians as well as reduce the practical distance and travel time between points in Sumner. Cul-de-sacs, dead-end streets, and loop roads create barriers in the network, increase travel distances, and, in residential areas, increase dependence on the automobile for daily activities.

The grid model differs in its application to various land uses. In residential areas, non-motorized movement must be accommodated, and the land is platted into smaller units. Therefore, the distance between streets should be smaller than in industrial areas, where efficient movement of vehicles, particularly freight vehicles, is emphasized and development generally occurs on large tracts of land.

The older residential neighborhoods in the vicinity of the downtown represent the general prototype for future residential development. Land is arranged into blocks of about 250 by 500 feet. This pattern should be maintained, to the extent practical, for future residential development. Blocks of this size encourage pedestrian movement and provide opportunities for alley access. In addition to the subdivision of land into a regular system of blocks, existing arterials should be extended to provide continuous transportation corridors and, where possible, to connect to other arterials. This benefits the community by reducing the volume of pass-through traffic on local streets.

New local streets are not explicitly defined in the Transportation Plan and are assumed to be built according to developer mitigation requirements (e.g., construction of sidewalks or payment of impact fees at time of development). Local street system plans may be prepared as part of future neighborhood or subarea studies. For example, increased commercial and residential development within the Town Center or East Sumner subareas will need to be balanced with appropriate circulation corridors to allow alternate access routes and provide acceptable levels of vehicular and non-motorized transportation connectivity. The actual alignment of the future circulation corridors will be determined based on property boundaries, environmental impacts, and engineering considerations.

Exhibit 5-3. Truck Route Plan



CITY OF SUMNER

Truck Route Plan



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

Maintenance and Operations Program

To maximize the use and efficiency of the existing and future transportation infrastructure, the City will continue with a comprehensive, systematic street maintenance program. The program will evaluate arterials and local roadways for pavement condition, signage, sight distance restrictions (such as vegetation blocking sight lines), trail maintenance and non-motorized facilities, and neighborhood safety impacts. Traffic control devices, including traffic signals, should be monitored, and serviced regularly. The program will also be used to evaluate speed limits based on functional classification, design, and roadway conditions.

The program should continue to use a Pavement Management System (PMS) to provide a consistent and systematic approach for identifying overlay projects each year. The PMS provides input regarding the need to rebuild existing streets or overlay. These programs should systematically cover all city arterials on a regular schedule with immediate response to potential safety issues that are observed.

In addition, the city should undertake a signal replacement program to review aging traffic control equipment and develop a systematic approach for upgrading and replacing signal systems or other related roadway technology. Replacing outdated equipment will ensure continued operations and allow for integration and communication to better manage traffic flows within the city, and to increase safety at crossings for pedestrians and bikes.

To assure that the existing and future transportation infrastructure is preserved in a cost-effective manner, the city will allocate annual budget resources to maintaining existing infrastructure. The city should develop a system to monitor traffic and land use changes, and to evaluate social and environmental justice impacts, for use in setting project priorities (see Recommendation 1 at the beginning of the chapter). The operations budget will need to provide time and staff resources to develop and submit grant applications and to coordinate with other jurisdictions.

Neighborhood Traffic Control

Providing safe and convenient local streets is an important element of the Transportation Plan. This includes keeping travel speeds at or below adopted/posted limits, improving safety for pedestrians and bicyclists, and minimizing the intrusion of non-local traffic on collectors and local streets. The Plan acknowledges that congestion on the arterial system can result in traffic diverting to collector and local access streets, resulting in undesirable impacts on neighborhoods. Much emphasis in the project list focuses on providing additional capacity to arterial streets and intersections. Until these and other improvements on the principal and minor arterials are implemented, some traffic may choose to divert onto neighborhood streets. Sumner should continue to implement neighborhood traffic control as an important element of the Transportation Plan.

Public Transit and Travel Demand Management

The City of Sumner recognizes the importance of transit and travel demand management programs as key elements of a multimodal transportation system. These programs build on regional programs and plans with some refinements to reflect the specific needs of the city. No changes are recommended

related to the travel demand management program. The transportation element includes policy related to exploring service with Pierce Transit and the transit plan included herein supports this direction.

Transit

Projects are incorporated into the overall TIP to support connectivity and access to transit. Transit objectives for Sumner focuses on multimodal connectivity to the Sounder Station. There is no public local transit service within the City. Consistent with the goals and policies of the Transportation Element, the city should explore local transit opportunities including coordinating with Pierce Transit to support the anticipated 20-year growth.

Recommendation 3: Explore additional transit service for Sumner.

- **North-South Transit Across County Line.** Continue to evaluate local routes or shuttle programs to provide north-south transit service between Sumner and the employment centers in the Green River Valley and the Sumner MIC.
- **Coordinate with Transit Agencies and Local Jurisdictions on Service.** The City of Sumner should also coordinate with transit agencies and work with other east Pierce County jurisdictions, such as Bonney Lake, to evaluate future transit routes to serve downtown Sumner and the region. The City of Sumner should participate in Pierce Transit's long-range planning efforts to ensure that policy is in place to move forward on studies and plans to return to the Pierce Transit benefit area if desired.
- **Evaluate Increased Service for Existing Routes.** Sound Transit Route 596 serves both Sumner and Bonney Lake but is only a weekday peak period route. Increased frequency of bus service between neighboring residential communities should be evaluated as Sumner is an employment center.
- **Coordinate with Regional Agencies.** In addition, the city should continue to coordinate with agencies on regional transit projects that serve the community. Successful use of transit and other HOV modes in the city is largely tied to the development of a regional system of HOV facilities and programs. Near the City, the Washington State Highway Statewide Improvement Program (2023-2026) identifies development of the SR 167 southbound high occupancy or toll (HOT) between Auburn and SR 410.

Recommendation 4: If public transit service is provided within Sumner in the future, the City should adopt a transit LOS.

Transportation Demand Management Program

Continued implementation of the Sumner TDM programs is recommended as part of the TIP. The goal of the TDM programs is to reduce the overall amount of travel by single occupant vehicles (SOVs) within the city. The City of Sumner TDM program builds on State, Pierce County, and other local legislation.

The Washington Commute Trip Reduction Law (RCW 70.94.521) requires TDM performance targets for firms with over 100 employees. The City of Sumner has adopted a CTR program. The CTR program establishes goals consistent with State legislation. The individual demand management strategies that are typical elements of the CTR and TDM programs are different for employment and residential developments. The key elements of a TDM program are listed below. These TDM elements should be

considered a starting point, and the city, employers or applicant may implement other measures to reduce reliance on SOV travel:

- Assign transportation coordinator
- Transit Incentives
- Parking Management
- Bike Racks and Facilities.
- Telecommuting
- Compressed Work Week
- Flexible Work Schedules
- Site and Street Design
- Rideshare and shuttle services
- Incentives
- Commuter information

Pedestrians and Bicycles

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

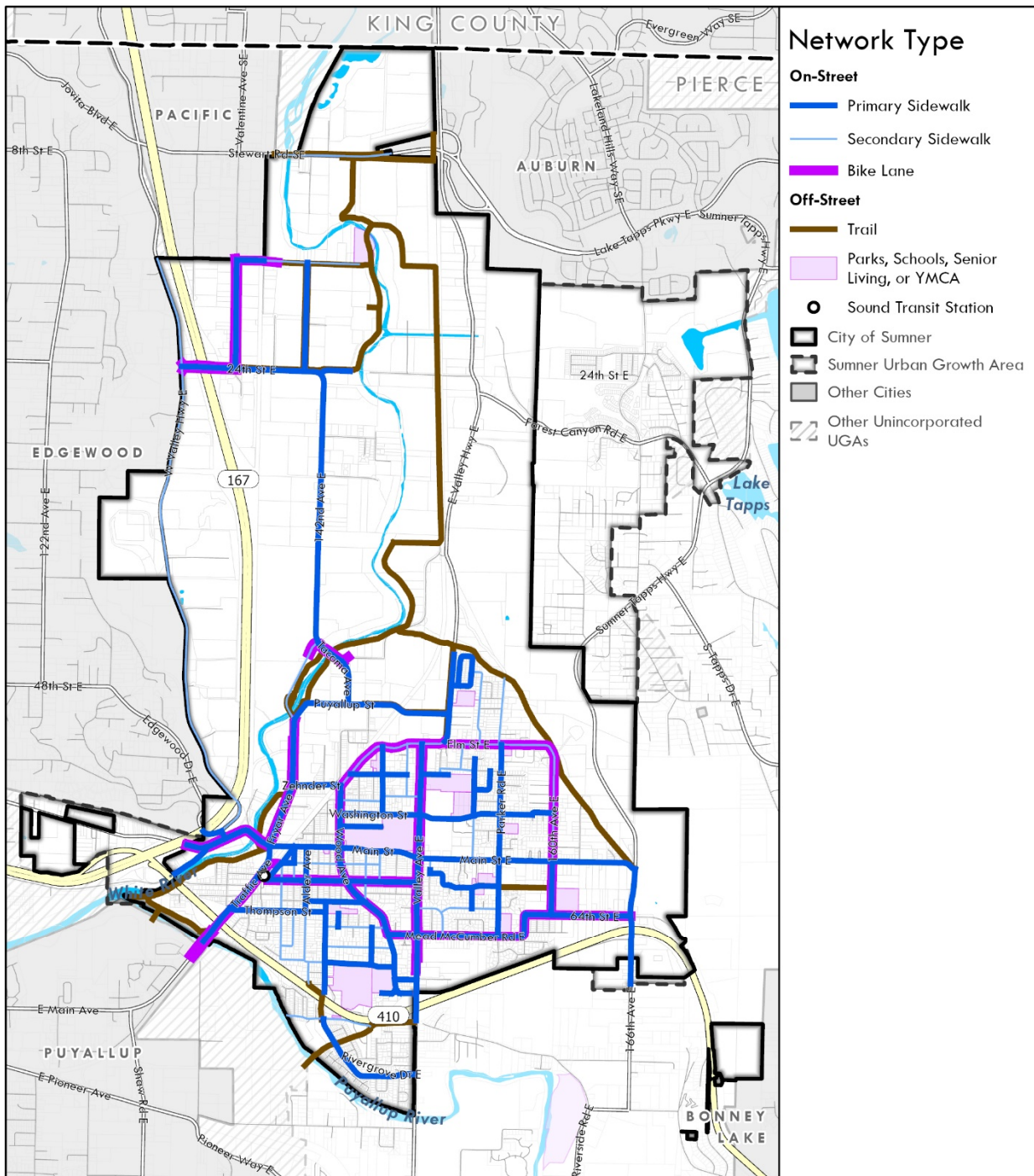
Recommendation 5: Adopt the non-motorized system and LOS standards. Monitor implementation and performance of the non-motorized system as an important component of the overall transportation system.

The pedestrian and bicycle network identified in the previous chapter was used to confirm specific LOS standards for non-motorized transportation facilities and to identify and develop the long-term non-motorized project list. The future non-motorized transportation system, shown in **Exhibit 5-4**, provides a comprehensive network of non-motorized transportation facilities for Sumner. The Plan shows the interconnected system of on-road and off-road facilities, which include sidewalks, pathways, shared-use trails, and bike facilities (e.g., bicycle routes, sharrows or bike lanes). The system is designed to facilitate non-motorized travel to key destinations within Sumner. The non-motorized projects to achieve the Plan are described in a subsequent section.

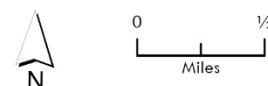
The non-motorized plan contains a series of primary or secondary sidewalk routes. Corridors identified as primary or secondary routes are not indicative of a hierarchy for future non-motorized transportation facility development, rather they are used to make a distinction between routes that are more regional or that extend completely through the community (primary), and those that serve to make the second leg of the journey to connect to destinations, extend into neighborhoods, or complete a loop (secondary).

Along with the project list, the City has established two sidewalk funding programs, the Sidewalk Maintenance Program and ADA Transition Plan, that will help maintain the existing sidewalk system by adding more wheelchair ramps and completing missing or damaged sidewalk sections. The City works with neighboring property owners on sidewalk construction and maintenance. The sidewalk funding programs help maintain and improve the existing sidewalks already found throughout the city.

Exhibit 5-4. Non-Motorized Plan



CITY OF SUMNER
Non-Motorized Plan



Map Date: February 2024

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Freight Rail Service

The City of Sumner is traversed by both BNSF and UPRR railroad lines. These lines generally travel north-south. As described in the transit section, Sound Transit's Sounder commuter rail service provides public transit service from the Sumner Train Station on Traffic Avenue. Most of the use of the rail links is for regional freight movement through the city. The rail lines do not provide any significant local rail access for businesses in Sumner. There are no changes to freight rail as part of this Plan.

Air Transportation

There are no airports in the immediate Sumner planning area. Regional, national, and international air travel for Sumner is provided via Sea-Tac International Airport, located approximately 20 miles northwest of Sumner. The airport is accessed via SR 167 in Sumner. North of Sumner, Auburn Municipal Airport provides for local general aviation. It is accessed from Sumner via SR 167 or East Valley Highway. There are no changes to air transportation as part of this Plan.

Transportation Improvement Projects

Based on the existing and future transportation needs analysis and the proposed modal plans for the components described above, a list of multimodal transportation improvement projects was defined.

Recommendation 6: Adopt the list of multimodal transportation improvements and continue to monitor the establishment LOS by mode (such as the 6-year TIP) to ensure the improvements continue to support the goals and policies.

The improvements address safety, capacity, trail connections, expanded non-motorized transportation facilities, and roadway preservation needs. They also cover upgrades to existing roads and construction of new roadways and interconnected street systems to support the forecast economic development and growth in the city and its UGA. The roadway and intersection projects incorporate needs for pedestrians, bicyclists, and transit riders that will use the same corridors. The projects were categorized into three primary types:

- Spot or intersection improvements
- Roadway improvements
- Non-motorized improvements

Spot/Intersection Improvements

Spot or intersection improvements were identified where existing or forecast operational deficiencies are anticipated with growth in and around the City of Sumner. The projects are intended to improve operations at the identified intersections to meet the City's LOS standard. Some of the spot/intersection improvements were previously identified as a need in the 6-year transportation improvement program (TIP) and/or the 2015 Comprehensive Plan and should continue to be considered to support growth into 2044. There are also new intersection improvements identified to support the Sumner land use plan.

Roadway Improvements

The roadway improvements were previously identified as part of the 2023-2029 TIP and evaluation of the alternatives indicated continued need for the projects based on operations and safety, and completion of motorized and non-motorized networks. No new roadway improvement projects are proposed beyond what was already identified on the TIP.

Non-Motorized Improvements

While non-motorized improvements will be incorporated into both the spot/intersection and roadway improvements, separate non-motorized improvements have been identified. Non-motorized projects have been identified to increase accessibility and connectivity by completing missing links in the current trail, pedestrian, and bike system and to increase opportunities for alternative modes of transportation such as walking and biking and reducing reliance on SOVs. The non-motorized improvements include both projects that are already on the TIP as well as new improvements to support the Sumner land use plan.

A description and cost estimate for each project is presented in Exhibit 5-5. New projects are shown in bold in Exhibit 5-5. Exhibit 5-6 shows the location of each project. A map identification number is included in Exhibit 5-5 to assist in referencing the projects shown on Exhibit 5-6.

Planning level cost estimates were prepared for each project based on typical per unit costs, type of roadway and scope of the improvement. Where costs had been calculated as part of ongoing design projects or projects listed in the current City's 6-year TIP, the original estimate was adjusted for cost escalation or inflation, as needed. The cost estimates include allowances for right-of-way acquisition based on generalized needs to meet the City's Street standards. Construction costs were adjusted, as needed, to reflect any specific implementation issues, such as environmental impacts or impacts on adjacent properties.

Exhibit 5-5. 20-Year Transportation Improvement Projects and Costs

Map ID ¹	Title and Location	Description	Project Cost ²
SP1	E Valley Highway E/Forest Canyon Road E	Construction of a new signal or roundabout	\$3,000,000
SP2	Puyallup Street/Tacoma Avenue and overlay	Plane, repair, and overlay, complete intersection channelization improvements, add an eastbound left-turn pocket on Puyallup Street at Tacoma Avenue. Add	\$2,600,000

Map ID ¹	Title and Location	Description	Project Cost ²
	Puyallup Street to White River Bridge (WSDOT SUM-30)	a signal at the Puyallup Street/Tacoma Avenue intersection	
SP3	E Valley Highway E/Elm Street E	New signal when warranted	\$1,500,000
SP4	Valley Avenue/Elm Street E	New signal when warranted	\$1,500,000
SP5	Traffic Avenue/Main Street	Add EB right-turn overlap. Convert W Main Street to one-way facility westbound.	\$150,000
SP6	Parker Road E/Main Street E	New signal when warranted	\$1,650,000
SP7	160th Avenue E/Main Street (60th Street E)	New signal or RAB when warranted	\$3,000,000
SP8	Valley Avenue/74th Street E	Add EB/WB left-turn restrictions. Shift WB left-turns to U-turning movement at Valley Avenue/SR 410 EB Ramp RAB	\$75,000
SP9	Sumner Tapps Highway/60th Street E	Signalization of the intersection. Construct EB right-turn lane	\$3,400,000
		<i>Sport/Intersection Subtotal</i>	<i>\$16,875,000</i>
RW1	166th Avenue E Widening; SR 410 WB ramps to 64th St E (WSDOT SUM-24)	Widen to 4-5 lanes, includes new roundabouts at WB ramp and 64th Street E	\$19,000,000
RW2	160th Avenue E; Main Street to 64th Street E	Improve and widen streets to minor arterial standards with bike paths and sidewalks	\$500,000
RW3	Valley Avenue; South City Limits to Main Street	Overlay existing roadway surface, ADA upgrades	\$1,850,750
RW4	Stewart Rd Corridor ITS improvements; SR 167 to Lakeland Hills (WSDOT SUM-27)	Connect traffic signals and railroad crossings to coordinate signal timing	\$3,500,000
RW5	160th Avenue E; Elm St to Main Street	Improve to collector standards with curb, gutter, sidewalks on both sides, and bike facilities	\$2,900,000
RW6	Elm Street; E Valley Hwy to 160th Avenue E	Improve to collector standards with curb, gutter, sidewalks on both sides, and bike facilities	\$2,600,000
RW7	Parker Road E; 62nd Street to 63rd Street	Construct curb, gutter, and sidewalk on east side of street	\$250,000
RW8	Parker Road E; Main Street to Elm Street	Improve to collector standards with curb, gutter, and sidewalks on both sides	\$1,300,000
RW9	Zehnder Street; Pease Avenue to Wood Avenue	Railroad Crossing Improvements	\$1,000,000

Map ID ¹	Title and Location	Description	Project Cost ²
RW10	162nd Avenue E Segment Extension; 64th Street to 60th Street	Construct 2-lane facility	\$3,000,000
RW11	164th Avenue Court E Segment Extension; 160th Avenue E to existing 164th Avenue Court E	Construct 2-lane facility	\$2,000,000
RW12	Systemic Horizontal Curve and Roadway Departure Safety Improvements (WSDOT SUM-28)	East Valley Highway, West Valley Highway, Sumner-Tapps Highway/166th Avenue E, 142nd Avenue E/24th Street E. Install static and/or dynamic curve warning signs, speed feedback signs, centerline and edge line profiled striping, rumble strips, reflective markers on-pavement as appropriate to delineate roadside objects, channelization, guardrail/roadway shouldering, and street lighting	\$903,000
-	Stewart Road SW: Butte Avenue SE to 140th Avenue Court E ⁴	Widen to 5 lanes including a center two-way left-turn lane	-
<i>Roadway Subtotal</i>			<i>\$38,803,750</i>
NM1	West Valley Highway Sidewalks	Complete missing sidewalk facilities on the east side between 16th Street E and SR 167 SB Ramps	\$1,000,000
NM2	16th Street E Ped/Bike	Construct ped/bike facilities between Valentine Avenue and 138th Avenue E	\$2,000,000
NM3	White River Restoration Tail	#9 Ditch to area north of 16th Street	\$3,000,000
NM4	Tacoma Avenue Trail	New trail facilities between the White River and 45th Street E	\$150,000
NM5	Salmon Creek Trail	New trail between current end at 149th Avenue E and Sumner-Tapps Highway E	\$3,000,000
NM6	Edgewood Drive Sidewalks	Complete missing sidewalk facilities between SR 167 and Sumner Heights Drive E	\$550,000
NM7	Fryar Avenue Trail (WSDOT SUM-17)	West Main Street to Puyallup Street	\$7,200,000
NM8	Zehnder Street/Elm Street Sidewalks	"Construct pedestrian and bike facilities. Bike lanes from Valley Avenue to Main Street Complete missing sidewalk facilities between Pease Avenue and Wright Avenue"	\$1,600,000
NM9	Academy Street Bike Facilities	Construct bike facilities between Wood Avenue and Valley Avenue E	\$800,000
NM10	Wood Avenue/Meade McCumber Road	Construct bike facilities between Main Street E and Valley Avenue	\$1,800,000

Map ID ¹	Title and Location	Description	Project Cost ²
NM11	62nd Street Court E Trail	Construct trail east of 62nd Street Court E between Parker Road and 160th Avenue E	\$1,000,000
NM12	Main Street E Sidewalks	Construct missing sidewalk facilities between 162nd Avenue E and Sumner-Tapps Highway E	\$575,000
NM13	Puyallup River Crossing	Over White River. Two-part project: 1. Study best location for trail crossing 2. Construct ped/bike trail crossing	\$4,000,000
NM14	Construct sidewalks on one side of 72nd Street E	Between River Street and 143rd Avenue E	\$250,000
NM15	Rivergrove Pedestrian Bridge (WSDOT SUM-29)	Trail overpass connecting the vicinity of Alder Ave. to 143rd Ave. E over SR 410	\$11,200,000
NM16	Puyallup River Trail Bridge	Bridge and trail connections to the Foothills Trail. Trail overpass connecting 144th Ave E to 143rd Ave E	\$6,000,000
NM17	Mead McCumber Road/64th Street E Non-motor	Construct pedestrian and bike facilities between Valley Avenue E and Sumner-Tapps Highway	\$900,000
NM18	Sumner-Tapps Highway Sidewalks	Construct missing sidewalk facilities between Main Street E and the southern City Limits	\$1,000,000
NM19	Rainier Street Sidewalks	Construct missing sidewalk facilities between Sumner Avenue and Guptil Avenue	\$150,000
NM20	Traffic Avenue Pedestrian Signal (WSDOT SUM-25)	Replace existing pedestrian rectangular rapid flashing beacon with pedestrian signal	\$616,753
NM21	Alder Avenue Sidewalks	Construct pedestrian and bike facilities between SR 410 and Academy Street	\$950,000
NM22	Houston Road E Sidewalks	Construct pedestrian facilities between Valley Avenue E and the west City limits	\$850,000
<i>Non-Motorized Subtotal</i>			\$48,591,753
Total			\$104,270,503

Notes:

BOLD indicates a **new** project that has been identified based on the transportation analysis of land use alternatives.

1. Map identification references to Exhibit 5-6, 20-Year Transportation Improvement Projects.

2. Project cost represents 2023 dollars. Source:

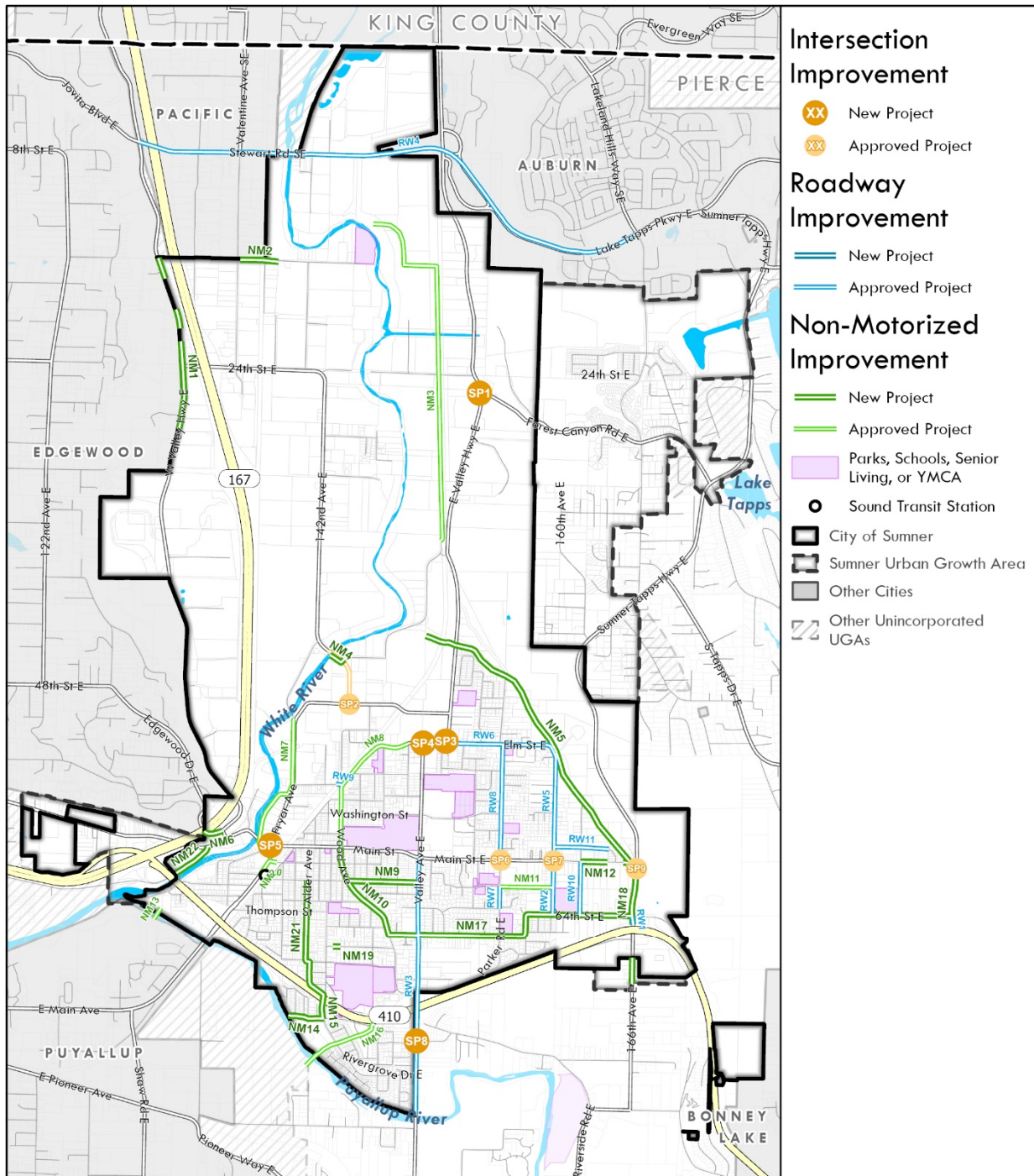
Transpo Group 2023

3. Identifies current WSDOT or grant funding.

4. This project is fully funded and will be completed before 2044; however, to remain eligible for transportation impact fees already set aside for the project, it is included on the 20-year project list.

The following chapter discusses how to finance the implement the modal plans.

Exhibit 5-6. 20-Year Transportation Improvement Projects



CITY OF SUMNER
20-Year Improvement Projects



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

6. Finance and Implementation Program

The transportation improvement projects must be funded and implemented to meet existing and future travel demands in and around the City of Sumner. A summary of project costs and a strategy for funding the projects over the life of the Transportation Plan are presented. In addition, implementation strategies are discussed, including continuing coordination with WSDOT and other agencies to prioritize and fund regional improvements. Other strategies call for monitoring and refining the City's transportation impact fee programs to ensure development addresses multimodal needs and does not out pace transportation system investments. The implementation plan provides the framework for the City to prioritize and fund the improvements identified in the transportation improvement program. It also addresses the City's development review program covering LOS standards and concurrency.

Financing Program

The GMA requires the Transportation Plan to include a multi-year financing plan based on the identified needs in the transportation improvement program. The financing plan for the Transportation Plan provides a basis for the City's annual Six-Year Transportation Improvement Program (TIP). As required by the GMA, the financing program also includes a discussion of how additional funds will be raised and/or level of service standards will be reassessed to assure that the Transportation Plan can adequately support the Land Use Element. Alternatively, the city may reassess its Land Use Element.

The transportation financing program becomes a subset of the City's Capital Facilities Plan (CFP) Element. The GMA requires the CFP Element to include at least a six-year plan for financing capital facilities and identifies the sources of public money for the projects.

Project Cost Summary

Planning level project cost estimates have been prepared to determine the magnitude of the transportation investments needed over the life of the Plan. Exhibit 5-5, in the previous chapter, summarizes the list of capital transportation improvement projects based on the analyses of existing and future 2044 conditions. Exhibit 6-1 summarizes the planning level capital costs into three primary improvement categories: Spot/Intersections, Roadway Improvements, and Non-Motorized Improvements. In addition, Exhibit 6-1 includes a summary of transportation programs and administration costs allocated to the City of Sumner to implement the Plan through 2044.

Exhibit 6-1. Transportation Projects and Programs Cost Summary

Cost (2023 Dollars) ¹	
Transportation Capital Projects	
Spot/Intersection Improvements	\$16,875,000
Roadway Improvements	\$38,803,750
Non-Motorized Improvements	\$48,591,753
Total	\$104,270,503
Citywide Transportation Programs	
Arterial Maintenance/Street Overlay	\$3,000,000
Roadway Paint Line Application	\$800,000
Pavement Repairs	\$1,323,000
Roadway Plastic Marking Application	\$1,122,000
Chip Seal Application	\$2,730,000
Crack Seal Application	\$1,575,000
Neighborhood Traffic Control Program	\$560,000
Signal Replacement Program (NEW)	\$2,000,000
ADA Transition Plan	\$800,000
Sidewalk Maintenance Program	\$2,500,000
Total	\$16,410,000
Total Cost (Capital and Programs)	\$120,680,503
Cost/Year	\$6,034,025

Notes:

1. Planning level costs in 2023 dollars.

Source: Transpo Group and City of Sumner 2023

Approximately \$104 million (2023 dollars) will be needed to fully fund the capital improvements over the 20-year horizon of the Plan. Of these costs, over \$16.8 million are related to intersection improvements, \$38.8 million are related to roadway improvements, and over \$48.5 million are related to non-motorized improvements. In addition, \$16.4 million is anticipated to implement the citywide transportation programs over the life of the Plan. Combined, the total costs for the Sumner Transportation Plan is estimated at approximately \$120.6 million. This equates to an average of approximately \$6 million each year for the life of the Plan through 2044. Funding the transportation projects and programs will require Sumner to seek outside sources, which is consistent with current practices. Ultimately, the portion of funding that is solely the responsibility of Sumner will vary by project and program and will depend on the availability of grants, partnerships, and other sources. The following section describes the Sumner funding strategy for implementing the 2024 Transportation Plan.

Funding Strategy

The City of Sumner utilizes fees and tax revenues to construct and maintain their transportation facilities. Funding sources include local tax revenues, fees, grants, partnerships with other agencies, and developer impact fees. The City also uses fuel taxes and can direct revenues from its General Fund to transportation capital projects, as needed, to balance its Six-Year Transportation Improvement Program (TIP).

Developer mitigation includes transportation impact fees and/or construction of frontage improvements at the time of development. Other agencies such as WSDOT are expected to share in the cost of state highway improvements to meet regional transportation needs.

The City identifies the most appropriate potential funding sources for each of the improvement projects. For example, grants or other agency funding are assumed to be a greater share of the revenues for funding improvements on SR 167 or SR 410 than on the local arterial improvements. While it is unlikely that implementation of the Transportation Plan projects will match the city's funding assumptions at a project-by-project level, this process does provide for a reasonable estimate of anticipated revenues needed for the overall capital improvement program. It also establishes a level of funding needed through transportation impact fees.

Exhibit 6-2 summarizes the anticipated sources of revenues used by the city to fund transportation improvements and programs. Key strategies related to funding transportation include:

- **Grants.** The city has been successful in applying for State and Federal grants. Partial grant funding was allocated to projects based on the type and location of the improvement. Projects that would serve Sumner as well as regional traffic and provided multimodal solutions are excellent candidates for grants. Projects that also support economic development are also good candidates.
- **Local Improvement District (LIDs) and Developer Funding.** LIDs or developer improvements would cover the cost of curb, gutter, sidewalks, planter strips, and a portion of the street lighting that are not included in the impact fee program. Other improvements would also be covered by developers based on SEPA mitigation or frontage improvement requirements. While the City has rarely used LIDs, the City could use this approach to set up LIDs that fund improvements and benefit the adjacent property owners. The City could pursue low interest loans from the Public Works Trust Fund (PWTF) and then pay off the loans with annual proceeds from the LIDs.
- **Transportation Impact Fee (TIF) Update.** The city will update the TIF based on the 20-Year project list and the allowance of multimodal fees. Additional details on the TIF are provided in the second following Exhibit 6-2.

Exhibit 6-2. Existing and Projected Revenues

	Annual Revenue (2023 Dollars)	2023-2044 20-Year Revenues (2023 Dollars)
General Revenue Source		
Motor Vehicle Fuel – City	\$210,000	\$4,200,000
Local Parking Tax	\$58,000	\$1,160,000
Street & Curb Permits	\$27,500	\$550,000
Plan Check Fees	\$430,000	\$8,600,000
Subtotal	\$725,500	\$14,510,000
Grants or Other Funding		
Federal State, or Other Grants/Funding Partnership	\$5,810,000	\$116,200,000
Local Improvement District/Developer Funded	\$100,000	\$2,000,000
Transportation Impact Fees ¹	\$500,000	\$10,000,000
Subtotal	\$6,410,000	\$128,200,000
Total Existing Revenue and Other Funding	\$7,135,500	\$142,710,000

Source: City of Sumner 2023

Notes:

1. Based review of historic Transportation Impact Fee (TIF) revenue data.

Transportation Impact Fees Update

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

- Related to improvements to serve new developments and not existing deficiencies.
- Assessed proportional to the impacts of new developments.
- Allocated for improvements that reasonably benefit new development.
- Spent on facilities identified in the CFP.

TIFs can only be used to help fund improvements that are needed to serve new growth. The projects can include recently completed projects to the extent that they serve future growth and do not solely resolve existing deficiencies. The cost of projects needed to resolve existing deficiencies cannot be included.

State Bill 5452 effective July 23, 2023, amends 82.02.090(7) RCW to include bike and pedestrian facilities designed with the intent of multimodal commuting as part of the definition of public facilities where impact fees are allowed. With this amendment, the City intends to adopt a multimodal transportation impact fee to help fund improvements.

The City implemented and adopted a transportation impact fee program in 2003. The program is defined in Chapter 12.36 of the Sumner Municipal Code (SMC). As part of the Transportation Plan, the City would amend SMC Chapter 12.36 to include pedestrian and bike facilities in the TIF program consistent with the State law.

The funding strategy assumes the TIF program is updated based on the 20-year list of improvement projects, as identified in Exhibit 5-5. An evaluation and update of the TIF rates has been conducted as part of the Transportation Plan to reflect changes in land use plans, funding, level of service standards, and the new State legislation allowing funding to be directed towards non-motorized transportation projects. The TIF eligible projects are a subset of the long-term transportation projects identified in Chapter 5 Exhibit 5-5. Appendix C provides a more detailed summary of the traffic impact fee eligibility and the amount of the project cost that was applied in the development of the TIF.

The current TIF program divides Sumner into districts. The district approach was used due to the large amount of growth in jobs that was anticipated in the MIC area with implementation of the 2015 Comprehensive Plan and to help incentivize development in the Town Center. The growth allocation for the current plan does not anticipate significant growth in jobs and residential growth is spread more evenly throughout the City, within the Town Center and other residential areas. The current TIF approach recommends eliminating the three districts and having one fee schedule for the entire City. This approach simplifies the fee structure and provides ease in understanding fees. Exhibit 6-3 summarizes the potential transportation impact fee based on the Preferred Alternative land use plan and cost for the TIF applied to the projects. The application of the TIF was reduced from the eligible amount based on anticipated grant funding or developer contributions to improvement projects. Appendix C provides a breakdown of the TIF eligible and the applied TIF percentages for each of the improvement projects.

Alternative 1 and the Preferred Alternative have a higher TIF per PM peak hour trip since there is less growth, but the system needs are similar to that of Alternative 2. Alternative 3 has approximately the same amount of growth in trips as Alternative 2 so the TIF per PM peak hour trip would be about the same as Alternative 2. The Preferred Alternative is used as the basis of the TIF calculations presented below.

Exhibit 6-3. Potential Transportation Impact Fee Rates

Applied TIF Share ¹	Total New PM Peak Hour Trips (Passenger car equivalents)	Cost Per New PM Peak Hour Trip (Passenger car equivalents)
\$26,515,384	2,479	\$7,452

Notes:

1. Total cost share in 2023 dollars, based on relative impact of the 2023 - 2044 traffic growth on each capacity-added project on a passenger car equivalent basis.

The transportation impact fees are estimated to account for almost 26.5 million (2023 dollars) in revenues. This represents approximately 22 percent of the total funding program, including the contributions related to expected debt service.

The current fee per weekday PM peak hour trip for the City ranges between \$1,900 to \$3,400 depending on the location of the development. The proposed fee estimate, including non-motorized transportation improvements, will be a significant increase over current fees. Staff will review the TIF with City Council who will determine the fee that is ultimately selected.

The following section describes the reassessment strategy that can be used in the case the TIF proportion or other funding source are less than estimated in this initial funding strategy.

Reassessment Strategy

The funding strategy is partially based on grants and other outside funding that the City does not control. The City may be able to shift revenues from other funding programs to address specific needs as yearly budgets are prepared or consider other revenue options such as increasing the vehicle license tab fee. In addition, the City is committed to reassessing their transportation needs and funding sources each year as part of their annual Six-Year Transportation Improvement Program (TIP). This allows the City to match the financing program with the shorter-term improvement projects and funding. The Transportation Plan also includes goals and policies to periodically review land use growth, adopted level of service standards, and funding sources to ensure they support one another and meet concurrency requirements.

To maintain the vitality of Sumner's transportation system, the City should adhere to the following principles in its funding program:

- As part of the development of the annual Six-Year Transportation Improvement Program, the City will balance improvement costs with available revenues.
- Review project design during the development review process to determine whether costs could be reduced through reasonable changes in scope or deviations from design standards.
- Coordinate and partner with WSDOT and other agencies to vigorously pursue grants from state, federal, and regional agencies to help fund and implement improvements along SR 167 and SR 410.
- Work with regional and local agencies to develop multi-agency grant applications for projects that serve regional travel.
- Review transportation impact fee revenues each year to determine whether the impact fees should be adjusted to account for project cost increases and/or decreases in grants or WSDOT cost sharing.
- If the actions above are not sufficient, consider changes in the level of service standards and/or limit the rate of growth.

Implementation Program

Implementation of the Transportation Plan involves several strategies. These include coordination with developers and partnering with other agencies to construct the transportation improvement projects. Partnering with other agencies and use of grants will be especially critical in the implementation of safety, capacity, and operational improvements along SR 167 and SR 410. This may include re-prioritizing roadway projects as new funding sources become available or by focusing on areas most impacted by new development. The City will also continue to review strategies for phasing improvements allowing

funding to be spread over a longer period. In addition, the City will need to review, maintain, and update its concurrency management, Transportation Impact Fee, and other development review processes to account for the revised multimodal LOS standards and assure that the impacts of growth are mitigated, and transportation improvements are completed concurrent with new development.

Partnering with Other Agencies

The Transportation Plan supports the City's role in the regional transportation strategy (in PSRCs Vision 2050) through its policies to support and expand use of transit, transportation demand management, and active travel to reduce the number of vehicle trips generated by development in the city. Sumner will need to coordinate with Sound Transit, other transit providers, and other nearby cities to implement facilities and services to meet those objectives. Coordination will also help assure consistency in plans and implementation programs between agencies to meet the goals of the regional plan.

The City will continue to partner with WSDOT to implement improvements along both SR 167 and SR 410 consistent with the Transportation Plan project list. Projects along both state highways serve regional travel patterns as well as provide local access within the City of Sumner. Without WSDOT as a partner, the City is unable to put a high priority on major capacity improvements along both state highways since the improvements serve significant levels of regional traffic and the projects will cost more than the City can reasonably fund on their own. These projects should be considered for joint submittal of grants, with the local match being combined from benefiting agencies. Partnering with WSDOT will be critical in the implementation of the Transportation Element project list.

Project Priorities and Timing

The City of Sumner will use the annual update of the Six-Year TIP to re-evaluate priorities and timing of projects. Throughout the planning period, projects will be completed, and priorities will be revised. The development of the TIP will also be used to identify potential phasing options to fit within available revenues during that six-year time horizon. The city will monitor traffic volumes and the location and intensity of land use growth in the city. The city will also need to monitor traffic growth from other adjacent communities. Based on this information, the city will then be able to direct funding to areas that are most impacted by growth or may fall below the City's level of service standard. The development of the TIP will be an ongoing process over the life of the plan and will be reviewed and amended annually.

Concurrency Management and Development Review

Concurrency refers to the ongoing process of coordinating infrastructure needs with community development. This concept was formalized in the GMA to ensure that adequate public facilities are provided in concert with population and employment growth. For transportation facilities, the GMA requirement is fulfilled if its level of service standards will continue to be met including the additional travel demand generated by each development.

As part of the review of developments applications, the city will apply its level of service standards, street classifications and conceptual street designs, and other regulations related to transportation. The City has options for implementing its concurrency requirements. Development permit applications are evaluated for vehicle trips generated, and Transportation Impact Fees (TIF) are assessed. Alternatively, depending on the scale of a proposed project, the City may also review concurrency through the SEPA

review process. The SEPA process also ties the concurrency to specific development applications, instead of applying it citywide or to subareas of the city. This process is consistent with the 2015 Transportation Plan.

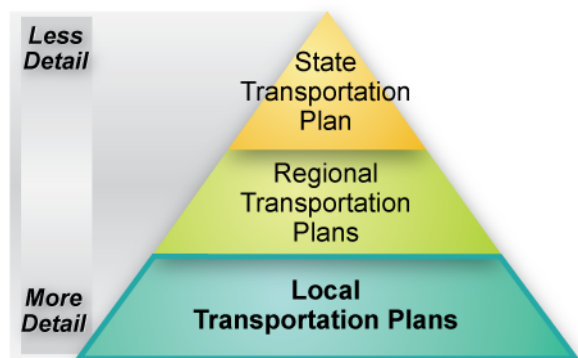
The following summarizes the City's framework for the SEPA-based concurrency review:

- Baseline traffic forecasts to be developed and based on existing traffic, historical growth rates, and pipeline development traffic.
- Project traffic based on trip generation, distribution, and assignment.
- Future conditions evaluated based on city or other agency improvements that are funded for construction within six years.
- Assess project impacts at locations that fall below the city's adopted LOS standard.
- Require mitigation to resolve LOS deficiencies, unless exempt from concurrency based on policies.
- If deficient location is exempt from concurrency, require appropriate mitigation (such as payment of impact fees or proportionate share mitigation, construct partial improvements to offset project impacts, or reduce development impacts through phasing or TDM programs)
- If adequate mitigation is not defined to resolve the LOS deficiency, then the city will deny the development.
- Identified LOS deficiencies will be used to seek grants or other funding and as an input to the annual Six-Year TIP process.

7. Consistency With Other Agencies

Sumner's transportation system is part of, and connected to, a broader regional highway and arterial system. The GMA works to increase coordination and compatibility between the various agencies that are responsible for the overall transportation system. Since transportation improvements need to be coordinated across jurisdictional boundaries, the Transportation Plan needs to be consistent with and supportive of the objectives identified in the Washington State Transportation Plan, PSRC's Vision 2050, and the transportation plans or capital improvement plans of the surrounding agencies. Developing the Transportation Plan is primarily a bottoms-up approach to planning, with the city exploring its needs based on the land use plan. Eventually, local projects are incorporated into regional and state plans. A schematic of this approach is shown below in Exhibit 7-1. The following sections provide a review of this Plan's consistency with neighboring jurisdictions.

Exhibit 7-1. Transportation Plan Approach



Washington State Department of Transportation

As required by the 1998 amendments to the GMA, the Sumner Transportation Plan addresses the state highway system. Specifically, the Transportation Plan addresses the following elements related to the state highway system:

- Inventory of existing facilities – see Chapter 3
- Level of service standards – see Chapter 3 and 4
- Concurrency on state facilities – see Chapters 4 and 5
- Analysis of traffic impacts on state facilities – see Chapter 4
- Consistency with the State Highway Systems Plan – see Chapter 5 and Exhibit 7-2

Exhibit 7-2 summarizes the improvements on state facilities listed in the Statewide Transportation Improvement Program (STIP) 2023 – 2026, which are consistent with the Plan identified in chapter 5.

Exhibit 7-2. State Highway Improvement Plan

State Route (limits) ¹	State Project ID (Sumner Project ID)	State Highway System Plan Project Description
166th Avenue E SR 410 WB Ramp Intersection to 64th Street E	SUM-24 (RW1)	Widen 166th Avenue E to a 4-lane facility with roundabouts at the SR 410 WB Ramp and 64th Street E
Fryar Avenue W Main Street to Puyallup Street	SUM-17 (NM7)	Shared Use Trail W Main Street to Puyallup Street
Main Street/Traffic Avenue	SUM-25 (NM21)	Replace existing pedestrian rectangular rapid flashing beacon with pedestrian signal
Rivergrove Community Pedestrian Bridge Alder Avenue and Maybelle Street to 143rd Avenue E	SUM-29 (NM16)	Construct a non-motorized pedestrian bridge over SR 410 with approach ramp, shared use path and sidewalk connections to Alder Avenue, 143rd Avenue E, and 72nd Street E
Stewart Road Corridor Completion Butte Avenue E to 140th Avenue Curt E	SUM-16	Replace and widen existing bridge to accommodate 4 travel lanes and separate shared use path
Stewart Road ITS W Valley Highway E - SR 167/Stewart Road Interchange to Future signal at Golf Course Entrance west of East Valley Highway	SUM-27 (RW4)	Add/replace/upgrade interconnected conduit/cabling and signal hardware to coordinate traffic signals and devices along Stewart Road
Systemic Horizontal Curve and Roadway Departure Safety Improvements East Valley Highway, West Valley Highway, Sumner-Tapps Highway/166th Avenue E, 142nd Avenue E/24th Street E	SUM-28 (RW12)	Install static and/or dynamic curve warning signs, speed feedback signs, centerline and edge line profiled striping, rumble strips, reflective markers on-pavement as appropriate to delineate roadside objects, channelization, guardrail/roadway shouldering, and street lighting
Tacoma Avenue Overlay Puyallup Street to the White River Bridge	SUM-30 (SP2)	Plane, repair, and overlay, complete intersection channelization improvements, add an eastbound left-turn pocket on Puyallup Street at Tacoma Avenue. Add a signal at the Puyallup Street/Tacoma Avenue intersection
Valley Ave Overlay Sumner City Limits to Meade McCumber Rd E	SUM-26 (RW3 in part)	Grinde and overlay Valey Avenue

Notes:

1. Based on the WSDOT Statewide Transportation Improvement Program (STIP) 2023-2026.

Pierce County

The recommendations and functional classifications of arterials and collectors are consistent between the City's and County's Plans.

The most significant improvement project in the Transportation Plan involving Pierce County is the widening of Stewart Road SE Bridge over the White (Stuck) River (SUM-16). This project is fully funded and is being led by the City of Sumner with participation by Pierce County and the Cities of Auburn and Pacific. It provides the principal east-west route in the north part of the City of Sumner connecting with Stewart Road from the SR 167 interchange to Lake Tapps Parkway.

Sound Transit

The future transit recommendations in the Sumner Transportation Plan are consistent with Sound Transit's short and long-term plans for the area.

City of Auburn

Auburn is planning on widening East Valley Highway between Lakeland Hills Way and E Valley Access Road to four to five lanes including storm water, illumination, and intelligent transportation system (ITS) improvements. A separate non-motorized trail would also be constructed on the east side of East Valley Highway. This project provides a continuation of the Auburn Way principal arterial to connect to the Stewart Road/Lake Tapps Parkway corridor.

City of Pacific

The Cities of Sumner and Pacific transportation systems connect in the northwest part of Sumner. The City of Pacific is also participating in Pierce County's expansion of the Stewart Road SE Bridge. The Sumner Regional Trail system along the White (Stuck) River also will connect with segments in Pacific. The trail project is being coordinated between the two cities and Pierce County.

City of Edgewood

The City of Edgewood is located west of Sumner. The primary transportation system interface is in the Pacific Avenue/West Valley Highway corridor. Traffic using Sumner Heights Drive or Edgewood Drive E in southeast Edgewood access either Valley Avenue or Pacific Avenue. Traffic using Pacific Avenue can access SR 410 via Bridge Street and Traffic Avenue. Traffic to/from Edgewood is also able to use the North Sumner interchange with SR 167 at 24th Street E.

City of Puyallup

The City of Puyallup is located southwest of Sumner. The primary transportation system interface is in the E Main Avenue (Traffic Avenue) corridor and SR 162 via Pioneer Way E. City of Puyallup has acknowledged the need for working with Sumner.

Appendix A LOS Definition

Highway Capacity Manual 2010/6th Edition

Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). Control delay is a complex measure based on many variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Table 1 summarizes the LOS criteria for signalized intersections, as described in the *Highway Capacity Manual 2010* and 6th Edition (Transportation Research Board, 2010 and 2016, respectively).

Table 1. Level of Service Criteria for Signalized Intersections

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

Source: *Highway Capacity Manual 2010 and 6th Edition*, Transportation Research Board, 2010 and 2016, respectively.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

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

Table 2. Level of Service Criteria for Unsignalized Intersections

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

Source: *Highway Capacity Manual 2010 and 6th Edition*, Transportation Research Board, 2010 and 2016, respectively.

1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

Appendix A LOS Definition

Highway Capacity Manual, 2000

Signalized intersection level of service (LOS) is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria are stated in terms of average delay per vehicle during a specified time period (for example, the PM peak hour). Vehicle delay is a complex measure based on many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Table 1 shows LOS criteria for signalized intersections, as described in the *Highway Capacity Manual* (Transportation Research Board, Special Report 209, 2000).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (sec/veh)	General Description (Signalized Intersections)
A	≤10	Free Flow
B	>10 - 20	Stable Flow (slight delays)
C	>20 - 35	Stable flow (acceptable delays)
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 - 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report 209, 2000.

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2 shows LOS criteria for unsignalized intersections (both all-way and two-way, stop-controlled).

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report 209, 2000.

Appendix B LOS Summary and Worksheets

Sumner Comp Plan Update - 2024
PM Peak Hour

Intersection	Traffic Control	2023 Existing			2044 Alt 1			2044 Alt 2		
		LOS	Delay	WM	LOS	Delay	WM or v/c	LOS	Delay	WM or v/c
1. Stewart Rd SE/Butte Ave SE	TWSC	F	186.4	SB	C	32.5	-	D	35.6	-
2. 140th Ave Ct E/Stewart Rd SE	Signal	B	10	-	A	7.3	-	A	7.4	-
3. W Valley Hwy E/24th St E	Signal	C	21.6	-	C	26.6	-	C	25.8	-
4. SR 167 NB Ramps/24th St E	Signal	D	35.8	-	C	33.6	-	C	33.6	-
5. 136th Ave E/24th St E	Signal	C	25.1	-	C	27.9	-	C	28.1	-
6. 142nd Ave E/24th St E	TWSC	B	13.9	WB	C	15.3	WB	C	16.4	WB
7. E Valley Hwy E/Forest Canyon Rd E	TWSC	F	327.1	WB	F	1268.8	WB	F	2472.2	WB
8. W Valley Hwy E/SR 167 SB Ramps	Signal	B	18.5	-	C	20.9	-	C	21	-
9. 142nd Ave E/Costco Access	Signal	A	6.8	-	A	6.7	-	A	6.6	-
10. W Valley Hwy E/42nd St E	TWSC	B	11.3	WB	B	14.2	WB	B	14.4	WB
11. 142nd Avenue E/Tacoma Avenue	TWSC	B	13.1	EBL	C	16.3	EBL	C	16.9	EBL
12. Puyallup St/Tacoma Ave	AWSC	C	18.9	-	F	84.3	-	F	105.8	-
13. E Valley Hwy E/Puyallup St	Signal	B	14.4	-	B	16.1	-	B	17.5	-
14. E Valley Hwy E/Elm St E	TWSC	D	29.6	NBL	F	57.4	NBL	F	64.1	NBL
15. Valley Ave/Elm St E	TWSC	D	30.7	NBL	E	43.1	NBL	E	45.2	NBL
16. Fryar Ave/Zehnder St	TWSC	C	20.7	WB	C	24.6	WB	D	25.9	WB
17. Parker Rd E/Washington St	TWSC	B	10.3	EB	B	11	EB	B	11.2	EB
18. Sumner Heights Dr E/W Valley Hwy E	Signal	C	28.6	-	D	41.1	-	D	42.5	-
19. Sumner Heights Dr E/Valley Ave E/Cannery Way	Signal	C	20.5	-	C	30.7	-	C	31.8	-
20. Traffic Ave/Main St	Signal	D	43.1	-	E	58.1	-	E	59.5	-
21. Alder Ave/Main St	AWSC	B	11.1	-	B	13.6	-	B	14.6	-
22. Ryan St/Main St	TWSC	B	11.8	NB	B	12.4	NB	B	12.6	NB
23. Wood Ave/Main St	Signal	B	10.7	-	B	13	-	B	13.3	-
24. Valley Ave/Main St	Signal	C	22.7	-	C	32.4	-	D	36.7	-
25. Parker Rd E/Main St E	TWSC	C	24.4	SB	F	55.9	SB	F	66.2	SB
26. 160th Ave E/Main St (60th St E)	AWSC	C	15.8	-	E	46.5	-	F	56.3	-
27. Sumner Tapps Hwy E/60th St E	TWSC	C	18.9	EBR	C	27.7	-	C	30.8	-
28. Traffic Ave/Maple St	TWSC	C	22.3	EB	D	25.4	EB	D	26	EB
29. Traffic Ave/Thompson St	Signal	C	23.8	-	D	35.9	-	D	36.7	-
30. Station Ln/Thompson St	Signal	A	7.5	-	A	7.5	-	A	7.5	-
31. Alder Avenue/Thompson Street	TWSC	B	11.7	NB	B	11.8	NB	B	12.1	NB
32. E Main Ave/SR 410 EB Ramps	Signal	B	19	-	C	23.1	-	C	21.7	-
33. Valley Ave/Meade-McCumber Rd E	Signal	B	18.1	-	C	29.7	-	C	34.9	-
34. Parker Rd E/Meade-McCumber Rd E	TWSC	B	11	NB	B	11.3	SB	B	11.8	SB
35. 160th Ave E/64th St E	AWSC	B	11.8	-	C	17.8	-	C	19.7	-
36. Sumner-Tapps Hwy E/64th St E	Signal	C	22.3	-	A	6.7	0.398	A	6.9	0.414
37. Sumner-Tapps Hwy E/SR 410 WB Ramps	TWSC	F	61	WB	A	7.4	0.539	A	7.6	0.55
38. Sumner-Tapps Hwy E/SR 410 EB Ramps	Signal	C	21.2	-	B	18.4	-	B	18.4	-
39. Valley Ave/Gary St E	TWSC	B	12	EB	C	18.4	EB	C	20	EB
40. Valley Ave/SR 410 WB Ramps	Signal	C	27.7	-	A	8	0.597	A	8.5	0.628
41. Valley Ave/SR 410 EB Ramps	Signal	F	80.4	-	B	12.2	0.867	B	12.5	0.875
42. Valley Ave/74th St E	TWSC	F	110	EB	F	611.8	EB	F	685.5	WB
43. Valley Ave/Rivergrove Dr E	Signal	B	16.5	-	B	15.4	-	B	15.4	-

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

1: Stewart Road SE (8th St E) & Butte Ave SE

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	20.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	885	5	5	525	20	15	0	10	75	0	95
Future Vol, veh/h	40	885	5	5	525	20	15	0	10	75	0	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	6	6	6	5	5	5	0	0	0	2	2	2
Mvmt Flow	42	922	5	5	547	21	16	0	10	78	0	99
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	568	0	0	927	0	0	1626	1587	925	1582	1579	558
Stage 1	-	-	-	-	-	-	1009	1009	-	568	568	-
Stage 2	-	-	-	-	-	-	617	578	-	1014	1011	-
Critical Hdwy	4.16	-	-	4.15	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.254	-	-	2.245	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	985	-	-	725	-	-	83	109	329	88	109	529
Stage 1	-	-	-	-	-	-	292	320	-	508	506	-
Stage 2	-	-	-	-	-	-	481	504	-	288	317	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	985	-	-	725	-	-	62	98	329	79	98	529
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	98	-	79	98	-
Stage 1	-	-	-	-	-	-	266	292	-	463	501	-
Stage 2	-	-	-	-	-	-	387	499	-	254	289	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0.4		0.1			58.9			186.4			
HCM LOS						F			F			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	92	985	-	-	725	-	-	151				
HCM Lane V/C Ratio	0.283	0.042	-	-	0.007	-	-	1.173				
HCM Control Delay (s)	58.9	8.8	0	-	10	0	-	186.4				
HCM Lane LOS	F	A	A	-	B	A	-	F				
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0	-	-	9.9				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary
2: 140th Ct E & Stewart Road SE (8th St E)

Summer Comp Plan Update
Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	970	10	5	490	0	45	0	20	5	0	10
Future Volume (veh/h)	5	970	10	5	490	0	45	0	20	5	0	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1811	1811	1811	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	5	1000	10	5	505	0	46	0	21	5	0	10
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	4	4	6	6	6	5	5	5	6	6	6
Cap, veh/h	586	1169	12	254	1164	986	337	0	216	134	32	143
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.00	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	879	1819	18	540	1811	1535	1367	0	1543	278	231	1018
Grp Volume(v), veh/h	5	0	1010	5	505	0	46	0	21	15	0	0
Grp Sat Flow(s),veh/h/ln	879	0	1837	540	1811	1535	1367	0	1543	1528	0	0
Q Serve(g_s), s	0.1	0.0	22.1	0.4	7.0	0.0	1.0	0.0	0.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.1	0.0	22.1	22.5	7.0	0.0	1.4	0.0	0.6	0.4	0.0	0.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	0.33		0.67
Lane Grp Cap(c), veh/h	586	0	1181	254	1164	986	337	0	216	309	0	0
V/C Ratio(X)	0.01	0.00	0.86	0.02	0.43	0.00	0.14	0.00	0.10	0.05	0.00	0.00
Avail Cap(c_a), veh/h	707	0	1433	328	1412	1197	806	0	747	811	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.3	0.0	7.2	16.1	4.5	0.0	19.3	0.0	19.0	18.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	4.7	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	6.4	0.0	1.6	0.0	0.5	0.0	0.2	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.3	0.0	11.9	16.1	4.8	0.0	19.4	0.0	19.1	18.9	0.0	0.0
LnGrp LOS	A	A	B	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h	1015			510			67			15		
Approach Delay, s/veh	11.9			4.9			19.3			18.9		
Approach LOS	B			A			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	38.1			12.6			38.1			12.6		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	39.5			24.5			39.5			24.5		
Max Q Clear Time (g_c+I1), s	24.1			2.4			24.5			3.4		
Green Ext Time (p_c), s	8.4			0.0			3.4			0.1		
Intersection Summary												
HCM 6th Ctrl Delay	10.0											
HCM 6th LOS	B											

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Summer Comp Plan Update

3: W Valley Highway E & 24th Street E

Existing PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	365	30	60	190	190	515
Future Volume (veh/h)	365	30	60	190	190	515
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1707	1707	1544	1544	1781	1781
Adj Flow Rate, veh/h	380	31	62	198	198	536
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	13	13	24	24	8	8
Cap, veh/h	476	219	818	715	234	1330
Arrive On Green	0.15	0.15	0.56	0.56	0.14	0.75
Sat Flow, veh/h	3155	1447	1544	1282	1697	1781
Grp Volume(v), veh/h	380	31	62	198	198	536
Grp Sat Flow(s),veh/h/ln	1577	1447	1467	1282	1697	1781
Q Serve(g_s), s	10.5	1.7	1.8	7.3	10.3	9.8
Cycle Q Clear(g_c), s	10.5	1.7	1.8	7.3	10.3	9.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	476	219	818	715	234	1330
V/C Ratio(X)	0.80	0.14	0.08	0.28	0.85	0.40
Avail Cap(c_a), veh/h	890	408	818	715	385	1330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	33.1	9.2	10.4	37.9	4.1
Incr Delay (d2), s/veh	2.2	0.2	0.2	1.0	7.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.6	0.6	2.1	4.6	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.0	33.3	9.4	11.4	45.0	5.0
LnGrp LOS	D	C	A	B	D	A
Approach Vol, veh/h	411		260			734
Approach Delay, s/veh	38.6		10.9			15.8
Approach LOS	D		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	17.0	54.8			71.8	18.2
Change Period (Y+Rc), s	4.6	4.6			4.6	4.6
Max Green Setting (Gmax), s	20.4	30.4			55.4	25.4
Max Q Clear Time (g_c+I1), s	12.3	9.3			11.8	12.5
Green Ext Time (p_c), s	0.3	1.5			3.7	1.1
Intersection Summary						
HCM 6th Ctrl Delay			21.6			
HCM 6th LOS			C			
Notes						
User approved pedestrian interval to be less than phase max green.						

Synchro 11 Report

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

4: SR-167 NB Ramps & 24th Street E

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	290	0	0	375	265	20	5	250	0	0	0
Future Volume (veh/h)	85	290	0	0	375	265	20	5	250	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1574	1574	0	0	1693	1693	1678	1678	1678			
Adj Flow Rate, veh/h	90	309	0	0	399	282	13	16	0			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	22	22	0	0	14	14	15	15	15			
Cap, veh/h	110	1090	0	0	772	345	852	895				
Arrive On Green	0.07	0.36	0.00	0.00	0.08	0.08	0.53	0.53	0.00			
Sat Flow, veh/h	1499	3069	0	0	3300	1434	1598	1678	1422			
Grp Volume(v), veh/h	90	309	0	0	399	282	13	16	0			
Grp Sat Flow(s),veh/h/ln	1499	1495	0	0	1608	1434	1598	1678	1422			
Q Serve(g_s), s	5.3	6.6	0.0	0.0	10.7	17.4	0.3	0.4	0.0			
Cycle Q Clear(g_c), s	5.3	6.6	0.0	0.0	10.7	17.4	0.3	0.4	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	110	1090	0	0	772	345	852	895				
V/C Ratio(X)	0.82	0.28	0.00	0.00	0.52	0.82	0.02	0.02				
Avail Cap(c_a), veh/h	157	1376	0	0	979	437	852	895				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	0.66	0.66	0.00	0.00	0.95	0.95	1.00	1.00	0.00			
Uniform Delay (d), s/veh	41.1	20.3	0.0	0.0	36.4	39.5	9.9	9.9	0.0			
Incr Delay (d2), s/veh	12.4	0.1	0.0	0.0	0.5	8.7	0.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.3	2.3	0.0	0.0	4.6	7.5	0.1	0.2	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.5	20.4	0.0	0.0	36.9	48.2	9.9	9.9	0.0			
LnGrp LOS	D	C	A	A	D	D	A	A				
Approach Vol, veh/h	399			681			29					
Approach Delay, s/veh	27.8			41.6			9.9					
Approach LOS	C			D			A					
Timer - Assigned Phs	2			4			7			8		
Phs Duration (G+Y+Rc), s	52.6			37.4			11.2			26.2		
Change Period (Y+Rc), s	4.6			4.6			4.6			4.6		
Max Green Setting (Gmax), s	39.4			41.4			9.4			27.4		
Max Q Clear Time (g_c+l1), s	2.4			8.6			7.3			19.4		
Green Ext Time (p_c), s	0.1			2.0			0.0			2.2		

Intersection Summary

HCM 6th Ctrl Delay 35.8

HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Summer Comp Plan Update

5: 136th Avenue E & 24th Street E

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	345	75	35	355	60	70	20	60	210	20	220
Future Volume (veh/h)	115	345	75	35	355	60	70	20	60	210	20	220
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1604	1604	1604	1648	1648	1648	1841	1841	1841	1693	1693	1693
Adj Flow Rate, veh/h	126	379	82	38	390	66	77	22	66	231	22	242
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	20	20	20	17	17	17	4	4	4	14	14	14
Cap, veh/h	477	1220	261	434	1250	210	221	76	227	380	26	283
Arrive On Green	0.02	0.16	0.16	0.04	0.47	0.47	0.06	0.19	0.19	0.08	0.21	0.21
Sat Flow, veh/h	1527	2496	534	1570	2682	450	1753	404	1213	1612	121	1328
Grp Volume(v), veh/h	126	230	231	38	226	230	77	0	88	231	0	264
Grp Sat Flow(s),veh/h/ln	1527	1523	1507	1570	1566	1566	1753	0	1618	1612	0	1449
Q Serve(g_s), s	3.8	12.0	12.2	1.1	8.1	8.3	3.1	0.0	4.2	7.5	0.0	15.8
Cycle Q Clear(g_c), s	3.8	12.0	12.2	1.1	8.1	8.3	3.1	0.0	4.2	7.5	0.0	15.8
Prop In Lane	1.00		0.35	1.00		0.29	1.00		0.75	1.00		0.92
Lane Grp Cap(c), veh/h	477	745	737	434	730	730	221	0	302	380	0	309
V/C Ratio(X)	0.26	0.31	0.31	0.09	0.31	0.31	0.35	0.00	0.29	0.61	0.00	0.85
Avail Cap(c_a), veh/h	558	745	737	501	730	730	268	0	530	380	0	475
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	24.3	24.4	11.8	15.0	15.0	28.0	0.0	31.5	29.5	0.0	34.1
Incr Delay (d2), s/veh	0.1	1.0	1.1	0.0	1.1	1.1	0.3	0.0	0.2	2.0	0.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	5.1	5.1	0.4	3.0	3.0	1.3	0.0	1.6	1.4	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.9	25.3	25.5	11.8	16.1	16.2	28.3	0.0	31.7	31.5	0.0	39.8
LnGrp LOS	B	C	C	B	B	B	C	A	C	C	A	D
Approach Vol, veh/h	587			494			165			495		
Approach Delay, s/veh	22.5			15.8			30.1			35.9		
Approach LOS	C			B			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	46.4	12.0	21.3	8.2	48.5	9.6	23.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	10.5	24.5	7.5	29.5	7.5	27.5	7.5	29.5				
Max Q Clear Time (g_c+I1), s	5.8	10.3	9.5	6.2	3.1	14.2	5.1	17.8				
Green Ext Time (p_c), s	0.1	3.2	0.0	0.3	0.0	3.2	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay	25.1											
HCM 6th LOS	C											
Notes												

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
6: 142nd Ave E & 24th St E

Sumner Comp Plan Update
Existing PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔		↔		↔	↔↔
Traffic Vol, veh/h	15	25	390	15	35	750
Future Vol, veh/h	15	25	390	15	35	750
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	34	34	23	23	18	18
Mvmt Flow	16	27	424	16	38	815
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	918	433	0	0	441	0
Stage 1	433	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Critical Hdwy	7.11	6.71	-	-	4.37	-
Critical Hdwy Stg 1	5.91	-	-	-	-	-
Critical Hdwy Stg 2	6.31	-	-	-	-	-
Follow-up Hdwy	3.823	3.623	-	-	2.371	-
Pot Cap-1 Maneuver	241	547	-	-	1024	-
Stage 1	577	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	232	547	-	-	1023	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13.9	0	0.4			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	450	1023	-	
HCM Lane V/C Ratio	-	-	0.097	0.037	-	
HCM Control Delay (s)	-	-	13.9	8.7	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

7: E Valley Highway E & Forest Canyon Road E

Existing PM Peak Hour

Intersection												
Int Delay, s/veh		23										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↘		↙	↘	
Traffic Vol, veh/h	0	0	5	40	0	55	5	230	135	395	660	0
Future Vol, veh/h	0	0	5	40	0	55	5	230	135	395	660	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	65	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	6	6	6	2	2	2	3	3	3
Mvmt Flow	0	0	5	44	0	60	5	253	148	434	725	0
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1960	2004	725	1933	1930	327	725	0	0	401	0	0
Stage 1	1593	1593	-	337	337	-	-	-	-	-	-	-
Stage 2	367	411	-	1596	1593	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.56	6.26	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4.054	3.354	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	48	60	428	49	65	705	878	-	-	1152	-	-
Stage 1	136	168	-	669	634	-	-	-	-	-	-	-
Stage 2	657	598	-	131	163	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	31	37	428	~ 34	40	705	878	-	-	1152	-	-
Mov Cap-2 Maneuver	31	37	-	~ 34	40	-	-	-	-	-	-	-
Stage 1	135	105	-	665	630	-	-	-	-	-	-	-
Stage 2	597	594	-	81	102	-	-	-	-	-	-	-
Approach	EB		WB		NB			SB				
HCM Control Delay, s	13.5		\$ 327.1		0.1			3.7				
HCM LOS	B		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	878	-	-	428	76	1152	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.013	1.374	0.377	-	-				
HCM Control Delay (s)	9.1	-	-	13.5	\$ 327.1	10	-	-				
HCM Lane LOS	A	-	-	B	F	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	8.3	1.8	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Synchro 11 Report

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary 8: W Valley Highway E & SR-167 SB Ramps

Sumner Comp Plan Update
Existing PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	60	190	55	530	365
Future Volume (veh/h)	35	60	190	55	530	365
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1411	1411	1648	1648	1767	1767
Adj Flow Rate, veh/h	37	64	202	59	564	388
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	33	33	17	17	9	9
Cap, veh/h	128	200	533	151	639	0
Arrive On Green	0.09	0.09	0.22	0.22	0.38	0.00
Sat Flow, veh/h	1344	2104	2476	678	1682	564
Grp Volume(v), veh/h	37	64	130	131	564	19.5
Grp Sat Flow(s),veh/h/ln	1344	1052	1566	1506	1682	B
Q Serve(g_s), s	1.2	1.3	3.2	3.4	14.3	
Cycle Q Clear(g_c), s	1.2	1.3	3.2	3.4	14.3	
Prop In Lane	1.00	1.00		0.45	1.00	
Lane Grp Cap(c), veh/h	128	200	349	336	639	
V/C Ratio(X)	0.29	0.32	0.37	0.39	0.88	
Avail Cap(c_a), veh/h	454	710	1215	1169	937	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	19.2	19.3	15.0	15.1	13.2	
Incr Delay (d2), s/veh	1.1	0.8	0.6	0.7	6.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.4	0.3	1.0	1.1	5.3	
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.3	20.1	15.6	15.8	19.5	
LnGrp LOS	C	C	B	B	B	
Approach Vol, veh/h	101		261			
Approach Delay, s/veh	20.2		15.7			
Approach LOS	C		B			
Timer - Assigned Phs	1	2			8	
Phs Duration (G+Y+Rc), s	21.9	14.8			8.9	
Change Period (Y+Rc), s	4.6	4.6			4.6	
Max Green Setting (Gmax), s	25.4	35.4			15.4	
Max Q Clear Time (g_c+I1), s	16.3	5.4			3.3	
Green Ext Time (p_c), s	1.1	1.5			0.2	
Intersection Summary						
HCM 6th Ctrl Delay			18.5			
HCM 6th LOS			B			

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

9: 142nd Ave E & Costco Access

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	15	5	0	5	5	280	5	0	610	5
Future Volume (veh/h)	5	0	15	5	0	5	5	280	5	0	610	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	477	477	477	1900	1900	1900	1722	1722	1722	1781	1781	1781
Adj Flow Rate, veh/h	5	0	16	5	0	5	5	295	5	0	642	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
Percent Heavy Veh, %	96	96	96	0	0	0	12	12	12	8	8	8
Cap, veh/h	355	0	14	343	0	57	530	1919	32	749	1332	10
Arrive On Green	0.04	0.00	0.04	0.04	0.00	0.04	0.01	0.58	0.58	0.00	0.39	0.39
Sat Flow, veh/h	357	0	404	1419	0	1586	1640	3292	56	1697	3442	27
Grp Volume(v), veh/h	5	0	16	5	0	5	5	146	154	0	316	331
Grp Sat Flow(s),veh/h/ln	357	0	404	1419	0	1586	1640	1636	1712	1697	1692	1776
Q Serve(g_s), s	0.3	0.0	0.8	0.0	0.0	0.1	0.0	0.9	0.9	0.0	2.9	3.0
Cycle Q Clear(g_c), s	0.4	0.0	0.8	0.8	0.0	0.1	0.0	0.9	0.9	0.0	2.9	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.02
Lane Grp Cap(c), veh/h	355	0	14	343	0	57	530	954	998	749	655	687
V/C Ratio(X)	0.01	0.00	1.11	0.01	0.00	0.09	0.01	0.15	0.15	0.00	0.48	0.48
Avail Cap(c_a), veh/h	614	0	308	1374	0	1210	833	1247	1305	1064	1290	1354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	10.0	0.0	10.1	10.5	0.0	9.8	3.4	2.0	2.0	0.0	4.8	4.8
Incr Delay (d2), s/veh	0.0	0.0	141.7	0.0	0.0	0.7	0.0	0.1	0.1	0.0	0.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	0.0	151.8	10.5	0.0	10.4	3.4	2.1	2.1	0.0	5.4	5.4
LnGrp LOS	A	A	F	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h	21			10			305			647		
Approach Delay, s/veh	118.0			10.5			2.1			5.4		
Approach LOS	F			B			A			A		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	4.8		0.0	16.2		4.8		4.1	12.1			
Change Period (Y+Rc), s	4.0		4.0	4.0		4.0		4.0	4.0			
Max Green Setting (Gmax), s	16.0		4.0	16.0		16.0		4.0	16.0			
Max Q Clear Time (g_c+I1), s	2.8		0.0	2.9		2.8		2.0	5.0			
Green Ext Time (p_c), s	0.0		0.0	1.4		0.1		0.0	3.0			
Intersection Summary												
HCM 6th Ctrl Delay	6.8											
HCM 6th LOS	A											

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

10: W Valley Highway E & 42nd Street E

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑	↑	↑
Traffic Vol, veh/h	25	40	125	10	15	385
Future Vol, veh/h	25	40	125	10	15	385
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	20	20	29	29	11	11
Mvmt Flow	26	42	132	11	16	405
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	569	132	0	0	143	0
Stage 1	132	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.21	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.299	-
Pot Cap-1 Maneuver	455	871	-	-	1386	-
Stage 1	852	-	-	-	-	-
Stage 2	615	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	450	871	-	-	1386	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.3	0	0.3			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	641	1386	-	
HCM Lane V/C Ratio	-	-	0.107	0.011	-	
HCM Control Delay (s)	-	-	11.3	7.6	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.4	0	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

11: Tacoma Ave & 142nd Ave E

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	5	20	275	345	405
Future Vol, veh/h	10	5	20	275	345	405
Conflicting Peds, #/hr	1	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	170	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	46	46	22	22	12	12
Mvmt Flow	11	5	22	299	375	440
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	570	375	815	0	-	0
Stage 1	375	-	-	-	-	-
Stage 2	195	-	-	-	-	-
Critical Hdwy	7.29	6.89	4.43	-	-	-
Critical Hdwy Stg 1	6.09	-	-	-	-	-
Critical Hdwy Stg 2	6.49	-	-	-	-	-
Follow-up Hdwy	3.937	3.737	2.409	-	-	-
Pot Cap-1 Maneuver	387	567	711	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	375	567	711	-	-	-
Mov Cap-2 Maneuver	456	-	-	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.5	0.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	711	-	456	567	-	-
HCM Lane V/C Ratio	0.031	-	0.024	0.01	-	-
HCM Control Delay (s)	10.2	-	13.1	11.4	-	-
HCM Lane LOS	B	-	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

Appendix B LOS Summary and Worksheets

HCM 6th AWSC
12: Puyallup St & Tacoma Ave

Sumner Comp Plan Update
Existing PM Peak Hour

Intersection	
Intersection Delay, s/veh	18.9
Intersection LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	130	50	95	115	335	135
Future Vol, veh/h	130	50	95	115	335	135
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	25	25	22	22	12	12
Mvmt Flow	143	55	104	126	368	148
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	12.9	12.3	24.1
HCM LOS	B	B	C

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	72%	0%	71%
Vol Thru, %	28%	45%	0%
Vol Right, %	0%	55%	29%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	180	210	470
LT Vol	130	0	335
Through Vol	50	95	0
RT Vol	0	115	135
Lane Flow Rate	198	231	516
Geometry Grp	1	1	1
Degree of Util (X)	0.351	0.373	0.77
Departure Headway (Hd)	6.381	5.823	5.365
Convergence, Y/N	Yes	Yes	Yes
Cap	562	616	677
Service Time	4.432	3.873	3.401
HCM Lane V/C Ratio	0.352	0.375	0.762
HCM Control Delay	12.9	12.3	24.1
HCM Lane LOS	B	B	C
HCM 95th-tile Q	1.6	1.7	7.3

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

Sumner Comp Plan Update

13: E Valley Highway E & Puyallup Street

Existing PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	285	100	300	665	70
Future Volume (vph)	80	285	100	300	665	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1599	1769	1863	1845	1534
Flt Permitted	0.95	1.00	0.24	1.00	1.00	1.00
Satd. Flow (perm)	1787	1599	445	1863	1845	1534
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	82	294	103	309	686	72
RTOR Reduction (vph)	0	262	0	0	0	7
Lane Group Flow (vph)	82	32	103	309	686	65
Confl. Peds. (#/hr)	2		1			1
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	6		7	4	8	
Permitted Phases		6	4			8
Actuated Green, G (s)	8.5	8.5	58.5	58.5	44.3	44.3
Effective Green, g (s)	8.5	8.5	58.5	58.5	44.3	44.3
Actuated g/C Ratio	0.11	0.11	0.76	0.76	0.58	0.58
Clearance Time (s)	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
Lane Grp Cap (vph)	197	176	496	1415	1061	882
v/s Ratio Prot	c0.05		0.02	c0.17	c0.37	
v/s Ratio Perm		0.02	0.13			0.04
v/c Ratio	0.42	0.18	0.21	0.22	0.65	0.07
Uniform Delay, d1	31.9	31.1	5.4	2.7	11.1	7.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.4	0.2	0.1	1.2	0.0
Delay (s)	33.0	31.5	5.6	2.7	12.3	7.3
Level of Service	C	C	A	A	B	A
Approach Delay (s)	31.8			3.4	11.8	
Approach LOS	C			A	B	

Intersection Summary

HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	77.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

14: Elm Street E & E Valley Highway E

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	320	80	270	650	25	80
Future Vol, veh/h	320	80	270	650	25	80
Conflicting Peds, #/hr	0	0	0	0	1	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	45	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	333	83	281	677	26	83
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	416	0	1615	382
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	1240	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1143	-	115	670
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	276	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1143	-	87	666
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	208	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	2.7		15.6		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	172	666	-	-	1143	-
HCM Lane V/C Ratio	0.151	0.125	-	-	0.246	-
HCM Control Delay (s)	29.6	11.2	-	-	9.2	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.4	-	-	1	-

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

15: Valley Avenue & Elm Street E

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	6.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	190	25	465	210	20	210
Future Vol, veh/h	190	25	465	210	20	210
Conflicting Peds, #/hr	0	1	1	0	2	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	275	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	198	26	484	219	21	219
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	225	0	1401	213
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	1189	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1350	-	155	830
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	290	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1349	-	99	829
Mov Cap-2 Maneuver	-	-	-	-	161	-
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	186	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	6.3		12.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	161	829	-	-	1349	-
HCM Lane V/C Ratio	0.129	0.264	-	-	0.359	-
HCM Control Delay (s)	30.7	10.9	-	-	9.2	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	1.1	-	-	1.7	-

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

16: Fryar Avenue & Zehnder Avenue

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	2.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	5	215	185	70	500
Future Vol, veh/h	120	5	215	185	70	500
Conflicting Peds, #/hr	0	1	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	10	10	7	7
Mvmt Flow	130	5	234	201	76	543
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1032	338	0	0	437	0
Stage 1	337	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.17	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.263	-
Pot Cap-1 Maneuver	257	702	-	-	1097	-
Stage 1	721	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	239	700	-	-	1095	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	720	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	20.7	0	1			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	363	1095	-	
HCM Lane V/C Ratio	-	-	0.374	0.069	-	
HCM Control Delay (s)	-	-	20.7	8.5	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	1.7	0.2	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

17: Parker Road E & Washington Street

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	15	10	5	5	5	5	45	5	10	115	10
Future Vol, veh/h	15	15	10	5	5	5	5	45	5	10	115	10
Conflicting Peds, #/hr	4	0	4	4	0	4	3	0	1	1	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	2	2	2
Mvmt Flow	17	17	11	6	6	6	6	51	6	11	129	11
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	236	230	142	242	232	59	143	0	0	58	0	0
Stage 1	160	160	-	67	67	-	-	-	-	-	-	-
Stage 2	76	70	-	175	165	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	723	673	911	716	672	1012	1427	-	-	1546	-	-
Stage 1	847	769	-	948	843	-	-	-	-	-	-	-
Stage 2	938	841	-	832	766	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	703	663	906	684	662	1008	1423	-	-	1545	-	-
Mov Cap-2 Maneuver	703	663	-	684	662	-	-	-	-	-	-	-
Stage 1	842	761	-	943	839	-	-	-	-	-	-	-
Stage 2	920	837	-	794	758	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.3		9.9		0.7		0.5					
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1423	-	-	727	757	1545	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.062	0.022	0.007	-	-				
HCM Control Delay (s)	7.5	0	-	10.3	9.9	7.3	0	-				
HCM Lane LOS	A	A	-	B	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-				

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis
18: W Valley Highway E & Sumner-Heights Drive E

Sumner Comp Plan Update
Existing PM Peak Hour

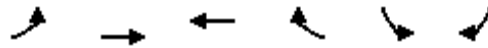
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	W	T
Traffic Volume (vph)	125	90	10	135	445	15
Future Volume (vph)	125	90	10	135	445	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0		3.5	5.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.98		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.94		0.87		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1487		1612		1626	1712
Flt Permitted	0.97		1.00		0.66	1.00
Satd. Flow (perm)	1487		1612		1121	1712
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	139	100	11	150	494	17
RTOR Reduction (vph)	0	0	100	0	0	0
Lane Group Flow (vph)	239	0	61	0	494	17
Confl. Bikes (#/hr)		2		1		
Heavy Vehicles (%)	16%	16%	1%	1%	11%	11%
Turn Type	Perm		NA		pm+pt	NA
Protected Phases			4		1	8
Permitted Phases	2				8	
Actuated Green, G (s)	19.9		26.4		34.3	15.2
Effective Green, g (s)	19.9		26.4		34.3	15.2
Actuated g/C Ratio	0.25		0.33		0.43	0.19
Clearance Time (s)	5.0		5.0		3.5	5.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	375		539		609	329
v/s Ratio Prot			c0.04		c0.20	0.01
v/s Ratio Perm	c0.16				c0.16	
v/c Ratio	0.64		0.11		0.81	0.05
Uniform Delay, d1	26.3		18.2		18.8	26.0
Progression Factor	1.36		1.00		1.00	1.00
Incremental Delay, d2	3.5		0.1		8.1	0.1
Delay (s)	39.3		18.3		26.8	26.0
Level of Service	D		B		C	C
Approach Delay (s)	39.3		18.3			26.8
Approach LOS	D		B			C
Intersection Summary						
HCM 2000 Control Delay			28.6		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.67			
Actuated Cycle Length (s)			78.9		Sum of lost time (s)	17.0
Intersection Capacity Utilization			57.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis 19: Valley Avenue E & Sumner-Heights Drive E

Sumner Comp Plan Update

Existing PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	230	175	145	325	240
Future Volume (vph)	65	230	175	145	325	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	0.98	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.94	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1654	1743	1881	1561	1598	
Flt Permitted	0.44	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	767	1743	1881	1561	1598	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	69	245	186	154	346	255
RTOR Reduction (vph)	0	0	0	124	0	0
Lane Group Flow (vph)	69	245	186	30	601	0
Confl. Peds. (#/hr)	2			2		1
Heavy Vehicles (%)	9%	9%	1%	1%	8%	8%
Turn Type	pm+pt	NA	NA	Perm	Perm	
Protected Phases	7	4	8			
Permitted Phases	4			8	6	
Actuated Green, G (s)	26.4	26.4	15.2	15.2	42.5	
Effective Green, g (s)	26.4	26.4	15.2	15.2	42.5	
Actuated g/C Ratio	0.33	0.33	0.19	0.19	0.54	
Clearance Time (s)	3.5	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	343	583	362	300	860	
v/s Ratio Prot	0.02	c0.14	c0.10			
v/s Ratio Perm	0.05			0.02	c0.38	
v/c Ratio	0.20	0.42	0.51	0.10	0.70	
Uniform Delay, d1	18.5	20.3	28.5	26.2	13.5	
Progression Factor	1.00	1.00	1.00	1.00	1.03	
Incremental Delay, d2	0.3	0.5	1.2	0.1	2.3	
Delay (s)	18.7	20.8	29.8	26.4	16.3	
Level of Service	B	C	C	C	B	
Approach Delay (s)		20.4	28.2		16.3	
Approach LOS		C	C		B	

Intersection Summary

HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Summer Comp Plan Update

20: Traffic Avenue/Fryar Avenue & Cannery Way/Main Street

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	205	290	140	125	25	115	245	115	40	580	95
Future Volume (veh/h)	105	205	290	140	125	25	115	245	115	40	580	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1811	1811	1811	1826	1826	1826
Adj Flow Rate, veh/h	115	225	319	154	137	27	126	269	126	44	637	104
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	1	1	1	6	6	6	5	5	5
Cap, veh/h	556	450	378	475	368	73	283	322	267	408	739	120
Arrive On Green	0.16	0.24	0.24	0.17	0.24	0.24	0.16	0.18	0.18	0.23	0.25	0.25
Sat Flow, veh/h	1795	1885	1584	1795	1525	301	1725	1811	1505	1739	2979	486
Grp Volume(v), veh/h	115	225	319	154	0	164	126	269	126	44	370	371
Grp Sat Flow(s),veh/h/ln	1795	1885	1584	1795	0	1826	1725	1811	1505	1739	1735	1730
Q Serve(g_s), s	4.9	12.4	23.0	6.7	0.0	9.0	7.9	17.2	6.2	2.4	24.5	24.6
Cycle Q Clear(g_c), s	4.9	12.4	23.0	6.7	0.0	9.0	7.9	17.2	6.2	2.4	24.5	24.6
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	556	450	378	475	0	440	283	322	267	408	430	429
V/C Ratio(X)	0.21	0.50	0.84	0.32	0.00	0.37	0.44	0.84	0.47	0.11	0.86	0.86
Avail Cap(c_a), veh/h	779	699	587	694	0	677	496	823	683	500	788	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	39.5	43.6	24.1	0.0	37.9	45.2	47.6	20.9	36.0	43.1	43.2
Incr Delay (d2), s/veh	0.2	0.9	6.7	0.4	0.0	0.5	1.1	5.7	1.3	0.1	5.2	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.9	9.6	2.9	0.0	4.1	3.4	8.2	3.3	1.0	11.0	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	40.4	50.2	24.5	0.0	38.5	46.3	53.4	22.2	36.2	48.3	48.4
LnGrp LOS	C	D	D	C	A	D	D	D	C	D	D	D
Approach Vol, veh/h	659			318			521			785		
Approach Delay, s/veh	42.2			31.7			44.1			47.7		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.1	34.4	33.7	26.8	25.4	34.1	25.2	35.3				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	34.5	44.5	34.5	54.5	34.5	44.5	34.5	54.5				
Max Q Clear Time (g_c+I1), s	6.9	11.0	4.4	19.2	8.7	25.0	9.9	26.6				
Green Ext Time (p_c), s	0.4	0.7	0.1	1.6	0.6	2.4	0.3	3.2				
Intersection Summary												
HCM 6th Ctrl Delay	43.1											
HCM 6th LOS	D											

Synchro 11 Report

Appendix B LOS Summary and Worksheets

HCM 6th AWSC

Summer Comp Plan Update

21: Alder Avenue & Main Street

Existing PM Peak Hour

Intersection

Intersection Delay, s/veh 11.1

Intersection LOS B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	330	45	75	250	25	25
Future Vol, veh/h	330	45	75	250	25	25
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	355	48	81	269	27	27
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	11.4	11.1	8.8
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	50%	0%	23%
Vol Thru, %	0%	88%	77%
Vol Right, %	50%	12%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	50	375	325
LT Vol	25	0	75
Through Vol	0	330	250
RT Vol	25	45	0
Lane Flow Rate	54	403	349
Geometry Grp	1	1	1
Degree of Util (X)	0.079	0.486	0.44
Departure Headway (Hd)	5.307	4.341	4.532
Convergence, Y/N	Yes	Yes	Yes
Cap	673	831	797
Service Time	3.359	2.364	2.557
HCM Lane V/C Ratio	0.08	0.485	0.438
HCM Control Delay	8.8	11.4	11.1
HCM Lane LOS	A	B	B
HCM 95th-tile Q	0.3	2.7	2.3

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

22: Ryan Ave & Main Street

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	340	10	10	295	5	15
Future Vol, veh/h	340	10	10	295	5	15
Conflicting Peds, #/hr	0	20	20	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	366	11	11	317	5	16
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	397	0	731	394
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	339	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1162	-	392	659
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1143	-	381	647
Mov Cap-2 Maneuver	-	-	-	-	381	-
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	717	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		11.8	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	551	-	-	1143	-	
HCM Lane V/C Ratio	0.039	-	-	0.009	-	
HCM Control Delay (s)	11.8	-	-	8.2	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

23: Wood Avenue & Main Street

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	285	35	10	185	35	10	35	15	60	160	105
Future Volume (veh/h)	45	285	35	10	185	35	10	35	15	60	160	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1945	1870	1900	1900	1900
Adj Flow Rate, veh/h	51	320	39	11	208	39	11	39	17	67	180	118
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	0	0	0
Cap, veh/h	174	502	57	132	513	93	169	369	137	201	288	167
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	126	1474	168	28	1506	273	108	1225	453	207	956	556
Grp Volume(v), veh/h	410	0	0	258	0	0	67	0	0	365	0	0
Grp Sat Flow(s),veh/h/ln	1768	0	0	1807	0	0	1786	0	0	1718	0	0
Q Serve(g_s), s	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0
Cycle Q Clear(g_c), s	5.9	0.0	0.0	3.3	0.0	0.0	0.8	0.0	0.0	5.7	0.0	0.0
Prop In Lane	0.12		0.10	0.04		0.15	0.16		0.25	0.18		0.32
Lane Grp Cap(c), veh/h	734	0	0	738	0	0	675	0	0	657	0	0
V/C Ratio(X)	0.56	0.00	0.00	0.35	0.00	0.00	0.10	0.00	0.00	0.56	0.00	0.00
Avail Cap(c_a), veh/h	1014	0	0	1027	0	0	904	0	0	888	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.6	0.0	0.0	7.8	0.0	0.0	7.8	0.0	0.0	9.4	0.0	0.0
Incr Delay (d2), s/veh	2.4	0.0	0.0	1.0	0.0	0.0	0.2	0.0	0.0	2.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	1.1	0.0	0.0	0.3	0.0	0.0	2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	0.0	0.0	8.8	0.0	0.0	8.0	0.0	0.0	12.1	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	A	A	A	B	A	A
Approach Vol, veh/h		410			258			67			365	
Approach Delay, s/veh		11.0			8.8			8.0			12.1	
Approach LOS		B			A			A			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.8		16.0		14.8		16.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		13.5		15.5		13.5		15.5				
Max Q Clear Time (g_c+I1), s		2.8		7.9		7.7		5.3				
Green Ext Time (p_c), s		0.3		2.5		1.8		1.8				
Intersection Summary												
HCM 6th Ctrl Delay				10.7								
HCM 6th LOS				B								

Synchro 11 Report

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Summer Comp Plan Update

24: Valley Avenue & Main Street

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	255	65	185	200	45	45	265	80	60	400	50
Future Volume (veh/h)	160	255	65	185	200	45	45	265	80	60	400	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1976	1900	1900	1900	1900	1961	1885	1885	1900	1976	1900
Adj Flow Rate, veh/h	168	268	68	195	211	47	47	279	84	63	421	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	0	0	0
Cap, veh/h	435	373	95	392	388	87	273	406	122	332	519	65
Arrive On Green	0.10	0.25	0.25	0.11	0.26	0.26	0.05	0.29	0.29	0.06	0.30	0.30
Sat Flow, veh/h	1810	1512	384	1810	1497	333	1867	1385	417	1810	1717	216
Grp Volume(v), veh/h	168	0	336	195	0	258	47	0	363	63	0	474
Grp Sat Flow(s),veh/h/ln	1810	0	1896	1810	0	1831	1867	0	1802	1810	0	1933
Q Serve(g_s), s	4.6	0.0	11.2	5.4	0.0	8.4	1.2	0.0	12.3	1.6	0.0	15.7
Cycle Q Clear(g_c), s	4.6	0.0	11.2	5.4	0.0	8.4	1.2	0.0	12.3	1.6	0.0	15.7
Prop In Lane	1.00		0.20	1.00		0.18	1.00		0.23	1.00		0.11
Lane Grp Cap(c), veh/h	435	0	468	392	0	475	273	0	528	332	0	584
V/C Ratio(X)	0.39	0.00	0.72	0.50	0.00	0.54	0.17	0.00	0.69	0.19	0.00	0.81
Avail Cap(c_a), veh/h	652	0	1097	586	0	1060	582	0	1043	615	0	1119
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	23.8	17.1	0.0	22.1	16.9	0.0	21.6	16.1	0.0	22.3
Incr Delay (d2), s/veh	0.6	0.0	2.1	1.0	0.0	1.0	0.3	0.0	1.6	0.3	0.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	5.1	2.2	0.0	3.6	0.5	0.0	5.2	0.7	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	0.0	25.9	18.1	0.0	23.0	17.2	0.0	23.2	16.4	0.0	25.1
LnGrp LOS	B	A	C	B	A	C	B	A	C	B	A	C
Approach Vol, veh/h	504			453			410			537		
Approach Delay, s/veh	23.1			20.9			22.6			24.0		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.6	22.0	9.2	25.2	11.7	22.9	8.6	25.9				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	15.0	40.0	15.0	40.0	15.0	40.0	15.0	40.0				
Max Q Clear Time (g_c+I1), s	7.4	13.2	3.6	14.3	6.6	10.4	3.2	17.7				
Green Ext Time (p_c), s	0.4	1.5	0.1	1.6	0.4	1.1	0.1	2.1				
Intersection Summary												
HCM 6th Ctrl Delay	22.7											
HCM 6th LOS	C											

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

25: Parker Road E & Main Street

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	405	40	15	255	30	30	15	5	65	40	30
Future Vol, veh/h	30	405	40	15	255	30	30	15	5	65	40	30
Conflicting Peds, #/hr	5	0	10	10	0	5	0	0	4	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	235	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	1	1
Mvmt Flow	31	413	41	15	260	31	31	15	5	66	41	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	296	0	0	464	0	0	848	832	448	821	837	281
Stage 1	-	-	-	-	-	-	506	506	-	311	311	-
Stage 2	-	-	-	-	-	-	342	326	-	510	526	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1277	-	-	1108	-	-	284	307	615	295	304	760
Stage 1	-	-	-	-	-	-	552	543	-	702	660	-
Stage 2	-	-	-	-	-	-	677	652	-	548	530	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1272	-	-	1099	-	-	234	292	608	271	289	757
Mov Cap-2 Maneuver	-	-	-	-	-	-	234	292	-	271	289	-
Stage 1	-	-	-	-	-	-	534	526	-	682	648	-
Stage 2	-	-	-	-	-	-	600	640	-	513	513	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.4	21.7	24.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	266	1272	-	-	1099	-	-	323
HCM Lane V/C Ratio	0.192	0.024	-	-	0.014	-	-	0.426
HCM Control Delay (s)	21.7	7.9	-	-	8.3	-	-	24.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0	-	-	2

Appendix B LOS Summary and Worksheets

HCM 6th AWSC

Summer Comp Plan Update

26: 160th Avenue E & Main Street E

Existing PM Peak Hour

Intersection												
Intersection Delay, s/veh	15.8											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	145	320	30	225	50	75	10	5	90	100	20
Future Vol, veh/h	15	145	320	30	225	50	75	10	5	90	100	20
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	1	1	1
Mvmt Flow	16	159	352	33	247	55	82	11	5	99	110	22
Number of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	2			3			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			3			2		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			2			3		
HCM Control Delay	14.3			18.7			12.8			16.3		
HCM LOS	B			C			B			C		
Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1					
Vol Left, %	83%	100%	0%	0%	100%	0%	43%					
Vol Thru, %	11%	0%	100%	0%	0%	82%	48%					
Vol Right, %	6%	0%	0%	100%	0%	18%	10%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	90	15	145	320	30	275	210					
LT Vol	75	15	0	0	30	0	90					
Through Vol	10	0	145	0	0	225	100					
RT Vol	5	0	0	320	0	50	20					
Lane Flow Rate	99	16	159	352	33	302	231					
Geometry Grp	7	7	7	7	8	8	7					
Degree of Util (X)	0.217	0.032	0.287	0.564	0.07	0.59	0.467					
Departure Headway (Hd)	7.889	6.994	6.483	5.769	7.672	7.029	7.287					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	455	515	558	629	467	514	494					
Service Time	5.642	4.694	4.183	3.469	5.422	4.778	5.031					
HCM Lane V/C Ratio	0.218	0.031	0.285	0.56	0.071	0.588	0.468					
HCM Control Delay	12.8	9.9	11.8	15.7	11	19.5	16.3					
HCM Lane LOS	B	A	B	C	B	C	C					
HCM 95th-tile Q	0.8	0.1	1.2	3.5	0.2	3.8	2.4					

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

27: Sumner-Tapps Highway E & 60th Street E

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↑	↗	
Traffic Vol, veh/h	0	275	180	535	455	105
Future Vol, veh/h	0	275	180	535	455	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	1	2	2
Mvmt Flow	0	293	191	569	484	112
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	540	596	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	4.11	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	0	546	985	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	546	985	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	18.9	2.4		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	985	-	546	-	-	
HCM Lane V/C Ratio	0.194	-	0.536	-	-	
HCM Control Delay (s)	9.5	-	18.9	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.7	-	3.1	-	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

28: Traffic Avenue & Maple Street

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕				↗	↗	↕↕	↗	↗	↕↕	
Traffic Vol, veh/h	5	0	10	0	0	15	0	455	15	30	975	5
Future Vol, veh/h	5	0	10	0	0	15	0	455	15	30	975	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	45	-	115	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	7	7	7	5	5	5	4	4	4
Mvmt Flow	5	0	11	0	0	16	0	484	16	32	1037	5
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1348	1609	521	-	-	249	1042	0	0	505	0	0
Stage 1	1104	1104	-	-	-	-	-	-	-	-	-	-
Stage 2	244	505	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	-	-	7.04	4.2	-	-	4.18	-	-
Critical Hdwy Stg 1	6.5	5.5	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	3.37	2.25	-	-	2.24	-	-
Pot Cap-1 Maneuver	111	106	505	0	0	736	646	-	-	1042	-	-
Stage 1	229	289	-	0	0	-	-	-	-	-	-	-
Stage 2	744	544	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	106	102	505	-	-	732	646	-	-	1038	-	-
Mov Cap-2 Maneuver	106	102	-	-	-	-	-	-	-	-	-	-
Stage 1	229	280	-	-	-	-	-	-	-	-	-	-
Stage 2	727	542	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	22.3		10			0			0.3			
HCM LOS	C		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	646	-	-	224	732	1038	-	-				
HCM Lane V/C Ratio	-	-	-	0.071	0.022	0.031	-	-				
HCM Control Delay (s)	0	-	-	22.3	10	8.6	-	-				
HCM Lane LOS	A	-	-	C	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0.1	-	-				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

29: E Main Ave/Traffic Avenue & SR-410 WB Ramps/Thompson Street

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	15	205	235	100	10	265	400	185	20	655	330
Future Volume (veh/h)	70	15	205	235	100	10	265	400	185	20	655	330
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1914	1841	1914	1914	1841	1841	1841
Adj Flow Rate, veh/h	76	16	0	188	203	0	288	435	0	22	712	359
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	104	109		245	257		400	2040		646	1175	592
Arrive On Green	0.06	0.06	0.00	0.14	0.14	0.00	0.10	0.56	0.00	0.06	0.52	0.52
Sat Flow, veh/h	1753	1841	1560	1753	1841	0	1753	3733	0	1753	2246	1132
Grp Volume(v), veh/h	76	16	0	188	203	0	288	435	0	22	554	517
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1753	1841	0	1753	1819	0	1753	1749	1629
Q Serve(g_s), s	4.3	0.8	0.0	10.3	10.7	0.0	7.5	6.0	0.0	0.5	22.1	22.2
Cycle Q Clear(g_c), s	4.3	0.8	0.0	10.3	10.7	0.0	7.5	6.0	0.0	0.5	22.1	22.2
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		0.69
Lane Grp Cap(c), veh/h	104	109		245	257		400	2040		646	915	852
V/C Ratio(X)	0.73	0.15		0.77	0.79		0.72	0.21		0.03	0.61	0.61
Avail Cap(c_a), veh/h	289	304		447	469		447	2040		725	915	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.98	0.98	0.00	0.87	0.87	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.2	44.6	0.0	41.4	41.6	0.0	14.1	11.0	0.0	7.5	16.7	16.7
Incr Delay (d2), s/veh	9.4	0.6	0.0	4.9	5.3	0.0	4.3	0.2	0.0	0.0	3.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.4	0.0	4.8	5.2	0.0	3.0	2.3	0.0	0.2	9.4	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.6	45.2	0.0	46.3	46.8	0.0	18.5	11.2	0.0	7.5	19.6	19.9
LnGrp LOS	E	D		D	D		B	B		A	B	B
Approach Vol, veh/h	92				391				723			
Approach Delay, s/veh	53.8				46.6				14.1			
Approach LOS	D				D				B			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.3	56.8		18.5	10.5	60.6		10.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	12.5	27.5		25.5	10.5	29.5		16.5				
Max Q Clear Time (g_c+I1), s	9.5	24.2		12.7	2.5	8.0		6.3				
Green Ext Time (p_c), s	0.3	1.7		1.3	0.0	1.9		0.2				

Intersection Summary

HCM 6th Ctrl Delay 23.8

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

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

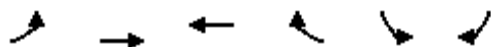
Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

30: Thompson Street & Station Lane

Existing PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	205	270	5	5	70
Future Volume (veh/h)	10	205	270	5	5	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.97	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1737	1737
Adj Flow Rate, veh/h	11	228	300	6	6	78
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	1	1	11	11
Cap, veh/h	448	904	507	10	10	126
Arrive On Green	0.01	0.48	0.28	0.28	0.09	0.09
Sat Flow, veh/h	1781	1870	1840	37	104	1357
Grp Volume(v), veh/h	11	228	0	306	85	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1877	1479	0
Q Serve(g_s), s	0.1	1.9	0.0	3.7	1.4	0.0
Cycle Q Clear(g_c), s	0.1	1.9	0.0	3.7	1.4	0.0
Prop In Lane	1.00			0.02	0.07	0.92
Lane Grp Cap(c), veh/h	448	904	0	517	137	0
V/C Ratio(X)	0.02	0.25	0.00	0.59	0.62	0.00
Avail Cap(c_a), veh/h	1109	1767	0	1773	1397	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.8	3.9	0.0	8.1	11.3	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.4	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.0	1.0	0.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.9	4.0	0.0	8.5	13.0	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		239	306		85	
Approach Delay, s/veh		4.1	8.5		13.0	
Approach LOS		A	A		B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.4	12.6			18.0	7.9
Change Period (Y+Rc), s	5.0	5.5			5.5	5.5
Max Green Setting (Gmax), s	10.0	24.5			24.5	24.5
Max Q Clear Time (g_c+I1), s	2.1	5.7			3.9	3.4
Green Ext Time (p_c), s	0.0	1.2			0.8	0.1
Intersection Summary						
HCM 6th Ctrl Delay			7.5			
HCM 6th LOS			A			

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

31: Alder Ave & Thompson Street

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	105	5	5	125	5	5	10	5	5	15	200
Future Vol, veh/h	30	105	5	5	125	5	5	10	5	5	15	200
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	6	6	6	0	0	0	0	0	0	1	1	1
Mvmt Flow	32	112	5	5	133	5	5	11	5	5	16	213
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	138	0	0	120	0	0	442	330	118	333	330	136
Stage 1	-	-	-	-	-	-	182	182	-	146	146	-
Stage 2	-	-	-	-	-	-	260	148	-	187	184	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1421	-	-	1480	-	-	529	592	939	622	591	915
Stage 1	-	-	-	-	-	-	824	753	-	859	778	-
Stage 2	-	-	-	-	-	-	749	779	-	817	749	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1421	-	-	1476	-	-	388	574	937	596	573	915
Mov Cap-2 Maneuver	-	-	-	-	-	-	388	574	-	596	573	-
Stage 1	-	-	-	-	-	-	803	733	-	838	775	-
Stage 2	-	-	-	-	-	-	561	776	-	781	730	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.6			0.3			11.7			10.7		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	561	1421	-	-	1476	-	-	869				
HCM Lane V/C Ratio	0.038	0.022	-	-	0.004	-	-	0.269				
HCM Control Delay (s)	11.7	7.6	0	-	7.4	0	-	10.7				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	1.1				

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

Sumner Comp Plan Update

32: E Main Ave & SR-410 EB Ramps

Existing PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	215	545	210	600	935	190
Future Volume (vph)	215	545	210	600	935	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	
Frpb, ped/bikes	0.98	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	0.92	0.85	1.00	1.00	0.97	
Flt Protected	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3012	1337	1770	3539	3416	
Flt Permitted	0.98	1.00	0.13	1.00	1.00	
Satd. Flow (perm)	3012	1337	247	3539	3416	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	226	574	221	632	984	200
RTOR Reduction (vph)	241	246	0	0	12	0
Lane Group Flow (vph)	272	41	221	632	1172	0
Confl. Peds. (#/hr)		7				
Heavy Vehicles (%)	7%	7%	2%	2%	3%	3%
Turn Type	Prot	Perm	D.P+P	NA	NA	
Protected Phases	8		1	6	2	
Permitted Phases		8	2			
Actuated Green, G (s)	14.4	14.4	62.4	66.9	49.8	
Effective Green, g (s)	14.4	14.4	62.4	66.9	49.8	
Actuated g/C Ratio	0.14	0.14	0.62	0.67	0.50	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	433	192	346	2367	1701	
v/s Ratio Prot	c0.09		c0.08	0.18	c0.34	
v/s Ratio Perm		0.03	0.32			
v/c Ratio	0.63	0.22	0.64	0.27	0.69	
Uniform Delay, d1	40.3	37.8	12.9	6.7	19.2	
Progression Factor	1.00	1.00	1.00	1.00	0.48	
Incremental Delay, d2	2.8	0.6	3.8	0.3	1.6	
Delay (s)	43.1	38.4	16.8	6.9	10.8	
Level of Service	D	D	B	A	B	
Approach Delay (s)	41.4			9.5	10.8	
Approach LOS	D			A	B	
Intersection Summary						
HCM 2000 Control Delay			19.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			67.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Summer Comp Plan Update

33: Valley Avenue & Meade-McCumber Road E

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	75	105	70	50	10	30	350	95	5	595	35
Future Volume (veh/h)	20	75	105	70	50	10	30	350	95	5	595	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1945	1870	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	22	81	113	75	54	11	32	376	102	5	640	38
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	0	0	0
Cap, veh/h	387	109	152	309	307	62	268	644	175	377	740	44
Arrive On Green	0.03	0.15	0.15	0.07	0.20	0.20	0.04	0.45	0.45	0.01	0.42	0.42
Sat Flow, veh/h	1795	710	990	1781	1567	319	1795	1428	387	1810	1773	105
Grp Volume(v), veh/h	22	0	194	75	0	65	32	0	478	5	0	678
Grp Sat Flow(s),veh/h/ln	1795	0	1699	1781	0	1886	1795	0	1815	1810	0	1878
Q Serve(g_s), s	0.6	0.0	6.2	1.9	0.0	1.6	0.6	0.0	11.2	0.1	0.0	18.8
Cycle Q Clear(g_c), s	0.6	0.0	6.2	1.9	0.0	1.6	0.6	0.0	11.2	0.1	0.0	18.8
Prop In Lane	1.00		0.58	1.00		0.17	1.00		0.21	1.00		0.06
Lane Grp Cap(c), veh/h	387	0	261	309	0	369	268	0	819	377	0	783
V/C Ratio(X)	0.06	0.00	0.74	0.24	0.00	0.18	0.12	0.00	0.58	0.01	0.00	0.87
Avail Cap(c_a), veh/h	523	0	686	368	0	761	385	0	1164	556	0	1204
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	23.1	18.2	0.0	19.2	11.8	0.0	11.7	10.2	0.0	15.2
Incr Delay (d2), s/veh	0.1	0.0	4.2	0.4	0.0	0.2	0.2	0.0	0.7	0.0	0.0	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.7	0.8	0.0	0.7	0.2	0.0	4.1	0.0	0.0	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.3	0.0	27.3	18.6	0.0	19.4	12.0	0.0	12.4	10.3	0.0	19.6
LnGrp LOS	B	A	C	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h	216			140			510			683		
Approach Delay, s/veh	26.5			19.0			12.4			19.5		
Approach LOS	C			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.0	30.3	8.7	13.3	6.9	28.4	6.3	15.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	36.7	6.1	23.1	6.1	36.7	6.1	23.1				
Max Q Clear Time (g_c+I1), s	2.1	13.2	3.9	8.2	2.6	20.8	2.6	3.6				
Green Ext Time (p_c), s	0.0	2.2	0.0	0.7	0.0	3.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	18.1											
HCM 6th LOS	B											

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

34: Parker Road E & Mead McCumber Road E

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	40	115	10	5	50	10	10	5	5	25	15	65
Future Vol, veh/h	40	115	10	5	50	10	10	5	5	25	15	65
Conflicting Peds, #/hr	10	0	2	2	0	10	0	0	5	5	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	2	2	2
Mvmt Flow	43	124	11	5	54	11	11	5	5	27	16	70

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	75	0	0	137	0	0	331	303	137	306	303	70
Stage 1	-	-	-	-	-	-	218	218	-	80	80	-
Stage 2	-	-	-	-	-	-	113	85	-	226	223	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	1531	-	-	1447	-	-	626	613	917	646	610	993
Stage 1	-	-	-	-	-	-	789	726	-	929	828	-
Stage 2	-	-	-	-	-	-	897	828	-	777	719	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1518	-	-	1445	-	-	553	585	912	613	583	985
Mov Cap-2 Maneuver	-	-	-	-	-	-	553	585	-	613	583	-
Stage 1	-	-	-	-	-	-	763	702	-	893	818	-
Stage 2	-	-	-	-	-	-	814	818	-	740	695	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	0.6	11	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	623	1518	-	-	1445	-	-	792
HCM Lane V/C Ratio	0.035	0.028	-	-	0.004	-	-	0.143
HCM Control Delay (s)	11	7.4	0	-	7.5	0	-	10.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.5

Appendix B LOS Summary and Worksheets

HCM 6th AWSC

Summer Comp Plan Update

35: 160th Avenue E & 64th Street E

Existing PM Peak Hour

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	110	5	5	50	60	5	0	0	370	5	15
Future Vol, veh/h	10	110	5	5	50	60	5	0	0	370	5	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	11	120	5	5	54	65	5	0	0	402	5	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	8.9	8.4	13.5
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	8%	4%	95%
Vol Thru, %	0%	88%	43%	1%
Vol Right, %	0%	4%	52%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	125	115	390
LT Vol	5	10	5	370
Through Vol	0	110	50	5
RT Vol	0	5	60	15
Lane Flow Rate	5	136	125	424
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.193	0.169	0.555
Departure Headway (Hd)	5.275	5.113	4.855	4.712
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	672	698	734	763
Service Time	3.357	3.175	2.919	2.763
HCM Lane V/C Ratio	0.007	0.195	0.17	0.556
HCM Control Delay	8.4	9.4	8.9	13.5
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0	0.7	0.6	3.5

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary
36: Sumner-Tapps Highway E & 64th Street E

Sumner Comp Plan Update
Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	5	410	20	10	5	160	590	15	0	675	50
Future Volume (veh/h)	120	5	410	20	10	5	160	590	15	0	675	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1722	1722	1722	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	126	5	432	21	11	5	168	621	16	0	711	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	12	12	12	1	1	1	2	2	2
Cap, veh/h	419	6	482	90	39	10	228	1161	33	0	1024	76
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.79	0.79	0.79	0.00	0.60	0.60
Sat Flow, veh/h	1408	18	1582	88	127	34	279	1950	55	0	1719	128
Grp Volume(v), veh/h	126	0	437	37	0	0	312	0	493	0	0	764
Grp Sat Flow(s),veh/h/ln	1408	0	1600	249	0	0	579	0	1706	0	0	1847
Q Serve(g_s), s	0.0	0.0	23.5	0.8	0.0	0.0	22.9	0.0	8.8	0.0	0.0	25.7
Cycle Q Clear(g_c), s	8.3	0.0	23.5	24.3	0.0	0.0	48.5	0.0	8.8	0.0	0.0	25.7
Prop In Lane	1.00		0.99	0.57		0.14	0.54		0.03	0.00		0.07
Lane Grp Cap(c), veh/h	419	0	487	139	0	0	406	0	1016	0	0	1100
V/C Ratio(X)	0.30	0.00	0.90	0.27	0.00	0.00	0.77	0.00	0.49	0.00	0.00	0.69
Avail Cap(c_a), veh/h	498	0	578	201	0	0	406	0	1016	0	0	1100
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	24.7	0.0	29.9	25.0	0.0	0.0	16.5	0.0	4.7	0.0	0.0	12.6
Incr Delay (d2), s/veh	0.4	0.0	14.8	0.9	0.0	0.0	13.1	0.0	1.7	0.0	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	10.9	0.6	0.0	0.0	6.5	0.0	2.6	0.0	0.0	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	0.0	44.7	26.0	0.0	0.0	29.6	0.0	6.4	0.0	0.0	16.2
LnGrp LOS	C	A	D	C	A	A	C	A	A	A	A	B
Approach Vol, veh/h	563			37			805			764		
Approach Delay, s/veh	40.3			26.0			15.4			16.2		
Approach LOS	D			C			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	58.1			31.9			58.1			31.9		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	48.5			32.5			48.5			32.5		
Max Q Clear Time (g_c+I1), s	27.7			26.3			50.5			25.5		
Green Ext Time (p_c), s	5.0			0.1			0.0			1.9		
Intersection Summary												
HCM 6th Ctrl Delay	22.3											
HCM 6th LOS	C											

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Sumner Comp Plan Update

37: Sumner-Tapps Highway E & SR-410 WB Ramps

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	10.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↗	↖			↗	
Traffic Vol, veh/h	0	0	0	35	0	280	105	485	0	0	770	340
Future Vol, veh/h	0	0	0	35	0	280	105	485	0	0	770	340
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	2	2	2	1	1	1	2	2	2
Mvmt Flow	0	0	0	36	0	286	107	495	0	0	786	347
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				1669	1843	495	1134	0	-	-	-	0
Stage 1				709	709	-	-	-	-	-	-	-
Stage 2				960	1134	-	-	-	-	-	-	-
Critical Hdwy				6.42	6.52	6.22	4.11	-	-	-	-	-
Critical Hdwy Stg 1				5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy				3.518	4.018	3.318	2.209	-	-	-	-	-
Pot Cap-1 Maneuver				106	75	575	620	-	0	0	-	-
Stage 1				488	437	-	-	-	0	0	-	-
Stage 2				372	278	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				88	0	575	620	-	-	-	-	-
Mov Cap-2 Maneuver				88	0	-	-	-	-	-	-	-
Stage 1				404	0	-	-	-	-	-	-	-
Stage 2				372	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				61		2.1		0				
HCM LOS				F								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		620	-	356	-	-						
HCM Lane V/C Ratio		0.173	-	0.903	-	-						
HCM Control Delay (s)		12	-	61	-	-						
HCM Lane LOS		B	-	F	-	-						
HCM 95th %tile Q(veh)		0.6	-	9	-	-						

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

38: Sumner-Tapps Highway E & SR-410 EB Ramps

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	0	195	0	0	0	0	265	80	355	450	0
Future Volume (veh/h)	330	0	195	0	0	0	0	265	80	355	450	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	344	0	203				0	276	83	370	469	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	1	1	1	1	0
Cap, veh/h	416	0	370				0	939	796	717	1256	0
Arrive On Green	0.23	0.00	0.23				0.00	0.50	0.50	0.04	0.22	0.00
Sat Flow, veh/h	1781	0	1585				0	1885	1598	1795	1885	0
Grp Volume(v), veh/h	344	0	203				0	276	83	370	469	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1885	1598	1795	1885	0
Q Serve(g_s), s	16.5	0.0	10.1				0.0	7.7	2.5	7.8	19.0	0.0
Cycle Q Clear(g_c), s	16.5	0.0	10.1				0.0	7.7	2.5	7.8	19.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	416	0	370				0	939	796	717	1256	0
V/C Ratio(X)	0.83	0.00	0.55				0.00	0.29	0.10	0.52	0.37	0.00
Avail Cap(c_a), veh/h	663	0	590				0	939	796	914	1256	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	0.0	30.3				0.0	13.3	12.0	8.9	19.1	0.0
Incr Delay (d2), s/veh	4.8	0.0	1.3				0.0	0.8	0.3	0.5	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	0.0	3.9				0.0	3.4	0.9	3.4	9.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	0.0	31.6				0.0	14.1	12.2	9.4	20.0	0.0
LnGrp LOS	D	A	C				A	B	B	A	B	A
Approach Vol, veh/h	547						359			839		
Approach Delay, s/veh	35.3						13.6			15.3		
Approach LOS	D						B			B		
Timer - Assigned Phs	1	2		4			6					
Phs Duration (G+Y+Rc), s	15.1	49.3		25.5			64.5					
Change Period (Y+Rc), s	4.5	4.5		4.5			4.5					
Max Green Setting (Gmax), s	20.5	22.5		33.5			47.5					
Max Q Clear Time (g_c+I1), s	9.8	9.7		18.5			21.0					
Green Ext Time (p_c), s	0.8	1.6		2.5			3.3					
Intersection Summary												
HCM 6th Ctrl Delay	21.2											
HCM 6th LOS	C											

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

39: Valley Avenue & Gary Street /Gary Street E

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↑		↗	↕	
Traffic Vol, veh/h	0	0	60	5	0	5	140	475	5	5	750	10
Future Vol, veh/h	0	0	60	5	0	5	140	475	5	5	750	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	175	-	-	175	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	0	0	0
Mvmt Flow	0	0	67	6	0	6	156	528	6	6	833	11
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	422	1272	-	531	844	0	0	534	0	0
Stage 1	-	-	-	843	-	-	-	-	-	-	-	-
Stage 2	-	-	-	429	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.93	7.3	-	6.2	4.115	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.319	3.5	-	3.3	2.2095	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	581	136	0	552	796	-	-	1044	-	-
Stage 1	0	0	-	361	0	-	-	-	-	-	-	-
Stage 2	0	0	-	580	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	581	102	-	552	796	-	-	1044	-	-
Mov Cap-2 Maneuver	-	-	-	102	-	-	-	-	-	-	-	-
Stage 1	-	-	-	290	-	-	-	-	-	-	-	-
Stage 2	-	-	-	510	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12		11.6		2.4		0.1					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	796	-	-	581	552	1044	-	-				
HCM Lane V/C Ratio	0.195	-	-	0.115	0.01	0.005	-	-				
HCM Control Delay (s)	10.6	-	-	12	11.6	8.5	-	-				
HCM Lane LOS	B	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0.7	-	-	0.4	0	0	-	-				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

40: Valley Avenue & SR-410 WB Ramps

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	115	0	200	215	425	0	0	655	160
Future Volume (veh/h)	0	0	0	115	0	200	215	425	0	0	655	160
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No				No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1900	1900
Adj Flow Rate, veh/h				125	0	217	234	462	0	0	712	174
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				1	1	1	1	1	0	0	0	0
Cap, veh/h				291	0	258	509	1387	0	0	763	646
Arrive On Green				0.16	0.00	0.16	0.57	1.00	0.00	0.00	0.40	0.40
Sat Flow, veh/h				1795	0	1593	1795	1885	0	0	1900	1610
Grp Volume(v), veh/h				125	0	217	234	462	0	0	712	174
Grp Sat Flow(s),veh/h/ln				1795	0	1593	1795	1885	0	0	1900	1610
Q Serve(g_s), s				5.6	0.0	11.9	6.9	0.0	0.0	0.0	32.3	6.5
Cycle Q Clear(g_c), s				5.6	0.0	11.9	6.9	0.0	0.0	0.0	32.3	6.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				291	0	258	509	1387	0	0	763	646
V/C Ratio(X)				0.43	0.00	0.84	0.46	0.33	0.00	0.00	0.93	0.27
Avail Cap(c_a), veh/h				447	0	396	509	1387	0	0	790	669
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.50	0.50	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				34.0	0.0	36.6	15.5	0.0	0.0	0.0	25.8	18.1
Incr Delay (d2), s/veh				0.4	0.0	5.7	0.4	0.3	0.0	0.0	19.9	1.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.5	0.0	5.0	2.4	0.1	0.0	0.0	18.2	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.3	0.0	42.3	15.9	0.3	0.0	0.0	45.7	19.1
LnGrp LOS				C	A	D	B	A	A	A	D	B
Approach Vol, veh/h					342			696			886	
Approach Delay, s/veh					39.4			5.5			40.5	
Approach LOS					D			A			D	
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	70.8			30.1			40.7			19.2		
Change Period (Y+Rc), s	4.6			4.6			* 4.6			4.6		
Max Green Setting (Gmax), s	58.4			16.5			* 37			22.4		
Max Q Clear Time (g_c+I1), s	2.0			8.9			34.3			13.9		
Green Ext Time (p_c), s	4.4			0.5			1.8			0.6		
Intersection Summary												
HCM 6th Ctrl Delay 27.7												
HCM 6th LOS C												
Notes												

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

41: Valley Avenue & SR-410 EB Ramps

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	0	600	0	0	0	0	480	115	95	690	0
Future Volume (veh/h)	170	0	600	0	0	0	0	480	115	95	690	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1870	1870	1885	1885	0
Adj Flow Rate, veh/h	181	0	638				0	511	122	101	734	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3				0	2	2	1	1	0
Cap, veh/h	558	0	496				0	460	110	387	1098	0
Arrive On Green	0.32	0.00	0.32				0.00	0.32	0.32	0.43	1.00	0.00
Sat Flow, veh/h	1767	0	1572				0	1458	348	1795	1885	0
Grp Volume(v), veh/h	181	0	638				0	0	633	101	734	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	0	1806	1795	1885	0
Q Serve(g_s), s	7.0	0.0	28.4				0.0	0.0	28.4	3.2	0.0	0.0
Cycle Q Clear(g_c), s	7.0	0.0	28.4				0.0	0.0	28.4	3.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.19	1.00		0.00
Lane Grp Cap(c), veh/h	558	0	496				0	0	570	387	1098	0
V/C Ratio(X)	0.32	0.00	1.29				0.00	0.00	1.11	0.26	0.67	0.00
Avail Cap(c_a), veh/h	558	0	496				0	0	570	389	1098	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.00	1.00	0.66	0.66	0.00
Uniform Delay (d), s/veh	23.5	0.0	30.8				0.0	0.0	30.8	21.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	143.2				0.0	0.0	71.7	0.2	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	30.1				0.0	0.0	23.0	1.3	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	0.0	174.0				0.0	0.0	102.5	21.2	2.2	0.0
LnGrp LOS	C	A	F				A	A	F	C	A	A
Approach Vol, veh/h	819						633			835		
Approach Delay, s/veh	140.8						102.5			4.5		
Approach LOS	F						F			A		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.0	33.0		33.0		57.0						
Change Period (Y+Rc), s	4.6	* 4.6		4.6		4.6						
Max Green Setting (Gmax), s	19.5	* 28		28.4		52.4						
Max Q Clear Time (g_c+I1), s	5.2	30.4		30.4		2.0						
Green Ext Time (p_c), s	0.2	0.0		0.0		6.0						
Intersection Summary												
HCM 6th Ctrl Delay			80.4									
HCM 6th LOS			F									
Notes												

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

Summer Comp Plan Update

42: Valley Avenue & 74th Street E

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Traffic Vol, veh/h	5	0	5	5	0	70	0	505	20	280	965	60
Future Vol, veh/h	5	0	5	5	0	70	0	505	20	280	965	60
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	2	2	2
Mvmt Flow	5	0	5	5	0	71	0	515	20	286	985	61
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2150	2124	1017	2115	2144	525	1047	0	0	535	0	0
Stage 1	1589	1589	-	525	525	-	-	-	-	-	-	-
Stage 2	561	535	-	1590	1619	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	35	51	291	37	49	554	665	-	-	1033	-	-
Stage 1	137	169	-	538	531	-	-	-	-	-	-	-
Stage 2	516	527	-	136	163	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	24	37	291	29	35	554	664	-	-	1033	-	-
Mov Cap-2 Maneuver	24	37	-	29	35	-	-	-	-	-	-	-
Stage 1	137	122	-	538	531	-	-	-	-	-	-	-
Stage 2	449	527	-	97	118	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	110		25.5		0		2.1					
HCM LOS	F		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	664	-	-	44	251	1033	-	-				
HCM Lane V/C Ratio	-	-	-	0.232	0.305	0.277	-	-				
HCM Control Delay (s)	0	-	-	110	25.5	9.8	-	-				
HCM Lane LOS	A	-	-	F	D	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.8	1.2	1.1	-	-				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

43: Valley Avenue & Rivergrove Drive E

Existing PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	75	20	25	450	865	90
Future Volume (veh/h)	75	20	25	450	865	90
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	20	25	455	874	91
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	170	151	43	1307	955	99
Arrive On Green	0.09	0.09	0.02	0.70	0.57	0.57
Sat Flow, veh/h	1810	1610	1781	1870	1666	173
Grp Volume(v), veh/h	76	20	25	455	0	965
Grp Sat Flow(s),veh/h/ln	1810	1610	1781	1870	0	1839
Q Serve(g_s), s	1.8	0.5	0.6	4.3	0.0	20.9
Cycle Q Clear(g_c), s	1.8	0.5	0.6	4.3	0.0	20.9
Prop In Lane	1.00	1.00	1.00			0.09
Lane Grp Cap(c), veh/h	170	151	43	1307	0	1054
V/C Ratio(X)	0.45	0.13	0.59	0.35	0.00	0.92
Avail Cap(c_a), veh/h	1037	923	221	2338	0	1054
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.0	18.4	21.4	2.7	0.0	8.5
Incr Delay (d2), s/veh	1.8	0.4	12.2	0.2	0.0	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.4	0.4	0.0	8.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.8	18.8	33.6	2.8	0.0	22.1
LnGrp LOS	C	B	C	A	A	C
Approach Vol, veh/h	96			480	965	
Approach Delay, s/veh	20.4			4.4	22.1	
Approach LOS	C			A	C	
Timer - Assigned Phs	2		4		5	6
Phs Duration (G+Y+Rc), s	35.6		8.8		5.6	30.0
Change Period (Y+Rc), s	4.6		4.6		4.5	4.6
Max Green Setting (Gmax), s	55.4		25.4		5.5	25.4
Max Q Clear Time (g_c+I1), s	6.3		3.8		2.6	22.9
Green Ext Time (p_c), s	3.1		0.2		0.0	1.6
Intersection Summary						
HCM 6th Ctrl Delay			16.5			
HCM 6th LOS			B			

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

1: Stewart Road SE (8th St E) & Butte Ave SE

Future (2044) PM Peak Hour - Alternative 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1320	5	5	710	20	15	0	10	80	0	105
Future Volume (veh/h)	45	1320	5	5	710	20	15	0	10	80	0	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1811	1811	1826	1826	1826	1900	1900	1900	1870	1870	1870
Adj Flow Rate, veh/h	47	1375	5	5	740	21	16	0	10	83	0	109
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	6	6	6	5	5	5	0	0	0	2	2	2
Cap, veh/h	269	1453	5	110	1424	40	386	0	339	380	0	338
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.21	0.00	0.21	0.21	0.00	0.21
Sat Flow, veh/h	683	3517	13	383	3445	98	1810	0	1589	1781	0	1585
Grp Volume(v), veh/h	47	673	707	5	372	389	16	0	10	83	0	109
Grp Sat Flow(s),veh/h/ln	683	1721	1809	383	1735	1808	1810	0	1589	1781	0	1585
Q Serve(g_s), s	4.1	28.2	28.3	1.0	12.0	12.0	0.5	0.0	0.4	2.9	0.0	4.4
Cycle Q Clear(g_c), s	16.2	28.2	28.3	29.2	12.0	12.0	0.5	0.0	0.4	2.9	0.0	4.4
Prop In Lane	1.00		0.01	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	711	748	110	717	747	386	0	339	380	0	338
V/C Ratio(X)	0.18	0.95	0.95	0.05	0.52	0.52	0.04	0.00	0.03	0.22	0.00	0.32
Avail Cap(c_a), veh/h	269	711	748	110	717	747	386	0	339	380	0	338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	21.2	21.2	35.3	16.4	16.4	23.4	0.0	23.4	24.3	0.0	24.9
Incr Delay (d2), s/veh	0.3	21.5	20.8	0.1	0.6	0.6	0.2	0.0	0.2	1.3	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	14.5	15.1	0.1	4.4	4.6	0.2	0.0	0.2	1.3	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	42.7	42.0	35.4	17.0	17.0	23.6	0.0	23.5	25.7	0.0	27.4
LnGrp LOS	C	D	D	D	B	B	C	A	C	C	A	C
Approach Vol, veh/h	1427			766			26			192		
Approach Delay, s/veh	41.7			17.1			23.6			26.7		
Approach LOS	D			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	20.0			35.0			20.0			35.0		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	16.0			31.0			16.0			31.0		
Max Q Clear Time (g_c+I1), s	2.5			30.3			6.4			31.2		
Green Ext Time (p_c), s	0.0			0.6			0.5			0.0		
Intersection Summary												
HCM 6th Ctrl Delay 32.5												
HCM 6th LOS C												

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary
2: 140th Ct E & Stewart Road SE (8th St E)

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1405	15	5	665	0	50	0	25	5	0	15
Future Volume (veh/h)	10	1405	15	5	665	0	50	0	25	5	0	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1811	1811	1811	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	10	1448	15	5	686	0	52	0	26	5	0	15
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	4	4	6	6	6	5	5	5	6	6	6
Cap, veh/h	429	2164	22	272	1106	937	371	0	244	122	33	182
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.00	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	744	3545	37	351	1811	1535	1363	0	1545	174	211	1155
Grp Volume(v), veh/h	10	714	749	5	686	0	52	0	26	20	0	0
Grp Sat Flow(s), veh/h/ln	744	1749	1833	351	1811	1535	1363	0	1545	1540	0	0
Q Serve(g_s), s	0.4	12.7	12.8	0.5	11.3	0.0	0.9	0.0	0.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.7	12.7	12.8	13.2	11.3	0.0	1.4	0.0	0.7	0.5	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	1.00		1.00	0.25		0.75
Lane Grp Cap(c), veh/h	429	1068	1119	272	1106	937	371	0	244	338	0	0
V/C Ratio(X)	0.02	0.67	0.67	0.02	0.62	0.00	0.14	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	594	1456	1526	350	1508	1278	859	0	798	868	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.5	6.1	6.1	10.4	5.8	0.0	17.4	0.0	17.1	17.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.8	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.0	3.1	0.0	2.7	0.0	0.5	0.0	0.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.5	7.0	6.9	10.5	6.5	0.0	17.5	0.0	17.2	17.1	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h	1473			691			78			20		
Approach Delay, s/veh	7.0			6.5			17.4			17.1		
Approach LOS	A			A			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	34.5			13.0			34.5			13.0		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	39.5			24.5			39.5			24.5		
Max Q Clear Time (g_c+I1), s	14.8			2.5			15.2			3.4		
Green Ext Time (p_c), s	14.2			0.0			6.3			0.1		

Intersection Summary

HCM 6th Ctrl Delay	7.3
HCM 6th LOS	A

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

3: W Valley Highway E & 24th Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	LT	RT	LT	RT	LT	RT
Traffic Volume (veh/h)	445	75	90	255	295	545
Future Volume (veh/h)	445	75	90	255	295	545
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1707	1707	1544	1544	1781	1781
Adj Flow Rate, veh/h	464	78	94	266	307	568
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	13	13	24	24	8	8
Cap, veh/h	566	260	684	598	341	1279
Arrive On Green	0.18	0.18	0.47	0.47	0.20	0.72
Sat Flow, veh/h	3155	1447	1544	1282	1697	1781
Grp Volume(v), veh/h	464	78	94	266	307	568
Grp Sat Flow(s), veh/h/ln	1577	1447	1467	1282	1697	1781
Q Serve(g_s), s	12.7	4.2	3.3	12.6	15.9	11.9
Cycle Q Clear(g_c), s	12.7	4.2	3.3	12.6	15.9	11.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	566	260	684	598	341	1279
V/C Ratio(X)	0.82	0.30	0.14	0.45	0.90	0.44
Avail Cap(c_a), veh/h	890	408	684	598	385	1279
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	32.0	13.7	16.2	35.1	5.2
Incr Delay (d2), s/veh	2.4	0.4	0.4	2.4	21.5	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	1.5	1.1	3.9	8.4	3.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.9	32.4	14.1	18.6	56.5	6.4
LnGrp LOS	D	C	B	B	E	A
Approach Vol, veh/h	542		360			875
Approach Delay, s/veh	37.1		17.4			24.0
Approach LOS	D		B			C
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	32.7	46.6			69.2	20.8
Change Period (Y+Rc), s	4.6	4.6			4.6	4.6
Max Green Setting (Gmax), s	30.4				55.4	25.4
Max Q Clear Time (g_c+I1), s	14.6				13.9	14.7
Green Ext Time (p_c), s	0.2	2.0			4.0	1.4

Intersection Summary

HCM 6th Ctrl Delay 26.6

HCM 6th LOS C

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

4: SR-167 NB Ramps & 24th Street E

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	475	0	0	450	170	70	5	260	0	0	0
Future Volume (veh/h)	75	475	0	0	450	170	70	5	260	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1574	1574	0	0	1693	1693	1678	1678	1678			
Adj Flow Rate, veh/h	80	505	0	0	479	181	78	0	0			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	22	22	0	0	14	14	15	15	15			
Cap, veh/h	98	948	0	0	646	288	1856	0				
Arrive On Green	0.07	0.32	0.00	0.00	0.07	0.07	0.58	0.00	0.00			
Sat Flow, veh/h	1499	3069	0	0	3300	1434	3196	0	1422			
Grp Volume(v), veh/h	80	505	0	0	479	181	78	0	0			
Grp Sat Flow(s), veh/h/ln	1499	1495	0	0	1608	1434	1598	0	1422			
Q Serve(g_s), s	4.7	12.5	0.0	0.0	13.2	11.1	0.9	0.0	0.0			
Cycle Q Clear(g_c), s	4.7	12.5	0.0	0.0	13.2	11.1	0.9	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	98	948	0	0	646	288	1856	0				
V/C Ratio(X)	0.82	0.53	0.00	0.00	0.74	0.63	0.04	0.00				
Avail Cap(c_a), veh/h	157	1376	0	0	979	437	1856	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	0.48	0.48	0.00	0.00	0.96	0.96	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.6	25.3	0.0	0.0	39.7	38.7	8.1	0.0	0.0			
Incr Delay (d2), s/veh	6.7	0.2	0.0	0.0	1.5	2.0	0.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.9	4.3	0.0	0.0	5.8	4.4	0.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	25.5	0.0	0.0	41.2	40.7	8.1	0.0	0.0			
LnGrp LOS	D	C	A	A	D	D	A	A				
Approach Vol, veh/h	585			660			78					
Approach Delay, s/veh	28.6			41.1			8.1					
Approach LOS	C			D			A					
Timer - Assigned Phs	2			4			7		8			
Phs Duration (G+Y+Rc), s	56.9			33.1			10.5		22.7			
Change Period (Y+Rc), s	4.6			4.6			4.6		4.6			
Max Green Setting (Gmax), s	39.4			41.4			9.4		27.4			
Max Q Clear Time (g_c+I1), s	2.9			14.5			6.7		15.2			
Green Ext Time (p_c), s	0.2			3.4			0.0		2.9			

Intersection Summary

HCM 6th Ctrl Delay 33.6

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

5: 136th Avenue E & 24th Street E

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	500	80	35	305	105	55	30	75	220	25	260
Future Volume (veh/h)	155	500	80	35	305	105	55	30	75	220	25	260
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1604	1604	1604	1648	1648	1648	1841	1841	1841	1693	1693	1693
Adj Flow Rate, veh/h	170	549	88	38	335	115	60	33	82	242	27	286
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	20	20	20	17	17	17	4	4	4	14	14	14
Cap, veh/h	463	1217	194	334	970	328	209	100	247	391	31	324
Arrive On Green	0.03	0.15	0.15	0.04	0.42	0.42	0.05	0.21	0.21	0.08	0.24	0.24
Sat Flow, veh/h	1527	2631	420	1570	2298	775	1753	467	1161	1612	125	1325
Grp Volume(v), veh/h	170	317	320	38	226	224	60	0	115	242	0	313
Grp Sat Flow(s),veh/h/ln	1527	1523	1527	1570	1566	1507	1753	0	1628	1612	0	1450
Q Serve(g_s), s	5.3	17.0	17.2	1.2	8.8	9.1	2.3	0.0	5.4	7.5	0.0	18.7
Cycle Q Clear(g_c), s	5.3	17.0	17.2	1.2	8.8	9.1	2.3	0.0	5.4	7.5	0.0	18.7
Prop In Lane	1.00		0.28	1.00		0.51	1.00		0.71	1.00		0.91
Lane Grp Cap(c), veh/h	463	705	707	334	661	637	209	0	347	391	0	355
V/C Ratio(X)	0.37	0.45	0.45	0.11	0.34	0.35	0.29	0.00	0.33	0.62	0.00	0.88
Avail Cap(c_a), veh/h	518	705	707	400	661	637	265	0	534	391	0	475
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	27.7	27.8	14.4	17.6	17.6	26.7	0.0	30.0	28.0	0.0	32.7
Incr Delay (d2), s/veh	0.2	1.9	1.9	0.1	1.4	1.5	0.3	0.0	0.2	2.2	0.0	11.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	7.3	7.3	0.4	3.3	3.3	1.0	0.0	2.1	1.6	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	29.6	29.7	14.4	19.0	19.1	26.9	0.0	30.2	30.2	0.0	44.3
LnGrp LOS	B	C	C	B	B	B	C	A	C	C	A	D
Approach Vol, veh/h	807			488			175			555		
Approach Delay, s/veh	26.2			18.7			29.1			38.2		
Approach LOS	C			B			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.8	42.5	12.0	23.7	8.2	46.1	9.2	26.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	1.5	24.5	7.5	29.5	7.5	27.5	7.5	29.5				
Max Q Clear Time (g_c+11), s	1.5	11.1	9.5	7.4	3.2	19.2	4.3	20.7				
Green Ext Time (p_c), s	0.1	3.1	0.0	0.4	0.0	3.3	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 27.9

HCM 6th LOS C

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
6: 142nd Ave E & 24th St E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	25	390	15	35	1030
Future Vol, veh/h	20	25	390	15	35	1030
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	34	34	23	23	18	18
Mvmt Flow	22	27	424	16	38	1120
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1070	433	0	0	441	0
Stage 1	433	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Critical Hdwy	7.11	6.71	-	-	4.37	-
Critical Hdwy Stg 1	5.91	-	-	-	-	-
Critical Hdwy Stg 2	6.31	-	-	-	-	-
Follow-up Hdwy	3.823	3.623	-	-	2.371	-
Pot Cap-1 Maneuver	190	547	-	-	1024	-
Stage 1	577	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	183	547	-	-	1023	-
Mov Cap-2 Maneuver	298	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.3	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 399		1023	-	
HCM Lane V/C Ratio	-	- 0.123		0.037	-	
HCM Control Delay (s)	-	- 15.3		8.7	-	
HCM Lane LOS	-	- C		A	-	
HCM 95th %tile Q(veh)	-	- 0.4		0.1	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

7: E Valley Highway E & Forest Canyon Road E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	111.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	0	0	5	60	0	100	5	295	180	400	815	0
Future Vol, veh/h	0	0	5	60	0	100	5	295	180	400	815	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	65	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	6	6	6	2	2	2	3	3	3
Mvmt Flow	0	0	5	66	0	110	5	324	198	440	896	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2264	2308	896	2212	2209	423	896	0	0	522	0	0
Stage 1	1776	1776	-	433	433	-	-	-	-	-	-	-
Stage 2	488	532	-	1779	1776	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.56	6.26	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4.054	3.354	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	29	39	342	~ 31	43	622	757	-	-	1039	-	-
Stage 1	107	137	-	593	575	-	-	-	-	-	-	-
Stage 2	565	529	-	102	132	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	16	22	342	~ 20	25	622	757	-	-	1039	-	-
Mov Cap-2 Maneuver	16	22	-	~ 20	25	-	-	-	-	-	-	-
Stage 1	106	79	-	589	571	-	-	-	-	-	-	-
Stage 2	462	525	-	~ 58	76	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.7		\$ 1268.8		0.1		3.6					
HCM LOS	C		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	757	-	-	342	51	1039	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.016	3.448	0.423	-	-				
HCM Control Delay (s)	9.8	-	-	15.7	\$ 1268.8	11	-	-				
HCM Lane LOS	A	-	-	C	F	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	19.1	2.1	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary 8: W Valley Highway E & SR-167 SB Ramps

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	95	85	260	60	545	445
Future Volume (veh/h)	95	85	260	60	545	445
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1411	1411	1648	1648	1767	1767
Adj Flow Rate, veh/h	101	90	277	64	580	473
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	33	33	17	17	9	9
Cap, veh/h	155	242	534	121	650	0
Arrive On Green	0.12	0.12	0.21	0.21	0.39	0.00
Sat Flow, veh/h	1344	2104	2605	572	1682	580
Grp Volume(v), veh/h	101	90	170	171	580	22.0
Grp Sat Flow(s),veh/h/ln	1344	1052	1566	1529	1682	C
Q Serve(g_s), s	3.5	1.9	4.6	4.8	15.5	
Cycle Q Clear(g_c), s	3.5	1.9	4.6	4.8	15.5	
Prop In Lane	1.00	1.00		0.37	1.00	
Lane Grp Cap(c), veh/h	155	242	331	324	650	
V/C Ratio(X)	0.65	0.37	0.51	0.53	0.89	
Avail Cap(c_a), veh/h	431	674	1153	1126	889	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	20.3	19.7	16.7	16.8	13.8	
Incr Delay (d2), s/veh	4.2	0.9	1.1	1.2	8.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.2	0.5	1.6	1.6	6.2	
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.5	20.5	17.9	18.0	22.0	
LnGrp LOS	C	C	B	B	C	
Approach Vol, veh/h	191		341			
Approach Delay, s/veh	22.6		17.9			
Approach LOS	C		B			
Timer - Assigned Phs	1	2			8	
Phs Duration (G+Y+Rc), s	23.1	14.8			10.1	
Change Period (Y+Rc), s	4.6	4.6			4.6	
Max Green Setting (Gmax), s	25.4	35.4			15.4	
Max Q Clear Time (g_c+I1), s	17.5	6.8			5.5	
Green Ext Time (p_c), s	1.0	2.0			0.4	
Intersection Summary						
HCM 6th Ctrl Delay			20.9			
HCM 6th LOS			C			

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

9: 142nd Ave E & Costco Access

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	15	5	0	5	5	260	5	0	915	5
Future Volume (veh/h)	5	0	15	5	0	5	5	260	5	0	915	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	477	477	477	1900	1900	1900	1722	1722	1722	1781	1781	1781
Adj Flow Rate, veh/h	5	0	16	5	0	5	5	274	5	0	963	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
Percent Heavy Veh, %	96	96	96	0	0	0	12	12	12	8	8	8
Cap, veh/h	309	0	14	297	0	56	443	2086	38	790	1601	8
Arrive On Green	0.04	0.00	0.04	0.04	0.00	0.04	0.01	0.63	0.63	0.00	0.46	0.46
Sat Flow, veh/h	357	0	404	1419	0	1586	1640	3287	60	1697	3453	18
Grp Volume(v), veh/h	5	0	16	5	0	5	5	136	143	0	472	496
Grp Sat Flow(s),veh/h/ln	357	0	404	1419	0	1586	1640	1636	1711	1697	1692	1778
Q Serve(g_s), s	0.3	0.0	0.9	0.0	0.0	0.1	0.0	0.8	0.8	0.0	5.0	5.0
Cycle Q Clear(g_c), s	0.4	0.0	0.9	0.9	0.0	0.1	0.0	0.8	0.8	0.0	5.0	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.01
Lane Grp Cap(c), veh/h	309	0	14	297	0	56	443	1038	1086	790	785	825
V/C Ratio(X)	0.02	0.00	1.12	0.02	0.00	0.09	0.01	0.13	0.13	0.00	0.60	0.60
Avail Cap(c_a), veh/h	532	0	267	1184	0	1047	705	1080	1130	1063	1118	1174
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	11.7	12.1	0.0	11.3	3.5	1.8	1.8	0.0	4.8	4.8
Incr Delay (d2), s/veh	0.0	0.0	147.1	0.0	0.0	0.7	0.0	0.1	0.1	0.0	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	158.8	12.1	0.0	12.0	3.5	1.8	1.8	0.0	5.6	5.5
LnGrp LOS	B	A	F	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h	21			10			284			968		
Approach Delay, s/veh	123.7			12.1			1.9			5.6		
Approach LOS	F			B			A			A		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	4.9			0.0			19.4			4.9		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	16.0			4.0			16.0			4.0		
Max Q Clear Time (g_c+I1), s	2.9			0.0			2.8			2.9		
Green Ext Time (p_c), s	0.0			0.0			1.3			0.1		

Intersection Summary

HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

10: W Valley Highway E & 42nd Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↘		↑	↗	↘	↑
Traffic Vol, veh/h	40	50	185	10	25	520
Future Vol, veh/h	40	50	185	10	25	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	20	20	29	29	11	11
Mvmt Flow	42	53	195	11	26	547
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	794	195	0	0	206	0
Stage 1	195	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.21	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.299	-
Pot Cap-1 Maneuver	333	803	-	-	1313	-
Stage 1	797	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	326	803	-	-	1313	-
Mov Cap-2 Maneuver	326	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	505	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	14.2	0	0.4			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	487	1313	-	
HCM Lane V/C Ratio	-	-	0.195	0.02	-	
HCM Control Delay (s)	-	-	14.2	7.8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
11: Tacoma Ave & 142nd Ave E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	5	20	255	610	450
Future Vol, veh/h	10	5	20	255	610	450
Conflicting Peds, #/hr	1	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	170	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	46	46	22	22	12	12
Mvmt Flow	11	5	22	277	663	489
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	847	663	1152	0	-	0
Stage 1	663	-	-	-	-	-
Stage 2	184	-	-	-	-	-
Critical Hdwy	7.29	6.89	4.43	-	-	-
Critical Hdwy Stg 1	6.09	-	-	-	-	-
Critical Hdwy Stg 2	6.49	-	-	-	-	-
Follow-up Hdwy	3.937	3.737	2.409	-	-	-
Pot Cap-1 Maneuver	252	375	519	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	241	375	519	-	-	-
Mov Cap-2 Maneuver	330	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	15.8	0.9	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	519	-	330	375	-	-
HCM Lane V/C Ratio	0.042	-	0.033	0.014	-	-
HCM Control Delay (s)	12.2	-	16.3	14.7	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

Appendix B LOS Summary and Worksheets

HCM 6th AWSC
12: Puyallup St & Tacoma Ave

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection	
Intersection Delay, s/veh	84.3
Intersection LOS	F

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	150	55	90	65	465	265
Future Vol, veh/h	150	55	90	65	465	265
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	25	25	22	22	12	12
Mvmt Flow	165	60	99	71	511	291
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	15.3	12.9	118.8
HCM LOS	C	B	F

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	73%	0%	64%
Vol Thru, %	27%	58%	0%
Vol Right, %	0%	42%	36%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	205	155	730
LT Vol	150	0	465
Through Vol	55	90	0
RT Vol	0	65	265
Lane Flow Rate	225	170	802
Geometry Grp	1	1	1
Degree of Util (X)	0.418	0.301	1.188
Departure Headway (Hd)	7.233	6.929	5.333
Convergence, Y/N	Yes	Yes	Yes
Cap	500	523	690
Service Time	5.233	4.929	3.333
HCM Lane V/C Ratio	0.45	0.325	1.162
HCM Control Delay	15.3	12.9	118.8
HCM Lane LOS	C	B	F
HCM 95th-tile Q	2	1.3	27

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

Sumner Comp Plan Update

13: E Valley Highway E & Puyallup Street

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	100	345	65	380	850	60
Future Volume (vph)	100	345	65	380	850	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1599	1770	1863	1845	1534
Flt Permitted	0.95	1.00	0.15	1.00	1.00	1.00
Satd. Flow (perm)	1787	1599	272	1863	1845	1534
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	356	67	392	876	62
RTOR Reduction (vph)	0	313	0	0	0	5
Lane Group Flow (vph)	103	43	67	392	876	57
Confl. Peds. (#/hr)	2		1			1
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	6		7	4	8	
Permitted Phases		6	4			8
Actuated Green, G (s)	9.1	9.1	56.7	56.7	45.5	45.5
Effective Green, g (s)	9.1	9.1	56.7	56.7	45.5	45.5
Actuated g/C Ratio	0.12	0.12	0.75	0.75	0.60	0.60
Clearance Time (s)	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
Lane Grp Cap (vph)	214	191	325	1393	1107	920
v/s Ratio Prot	c0.06		0.02	c0.21	c0.47	
v/s Ratio Perm		0.03	0.14			0.04
v/c Ratio	0.48	0.22	0.21	0.28	0.79	0.06
Uniform Delay, d1	31.1	30.2	8.6	3.0	11.5	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.4	0.2	0.1	3.8	0.0
Delay (s)	32.4	30.6	8.8	3.1	15.4	6.3
Level of Service	C	C	A	A	B	A
Approach Delay (s)	31.0			4.0	14.8	
Approach LOS	C			A	B	
Intersection Summary						
HCM 2000 Control Delay			16.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			75.8		Sum of lost time (s)	17.0
Intersection Capacity Utilization			74.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

14: Elm Street E & E Valley Highway E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection						
Int Delay, s/veh	3.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	380	65	400	760	25	80
Future Vol, veh/h	380	65	400	760	25	80
Conflicting Peds, #/hr	0	0	0	0	1	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	45	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	396	68	417	792	26	83
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	464	0	2057	437
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	1627	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1097	-	61	624
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	178	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1097	-	38	620
Mov Cap-2 Maneuver	-	-	-	-	94	-
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	110	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.5		22.6		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	94	620	-	-	1097	-
HCM Lane V/C Ratio	0.277	0.134	-	-	0.38	-
HCM Control Delay (s)	57.4	11.7	-	-	10.3	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	1	0.5	-	-	1.8	-

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
15: Valley Avenue & Elm Street E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection						
Int Delay, s/veh	6.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↰	↰	↰	↰
Traffic Vol, veh/h	210	30	545	240	20	235
Future Vol, veh/h	210	30	545	240	20	235
Conflicting Peds, #/hr	0	1	1	0	2	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	275	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	219	31	568	250	21	245
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	251	0	1624	237
Stage 1	-	-	-	-	236	-
Stage 2	-	-	-	-	1388	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1320	-	113	804
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	232	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1319	-	64	803
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	132	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		6.8		13.9	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	115	803	-	-	1319	-
HCM Lane V/C Ratio	0.181	0.305	-	-	0.43	-
HCM Control Delay (s)	43.1	11.4	-	-	9.8	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	1.3	-	-	2.2	-

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
16: Fryar Avenue & Zehnder Avenue

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection						
Int Delay, s/veh	2.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	95	5	240	165	90	655
Future Vol, veh/h	95	5	240	165	90	655
Conflicting Peds, #/hr	0	1	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	10	10	7	7
Mvmt Flow	103	5	261	179	98	712
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1261	354	0	0	442	0
Stage 1	353	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.17	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.263	-
Pot Cap-1 Maneuver	187	688	-	-	1092	-
Stage 1	709	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	170	686	-	-	1090	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	357	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	24.6	0		1		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	291	1090	-	
HCM Lane V/C Ratio	-	-	0.374	0.09	-	
HCM Control Delay (s)	-	-	24.6	8.6	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	1.7	0.3	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

17: Parker Road E & Washington Street

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	20	20	10	5	5	5	5	40	5	30	130	10
Future Vol, veh/h	20	20	10	5	5	5	5	40	5	30	130	10
Conflicting Peds, #/hr	4	0	4	4	0	4	3	0	1	1	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	2	2	2
Mvmt Flow	22	22	11	6	6	6	6	45	6	34	146	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	293	287	159	301	289	53	160	0	0	52	0	0
Stage 1	223	223	-	61	61	-	-	-	-	-	-	-
Stage 2	70	64	-	240	228	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	663	626	892	655	624	1020	1407	-	-	1554	-	-
Stage 1	784	723	-	955	848	-	-	-	-	-	-	-
Stage 2	945	846	-	768	719	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	637	607	887	612	605	1016	1403	-	-	1553	-	-
Mov Cap-2 Maneuver	637	607	-	612	605	-	-	-	-	-	-	-
Stage 1	779	704	-	950	844	-	-	-	-	-	-	-
Stage 2	927	842	-	714	700	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	10.3	0.8	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1403	-	-	661	702	1553	-
HCM Lane V/C Ratio	0.004	-	-	0.085	0.024	0.022	-
HCM Control Delay (s)	7.6	0	-	11	10.3	7.4	0
HCM Lane LOS	A	A	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.1	-

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis 18: W Valley Highway E & Sumner-Heights Drive E

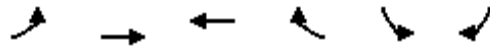
Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	135	20	180	580	30
Future Volume (vph)	140	135	20	180	580	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0		3.5	5.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.98		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.93		0.88		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1475		1621		1626	1712
Flt Permitted	0.98		1.00		0.62	1.00
Satd. Flow (perm)	1475		1621		1061	1712
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	156	150	22	200	644	33
RTOR Reduction (vph)	0	0	143	0	0	0
Lane Group Flow (vph)	306	0	79	0	644	33
Confl. Bikes (#/hr)		2		1		
Heavy Vehicles (%)	16%	16%	1%	1%	11%	11%
Turn Type	Perm		NA		pm+pt	NA
Protected Phases			4		1	8
Permitted Phases	2				8	
Actuated Green, G (s)	28.8		30.8		54.7	19.7
Effective Green, g (s)	28.8		30.8		54.7	19.7
Actuated g/C Ratio	0.27		0.28		0.51	0.18
Clearance Time (s)	5.0		5.0		3.5	5.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	392		461		719	311
v/s Ratio Prot			c0.05		c0.29	0.02
v/s Ratio Perm	c0.21				c0.16	
v/c Ratio	0.78		0.17		0.90	0.11
Uniform Delay, d1	36.7		29.1		23.2	36.9
Progression Factor	1.36		1.00		1.00	1.00
Incremental Delay, d2	9.2		0.2		13.7	0.2
Delay (s)	59.2		29.2		36.9	37.0
Level of Service	E		C		D	D
Approach Delay (s)	59.2		29.2			36.9
Approach LOS	E		C			D
Intersection Summary						
HCM 2000 Control Delay			41.1		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.80			
Actuated Cycle Length (s)			108.1		Sum of lost time (s)	17.0
Intersection Capacity Utilization			72.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis 19: Valley Avenue E & Sumner-Heights Drive E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	80	295	220	195	480	280
Future Volume (vph)	80	295	220	195	480	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	0.97	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1655	1743	1881	1559	1608	
Flt Permitted	0.30	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	529	1743	1881	1559	1608	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	314	234	207	511	298
RTOR Reduction (vph)	0	0	0	169	0	0
Lane Group Flow (vph)	85	314	234	38	809	0
Confl. Peds. (#/hr)	2			2		1
Heavy Vehicles (%)	9%	9%	1%	1%	8%	8%
Turn Type	pm+pt	NA	NA	Perm	Perm	
Protected Phases	7	4	8			
Permitted Phases	4			8	6	
Actuated Green, G (s)	30.8	30.8	19.7	19.7	67.3	
Effective Green, g (s)	30.8	30.8	19.7	19.7	67.3	
Actuated g/C Ratio	0.28	0.28	0.18	0.18	0.62	
Clearance Time (s)	3.5	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	229	496	342	284	1001	
v/s Ratio Prot	0.03	c0.18	0.12			
v/s Ratio Perm	0.08			0.02	c0.50	
v/c Ratio	0.37	0.63	0.68	0.13	0.81	
Uniform Delay, d1	29.8	33.7	41.3	37.0	15.5	
Progression Factor	1.00	1.00	1.00	1.00	1.19	
Incremental Delay, d2	1.0	2.6	5.6	0.2	3.7	
Delay (s)	30.8	36.4	46.9	37.3	22.2	
Level of Service	C	D	D	D	C	
Approach Delay (s)		35.2	42.4		22.2	
Approach LOS		D	D		C	
Intersection Summary						
HCM 2000 Control Delay			30.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			108.1		Sum of lost time (s)	17.0
Intersection Capacity Utilization			75.7%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

20: Traffic Avenue/Fryar Avenue & Cannery Way/Main Street

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	295	415	145	125	25	215	250	75	110	615	115
Future Volume (veh/h)	135	295	415	145	125	25	215	250	75	110	615	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1811	1811	1811	1826	1826	1826
Adj Flow Rate, veh/h	148	324	456	159	137	27	236	275	82	121	676	126
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	1	1	1	6	6	6	5	5	5
Cap, veh/h	578	566	476	403	458	90	262	311	258	418	758	141
Arrive On Green	0.14	0.30	0.30	0.14	0.30	0.30	0.15	0.17	0.17	0.24	0.26	0.26
Sat Flow, veh/h	1795	1885	1586	1795	1526	301	1725	1811	1504	1739	2912	542
Grp Volume(v), veh/h	148	324	456	159	0	164	236	275	82	121	402	400
Grp Sat Flow(s),veh/h/ln	1795	1885	1586	1795	0	1827	1725	1811	1504	1739	1735	1720
Q Serve(g_s), s	7.4	21.2	41.2	8.0	0.0	10.1	19.6	21.6	5.2	8.3	32.6	32.7
Cycle Q Clear(g_c), s	7.4	21.2	41.2	8.0	0.0	10.1	19.6	21.6	5.2	8.3	32.6	32.7
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	578	566	476	403	0	548	262	311	258	418	452	448
V/C Ratio(X)	0.26	0.57	0.96	0.39	0.00	0.30	0.90	0.88	0.32	0.29	0.89	0.89
Avail Cap(c_a), veh/h	757	575	484	582	0	558	408	677	562	418	648	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	43.1	50.1	27.4	0.0	39.2	60.8	59.0	29.2	45.2	51.9	52.0
Incr Delay (d2), s/veh	0.2	1.3	30.2	0.6	0.0	0.3	15.7	8.2	0.7	0.4	10.8	11.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	10.3	20.1	3.6	0.0	4.7	9.7	10.6	2.6	3.6	15.4	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	44.5	80.4	28.0	0.0	39.5	76.5	67.2	29.9	45.6	62.7	63.0
LnGrp LOS	C	D	F	C	A	D	E	E	C	D	E	E
Approach Vol, veh/h	928			323			593			923		
Approach Delay, s/veh	59.1			33.8			65.7			60.6		
Approach LOS	E			C			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.5	49.3	40.5	30.6	25.5	49.2	27.6	43.5				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	34.5	44.5	34.5	54.5	34.5	44.5	34.5	54.5				
Max Q Clear Time (g_c+1.9), s	12.1	12.1	10.3	23.6	10.0	43.2	21.6	34.7				
Green Ext Time (p_c), s	0.5	0.7	0.3	1.4	0.6	0.6	0.5	3.3				

Intersection Summary

HCM 6th Ctrl Delay	58.1
HCM 6th LOS	E

Appendix B LOS Summary and Worksheets

HCM 6th AWSC
21: Alder Avenue & Main Street

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection

Intersection Delay, s/veh 13.6

Intersection LOS B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	365	140	85	250	25	45
Future Vol, veh/h	365	140	85	250	25	45
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	392	151	91	269	27	48
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	15.3	12	9.3
HCM LOS	C	B	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	36%	0%	25%
Vol Thru, %	0%	72%	75%
Vol Right, %	64%	28%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	70	505	335
LT Vol	25	0	85
Through Vol	0	365	250
RT Vol	45	140	0
Lane Flow Rate	75	543	360
Geometry Grp	1	1	1
Degree of Util (X)	0.115	0.654	0.474
Departure Headway (Hd)	5.494	4.338	4.741
Convergence, Y/N	Yes	Yes	Yes
Cap	647	831	756
Service Time	3.571	2.377	2.789
HCM Lane V/C Ratio	0.116	0.653	0.476
HCM Control Delay	9.3	15.3	12
HCM Lane LOS	A	C	B
HCM 95th-tile Q	0.4	5	2.6

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
22: Ryan Ave & Main Street

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	395	10	10	310	5	15
Future Vol, veh/h	395	10	10	310	5	15
Conflicting Peds, #/hr	0	20	20	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	425	11	11	333	5	16
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	456	0	806	453
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1105	-	354	611
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	714	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1087	-	344	600
Mov Cap-2 Maneuver	-	-	-	-	344	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	705	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		12.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	506	-	-	1087	-	
HCM Lane V/C Ratio	0.043	-	-	0.01	-	
HCM Control Delay (s)	12.4	-	-	8.3	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

Sumner Comp Plan Update

23: Wood Avenue & Main Street

Future (2044) PM Peak Hour - Alternative 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	345	20	10	185	60	10	70	30	105	170	130
Future Volume (vph)	55	345	20	10	185	60	10	70	30	105	170	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	10	12	12	16	12	12	10	11
Total Lost time (s)	5.5	5.5			5.5			5.5			5.5	4.0
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			0.99			1.00			1.00	1.00
Flpb, ped/bikes	0.99	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.99			0.97			0.96			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			0.98	1.00
Satd. Flow (prot)	1715	1863			1684			2024			1740	1561
Flt Permitted	0.65	1.00			0.98			0.95			0.82	1.00
Satd. Flow (perm)	1177	1863			1651			1939			1457	1561
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	62	388	22	11	208	67	11	79	34	118	191	146
RTOR Reduction (vph)	0	5	0	0	26	0	0	23	0	0	0	146
Lane Group Flow (vph)	62	405	0	0	260	0	0	101	0	0	309	0
Confl. Peds. (#/hr)	9		11	11		9	1					1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	NA
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.0	17.0			17.0			13.2			13.2	0.0
Effective Green, g (s)	17.0	17.0			17.0			13.2			13.2	0.0
Actuated g/C Ratio	0.41	0.41			0.41			0.32			0.32	0.00
Clearance Time (s)	5.5	5.5			5.5			5.5			5.5	
Vehicle Extension (s)	6.0	6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)	485	768			681			621			466	0
v/s Ratio Prot		c0.22										
v/s Ratio Perm	0.05				0.16			0.05			c0.21	
v/c Ratio	0.13	0.53			0.38			0.16			0.66	0.00
Uniform Delay, d1	7.5	9.1			8.4			10.0			12.1	20.6
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	1.6			1.0			0.3			5.5	0.0
Delay (s)	7.8	10.7			9.4			10.4			17.6	20.6
Level of Service	A	B			A			B			B	C
Approach Delay (s)		10.3			9.4			10.4			18.6	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.0									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			41.2									
Intersection Capacity Utilization			59.4%									
Analysis Period (min)			15									
c Critical Lane Group												

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

24: Valley Avenue & Main Street

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	380	65	185	255	65	15	305	105	65	585	55
Future Volume (veh/h)	155	380	65	185	255	65	15	305	105	65	585	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1976	1900	1900	1900	1900	1961	1885	1885	1900	1976	1900
Adj Flow Rate, veh/h	163	400	68	195	268	68	16	321	111	68	616	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	0	0	0
Cap, veh/h	377	458	78	305	426	108	158	459	159	310	670	63
Arrive On Green	0.09	0.28	0.28	0.10	0.29	0.29	0.02	0.34	0.34	0.05	0.38	0.38
Sat Flow, veh/h	1810	1640	279	1810	1455	369	1867	1333	461	1810	1776	167
Grp Volume(v), veh/h	163	0	468	195	0	336	16	0	432	68	0	674
Grp Sat Flow(s),veh/h/ln	1810	0	1919	1810	0	1824	1867	0	1794	1810	0	1943
Q Serve(g_s), s	5.7	0.0	21.0	6.8	0.0	14.4	0.5	0.0	18.8	2.1	0.0	29.9
Cycle Q Clear(g_c), s	5.7	0.0	21.0	6.8	0.0	14.4	0.5	0.0	18.8	2.1	0.0	29.9
Prop In Lane	1.00		0.15	1.00		0.20	1.00		0.26	1.00		0.09
Lane Grp Cap(c), veh/h	377	0	536	305	0	534	158	0	618	310	0	733
V/C Ratio(X)	0.43	0.00	0.87	0.64	0.00	0.63	0.10	0.00	0.70	0.22	0.00	0.92
Avail Cap(c_a), veh/h	520	0	850	424	0	808	427	0	795	513	0	861
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	31.0	22.5	0.0	27.7	22.4	0.0	25.5	19.0	0.0	26.8
Incr Delay (d2), s/veh	0.8	0.0	6.2	2.2	0.0	1.2	0.3	0.0	1.9	0.4	0.0	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	10.5	3.0	0.0	6.4	0.2	0.0	8.2	0.9	0.0	16.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	0.0	37.2	24.8	0.0	28.9	22.7	0.0	27.4	19.4	0.0	40.4
LnGrp LOS	C	A	D	C	A	C	C	A	C	B	A	D
Approach Vol, veh/h	631					531		448		742		
Approach Delay, s/veh	33.2					27.4		27.3		38.5		
Approach LOS	C					C		C		D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.1	30.2	9.9	36.1	12.9	31.4	7.0	39.0				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	40.0	15.0	40.0	15.0	40.0	15.0	40.0				
Max Q Clear Time (g_c+1/3), s	23.0	4.1	20.8	7.7	16.4	2.5	31.9					
Green Ext Time (p_c), s	0.4	1.9	0.1	1.9	0.3	1.4	0.0	2.2				

Intersection Summary

HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
25: Parker Road E & Main Street

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	8.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	625	40	15	340	30	30	15	5	55	65	30
Future Vol, veh/h	20	625	40	15	340	30	30	15	5	55	65	30
Conflicting Peds, #/hr	5	0	10	10	0	5	0	0	4	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	235	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	1	1
Mvmt Flow	20	638	41	15	347	31	31	15	5	56	66	31
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	383	0	0	689	0	0	1150	1122	673	1111	1127	368
Stage 1	-	-	-	-	-	-	709	709	-	398	398	-
Stage 2	-	-	-	-	-	-	441	413	-	713	729	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1187	-	-	915	-	-	177	208	459	187	205	680
Stage 1	-	-	-	-	-	-	428	440	-	630	605	-
Stage 2	-	-	-	-	-	-	599	597	-	424	430	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1182	-	-	907	-	-	121	199	454	168	196	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	199	-	168	196	-
Stage 1	-	-	-	-	-	-	417	429	-	617	592	-
Stage 2	-	-	-	-	-	-	499	584	-	396	419	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0.2		0.4			40.9			55.9			
HCM LOS						E			F			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	150	1182	-	-	907	-	-	213				
HCM Lane V/C Ratio	0.34	0.017	-	-	0.017	-	-	0.719				
HCM Control Delay (s)	40.9	8.1	-	-	9	-	-	55.9				
HCM Lane LOS	E	A	-	-	A	-	-	F				
HCM 95th %tile Q(veh)	1.4	0.1	-	-	0.1	-	-	4.7				

Appendix B LOS Summary and Worksheets

HCM 6th AWSC

26: 160th Avenue E & Main Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Intersection Delay, s/veh	46.5											
Intersection LOS	E											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	280	410	30	290	35	105	45	15	180	110	20
Future Vol, veh/h	20	280	410	30	290	35	105	45	15	180	110	20
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	1	1	1
Mvmt Flow	22	308	451	33	319	38	115	49	16	198	121	22
Number of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	2			3			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			3			2		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			2			3		
HCM Control Delay	45.9			58.6			21.6			47.1		
HCM LOS	E			F			C			E		
Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1					
Vol Left, %	64%	100%	0%	0%	100%	0%	58%					
Vol Thru, %	27%	0%	100%	0%	0%	89%	35%					
Vol Right, %	9%	0%	0%	100%	0%	11%	6%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	165	20	280	410	30	325	310					
LT Vol	105	20	0	0	30	0	180					
Through Vol	45	0	280	0	0	290	110					
RT Vol	15	0	0	410	0	35	20					
Lane Flow Rate	181	22	308	451	33	357	341					
Geometry Grp	7	7	7	7	8	8	7					
Degree of Util (X)	0.491	0.054	0.714	0.955	0.092	0.936	0.857					
Departure Headway (Hd)	9.75	8.877	8.357	7.628	10.038	9.433	9.054					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	370	402	431	473	356	382	399					
Service Time	7.526	6.653	6.132	5.403	7.823	7.217	6.815					
HCM Lane V/C Ratio	0.489	0.055	0.715	0.953	0.093	0.935	0.855					
HCM Control Delay	21.6	12.2	29.5	58.7	13.8	62.7	47.1					
HCM Lane LOS	C	B	D	F	B	F	E					
HCM 95th-tile Q	2.6	0.2	5.5	11.7	0.3	10.1	8.3					

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary 27: Sumner-Tapps Highway E & 60th Street E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	260	275	160	505	605	175
Future Volume (veh/h)	260	275	160	505	605	175
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1870	1870
Adj Flow Rate, veh/h	277	293	170	537	644	186
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	1	1	2	2
Cap, veh/h	387	344	191	1253	694	200
Arrive On Green	0.21	0.21	0.11	0.66	0.50	0.50
Sat Flow, veh/h	1810	1610	1795	1885	1395	403
Grp Volume(v), veh/h	277	293	170	537	0	830
Grp Sat Flow(s), veh/h/ln	1810	1610	1795	1885	0	1798
Q Serve(g_s), s	9.3	11.5	6.2	8.8	0.0	28.4
Cycle Q Clear(g_c), s	9.3	11.5	6.2	8.8	0.0	28.4
Prop In Lane	1.00	1.00	1.00			0.22
Lane Grp Cap(c), veh/h	387	344	191	1253	0	894
V/C Ratio(X)	0.72	0.85	0.89	0.43	0.00	0.93
Avail Cap(c_a), veh/h	440	391	191	1318	0	956
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	24.9	29.0	5.2	0.0	15.4
Incr Delay (d2), s/veh	4.7	14.8	36.4	0.2	0.0	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	1.4	4.4	2.3	0.0	12.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.7	39.6	65.4	5.4	0.0	29.8
LnGrp LOS	C	D	E	A	A	C
Approach Vol, veh/h	570			707	830	
Approach Delay, s/veh	34.3			19.8	29.8	
Approach LOS	C			B	C	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	47.7			18.1	11.0	36.7
Change Period (Y+Rc), s	4.0			4.0	4.0	4.0
Max Green Setting (Gmax), s	46.0			16.0	7.0	35.0
Max Q Clear Time (g_c+l1), s	10.8			13.5	8.2	30.4
Green Ext Time (p_c), s	3.7			0.6	0.0	2.4
Intersection Summary						
HCM 6th Ctrl Delay			27.7			
HCM 6th LOS			C			

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

28: Traffic Avenue & Maple Street

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕				↗	↗	↕↕	↗	↗	↕↕	
Traffic Vol, veh/h	5	0	10	0	0	20	0	495	80	40	1035	5
Future Vol, veh/h	5	0	10	0	0	20	0	495	80	40	1035	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	45	-	115	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	7	7	7	5	5	5	4	4	4
Mvmt Flow	5	0	11	0	0	21	0	527	85	43	1101	5
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1456	1807	553	-	-	271	1106	0	0	617	0	0
Stage 1	1190	1190	-	-	-	-	-	-	-	-	-	-
Stage 2	266	617	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	-	-	7.04	4.2	-	-	4.18	-	-
Critical Hdwy Stg 1	6.5	5.5	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	3.37	2.25	-	-	2.24	-	-
Pot Cap-1 Maneuver	93	80	482	0	0	712	610	-	-	945	-	-
Stage 1	202	263	-	0	0	-	-	-	-	-	-	-
Stage 2	722	484	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	76	482	-	-	708	610	-	-	941	-	-
Mov Cap-2 Maneuver	87	76	-	-	-	-	-	-	-	-	-	-
Stage 1	202	251	-	-	-	-	-	-	-	-	-	-
Stage 2	699	482	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	25.4		10.2		0		0.3					
HCM LOS	D		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	610	-	-	192	708	941	-	-				
HCM Lane V/C Ratio	-	-	-	0.083	0.03	0.045	-	-				
HCM Control Delay (s)	0	-	-	25.4	10.2	9	-	-				
HCM Lane LOS	A	-	-	D	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.1	-	-				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

29: E Main Ave/Traffic Avenue & SR-410 WB Ramps/Thompson Street (2044) PM Peak Hour - Alternative 1

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	20	310	260	65	10	325	480	255	25	795	305
Future Volume (veh/h)	140	20	310	260	65	10	325	480	255	25	795	305
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1914	1841	1914	1914	1841	1841	1841
Adj Flow Rate, veh/h	152	22	0	182	212	0	353	522	0	27	864	332
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	187	197		253	266		357	1850		546	1095	419
Arrive On Green	0.11	0.11	0.00	0.14	0.14	0.00	0.13	0.51	0.00	0.06	0.44	0.44
Sat Flow, veh/h	1753	1841	1560	1753	1841	0	1753	3733	0	1753	2467	945
Grp Volume(v), veh/h	152	22	0	182	212	0	353	522	0	27	611	585
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1753	1841	0	1753	1819	0	1753	1749	1663
Q Serve(g_s), s	8.5	1.1	0.0	9.9	11.1	0.0	12.2	8.2	0.0	0.7	29.9	30.1
Cycle Q Clear(g_c), s	8.5	1.1	0.0	9.9	11.1	0.0	12.2	8.2	0.0	0.7	29.9	30.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		0.57
Lane Grp Cap(c), veh/h	187	197		253	266		357	1850		546	776	738
V/C Ratio(X)	0.81	0.11		0.72	0.80		0.99	0.28		0.05	0.79	0.79
Avail Cap(c_a), veh/h	289	304		447	469		357	1850		625	776	738
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.98	0.98	0.00	0.83	0.83	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	40.4	0.0	40.8	41.4	0.0	23.1	14.1	0.0	9.8	23.8	23.9
Incr Delay (d2), s/veh	9.5	0.2	0.0	3.7	5.3	0.0	40.7	0.3	0.0	0.0	8.0	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.5	0.0	4.6	5.4	0.0	8.6	3.3	0.0	0.3	13.7	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	40.6	0.0	44.6	46.7	0.0	63.8	14.4	0.0	9.8	31.8	32.4
LnGrp LOS	D	D		D	D		E	B		A	C	C
Approach Vol, veh/h	174				394				875			
Approach Delay, s/veh	51.6				45.7				34.3			
Approach LOS	D				D				C			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.0	48.9		18.9	10.5	55.4		15.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	12.5	27.5		25.5	10.5	29.5		16.5				
Max Q Clear Time (g_c+I1), s	14.2	32.1		13.1	2.7	10.2		10.5				
Green Ext Time (p_c), s	0.0	0.0		1.3	0.0	2.3		0.3				

Intersection Summary

HCM 6th Ctrl Delay 35.9

HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

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

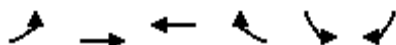
Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

30: Thompson Street & Station Lane

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	270	255	5	20	70
Future Volume (veh/h)	25	270	255	5	20	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.97	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1737	1737
Adj Flow Rate, veh/h	28	300	283	6	22	78
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	1	1	11	11
Cap, veh/h	472	907	483	10	34	120
Arrive On Green	0.04	0.48	0.26	0.26	0.10	0.10
Sat Flow, veh/h	1781	1870	1838	39	328	1162
Grp Volume(v), veh/h	28	300	0	289	101	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1877	1504	0
Q Serve(g_s), s	0.3	2.6	0.0	3.6	1.7	0.0
Cycle Q Clear(g_c), s	0.3	2.6	0.0	3.6	1.7	0.0
Prop In Lane	1.00			0.02	0.22	0.77
Lane Grp Cap(c), veh/h	472	907	0	493	155	0
V/C Ratio(X)	0.06	0.33	0.00	0.59	0.65	0.00
Avail Cap(c_a), veh/h	1076	1716	0	1722	1380	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.9	4.2	0.0	8.6	11.5	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.4	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.0	1.0	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.0	4.3	0.0	9.0	13.2	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		328	289		101	
Approach Delay, s/veh		4.4	9.0		13.2	
Approach LOS		A	A		B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.9	12.5			18.4	8.3
Change Period (Y+Rc), s	5.0	5.5			5.5	5.5
Max Green Setting (Gmax), s	10.0	24.5			24.5	24.5
Max Q Clear Time (g_c+12, s)	12.3	5.6			4.6	3.7
Green Ext Time (p_c), s	0.0	1.1			1.2	0.1

Intersection Summary

HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

31: Alder Ave & Thompson Street

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	70	160	5	5	125	5	0	10	5	5	15	200
Future Vol, veh/h	70	160	5	5	125	5	0	10	5	5	15	200
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	6	6	6	0	0	0	0	0	0	1	1	1
Mvmt Flow	74	170	5	5	133	5	0	11	5	5	16	213
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	138	0	0	178	0	0	584	472	176	475	472	136
Stage 1	-	-	-	-	-	-	324	324	-	146	146	-
Stage 2	-	-	-	-	-	-	260	148	-	329	326	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1421	-	-	1410	-	-	426	493	872	502	492	915
Stage 1	-	-	-	-	-	-	692	653	-	859	778	-
Stage 2	-	-	-	-	-	-	749	779	-	686	650	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1421	-	-	1406	-	-	302	461	870	467	461	915
Mov Cap-2 Maneuver	-	-	-	-	-	-	302	461	-	467	461	-
Stage 1	-	-	-	-	-	-	650	614	-	809	775	-
Stage 2	-	-	-	-	-	-	561	776	-	631	611	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.3			0.3			11.8			10.9		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	547	1421	-	-	1406	-	-	840				
HCM Lane V/C Ratio	0.029	0.052	-	-	0.004	-	-	0.279				
HCM Control Delay (s)	11.8	7.7	0	-	7.6	0	-	10.9				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	1.1				

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

Sumner Comp Plan Update

32: E Main Ave & SR-410 EB Ramps

Future (2044) PM Peak Hour - Alternative 1

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	225	660	255	835	1075	290
Future Volume (vph)	225	660	255	835	1075	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	
Frpb, ped/bikes	0.98	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	0.91	0.85	1.00	1.00	0.97	
Flt Protected	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	2998	1339	1770	3539	3393	
Flt Permitted	0.98	1.00	0.09	1.00	1.00	
Satd. Flow (perm)	2998	1339	170	3539	3393	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	695	268	879	1132	305
RTOR Reduction (vph)	276	293	0	0	19	0
Lane Group Flow (vph)	309	54	268	879	1418	0
Confl. Peds. (#/hr)		7				
Heavy Vehicles (%)	7%	7%	2%	2%	3%	3%
Turn Type	Prot	Perm	D.P+P	NA	NA	
Protected Phases	8		1	6	2	
Permitted Phases		8	2			
Actuated Green, G (s)	15.6	15.6	61.2	65.7	43.9	
Effective Green, g (s)	15.6	15.6	61.2	65.7	43.9	
Actuated g/C Ratio	0.16	0.16	0.61	0.66	0.44	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	467	208	380	2325	1489	
v/s Ratio Prot	c0.10		c0.12	0.25	c0.42	
v/s Ratio Perm		0.04	0.31			
v/c Ratio	0.66	0.26	0.71	0.38	0.95	
Uniform Delay, d1	39.7	37.1	25.0	7.8	27.0	
Progression Factor	1.00	1.00	1.00	1.00	0.52	
Incremental Delay, d2	3.5	0.7	5.9	0.5	4.9	
Delay (s)	43.2	37.8	30.9	8.3	18.9	
Level of Service	D	D	C	A	B	
Approach Delay (s)	41.2			13.6	18.9	
Approach LOS	D			B	B	
Intersection Summary						
HCM 2000 Control Delay			23.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			78.1%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary
33: Valley Avenue & Meade-McCumber Road E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	95	120	60	65	10	30	370	90	5	795	35
Future Volume (veh/h)	20	95	120	60	65	10	30	370	90	5	795	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1945	1870	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	22	102	129	65	70	11	32	398	97	5	855	38
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	0	0	0
Cap, veh/h	363	126	159	246	323	51	188	765	186	427	886	39
Arrive On Green	0.03	0.17	0.17	0.06	0.20	0.20	0.04	0.52	0.52	0.01	0.49	0.49
Sat Flow, veh/h	1795	754	953	1781	1640	258	1795	1464	357	1810	1803	80
Grp Volume(v), veh/h	22	0	231	65	0	81	32	0	495	5	0	893
Grp Sat Flow(s),veh/h/ln	1795	0	1707	1781	0	1897	1795	0	1821	1810	0	1884
Q Serve(g_s), s	0.7	0.0	9.7	2.2	0.0	2.7	0.6	0.0	13.2	0.1	0.0	34.0
Cycle Q Clear(g_c), s	0.7	0.0	9.7	2.2	0.0	2.7	0.6	0.0	13.2	0.1	0.0	34.0
Prop In Lane	1.00		0.56	1.00		0.14	1.00		0.20	1.00		0.04
Lane Grp Cap(c), veh/h	363	0	285	246	0	374	188	0	951	427	0	925
V/C Ratio(X)	0.06	0.00	0.81	0.26	0.00	0.22	0.17	0.00	0.52	0.01	0.00	0.97
Avail Cap(c_a), veh/h	458	0	533	286	0	592	266	0	951	562	0	934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	29.7	23.6	0.0	24.9	16.5	0.0	11.6	10.1	0.0	18.2
Incr Delay (d2), s/veh	0.1	0.0	5.5	0.6	0.0	0.3	0.4	0.0	0.5	0.0	0.0	21.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	4.3	0.9	0.0	1.2	0.3	0.0	5.0	0.0	0.0	18.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	0.0	35.2	24.2	0.0	25.2	17.0	0.0	12.1	10.1	0.0	39.6
LnGrp LOS	C	A	D	C	A	C	B	A	B	B	A	D
Approach Vol, veh/h	253			146			527			898		
Approach Delay, s/veh	34.3			24.8			12.4			39.4		
Approach LOS	C			C			B			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	51	43.2	8.9	16.9	7.4	40.9	6.7	19.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	61	36.7	6.1	23.1	6.1	36.7	6.1	23.1				
Max Q Clear Time (g_c+11), s	12.6	15.2	4.2	11.7	2.6	36.0	2.7	4.7				
Green Ext Time (p_c), s	0.0	2.2	0.0	0.7	0.0	0.4	0.0	0.2				

Intersection Summary

HCM 6th Ctrl Delay	29.7
HCM 6th LOS	C

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

34: Parker Road E & Mead McCumber Road E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	135	5	5	55	10	5	5	5	55	20	70
Future Vol, veh/h	40	135	5	5	55	10	5	5	5	55	20	70
Conflicting Peds, #/hr	10	0	2	2	0	10	0	0	5	5	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	2	2	2
Mvmt Flow	43	145	5	5	59	11	5	5	5	59	22	75
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	80	0	0	152	0	0	359	326	155	329	323	75
Stage 1	-	-	-	-	-	-	236	236	-	85	85	-
Stage 2	-	-	-	-	-	-	123	90	-	244	238	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	1524	-	-	1429	-	-	600	596	896	624	595	986
Stage 1	-	-	-	-	-	-	772	713	-	923	824	-
Stage 2	-	-	-	-	-	-	886	824	-	760	708	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1511	-	-	1427	-	-	523	569	891	592	568	978
Mov Cap-2 Maneuver	-	-	-	-	-	-	523	569	-	592	568	-
Stage 1	-	-	-	-	-	-	747	689	-	887	814	-
Stage 2	-	-	-	-	-	-	793	814	-	723	685	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.7			0.5			10.9			11.3		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	626	1511	-	-	1427	-	-	726				
HCM Lane V/C Ratio	0.026	0.028	-	-	0.004	-	-	0.215				
HCM Control Delay (s)	10.9	7.5	0	-	7.5	0	-	11.3				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.8				

Appendix B LOS Summary and Worksheets

HCM 6th AWSC

35: 160th Avenue E & 64th Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Intersection Delay, s/veh	17.8											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	20	155	5	5	45	135	5	0	0	460	5	25
Future Vol, veh/h	20	155	5	5	45	135	5	0	0	460	5	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	22	168	5	5	49	147	5	0	0	500	5	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB			NB			SB				
Opposing Approach	WB	EB			SB			NB				
Opposing Lanes	1	1			1			1				
Conflicting Approach Left	SB	NB			EB			WB				
Conflicting Lanes Left	1	1			1			1				
Conflicting Approach Right	NB	SB			WB			EB				
Conflicting Lanes Right	1	1			1			1				
HCM Control Delay	11.4	10.6			9.2			23				
HCM LOS	B	B			A			C				
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	100%	11%	3%	94%								
Vol Thru, %	0%	86%	24%	1%								
Vol Right, %	0%	3%	73%	5%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	5	180	185	490								
LT Vol	5	20	5	460								
Through Vol	0	155	45	5								
RT Vol	0	5	135	25								
Lane Flow Rate	5	196	201	533								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.009	0.311	0.297	0.765								
Departure Headway (Hd)	6.083	5.723	5.311	5.169								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	586	628	676	703								
Service Time	4.14	3.768	3.356	3.197								
HCM Lane V/C Ratio	0.009	0.312	0.297	0.758								
HCM Control Delay	9.2	11.4	10.6	23								
HCM Lane LOS	A	B	B	C								
HCM 95th-tile Q	0	1.3	1.2	7.2								

Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 101 [Sumner-Tapps Hwy E/64th St E (Site Folder: General)]

 Network: N101 [Network1 (Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: 166th Ave E														
3	L2	253	1.0	253	1.0	0.326	5.5	LOS A	0.8	19.4	0.19	0.08	0.19	33.6
8	T1	653	1.0	653	1.0	0.326	5.4	LOS A	0.8	19.7	0.19	0.07	0.19	34.6
18	R2	16	1.0	16	1.0	0.326	5.3	LOS A	0.8	19.7	0.19	0.07	0.19	34.0
Approach		921	1.0	921	1.0	0.326	5.4	LOS A	0.8	19.7	0.19	0.07	0.19	34.3
East: 64th St E														
1	L2	21	12.0	21	12.0	0.047	5.1	LOS A	0.1	1.7	0.49	0.44	0.49	28.4
6	T1	11	12.0	11	12.0	0.047	5.1	LOS A	0.1	1.7	0.49	0.44	0.49	33.4
16	R2	5	12.0	5	12.0	0.047	5.1	LOS A	0.1	1.7	0.49	0.44	0.49	32.4
Approach		37	12.0	37	12.0	0.047	5.1	LOS A	0.1	1.7	0.49	0.44	0.49	31.0
North: Sumner Tapps Hwy E														
7	L2	1	2.0	1	2.0	0.382	7.0	LOS A	0.8	20.7	0.45	0.33	0.45	34.4
4	T1	868	2.0	868	2.0	0.382	6.7	LOS A	0.8	21.1	0.44	0.32	0.44	29.4
14	R2	58	2.0	58	2.0	0.382	6.5	LOS A	0.8	21.1	0.44	0.31	0.44	33.4
Approach		927	2.0	927	2.0	0.382	6.7	LOS A	0.8	21.1	0.44	0.32	0.44	29.8
West: 64th St E														
5	L2	42	1.0	42	1.0	0.398	9.2	LOS A	0.8	21.0	0.65	0.70	0.78	32.8
2	T1	5	1.0	5	1.0	0.398	9.2	LOS A	0.8	21.0	0.65	0.70	0.78	32.7
12	R2	695	1.0	695	1.0	0.398	8.4	LOS A	0.9	21.5	0.64	0.68	0.75	27.6
Approach		742	1.0	742	1.0	0.398	8.4	LOS A	0.9	21.5	0.64	0.68	0.75	28.2
All Vehicles		2627	1.5	2627	1.5	0.398	6.7	LOS A	0.9	21.5	0.41	0.34	0.44	31.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 102 [166th Ave/SR 410 WB Ramps (Site Folder: General)]

 Network: N101 [Network1
(Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: 166th Ave E														
3	L2	107	1.0	107	1.0	0.445	6.7	LOS A	0.0	0.0	0.00	0.00	0.00	37.9
8	T1	541	1.0	541	1.0	0.445	6.7	LOS A	0.0	0.0	0.00	0.00	0.00	34.6
Approach		648	1.0	648	1.0	0.445	6.7	LOS A	0.0	0.0	0.00	0.00	0.00	35.4
East: SR 410 WB Off Ramp														
1	L2	41	2.0	41	2.0	0.050	4.8	LOS A	0.1	2.7	0.61	0.46	0.61	32.7
6	T1	1	2.0	1	2.0	0.050	4.8	LOS A	0.1	2.7	0.61	0.46	0.61	32.7
16	R2	352	2.0	352	2.0	0.296	5.8	LOS A	0.8	20.0	0.67	0.55	0.67	29.8
Approach		394	2.0	394	2.0	0.296	5.7	LOS A	0.8	20.0	0.66	0.54	0.66	30.3
North: 166th Ave E														
4	T1	1020	2.0	1020	2.0	0.539	8.3	LOS A	1.8	45.8	0.47	0.28	0.47	33.4
14	R2	515	2.0	515	2.0	0.539	7.7	LOS A	1.8	45.8	0.45	0.26	0.45	32.6
Approach		1536	2.0	1536	2.0	0.539	8.1	LOS A	1.8	45.8	0.47	0.28	0.47	33.1
All Vehicles		2578	1.7	2578	1.7	0.539	7.4	LOS A	1.8	45.8	0.38	0.25	0.38	33.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

38: Sumner-Tapps Highway E & SR-410 EB Ramps

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕	↗	↗	↕	
Traffic Volume (veh/h)	345	0	195	0	0	0	0	290	115	455	585	0
Future Volume (veh/h)	345	0	195	0	0	0	0	290	115	455	585	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	359	0	203				0	302	120	474	609	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	1	1	1	1	0
Cap, veh/h	431	0	384				0	836	709	703	1240	0
Arrive On Green	0.24	0.00	0.24				0.00	0.44	0.44	0.16	0.66	0.00
Sat Flow, veh/h	1781	0	1585				0	1885	1598	1795	1885	0
Grp Volume(v), veh/h	359	0	203				0	302	120	474	609	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1885	1598	1795	1885	0
Q Serve(g_s), s	17.2	0.0	10.0				0.0	9.6	4.1	11.9	14.7	0.0
Cycle Q Clear(g_c), s	17.2	0.0	10.0				0.0	9.6	4.1	11.9	14.7	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	431	0	384				0	836	709	703	1240	0
V/C Ratio(X)	0.83	0.00	0.53				0.00	0.36	0.17	0.67	0.49	0.00
Avail Cap(c_a), veh/h	663	0	590				0	836	709	817	1240	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.4	0.0	29.6				0.0	16.6	15.1	9.8	7.8	0.0
Incr Delay (d2), s/veh	5.4	0.0	1.1				0.0	1.2	0.5	1.7	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	3.9				0.0	4.3	1.6	4.5	5.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	0.0	30.8				0.0	17.8	15.6	11.5	9.2	0.0
LnGrp LOS	D	A	C				A	B	B	B	A	A
Approach Vol, veh/h	562						422			1083		
Approach Delay, s/veh	35.3						17.2			10.2		
Approach LOS	D						B			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), \$9.3	44.4	26.3		63.7								
Change Period (Y+Rc), s	4.5	4.5	4.5		4.5							
Max Green Setting (Gmax), s	20.5	22.5	33.5		47.5							
Max Q Clear Time (g_c+I13, s)	11.6	11.6	19.2		16.7							
Green Ext Time (p_c), s	0.9	1.7	2.6		4.9							

Intersection Summary

HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

39: Valley Avenue & Gary Street /Gary Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↗		↗	↗↘	
Traffic Vol, veh/h	0	0	200	15	0	25	155	470	5	5	965	5
Future Vol, veh/h	0	0	200	15	0	25	155	470	5	5	965	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	175	-	-	175	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	0	0	0
Mvmt Flow	0	0	222	17	0	28	172	522	6	6	1072	6

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	539	1417	-	525	1078	0	0	528	0	0
Stage 1	-	-	-	869	-	-	-	-	-	-	-	-
Stage 2	-	-	-	548	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.93	7.3	-	6.2	4.115	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.319	3.5	-	3.3	2.2095	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	488	107	0	556	650	-	-	1049	-	-
Stage 1	0	0	-	349	0	-	-	-	-	-	-	-
Stage 2	0	0	-	493	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	-	488	46	-	556	650	-	-	1049	-	-
Mov Cap-2 Maneuver	-	-	-	46	-	-	-	-	-	-	-	-
Stage 1	-	-	-	257	-	-	-	-	-	-	-	-
Stage 2	-	-	-	267	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	18.4		11.8		3.1		0	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	650	-	-	488	556	1049	-
HCM Lane V/C Ratio	0.265	-	-	0.455	0.05	0.005	-
HCM Control Delay (s)	12.5	-	-	18.4	11.8	8.4	-
HCM Lane LOS	B	-	-	C	B	A	-
HCM 95th %tile Q(veh)	1.1	-	-	2.3	0.2	0	-

Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 101 [Valley Ave/SR 410 WB Ramps (Site Folder: General)]

 Network: N101 [Network1
(Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Valley Ave														
3	L2	397	1.0	397	1.0	0.264	4.5	LOS A	0.0	0.0	0.00	0.00	0.00	35.2
8	T1	478	1.0	478	1.0	0.264	4.1	LOS A	0.0	0.0	0.00	0.00	0.00	38.2
Approach		875	1.0	875	1.0	0.264	4.3	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
East: SR 410 WB Off Ramp														
1	L2	207	1.0	207	1.0	0.197	5.2	LOS A	0.3	8.3	0.55	0.51	0.55	27.0
6	T1	1	1.0	1	1.0	0.197	5.2	LOS A	0.3	8.3	0.55	0.51	0.55	32.5
16	R2	207	1.0	207	1.0	0.239	6.7	LOS A	0.4	10.0	0.58	0.58	0.58	33.2
Approach		414	1.0	414	1.0	0.239	5.9	LOS A	0.4	10.0	0.57	0.54	0.57	30.7
North: Valley Ave														
4	T1	1136	0.0	1136	0.0	0.597	11.3	LOS B	2.8	70.3	0.85	0.87	1.12	26.4
14	R2	147	0.0	147	0.0	0.597	10.2	LOS B	2.8	70.3	0.84	0.81	1.06	31.7
Approach		1283	0.0	1283	0.0	0.597	11.2	LOS B	2.8	70.3	0.85	0.86	1.11	27.3
All Vehicles		2572	0.5	2572	0.5	0.597	8.0	LOS A	2.8	70.3	0.52	0.52	0.64	31.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 101 [Valley Ave/SR 410 EB Ramps (Site Folder: General)]

 Network: N101 [Network1
(Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: Valley Ave														
8	T1	665	2.0	665	2.0	0.422	8.4	LOS A	1.1	28.6	0.66	0.57	0.66	28.2
18	R2	186	2.0	186	2.0	0.422	7.9	LOS A	1.1	28.6	0.66	0.55	0.66	32.7
Approach		851	2.0	851	2.0	0.422	8.3	LOS A	1.1	28.6	0.66	0.57	0.66	29.6
North: Valley Ave														
7	L2	293	1.0	293	1.0	0.397	5.9	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
4	T1	1021	1.0	1021	1.0	0.397	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
Approach		1314	1.0	1314	1.0	0.397	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
West: SR 410 EB Off Ramp														
5	L2	191	3.0	191	3.0	0.330	10.8	LOS B	0.6	15.0	0.70	0.73	0.80	24.1
2	T1	1	3.0	1	3.0	0.330	10.8	LOS B	0.6	15.0	0.70	0.73	0.80	30.1
12	R2	798	3.0	798	3.0	0.867	27.5	LOS C	5.4	137.9	0.89	1.43	2.47	25.3
Approach		990	3.0	990	3.0	0.867	24.3	LOS C	5.4	137.9	0.86	1.29	2.14	25.2
All Vehicles		3155	1.9	3155	1.9	0.867	12.2	LOS B	5.4	137.9	0.45	0.56	0.85	31.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix B LOS Summary and Worksheets

HCM 6th TWSC
42: Valley Avenue & 74th Street E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 1

Intersection												
Int Delay, s/veh	32.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	0	5	15	0	110	0	670	20	320	1340	60
Future Vol, veh/h	5	0	5	15	0	110	0	670	20	320	1340	60
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	2	2	2
Mvmt Flow	5	0	5	15	0	112	0	684	20	327	1367	61
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2803	2757	1399	2748	2777	694	1429	0	0	704	0	0
Stage 1	2053	2053	-	694	694	-	-	-	-	-	-	-
Stage 2	750	704	-	2054	2083	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	12	20	174	~ 13	19	444	476	-	-	894	-	-
Stage 1	73	99	-	435	446	-	-	-	-	-	-	-
Stage 2	407	443	-	73	95	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	6	13	174	~ 9	12	444	476	-	-	894	-	-
Mov Cap-2 Maneuver	6	13	-	~ 9	12	-	-	-	-	-	-	-
Stage 1	73	63	-	435	446	-	-	-	-	-	-	-
Stage 2	304	443	-	45	60	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s\$	611.8		\$ 586.4		0		2.1					
HCM LOS	F		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	476	-	-	12	65	894	-	-				
HCM Lane V/C Ratio	-	-	-	0.85	1.962	0.365	-	-				
HCM Control Delay (s)	0	-	-	\$ 611.8	\$ 586.4	11.3	-	-				
HCM Lane LOS	A	-	-	F	F	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.8	11.9	1.7	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

43: Valley Avenue & Rivergrove Drive E

Future (2044) PM Peak Hour - Alternative 1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	45	35	635	1260	80
Future Volume (veh/h)	55	45	35	635	1260	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	56	45	35	641	1273	81
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	85	75	45	1644	1423	91
Arrive On Green	0.05	0.05	0.02	0.88	0.82	0.82
Sat Flow, veh/h	1810	1610	1781	1870	1740	111
Grp Volume(v), veh/h	56	45	35	641	0	1354
Grp Sat Flow(s),veh/h/ln	1810	1610	1781	1870	0	1850
Q Serve(g_s), s	3.8	3.4	2.4	7.8	0.0	61.7
Cycle Q Clear(g_c), s	3.8	3.4	2.4	7.8	0.0	61.7
Prop In Lane	1.00	1.00	1.00			0.06
Lane Grp Cap(c), veh/h	85	75	45	1644	0	1513
V/C Ratio(X)	0.66	0.60	0.79	0.39	0.00	0.89
Avail Cap(c_a), veh/h	294	262	65	1665	0	1513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.2	58.1	60.2	1.4	0.0	7.7
Incr Delay (d2), s/veh	8.5	7.3	31.6	0.2	0.0	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	1.5	1.1	0.0	19.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	66.7	65.4	91.9	1.5	0.0	16.2
LnGrp LOS	E	E	F	A	A	B
Approach Vol, veh/h	101			676	1354	
Approach Delay, s/veh	66.1			6.2	16.2	
Approach LOS	E			A	B	
Timer - Assigned Phs						
	2			4	5	6
Phs Duration (G+Y+Rc), s	113.8			10.4	7.6	106.2
Change Period (Y+Rc), s	4.6			4.6	4.5	4.6
Max Green Setting (Gmax), s	110.6			20.2	4.5	101.6
Max Q Clear Time (g_c+I1), s	9.8			5.8	4.4	63.7
Green Ext Time (p_c), s	5.0			0.2	0.0	20.2
Intersection Summary						
HCM 6th Ctrl Delay			15.4			
HCM 6th LOS			B			

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

1: Stewart Road SE (8th St E) & Butte Ave SE

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	1355	5	5	735	20	15	0	10	80	0	105
Future Volume (veh/h)	45	1355	5	5	735	20	15	0	10	80	0	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1811	1811	1826	1826	1826	1900	1900	1900	1870	1870	1870
Adj Flow Rate, veh/h	47	1411	5	5	766	21	16	0	10	83	0	109
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	6	6	6	5	5	5	0	0	0	2	2	2
Cap, veh/h	260	1454	5	103	1426	39	386	0	339	380	0	338
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.21	0.00	0.21	0.21	0.00	0.21
Sat Flow, veh/h	666	3517	12	370	3449	95	1810	0	1589	1781	0	1585
Grp Volume(v), veh/h	47	690	726	5	385	402	16	0	10	83	0	109
Grp Sat Flow(s),veh/h/ln	666	1721	1809	370	1735	1809	1810	0	1589	1781	0	1585
Q Serve(g_s), s	4.3	29.5	29.5	1.0	12.6	12.6	0.5	0.0	0.4	2.9	0.0	4.4
Cycle Q Clear(g_c), s	16.9	29.5	29.5	30.5	12.6	12.6	0.5	0.0	0.4	2.9	0.0	4.4
Prop In Lane	1.00		0.01	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	711	748	103	717	748	386	0	339	380	0	338
V/C Ratio(X)	0.18	0.97	0.97	0.05	0.54	0.54	0.04	0.00	0.03	0.22	0.00	0.32
Avail Cap(c_a), veh/h	260	711	748	103	717	748	386	0	339	380	0	338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.9	21.6	21.6	36.5	16.6	16.6	23.4	0.0	23.4	24.3	0.0	24.9
Incr Delay (d2), s/veh	0.3	26.5	25.8	0.2	0.7	0.7	0.2	0.0	0.2	1.3	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	16.0	16.7	0.1	4.6	4.8	0.2	0.0	0.2	1.3	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.3	48.1	47.3	36.7	17.3	17.3	23.6	0.0	23.5	25.7	0.0	27.4
LnGrp LOS	C	D	D	D	B	B	C	A	C	C	A	C
Approach Vol, veh/h	1463			792			26			192		
Approach Delay, s/veh	46.9			17.4			23.6			26.7		
Approach LOS	D			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	20.0			35.0			20.0			35.0		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	16.0			31.0			16.0			31.0		
Max Q Clear Time (g_c+I1), s	2.5			31.5			6.4			32.5		
Green Ext Time (p_c), s	0.0			0.0			0.5			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	35.6											
HCM 6th LOS	D											

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary
2: 140th Ct E & Stewart Road SE (8th St E)

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1440	15	5	685	0	50	0	25	5	0	15
Future Volume (veh/h)	10	1440	15	5	685	0	50	0	25	5	0	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1811	1811	1811	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	10	1485	15	5	706	0	52	0	26	5	0	15
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	4	4	4	6	6	6	5	5	5	6	6	6
Cap, veh/h	420	2185	22	264	1116	946	366	0	241	120	33	180
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.00	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	730	3546	36	339	1811	1535	1363	0	1545	175	210	1155
Grp Volume(v), veh/h	10	732	768	5	706	0	52	0	26	20	0	0
Grp Sat Flow(s), veh/h/ln	730	1749	1833	339	1811	1535	1363	0	1545	1539	0	0
Q Serve(g_s), s	0.4	13.4	13.4	0.5	11.9	0.0	1.0	0.0	0.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.3	13.4	13.4	13.9	11.9	0.0	1.5	0.0	0.7	0.5	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	1.00		1.00	0.25		0.75
Lane Grp Cap(c), veh/h	420	1077	1130	264	1116	946	366	0	241	334	0	0
V/C Ratio(X)	0.02	0.68	0.68	0.02	0.63	0.00	0.14	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	567	1429	1498	332	1480	1254	844	0	783	852	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.7	6.1	6.1	10.7	5.8	0.0	17.8	0.0	17.5	17.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.0	0.9	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.2	3.3	0.0	2.9	0.0	0.5	0.0	0.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.7	7.1	7.1	10.7	6.6	0.0	17.9	0.0	17.6	17.4	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h	1510			711			78			20		
Approach Delay, s/veh	7.1			6.6			17.8			17.4		
Approach LOS	A			A			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	35.3			13.1			35.3			13.1		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	39.5			24.5			39.5			24.5		
Max Q Clear Time (g_c+I1), s	15.4			2.5			15.9			3.5		
Green Ext Time (p_c), s	14.4			0.0			6.5			0.1		

Intersection Summary

HCM 6th Ctrl Delay	7.4
HCM 6th LOS	A

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

3: W Valley Highway E & 24th Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←	→	→	←	←	→
Traffic Volume (veh/h)	455	80	90	260	275	560
Future Volume (veh/h)	455	80	90	260	275	560
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No	
Adj Sat Flow, veh/h/ln	1707	1707	1544	1544	1781	1781
Adj Flow Rate, veh/h	474	83	94	271	286	583
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	13	13	24	24	8	8
Cap, veh/h	577	265	696	608	321	1274
Arrive On Green	0.18	0.18	0.47	0.47	0.19	0.71
Sat Flow, veh/h	3155	1447	1544	1282	1697	1781
Grp Volume(v), veh/h	474	83	94	271	286	583
Grp Sat Flow(s), veh/h/ln	1577	1447	1467	1282	1697	1781
Q Serve(g_s), s	13.0	4.5	3.2	12.7	14.8	12.5
Cycle Q Clear(g_c), s	13.0	4.5	3.2	12.7	14.8	12.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	577	265	696	608	321	1274
V/C Ratio(X)	0.82	0.31	0.13	0.45	0.89	0.46
Avail Cap(c_a), veh/h	890	408	696	608	385	1274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	31.9	13.3	15.7	35.6	5.4
Incr Delay (d2), s/veh	2.5	0.4	0.4	2.4	18.9	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	1.6	1.1	3.9	7.7	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.9	32.3	13.7	18.1	54.5	6.6
LnGrp LOS	D	C	B	B	D	A
Approach Vol, veh/h	557		365			869
Approach Delay, s/veh	37.1		17.0			22.4
Approach LOS	D		B			C
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	1.6	47.3			68.9	21.1
Change Period (Y+Rc), s	4.6	4.6			4.6	4.6
Max Green Setting (Gmax), s	20.4	30.4			55.4	25.4
Max Q Clear Time (g_c+I10), s	11.6	14.7			14.5	15.0
Green Ext Time (p_c), s	0.2	2.0			4.1	1.5

Intersection Summary

HCM 6th Ctrl Delay 25.8

HCM 6th LOS C

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

4: SR-167 NB Ramps & 24th Street E

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	460	0	0	465	175	70	5	260	0	0	0
Future Volume (veh/h)	75	460	0	0	465	175	70	5	260	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1574	1574	0	0	1693	1693	1678	1678	1678			
Adj Flow Rate, veh/h	80	489	0	0	495	186	78	0	0			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	22	22	0	0	14	14	15	15	15			
Cap, veh/h	98	964	0	0	663	296	1839	0				
Arrive On Green	0.07	0.32	0.00	0.00	0.07	0.07	0.58	0.00	0.00			
Sat Flow, veh/h	1499	3069	0	0	3300	1434	3196	0	1422			
Grp Volume(v), veh/h	80	489	0	0	495	186	78	0	0			
Grp Sat Flow(s), veh/h/ln	1499	1495	0	0	1608	1434	1598	0	1422			
Q Serve(g_s), s	4.7	11.9	0.0	0.0	13.6	11.4	1.0	0.0	0.0			
Cycle Q Clear(g_c), s	4.7	11.9	0.0	0.0	13.6	11.4	1.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	98	964	0	0	663	296	1839	0				
V/C Ratio(X)	0.82	0.51	0.00	0.00	0.75	0.63	0.04	0.00				
Avail Cap(c_a), veh/h	157	1376	0	0	979	437	1839	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	0.50	0.50	0.00	0.00	0.94	0.94	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.6	24.7	0.0	0.0	39.6	38.6	8.3	0.0	0.0			
Incr Delay (d2), s/veh	6.9	0.2	0.0	0.0	1.5	1.9	0.0	0.0	0.0			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	1.9	4.1	0.0	0.0	6.0	4.5	0.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.5	24.9	0.0	0.0	41.1	40.5	8.4	0.0	0.0			
LnGrp LOS	D	C	A	A	D	D	A	A				
Approach Vol, veh/h	569				681		78					
Approach Delay, s/veh	28.2				41.0		8.4					
Approach LOS	C				D		A					
Timer - Assigned Phs	2		4		7		8					
Phs Duration (G+Y+Rc), s	56.4		33.6		10.5		23.2					
Change Period (Y+Rc), s	4.6		4.6		4.6		4.6					
Max Green Setting (Gmax), s	39.4		41.4		9.4		27.4					
Max Q Clear Time (g_c+I1), s	3.0		13.9		6.7		15.6					
Green Ext Time (p_c), s	0.2		3.3		0.0		3.0					

Intersection Summary

HCM 6th Ctrl Delay 33.6

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

5: 136th Avenue E & 24th Street E

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	485	80	40	320	105	55	35	80	220	25	265
Future Volume (veh/h)	155	485	80	40	320	105	55	35	80	220	25	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1604	1604	1604	1648	1648	1648	1841	1841	1841	1693	1693	1693
Adj Flow Rate, veh/h	170	533	88	44	352	115	60	38	88	242	27	291
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	20	20	20	17	17	17	4	4	4	14	14	14
Cap, veh/h	453	1193	196	341	974	314	209	106	247	387	31	329
Arrive On Green	0.03	0.15	0.15	0.04	0.42	0.42	0.05	0.22	0.22	0.08	0.25	0.25
Sat Flow, veh/h	1527	2618	431	1570	2328	749	1753	492	1140	1612	123	1327
Grp Volume(v), veh/h	170	309	312	44	235	232	60	0	126	242	0	318
Grp Sat Flow(s),veh/h/ln	1527	1523	1526	1570	1566	1512	1753	0	1632	1612	0	1450
Q Serve(g_s), s	5.4	16.6	16.8	1.4	9.2	9.5	2.3	0.0	5.9	7.5	0.0	19.0
Cycle Q Clear(g_c), s	5.4	16.6	16.8	1.4	9.2	9.5	2.3	0.0	5.9	7.5	0.0	19.0
Prop In Lane	1.00		0.28	1.00		0.50	1.00		0.70	1.00		0.92
Lane Grp Cap(c), veh/h	453	694	695	341	655	633	209	0	353	387	0	359
V/C Ratio(X)	0.37	0.45	0.45	0.13	0.36	0.37	0.29	0.00	0.36	0.63	0.00	0.88
Avail Cap(c_a), veh/h	507	694	695	402	655	633	264	0	535	387	0	475
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.7	27.9	27.9	14.4	17.9	18.0	26.5	0.0	29.9	28.0	0.0	32.6
Incr Delay (d2), s/veh	0.2	1.9	1.9	0.1	1.5	1.6	0.3	0.0	0.2	2.4	0.0	12.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	7.1	7.2	0.5	3.5	3.5	1.0	0.0	2.3	1.6	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	29.8	29.8	14.5	19.4	19.6	26.8	0.0	30.2	30.3	0.0	44.8
LnGrp LOS	B	C	C	B	B	B	C	A	C	C	A	D
Approach Vol, veh/h	791					511		186		560		
Approach Delay, s/veh	26.4					19.1		29.1		38.5		
Approach LOS	C					B		C		D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.9	42.2	12.0	24.0	8.5	45.5	9.2	26.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	1.5	24.5	7.5	29.5	7.5	27.5	7.5	29.5				
Max Q Clear Time (g_c+11), s	1.5	11.5	9.5	7.9	3.4	18.8	4.3	21.0				
Green Ext Time (p_c), s	0.1	3.2	0.0	0.4	0.0	3.3	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 28.1

HCM 6th LOS C

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
6: 142nd Ave E & 24th St E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	25	420	20	35	1055
Future Vol, veh/h	25	25	420	20	35	1055
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	34	34	23	23	18	18
Mvmt Flow	27	27	457	22	38	1147
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1120	469	0	0	480	0
Stage 1	469	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Critical Hdwy	7.11	6.71	-	-	4.37	-
Critical Hdwy Stg 1	5.91	-	-	-	-	-
Critical Hdwy Stg 2	6.31	-	-	-	-	-
Follow-up Hdwy	3.823	3.623	-	-	2.371	-
Pot Cap-1 Maneuver	176	520	-	-	989	-
Stage 1	554	-	-	-	-	-
Stage 2	417	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	169	520	-	-	988	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	401	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	16.4	0	0.3			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	369	988	-	
HCM Lane V/C Ratio	-	-	0.147	0.039	-	
HCM Control Delay (s)	-	-	16.4	8.8	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

7: E Valley Highway E & Forest Canyon Road E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	234.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	5	85	0	100	5	330	200	405	840	0
Future Vol, veh/h	0	0	5	85	0	100	5	330	200	405	840	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	65	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	6	6	6	2	2	2	3	3	3
Mvmt Flow	0	0	5	93	0	110	5	363	220	445	923	0
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	2351	2406	923	2299	2296	473	923	0	0	583	0	0
Stage 1	1813	1813	-	483	483	-	-	-	-	-	-	-
Stage 2	538	593	-	1816	1813	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.56	6.26	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4.054	3.354	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	25	34	330	~ 26	38	583	740	-	-	986	-	-
Stage 1	101	131	-	557	546	-	-	-	-	-	-	-
Stage 2	531	497	-	97	127	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	13	19	330	~ 16	21	583	740	-	-	986	-	-
Mov Cap-2 Maneuver	13	19	-	~ 16	21	-	-	-	-	-	-	-
Stage 1	100	72	-	553	542	-	-	-	-	-	-	-
Stage 2	428	494	-	~ 52	70	-	-	-	-	-	-	-
Approach	EB		WB		NB			SB				
HCM Control Delay, s	16.1		\$ 2472.2		0.1			3.8				
HCM LOS	C		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	740	-	-	330	34	986	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.017	5.979	0.451	-	-				
HCM Control Delay (s)	9.9	-	-	16.5	2472.2	11.6	-	-				
HCM Lane LOS	A	-	-	C	F	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	24.3	2.4	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined			*: All major volume in platoon				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary 8: W Valley Highway E & SR-167 SB Ramps

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	75	85	265	65	555	480
Future Volume (veh/h)	75	85	265	65	555	480
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1411	1411	1648	1648	1767	1767
Adj Flow Rate, veh/h	80	90	282	69	590	511
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	33	33	17	17	9	9
Cap, veh/h	150	235	525	126	659	0
Arrive On Green	0.11	0.11	0.21	0.21	0.39	0.00
Sat Flow, veh/h	1344	2104	2573	598	1682	590
Grp Volume(v), veh/h	80	90	175	176	590	22.5
Grp Sat Flow(s),veh/h/ln	1344	1052	1566	1523	1682	C
Q Serve(g_s), s	2.7	1.9	4.8	5.0	15.9	
Cycle Q Clear(g_c), s	2.7	1.9	4.8	5.0	15.9	
Prop In Lane	1.00	1.00		0.39	1.00	
Lane Grp Cap(c), veh/h	150	235	330	321	659	
V/C Ratio(X)	0.53	0.38	0.53	0.55	0.90	
Avail Cap(c_a), veh/h	429	672	1149	1118	886	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	20.2	19.9	16.9	17.0	13.8	
Incr Delay (d2), s/veh	2.7	0.9	1.2	1.3	8.7	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.9	0.5	1.6	1.6	6.4	
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.9	20.8	18.1	18.3	22.5	
LnGrp LOS	C	C	B	B	C	
Approach Vol, veh/h	170		351			
Approach Delay, s/veh	21.8		18.2			
Approach LOS	C		B			
Timer - Assigned Phs	1	2			8	
Phs Duration (G+Y+Rc), s	23.5	14.8			10.0	
Change Period (Y+Rc), s	4.6	4.6			4.6	
Max Green Setting (Gmax), s	25.4	35.4			15.4	
Max Q Clear Time (g_c+I1), s	17.9	7.0			4.7	
Green Ext Time (p_c), s	1.0	2.1			0.4	
Intersection Summary						
HCM 6th Ctrl Delay			21.0			
HCM 6th LOS			C			

Notes

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

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

9: 142nd Ave E & Costco Access

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	15	5	0	5	5	285	5	0	960	5
Future Volume (veh/h)	5	0	15	5	0	5	5	285	5	0	960	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	477	477	477	1900	1900	1900	1722	1722	1722	1781	1781	1781
Adj Flow Rate, veh/h	5	0	16	5	0	5	5	300	5	0	1011	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
Percent Heavy Veh, %	96	96	96	0	0	0	12	12	12	8	8	8
Cap, veh/h	303	0	14	292	0	56	431	2110	35	783	1634	8
Arrive On Green	0.04	0.00	0.04	0.04	0.00	0.04	0.01	0.64	0.64	0.00	0.47	0.47
Sat Flow, veh/h	357	0	404	1419	0	1586	1640	3293	55	1697	3454	17
Grp Volume(v), veh/h	5	0	16	5	0	5	5	149	156	0	495	521
Grp Sat Flow(s),veh/h/ln	357	0	404	1419	0	1586	1640	1636	1712	1697	1692	1778
Q Serve(g_s), s	0.3	0.0	0.9	0.0	0.0	0.1	0.0	0.9	0.9	0.0	5.4	5.4
Cycle Q Clear(g_c), s	0.4	0.0	0.9	0.9	0.0	0.1	0.0	0.9	0.9	0.0	5.4	5.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.01
Lane Grp Cap(c), veh/h	303	0	14	292	0	56	431	1048	1097	783	801	841
V/C Ratio(X)	0.02	0.00	1.12	0.02	0.00	0.09	0.01	0.14	0.14	0.00	0.62	0.62
Avail Cap(c_a), veh/h	522	0	262	1162	0	1028	688	1061	1110	1051	1097	1153
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	0.0	11.9	12.3	0.0	11.5	3.5	1.8	1.8	0.0	4.8	4.8
Incr Delay (d2), s/veh	0.0	0.0	147.8	0.0	0.0	0.7	0.0	0.1	0.1	0.0	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.7	0.0	159.7	12.4	0.0	12.2	3.5	1.8	1.8	0.0	5.6	5.6
LnGrp LOS	B	A	F	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h	21				10				310			
Approach Delay, s/veh	124.5				12.3				1.8			
Approach LOS	F				B				A			
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	4.9		0.0		19.8		4.9		4.1		15.7	
Change Period (Y+Rc), s	4.0		4.0		4.0		4.0		4.0		4.0	
Max Green Setting (Gmax), s	16.0		4.0		16.0		16.0		4.0		16.0	
Max Q Clear Time (g_c+I1), s	2.9		0.0		2.9		2.9		2.0		7.4	
Green Ext Time (p_c), s	0.0		0.0		1.4		0.1		0.0		4.2	
Intersection Summary												
HCM 6th Ctrl Delay			6.6									
HCM 6th LOS			A									

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

10: W Valley Highway E & 42nd Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↘		↑	↗	↘	↑
Traffic Vol, veh/h	40	50	190	10	25	530
Future Vol, veh/h	40	50	190	10	25	530
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	20	20	29	29	11	11
Mvmt Flow	42	53	200	11	26	558
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	810	200	0	0	211	0
Stage 1	200	-	-	-	-	-
Stage 2	610	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.21	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.299	-
Pot Cap-1 Maneuver	326	797	-	-	1308	-
Stage 1	792	-	-	-	-	-
Stage 2	509	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	319	797	-	-	1308	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	792	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	14.4	0	0.4			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	478	1308	-	
HCM Lane V/C Ratio	-	-	0.198	0.02	-	
HCM Control Delay (s)	-	-	14.4	7.8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
11: Tacoma Ave & 142nd Ave E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	5	20	280	645	465
Future Vol, veh/h	10	5	20	280	645	465
Conflicting Peds, #/hr	1	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	170	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	46	46	22	22	12	12
Mvmt Flow	11	5	22	304	701	505
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	898	701	1206	0	-	0
Stage 1	701	-	-	-	-	-
Stage 2	197	-	-	-	-	-
Critical Hdwy	7.29	6.89	4.43	-	-	-
Critical Hdwy Stg 1	6.09	-	-	-	-	-
Critical Hdwy Stg 2	6.49	-	-	-	-	-
Follow-up Hdwy	3.937	3.737	2.409	-	-	-
Pot Cap-1 Maneuver	233	354	494	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	223	354	494	-	-	-
Mov Cap-2 Maneuver	313	-	-	-	-	-
Stage 1	382	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.4	0.8		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	494	-	313	354	-	-
HCM Lane V/C Ratio	0.044	-	0.035	0.015	-	-
HCM Control Delay (s)	12.6	-	16.9	15.3	-	-
HCM Lane LOS	B	-	C	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	-	-

Appendix B LOS Summary and Worksheets

HCM 6th AWSC
12: Puyallup St & Tacoma Ave

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection	
Intersection Delay, s/veh	105.8
Intersection LOS	F

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	155	60	90	85	490	275
Future Vol, veh/h	155	60	90	85	490	275
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	25	25	22	22	12	12
Mvmt Flow	170	66	99	93	538	302
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	16.2	13.7	152.1
HCM LOS	C	B	F

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	72%	0%	64%
Vol Thru, %	28%	51%	0%
Vol Right, %	0%	49%	36%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	215	175	765
LT Vol	155	0	490
Through Vol	60	90	0
RT Vol	0	85	275
Lane Flow Rate	236	192	841
Geometry Grp	1	1	1
Degree of Util (X)	0.441	0.34	1.271
Departure Headway (Hd)	7.46	7.098	5.441
Convergence, Y/N	Yes	Yes	Yes
Cap	487	510	673
Service Time	5.46	5.098	3.441
HCM Lane V/C Ratio	0.485	0.376	1.25
HCM Control Delay	16.2	13.7	152.1
HCM Lane LOS	C	B	F
HCM 95th-tile Q	2.2	1.5	32.2

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

Sumner Comp Plan Update

13: E Valley Highway E & Puyallup Street

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	125	340	85	440	870	55
Future Volume (vph)	125	340	85	440	870	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1599	1770	1863	1845	1534
Flt Permitted	0.95	1.00	0.12	1.00	1.00	1.00
Satd. Flow (perm)	1787	1599	227	1863	1845	1534
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	129	351	88	454	897	57
RTOR Reduction (vph)	0	304	0	0	0	5
Lane Group Flow (vph)	129	47	88	454	897	52
Confl. Peds. (#/hr)	2		1			1
Heavy Vehicles (%)	1%	1%	2%	2%	3%	3%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	6		7	4	8	
Permitted Phases		6	4			8
Actuated Green, G (s)	10.3	10.3	57.4	57.4	45.5	45.5
Effective Green, g (s)	10.3	10.3	57.4	57.4	45.5	45.5
Actuated g/C Ratio	0.13	0.13	0.74	0.74	0.59	0.59
Clearance Time (s)	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
Lane Grp Cap (vph)	236	211	304	1376	1080	898
v/s Ratio Prot	c0.07		0.03	c0.24	c0.49	
v/s Ratio Perm		0.03	0.19			0.03
v/c Ratio	0.55	0.22	0.29	0.33	0.83	0.06
Uniform Delay, d1	31.5	30.1	10.5	3.5	13.0	6.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.4	0.4	0.1	5.4	0.0
Delay (s)	33.6	30.5	10.9	3.6	18.4	6.9
Level of Service	C	C	B	A	B	A
Approach Delay (s)	31.3			4.8	17.7	
Approach LOS	C			A	B	
Intersection Summary						
HCM 2000 Control Delay			17.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.77			
Actuated Cycle Length (s)			77.7		Sum of lost time (s)	17.0
Intersection Capacity Utilization			75.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

14: Elm Street E & E Valley Highway E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	420	65	415	765	25	105
Future Vol, veh/h	420	65	415	765	25	105
Conflicting Peds, #/hr	0	0	0	0	1	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	45	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	438	68	432	797	26	109
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	506	0	2134	479
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	1662	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1059	-	55	591
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	171	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1059	-	33	588
Mov Cap-2 Maneuver	-	-	-	-	86	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	101	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	3.8		22.4		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	86	588	-	-	1059	-
HCM Lane V/C Ratio	0.303	0.186	-	-	0.408	-
HCM Control Delay (s)	64.1	12.5	-	-	10.7	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	1.1	0.7	-	-	2	-

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
15: Valley Avenue & Elm Street E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection						
Int Delay, s/veh	7.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	235	35	555	235	20	250
Future Vol, veh/h	235	35	555	235	20	250
Conflicting Peds, #/hr	0	1	1	0	2	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	275	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	245	36	578	245	21	260
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	282	0	1667	265
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	1403	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1286	-	107	776
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	229	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1285	-	59	775
Mov Cap-2 Maneuver	-	-	-	-	110	-
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	126	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	7.1		14.5		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	110	775	-	-	1285	-
HCM Lane V/C Ratio	0.189	0.336	-	-	0.45	-
HCM Control Delay (s)	45.2	12	-	-	10.1	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	0.7	1.5	-	-	2.4	-

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
16: Fryar Avenue & Zehnder Avenue

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection						
Int Delay, s/veh	2.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	95	10	245	190	95	680
Future Vol, veh/h	95	10	245	190	95	680
Conflicting Peds, #/hr	0	1	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	10	10	7	7
Mvmt Flow	103	11	266	207	103	739
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1317	373	0	0	475	0
Stage 1	372	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.17	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.263	-
Pot Cap-1 Maneuver	173	671	-	-	1061	-
Stage 1	695	-	-	-	-	-
Stage 2	376	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	156	669	-	-	1059	-
Mov Cap-2 Maneuver	268	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	25.9	0	1.1			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	284	1059	-	
HCM Lane V/C Ratio	-	-	0.402	0.098	-	
HCM Control Delay (s)	-	-	25.9	8.8	-	
HCM Lane LOS	-	-	D	A	-	
HCM 95th %tile Q(veh)	-	-	1.9	0.3	-	

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

17: Parker Road E & Washington Street

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	15	30	10	5	5	5	5	40	5	30	135	10
Future Vol, veh/h	15	30	10	5	5	5	5	40	5	30	135	10
Conflicting Peds, #/hr	4	0	4	4	0	4	3	0	1	1	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	0	0	0	4	4	4	2	2	2
Mvmt Flow	17	34	11	6	6	6	6	45	6	34	152	11
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	299	293	165	313	295	53	166	0	0	52	0	0
Stage 1	229	229	-	61	61	-	-	-	-	-	-	-
Stage 2	70	64	-	252	234	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	657	621	885	643	620	1020	1400	-	-	1554	-	-
Stage 1	778	718	-	955	848	-	-	-	-	-	-	-
Stage 2	945	846	-	757	715	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	631	602	880	592	601	1016	1397	-	-	1553	-	-
Mov Cap-2 Maneuver	631	602	-	592	601	-	-	-	-	-	-	-
Stage 1	773	699	-	950	844	-	-	-	-	-	-	-
Stage 2	927	842	-	692	696	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.2		10.3		0.8		1.3					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1397	-	-	647	692	1553	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.096	0.024	0.022	-	-				
HCM Control Delay (s)	7.6	0	-	11.2	10.3	7.4	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.1	-	-				

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis 18: W Valley Highway E & Sumner-Heights Drive E

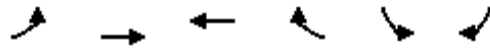
Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	L	L
Traffic Volume (vph)	145	135	20	180	595	35
Future Volume (vph)	145	135	20	180	595	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0		3.5	5.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frpb, ped/bikes	0.99		0.98		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.93		0.88		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1476		1621		1626	1712
Flt Permitted	0.97		1.00		0.62	1.00
Satd. Flow (perm)	1476		1621		1061	1712
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	161	150	22	200	661	39
RTOR Reduction (vph)	0	0	144	0	0	0
Lane Group Flow (vph)	311	0	78	0	661	39
Confl. Bikes (#/hr)		2		1		
Heavy Vehicles (%)	16%	16%	1%	1%	11%	11%
Turn Type	Perm		NA		pm+pt	NA
Protected Phases			4		1	8
Permitted Phases	2				8	
Actuated Green, G (s)	29.4		31.2		57.2	20.1
Effective Green, g (s)	29.4		31.2		57.2	20.1
Actuated g/C Ratio	0.26		0.28		0.51	0.18
Clearance Time (s)	5.0		5.0		3.5	5.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	390		454		734	309
v/s Ratio Prot			c0.05		c0.30	0.02
v/s Ratio Perm	c0.21				c0.16	
v/c Ratio	0.80		0.17		0.90	0.13
Uniform Delay, d1	38.1		30.2		23.5	38.2
Progression Factor	1.35		1.00		1.00	1.00
Incremental Delay, d2	10.2		0.2		14.2	0.2
Delay (s)	61.8		30.4		37.6	38.4
Level of Service	E		C		D	D
Approach Delay (s)	61.8		30.4			37.7
Approach LOS	E		C			D
Intersection Summary						
HCM 2000 Control Delay			42.5		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			111.2		Sum of lost time (s)	17.0
Intersection Capacity Utilization			73.1%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis 19: Valley Avenue E & Sumner-Heights Drive E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	80	300	225	200	490	285
Future Volume (vph)	80	300	225	200	490	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	0.97	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.95	
Flt Protected	0.95	1.00	1.00	1.00	0.97	
Satd. Flow (prot)	1655	1743	1881	1559	1608	
Flt Permitted	0.29	1.00	1.00	1.00	0.97	
Satd. Flow (perm)	502	1743	1881	1559	1608	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	85	319	239	213	521	303
RTOR Reduction (vph)	0	0	0	174	0	0
Lane Group Flow (vph)	85	319	239	39	824	0
Confl. Peds. (#/hr)	2			2		1
Heavy Vehicles (%)	9%	9%	1%	1%	8%	8%
Turn Type	pm+pt	NA	NA	Perm	Perm	
Protected Phases	7	4	8			
Permitted Phases	4			8	6	
Actuated Green, G (s)	31.2	31.2	20.1	20.1	70.0	
Effective Green, g (s)	31.2	31.2	20.1	20.1	70.0	
Actuated g/C Ratio	0.28	0.28	0.18	0.18	0.63	
Clearance Time (s)	3.5	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	219	489	340	281	1012	
v/s Ratio Prot	0.03	c0.18	0.13			
v/s Ratio Perm	0.08			0.02	c0.51	
v/c Ratio	0.39	0.65	0.70	0.14	0.81	
Uniform Delay, d1	31.1	35.2	42.7	38.3	15.7	
Progression Factor	1.00	1.00	1.00	1.00	1.19	
Incremental Delay, d2	1.1	3.1	6.5	0.2	3.8	
Delay (s)	32.2	38.3	49.2	38.5	22.4	
Level of Service	C	D	D	D	C	
Approach Delay (s)		37.1	44.2		22.4	
Approach LOS		D	D		C	
Intersection Summary						
HCM 2000 Control Delay			31.8		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			111.2		Sum of lost time (s)	17.0
Intersection Capacity Utilization			76.8%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

20: Traffic Avenue/Fryar Avenue & Cannery Way/Main Street

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	305	420	145	145	25	215	260	75	125	625	120
Future Volume (veh/h)	150	305	420	145	145	25	215	260	75	125	625	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1811	1811	1811	1826	1826	1826
Adj Flow Rate, veh/h	165	335	462	159	159	27	236	286	82	137	687	132
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	1	1	1	6	6	6	5	5	5
Cap, veh/h	556	566	476	393	471	80	261	322	267	415	767	147
Arrive On Green	0.13	0.30	0.30	0.13	0.30	0.30	0.15	0.18	0.18	0.24	0.26	0.26
Sat Flow, veh/h	1795	1885	1586	1795	1567	266	1725	1811	1505	1739	2896	556
Grp Volume(v), veh/h	165	335	462	159	0	186	236	286	82	137	411	408
Grp Sat Flow(s),veh/h/ln	1795	1885	1586	1795	0	1834	1725	1811	1505	1739	1735	1717
Q Serve(g_s), s	8.5	22.4	42.6	8.1	0.0	11.7	19.9	22.9	5.2	9.6	33.9	33.9
Cycle Q Clear(g_c), s	8.5	22.4	42.6	8.1	0.0	11.7	19.9	22.9	5.2	9.6	33.9	33.9
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	556	566	476	393	0	550	261	322	267	415	460	455
V/C Ratio(X)	0.30	0.59	0.97	0.40	0.00	0.34	0.90	0.89	0.31	0.33	0.89	0.90
Avail Cap(c_a), veh/h	732	566	476	569	0	551	402	666	553	415	638	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	44.1	51.2	28.2	0.0	40.4	61.8	59.5	29.5	46.6	52.5	52.5
Incr Delay (d2), s/veh	0.3	1.6	33.4	0.7	0.0	0.4	16.5	8.3	0.6	0.5	11.8	12.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	10.9	21.2	3.7	0.0	5.5	9.9	11.2	2.7	4.3	16.1	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	45.8	84.6	28.8	0.0	40.7	78.3	67.8	30.1	47.1	64.3	64.6
LnGrp LOS	C	D	F	C	A	D	E	E	C	D	E	E
Approach Vol, veh/h	962			345			604			956		
Approach Delay, s/veh	61.2			35.3			66.8			61.9		
Approach LOS	E			D			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.5	50.0	40.9	31.8	25.5	50.0	28.0	44.8				
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Max Green Setting (Gmax), s	34.5	44.5	34.5	54.5	34.5	44.5	34.5	54.5				
Max Q Clear Time (g_c+I10), s	10.5	13.7	11.6	24.9	10.1	44.6	21.9	35.9				
Green Ext Time (p_c), s	0.6	0.7	0.3	1.5	0.6	0.0	0.5	3.3				

Intersection Summary

HCM 6th Ctrl Delay	59.5
HCM 6th LOS	E

Appendix B LOS Summary and Worksheets

HCM 6th AWSC
21: Alder Avenue & Main Street

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection

Intersection Delay, s/veh 14.6

Intersection LOS B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	370	160	85	265	30	45
Future Vol, veh/h	370	160	85	265	30	45
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	0	0	2	2	0	0
Mvmt Flow	398	172	91	285	32	48
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	16.7	12.6	9.5
HCM LOS	C	B	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	40%	0%	24%
Vol Thru, %	0%	70%	76%
Vol Right, %	60%	30%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	75	530	350
LT Vol	30	0	85
Through Vol	0	370	265
RT Vol	45	160	0
Lane Flow Rate	81	570	376
Geometry Grp	1	1	1
Degree of Util (X)	0.126	0.691	0.501
Departure Headway (Hd)	5.616	4.365	4.789
Convergence, Y/N	Yes	Yes	Yes
Cap	632	826	749
Service Time	3.706	2.41	2.844
HCM Lane V/C Ratio	0.128	0.69	0.502
HCM Control Delay	9.5	16.7	12.6
HCM Lane LOS	A	C	B
HCM 95th-tile Q	0.4	5.7	2.8

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
22: Ryan Ave & Main Street

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	405	10	10	320	5	15
Future Vol, veh/h	405	10	10	320	5	15
Conflicting Peds, #/hr	0	20	20	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	435	11	11	344	5	16
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	466	0	827	463
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	366	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1095	-	344	603
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	706	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1077	-	334	592
Mov Cap-2 Maneuver	-	-	-	-	334	-
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	697	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.3		12.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	496	-	-	1077	-	
HCM Lane V/C Ratio	0.043	-	-	0.01	-	
HCM Control Delay (s)	12.6	-	-	8.4	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

23: Wood Avenue & Main Street

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	355	25	10	195	55	10	75	35	115	165	130
Future Volume (vph)	50	355	25	10	195	55	10	75	35	115	165	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	10	12	12	16	12	12	10	11
Total Lost time (s)	5.5	5.5			5.5			5.5			5.5	4.0
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			0.99			1.00			1.00	1.00
Flpb, ped/bikes	0.99	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.99			0.97			0.96			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			0.98	1.00
Satd. Flow (prot)	1716	1859			1691			2020			1738	1561
Flt Permitted	0.64	1.00			0.98			0.96			0.81	1.00
Satd. Flow (perm)	1163	1859			1657			1940			1429	1561
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	56	399	28	11	219	62	11	84	39	129	185	146
RTOR Reduction (vph)	0	6	0	0	23	0	0	27	0	0	0	146
Lane Group Flow (vph)	56	421	0	0	269	0	0	107	0	0	314	0
Confl. Peds. (#/hr)	9		11	11		9	1					1
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	NA
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.3	17.3			17.3			13.3			13.3	0.0
Effective Green, g (s)	17.3	17.3			17.3			13.3			13.3	0.0
Actuated g/C Ratio	0.42	0.42			0.42			0.32			0.32	0.00
Clearance Time (s)	5.5	5.5			5.5			5.5			5.5	
Vehicle Extension (s)	6.0	6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)	483	773			689			620			456	0
v/s Ratio Prot		c0.23										
v/s Ratio Perm	0.05				0.16			0.06			c0.22	
v/c Ratio	0.12	0.54			0.39			0.17			0.69	0.00
Uniform Delay, d1	7.5	9.2			8.5			10.2			12.3	20.8
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	1.8			1.0			0.4			6.5	0.0
Delay (s)	7.8	11.0			9.5			10.6			18.8	20.8
Level of Service	A	B			A			B			B	C
Approach Delay (s)		10.6			9.5			10.6			19.4	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.3									
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			41.6									
Intersection Capacity Utilization			57.2%									
Analysis Period (min)			15									
c Critical Lane Group												

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

24: Valley Avenue & Main Street

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	390	80	185	250	70	15	345	100	75	605	65
Future Volume (veh/h)	160	390	80	185	250	70	15	345	100	75	605	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1976	1900	1900	1900	1900	1961	1885	1885	1900	1976	1900
Adj Flow Rate, veh/h	168	411	84	195	263	74	16	363	105	79	637	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	0	0	0
Cap, veh/h	379	459	94	288	426	120	141	494	143	291	676	72
Arrive On Green	0.09	0.29	0.29	0.10	0.30	0.30	0.02	0.35	0.35	0.05	0.39	0.39
Sat Flow, veh/h	1810	1586	324	1810	1419	399	1867	1400	405	1810	1752	187
Grp Volume(v), veh/h	168	0	495	195	0	337	16	0	468	79	0	705
Grp Sat Flow(s),veh/h/ln	1810	0	1910	1810	0	1819	1867	0	1805	1810	0	1939
Q Serve(g_s), s	6.2	0.0	24.2	7.2	0.0	15.5	0.5	0.0	22.0	2.6	0.0	34.1
Cycle Q Clear(g_c), s	6.2	0.0	24.2	7.2	0.0	15.5	0.5	0.0	22.0	2.6	0.0	34.1
Prop In Lane	1.00		0.17	1.00		0.22	1.00		0.22	1.00		0.10
Lane Grp Cap(c), veh/h	379	0	552	288	0	546	141	0	637	291	0	748
V/C Ratio(X)	0.44	0.00	0.90	0.68	0.00	0.62	0.11	0.00	0.73	0.27	0.00	0.94
Avail Cap(c_a), veh/h	502	0	786	391	0	749	389	0	743	472	0	799
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	0.0	33.1	24.1	0.0	29.2	24.2	0.0	27.5	20.5	0.0	28.8
Incr Delay (d2), s/veh	0.8	0.0	9.8	2.8	0.0	1.1	0.4	0.0	3.2	0.5	0.0	18.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	12.5	3.3	0.0	6.9	0.2	0.0	9.9	1.1	0.0	19.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	0.0	42.9	26.9	0.0	30.3	24.5	0.0	30.7	21.0	0.0	47.6
LnGrp LOS	C	A	D	C	A	C	C	A	C	C	A	D
Approach Vol, veh/h	663		532			484			784			
Approach Delay, s/veh	37.8		29.1			30.5			44.9			
Approach LOS	D		C			C			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.5	33.1	10.3	39.3	13.4	34.2	7.1	42.5				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	40.0	40.0	15.0	40.0	15.0	40.0	15.0	40.0				
Max Q Clear Time (g_c+1.9, s)	26.2	26.2	4.6	24.0	8.2	17.5	2.5	36.1				
Green Ext Time (p_c), s	0.3	1.9	0.1	1.9	0.3	1.4	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay	36.7
HCM 6th LOS	D

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
25: Parker Road E & Main Street

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	9.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	650	40	15	345	30	30	15	10	55	70	30
Future Vol, veh/h	20	650	40	15	345	30	30	15	10	55	70	30
Conflicting Peds, #/hr	5	0	10	10	0	5	0	0	4	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	235	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	1	1
Mvmt Flow	20	663	41	15	352	31	31	15	10	56	71	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	388	0	0	714	0	0	1183	1152	698	1143	1157	373
Stage 1	-	-	-	-	-	-	734	734	-	403	403	-
Stage 2	-	-	-	-	-	-	449	418	-	740	754	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1182	-	-	895	-	-	168	199	444	178	197	675
Stage 1	-	-	-	-	-	-	415	429	-	626	601	-
Stage 2	-	-	-	-	-	-	593	594	-	410	419	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1177	-	-	888	-	-	109	190	439	158	188	672
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	190	-	158	188	-
Stage 1	-	-	-	-	-	-	405	418	-	613	588	-
Stage 2	-	-	-	-	-	-	489	582	-	378	409	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.4			44.3			66.2		
HCM LOS							E			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	146	1177	-	-	888	-	-	203
HCM Lane V/C Ratio	0.384	0.017	-	-	0.017	-	-	0.779
HCM Control Delay (s)	44.3	8.1	-	-	9.1	-	-	66.2
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0.1	-	-	5.4

Appendix B LOS Summary and Worksheets

HCM 6th AWSC

26: 160th Avenue E & Main Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Intersection Delay, s/veh	56.3											
Intersection LOS	F											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	285	415	30	290	45	110	55	15	185	120	20
Future Vol, veh/h	35	285	415	30	290	45	110	55	15	185	120	20
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	1	1	1
Mvmt Flow	38	313	456	33	319	49	121	60	16	203	132	22
Number of Lanes	1	1	1	1	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	2			3			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			3			2		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			2			3		
HCM Control Delay	56.1			72			24.1			57		
HCM LOS	F			F			C			F		
Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1					
Vol Left, %	61%	100%	0%	0%	100%	0%	57%					
Vol Thru, %	31%	0%	100%	0%	0%	87%	37%					
Vol Right, %	8%	0%	0%	100%	0%	13%	6%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	180	35	285	415	30	335	325					
LT Vol	110	35	0	0	30	0	185					
Through Vol	55	0	285	0	0	290	120					
RT Vol	15	0	0	415	0	45	20					
Lane Flow Rate	198	38	313	456	33	368	357					
Geometry Grp	7	7	7	7	8	8	7					
Degree of Util (X)	0.541	0.099	0.761	1.015	0.094	0.992	0.91					
Departure Headway (Hd)	10.084	9.276	8.742	8.011	10.499	9.871	9.365					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	360	389	417	456	344	372	389					
Service Time	7.784	6.976	6.454	5.723	8.199	7.571	7.065					
HCM Lane V/C Ratio	0.55	0.098	0.751	1	0.096	0.989	0.918					
HCM Control Delay	24.1	13	34.4	74.7	14.3	77.2	57					
HCM Lane LOS	C	B	D	F	B	F	F					
HCM 95th-tile Q	3.1	0.3	6.3	13.5	0.3	11.5	9.5					

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary 27: Sumner-Tapps Highway E & 60th Street E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	275	280	165	510	615	185
Future Volume (veh/h)	275	280	165	510	615	185
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1870	1870
Adj Flow Rate, veh/h	293	298	176	543	654	197
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	1	1	2	2
Cap, veh/h	390	347	187	1255	693	209
Arrive On Green	0.22	0.22	0.10	0.67	0.50	0.50
Sat Flow, veh/h	1810	1610	1795	1885	1380	416
Grp Volume(v), veh/h	293	298	176	543	0	851
Grp Sat Flow(s), veh/h/ln	1810	1610	1795	1885	0	1796
Q Serve(g_s), s	10.2	12.0	6.5	9.1	0.0	30.2
Cycle Q Clear(g_c), s	10.2	12.0	6.5	9.1	0.0	30.2
Prop In Lane	1.00	1.00	1.00			0.23
Lane Grp Cap(c), veh/h	390	347	187	1255	0	901
V/C Ratio(X)	0.75	0.86	0.94	0.43	0.00	0.94
Avail Cap(c_a), veh/h	431	383	187	1290	0	935
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.7	25.4	29.9	5.3	0.0	15.8
Incr Delay (d2), s/veh	6.6	16.4	49.1	0.2	0.0	17.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	1.6	5.2	2.5	0.0	14.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.3	41.8	79.0	5.5	0.0	33.1
LnGrp LOS	C	D	E	A	A	C
Approach Vol, veh/h	591			719	851	
Approach Delay, s/veh	36.6			23.5	33.1	
Approach LOS	D			C	C	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	48.7			18.5	11.0	37.7
Change Period (Y+Rc), s	4.0			4.0	4.0	4.0
Max Green Setting (Gmax), s	46.0			16.0	7.0	35.0
Max Q Clear Time (g_c+l1), s	11.1			14.0	8.5	32.2
Green Ext Time (p_c), s	3.8			0.5	0.0	1.6
Intersection Summary						
HCM 6th Ctrl Delay			30.8			
HCM 6th LOS			C			

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

28: Traffic Avenue & Maple Street

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕				↗	↗	↕↕	↗	↗	↕↕	
Traffic Vol, veh/h	5	0	10	0	0	20	0	500	80	45	1040	5
Future Vol, veh/h	5	0	10	0	0	20	0	500	80	45	1040	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	45	-	115	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	7	7	7	5	5	5	4	4	4
Mvmt Flow	5	0	11	0	0	21	0	532	85	48	1106	5
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1473	1827	556	-	-	273	1111	0	0	622	0	0
Stage 1	1205	1205	-	-	-	-	-	-	-	-	-	-
Stage 2	268	622	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	-	-	7.04	4.2	-	-	4.18	-	-
Critical Hdwy Stg 1	6.5	5.5	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	3.37	2.25	-	-	2.24	-	-
Pot Cap-1 Maneuver	90	78	480	0	0	710	607	-	-	941	-	-
Stage 1	198	259	-	0	0	-	-	-	-	-	-	-
Stage 2	720	482	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	84	74	480	-	-	706	607	-	-	937	-	-
Mov Cap-2 Maneuver	84	74	-	-	-	-	-	-	-	-	-	-
Stage 1	198	246	-	-	-	-	-	-	-	-	-	-
Stage 2	697	480	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	26		10.3		0		0.4					
HCM LOS	D		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	607	-	-	187	706	937	-	-				
HCM Lane V/C Ratio	-	-	-	0.085	0.03	0.051	-	-				
HCM Control Delay (s)	0	-	-	26	10.3	9	-	-				
HCM Lane LOS	A	-	-	D	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.2	-	-				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

29: E Main Ave/Traffic Avenue & SR-410 WB Ramps/Thompson Street (2044) PM Peak Hour - Alternative 2

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	20	315	265	65	15	325	475	260	25	815	300
Future Volume (veh/h)	140	20	315	265	65	15	325	475	260	25	815	300
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1914	1841	1914	1914	1841	1841	1841
Adj Flow Rate, veh/h	152	22	0	188	212	0	353	516	0	27	886	326
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	187	197		253	266		353	1849		549	1109	406
Arrive On Green	0.11	0.11	0.00	0.14	0.14	0.00	0.13	0.51	0.00	0.06	0.44	0.44
Sat Flow, veh/h	1753	1841	1560	1753	1841	0	1753	3733	0	1753	2501	916
Grp Volume(v), veh/h	152	22	0	188	212	0	353	516	0	27	619	593
Grp Sat Flow(s),veh/h/ln	1753	1841	1560	1753	1841	0	1753	1819	0	1753	1749	1668
Q Serve(g_s), s	8.5	1.1	0.0	10.3	11.1	0.0	12.5	8.1	0.0	0.7	30.5	30.7
Cycle Q Clear(g_c), s	8.5	1.1	0.0	10.3	11.1	0.0	12.5	8.1	0.0	0.7	30.5	30.7
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	1.00		0.55
Lane Grp Cap(c), veh/h	187	197		253	266		353	1849		549	776	740
V/C Ratio(X)	0.81	0.11		0.74	0.80		1.00	0.28		0.05	0.80	0.80
Avail Cap(c_a), veh/h	289	304		447	469		353	1849		627	776	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.97	0.97	0.00	0.84	0.84	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	40.4	0.0	41.0	41.3	0.0	23.8	14.1	0.0	9.8	24.0	24.0
Incr Delay (d2), s/veh	9.5	0.2	0.0	4.1	5.2	0.0	44.0	0.3	0.0	0.0	8.4	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.5	0.0	4.7	5.4	0.0	9.0	3.2	0.0	0.3	14.1	13.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	40.6	0.0	45.1	46.6	0.0	67.8	14.4	0.0	9.8	32.3	33.0
LnGrp LOS	D	D		D	D		F	B		A	C	C
Approach Vol, veh/h	174			400			869			1239		
Approach Delay, s/veh	51.6			45.9			36.1			32.2		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.0	48.8		19.0	10.5	55.3		15.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	12.5	27.5		25.5	10.5	29.5		16.5				
Max Q Clear Time (g_c+I1), s	14.5	32.7		13.1	2.7	10.1		10.5				
Green Ext Time (p_c), s	0.0	0.0		1.3	0.0	2.2		0.3				

Intersection Summary

HCM 6th Ctrl Delay 36.7

HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

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

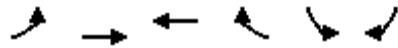
Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

30: Thompson Street & Station Lane

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	280	265	5	20	70
Future Volume (veh/h)	20	280	265	5	20	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.97	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1737	1737
Adj Flow Rate, veh/h	22	311	294	6	22	78
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	1	1	11	11
Cap, veh/h	460	906	495	10	34	120
Arrive On Green	0.03	0.48	0.27	0.27	0.10	0.10
Sat Flow, veh/h	1781	1870	1840	38	328	1162
Grp Volume(v), veh/h	22	311	0	300	101	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1877	1504	0
Q Serve(g_s), s	0.2	2.7	0.0	3.7	1.7	0.0
Cycle Q Clear(g_c), s	0.2	2.7	0.0	3.7	1.7	0.0
Prop In Lane	1.00			0.02	0.22	0.77
Lane Grp Cap(c), veh/h	460	906	0	505	155	0
V/C Ratio(X)	0.05	0.34	0.00	0.59	0.65	0.00
Avail Cap(c_a), veh/h	1077	1717	0	1724	1381	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.9	4.2	0.0	8.5	11.5	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.4	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.5	0.0	1.1	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.0	4.3	0.0	8.9	13.2	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		333	300		101	
Approach Delay, s/veh		4.4	8.9		13.2	
Approach LOS		A	A		B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.8	12.7			18.4	8.3
Change Period (Y+Rc), s	5.0	5.5			5.5	5.5
Max Green Setting (Gmax), s	10.0	24.5			24.5	24.5
Max Q Clear Time (g_c+12.2), s	12.2	5.7			4.7	3.7
Green Ext Time (p_c), s	0.0	1.1			1.2	0.1

Intersection Summary

HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

31: Alder Ave & Thompson Street

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	75	175	5	5	135	5	0	10	5	5	15	200
Future Vol, veh/h	75	175	5	5	135	5	0	10	5	5	15	200
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	6	6	6	0	0	0	0	0	0	1	1	1
Mvmt Flow	80	186	5	5	144	5	0	11	5	5	16	213
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	149	0	0	194	0	0	623	511	192	514	511	147
Stage 1	-	-	-	-	-	-	352	352	-	157	157	-
Stage 2	-	-	-	-	-	-	271	159	-	357	354	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1408	-	-	1391	-	-	401	469	855	473	467	903
Stage 1	-	-	-	-	-	-	669	635	-	848	770	-
Stage 2	-	-	-	-	-	-	739	770	-	663	632	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1408	-	-	1388	-	-	282	436	853	438	434	903
Mov Cap-2 Maneuver	-	-	-	-	-	-	282	436	-	438	434	-
Stage 1	-	-	-	-	-	-	625	593	-	794	767	-
Stage 2	-	-	-	-	-	-	551	767	-	606	590	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.3			0.3			12.1			11.1		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	521	1408	-	-	1388	-	-	823				
HCM Lane V/C Ratio	0.031	0.057	-	-	0.004	-	-	0.284				
HCM Control Delay (s)	12.1	7.7	0	-	7.6	0	-	11.1				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	1.2				

Appendix B LOS Summary and Worksheets

HCM Signalized Intersection Capacity Analysis

Sumner Comp Plan Update

32: E Main Ave & SR-410 EB Ramps

Future (2044) PM Peak Hour - Alternative 2

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	220	660	250	840	1100	295
Future Volume (vph)	220	660	250	840	1100	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	
Frpb, ped/bikes	0.97	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	0.91	0.85	1.00	1.00	0.97	
Flt Protected	0.98	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	2995	1339	1770	3539	3394	
Flt Permitted	0.98	1.00	0.09	1.00	1.00	
Satd. Flow (perm)	2995	1339	166	3539	3394	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	695	263	884	1158	311
RTOR Reduction (vph)	283	294	0	0	18	0
Lane Group Flow (vph)	297	53	263	884	1451	0
Confl. Peds. (#/hr)		7				
Heavy Vehicles (%)	7%	7%	2%	2%	3%	3%
Turn Type	Prot	Perm	D.P+P	NA	NA	
Protected Phases	8		1	6	2	
Permitted Phases		8	2			
Actuated Green, G (s)	15.3	15.3	61.5	66.0	44.8	
Effective Green, g (s)	15.3	15.3	61.5	66.0	44.8	
Actuated g/C Ratio	0.15	0.15	0.62	0.66	0.45	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	458	204	369	2335	1520	
v/s Ratio Prot	c0.10		c0.12	0.25	c0.43	
v/s Ratio Perm		0.04	0.32			
v/c Ratio	0.65	0.26	0.71	0.38	0.95	
Uniform Delay, d1	39.8	37.4	25.3	7.7	26.6	
Progression Factor	1.00	1.00	1.00	1.00	0.52	
Incremental Delay, d2	3.2	0.7	6.4	0.5	2.0	
Delay (s)	43.0	38.0	31.7	8.2	15.8	
Level of Service	D	D	C	A	B	
Approach Delay (s)	41.1			13.6	15.8	
Approach LOS	D			B	B	
Intersection Summary						
HCM 2000 Control Delay			21.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	18.0
Intersection Capacity Utilization			78.5%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary
33: Valley Avenue & Meade-McCumber Road E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	95	125	65	65	10	30	380	85	5	820	40
Future Volume (veh/h)	25	95	125	65	65	10	30	380	85	5	820	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1945	1870	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	27	102	134	70	70	11	32	409	91	5	882	43
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	0	0	0
Cap, veh/h	370	125	164	247	322	51	166	778	173	421	879	43
Arrive On Green	0.03	0.17	0.17	0.06	0.20	0.20	0.04	0.52	0.52	0.01	0.49	0.49
Sat Flow, veh/h	1795	737	968	1781	1640	258	1795	1493	332	1810	1795	87
Grp Volume(v), veh/h	27	0	236	70	0	81	32	0	500	5	0	925
Grp Sat Flow(s),veh/h/ln	1795	0	1704	1781	0	1897	1795	0	1825	1810	0	1882
Q Serve(g_s), s	0.9	0.0	10.0	2.4	0.0	2.7	0.6	0.0	13.5	0.1	0.0	36.7
Cycle Q Clear(g_c), s	0.9	0.0	10.0	2.4	0.0	2.7	0.6	0.0	13.5	0.1	0.0	36.7
Prop In Lane	1.00		0.57	1.00		0.14	1.00		0.18	1.00		0.05
Lane Grp Cap(c), veh/h	370	0	289	247	0	373	166	0	951	421	0	922
V/C Ratio(X)	0.07	0.00	0.82	0.28	0.00	0.22	0.19	0.00	0.53	0.01	0.00	1.00
Avail Cap(c_a), veh/h	455	0	525	282	0	585	242	0	951	554	0	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	30.0	23.8	0.0	25.3	17.5	0.0	11.8	10.3	0.0	19.1
Incr Delay (d2), s/veh	0.1	0.0	5.6	0.6	0.0	0.3	0.6	0.0	0.5	0.0	0.0	30.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.5	1.0	0.0	1.2	0.3	0.0	5.2	0.0	0.0	22.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	0.0	35.6	24.4	0.0	25.5	18.0	0.0	12.4	10.3	0.0	49.6
LnGrp LOS	C	A	D	C	A	C	B	A	B	B	A	F
Approach Vol, veh/h	263		151			532			930			
Approach Delay, s/veh	34.4		25.0			12.7			49.4			
Approach LOS	C		C			B			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	43.5	9.1	17.2	7.4	41.2	7.1	19.2					
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5					
Max Green Setting (Gmax), s	36.7	6.1	23.1	6.1	36.7	6.1	23.1					
Max Q Clear Time (g_c+11.2, s)	15.5	4.4	12.0	2.6	38.7	2.9	4.7					
Green Ext Time (p_c), s	0.0	2.3	0.0	0.7	0.0	0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			34.9									
HCM 6th LOS			C									

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

34: Parker Road E & Mead McCumber Road E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	145	5	5	65	10	10	5	5	65	20	75
Future Vol, veh/h	40	145	5	5	65	10	10	5	5	65	20	75
Conflicting Peds, #/hr	10	0	2	2	0	10	0	0	5	5	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	2	2	2	0	0	0	2	2	2
Mvmt Flow	43	156	5	5	70	11	11	5	5	70	22	81
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	91	0	0	163	0	0	384	348	166	351	345	86
Stage 1	-	-	-	-	-	-	247	247	-	96	96	-
Stage 2	-	-	-	-	-	-	137	101	-	255	249	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.1	6.5	6.2	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.5	4	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	1510	-	-	1416	-	-	578	579	884	604	578	973
Stage 1	-	-	-	-	-	-	761	706	-	911	815	-
Stage 2	-	-	-	-	-	-	871	815	-	749	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1497	-	-	1414	-	-	499	553	879	573	552	965
Mov Cap-2 Maneuver	-	-	-	-	-	-	499	553	-	573	552	-
Stage 1	-	-	-	-	-	-	735	682	-	875	805	-
Stage 2	-	-	-	-	-	-	774	805	-	712	677	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.6			0.5			11.5			11.8		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	575	1497	-	-	1414	-	-	704				
HCM Lane V/C Ratio	0.037	0.029	-	-	0.004	-	-	0.244				
HCM Control Delay (s)	11.5	7.5	0	-	7.6	0	-	11.8				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	1				

Appendix B LOS Summary and Worksheets

HCM 6th AWSC

35: 160th Avenue E & 64th Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Intersection Delay, s/veh	19.7											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	25	170	5	5	55	145	5	0	0	470	5	25
Future Vol, veh/h	25	170	5	5	55	145	5	0	0	470	5	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	27	185	5	5	60	158	5	0	0	511	5	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	12.1			11.3			9.4			26.3		
HCM LOS	B			B			A			D		
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	100%	12%	2%	94%								
Vol Thru, %	0%	85%	27%	1%								
Vol Right, %	0%	3%	71%	5%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	5	200	205	500								
LT Vol	5	25	5	470								
Through Vol	0	170	55	5								
RT Vol	0	5	145	25								
Lane Flow Rate	5	217	223	543								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.01	0.353	0.337	0.801								
Departure Headway (Hd)	6.303	5.841	5.44	5.307								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	565	613	657	679								
Service Time	4.374	3.897	3.496	3.343								
HCM Lane V/C Ratio	0.009	0.354	0.339	0.8								
HCM Control Delay	9.4	12.1	11.3	26.3								
HCM Lane LOS	A	B	B	D								
HCM 95th-tile Q	0	1.6	1.5	8.1								

Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 101 [Sumner-Tapps Hwy E/64th St E (Site Folder: General)]

 Network: N101 [Network1 (Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] ft				
South: 166th Ave E														
3	L2	258	1.0	258	1.0	0.331	5.6	LOS A	0.8	19.8	0.22	0.09	0.22	33.5
8	T1	653	1.0	653	1.0	0.331	5.4	LOS A	0.8	20.1	0.21	0.09	0.21	34.6
18	R2	16	1.0	16	1.0	0.331	5.4	LOS A	0.8	20.1	0.21	0.09	0.21	34.0
Approach		926	1.0	926	1.0	0.331	5.5	LOS A	0.8	20.1	0.22	0.09	0.22	34.3
East: 64th St E														
1	L2	26	12.0	26	12.0	0.055	5.3	LOS A	0.1	1.9	0.50	0.45	0.50	28.2
6	T1	11	12.0	11	12.0	0.055	5.3	LOS A	0.1	1.9	0.50	0.45	0.50	33.2
16	R2	5	12.0	5	12.0	0.055	5.3	LOS A	0.1	1.9	0.50	0.45	0.50	32.2
Approach		42	12.0	42	12.0	0.055	5.3	LOS A	0.1	1.9	0.50	0.45	0.50	30.5
North: Sumner Tapps Hwy E														
7	L2	1	2.0	1	2.0	0.387	7.1	LOS A	0.8	21.2	0.46	0.35	0.46	34.3
4	T1	868	2.0	868	2.0	0.387	6.8	LOS A	0.9	21.7	0.45	0.34	0.45	29.3
14	R2	63	2.0	63	2.0	0.387	6.6	LOS A	0.9	21.7	0.45	0.33	0.45	33.4
Approach		933	2.0	933	2.0	0.387	6.8	LOS A	0.9	21.7	0.45	0.34	0.45	29.7
West: 64th St E														
5	L2	53	1.0	53	1.0	0.414	9.5	LOS A	0.9	22.8	0.66	0.72	0.82	32.6
2	T1	5	1.0	5	1.0	0.414	9.5	LOS A	0.9	22.8	0.66	0.72	0.82	32.5
12	R2	711	1.0	711	1.0	0.414	8.6	LOS A	0.9	23.5	0.65	0.70	0.79	27.4
Approach		768	1.0	768	1.0	0.414	8.7	LOS A	0.9	23.5	0.65	0.70	0.79	28.0
All Vehicles		2669	1.5	2669	1.5	0.414	6.9	LOS A	0.9	23.5	0.43	0.36	0.47	31.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 102 [166th Ave/SR 410 WB Ramps (Site Folder: General)]

 Network: N101 [Network1
(Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: 166th Ave E														
3	L2	117	1.0	117	1.0	0.455	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.9
8	T1	546	1.0	546	1.0	0.455	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	34.5
Approach		663	1.0	663	1.0	0.455	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	35.4
East: SR 410 WB Off Ramp														
1	L2	41	2.0	41	2.0	0.051	4.9	LOS A	0.1	2.7	0.62	0.46	0.62	32.7
6	T1	1	2.0	1	2.0	0.051	4.9	LOS A	0.1	2.7	0.62	0.46	0.62	32.7
16	R2	352	2.0	352	2.0	0.298	5.8	LOS A	0.8	20.4	0.68	0.56	0.68	29.8
Approach		394	2.0	394	2.0	0.298	5.7	LOS A	0.8	20.4	0.67	0.55	0.67	30.3
North: 166th Ave E														
4	T1	1046	2.0	1046	2.0	0.550	8.5	LOS A	1.9	47.1	0.49	0.30	0.49	33.3
14	R2	510	2.0	510	2.0	0.550	8.0	LOS A	1.9	47.1	0.47	0.28	0.47	32.5
Approach		1556	2.0	1556	2.0	0.550	8.4	LOS A	1.9	47.1	0.49	0.29	0.49	33.0
All Vehicles		2613	1.7	2613	1.7	0.550	7.6	LOS A	1.9	47.1	0.39	0.26	0.39	33.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

38: Sumner-Tapps Highway E & SR-410 EB Ramps

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	0	195	0	0	0	0	310	115	455	610	0
Future Volume (veh/h)	340	0	195	0	0	0	0	310	115	455	610	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1885	1885	1885	1885	0
Adj Flow Rate, veh/h	354	0	203				0	323	120	474	635	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	1	1	1	1	0
Cap, veh/h	426	0	379				0	843	715	691	1246	0
Arrive On Green	0.24	0.00	0.24				0.00	0.45	0.45	0.16	0.66	0.00
Sat Flow, veh/h	1781	0	1585				0	1885	1598	1795	1885	0
Grp Volume(v), veh/h	354	0	203				0	323	120	474	635	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1885	1598	1795	1885	0
Q Serve(g_s), s	17.0	0.0	10.1				0.0	10.3	4.0	11.8	15.5	0.0
Cycle Q Clear(g_c), s	17.0	0.0	10.1				0.0	10.3	4.0	11.8	15.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	426	0	379				0	843	715	691	1246	0
V/C Ratio(X)	0.83	0.00	0.54				0.00	0.38	0.17	0.69	0.51	0.00
Avail Cap(c_a), veh/h	663	0	590				0	843	715	807	1246	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.5	0.0	29.9				0.0	16.6	14.9	9.9	7.8	0.0
Incr Delay (d2), s/veh	5.2	0.0	1.2				0.0	1.3	0.5	1.9	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	0.0	3.9				0.0	4.7	1.5	4.5	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	0.0	31.0				0.0	17.9	15.4	11.8	9.3	0.0
LnGrp LOS	D	A	C				A	B	B	B	A	A
Approach Vol, veh/h	557							443		1109		
Approach Delay, s/veh	35.3							17.2		10.4		
Approach LOS	D							B		B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	49.2	44.8	26.0		64.0							
Change Period (Y+Rc), s	4.5	4.5	4.5		4.5							
Max Green Setting (Gmax), s	20.5	22.5	33.5		47.5							
Max Q Clear Time (g_c+I), s	13.8	12.3	19.0		17.5							
Green Ext Time (p_c), s	0.9	1.8	2.6		5.1							

Intersection Summary

HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

Appendix B LOS Summary and Worksheets

HCM 6th TWSC

39: Valley Avenue & Gary Street /Gary Street E

Sumner Comp Plan Update

Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗	↗	↑		↗	↑↑	
Traffic Vol, veh/h	0	0	220	15	0	25	160	490	5	5	980	5
Future Vol, veh/h	0	0	220	15	0	25	160	490	5	5	980	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	175	-	-	175	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	0	1	1	1	0	0	0
Mvmt Flow	0	0	244	17	0	28	178	544	6	6	1089	6
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	548	1460	-	547	1095	0	0	550	0	0
Stage 1	-	-	-	903	-	-	-	-	-	-	-	-
Stage 2	-	-	-	557	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.93	7.3	-	6.2	4.115	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.319	3.5	-	3.3	2.2095	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	481	100	0	541	640	-	-	1030	-	-
Stage 1	0	0	-	335	0	-	-	-	-	-	-	-
Stage 2	0	0	-	487	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	481	38	-	541	640	-	-	1030	-	-
Mov Cap-2 Maneuver	-	-	-	38	-	-	-	-	-	-	-	-
Stage 1	-	-	-	242	-	-	-	-	-	-	-	-
Stage 2	-	-	-	238	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	20		12		3.1		0					
HCM LOS	C		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	640	-	-	481	541	1030	-	-				
HCM Lane V/C Ratio	0.278	-	-	0.508	0.051	0.005	-	-				
HCM Control Delay (s)	12.8	-	-	20	12	8.5	-	-				
HCM Lane LOS	B	-	-	C	B	A	-	-				
HCM 95th %tile Q(veh)	1.1	-	-	2.8	0.2	0	-	-				

Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 101 [Valley Ave/SR 410 WB Ramps (Site Folder: General)]

 Network: N101 [Network1
(Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Valley Ave														
3	L2	408	1.0	408	1.0	0.273	4.6	LOS A	0.0	0.0	0.00	0.00	0.00	35.2
8	T1	495	1.0	495	1.0	0.273	4.2	LOS A	0.0	0.0	0.00	0.00	0.00	38.2
Approach		902	1.0	902	1.0	0.273	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
East: SR 410 WB Off Ramp														
1	L2	217	1.0	217	1.0	0.209	5.4	LOS A	0.4	8.9	0.56	0.52	0.56	27.0
6	T1	1	1.0	1	1.0	0.209	5.4	LOS A	0.4	8.9	0.56	0.52	0.56	32.4
16	R2	217	1.0	217	1.0	0.254	6.9	LOS A	0.4	10.8	0.59	0.59	0.59	33.1
Approach		436	1.0	436	1.0	0.254	6.2	LOS A	0.4	10.8	0.58	0.56	0.58	30.6
North: Valley Ave														
4	T1	1163	0.0	1163	0.0	0.628	12.3	LOS B	3.2	80.9	0.88	0.93	1.22	25.8
14	R2	158	0.0	158	0.0	0.628	11.1	LOS B	3.2	80.9	0.87	0.88	1.16	31.3
Approach		1321	0.0	1321	0.0	0.628	12.2	LOS B	3.2	80.9	0.88	0.92	1.21	26.8
All Vehicles		2659	0.5	2659	0.5	0.628	8.5	LOS A	3.2	80.9	0.53	0.55	0.70	31.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix B LOS Summary and Worksheets

MOVEMENT SUMMARY

 Site: 101 [Valley Ave/SR 410 EB Ramps (Site Folder: General)]

 Network: N101 [Network1
(Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: Valley Ave														
8	T1	676	2.0	676	2.0	0.436	8.7	LOS A	1.2	30.0	0.69	0.60	0.69	27.9
18	R2	186	2.0	186	2.0	0.436	8.2	LOS A	1.2	30.0	0.68	0.58	0.68	32.6
Approach		862	2.0	862	2.0	0.436	8.6	LOS A	1.2	30.0	0.68	0.59	0.69	29.4
North: Valley Ave														
7	L2	298	1.0	298	1.0	0.409	6.0	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
4	T1	1053	1.0	1053	1.0	0.409	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
Approach		1351	1.0	1351	1.0	0.409	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
West: SR 410 EB Off Ramp														
5	L2	207	3.0	207	3.0	0.355	11.3	LOS B	0.7	16.9	0.71	0.75	0.85	23.9
2	T1	1	3.0	1	3.0	0.355	11.3	LOS B	0.7	16.9	0.71	0.75	0.85	30.0
12	R2	798	3.0	798	3.0	0.875	28.6	LOS C	5.6	142.2	0.90	1.46	2.55	25.0
Approach		1006	3.0	1006	3.0	0.875	25.0	LOS C	5.6	142.2	0.86	1.31	2.20	24.9
All Vehicles		3219	1.9	3219	1.9	0.875	12.5	LOS B	5.6	142.2	0.45	0.57	0.87	30.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: M:\22\1.22330.00 - Sumner Comp Plan Update\Traffic Analysis\Traffic Operations\Sidra\SR 410 & SR 162 RABs - Alt 2.sip9

Appendix B LOS Summary and Worksheets

HCM 6th TWSC
42: Valley Avenue & 74th Street E

Sumner Comp Plan Update
Future (2044) PM Peak Hour - Alternative 2

Intersection												
Int Delay, s/veh	38.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	5	15	0	115	0	680	20	335	1355	60
Future Vol, veh/h	5	0	5	15	0	115	0	680	20	335	1355	60
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	2	2	2
Mvmt Flow	5	0	5	15	0	117	0	694	20	342	1383	61
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2862	2813	1415	2804	2833	704	1445	0	0	714	0	0
Stage 1	2099	2099	-	704	704	-	-	-	-	-	-	-
Stage 2	763	714	-	2100	2129	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	11	18	170	~ 12	18	439	469	-	-	886	-	-
Stage 1	69	94	-	429	441	-	-	-	-	-	-	-
Stage 2	400	438	-	68	90	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	6	11	170	~ 8	11	439	469	-	-	886	-	-
Mov Cap-2 Maneuver	6	11	-	~ 8	11	-	-	-	-	-	-	-
Stage 1	69	58	-	429	441	-	-	-	-	-	-	-
Stage 2	293	438	-	40	55	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s\$	611.8		\$ 685.5		0		2.2					
HCM LOS	F		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	469	-	-	12	61	886	-	-				
HCM Lane V/C Ratio	-	-	-	0.85	2.175	0.386	-	-				
HCM Control Delay (s)	0	-	-	\$ 611.8	\$ 685.5	11.6	-	-				
HCM Lane LOS	A	-	-	F	F	B	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.8	12.8	1.8	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Appendix B LOS Summary and Worksheets

HCM 6th Signalized Intersection Summary

Sumner Comp Plan Update

43: Valley Avenue & Rivergrove Drive E

Future (2044) PM Peak Hour - Alternative 2



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	45	35	635	1280	70
Future Volume (veh/h)	55	45	35	635	1280	70
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	56	45	35	641	1293	71
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	85	75	45	1644	1437	79
Arrive On Green	0.05	0.05	0.02	0.88	0.82	0.82
Sat Flow, veh/h	1810	1610	1781	1870	1757	96
Grp Volume(v), veh/h	56	45	35	641	0	1364
Grp Sat Flow(s),veh/h/ln	1810	1610	1781	1870	0	1853
Q Serve(g_s), s	3.8	3.4	2.4	7.8	0.0	63.1
Cycle Q Clear(g_c), s	3.8	3.4	2.4	7.8	0.0	63.1
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	85	75	45	1644	0	1516
V/C Ratio(X)	0.66	0.60	0.79	0.39	0.00	0.90
Avail Cap(c_a), veh/h	294	262	65	1665	0	1516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.2	58.1	60.2	1.4	0.0	7.8
Incr Delay (d2), s/veh	8.5	7.3	31.6	0.2	0.0	8.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	1.5	1.1	0.0	20.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	66.7	65.4	91.9	1.5	0.0	16.7
LnGrp LOS	E	E	F	A	A	B
Approach Vol, veh/h	101			676	1364	
Approach Delay, s/veh	66.1			6.2	16.7	
Approach LOS	E			A	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		113.8		10.4	7.6	106.2
Change Period (Y+Rc), s		4.6		4.6	4.5	4.6
Max Green Setting (Gmax), s		110.6		20.2	4.5	101.6
Max Q Clear Time (g_c+I1), s		9.8		5.8	4.4	65.1
Green Ext Time (p_c), s		5.0		0.2	0.0	20.1
Intersection Summary						
HCM 6th Ctrl Delay			15.7			
HCM 6th LOS			B			

Appendix C Transportation Impact Fee Detail

Sumner Comp Plan Update - 2024

		Funding							
Map ID	Intersection	Project	Estimated Total Cost	Grants	WSDOT	Sumner Cost / Additional Funds Needed	TIF Eligible %	Applied TIF %	TIF Cost
	Spot Improvements								
SP1	E Valley Hwy E/Forest Canyon Rd E	New signal or RAB when warranted	\$3,000,000			\$3,000,000	15%	15%	\$450,000
SP2	Puyallup St/Tacoma Ave Puyallup Street to the White River Bridge (WSDOT SUM-30)	Plane, repair, and overlay ,complete intersection channelization improvements, add an eastbound left-turn pocket on Puyallup Street at Tacoma Avenue. Add a signal at the Puyallup Street/Tacoma Avenue intersection	\$2,600,000	\$328,700		\$2,271,300	40%	20%	\$520,000
SP3	E Valley Hwy E/Elm St E	New signal when warranted	\$1,500,000			\$1,500,000	50%	50%	\$750,000
SP4	Valley Ave/Elm St E	New signal when warranted	\$1,500,000			\$1,500,000	50%	50%	\$750,000
SP5	Traffic Ave/Main St	Add EB right-turn overlap. Convert W Main Street to one-way facility westbound.	\$150,000			\$150,000	10%	10%	\$15,000
SP6	Parker Rd E/Main St E	New signal when warranted	\$1,650,000			\$1,650,000	50%	50%	\$825,000
SP7	160th Ave E/Main St (60th St E)	New signal or RAB when warranted	\$3,000,000			\$3,000,000	50%	50%	\$1,500,000
SP8	Valley Ave/74th St E	Add EB/WB left-turn restrictions. Shift WB left-turns to U-turning movement at Valley Avenue/SR 410 EB Ramp RAB	\$75,000			\$75,000	10%	10%	\$7,500
SP9	Sumner Tapps Hwy/60th St E	Signalization of the intersection. Construct EB right-turn lane	\$3,400,000			\$3,400,000	50%	50%	\$1,700,000
SP10	Signal replacement program	Replace and modernize all signals in Sumner (15 City owned signals)					0%	0%	\$0
		Spot Improvements Subtotal	\$16,875,000	\$328,700	\$0	\$16,546,300			\$6,517,500
	Roadway								
RW1	166th Ave E Widening; SR 410 WB ramps to 64th St E (WSDOT SUM-24)	Widen to 4-5 lanes, includes new roundabouts at WB ramp and 64th Street E	\$19,000,000	\$2,249,000	\$500,000	\$16,251,000	40%	20%	\$3,800,000
RW2	160th Ave E; Main Street to 64th St E	Improve and widen streets to minor arterial standards with bike paths and sidewalks	\$500,000			\$500,000	40%	40%	\$200,000
RW3	Valley Ave; South City Limits to Main St	Overlay existing roadway surface, ADA upgrades	\$1,850,750			\$1,850,750	0%	0%	\$0
RW4	Stewart Rd Corridor ITS improvements; SR 167 to Lakeland Hills (WSDOT SUM-27)	Connect traffic signals and railroad crossings to coordinate signal timing	\$3,500,000	\$495,285		\$3,004,715	20%	20%	\$700,000
RW5	160th Ave E; Elm St to Main St	Improve to collector standards with curb, gutter and sidewalks on both sides, and bike facilities	\$2,900,000			\$2,900,000	20%	20%	\$580,000
RW6	Elm St; E Valley Hwy to 160th Ave E	Improve to collector standards with curb, gutter and sidewalks on both sides, and bike facilities	\$2,600,000			\$2,600,000	20%	20%	\$520,000
RW7	Parker Rd E; 62nd St to 63rd St	Construct curb, gutter, and sidewalk on east side of street	\$250,000			\$250,000	20%	20%	\$50,000
RW8	Parker Rd E; Main St to Elm St	Improve to collector standards with curb, gutter and sidewalks on both sides	\$1,300,000			\$1,300,000	20%	20%	\$260,000
RW9	Zehnder St; Pease Ave to Wood Ave	Railroad Crossing Improvements	\$1,000,000			\$1,000,000	20%	20%	\$200,000
RW10	162nd Ave E Segment Extension; 64th St to 60th St	Construct 2-lane facility	\$3,000,000			\$3,000,000	50%	0%	\$0
RW11	164th Ave Ct E Segment Extension; 160th Ave E to existing 164th Ave Ct E	Construct 2-lane facility	\$2,000,000			\$2,000,000	50%	0%	\$0
RW12	Systemic Horizontal Curve and Roadway Departure Safety Improvements (WSDOT SUM-28)	East Valley Highway, West Valley Highway, Sumner-Tapps Highway/166th Avenue E, 142nd Avenue E/24th Street E. Install static and/or dynamic curve warning signs, speed feedback signs, centerline and edge lie profiled striping, rumble strips, reflective markers on-pavement as appropriate to delineate roadside objects, channelization, guardrail/roadway shouldering, and street lighting	\$903,000	\$903,000		\$0	0%	0%	\$0
-	Stewart Road SW: Butte Avenue SE to 140th Avenue Court E ¹	Widen to 5 lanes including a center two-way left-turn lane	-	-	-	-	-	-	-
		Roadway Improvements Subtotal	\$38,803,750	\$3,647,285	\$500,000	\$34,656,465			\$6,310,000
	Non-Motorized								
NM1	West Valley Highway Sidewalks	Complete missing sidewalk facilities on the east side between 16th Street E and SR 167 SB Ramps	\$1,000,000			\$1,000,000	60%	15%	\$150,000
NM2	16th Street E Ped/Bike	Construct ped/bike facilities between Valentine Avenue and 138th Avenue E	\$2,000,000			\$2,000,000	60%	15%	\$300,000
NM3	White River Restoration Trail	#9 Ditch to area north of 16th Street	\$3,000,000			\$3,000,000	60%	0%	\$0
NM4	Tacoma Avenue Trail	New trail facilities between the White River and 45th Street E	\$150,000			\$150,000	60%	15%	\$22,500
NM5	Salmon Creek Trail	New trail between current end at 149th Avenue E and Sumner-Tapps Highway E	\$3,000,000			\$3,000,000	60%	0%	\$0
NM6	Edgewood Drive Sidewalks	Complete missing sidewalk facilities between SR 167 and Sumner Heights Drive E	\$550,000			\$550,000	60%	15%	\$82,500
NM7	Fyar Avenue Trail (WSDOT SUM-17)	West Main Street to Puyallup Street	\$7,200,000	\$655,143		\$6,544,857	60%	15%	\$1,080,000
NM8	Zehnder Street/Elm Street Non-Motor	Construct pedestrian and bike facilities. Bike lanes from Valley Avenue to Main Street							
NM8	Zehnder Street/Elm Street Non-Motor	Complete missing sidewalk facilities between Pease Avenue and Wright Avenue	\$1,600,000	\$346,000		\$1,254,000	60%	15%	\$240,000
NM9	Academy Street Bike Facilities	Construct bike facilities between Wood Avenue and Valley Avenue E	\$800,000			\$800,000	60%	15%	\$120,000
NM10	Wood Avenue/Meade McCumber Road	Construct bike facilities between Main Street E and Valley Avenue	\$1,800,000			\$1,800,000	-	15%	\$270,000
NM11	62nd Street Court E Trail	Construct trail east of 62nd Street Court E between Parker Road and 160th Avenue E	\$1,000,000			\$1,000,000	60%	0%	\$0
NM12	Main Street E Sidewalks	Construct missing sidewalk facilities between 162nd Avenue E and Sumner-Tapps Highway E	\$575,000			\$575,000	60%	0%	\$0
NM13	Puyallup River Crossing	Over White River. Two part project: 1. Study best location for trail crossing 2. Construct ped/bike trail crossing	\$4,000,000			\$4,000,000	60%	15%	\$600,000
NM14	Construct sidewalks on one side of 72nd Street E	Between River Street and 143rd Avenue E	\$250,000			\$250,000	60%	0%	\$0
NM15	Rivergrove Pedestrian Bridge (WSDOT SUM-29)	Trail overpass connecting the vicinity of Alder Ave. to 143rd Ave. E over SR 410	\$11,200,000	\$5,000,000		\$6,200,000	60%	15%	\$1,680,000
NM16	Puyallup River Trail Bridge	Bridge and trail connections to the Foothills Trail. Trail overpass connecting 144th Ave E to 143rd Ave E	\$6,000,000			\$6,000,000	60%	15%	\$900,000
NM17	Mead McCumber Road/64th Street E Non-motor	Construct pedestrian and bike facilities between Balley Avenue E and Sumner-Tapps Highway	\$900,000			\$900,000	60%	0%	\$0
NM18	Sumner-Tapps Highway Sidewalks	Construct missing sidewalk facilities between Main Street E and the southern City Limits	\$1,000,000			\$1,000,000	60%	0%	\$0
NM19	Rainier Street Sidewalks	Construct missing sidewalk facilities between Sumner Avenue and Guptil Avenue	\$150,000			\$150,000	60%	0%	\$0
NM20	Traffic Avenue Pedestrian Signal (WSDOT SUM-25)	Replace existing pedestrian rectangular rapid flashing beacon with pedestrian signal	\$616,753	\$531,753		\$85,000	10%	10%	\$61,675
NM21	Alder Avenue Sidewalks	Construct pedestrian and bike facilities between SR 410 and Academy Street	\$950,000			\$950,000	60%	15%	\$142,500
NM22	Houston Road E Sidewalks	Construct pedestrian facilities between Valley Avenue E and the west City limits	\$850,000			\$850,000	60%	0%	\$0
		Non-Motorized Improvements	\$48,591,753	\$6,532,896	\$0	\$42,058,857			\$5,649,175

1. This project is fully funded and will be completed before 2044; however, to remain eligible for transportation impact fees already set aside for the project, it is included on the 20-year project list.

Transportation

Note: The current Transportation element has a lot of introduction paragraphs that are not goals or policies but rather background that can be provided in the Transportation Plan rather than the element (chapter). This edited version focuses on the goals and policies and removes all the introduction paragraphs for each goal/policy section. One introduction is suggested at the beginning of the transportation element. The Transportation Plan is the city's roadmap and vision for transportation. The Plan provides more detail on the state of the city transportation system and future transportation projects.

Introduction

~~Sumner's existing and future transportation needs are addressed in the Sumner Comprehensive Transportation Plan as well as the Draft EIS. Issues discussed in these documents include: levels of service, travel forecasts, transportation improvements, alternate modes, funding strategies, and concurrency management. Planned transportation improvements are shown following the goals and policies.~~

The Transportation Element provides the link between the Land Use Element and the transportation facilities and services that the City of Sumner needs to support forecast growth during the next 20 years. It addresses issues related to mobility and access, safety, the impact of transportation systems on the natural environment, and the intrinsic relationship between transportation and land use. The availability of transportation facilities and resources is a major factor in determining land use development patterns. Similarly, the use of land influences the need for and location of new or expanded transportation facilities, as well as the required scope of ongoing repair and maintenance of existing facilities. A conscious effort shall be made to ensure a coordinated planning effort between land use and transportation to ensure that Sumner's transportation system is effective, efficient, and modally integrated.

The Transportation Element identifies the City of Sumner's goals and policies for transportation including future transportation system and facilities, level-of-service (LOS) standards, and a concurrency monitoring system. Future land uses proposed as part of the Land Use Element inform the selection of transportation strategies and necessary transportation facilities (roadways, sidewalks, trails, bike lanes, etc.). Similarly, the Capital Facilities Element and the City's ongoing Transportation Improvement Program (TIP) present specific facility recommendations based on the goals and policies stated in the Transportation Element.

The City of Sumner transportation system is part of the larger Metropolitan Transportation Plan (MTP) assembled by the Puget Sound Regional Council (PSRC). Major improvements to arterials, freeways, non-motorized facilities, and transit system facilities/services identified by the City of Sumner need to be included in the MTP to be eligible for certain funding programs. Furthermore, inclusion of key projects in

and around Sumner in the MTP provides for a regionally compatible system of multimodal improvements.

In accordance with the PSRC's focus on people and sustainability, the Transportation Element strives to emphasize the importance of pedestrians and bicycles and prioritizing the creation a network of multimodal transportation related improvements and policies to ensure that vehicle traffic can coexist with the community's need for a safe and comfortable active transportation environment. It also recognizes the need for the City to work with other transportation service providers to plan, design, fund, and implement transportation projects and programs to serve the community.

Forecast land use alternatives were evaluated for the City of Sumner and utilized to develop improvements to the motorized and non-motorized facilities in the City of Sumner. Future 2044 traffic forecasts were developed through the modeling process, which converts land use estimates of housing and employment (by category) into daily person trips by trip purpose. The daily person trips are then converted into weekday PM peak hour vehicle trips based on factors from the PSRC regional travel demand model. Under the planned growth, there are expected to be approximately 12,550 weekday PM peak hour vehicle trips and 30,016 weekday PM peak hour vehicle miles traveled by 2044, which is an increase of almost 2,500 vehicle trips and 6,400 vehicle miles traveled over 2024 conditions.

Goals, Policies, and Objectives

Overall

1. ***Provide an efficient and safe multimodal transportation system to improve mobility for all residents, employees, and visitors of Sumner while ~~maintaining the small town quality of life within the city and balancing the city~~ Sumner's quality of life, needs related to growth, and supporting the economic vitality of the city consistent with the Regional Transportation Plan.***
 - 1.1. Provide a multimodal transportation system that is compatible with State and regional growth plans, plans of adjacent jurisdictions, and with public transit providers. ~~Meet the mobility needs of the people that live, work, or visit Sumner.~~
 - 1.2. Support a range of travel modes: auto and truck vehicles, pedestrian, bicycle, and bus and rail transit.
 - 1.3. ~~Maintain its small-town character by minimizing the development of transportation improvements that would increase the ability or desire of regional traffic to travel through the community. In managing transportation improvements that might increase regional traffic through the community, balance the desire to maintain the city character with future growth and diverse needs of the community.~~
 - 1.4. ~~The transportation system must provide improved access and circulation to support the economic development of the city. The system should be~~ Design the transportation system to provide adequate access to the industrial and commercial areas while reducing freight conflicts in protecting residential areas ~~from intrusion of auto and freight traffic.~~

- 1.5. Adopt construction guidelines that will reduce the potential failure of key bridges and transportation routes.

Public Involvement

~~The City of Sumner transportation system is intended to serve...involving the community is very important...~~

Note: Unnecessary narrative deleted.

2. *Involve and educate the residents, employees, and business/property owners of Sumner in planning for and implementing transportation projects and programs in and around the city.*

- 2.1. Encourage and solicit public participation ~~in all on~~ transportation-related decisions to help ensure planning and implementation have public support. ~~The City will continue to provide opportunities for the public to provide input on the transportation plans improvement projects, priorities and funding, and designs. These will include meetings with the Planning Commission, City Council, and special forums, as appropriate. Input from and education to the public will provide better use of available funds and integration of the transportation system to meet land use and other community goals.~~

Note: This is already part of Goal 2. How the public gets involved will change over time so the city does not need to have a policy on method. Also see Goal 9 for policies related to considering underserved populations.

~~X.X. Include public review of transportation improvements proposed in public or private land development projects. The public is most often concerned about the potential transportation impacts...The City will review the public's comments and issues related to transportation impacts based on the goals, policies, and criteria set forth in the Transportation Plan, the city's Comprehensive Plan, and other applicable requirements such as the State Environmental Policy Act (SEPA).~~

Note: Review of other plans and SEPA are already required so no need for a policy.

- 2.2. Continue to ~~Strive to meet the user~~ educate ~~ion the community on the needs of the Sumner UGA~~ transportation system. ~~These include~~ ing traffic laws, transportation planning concepts, future Sumner transportation system needs for all travel modes, and other topics to help the community in understanding transportation and making decisions.
- ~~■ Educating the public on transportation planning concepts such as levels of service, concurrency, traffic calming, and funding programs.~~
 - ~~■ Increasing user awareness of existing traffic law abuses and the dangers associated with them;~~
 - ~~■ Informing the public of advances in traffic safety from both system and vehicle perspectives;~~
 - ~~■ Supporting driver education by having police meeting with high schooler, elderly, and other groups; and~~

- ~~Developing rider information packages that inform users of commuter, transit, rail, and air transportation opportunities.~~
- ~~Develop information packages on pedestrian and bicycle facilities and safety.~~

~~The more the public understands about transportation...the better the decisions...~~

Agency Coordination

~~Sumner is geographically located at the confluence of several regional transportation corridors...~~

~~3. The City of Sumner will provide a transportation system that is compatible with State and regional plans, plans of adjacent jurisdictions, and with public transit providers. Coordinate the planning and implementation of the Sumner Transportation Plan with the Regional Metropolitan Transportation Plan (MTP) and State and local agency plans.~~

~~X.X. Coordinate with the development and implementation of the Sumner Transportation Plan with the State Highway Systems Plan.~~

3.1. The State highway system provides... Coordinate with the State and other major providers of regional infrastructure such as freight corridor operators to identify and implement improvement needs along the State highway system and other regional facilities serving Sumner. ~~The coordination includes involving the State in:~~

- ~~The development of the City's Transportation Plan;~~
- ~~Working with the State to fund and implement improvements such as improvements to Traffic Avenue and SR 410 interchange in Sumner;~~
- ~~Providing support for future extension of the SR 167 freeway from Puyallup to Tacoma;~~
- ~~Future widening of SR 410 to add high-occupancy vehicle (HOV) lanes and interchange improvements, including structural and vegetative sound abatement; and~~
- ~~Future improvements at State interchanges and State highways that serve Sumner.~~

Note: Remove specific projects so this section stays relevant.

~~X.X. Coordinate the planning and implementation of the Sumner Transportation Plan with the Regional Metropolitan Transportation Plan (MTP). The City of Sumner transportation system is part of the larger MTP... major improvements to arterials, freeways, non-motorized facilities, and transit system facilities/services identified by the City of Sumner need to be included...~~

Note: Unnecessary narrative deleted and captured in Goal 3.

3.2. Coordinate planning and implementation of transportation improvement projects and programs with local agencies. Sumner's Transportation Improvement Plan relies in part on improvements to transportation facilities under the jurisdiction of other agencies... ~~These types of projects require coordination to...~~

Note: Unnecessary narrative deleted.

- 3.2.1. Plan, design, and construct the improvements to provide continuity for vehicular and non-motorized transportation modes.
- 3.2.2. Jointly fund significant improvements that serve regional travel patterns.
- 3.2.3. Ensure compatibility of improvement projects and the timing of their implementation.

~~Specific coordination is required for the following projects:~~

- ~~▪ 8th Street E (with Pierce County and City of Pacific);~~
- ~~▪ Shaw Road extension (City of Puyallup);~~
- ~~▪ SR 410/Traffic Avenue Interchange (WSDOT and City of Puyallup);~~
- ~~▪ East Valley Highway improvements (City of Auburn and Pierce County);~~
- ~~▪ 136th Avenue E (City of Pacific);~~
- ~~▪ Sumner Regional Trail (City of Pacific, City of Puyallup, City of Bonney Lake, City of Edgewood and Pierce County);~~
- ~~▪ SR 162 East and SR 410 Interchange (Pierce County and WSDOT);~~
- ~~▪ SR 162 widening (Pierce County and WSDOT);~~
- ~~▪ Sumner Tapps Highway East and SR 410 Interchange (Pierce County and WSDOT); and~~
- ~~▪ Bridge Street Bridge and West Valley Highway improvements (City of Edgewood and Pierce County);~~

Note: Recommend keeping policies at a level where they do not become outdated.

- 3.3. ~~1. Support regional transit connections in the Sumner Planning Area. Continue to Work with Sound Transit, Pierce Transit, and other transit providers to support and enhance expand a multimodal transportation system by ensuring that the City's transportation plans and facilities are consistent with public transit plans and programs. The City will continue to monitor growth and development and address the demand for transit through a local transit system or Pierce Transit. Prior to initiation of any expanded transit service the City will conduct a thorough demand study and fiscal analysis. The City of Sumner does not operate bus or rail transit services. These are provided by...~~

Note: Condensed and moved to Transit Section.

- 3.4. Work in conjunction with the County to continue its Bridge Retrofit Program.

~~Streets and Highways Transportation System Mobility and Efficiency~~

~~Streets and highways provide the basic framework for the City of Sumner transportation system. The system is comprised of freeways, arterials...~~

Note: Unnecessary narrative deleted.

4. Plan, design, implement, and maintain Develop a street and highway transportation system that provides safe and cost-efficient mobility and accessibility of goods, services, and people for the community of Sumner.

4.1. Maintain The a LOS D standard or better for selected arterials and collectors in the city where analysis indicates such LOS is warranted. City of Sumner shall be LOS D or better, except for the following locations:

- ~~—Traffic Avenue/Main Street/Fryar Avenue (LOS F)~~
- ~~—Main Street/Alder Avenue (LOS F)~~
- ~~—Valley Avenue East/Main Street (LOS F)~~
- ~~—West Valley Highway East/Valley Avenue/Sumner Heights Drive (LOS F)~~
- ~~—W Valley Highway/Sumner Heights Drive E/Valley Avenue (LOS F)~~
- ~~—Main Street/Valley Avenue (LOS F)~~

The levels of service shall be measured using methodologies identified in the *Highway Capacity Manual* (HCM).

4.1.1. The City desires to Provide reasonable levels of traffic operations while minimizing optimizing the impacts and costs of creating wider roadways and intersections to improve transportation capacity and efficiency. accommodate traffic. The Transportation Plan identifies improvements... The LOS F standard at the Traffic Avenue/Main Street/Fryar Avenue and W Valley Highway/Sumner Heights Drive E/Valley Avenue intersections since providing LOS D would require extensive additional improvements...

Note: Explanation deleted; it is not a policy. The intent is captured in 4.1.

4.1.2. Allow left turns and through movements on side streets intersecting with arterials may to operate below the adopted LOS D standard. The poor level of service may affect when the LOS affects relatively low traffic volumes and may not meet warrants for traffic signals. Furthermore, installation of traffic signal Each location will need to be reviewed based on traffic engineering studies at the time of development review. Appropriate mitigation should be identified and implemented to reduce potential safety and operation impacts, even though the intersection may operate below the adopted standard.

Note: Narrative to be deleted because this is not how the City identifies traffic impacts or mitigation.

~~X.X Levels of service for non-arterial collector roads, streets, or driveways intersecting with arterials will be evaluated at the time of development review. The City Engineer shall identify appropriate mitigation to address potential operations or safety impacts.~~

Note: Recommended for removal because this is not how the City operates per M. Kosa.

~~X.X Transportation improvements or strategies shall be constructed to ensure that an adequate transportation system is in place to serve increased travel demands.~~

Note: This is covered under concurrency policies below.

4.2. Construct multimodal transportation improvements to ensure that an adequate transportation system is in place to serve increased travel demands.

4.2.1. Concurrency shall be defined as having a financial commitment in place to resolve the deficiency within six years, is an acceptable strategy. Concurrency shall be implemented as part of the City's development review process under SEPA. The City will not approve new developments unless the LOS standards or concurrency requirements are met.

4.2.2. The City will not apply Concurrency shall not be applied to Highways of Statewide Significance (HSS) per State guidelines adopted on SR 167, a designated Highway of Statewide Significance (HSS), or its interchanges (per HB 1487).

4.2.3. Exceptions to concurrency also will be provided at the following locations in the City until improvements identified in the transportation plan are funded and constructed:

- On SR 167, a designated HSS, or its interchanges (per HB 1487);
- On SR 410, SR 162, or the three interchanges of SR 410 state highways serving the city (Traffic Avenue, SR 162, and Sumner-Tapps Highway);
- The Traffic Avenue/Main Street/Fryar Avenue intersection;
- The East Valley Highway/Forest Canyon Road; and
- The Pacific Avenue/West Valley Highway corridor or Bridge Street Cannery Way

The above exceptions from denial under concurrency are identified since these corridors are affected by significant regional traffic growth and require regional funding solutions. Until improvements identified in the Transportation Plan are able to be implemented using State, other regional, and local funding, congestion will be allowed to occur. The City will review potential impacts and identify appropriate mitigation through impact fees and SEPA. The City will coordinate with the Washington State Department of Transportation (WSDOT) on identifying appropriate mitigation along SR 162 and at the interchanges of SR 410.

Note: Unnecessary narrative deleted.

4.3. Streets and arterials shall be classified to reflect their desired functional use: and be designed consistent with the design guidelines in the Sumner Transportation Plan and the City of Sumner Development Specifications and Standard Details. Design standards should be implemented based on the functional classification, location in the City, and land uses it serves. The Transportation Plan identifies the general characteristics used to define the classification of freeways, arterials, collectors, and local streets in Sumner. Design guidelines are presented in Appendix B of the Transportation Plan, which further identify potential characteristics by classification and the type of area and land uses it serves. The design guidelines cover provisions for the various travel modes served by a type of roadway....

Note: Unnecessary narrative deleted.

- 4.4. Plan for, design, construct, operate, and maintain an appropriate and integrated transportation system as outlined in its adopted Complete Streets Policy.
- 4.5. To minimize impacts of freight and commercial traffic on the city transportation system and the community, maintain ~~Establish~~ truck route restrictions based on functional classification, connectivity, and land uses and work with freight and regional partners to identify options for truck parking. ~~The truck route system primarily consists of principal and minor arterials... On other City streets, only local deliveries should be allowed by trucks... Trucks entering/exiting the City to/from a destination within the City should use only the designated truck routes between the regional system (or City limits) and the intersection nearest the destination.~~

Note: A truck route map is included. Unnecessary narrative deleted.

- 4.6. Ensure the efficient movement of goods and services to and from the Sumner-Pacific Manufacturing Industrial Center (MIC) and along trucks routes. Consider freight needs along truck routes including identifying existing areas that need improvements and accommodating truck travel with new transportation projects.
- 4.7. Provide a highly interconnected network of streets, sidewalks, bicycle lanes, and trails for ease and variety of travel. The City of Sumner recognizes that increasing connections throughout the City ~~Provides~~ efficiencies in traffic circulation and increases the sense of unity of the community. A ~~through a~~ flexible, interconnected grid system that avoids of roadways is preferred over the use of cul-de-sacs, dead-end streets, loops, and other designs that form barriers. ~~Creating a pattern of continuous through streets with a system of highly integrated secondary access streets will provide long-term economic and social benefits to the community. The City will~~ Provide an interconnected system of sidewalks, trails and other non-motorized corridors that provide ease of encourage travel between neighborhoods and community centers.

To achieve an interconnected street transportation network, the City should:

- Allow cul-de-sacs only where the natural or built environment would logically preclude a grid street system.;
- ~~Consider future needs and opportunities for development of the local service street grid in project review of development proposals;~~
- Require new development to provide full or partial/half street improvements.; ~~where such streets will expand, complement or improve access to the larger street network; consistent with existing development patterns and environmental constraints;~~
- ~~Seek to establish a maximum interval between local access streets in industrial areas of ¼ mile;~~
- Seek to establish a maximum interval between local access streets in residential and pedestrian-oriented commercial areas of 500 feet and
- ~~Establish logical new transportation links at the first available opportunity, to avoid sacrificing future options;~~

- Prohibit private roads and gated access drives in new subdivisions, multifamily and mixed-use developments, except where there is a demonstrated need.
- Support multimodal travel by encouraging streetscape that enhances the pedestrian and bicycle environment.

~~The City should maintain flexibility in implementing these strategies. Requirements for improvements to establish a continuous grid street system should be determined on a case-by-case basis. The public benefit of new roadways should be considered...~~

Note: Unnecessary narrative deleted.

~~The provisions of this policy do not extend to a street connection in the Sumner Avenue/ Alder Avenue corridor to connect areas south of SR 410...~~

Note: Unnecessary narrative deleted.

~~X.X. The City of Sumner discourages the use of private streets and will not agree to maintain them.~~

Note: Covered in policies above.

4.8. Retain existing and identify, acquire, and preserve rights-of-way to implement the interconnected transportation system identified in the Transportation Plan.

4.8.1. The vacation of public right of way should not be approved unless there will be an overriding public benefit.

~~The City intends to use the Transportation Plan's recommendations to identify current and future transportation system needs. The City has identified specific transportation corridors where rights-of-way should be protected to serve potential short- or long-range transportation system needs...~~

Note: Covered in policies above.

~~The City also seeks protecting rights-of-way from encroachment by any structure, substantial landscaping, or other obstruction to preserve comprehensive plan recommendations. Protection methods may include minimum...~~

Note: Covered in policies above.

~~X.X. Limit and provide access to the street network in a manner consistent with the function and purpose of each roadway. The City will seek to consolidate and minimize the addition of new access points to State highways, arterials, and collectors, as appropriate. This will help preserve capacity and improve safety of the highway and arterial system, reduce interference with traffic flows on arterials, and discourage through traffic on local streets.~~

~~To achieve this level of access control, the City:~~

- ~~■ Supports the State's controlled access policy on all State highway facilities;~~
- ~~■ May acquire access rights along some arterials and collectors;~~

- ~~Encourages and may require landowners to work together to prepare comprehensive access plans that emphasize internal circulation and discourage multiple access points to major roadways;~~
- ~~Encourages consolidation of access in developing commercial and high-density residential areas through shared use of driveways, local access streets, and cross-access corridors; and~~
- ~~Requires defined access and circulation systems as part of subarea land use plans.~~

Note: This section on access management is covered in SMC Chapter 18.43 and new Policy 4.9 below.

- 4.9. Implement the access management strategies including those in the East Main Street Design Strategy while balancing the rights of property owners with the public purpose of safe and efficient movement of vehicles and pedestrians.
- 4.10. Provide for the efficient movement of traffic through transportation system management strategies (TSM) such as advanced traffic control measures, intelligent transportation system (ITS) technologies, speed management, access management, channelization improvements and multimodal design features. Use advanced technologies to better manage traffic volumes on major arterials and improve the efficiency and coordination of traffic signals. Advocate for technology upgrades in adjacent jurisdictions and on state highways that affect the City's transportation network.

~~X.X. Strive to efficiently operate the transportation system through Transportation Systems Management (TSM) strategies:~~

~~These strategies will include:~~

- ~~Signal interconnect systems, signal coordination and synchronization, and other signal systems to ease traffic flow;~~
- ~~Turn lanes and pockets to allow turning vehicles to move out of through traffic lanes; and~~
- ~~Access control for arterials and major collectors to minimize disruptions in traffic flow.~~

Note: Covered in Policy 4.10.

- 4.11. Prioritize maintenance, service needs and enforcement of the transportation system so that it is safe and functional and preserves the existing facilities.
- 4.11.1. Maintain the existing and future arterial and street transportation system and associated facilities (e.g., sidewalks, transit stops, landscaping) through an ongoing Pavement Management System (PMS) and traffic operations program transportation maintenance and preservation programs.
- 4.11.2. Coordinate with service providers and developers on the location of major utility and transportation corridors and the construction of roadway improvements. Such coordination will to help minimize transportation disruptions caused by construction. In addition, this will reduce costs, and maintain pavement integrity.

4.11.3. Continue to review and implement a systematic program for defining, designing, and implementing traffic control and pedestrian safety improvements in residential areas of the city. The City will d Define and prioritize locations for such programs improvements based on:

- Traffic engineering studies
- Traffic speeds
- Safety and accident crash data, and police department observations
- ~~Truck impacts~~
- Input from the community

4.11.4. Include mapped inventories of Sumner's transportation system, conduct studies, and review data to support operational changes and designs that improve safety.

4.12. Accommodate the transportation needs of special events and assess the costs of such accommodation to the event promoter, such as alley activation projects, temporary street closures, and construction zones, while safeguarding public safety and property. Follow the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) or other guidelines and standards in planning for special event accommodations.

~~The City recognizes that special events such as fairs, parades, athletic events, and large meetings can burden the transportation system beyond its ordinary capacity. The City also recognizes that such events can expand the culture and quality of life of the community. The City will seek to provide for such events by making appropriate provision such as bus transportation, traffic control, and temporary street closures. The City will notify affected businesses through mailings and the Sumner Promotions Association of Street Closures for special events. The City may assess some or all of the costs of such provisions will be assessed to the promoters or organizers of such events.~~

Note: Special events are covered in detail in SMC 12.52, so narrative text unnecessary here.

4.13. Allow food truck parking within City right-of-way, where appropriate and after consideration of public safety and health and impacts to private property.

Subarea Plan Transportation and Circulation System

5. Support implementation of the multimodal transportation system identified in adopted Sumner Subarea Plans.

5.1. For the Town Center Plan Area, apply form-based code and street design standards in new and upgraded street improvement projects, to promote a pedestrian-friendly, bicycle-friendly, landscaped, active streetscape.

5.1.1. Implement the specific street designs in the form-based code for arterial streets, collector streets, local streets, and West Main Street as specified in the Town Center Plan.

- 5.2. For the East Sumner Neighborhood Plan Area, implement the transportation objectives of the plan and the circulation map.
 - 5.2.1. Provide vehicular routes through the neighborhood to diffuse traffic, reduce congestion, and complete the street/sidewalk grid.
 - 5.2.2. Improve local and regional transit service to reduce vehicle traffic and connect residential and commercial areas.
 - 5.2.3. Provide a non-vehicular network of sidewalks and pathways that supports alternate modes of travel and connects key amenities, such as the central wetlands and the YMCA, to residences and businesses.
- 5.3. Support the Sumner-Pacific MIC as a primary hub for regional, national, and international goods movement by ensuring the integrated development and operation of trucking and rail terminals to enhance the freight transportation system.
- 5.4. Recognize the critical role of safe, reliable and efficient movement of people and goods by identifying and addressing areas within the MIC or connecting corridors where access and circulation is hindered by infrastructure gaps and inadequate design. Ensure future transportation improvements allow for safe and efficient movement of both freight and people.
- 5.5. Pursue the expansion of the Pierce Transit benefit district to serve Sumner and eastern Pierce County and provide options for access to the Sumner Sounder Station.

Pedestrians and Bicycles

6. ~~Promote use the design of alternative transportation multimodal transportation facilities modes that support local and regional growth centers by providing an interconnected system of pedestrian and bicycle facilities.~~

- 6.1. Develop pedestrian and bicycle level of service guidelines to assess completion of the established pedestrian and bicycle network in the Sumner Transportation Plan.
- 6.2. Maintain the Sumner Link Trail as a regional non-motorized corridor and prioritize projects that enhance the trail with neighborhood connections, trailheads and amenities.
- 6.3. Ensure design standards for the transportation system principal and minor arterials, collectors and local streets will include provisions for travel by should facilitate and encourage access and circulation by pedestrians and bicyclists, based on the Sumner/Pacific Master Trail Plan and the Sumner Transportation Plan and provides connections to schools, parks, community facilities, transit and commercial districts.
- 6.4. Collector roads and local streets should be designed and constructed to facilitate access and circulation by pedestrians and bicyclists within the neighborhoods and provide connections to schools, parks, community facilities, transit, and commercial districts. Development

~~application will proposals shall~~ provide for convenient non-motorized connections where feasible, commensurate with the scale and occupancy of the development.

- 6.5. Sidewalks will be provided on both sides of all City streets unless special circumstances, such as topography or environmental constraints, make it cost prohibitive ~~as determined by the Public Works Director.~~
- 6.6. ~~The City will pursue the construction of interim asphalt walkways/sidewalks along city streets that are used by a considerable number of children walking to/from school. Interim asphalt walkways/sidewalks should include, but not be limited to, Parker Road, Elm Street, and 160th Street E. The construction of interim walkways/sidewalks is not intended to preclude future full street improvements. Prioritize sidewalks one side of the street where no sidewalks exist, particularly along school routes.~~

Note: The City does not build interim asphalt sidewalks, we want to have permanent sidewalks.

- 6.7. ~~Construct a separate~~ system of ~~separated~~, multi-purpose trails ~~should be constructed~~ to serve transportation and recreation needs of the community. ~~It should also Connect the system~~ with adjacent communities to facilitate regional connectivity. Implement the trail system and connections to the arterial, collector, and other pedestrian and bicycle facilities ~~should be made~~ per the Sumner Parks and Trails Plan, Sumner/Pacific Master Trail Plan.
- 6.8. Develop and maintain street cross-section designs that promote street trees, separated sidewalks, and wide sidewalks along commercial uses; and develop and maintain cross-section designs for mid-block pedestrian and bike corridors that encourage non-auto circulation.

Commuter Rail and Transit

7. Reduce the need to expand the general capacity of arterials and collector streets in the city by developing and expanding an integrated system of public transportation alternatives and demand management programs options and strategies to provide mobility alternatives and reduce the need to expand the general capacity of arterials and collector streets in the City.

- 7.1. ~~The City will continue to Monitor~~ growth and development for changes in transit demand and address ~~the demand for transit needs~~ through a local transit system, ~~or Pierce Transit.~~ Prior to initiation of any expanded transit service the City will conduct a thorough demand study and fiscal analysis.
- 7.2. Continue working with transit providers to expand and enhance bus transit service and a regional park-and-ride system to that serves regional destinations and growing neighborhoods and employment areas of Sumner. ~~Key connections that should be considered for new or expanded service include:~~
- ~~■ Between Sumner and Auburn/Kent/Green Valley employment centers;~~
 - ~~■ To connect Lakeland Hills residential area to Sumner and regional transit service;~~
 - ~~■ To serve travel between Sumner, Bonney Lake, and Tehaleh development area;~~

- ~~■ To serve travel within Sumner and connections to the commuter rail station;~~
- ~~■ Connections between East Sumner Neighborhood and historic Downtown Sumner, including the commuter rail station;~~
- ~~■ From downtown commuter rail station to the Manufacturing/Industrial Center.~~

~~X.X Continue working with Sound Transit, WSDOT, and local agencies to enhance access to the regional commuter rail system and Sumner's commuter rail station, and bus transit connections to various Sumner neighborhoods.~~

Note: Deleted, redundant with above.

7.3. Prioritize agency coordination and funding for commuter connections to Sumner's primary employment center, the Sumner-Pacific Manufacturing Industrial Center (MIC).

7.4. Preserve existing railroad rights-of-way within the City's Urban Growth Area and connections to the national rail system.

7.4.1 Promote safety upgrades at railroad crossings to improve safety of the traveling public.

7.5. Support construction of improved pedestrian and bicycle connections with local and regional transit service. Work to provide transit stops and shelters, and pedestrian safety improvements along arterials. Additionally, work to provide and bike lockers and facilities at transit connections.

~~X.X Support WSDOT and transit providers in implementing the regional plan for HOV lanes on SR 167 and SR 410, consistent with the State Highway Systems Plan.~~

Note: Redundant with other policies.

~~X.X Support and coordinate with Sound Transit and WSDOT on the development of an expanded regional park-and-ride system to support use of alternative transportation modes in the Sumner area. Seek to provide tax credits or other incentives for allowing public parking on private property.~~

Note: Redundant with other policies related to agency coordination. Also, City Code does not allow paid public parking on private parking lots.

7.6. Enhance safety and operations of rail service (freight and passenger) through grade separation of roadways and improving at-grade crossings.

7.7. Explore the feasibility of a trolley system. Support a shuttle or autonomous transit that would connect the Historic Downtown area with eastern areas of the city.

~~X.X Collaborate when possible with Sound Transit, Pierce County and surrounding cities to do joint planning on future services concerning the commuter rail and transit system.~~

Note: Policy is similar to what is already under agency coordination.

~~X.X Work with local property owners to encourage the development of commercial and residential uses compatible with the commuter rail station.~~

Note: Policies regarding transit-oriented development are already covered in the Housing and Environment elements.

- 7.8. Ensure that the commuter rail station does not have an unreasonable adverse impact on the residential character of the neighborhood.

~~X.X. Consider and pursue opportunities for an increased pedestrian connection to the West Sumner Neighborhood and the Downtown business core such as a pedestrian overpass across the railroad tracks.~~

Note: Connectivity for the pedestrian system is addressed under the pedestrian and bicycle section.

~~X.X. Continue to explore the parking options and access options for the commuter rail station that are compatible with the surrounding land uses, safe, convenient, and attractive. Address options for location of future parking for expanded service over time.~~

- 7.9. Promote Support the use of the Sounder high-capacity transit and commuter train by the entire Sumner community. Provide Encourage housing near the train station for households desiring ~~the close~~ transit availability, and provide services and businesses that cater to residents and train commuters, and provide safe connections for pedestrian and bicycle commuters.

~~X.X. Promote and pursue the use of underutilized parking lots throughout the city as potential satellite sites for commuter rail station parking.~~

~~X.X. Seek alternatives to the expansion of a stand-alone parking garage in the Town Center.~~

~~X.X. Request that Sound Transit provide additional bicycle lockers at the station to encourage bicycle commuting to the station. Require that any expansions to parking for the station include increased bicycle lockers.~~

~~X.X. Request, as part of any future expansion of the commuter rail station parking and access, that Sound Transit partner with the City and other entities to provide funding and support for improvement of the interchange on SR410 and Traffic Avenue.~~

Note: The Sounder Station is already under construction so policies no longer relevant.

Commute Trip Reduction and Transportation Demand Management (TDM)

8. Promote programs that reduce the demand on the transportation system. through the following strategies:

- 8.1. Encourage the use of high occupancy vehicles (HOV) programs – buses, carpools, and vanpools – through both private programs and under the direction of Pierce Transit and Sound Transit.

- 8.2. Promote ~~flexible work schedules allowing~~ the use of transit, carpools, or vanpools.

- 8.3. Promote reduced employee travel during the daily peak travel periods through flexible work schedules and programs ~~to allow employees to work part- or full-time at home for telecommuting~~ or at an alternate work site closer to home.
- 8.4. Encourage employers to provide TDM measures in the workplace through such programs as preferential parking for HOVs, transit pass subsidies, improved access for transit vehicles, and employee incentives for using HOVs.
- 8.5. Implement the provisions of the State Commute Trip Reduction Act.
- 8.6. Consider pricing programs as an option for reducing reliance on single-occupancy vehicle (SOV) travel.
- 8.7. Incentivize transit oriented and higher density land uses that encourage walking or biking near transit stations.

~~X.X. Ensure mobility for all residents within the UGA, including the elderly and persons with disabilities by providing an accessible and affordable transportation system. The City of Sumner will ensure that its transportation system meets the requirements outlined in the Americans with Disabilities Act (ADA). The City will apply design standards that respond to the needs of persons who are elderly, disabled, or have other special needs. The City will identify existing transportation facilities and locations that are not accessible or usable by such persons and will improve such facilities. The City will encourage public and private transportation operators to fit the special needs of such persons.~~

Note: Accessibility is covered under goal 9 below.

Equity in Transportation-Related Decisions

9. Consider the impacts of transportation on underserved populations and provide transportation in an equitable manner.

- 9.1. Prioritize improvements that will improve multimodal transportation in underserved neighborhoods.
- 9.2. Incorporate social equity in planning for transportation improvements, programs, and services in historically underserved neighborhoods and vulnerable populations.
- 9.3. Ensure mobility for all residents within the UGA, ~~including the elderly and persons with disabilities~~, by providing an accessible and affordable transportation system and encouraging public and private transportation operators to meet the needs of such persons. The City ~~of Sumner~~ shall ensure that its transportation system meets the requirements ~~outlined~~ in the Americans with Disabilities Act (ADA), apply design standards responding to the diverse community needs ~~of persons who are elderly, disabled, or have other special needs~~, and improvement improve existing City transportation facilities ~~and locations that are not accessible or usable by such persons to meet these needs~~.

Land Use and Environmental Considerations

10. Establish a transportation system with minimal environmental impact and energy consumption that provides for a high quality of life to be enjoyed by the residents ~~citizens~~.

10.1. Incorporate environmental factors into transportation decision-making, including attention to human health and safety by designing transportation facilities within the Sumner UGA minimizing adverse environmental impacts resulting from both their construction and operation.

10.1.1. The City ~~of Sumner~~ ~~will~~ shall fulfill this need by:

- Considering environmental costs of development and operation of the transportation system
- Aligning and locating transportation facilities away from environmentally sensitive areas
- Working with the State to incorporate appropriate structural and vegetative sound abatement as part of highway widening projects
- Mitigating unavoidable environmental impacts wherever possible
- Soliciting and incorporating the concerns and comments of interested parties
- Considering the social equity and environmental justice impacts of ~~street~~ transportation projects
- Evaluate street cross-sections for efficient and effective use of pavement and landscaping features and low impact design.

10.2. Ensure that transportation system improvements are compatible with adjacent land uses, ~~and will~~ minimize potential conflicts, and create safe and adequate connections to adjacent land uses. The City ~~will~~ shall:

- Prevent new residential ~~areas~~ driveways from ~~fronting on~~ having direct access to arterials, unless no other options exist
- Incorporate transit, pedestrian, and bicycle access to major developments
- Provide landscaping and noise buffers along major roadways
- Provide facilities for bicyclists and pedestrians to access transit
- ~~Provide changes to Promote development~~ site plans that encourage pedestrian travel

10.3. Support continuing efforts for improving air quality and reducing greenhouse gas emissions throughout the Sumner area, and develop a transportation system compatible with the goals of the Federal and State clean air acts. ~~Federal and State legislation have made clean air a priority.~~

10.3.1. The ~~City~~ will shall:

- Support ~~and enforce~~ vehicle emissions reduction ~~testing~~ and cleaner burning fuels programs

- Coordinate with Sound Transit and other jurisdictions on Commute Trip Reduction (CTR) programs for major employers in the Sumner planning area
- Require air quality studies of ~~future new~~ major developments ~~on-likely to have significant~~ impacts created by site-generated traffic
- Promote other TDM Programs
- Work with the private and other public sectors to introduce cleaner burning fuels for the existing motorized fleet, and vehicles powered by alternate fuel sources
- Support and implement projects that promote cleaner burning and alternative fuels such as providing electric vehicle charging infrastructure.

~~X.X. Allow major changes to the land use plan only when those proposals accompany specific analyses showing how the transportation system can adequately support existing and proposed development needs in a financially balanced manner.~~

Note: Requiring new developments to meet "concurrency" and address traffic impacts is already covered in other policies and codes.

10.4. ~~Provide~~ Promote, through regulations and incentives, ~~for~~ the use of low impact development techniques that will reduce impervious surfaces, provide for stormwater infiltration, and protect the natural environment and systems. Low impact development should be ~~the preferred alternatives for included in~~ new transportation projects where possible.

10.5. Increase the resilience of the transportation system and support security and emergency management to protect the transportation system against disaster, develop prevention and recovery strategies, and plan for coordinated responses.

~~X.X. Transportation Energy Conservation: Reduce the rate of energy use per capita, both in building use and in transportation activities:~~

Note: Not specific and already covered in other policies.

10.6. ~~Transportation Greenhouse Gas Alternatives:~~ Reduce greenhouse gases by expanding the use of conservation and alternative ~~energy fuel~~ sources and by reducing vehicle miles traveled by increasing alternatives to driving alone.

10.7. Convert public fleets to zero-emission vehicles.

10.8. The City should promote and allow telework wherever possible.

10.9. Expand public electric vehicle charging stations and encourage and incentivize private electric vehicle charging stations.

Program Financing and Implementation

11. Fund and implement the transportation plan based on the relative benefits to various user groups and to meet the needs of the community in an orderly manner based on the community and regional priorities, benefits, and cost allocation.

11.1. Prioritize city improvement projects and participation in State and regional projects based on the following objectives:

- Human health and transportation safety of all modes
- Maintenance and preservation of existing transportation system facilities
- Meet current and future demands ~~Upgrade or expand facilities needed~~ to support growth within Sumner and maintain transportation concurrency
- Expand facilities and services to improve connectivity of the transportation system
- Environmentally beneficial
- Addresses a need identified for underserved and/or vulnerable populations.

11.2. ~~Fund and implement the Transportation Plan based on the relative benefits to various user groups.~~ Funding programs that ~~will~~ should be considered by the City include:

- Local, State and Federal grant programs;
- Development mitigation;
- Local city transportation and general tax funds;
- Local Improvement Districts (LIDs);
- Expanded business license fees; and
- Other local option taxes fees that are currently allowed or that may be available in the future.

Note: First line of policy moved to Goal 7.

11.3. ~~Work with other transportation service providers and agencies~~ ~~Continue to develop partnerships with WSDOT, Pierce County, Sound Transit, and local agencies to~~ define and fund and implement improvement transportation projects and programs in the Transportation Plan to serve the community and connect to major transportation hubs.

11.4. Ensure that new growth pays a proportionate share of the costs of transportation facilities needed to support growth. Where applicable, new development shall contribute to the costs of needed improvements through such means as:

- SEPA-based mitigation
- Transportation Impact Fees
- Frontage Improvements
- Low Impact Development (LID) that reduces public impacts and costs
- Other means allowed by State and local law.

- 11.5. Ensure that the annual Six-Year Transportation Improvement Program (TIP) is financially feasible, leverages available City Funds, and is consistent with the priorities of the Transportation Plan.

Note: The TIP is used to program City funding, supports concurrency and is used in development reviews, and is updated annually.

~~The TIP used by the City to implement TIPs. It is used by the PSRC in developing the Regional TIP...The annual update of the TIP is also used to reevaluate project priorities...~~

Note: Unnecessary narrative deleted.

- 11.6. ~~If probable funding falls short of meeting the identified needs of the plan, the City will review and update the Plan, as needed. The City will~~ Reassess improvement needs, priorities, level of service standards, and the land use plan if available and achievable funding falls short of meeting the identified needs.

- 11.7. Approve major land use changes only when those proposals accompany specific documentation or plans showing how the transportation system can adequately support existing and proposed development needs based on concurrency, access, safety, and ~~alternative travel modes~~ level of service standards or guidelines.

~~X.X. Continue planning for transportation facilities within Sumner and its UGA on a continuing basis meeting changes in land use decisions.~~

Note: Policy is unnecessary since it is part of the comp plan process and required by GMA.

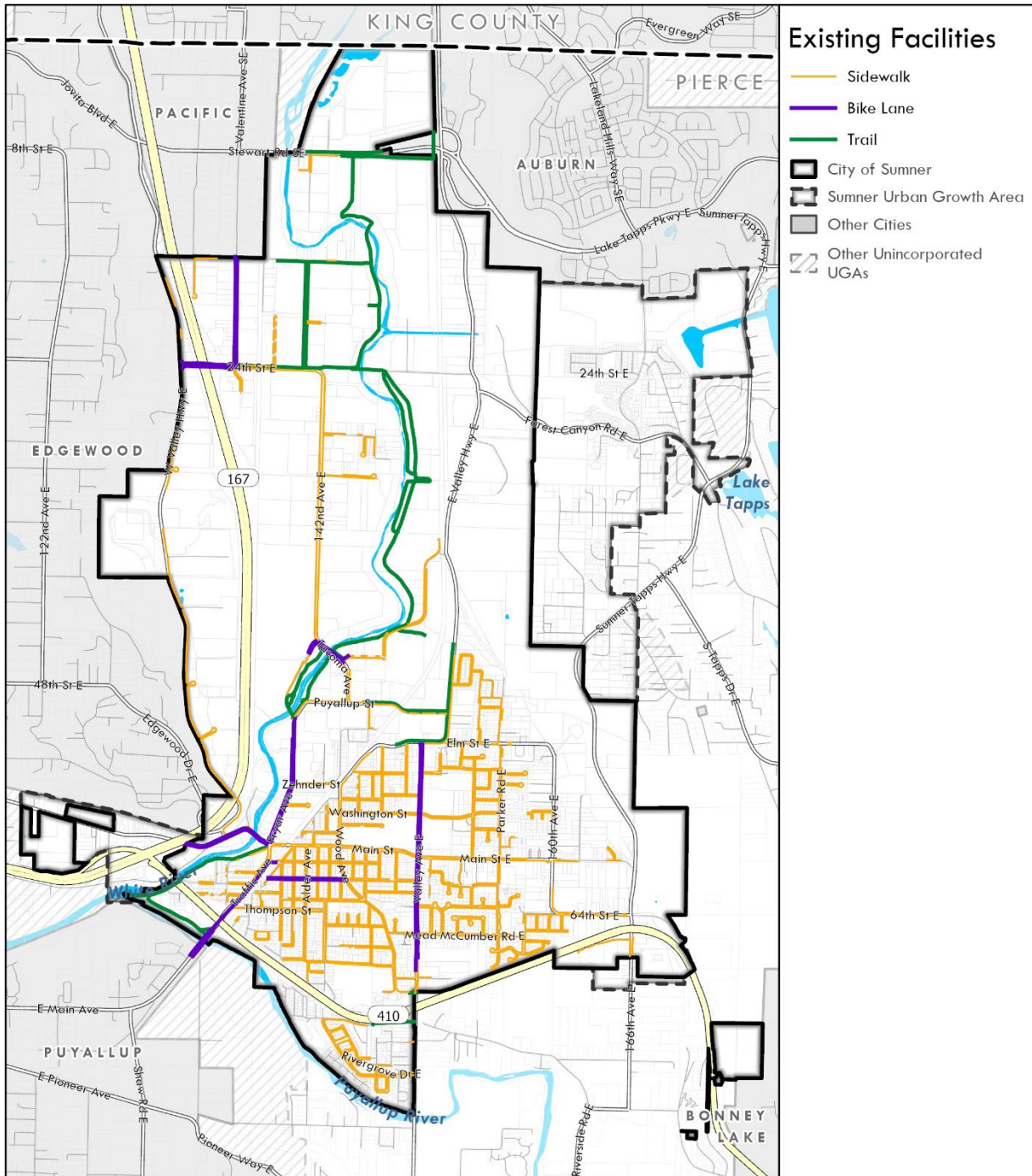
- 11.8. Develop and charge a multimodal transportation impact fee for the purposes of building a transportation network that supports multiple travel operations.

Note: Recent state legislation provided flexibility for jurisdictions to charge impact fees that support not just autos but pedestrian and bicycle system improvements.

- 11.9. Balance 20-year financing of transportation improvements between both existing and future users based on the principle of proportional benefit to all users.

- 11.10. ~~The City will~~ Update the Transportation Plan whenever the Sumner Comprehensive Plan is revised or updated in such a way that it affects the ~~Transportation Plan~~ city's transportation demands or. ~~The City will also revise the Transportation Plan if~~ projects outside the city's control, such as special transportation related projects led by the WSDOT, PSRC, transit agencies, or Pierce County, cause a fundamental shift in transportation ~~services demands or capacity with the~~ throughout the Sumner UGA.

Figure 16-1: Existing Non-Motorized Facilities



CITY OF SUMNER

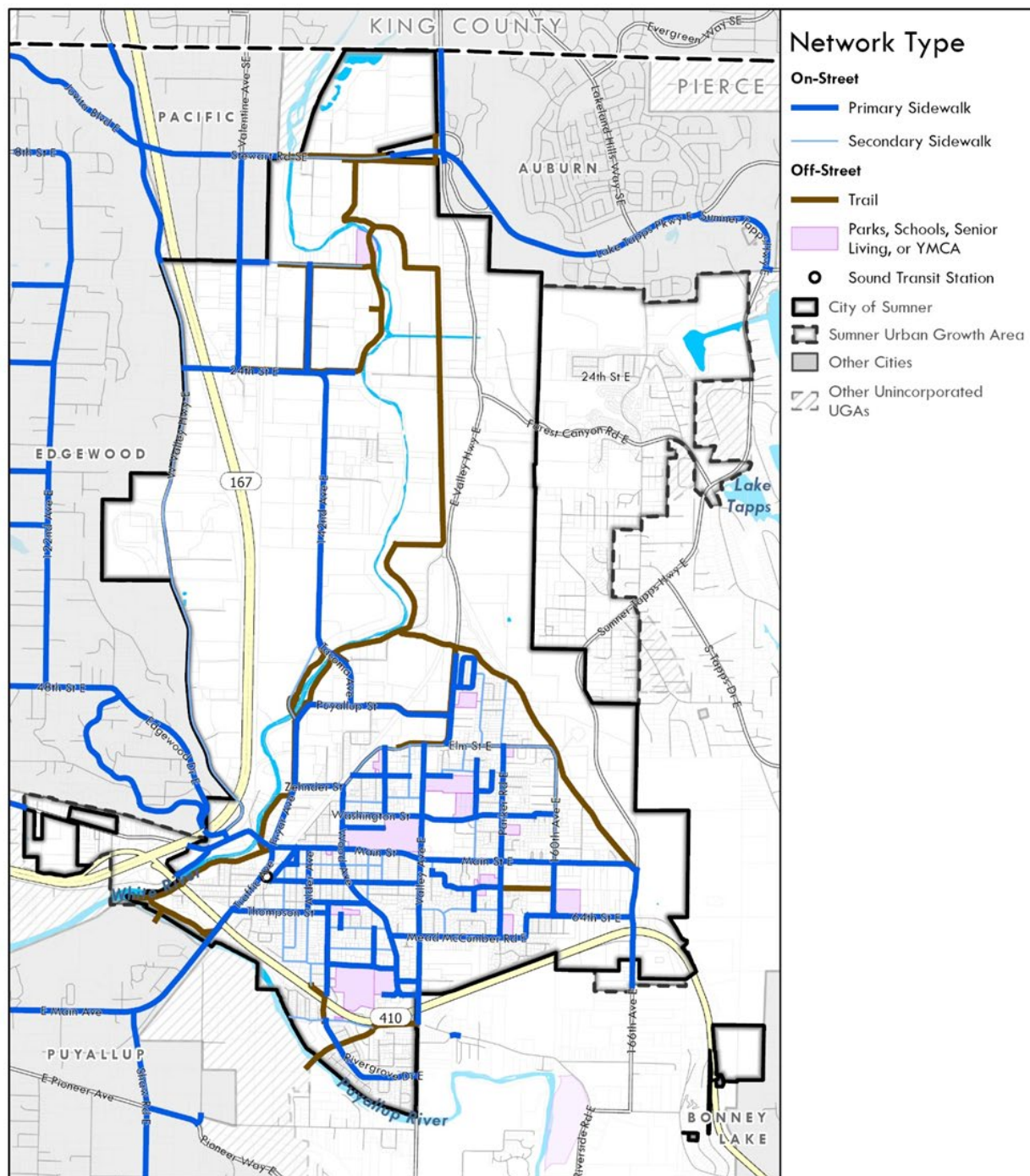
Existing Non-Motorized Facilities



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Map Date: August 2024

Figure 16-2: Future Pedestrian Network



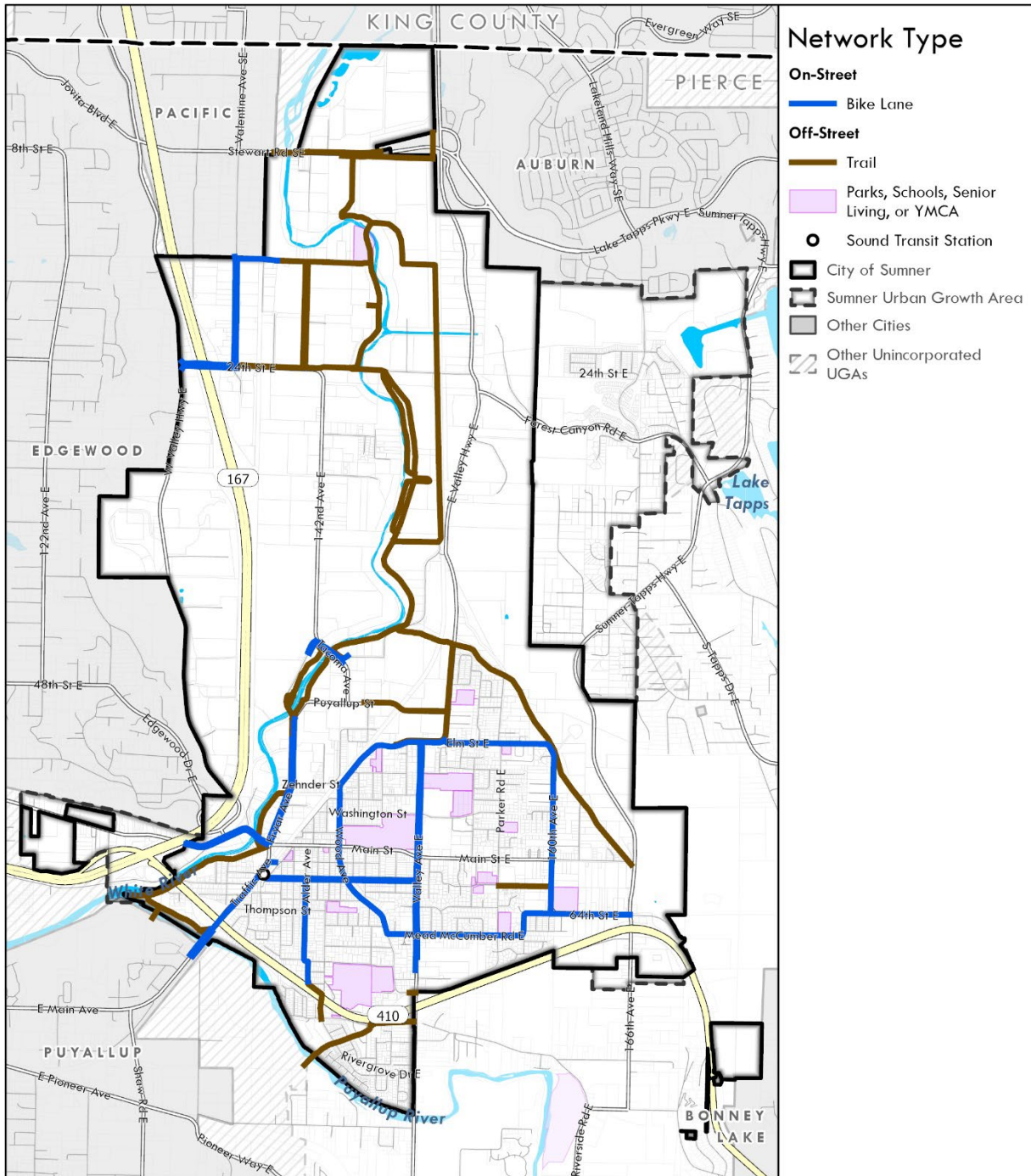
CITY OF SUMNER Future Pedestrian Network



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Map Date: February 2024

Figure 16-3: Future Bike Network



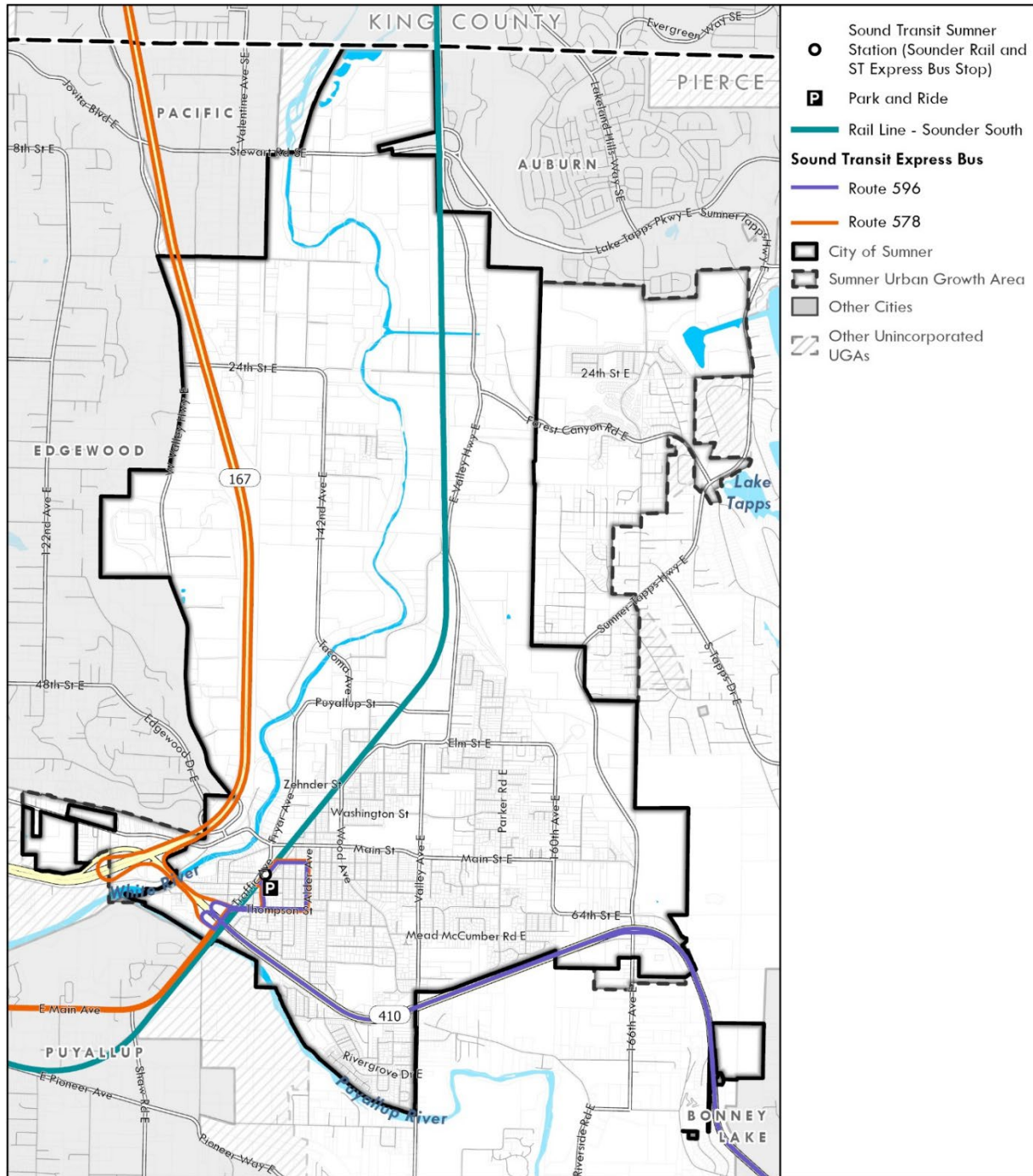
CITY OF SUMNER Future Bike Network



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Map Date: August 2024

Figure 16-4: Existing Transit Service



CITY OF SUMNER

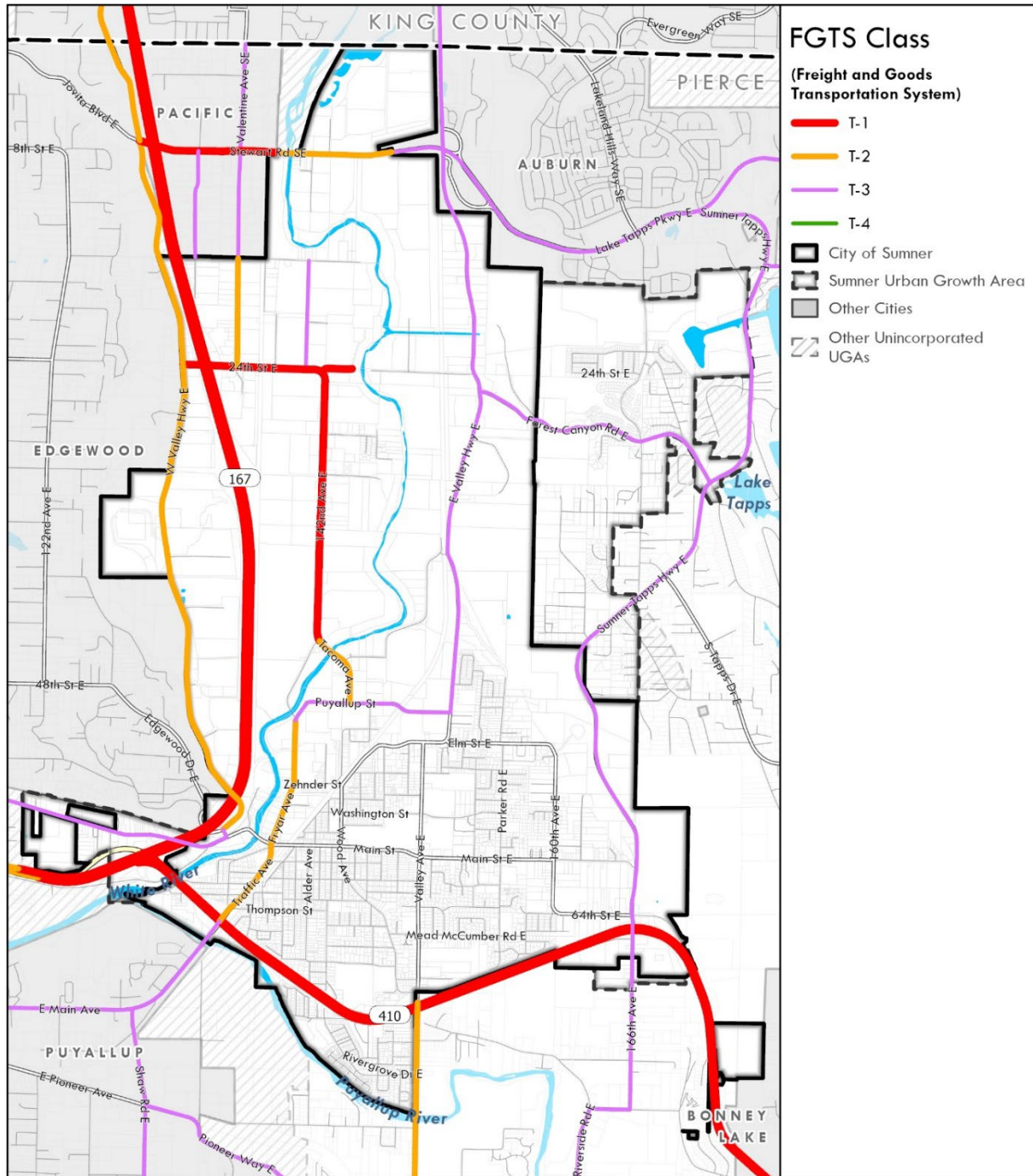
Existing Transit Service

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Map Date: February 2024

Figure 16-5: Existing Truck Routes



CITY OF SUMNER

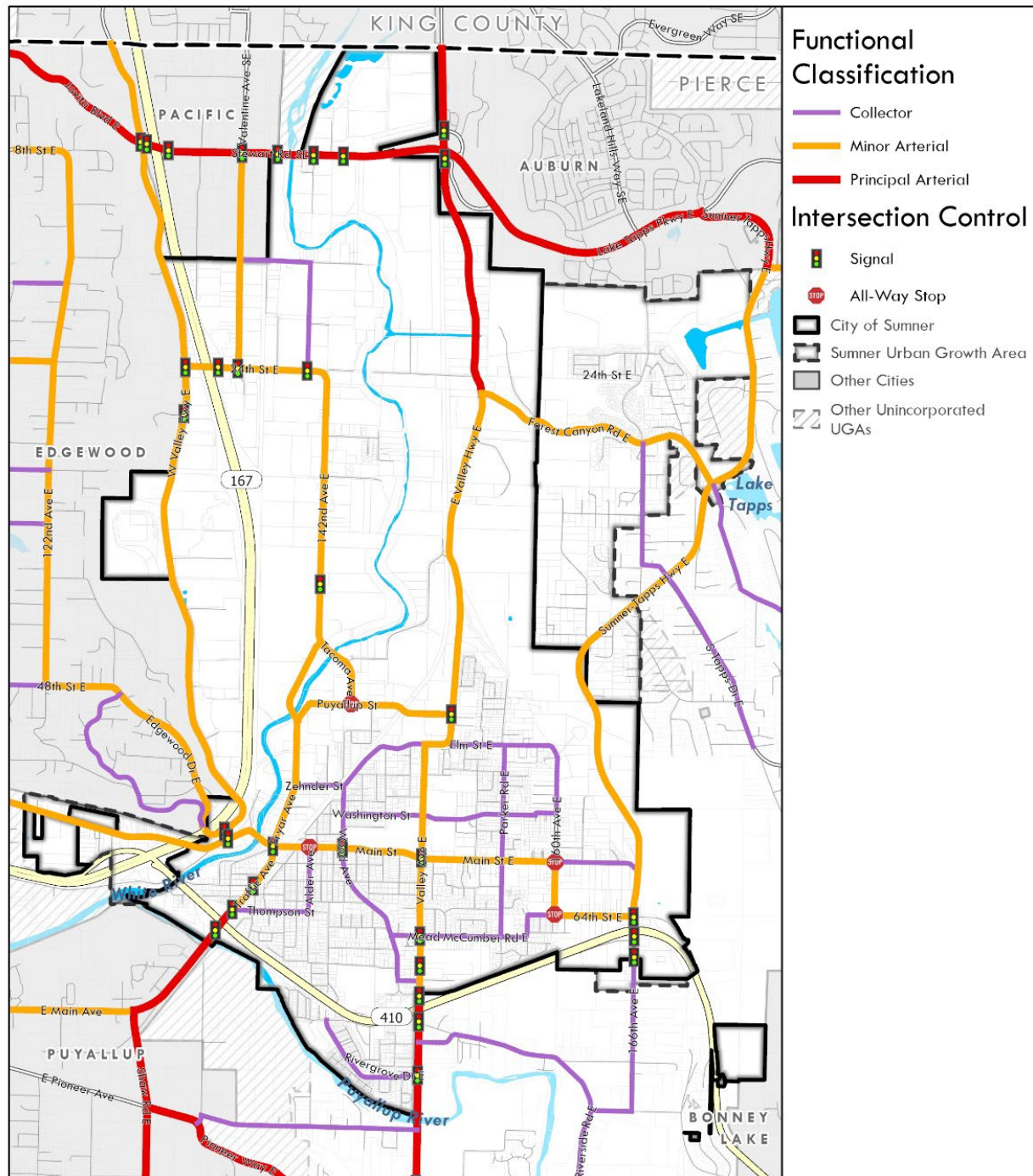
Existing Truck Routes



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Map Date: February 2024

Figure 16-6: Existing Traffic Control and Functional Classification



CITY OF SUMNER

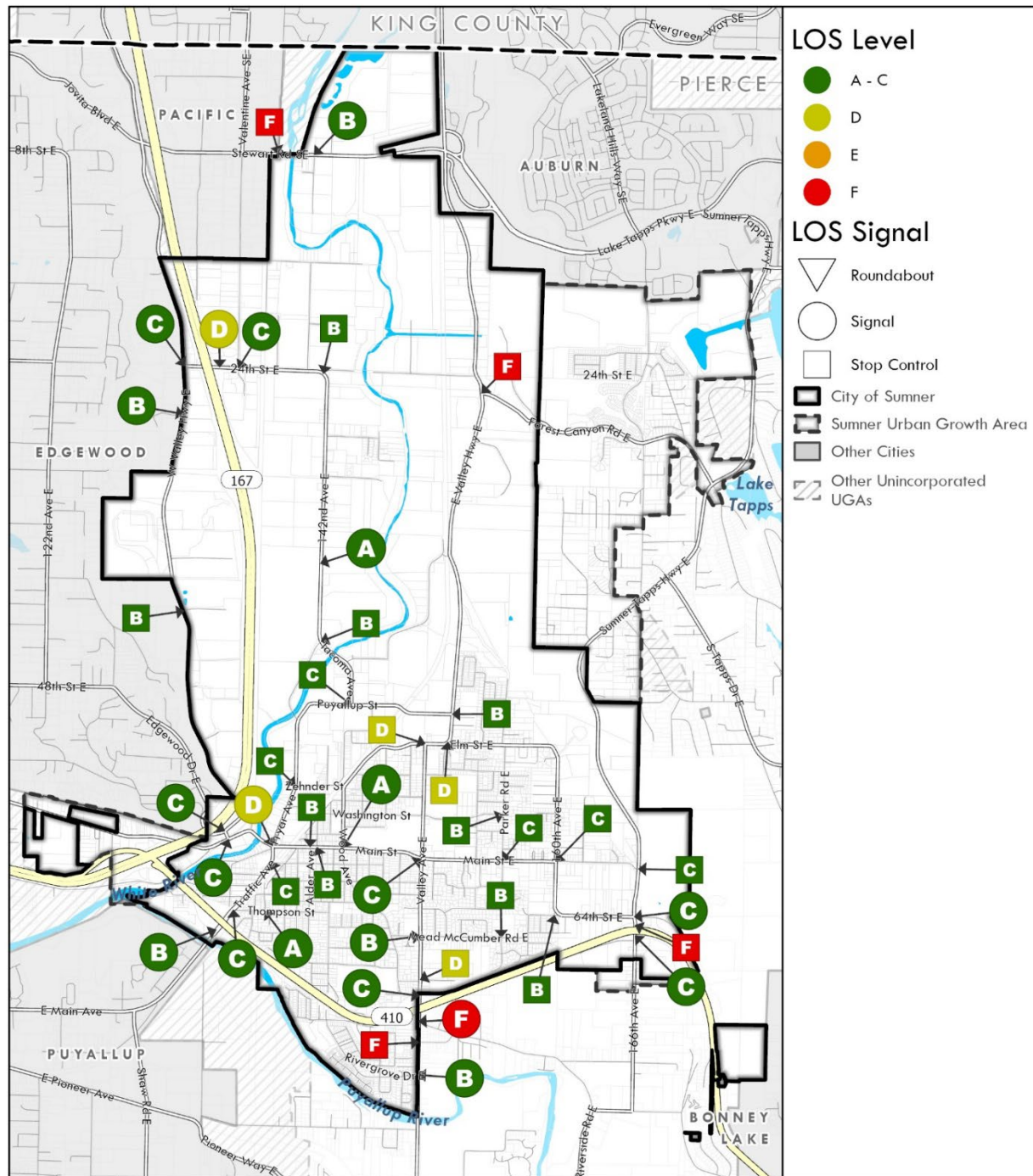
Existing Traffic Control and Functional Classification

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Map Date: February 2024

Figure 16-7: Existing Weekday PM Peak Hour Level of Service



CITY OF SUMNER

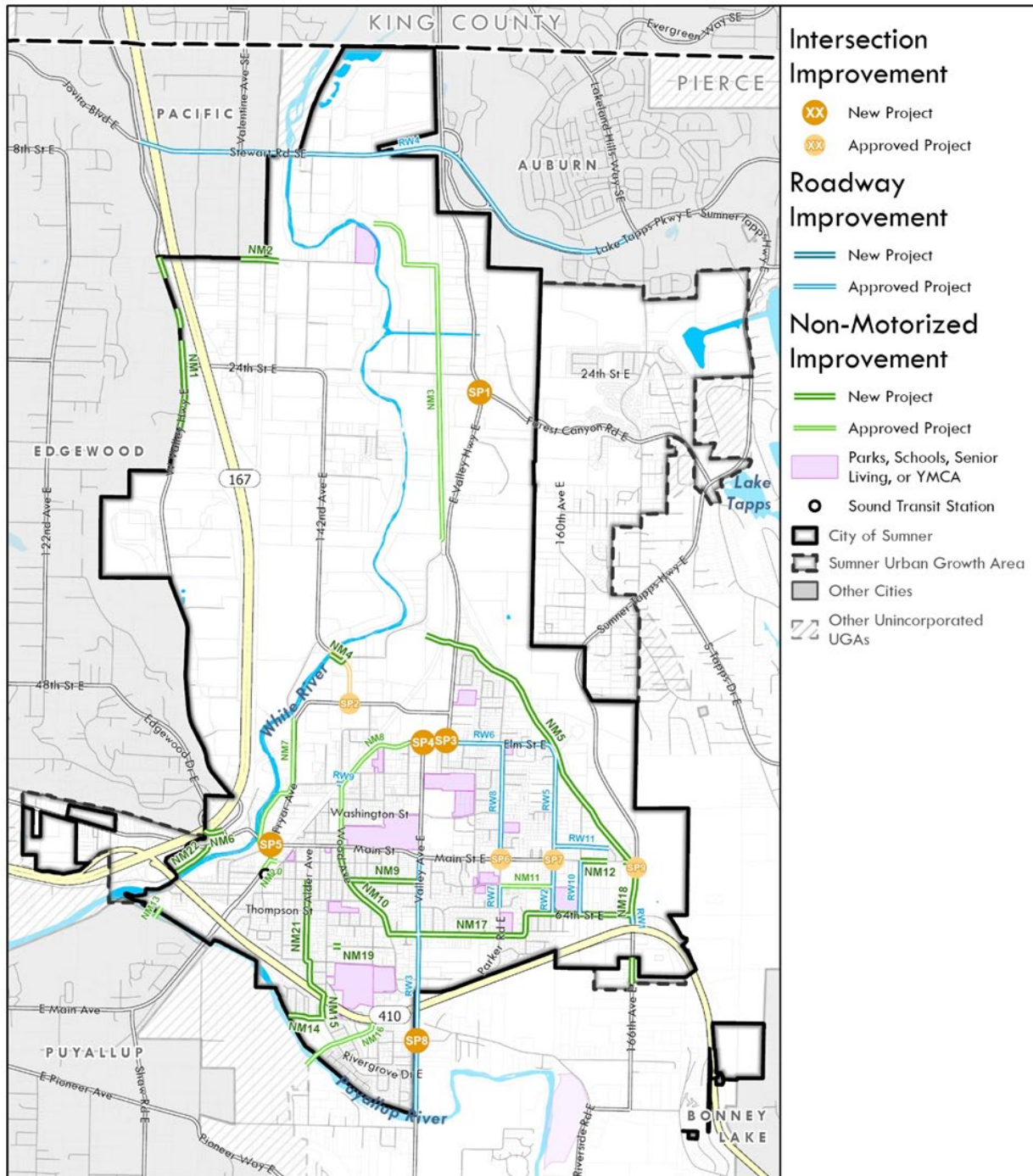
Existing Weekday PM Peak Hour Level of Service

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

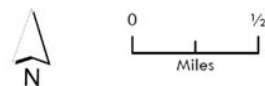


Map Date: February 2024

Figure 16-8: 20-Year Transportation Improvement Projects



CITY OF SUMNER 20-Year Improvement Projects



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Map Date: February 2024

City of Sumner

Draft Capital Facilities Plan

November 1, 2024



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Executive Summary

What is the Capital Facilities Plan for the City of Sumner?

This Capital Facilities Plan (CFP) is a supporting document to the Comprehensive Plan.

The CFP identifies what public facilities and services are needed for the planned growth and how to finance them. It evaluates existing infrastructure and levels of service (LOS) for government facilities, water facilities, sanitary sewer, stormwater, parks, public streets, fire facilities, and public school facilities. With a set of capital projects and financial plans to carry them out, a CFP provides a clear path forward for infrastructure expansion. The CFP also ensures that infrastructure improvements are provided at the same time as development ("concurrent") as required by state law.

General Government Facilities

There are known existing deficiencies and capacity issues with the City's general government facilities, such as sufficient police officer staffing and building space. As population growth occurs in Sumner, additional staffing and projects will be needed to meet LOS standards. The City has identified several projects related to government facilities over the next six years, including a new Public Works shop. The City will also be considering options for increasing general government capacity that include expansion of existing facilities, acquiring land and building new facilities, or locating offices within other city facilities such as the planned Operations Facility or new events building at Heritage Park, as well as increasing police staffing.

Water Facilities

The Sumner Water System Plan anticipates growth to 2068 and identifies associated strategies and investments. Growth assumptions for the 2068 high growth scenario in the Water System Plan are higher than planned growth through 2044, and it is possible that the 2044 growth could be accommodated. Growth timing can be addressed through regular monitoring and capital planning, as the Water System Plan is updated every 6-10 years. The 2020 Capital Improvement Plan for water facilities (in the 2020 Water System Plan) has projects related to the distribution system, source improvements, storage, and operations and maintenance to improve the system and accommodate growth.

Sanitary Sewer

The 2020 Sanitary Sewer Plan identifies existing gravity sewer deficiencies, though there are no pump station or force main deficiencies. The 2020 Capital Improvement Program for sanitary sewer shows a number of projects in the 20-year planning period (2018-2038) to

address system deficiencies and accommodate growth including sewer line extension, replacement, and relocation; wastewater treatment upgrades; pump and equipment replacement.

Stormwater Facilities

The 2020 Stormwater Capital Improvement Plan outlines recommended capital improvement projects based on existing deficiencies in the system. These projects are scheduled through 2026 and after 2026. Outlined projects include levee improvements, culvert replacements, and numerous other system improvements.

Parks Facilities

No existing deficiencies for active recreation facilities are identified based on the 2024 Sumner population, however, population and job growth will result in more facilities and system investment needed by 2044 to maintain the current levels of service. Projects identified in the adopted Sumner 2023-24 budget include replacement of Rainier View Park playground, continued funding of improvements to Seibenthaler Park and the proposed Bennet Park property, and projects to replace playground equipment, add shelters, and add picnic areas.

Fire Facilities

Staffing at Station 113 currently meets the minimum recommended firefighters per the 2015 CFP. In 2022, EPFR's urban response was slightly below target levels of service. The increase in the number of calls requiring dispatch means that Station 113 may struggle to meet minimum levels of service in coming years and staffing of fire stations serving the current area should be increased. Additional fire stations may also be required. A voter-approved bond passed in 2018 in the East Pierce Fire and Rescue district. This bond made it possible for EPFR to upgrade or re-construct five fire stations in the district. While none of the voter-approved bonds will go directly to Station 113 renovations, additional capacity, updated facilities, and new stations elsewhere in the district can increase the overall level of service within Sumner due to equipment, staff, and dispatch overlap.

Public School Facilities

Both Bonney-Lake and Dieringer School Districts have schools that are currently enrolled over their student capacity and are expected to need to add capacity to accommodate growth. Both districts have Capital Facilities Plans that include projects to add capacity (high school capacity for Bonney-Lake and elementary school capacity for Dieringer). However, both districts serve students outside of Sumner city limits, which will affect facility planning.

Public Streets & Roads Facilities

Overall, the analysis finds that most of the roadway study intersections operate at level of service (LOS) D or better during the weekday PM peak hour with the projected growth. Some intersections, however, are forecast to degrade below LOS D during the weekday PM hour. The pedestrian LOS analysis shows most of the future pedestrian network meets the standard. There are some key connections to trails south of SR 410 that are missing as well as corridors such as Elm Street and 160th Avenue E that have missing sidewalks. The bike LOS analysis shows that bike connectivity east-west is limited and there is a lack of facilities within the east part of Sumner. The 2024 Transportation Plan contains numerous transportation improvements and projects that will be necessary to maintain the levels of service for vehicle, pedestrian, and cyclist networks as the city grows.

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Chapter 1: Introduction

The 1990 State Legislature approved the Growth Management Act (GMA), which directs local government to control and manage growth. The State Legislature recognized that uncoordinated and unplanned growth, together with a lack of common goals, could impact the environment and affect economic development and the high quality of life for Washington citizens.

GMA has significant requirements in the areas of facilities planning and capital improvement financing. GMA is to ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use, without decreasing current levels of service below locally established minimum standards.

The requirements for preparing a capital facilities plan under GMA have changed the way comprehensive planning generally has been done. Both the transportation element and the capital facilities element reinforce the requirement that comprehensive plans prepared according to GMA be realistic. The requirements for setting level of service standards, inventories, and forecasts of existing and needed capital facilities, six-year financing plans, and concurrency all require a more complex level of planning than what existed prior to GMA.

The Sumner Capital Facilities Plan (CFP) is a document that provides a list of proposed major capital expenditures throughout the City. It also provides a multi-year look at the strategies and financing requirements for major capital programs. The plan projects needs six years into the future for major construction, infrastructure improvements, and land acquisition, in addition to machinery and equipment purchases. The plan then provides a funding strategy and projected funding scenarios for each succeeding year. A CFP makes good business and planning sense.

The following are some of the benefits of a CFP:

- It provides policy makers with a current and future view of the capital needs
- It provides a mechanism for assessing the financial ramifications of funding or not funding programs
- It provides an opportunity to combine similar projects across departmental lines
- It supports good management that demonstrates the need for facilities and the need for revenues to pay for them
- It provides accessibility to various sources of revenues (i.e. grants, Public Works Trust Fund, impact fees, real estate excise taxes) that require a CFP in order to qualify for the revenue

The City of Sumner is responsible for providing facilities and services that are needed by the residents and businesses of the City for a safe, secure, and efficient environment within which to conduct their affairs. GMA defines public facilities to include: streets, roads, highways, sidewalks, street and road lighting systems, and traffic signals; domestic water systems; storm and sanitary sewer systems; parks and recreational facilities; and schools. It further defines public services to include fire protection and suppression, law enforcement, public health, education, recreation, environmental protection, and other governmental services.

As provided in GMA, capital facilities plans are a required part of the Comprehensive Plan and are to provide capital facilities for land development that is envisioned or authorized by the Land Use element. Capital facilities planning is grounded in local decisions. The City of Sumner defines what constitutes a capital facility, and sets overall levels of service, differential levels of service, contingencies, etc. based on local desires and needs. The capital facilities plan is meant to coordinate and provide consistency among the many plans for capital improvements, various master plans, and other studies. It should ensure the timely provision of adequate facilities as required by GMA.

The CFP is the element that makes the rest of the Comprehensive Plan come to life. By funding projects needed to maintain levels of service and concurrency, the CFP determines the quality of life in the community. The requirement to fully finance the CFP provides a reality check for the vision of the Comprehensive Plan.

Planning for capital facilities is a complex task. First, it requires an understanding of future needs; second, it must assess the various types of capital facilities that could be provided and identify the most effective and efficient array of facilities to support the needed services. Finally, it must address how these facilities will be financed.

Planning what is needed is itself only a beginning. Planning how to pay for these needs is another step. Only so much can and will be afforded. Securing the most effective array of facilities in light of limited resources and competing demands requires coordination of the planned facilities and their implementation. It also requires a thorough understanding of the fiscal capacity of the City to finance these facilities. Financial planning and implementation of capital facilities cannot be effectively carried out on an annual basis, since often the financing requires multi-year commitments of fiscal resources. As such, this plan is long-range in its scope.

Prioritization of the various projects has been done to set the funding package together. Each project proposal is matched against the criteria.

That criterion (in order) is:

- A legal or statutory requirement for carrying out the improvement (a legal mandate)
- An emergency repair
- A continuation of multi-year projects (contractual obligations, etc.)
- Implementation of legislative (Council) goals and objectives
- Ability to leverage outside sources (grants, mitigation, impact fees, low interest loans, etc.)
- An enhancement of or general repair of existing facilities
- An acquisition and development of new facilities

For financial and accounting purposes, municipal operations are divided into two broad categories: general governmental, and enterprise.

1. General governmental activities are primarily tax and user fee supported, while
2. Enterprise activities rely primarily on fees generated from the sale of goods and services for their operations (rate payers).

Capital improvements for police, fire, parks, administration, and transportation are traditionally general governmental in nature, while water, sanitary sewer, storm drain, and cemetery are enterprise.

Capital funding for both general governmental and enterprise categories emanates primarily from operating revenues, with grants, local improvement districts, latecomer, and impact fees frequently contributing substantial sums towards capital construction. General governmental and enterprise operations both use such debt financing strategies as bonding and leasing to help fund improvements like water, sewer, and storm drain rates or raising the connection charges or system development charges. In the general governmental area, however, Washington State law limits the revenue sources that municipalities can use, the tax rates, and the amount of general obligation debt capacity that can be issued to raise funds for capital improvements.

As a result of GMA, through proper legislation of the City Council, impact fees for various areas can be established. They include:

- public streets and roads;
- publicly owned parks, open space, and recreation facilities;
- school facilities; and
- fire protection facilities in jurisdictions that are not part of a fire district

The City of Sumner has adopted a Traffic Impact Fee (TIF) and school, parks, and trails impact fees, and adopted mitigation fees for fire protection.

Chapter 2: Concurrency of Capital Facilities

2.1 Introduction

Concurrency is a requirement that the capital facilities needed to serve new development are available concurrent with the impact of the new development on the community. This can be accomplished in several ways. It is based on maintaining a “level of service” (LOS) for these facilities that is adopted by the community in its comprehensive plan. In specific terms, the “concurrent” capital facilities must be constructed or have strategies in place (such as an impact fee program) at the time the new development is ready for occupancy. Alternatively, it is possible for a city to accept a performance bond to install the concurrent facilities within a six-year period of time after occupancy of the development. Concurrency is a comparison of the infrastructure needed by the new development (example: 4 lane road) to the existing infrastructure in place (example: 2 lane road) and providing for the construction of the new facilities needed (additional 2 lanes of road).

When concurrency is applied to a specific development, one of two outcomes is possible:

Outcome 1

When a new development requires capacity of capital facilities that are already in place, then that development has satisfied the concurrency test. Development and occupancy can then proceed.

Outcome 2

When a new development requires capital facilities that do not exist in order to maintain an adopted level of service, then that development does not satisfy the concurrency test. The new enhanced capital facilities must be strategized for, constructed, or bonded. Costs of the new facilities will be borne by the developer’s fair share impact, the City, and possibly other parties participating in the installation of facilities.

2.2 Concurrency – What is it?

Concurrency is synonymous with the provision of adequate public facilities for a particular development project. GMA gives numerous statements of standards to follow:

GMA Planning Goals 12 (RCW 36.70A.020)

“...public facilities and services. . . shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.”

Subdivisions (RCW 58.17.110 (2))

"A proposed subdivision and dedication shall not be approved unless the city, town, or county legislative body makes written findings that: (a) appropriate provisions are made for the public health, safety, and general welfare and for such open spaces, drainageways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools, and school grounds. . ."

Comprehensive Plans - Mandatory Elements (RCW 36.70A.070 (6)(b))

". . . local jurisdictions must adopt and enforce ordinances which prohibit development approval if the development causes the level of services on a locally owned transportation facility to decline below the standards adopted in the transportation element of the comprehensive plan, unless transportation improvements or strategies to accommodate the impacts of development are made concurrent with the development . . . For the purposes of this subsection, 'concurrent with the development' shall mean that improvements or strategies are in place at the time of development, or that a financial commitment is in place to complete the improvements or strategies within six years."

Impact Fees (RCW 82.02.050 (1)(a))

"...It is the intent of the legislature . . . To ensure that adequate facilities are available to serve new growth and development."

Concurrency (WAC 365-196-840 (1)(b))

"...Concurrency describes the situation in which adequate facilities are available when the impacts of development occur, or within a specified time thereafter. Concurrency ensures consistency in land use approval and the development of adequate public facilities as plans are implemented, and it prevents development that is inconsistent with the public facilities necessary to support the development."

2.3 Concurrency Applied

Adopted policies in the Capital Facilities Element of the Comprehensive Plan and in the Transportation Plan address the topic of concurrency. Draft policies in the 2024 update continue to support the concurrency of development and adequate public facilities.

2.4 Absence of Concurrency

If a particular development fails to meet levels of service or other plan performance measures, development standards, impact, or mitigation fee charges, then that development should not be permitted for construction or occupancy. Furthermore, the city may enact a

moratorium on new development if the level of service is not being met or will not be met in six years.

2.5 Comprehensive Plan Consistency

The Growth Management Act requires local capital facilities plans to ensure that their comprehensive plans' land use, transportation, and capital facilities elements are coordinated and consistent.

As the City's Land Use and Transportation Plans are set forth, capital facility system improvements needed to support growth can be adequately financed by the City through the Capital Facilities Plan (CFP). If, in the future, capital facilities (system improvements) needed to obtain concurrency for development are not funded by the CFP due to omission or lack of funds, one or more of five strategies must be employed to obtain consistency of plans and concurrency of necessary infrastructure:

Strategy 1: Unfunded infrastructure projects can be voluntarily fully-funded by a project developer. The provision to use fair-share payback arrangements such as latecomers' agreements would be available. Also, the LID process would be an alternative funding source.

Strategy 2: The City increases tax revenues, grants, and/or issue bonds to increase CFP funding and thereby construct needed infrastructure.

Strategy 3: The City amends the CFP to re-prioritize projects and thereby fund infrastructure projects needed to obtain concurrency.

Strategy 4: The City reassesses its Land Use Plan and zoning to lower land use densities and thereby decrease the demand for construction of new infrastructure.

Strategy 5: The City lowers its level of service standards for transportation and identifies minimum standards for other infrastructure through respective plan documents.

Strategy 6: The City Council may consider adopting a moratorium on development if concurrency cannot be met by the other strategies. Capital Facilities Defined

GMA requires a jurisdiction's capital facilities plan to discuss what existing capital facilities are owned and identify their locations and capacities. For the purposes of this CFP, a capital facility means a structure, improvement, piece of equipment, or other major asset that has a useful life of at least 10 years, costs at least \$50,000, and has a specified level of service defined by the Comprehensive Plan.

These capital facilities are provided for public purposes and services and are limited to: potable water, sanitary sewer; stormwater, parks and open space, police, fire, public schools, streets and sidewalks, and general government facilities. Table 2-1 illustrates what types of structures, improvements, equipment, and other major assets may be considered “capital facilities.”

Table 2-1: Capital Facilities

Facility	Improvements, equipment, etc.
Potable Water System	New well/Springs Water tanks Treatment facilities/buildings Transmission/distribution pipeline system
Sanitary Sewer	Wastewater Treatment Facility Pump stations & standby generators Sewer collection and conveyance system
Stormwater	Regional detention/Treatment facilities Subdivision detention/treatment facilities (public) Pipeline/open channel conveyance systems
Parks and Open Space	Purchase of park property Construction of park facilities Construction of trail facilities
Police	Expansion of City Hall and/or construction of a police precinct facility
Fire	Expansion of fire station Construction of new fire station Purchase of apparatus over \$50,000 in cost
Public Schools	New school/administration buildings Expansion of schools
Streets and Sidewalks	Arterial street improvements Collector, residential & neighborhood streets Intersection improvements including traffic signals Sidewalks Traffic calming and street amenities and roundabouts
General Government	Expansion of City Hall, senior center, or library
Public Works Shops	Expansion of Public Works shops buildings or site Purchase of major piece of equipment over \$50,000 in cost (backhoe, etc.)

Chapter 3: Existing Facilities

3.1 Introduction

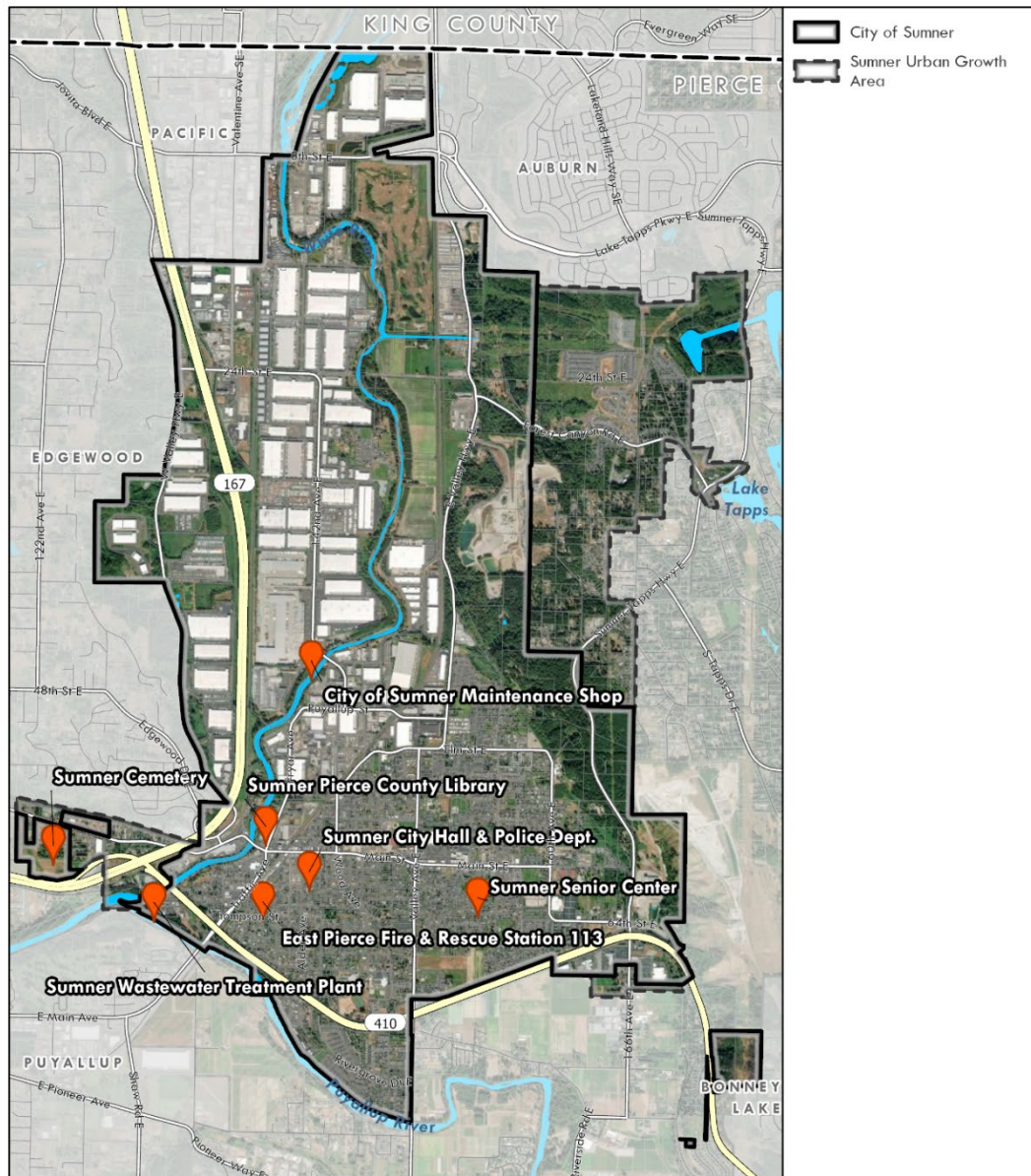
This chapter contains a summary of capacities and locations for existing capital facilities owned by the City of Sumner, East Pierce Fire & Rescue (EPFR), and the school districts.

3.2 General Government Facilities

General Government Buildings

General government facilities are mainly housed in City Hall at 1104 Maple Street (Figure 3-1). City Hall houses offices for the Administration, Finance, Community Development, Development Services, City Attorney, Human Resources, and Public Works Departments. The City Hall building area housing these services is 14,577 square feet (this does not include the Police Department that is also in the same building; see Police Facilities below).

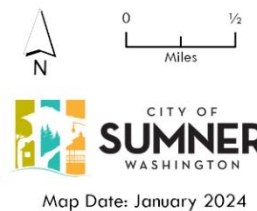
Figure 3-1: General Government Facilities



CITY OF SUMNER

General Government Facilities

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Source: City of Sumner 2023; Parametrix 2023.

The current facilities square footage is outlined in Table 3-1 below:

Table 3-1: City Government Buildings

Facility	Building Area (s.f.)
General Government	14,577
Police	7,654
Public Works Shops	17,136
Cemetery Buildings	11,585
Senior Center	6,015
Sumner Library Building	10,802

Police Facilities

The Sumner Police Department (SPD) provides law enforcement services within city limits. SPD headquarters are located at Sumner City Hall in a building area of 7,654 square feet. The SPD currently employs 21 commissioned officers, 4 non-commissioned employees, and 1 special commissioned officer. In 2021, SPD responded to 15,800 calls for police service¹ and 14,530 calls in 2023 (slightly fewer due to reduced number of officers, who initiate many of the calls). Officers circulate throughout the City on patrol and respond to calls from a dispatch center in Tacoma through South Sound 911. The police facility in City Hall currently houses the communications center, holding cells, conference room, locker facilities, and sundry offices. Jail facilities are provided through an inter-local agreement with the City of Puyallup. Sumner's court services operate through Bonney Lake Municipal Court with Sumner judge presiding.

The animal control shelter is located at 1200 39th Ave S.E. in Puyallup in a building area of 3,080 sf. The shelter contains a combination of 16 kennels for dogs and 46 for cats and small animals. These include kennels for housing adoptable pets, stray dogs, and quarantine facilities. In day-to-day operations, these kennels may be used for different needs depending on demand. The shelter is provided by the City of Puyallup but operated by the City of Sumner. The facility provides animal sheltering and enforcement for seven agencies in the area.

¹ City of Sumner 2023-2024 Biennial Budget, 2023. Retrieved from <https://sumnerwa.gov/wp-content/uploads/2023/04/2023-2024-City-of-Sumner-Biennial-Budget-shrunk.pdf>.

Public Works Shop Facilities

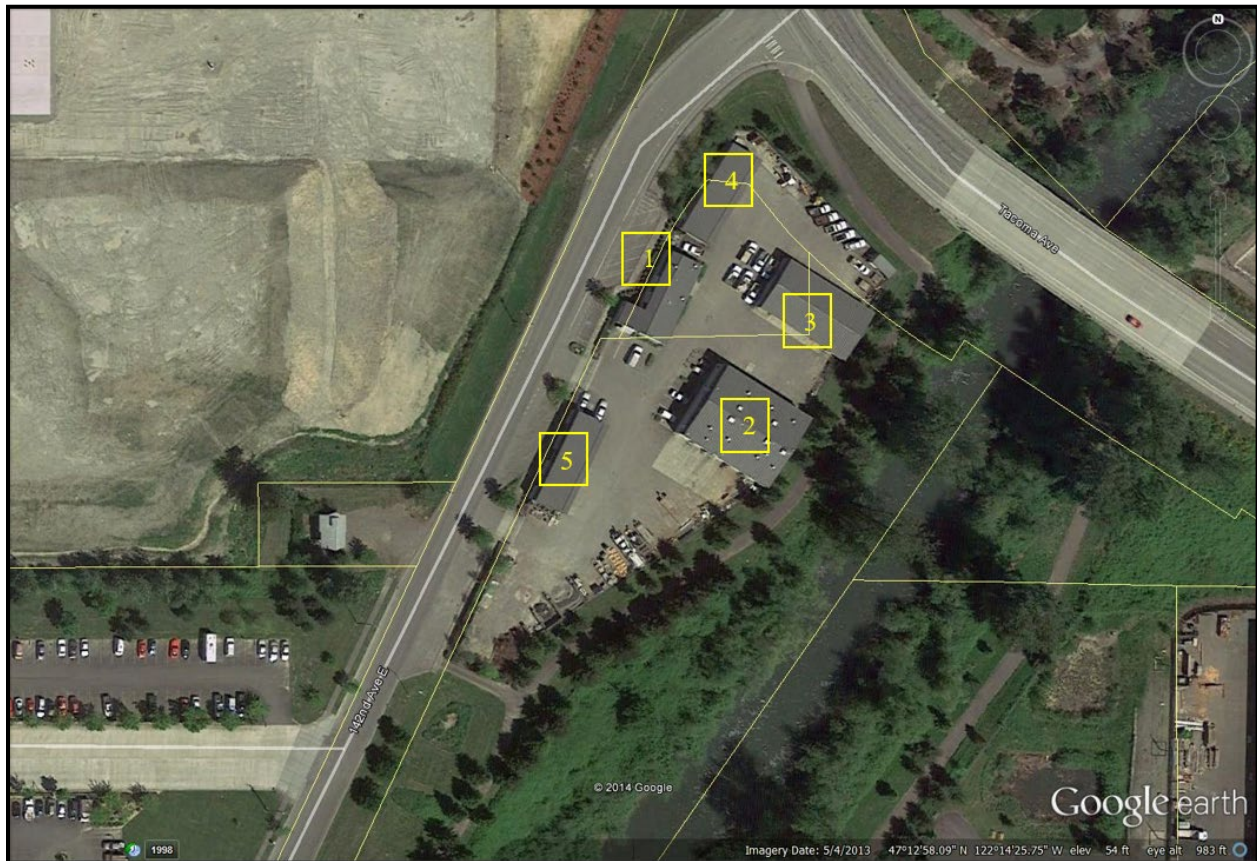
The existing Public Works shops are located at 4711 142nd Ave E (see Figure 3-2) on approximately 8.35 acres. The shops were constructed in 2000. This facility is made up of five buildings totaling 17,136 square feet (see summary in Table 3-2). A new Public Works Operations Facility located on 29th Street East is planned to begin construction in 2024. The facility will have approximately 88,000 s.f. of building space on a 7.6-acre site.

Table 3-2: Current Public Works Shop Buildings

Building No.	Description	Size (s.f.)
1	Offices, meeting rooms, restroom, lockers	2,520
2	Vehicle wash, repair, storage, sign shop, welding/fab shop.	5,880
3	Vehicle storage	4,032
4	Vehicle storage	2,352
5	Material storage (pipe, etc.)	2,352
Total		17,136

Source: City of Sumner Community Development Department, 2023

Figure 3-2: Public Works Shop Facilities - Current



Source: City of Sumner, 2015; Google Earth, 2015.

3.3 Water Facilities

A schematic of the Sumner Water System is in the *City of Sumner General Water Plan Update, August 2020*, and shows the size and location of pipes. The reader is directed to this large format map for a complete inventory of the system.

Water Facilities Service Area

The Sumner water utility service area is situated in the Puyallup/White River basin and is adjoined by the water services areas of the City of Bonney Lake, Mountain View-Edgewood, the City of Puyallup, Valley Water District, the City of Auburn, Tacoma Water, and the City of Pacific. The Sumner water system has interties with both the Pacific and Puyallup water systems. These interties are for use during emergencies only and do not provide additional water for daily demands. The future Sumner water service area, which is shown in Figure 3-3, is consistent with the *Pierce County Coordinated Water System Plan* and is located entirely within the Urban Growth Area (UGA) boundary established by Pierce County.

Table 3-3: Sumner Potable Water Source Capacities

DOH ID	Source Name	Source Type	Source Capacity (mgd)	Water Right (mgd)
SO 1	Sumner Springs	Free-flowing spring	1.15 ¹	4.04
SO 2	Weber Springs	Free-flowing spring	Flow and water rights are combined with Sumner Springs and County Springs	Flow and water rights are combined with Sumner Springs and County Springs
SO 3	Elhi Springs	Free-flowing spring	0.13 ²	0.52
SO 4	County Springs	Free-flowing spring	0.79 ¹	1.15
SO 5 ⁴	West Well	Artesian Well	0.36 ³	0.36
SO 6	South Well	Artesian Well	1.013	1.445
SO 7	Dieringer Well	Artesian Well	0.363	.14
SO-CW	Central Well	Artesian Well	1.51 ³	0.43/1.51 ⁶

Source: City of Sumner General Water Plan Update, 2020

¹. Source capacity based on historic station meter readings.

². Source capacity based on City records; Elhi Springs is typically not being utilized.

³. Source capacity based on well pump capacity.

⁴. The West Well is currently utilized primarily for irrigation.

⁵. Source pumping capacity is less than the City's Water Rights.

⁶. The City obtained a Temporary Water Right to use the Central Well as an additional point of withdrawal for the South and West Well water rights. Combined instantaneous withdrawal from the Central, South, and West Wells is not to exceed 1.8 mgd.

Water System Source

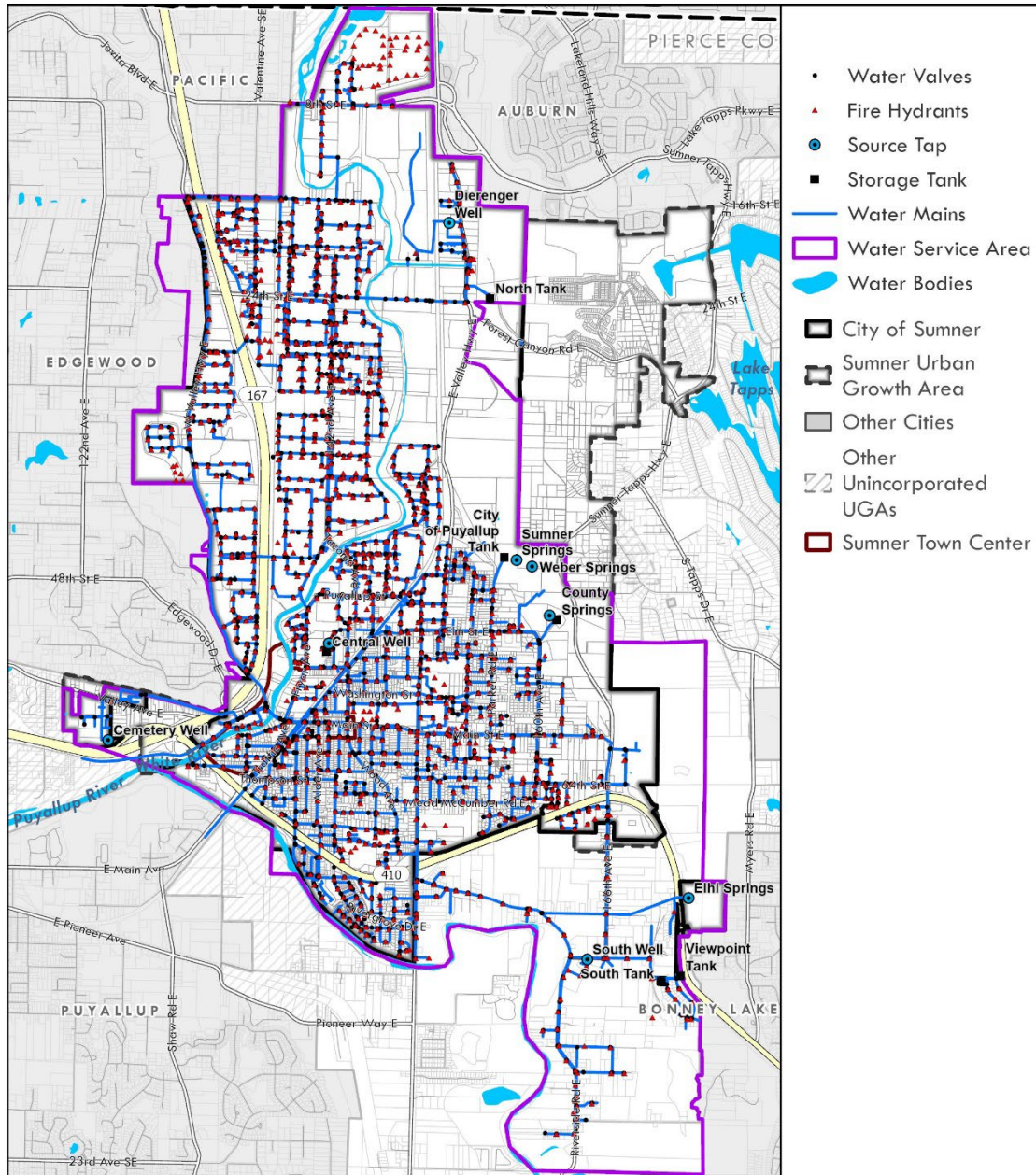
Sumner currently uses eight potable water sources, including four springs (County Springs, Sumner Springs, Weber Springs, and Elhi Springs) and four wells (South Well, Dieringer Well, West Well, and Central Well). The Sumner potable water sources' physical capacity inventory is in Table 3-3. These water sources are also served by chlorination facilities.

Water System Storage

The City has five (5) storage tanks, all but one being gravity-fed, with a total storage capacity of 5.398 million gallons; a summary of storage information is provided in Table 3-4. The tanks are in good condition, and in 1998 a 2.0 million gallon concrete post-tensioned cable wrap North Tank was constructed on the east hill to provide adequate fire flows to the North Sumner Industrial area. The 1.0 million-gallon welded steel Sumner Springs Tank was refurbished and repainted (inside and out) in 2023. The 2.0 million-gallon welded steel South

Tank was repainted in 2005 and is scheduled to be repainted in 2024 or 2025. The Sumner Viewpoint tank was constructed in 2006 to serve a 120-lot subdivision.

Figure 3-3: Water Service Area Map



CITY OF SUMNER Water Utility & Infrastructure Area

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Source: City of Sumner Water System Plan, 2020

Table 3-4: Water System Storage Information

Name	Functions	Total Volume	Working Volume ¹	Dimensions (Diameter)	Height (feet)	Overflow Elevation (feet)	Floor Elevations (feet)	Condition
Sumner Springs Tank Built in 1956 (steel) Repainted in 2002	Storage, Chlorine Contact	1.0 MG	1.0 MG	81 ft.	26.0	234.0	208.0	Good
County Springs Tank Built in 1986 Cast-in-place concrete	Primarily Chlorine Contact	68,000 gal	66,000 gal	20 ft.	28.0	234.0	207.0	Good
South Tank Built in 1973 (steel) To be repainted in 2005	Storage	2.0 MG	2.0 MG	104 ft.	32.0	234.0	202.0	Good
North Tank Built in 1998 Concrete post-tensioned	Storage	2.0 MG	2.0 MG	120 ft.	24.23	234.23	210.0	Good
Sumner Viewpoint Built in 2006	Storage, high pressure zone	330,000 gal	194,000 gal	26 ft.	85.00	392.00	310.0	Good

Source: General Water Plan Update, 2020

¹ To overflow elevation.

Water Distribution System

The distribution system piping ranges in size from a 2- to 18-inch diameter. The 90 miles of pipe also vary in age and material; most of the pipe installed before 1960 is cast iron with packed joints or small diameter steel pipe, while the pipe installed between 1960 and the mid-1980s is mostly asbestos cement pipe with O-ring rubber gasket couplers. All new water mains installed since the mid-1980s are Class 52 ductile iron pipe. All three pipe materials have a long design life. The system has a sufficient number of in-line valves to isolate small sections, in an effort to reduce the number of services out of water during repair events. Detailed maps of the distribution network are maintained and updated by the City. These water system maps show pipe diameters, pipe material, locations of hydrants, valves, and abandoned pipes, and give the year of installation for most pipes. Figure 3-3 is derived from these maps and shows the distribution network and other water system features as they currently exist. The approximate length and percentage of each pipe size in the distribution network is listed in Table 3-5.

Table 3-5: Water System Distribution Network Inventory (August 2017)

Pipe Sizes (Inches)	Length (Feet)	Percentage of Total System
2	6,706	1.4
3	2,739	0.6
4	6,198	1.3
6	104,199	22.0
8	165,270	34.8
10	6,889	1.5
12	160,116	33.7
14	11,338	2.4
16	6,246	1.3
18	4,903	1.0
Total:	474,603	100.0

Source: General Water Plan Update, 2020

3.4 Sanitary Sewer

The information in this section is based on the City of Sumner Sanitary Sewer Comprehensive Plan (City Sanitary Sewer Plan), adopted in August 2020 (BHC 2020), and the Wastewater Treatment Facility Capacity Increase Analysis completed in October 2009 (Gray & Osborne, Inc. 2009). The City Sanitary Sewer Plan analyzes the City's collection system, identifies any system deficiencies for existing and future flow conditions, and provides recommended

improvements and cost estimates. In preparing the plan, the City's wastewater collection system was analyzed for existing and future capacity.

Sanitary Sewer Service Area

The City of Sumner has operated a sanitary sewer system since 1927 and a wastewater treatment facility since 1957. The City's sanitary sewer service area includes the Sumner city limits, as well as portions of the Sumner UGA. As of 2020, the service area contains 7.4 miles of force mains, 52.4 miles of gravity sewer mains, and 16 pump stations (Table 3-6) for different drainage basins throughout the area. The service area is divided into basins to analyze capacity needs. The boundaries of the service area and its constituent basins are shown in Figure 3-4, along with the existing collection system for sanitary sewers.

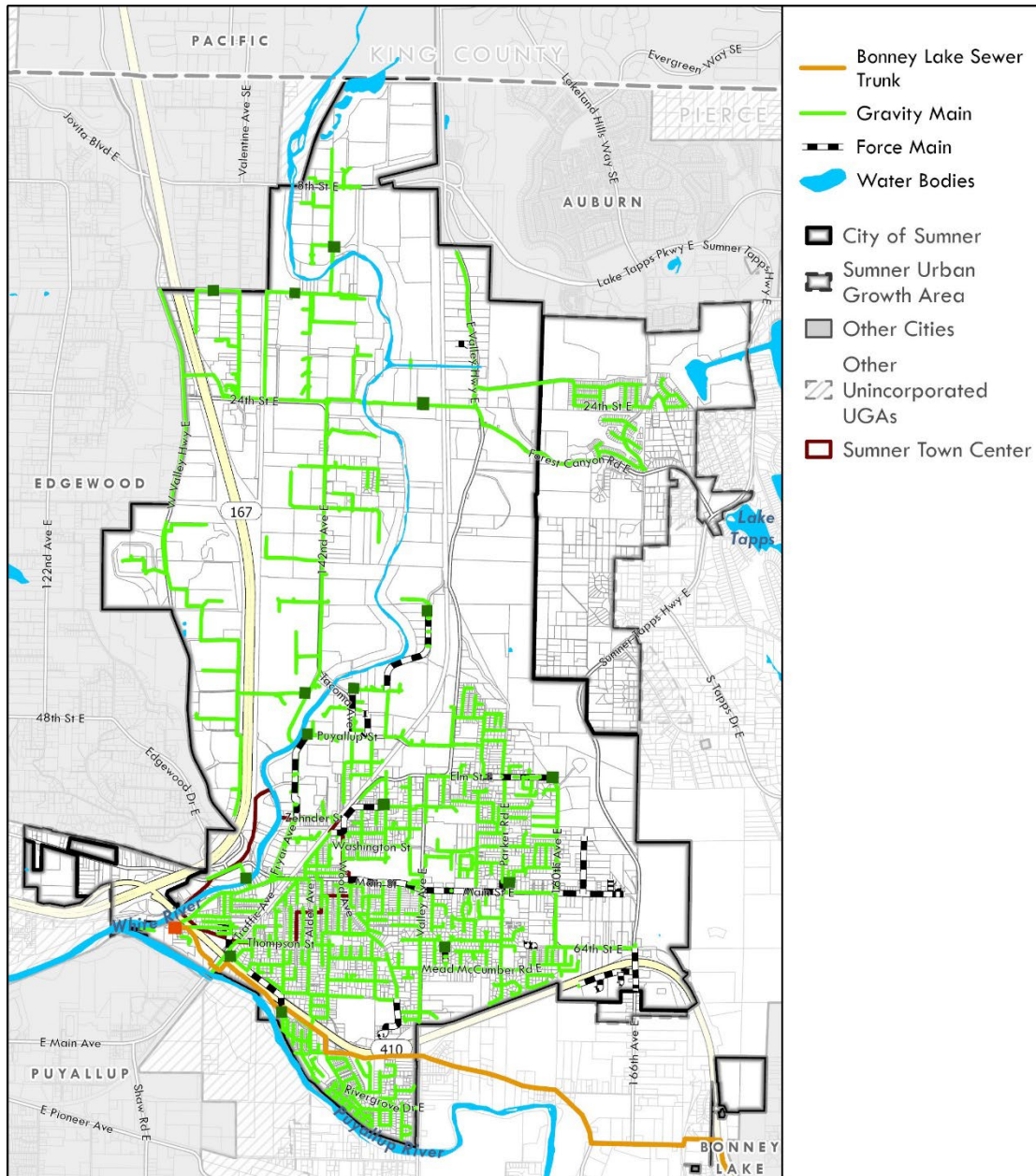
Table 3-6: Pump Station Characteristics

Pump Station	Station Name	Year Constructed	Last Year Rebuilt	Type	Station Design Capacity (Gallons per Minute)
PS-1	Tacoma	1982	2009	Submersible / Recessed Impeller	400
PS-2	North	1957	1987	Dry/wet well	500
PS-3	Van tassel	1977	2007	Submersible	250
PS-4	Jansen	1979	2006	Submersible / Recessed Impeller	130
PS-5	Parker	1963	2017	Submersible	1,330
PS-6	16th Street	1967	2017	Submersible	700
PS-7	Cherry	1966	2017	Submersible	1,180
PS-8	South	1966	2017	Submersible	775
PS-9	160th Street	1996		Submersible	130
PS-10	142nd Street	1998	2018	Submersible	1,500
PS-11	16th Ave 1	1998		Submersible	100
PS-12	16th Ave 2	1998		Submersible	100
PS-13	Cannery	2006		Submersible	213
PS-14	Forest Canyon	2007		Submersible	600
PS-15	North	2010		Submersible	500

Pump Station	Station Name	Year Constructed	Last Year Rebuilt	Type	Station Design Capacity (Gallons per Minute)
PS-16	Mastro	2012		Submersible / Recessed Impeller	200

Source: Sanitary Sewer Comprehensive Plan, 2020

Figure 3-4: Sanitary Sewers Facilities Map



CITY OF SUMNER
Sewer System

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: November 2023

Source: City of Sumner, 2023; Parametrix, 2023.

Wastewater Treatment Facility (WWTF)

The Wastewater Treatment Facility (WWTF) is located at 13114 63rd Street East, at the confluence of the Puyallup and White (Stuck) rivers (Figure 3-5). The WWTF provides sanitary sewer treatment to all of the current plan area as well as the City of Bonney Lake. The City maintains an agreement with the City of Bonney Lake which allows Bonney Lake to use up to approximately 54% of the plant's capacity, while the remaining approximately 46% of the plant's capacity is reserved for flows from the Sumner service area.

The WWTF is a secondary treatment facility and discharges treated effluent to the White (Stuck) River. The last major upgrade to the WWTF was completed in 2016. Capacity measurements for treatment plants include wastewater flow (measured in gallons per day) and organic influent loadings (or solids). The most common measurements of organic loadings are 5-day biochemical oxygen demand (BOD₅) and total suspended solids (TSS). According to the 2020 General Sewer Plan, the WWTF treats an average wet weather wastewater flow of 1.67 MGD.

The resulting treatment capacity of the WWTF upgrade is as follows:

- Maximum Month (Design Flow): 6.10 MGD
- Peak Day Flow: 11.66 MGD
- Peak Hour Flow: 19.87 MGD
- Influent BOD₅: 10,900 lbs/day
- Influent TSS: 12,660 lbs/day

As City of Bonney Lake anticipates more rapid growth of its sewer area than Sumner in the future, another WWTF expansion may be necessary and would likely be funded heavily by the City of Bonney Lake. A WWTF Feasibility Study was completed in 2016, concluding that a maximum month WWTF capacity of 9.2 MGD was achievable at the existing treatment facility site.

Figure 3-5: Wastewater Treatment Facility - 13114 63rd Street East



Source: Google Earth, 2023.

3.5 Stormwater Facilities

The information in this section is based on the *City of Sumner 2011 Stormwater Comprehensive Plan Update* (City of Sumner 2011), which is an update to the *City of Sumner Stormwater Comprehensive Plan* adopted in 1992 and is incorporated in this study by reference. This section deals with the capacity issues associated with the physical stormwater collection and discharge system. Additionally, the City completed a *2020 Stormwater Capital Improvement Plan* to update the planned project list

The Sumner Valley has historically been drained to lower the natural water table, control flooding, and create land that was more conducive for agriculture. As more intensive commercial/industrial and residential development has occurred, expansion of the stormwater system has been necessary to collect and convey stormwater to the rivers and to prevent flooding.

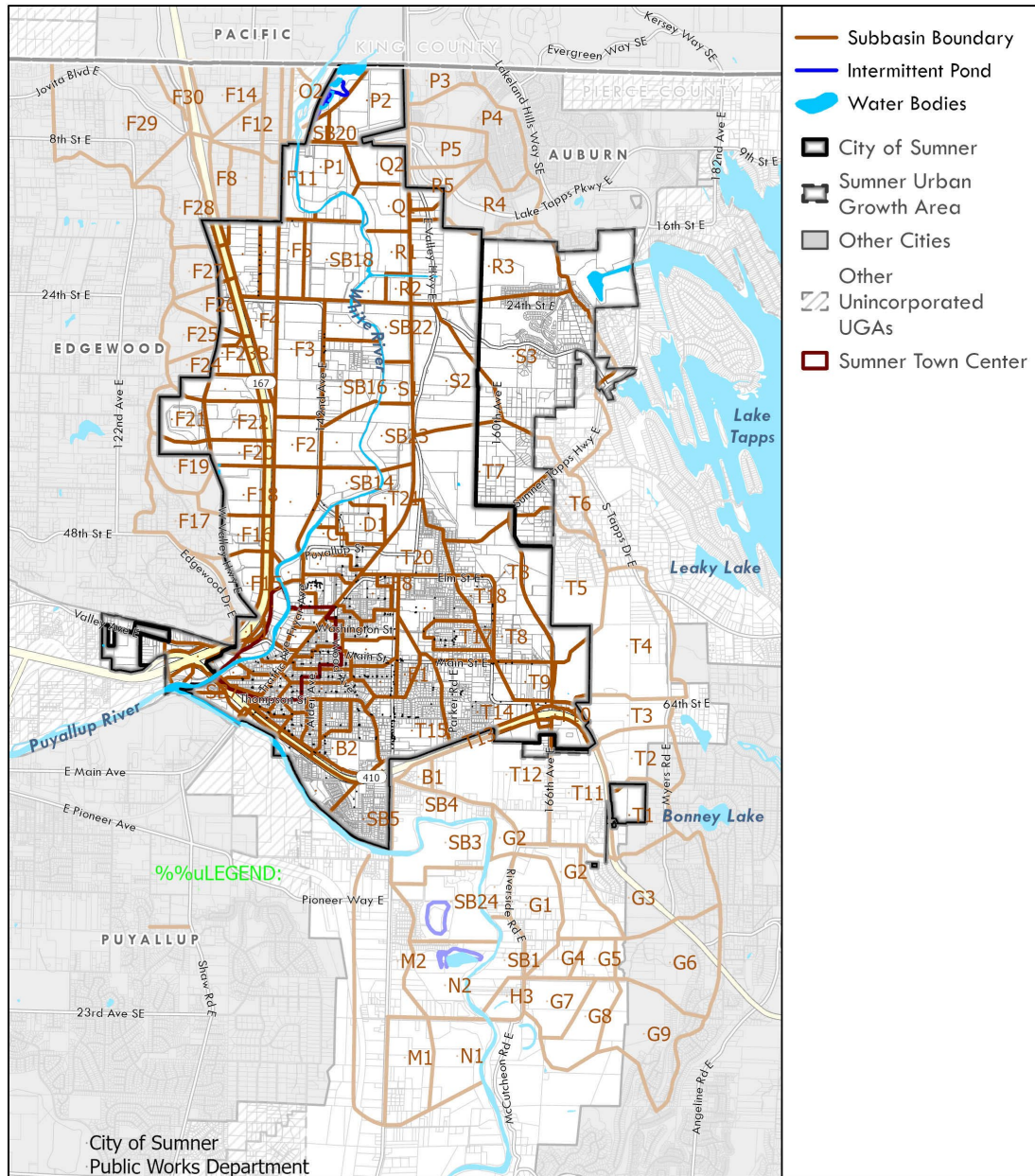
The Sumner Stormwater Comprehensive Plan was completed in 2011 and projects capacity infrastructure needs within the City's stormwater system based on changes in state and federal water quality regulations, stormwater retention and detention standards, and other parameters that have an effect on the overall system. The Stormwater Comprehensive Plan contains projects which try to offset the impact to surface waters that land uses have, and establishes a System Development Charge and monthly stormwater fee to fund construction and operation of the system. Sufficient revenue is needed to construct the new projects and to maintain the existing and new infrastructure.

The Washington State Department of Ecology (Ecology) issues an NPDES Phase II Stormwater Permit every 5 years with the current permit set to expire in 2024. The 2020 Stormwater Management Program is developed and implemented as part of the NPDES Permit and consists of 8 actions/activities, participation in a monitoring program, and additional work to remove Salmon Creek from Ecology's 303d impaired waters list by reducing fecal coliform levels.

[Stormwater Facilities Inventory](#)

The 1992 Stormwater Comprehensive Plan identified 44 drainage basins that generate and affect stormwater flows within the city limits. These basins were further divided into 115 sub basins. See Figure 3-6. The majority of these basins were modeled in 1992 for the 25-year, 24-hour event and the 100-year, 24-hour event using Type 1A precipitation distribution.

Figure 3-6: Stormwater Subbasins



CITY OF SUMNER

Stormwater Subbasin Boundaries

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: October 2023

Source: City of Sumner, 2023; Parametrix, 2023.

Hydraulic modeling was completed for the stormwater infrastructure to determine system deficiencies and identify potential capital improvement projects. The results of the modeling are contained in the 1992 Stormwater Comprehensive Plan.

The 2004 Stormwater Comprehensive Plan update included remodeling up to four of the sub-basins because of a significant change of land use designation (i.e., allowable development density) between 1992 and present. When remodeling was done based on the 2004 land use map and allowable land use densities, it was determined there was no significant increase in allowable density for developable areas located within the city limits over what was modeled in 1992.

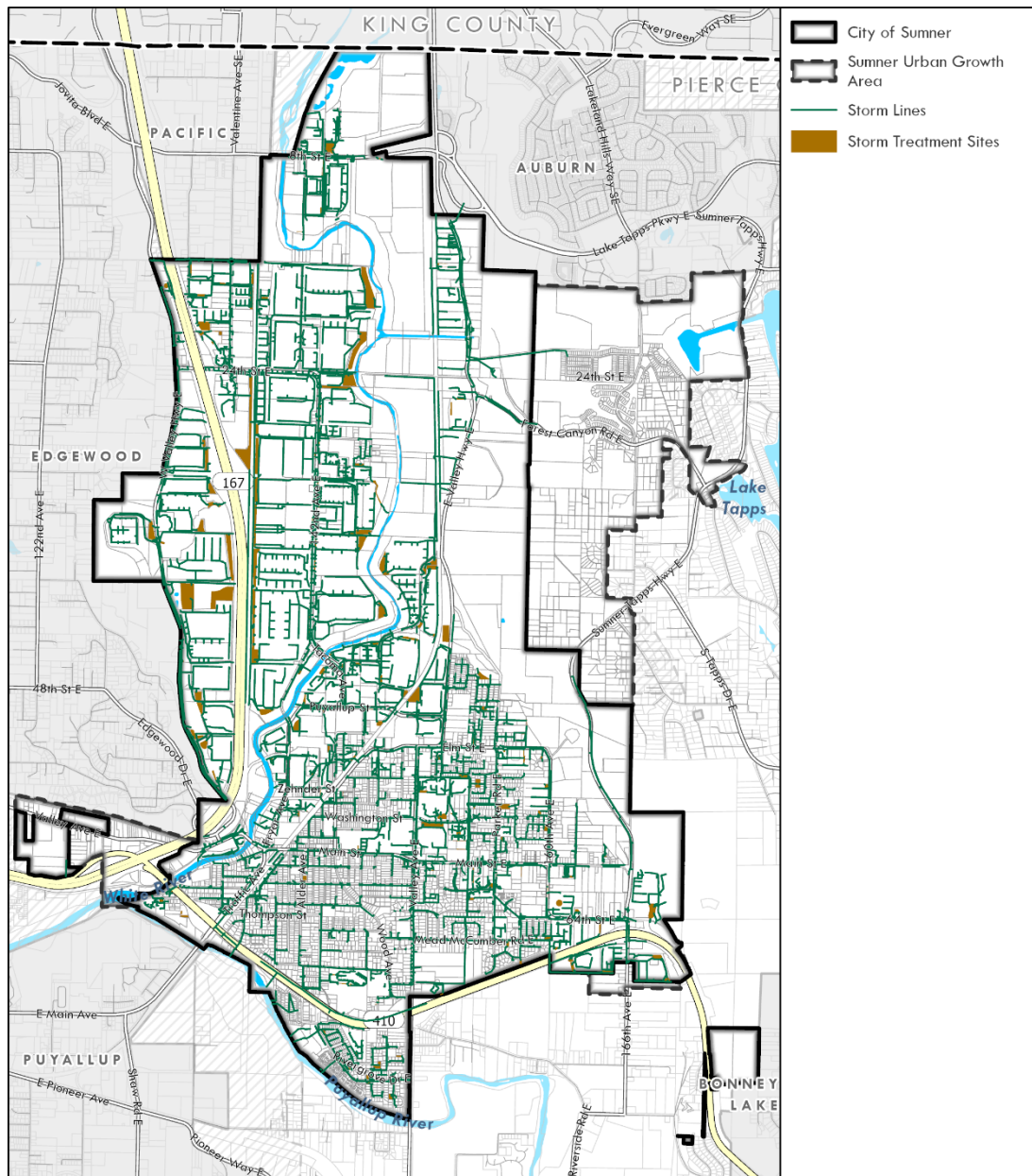
The 2004 Stormwater Comprehensive Plan identified stormwater capital improvement projects from the 1992 Stormwater Comprehensive Plan that had been completed, which projects were no longer needed, that needed to be carried forward, and additional projects that were needed. A Stormwater Comprehensive Plan Update was completed in 2011.

Low Impact Development

The 2013 NPDES permit required the City to update development regulations, code, and long range plans to make low-impact development the preferred and commonly-used approach to site development. This can range from capital projects identified in the 2020 Stormwater Capital Improvement Plan that infiltrate water at a level to mimic predeveloped condition or to changes that allow for denser development, reducing the overall impervious surface of a site. The permit requires annual evaluation of tactics to further increase the implementation of Low Impact Development. These annual evaluations typically involve review of City code and City Development Specifications and Standard Details.

The inventory of storm sewer facilities in the City of Sumner is shown in Figure 3-7.

Figure 3-7: Stormwater Drainage Facilities Map



CITY OF SUMNER

Stormwater Drainage Facilities

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: January 2024

Source: City of Sumner 2023; BERK 2023.

Flood Protection

Most stormwater Capital Improvement Projects involve reduction of flooding related to storm events. Localized street flooding is an issue, but the City also faces a significant riverine flooding threat from the White River during storm events and subsequent releases from Mud Mountain Dam. In the 2011 Capital Improvement Plan, projects to combat riverine flooding were identified along the White River. Additionally, adoption of new FEMA maps has led to an increased identified need for floodplain restoration to protect threatened populated areas. This resulted in the expansion of levee and floodplain protection projects in a suite of projects identified as the White River Restoration project. These projects reserve 200+ acres of land along the White River which will be used to increase flood conveyance and prevent flooding of the manufacturing industrial center.

3.6 Parks Facilities

The City offers a variety of parks with amenities ranging from picnic areas to tennis courts and regulation softball fields. The schools in Sumner also provide a substantial number of fields and facilities for the community, including soccer fields. An inventory of park facilities and acreage is shown in Table 3-7 and mapped in Figure 3-8 (per the 2024 *Parks and Trails Plan*).

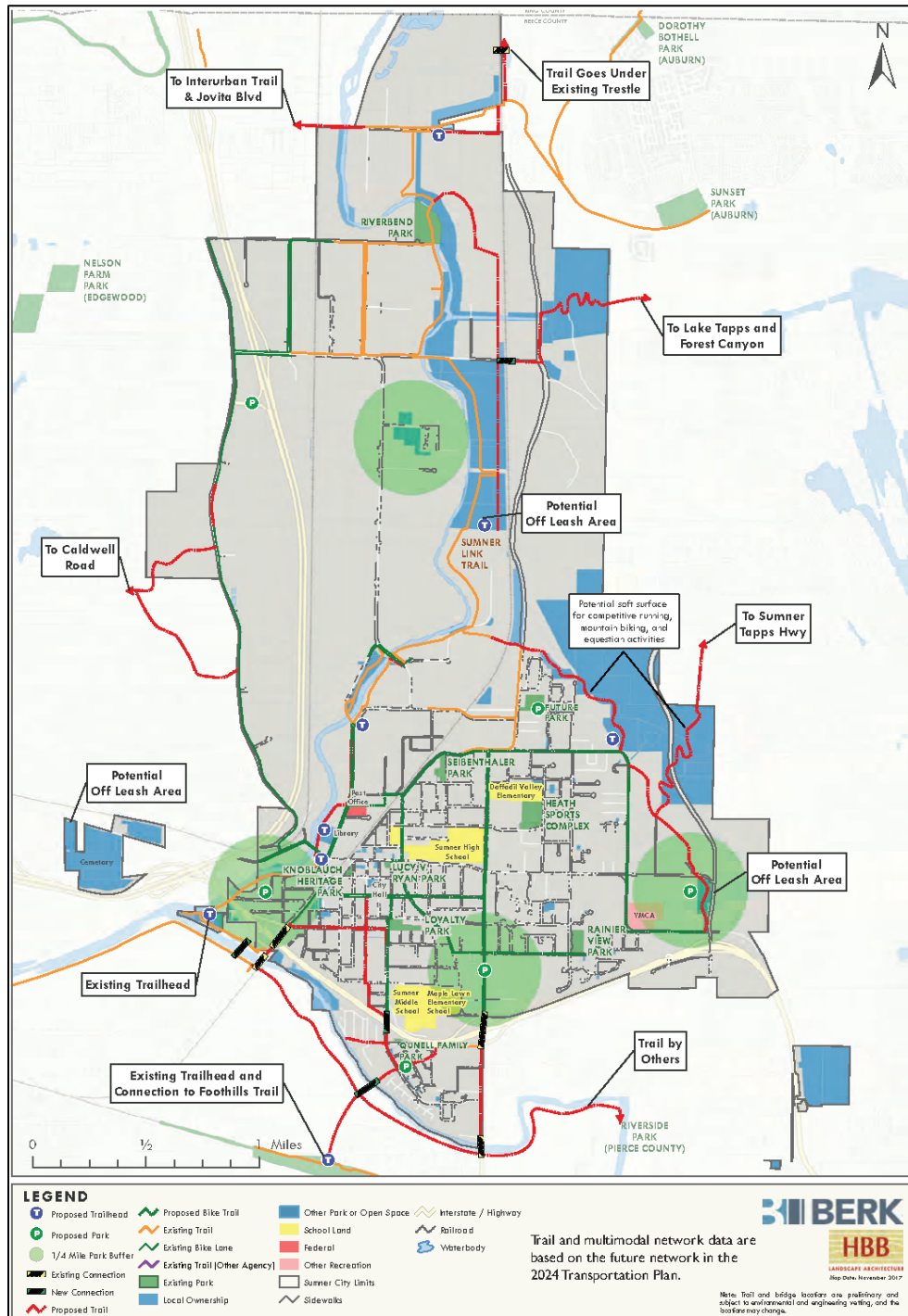
Table 3-7: Summary of City Park Spaces

Park Areas and Facilities	Acres
<i>Developed Local Parks</i>	<i>9.8</i>
Rainier View Park	3.9
Loyalty Park	3.3
Seibenthaler Park	2.3
<i>Undeveloped Local Parks</i>	<i>4.5</i>
Bennett Property	4.2
Qunell Family Park	0.3
<i>Special Facilities</i>	<i>1.1</i>
Reuben A. Knoblauch Heritage Park	0.8
Lucy V. Ryan Park*	0.4
<i>Regional Parks</i>	<i>7.0</i>
Bill Heath Sports Complex	7.0
<i>Linear Parks Along Sumner Link Trail</i>	<i>16.7</i>
Total City Parks Acreage	38.8
<i>Open Space Areas</i>	<i>33.5</i>
<i>Trails</i>	<i>5.5 miles</i>
Sumner Link Trail	5.5 miles

Source: City of Sumner Parks and Trails Plan, 2024

Notes: *The Ryan House is expected to be demolished, with the site remaining as a park.

Figure 3-8: Parks and Open Space Map



Source: Sumner Parks and Trails Plan, 2024.

The Parks and Open Space Element of the Comprehensive Plan sets forth policies relating to concurrency, requiring that new development that impacts the park system pay its fair share of the cost of providing new park facilities.

3.7 Fire Facilities

Inventory

In 2008, the City of Sumner and Pierce County Fire District 1 joined East Pierce Fire and Rescue District (EPFR). EPFR serves a population of more than 88,200 living in and around Bonney Lake, Sumner, Lake Tapps, the Ridge Communities, South Prairie, Edgewood, Milton, and Wilkeson. The district covers approximately 151 square miles and protects residents from eleven stations – five staffed stations and six volunteer stations. This includes 1 Fire Chief, 1 Deputy Chief, 4 Assistant Chiefs, 4 Battalion Chiefs, 9 administrative support staff, 34 career firefighter-EMTs, 49 career Firefighter-Paramedics, 44 volunteer firefighters, and 7 EMS-only volunteers. All full-time firefighters are cross trained as either emergency medical technicians (EMTs) or paramedics and can respond to both medical emergencies and fires. An independently elected board of citizens, called Fire Commissioners, governs the agency.

Three EPFR stations are located within and near the current plan area. Station 113 (Sumner Station) is located at 800 Harrison Street in Downtown Sumner (see Figure 3-9). This facility is approximately 8,200 square feet and includes sleeping quarters, a large drive-through apparatus bay, dayroom, conference room, and fitness space. The station is staffed by a minimum of 5 career personnel. Equipment available at Station 113 includes:

- 2 medic units
- 1 ladder truck
- 1 rescue vehicle
- 1 rescue trailer

Station 114 (West Tapps Station) is located within the East Hill UGA of the current plan area. The station is located at 3206 West Tapps Drive. Station 114 is approximately 3,616 square feet in size and is staffed by a minimum of 2 career fire personnel. Equipment available at Station 114 includes:

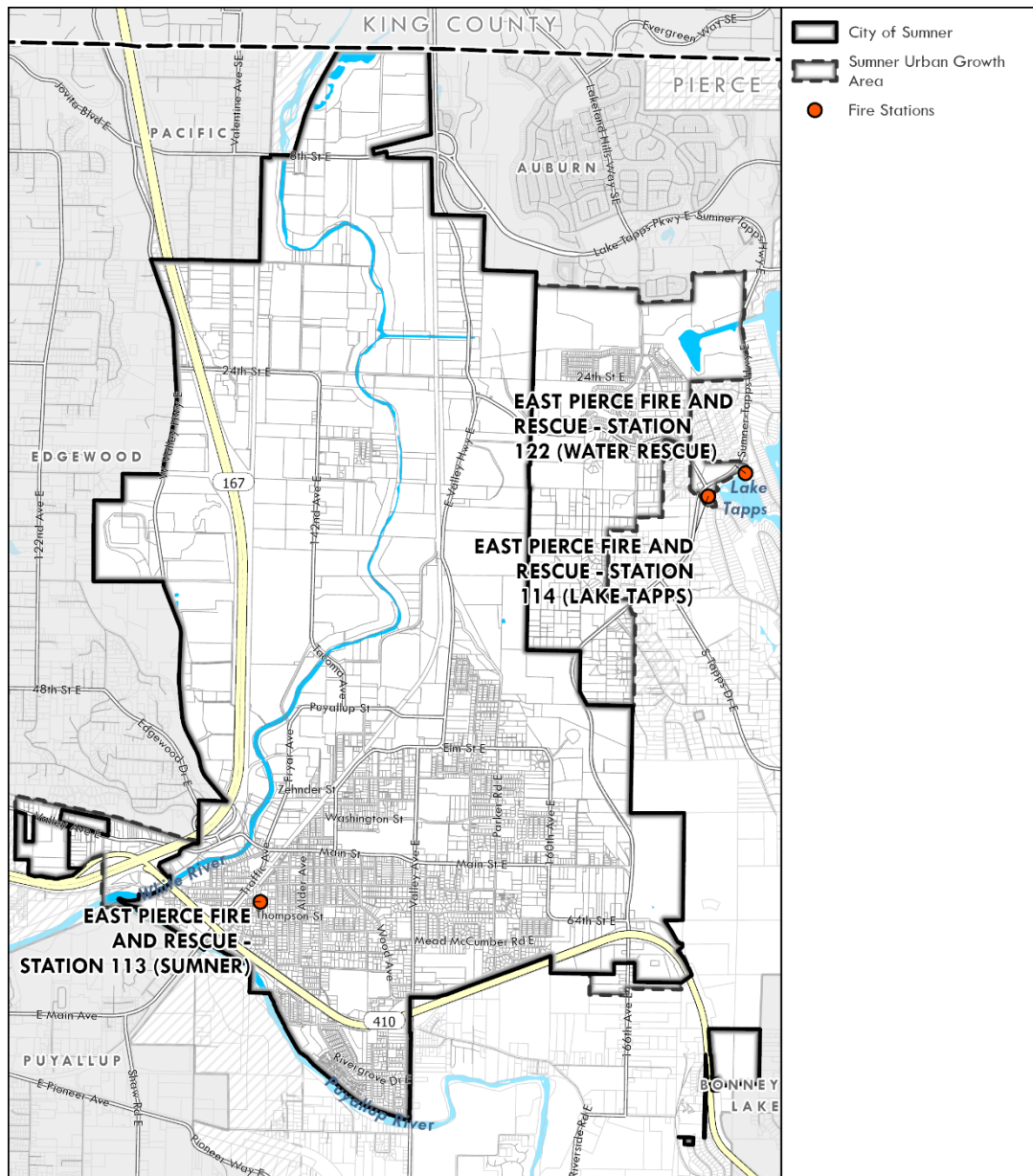
- 1 fire engine
- 1 medic unit

Station 122 (Boat House) is located at 2905 Sumner-Tapps Hwy. E. within the East Hill UGA and is used to store the following:

- 1 pontoon rescue boat.

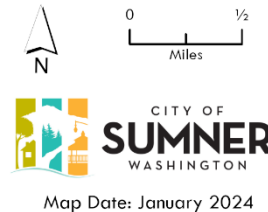
(Source: EPFR Capital Facilities Plan)

Figure 3-9: Fire Facilities



CITY OF SUMNER Fire Stations

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Source: Pierce County, 2023; City of Sumner, 2023; BERK, 2024.

3.8 Public School Facilities

Public schools are operated by local school districts and governed by State and federal laws and regulations. State funds provide a large part of school financing. School districts raise additional funds from local property taxes. State laws set standards for service levels and facility development, such as the site size and enrollment. They also specify funding methods. These laws perform much of the role of a functional plan for schools. For school districts to be eligible for development impact fees, the State GMA requires school capital facilities plans to be adopted and incorporated into city capital facilities plans.

The City of Sumner is served by the Sumner-Bonney Lake and Dieringer School Districts, which also serve surrounding cities and unincorporated areas.

According to the Washington State Office of the Superintendent of Public Instruction (OSPI), the Sumner-Bonney Lake School District had a districtwide enrollment of 10,622 students for the 2022-23 school year, with the four Sumner schools accounting for 3,651 students. Enrollment and capacity figures are shown in Table 4-9. Sumner Middle School is the only school under its enrollment capacity². The following schools serve the City of Sumner:

- Sumner High School
- Sumner Middle School
- Daffodil Valley Elementary
- Maple Lawn Elementary
- Elhi High School
- Early Learning Center

Sumner-Bonney Lake School District

The Sumner-Bonney Lake School District 2021-2027 Capital Facilities Plan was adopted in 2021. The Sumner School District operates within Sumner city limits and also encompasses the cities of Bonney Lake, portions of Edgewood, Pacific, and unincorporated Pierce County. The district consists of 16 schools total, 5 of which are in Sumner (see Figure 3-10); a performing arts center, community swimming pool, a public gymnasium, and a recreation department. The Sumner-Bonney Lake School District serves over 9,500 students. Table 2-9 shows existing schools in Sumner, in addition to locations, capacities of each, and support facilities serving the entire district.

² OSPI Report Card, 2023. Retrieved from <https://washingtonstatereportcard.ospi.k12.wa.us/ReportCard/ViewSchoolOrDistrict/100259>.

Table 2-9: Inventory of Existing School Facilities

Name	Net Capacity (Number of Students)	Acres	Location
Schools			
Daffodil Valley Elementary	481	12.7	1509 Valley Avenue
Maple Lawn Elementary	454	8.5	230 Wood Avenue
Sumner Middle School	722	23.0	1508 Willow Street
Early Learning Center	168 [^]	- [^]	1508 Willow Street
Sumner High School	1,260	26.8	1707 Main Street
Elhi Hill Program*	NA	0.10	802 Alder Ave
Total	3,085	71.13	
Support Facilities			
Central Office (Administration)			1202 Wood Avenue
District Athletics Office			1707 Main Street
Sunset Stadium			1707 Main Street
Robert Miller Gym			1509 Valley Avenue

Source: Sumner-Bonney Lake School District Capital Facilities Plan 2021-2027

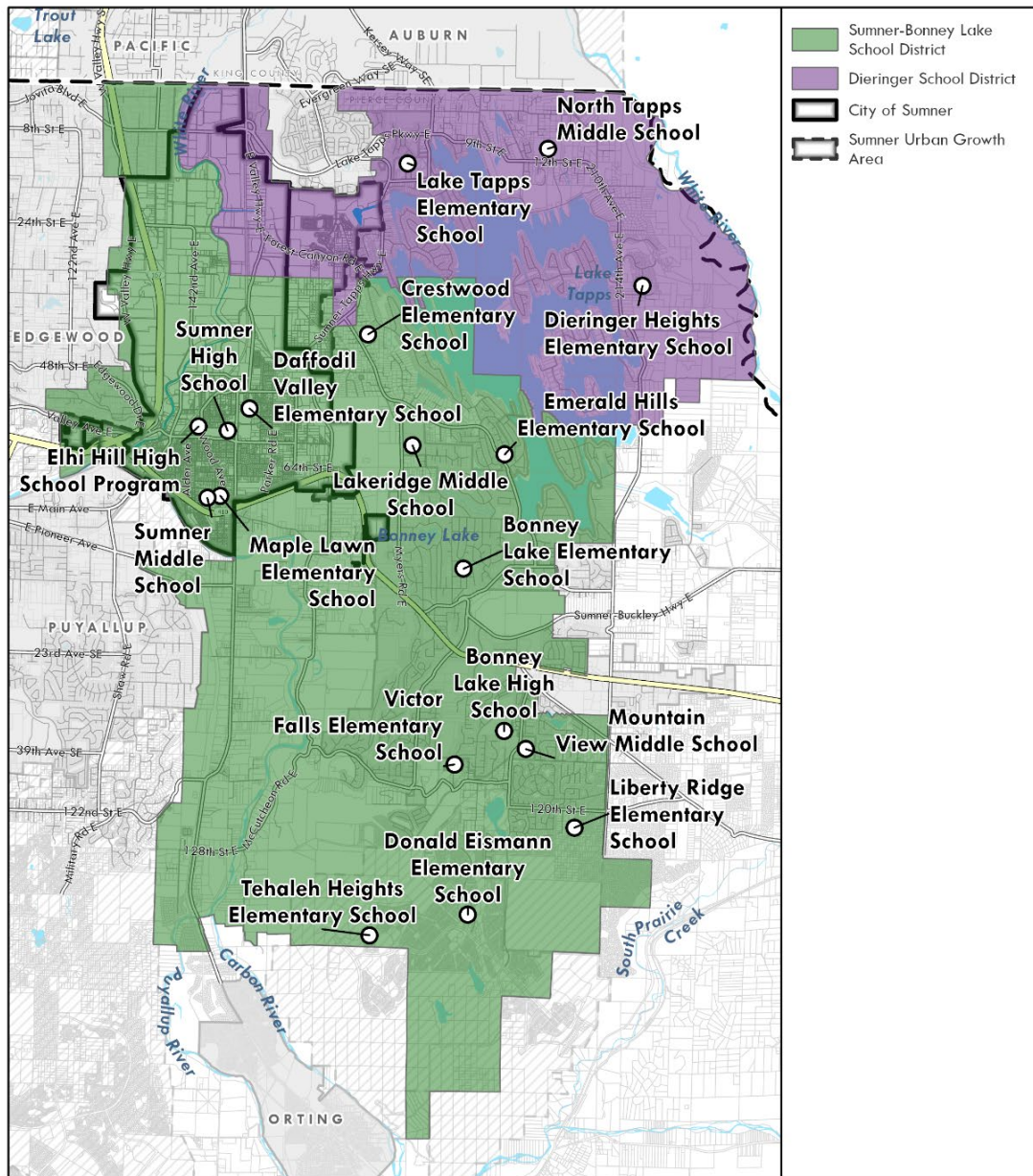
* Elhi Hill is a program offered to high school students who need services beyond the traditional school day.

[^]Includes kindergarten capacity only (not pre-K). The Early Learning Center is located within Sumner Middle School.

Dieringer School District

The Dieringer School District includes three schools: Lake Tapps Elementary School, Dieringer Heights Elementary School, and North Tapps Middle School, all of which are located outside of Sumner. The majority of Dieringer School District is located in unincorporated Pierce County, bounded by the eastern arm of the White River, on the west by the White River, on the north by the city of Auburn, and on the south by the cities of Bonney Lake and Sumner. The District surrounds the northern two-thirds of Lake Tapps and covers approximately 5.5 square miles (Dieringer School District, 2020). In the Sumner current plan area, the Dieringer School District serves the northeast Sumner city limits along East Valley Highway.

Figure 3-10: Schools and School Districts



CITY OF SUMNER
Public Schools



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: January 2024

Source: Pierce County, 2023; City of Sumner, 2023; BERK, 2024.

3.9 Transportation Facilities

The transportation system within the City of Sumner includes streets and highways, pedestrian and bicycle facilities, and transit and rail service. The city's functional classifications for roadways include principal arterials, minor arterials, collectors, and local streets. Arterial streets serve higher traffic volumes and may have few access points. Collector streets link arterials and local streets and may provide access to individual parcels. Collectors are also vital in connecting the residential areas to the central business district and are excellent candidates for multimodal facilities. Local streets provide neighborhood circulation and access to individual parcels.

The city also has two freeways, State Route (SR) 167 and 410 that run through it. The State has designated SR 167 as a Highway of Statewide Significance (HSS). HSS facilities provide and support transportation functions that promote and maintain significant statewide travel and economic linkages. Improvement plans for this HSS facility are developed from a statewide perspective. This planning includes policy development and accompanying funding support to represent a broad range of interests that depend on the facility. Because of its designation as an HSS facility, the State has the authority of setting the level of service (LOS) standards for SR 167. SR 410 is a State Highway of Regional Significance. LOS standards for SR 410 are established by the Puget Sound Regional Council (PSRC), in consultation with WSDOT.

Table 3-8 provides a summary of the key characteristics of the roadway serving Sumner.

Table 3-8: Characteristics of Key Roadways Serving Sumner

Roadway	Classification	Jurisdiction	# of Travel Lanes	Posted Speed Limit	Parking?	Sidewalks?	Bicycle Facilities
North-South Roadways							
SR 167	Freeway	WSDOT	4	60 mph	No	No	No
Valley Avenue	Minor/Principal Arterial ¹	Sumner	2 to 3	25 mph	No	Yes	Yes
Traffic Avenue	Minor Arterial ²	Sumner	4 to 5	25 mph	No	Yes	No
Fryar Avenue	Minor Arterial	Sumner	3	25 mph	No	Yes	Yes
142nd Avenue E	Minor Arterial	Sumner	5	35 mph	No	Yes	No
136th Avenue E	Minor Arterial	Sumner	3	30 mph	No	Yes	No
East Valley Highway	Minor Arterial ³	Sumner	2 to 3	25 mph	No	No	No

Roadway	Classification	Jurisdiction	# of Travel Lanes	Posted Speed Limit	Parking?	Sidewalks?	Bicycle Facilities
West Valley Highway	Minor Arterial	Sumner	2 to 4	35 mph	No	Yes	No
Sumner-Tapps Highway	Minor Arterial	Sumner	2	45 mph	No	No	No
Cannery Way (formerly Bridge Street)	Minor Arterial	Sumner	2	25 mph	No	Yes	No
Valley Avenue E	Minor Arterial	Sumner	2	25 mph	No	No	No
160th Avenue E	Minor Arterial ⁴	Sumner	2	25 mph	Yes	No	No
Sumner Heights Drive	Collector	Sumner	2	25 mph	No	Yes	No
Alder Avenue	Collector	Sumner	2	25 mph	Yes	Yes	No
Wood Avenue	Collector	Sumner	2	25 mph	Yes	Yes	No
158th Avenue E	Collector	Sumner	2	25 mph	No	Yes	No
Parker Road	Collector	Sumner	2	25 mph	No	Yes	No
East-West Roadways							
SR 410	Freeway	WSDOT	4	55 mph	No	No	no
24th Street E	Minor Arterial	Sumner	2 to 5	35 mph	No	Yes	No
Main Street	Minor Arterial	Sumner	2	25 mph	Yes	Yes	No
Stewart Road	Principal Arterial	Sumner	2-5	35 mph	No	Yes	No
Puyallup Street	Minor Arterial	Sumner	2	25 mph	No	Yes	No
Forest Canyon Road	Minor Arterial	Sumner	2	25 mph	No	No	No

Roadway	Classification	Jurisdiction	# of Travel Lanes	Posted Speed Limit	Parking?	Sidewalks?	Bicycle Facilities
64th Avenue E	Minor Arterial	Sumner	2	25 mph	Yes	Yes	No
Zehnder Street	Collector	Sumner	2	25 mph	No	Yes	No
Thompson Street	Collector	Sumner	2	25 mph	Yes	Yes	No
Elm Street	Minor Arterial Collector ⁵	Sumner	2 to 3	25 mph	No	Some ⁶	No
Meade-McCumber Road	Collector	Sumner	2	25 mph	Yes	Yes	No
Washington Street	Collector	Sumner	2	25 mph	No	Yes	No
Rivergrove Drive	Collector	Sumner	2	25 mph	Yes	Yes	No
Riverside Drive	Collector	Sumner	2	35 mph	No	No	No

Note: WSDOT = Washington State Department of Transportation; mph = miles per hour

1. Principal arterial south of SR 410

2. Principal arterial south of Thompson Street

3. Principal arterial north of Forest Canyon Road

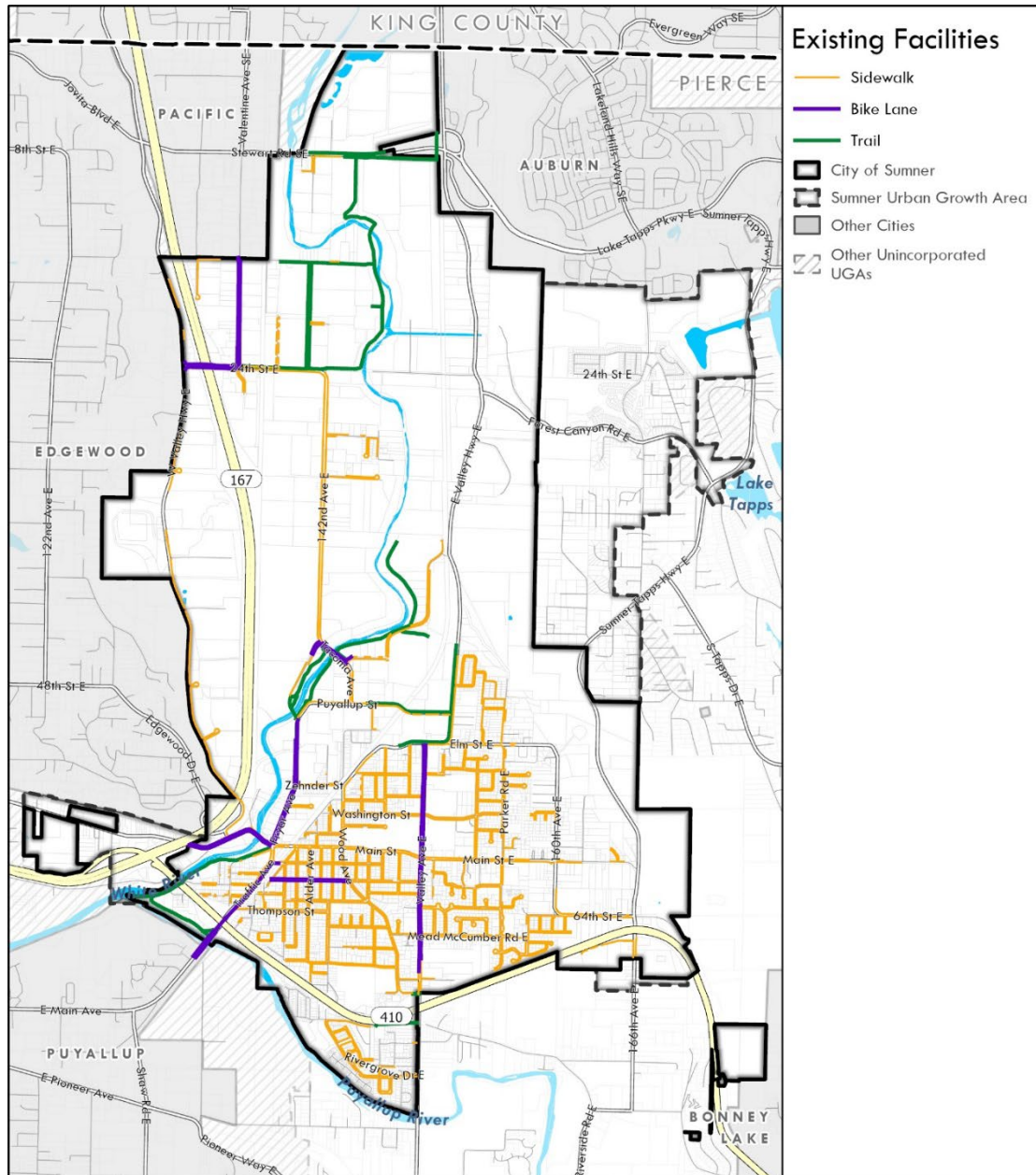
4. Collector north of Main Street E

5. Minor Arterial between Valley Avenue and East Valley Highway and Collector Arterial from Valley Avenue and Wood Avenue and East Valley Highway and 160th Avenue E.

6. Elm Street does not have sidewalks on portions between Valley Avenue and Wood Avenue

Sumner is also striving to create a fully integrated system for pedestrian and bicycle modes. The existing transportation network provides access for people on foot, bike, and other modes primarily with sidewalks, bike lanes, and off-street trails (see Figure 3-11). Sidewalks are located intermittently around the city, mostly along arterial roadways in the Sumner downtown and nearby neighborhoods. Bicyclists mostly share the roads with motorized traffic or use paved roadway shoulders where available, however formal bike lanes are present along Valley Avenue, Fryar Avenue, and Academy Street. The Sumner Link Trail also serves bicycle and pedestrian modes. See the City's Transportation Plan for more details on the Sumner non-motorized transportation network.

Figure 3-11: Existing Non-Motorized Facilities



CITY OF SUMNER

Existing Non-Motorized Facilities



0 1/2
Miles



CITY OF
SUMNER
WASHINGTON

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

Source: City of Sumner, 2024; Transpo, 2024.

Chapter 4: Planning Assumptions and Levels of Service

4.1 Introduction

GMA Administrative Code (WAC 365-195-315) recommends that local capital facilities plans include a discussion on “ . . .the selection of levels of service or planning assumptions for the various facilities to apply during the planning period (twenty years or more) and which reflect community goals.” This chapter will constitute that discussion for the Sumner Capital Facilities Plan.

Table 4-1 describes the population and employment assumptions used to calculate current and future levels of service. The population and employment assumptions are consistent with those to be used in the draft 2024 Comprehensive Plan and account for growth for the next 20 years. In 2022, Sumner’s estimated population was 10,800. The City is planning for a 2044 population of 15,525 based on anticipated housing growth. The City’s Urban Growth Area (UGA) has an estimated 2022 population of 1,839 and is expected to grow to approximately 3,030 residents by 2044.

Table 4-1: Population and Employment Assumptions

	2022 City	2022 Unincorporated UGA	2044 City	2044 Unincorporated UGA
Population	10,800	1,839	15,525	3,030
Housing Units	4,575	618	6,477	1,018
Employment	18,861*	411*	23,419	493

Source: Census 2020, OFM April 1 Population and Housing Estimates 2022, OFM Small Area Estimates 2022, Pierce County CPPs Appendix A, CensusOnTheMap

Notes: *2022 data not available for employment. Numbers shown are from 2021 (CensusOnTheMap). Unincorporated UGA numbers are estimates based on share of growth allocated in 2030, as Pierce County has yet to release allocations for specific UGAs.

4.2 General Government Facilities

General government planning assumptions are based on the projected population growth for the City and UGA. Table 4-2 shows the 2022 and 2044 needs for general government, police, and public works facilities based on the adopted levels of service. If the City were to annex the UGA within the planning period, total service population could reach 18,555 residents and these facility needs would increase.

General Government

The 2015 adopted level of service (LOS) for general government facilities is 1.13 square feet of building space per capita. This is to house City functions including Administration, Finance, Community Development, and Public Works. However, this LOS (adopted 2015) appears to be low, based on current space deficiencies at City Hall, and does not account for additional space needed for a range of services provided by the City that are not directly correlated with a “per capita” LOS. Other factors that should be considered in establishing a realistic LOS:

- The above services are conducted in City Hall, which was built for different functions in 1935, and has a high proportion of non-office, non-service-related square footage, such as large lobbies, unusable dormer/attic space, etc.
- Between 2020-2023, the City hired a number of additional staff at City Hall, who are currently sharing office space due to lack of useable floor area. There are 50 non-police related employees at city hall.
- Parks staff (5 FTE) are currently not housed at City Hall but are using temporary construction trailers off-site.
- Based on an estimate of City Hall floor area that can be used for functional office space needed to house staff that provide a range of services, the general government 2022 LOS would be closer to 170-180 square feet per employee (see separate discussion related to space needs for the Police Department). With 50 non-police department employees, the existing ratio of gross square foot per employee is 294, the same as the Police Department.
- An adjusted **LOS of 1.36 square foot per capita** based on current building size and population would increase the needed building area in 2044.

Table 4-2: City Government Buildings Level of Service

City Facility	Req'd LOS	Exist. Area (s.f.)	2022 need (City Pop. 10,800)	2044 need (City Pop. 15,525)	2044 with UGA annexed (Pop. 18,555)
General Gov.	1.36 (s.f./capita)	14,577	14,577	21,114	25,235
Police	294 s.f./employee	7,654	7,654	11,466	13,524
Public Works Shops	1.80 (s.f./capita)	17,136	19,440	27,945	33,399

Source: City of Sumner Comprehensive Plan 2021; Sumner 2023; BERK 2023.

Police Services

The Police Department building area has a 2015 adopted level of service of 0.44 square feet per capita. However, this LOS appears to be low based on current space deficiencies and does not account for additional space needed for ancillary functions (e.g. evidence storage, processing area, locker facilities, interview rooms, etc.). Table 4-2 shows a LOS that is Building Area/Employee that is needed to accommodate both the office and other functional spaces and ancillary spaces. **The LOS is calculated at 294 s.f. per employee.** Table 4-3 shows the LOS demand for commissioned officers and the resulting need for non-commissioned staff and support and total employment. The area needs for the Police Department are based on these projected employment needs as the City grows.

The police service demands are a factor of population demographics, employment growth, and types of business and land use. Statewide data from the 2022 Crime in Washington annual report suggests some offenses, including violent crime and some kinds of property crime, overwhelmingly occur at residences, so residential areas may have more demand for police and court services. Generally, industrial development does not generate the same service demands, but there is a significant demand for police service due to property crime, theft, and vehicle collisions. The current LOS of 2 officers per 1,000 population therefore is too low to account for service in non-residential areas. Of the total number of calls for police service noted above, approximately 24% of those calls are to the Manufacturing-Industrial Center. Therefore, the projected LOS standards for police should be reevaluated relative to not just population but also employment growth expected in Sumner. Further, Sumner's service demands are also affected by its geographic location between two State highways and borders with much larger cities. Level of service standards as proposed in the 2024 Comprehensive Plan are as follows:

7. Provide and maintain a police system sufficient to meet the community's public safety needs. This system may include normal police functions, responding to calls for service, community policing, care and custody of prisoners, and animal control.
- 7.1 Level of Service:
 - i. **Maintain a ratio of at least two (2) commissioned officers per 1,000 population.**
 - ii. Maintain a ratio of not less than 1 commissioned patrol officer for every 1000 calls for service per year. Patrol Officers should have at least 40% of their patrol shift available for proactive policing activities.
 - iii. Provide one sergeant for every 5 commissioned patrol officers.
 - iv. Provide and maintain one detective position at a ratio of 1/400 part A offenses.

Table 4-3 shows the 2022 and 2044 commissioned officer needs based on the existing and projected population in the city. The 2044 need is projected to be 31 officers. If the City were to annex the UGA within the planning period, this could increase to 37 officers to meet the needs of a total population of 18,555.

Table 4-3: Police Level of Service

Staffing	Req'd LOS	Existing	2022 need (City Pop. 10,800)	2044 need (City Pop. 15,525)	2044 with UGA annexed (Pop. 18,555)
Commissioned Officers	2 per 1,000 population	21	22	31	37
Special Commissioned Officers	NA	1	1	2	2
Non Commissioned Staff	NA	4	4	6	7
Total Employees	NA	26	26	39	46

Source: City of Sumner Comprehensive Plan 2021; Sumner 2023; BERK 2023.

Public Works Shops

The Public Works Shops have a **LOS of 1.80 square feet per capita**. See Table 4-2 for 2022 and 2044 needs compared to existing square footage.

4.3 Water Facilities

The Sumner General Water Plan projected demands look out 20 years to 2038 and a residential population within the water service area of 13,343 and 5,436 connections and a total average daily demand of 1.99 MGD (see Table 4-4). Using water consumption records from 2014 to 2017, the City's single family residential usage rate was estimated to be 189.6 gallons per day.

Table 4-4: Projected Max Day Demand and Peak Hour Demand with DSL

	2018	2024	2028	2038
Residential Population ¹	11,044	11,793	12,321	13,343
Average-Day Demand (ADD) (MGD) ²	1.77	1.81	1.87	1.99

	2018	2024	2028	2038
Maximum Daily Demand (MDD): --DOH Guideline Method (MGD) ³	3.36	3.52	3.64	3.89
Peak-Hour Demand (PHD): --DOH Guideline Method (gpm) ^{4 5}	3,764	3,979	4,111	4,389

¹. Population projections based on the City's 2020 General Water Plan Update.

². Average-demand requirement are calculated based on the per capita usage rates of the residential and employment population from 2014 to 2017.

³. DOH Water System Design Manual, August 2001. MDD = 2*ADD.

⁴. gpm = gallons per minute.

⁵. PHD = (MDD/1,440)[1.6*N+225] + 18. Use peak to average day factor in MDD.

The City of Sumner must comply with water quality regulations on both the federal and state level. State regulations enforced by the Washington State Department of Health (DOH) may be the same as or more stringent than the federal regulations. DOH regulates water quality of public water systems under the State Drinking Water Regulations, WAC 246-290-300 through 320. The DOH also has enforcement responsibility for federal regulations included in primacy agreements with the United States Environmental Protection Agency (EPA). Water quality regulations are currently evolving, and will continue to evolve, becoming more stringent due to implementation of the Safe Drinking Water Act and other state and federal legislation.

These water quality regulations address contaminant levels for inorganic chemicals, organic chemicals, heavy metals, pesticides, coliform, and other substances. The water system is regularly monitored to address levels of contamination and corrective actions are taken as needed to remain in compliance with state and federal laws.

4.4 Policy in the Comprehensive Plan

The Capital Facilities Element of the Comprehensive Plan contains the following policies in accordance with the Water System Plan:

11. Maintain an efficient water system to meet the needs of the community's residential, commercial, and industrial community as set forth in the City's most recently adopted Water System Plan.

- 11.1 Establish the following Levels of Service for water supply:

Demand

Residential Demand - 72.73 gpd

Employee Demand - 25.28 gpd/employee

Fire Flow

Use	Min. Flow (gpm)	Required Duration (hours)
Medium and low density residential	1,000	2
High density residential and commercial	1,500	2
Industrial	3,500	3
Several existing buildings	4,500	4

Water System Reliability LOS

Criteria	Level of Service			
	A	B	C	F
Conveyance Reliability; Loop (min. 6" pipe) System	95% + of services on loop lines	90% + of services on loop lines	80% + of services on loop lines	Less than 80% of services on loop lines
Source Reliability;	Meets peak day w/ largest supply out	Meets peak day w/all supplies on	Meets 95% of peak day - use storage	Water restriction required
Distribution System Reliability; Isolation valves a min of 660 ft.	95% + of services meet these criteria	90% + of services meet these criteria	80% + of services meet these criteria	<80% of services meet these criteria
Power Backup for Supply Pumps;(standby generators)	100% of pumps with backup gen.	Sufficient backup for meeting MMADF	Sufficient backup for avg. daily flow	Less backup than needed for ADF
Emergency Response by Repair Crew	< 4 hrs. on 24-7 basis	< 8 hrs. on 24-7 basis	< 24 hrs on a 24-7 basis	> 24 hrs on a 24-7 basis

The minimum LOS for reliability is "B" as outlined above.

11.2 Deliver a high degree of water quality that satisfies federal, state, and local regulations as follows:

LOS "A": Water quality that meets both Primary and Secondary Public Health Standards

LOS "B": Water quality meets only Primary Drinking Water Standards

For water quality, Sumner chooses a LOS "A".

The following is the level of service standard in the draft 2024 Comprehensive Plan, Capital Facilities and Public Services Element:

11.3 Require water services for new development, unless otherwise allowed by state or county regulations.

11.3.1 Encourage the design, siting, construction, operation, and relocation or closure of water infrastructure in a manner that is cost effective, environmentally sensitive, appropriate to the location and need, minimizes and mitigates impacts on adjacent land uses, and prioritizes action to protect vulnerable populations.

11.3.2 Require all new development to avoid or mitigate adverse impacts to functioning water, sanitary sewer, or septic systems.

11.4 Implement water conservation programs for residential, commercial, and industrial users consistent with the Sumner Water Plan.

11.4.1 Require new and existing businesses to use water at or below the average per capita employee level and businesses that use higher than average rates of water to mitigate their impacts.

11.4.2 Implement water service technologies, such as “smart meters,” that assist customers in monitoring and reducing water usage.

11.4.3 Support existing public education and outreach campaigns to address and promote water conservation.

Average 2044 daily water demand is estimated using factors in the Water System Plan (72.73 gpd/resident and 25.28 gpd/employee). Using the peaking factor of 2.05 established in the Water System Plan, the total additional maximum daily water demand for residents and employees is approx. 1.01 mgd by 2044.

4.5 Sanitary Sewer

The City has discretion in setting performance and design criteria and standards for its sewer system, so long as they meet or exceed the minimum standards for public sewers as set forth by the Washington State Department of Ecology (DOE) through Chapters 90.48, 90.52, and 90.54 of the Revised Code of Washington (RCW). The criteria focus on planning, design parameters, and other details that have been developed to establish consistency and to ensure that adequate levels of service are provided throughout the system. The criteria also provide the planning process with measuring tools to identify areas of the existing system that need to be improved to achieve the desired level of customer service. The sewer system

is regularly monitored to address concerns and corrective actions are taken as needed to remain in compliance with state and federal laws.

The following is the level of service standard as identified in the draft 2024 Comprehensive Plan, draft Capital Facilities and Public Services Element:

12. Provide a sanitary sewer system adequate to meet the demands of the community, that ensures public health and safety, and protects the environment.
 - 12.1 Establish and provide for a Level of Service as defined in the adopted Sanitary Sewer Plan.
 - 12.2 Require sanitary sewer services for new development, unless otherwise allowed by state or county regulations.
 - 12.2.1 Encourage the design, siting, construction, operation, and relocation or closure of sanitary sewer infrastructure in a manner that is cost effective, environmentally sensitive, appropriate to the location and need, minimizes, and mitigates impacts on adjacent land uses, and prioritizes action to protect vulnerable populations.
 - 12.2.2 Require all new development to avoid or mitigate adverse impacts to functioning water, sanitary sewer, or septic systems.
 - 12.3 SEPTIC SYSTEMS Ensure existing on-site septic systems may continue to serve existing residents as long as they are properly functioning, well maintained, and remain in compliance with Tacoma-Pierce County Health Department requirements.
 - 12.3.1 Allow interim onsite Tacoma-Pierce County Health Department approved septic systems where sewer facilities are not available, but prohibit on-site treatment in new development.
 - 12.3.2 Encourage homeowners to connect to the sanitary sewer system where available.
 - 12.3.3 Require homeowners to connect to the sanitary sewer system if existing onsite septic systems fail to maintain compliance with Tacoma-Pierce County Health Department requirements.

The Sanitary Sewer Plan establishes the following per capita flows to project future flows:

- Residential per capita flow: 68 gpd/resident
- Commercial and industrial per employee flow: 23 gpd/employee

Table 4-5: Existing and Projected WWTF Sumner Influent Flows (mgd)

	Average Annual Flow	Maximum Month Flow	Peak Day Flow	Peak Hour Flow
WWTF Rated Capacity ¹	4.27	6.10	11.66	19.87
Sumner Allocated WWTF Capacity ²	1.74	2.80	6.02	7.64
Existing 2016 Flows	1.06	1.71	6.67	4.66
Year 2024 Flows	1.23	1.86	3.93	5.00
Year 2038 Flows	1.53	2.32	4.38	5.56
2038 Surplus/(Deficit) Based on Sumner's Allocated Capacity	0.21	0.48	1.64	2.08

¹ The rated WWTF capacity numbers are taken from the City of Sumner Wastewater Treatment Facility Final Comprehensive Facility Plan Addendum No. 2 approved by Ecology.

² The maximum month flow of 2.8 mgd is the only specified capacity for Sumner stated within the WWTF Operating Agreement between the Cities of Sumner and Bonney Lake. Other values are interpolated using the peaking factors for flow established within Chapter 6 of the 2020 Sanitary Sewer Comprehensive Plan for purposes of illustrating hydraulic adequacy of the existing WWTF to meet future projections. Sources: BHC Consultants (Table 8-1), 2020; BERK, 2020.

Based on the per capita flow rates from the Sanitary Sewer Plan (68 gpd/resident and 23 gpd/employee), the total additional maximum month flow for residents and employees (using the peaking factor of 1.61 established in the 2020 Plan) is approx. 0.73 mgd by 2044. It may be possible that the anticipated deficit can be accommodated through regular monitoring and capital planning.

As Bonney Lake anticipates more rapid growth of its sewer service area than Sumner in the future, another plant expansion might become necessary. In anticipation of this need, the Wastewater Treatment Facility Phase III Feasibility Study was completed in 2016 and examines a service area that includes the city limits and the entire UGA. This study concluded that a maximum month WWTF capacity of 9.2 mgd was achievable on the current site. At such a time that influent flows necessitate the initiation of another expansion, the agreement would need to be updated to reallocate new capacity shares (BHC Consultants, 2020).

Per the Sanitary Sewer Plan, with the completion of the WWTF expansion in 2016, the WWTP has sufficient capacity to accommodate projected influent 5-day BOD5 and TSS loads through 2038. The 2038 projected maximum month influent loadings to the WWTF are 8,620 pounds/day for 5-day BOD5 and 9,400 pounds/day for TSS, approximately 2,280 and 3,260 pounds/day less than the respective permitted capacities (BHC Consultants, 2020, pp. 5-9, 8-2).

4.6 Stormwater Facilities

The following is the level of service standard as identified in the draft 2024 Comprehensive Plan, Capital Facilities and Public Services Element:

15. In conjunction with existing system providers, provide surface and storm drainage collection and discharge systems to protect water quality, public and private property, and the natural environment.

15.1 Establish and maintain the Level of Service as the 25-year storm event, except in those areas where the 100-year storm design is appropriate to protect the natural environment.

15.2 Require new development to provide for facilities to reduce water quantity and quality impacts associated with new development.

15.2.1 Encourage the design, siting, construction, operation, and relocation or closure of storm drainage infrastructure in a manner that is cost effective, environmentally sensitive, appropriate to the location and need, minimizes and mitigates impacts on adjacent land uses, and prioritizes action to protect vulnerable populations.

15.2.2 Encourage the use of low impact development (LID) and stormwater best management practices to manage stormwater runoff where feasible.

The Sumner Municipal Code reflects adoption of the Department of Ecology Stormwater Management Manual for Western Washington, adoption of the minimum requirements in Appendix I of the NPDES Phase II Permit with some exceptions, and adoption of the Puget Sound Partnership (PSP) Low Impact Development Technical Guidance Manual for Puget Sound.

In addition to program elements required under existing regulations, it is anticipated that additional steps will be necessary to protect habitat and promote salmon recovery, both under the federal Endangered Species Act and the salmon restoration initiatives undertaken by the Governor and the legislature and to meet the NPDES II permit requirements.

4.7 Parks Facilities

Minimum levels of service for parks include the following:

- Investment: Maintain a level of investment per capita (resident equivalent) that is consistent with the current value of the system per person. The 2024 value is \$1,652 per resident equivalent, as may be adjusted periodically for system value, inflation, or annexation.
- Recreation Facilities: Provide for a mix of parks and recreation facilities at a level consistent with the community's current level of facilities:

- Active Recreation Facilities (fields, courts, skate parks, and similar): Sumner facility per 1,000 resident equivalents consistent with the 2024 ratio of 0.4 facilities per 1,000.
- Informal Recreation Facilities (playgrounds, picnic shelters, open lawn areas, and similar): Sumner facility per 1,000 resident equivalents consistent with the 2024 ratio of 3.4 facilities per 1,000.
- Parks: Sumner park acres per 1,000 resident equivalents consistent with the 2024 ratio of 3.2 acres per 1,000.

Target levels of service for parks include the following:

- Investment: Achieve a level of investment per capita (resident equivalent) that is consistent with a 30% increase in the current value of the system per person. The 2024 value is \$2,148 per resident equivalent, as may be adjusted periodically for system value, inflation, or annexation.
- Recreation Facilities:
 - Active Recreation Facilities (fields, courts, skate parks, and similar): 0.5 facilities per 1,000 resident equivalents.
 - Informal Recreation Facilities (playgrounds, picnic shelters, open lawn areas, and similar): 4.4 facilities per 1,000 resident equivalents.
 - Parks: 5.4 acres per 1,000 resident equivalents.
- Open Space (including increases to tree canopy cover): 3.8 acres per 1,000 resident equivalents.
- Access: 10-minute maximum walk to a park for all Sumner residents.

Resident equivalent population is a calculation based on the number of residents and number of jobs in Sumner, considering an individual's estimated time available to use parks in a given week.

The City collects a Park Mitigation Fee to address level of investment per capita. Adoption of the fee by the City Council is done under a separate action and not as part of the adoption of the Capital Facilities Plan.

Table 4-6 illustrates the existing and future level of service for recreation facilities compared to the required level of service.

Table 4-6: Existing Park Facilities and Minimum LOS

Activity	Req'd LOS (2024 conditions)	Exist. #	2044 Demand
Active Recreation Facilities	0.4 per 1,000 resident equiv.	5	7
Informal Recreation Facilities	3.4 per 1,000 resident equiv.	41	56
Parks	3.2 acres per 1,000 resident equiv.	38.8 acres*	53

Source: Parks and Trails Plan, 2024; Sumner Public Works, 2024.

* Includes 16.7 acres along the Sumner Link Trail maintained by Parks staff that are commonly used for picnics and other recreation activities.

Deficits are expected for active recreation facilities, informal recreation facilities, and park acreage in 2044 based on the current facilities. The City will need to add 2 more active recreation facilities, 15 more informal recreation facilities, and more than 14 acres of parks to meet the community's needs.

To reach target levels of service, the City would need to invest in 4 active recreation facilities, 32 informal recreation facilities, and 52 acres of parks over the 2024 system inventory, as well as 31 acres of open space or tree canopy, and targeted investments to ensure all residents have access to a park within a 10-minute walk.

4.8 Fire Facilities

The City of Sumner contracts with East Pierce Fire and Rescue District (EPFR) and therefore adopts the fire district's level of service standards. These standards are based on first unit arrival time and the arrival of minimum acceptable (effective) response. The adopted fire service and EMS minimum level of service was reiterated as part of the most recent EPFR Unit and Response Benchmarks.

Sufficient "first alarm" staff and unit deployment for each different fire or emergency medical incident under Sumner's contract with EPFR has been summarized in Chapter 7 of the 2022 Standards of Cover Study. This study published on the EPFR website highlights recommended minimum staffing needed to mitigate active incidents but notes that additional staff and units may be required to handle complex rescues, fires, or medical emergencies.

When applied to the arrival of the first unit, the 2023 EPFR Unit and Response Benchmarks document states that for urban areas the established benchmark is 90% of calls will have a first unit on site within 8 minutes and 30 seconds. The same document states that 90% of calls will have an effective response force (ERF) in urban areas within 13 minutes and 30 seconds.

When applied to the arrival of the minimum ERF, the 2022 standards of coverage document describes an effective first alarm response force (ERF) by call type in Table 4-7 below:

Table 4-7: Effective Response Force Personnel by Call-Type

Incident Type	Low Risk	Medium Risk	High Risk
Structure Fire	16	21	27-28
Emergency Medical Services	2-5	5	8-10
Rescue	4	10-15	17-20
HazMat	3	-	17-20
Wildland Fire	6		24
Risk Definitions	Incidents involving small fires (fire flow less than 250 gallons per minute), single patient non-life-threatening medical incidents, minor rescues, small fuel spills, and small wildland fires without unusual weather or fire behavior.	Incidents involving fires in single-family dwellings and equivalently sized commercial office properties (fire flow between 250 gallons per minute to 1,000 gallons per minute), life threatening medical emergencies, hazardous materials emergencies requiring specialized skills and equipment, rescues involving specialized skills and equipment, and larger wildland fires.	Incidents involving fires in larger commercial properties with sustained attack (fire flows more than 1,000 gallons per minute), multiple patient medical incidents, major releases of hazardous materials, high risk rescues, and wildland fires with extreme weather or fire behavior.

Incident Type	Low Risk	Medium Risk	High Risk

Source: EPFR Unit and Response Benchmarks, 2023 <https://www.eastpiercefir.org/wp-content/uploads/EPFR-Unit-and-Response-Benchmarks.pdf>

As of 2009, EPFR was meeting its 5-minute response time goal only 60% of the time for fire response, though its 90% performance was 5 minutes and 37 seconds. For EMS-only responses, the district met its goal only 59% of the time, and its 90% performance was 6 minutes and 4 seconds.

Between the 2014 EPFR Standards of Cover report and 2023 Standards of Cover Report, the district has opted to raise the minimum travel time for first unit and ERF from 5 minutes to 8 minutes and 30 seconds for a Fire and EMS calls. This standard excludes medic unit specific calls which have an 11 minute first unit travel time target and HazMat, water, tech, and wildland calls which all have 12 minute first unit travel time targets.

In 2022 EPFR's urban response was slightly below target levels of service for each call type measured. 8,292 calls were made in urban areas and 48% were EMS incidents. Benchmarks and achievements in 2022 are listed in Table 4-8.

Table 4-8: 2022 EPFR Minimum Response Times by Incident Type and Count

2022 Call Type	Benchmark (mm:ss)	90 th Percentile	Total Incidents	% Achieving Benchmark
Turn out times	2:00	2:32	12,653*	74%
Travel Time 1 st Unit (Urban)				
Fire (All)	8:30	9:24	151	76.9%
EMS (All)	8:30	8:59	4014	87.7%
Medic Unit (All)	11:00	12:27	4044	86%
HazMat	12:00	12:37	39	87.2%
Water Rescue	12:00	8:32	2	100%
Technical Rescue	12:00	4:30	1	100%
Wildland Fire	12:00	13:07	41	85.4%

Source: EPFR 2022 Annual Report, BERK 2023

Of the 12,653 calls received within EPFR district and the associated 22,000 turnouts, 2,846 were responded to by Station 113 – Sumner. This is the highest number of calls by station within the district. The vast majority of these 12,653 calls were emergency medical calls (73.7%).

Currently, EPFR staffs the Sumner Fire Station (Station 113) with 5 personnel 24 hours per day. Based on the number of Sumner housing units as well as housing units within the unincorporated UGA there are roughly 2,527 citizens for each staff firefighter/EMS at any given moment in Sumner and its UGA. In projecting growth over the next 20 years, the city and UGA are estimated to grow by 5,916 residents to reach a total of 18,555 residents. To maintain the same level of service, 2 additional fire personnel will likely be needed at Station 113.

Given the size of the station as noted in the section Inventory, there is ample space for these additional staff but an additional apparatus for these staff may be required to meet the growing need in the service area.

The 2022 EPFR Annual Report also notes the aging population throughout the EPFR service area and the increased likelihood for older adults to require EMS response. The report states that in the service area, adults over 65 years of age call for EMS response 2-3 times more often than those under 65. While population and level of service can be extrapolated linearly to 2044, the growth in the population over age 65 could result in call volumes increasing at a higher rate than the rate of population growth, which could increase staffing and equipment needs.

The City collects mitigation fees for fire protection. Adoption of fees by the City Council is done under a separate action and not as part of the adoption of the Capital Facilities Plan.

4.9 Public School Facilities

Sumner-Bonney Lake School District

The *Sumner-Bonney Lake School District's 2021-2027 Capital Facilities Plan* provides for a variety of district standards intended to meet state requirements and provide for a quality education.

Class Size Standards

Standards are anticipated to remain approximately the same as the 2017 class size standards:

Grade level:		Students/Classroom (Average):
Kindergarten	-	19
Grades 1	-	21
Grades 2	-	22
Grades 3	-	22

Grade 4-5	-	27
Grade 6-12	-	30

School Size

In general, the District seeks to design new schools to have the following student capacity:

- Elementary School: 500-650 Students
- Middle School: 750 -950 Students
- High School: 1,700-1,800 Students

Generally, the District seeks to acquire school sites of the following sizes in order to comply with development regulations:

- Elementary School: 15 acres
- Middle School: 25 acres
- High School: 40 acres

Enrollment and Capacity

Currently, most of the Sumner-Bonney Lake School District schools in Sumner are at or over capacity, with the exception of Sumner Middle School, which is operating 6 percent under student capacity (Table 4-9).

Table 4-9: Sumner School Enrollment and Capacity

School	Capacity (Students)	2022-23 Enrollment (Students)	Percent Over/Under Capacity
Sumner High School	1,260	1,844	46%
Sumner Middle School	722	681	-6%
Daffodil Valley Elementary	481	492	0.2%
Maple Lawn Elementary	454	634	40%
Sumner Early Learning Center	168	--	--

Source: Enrollment: OPSI Report Card, 2023.

The Sumner-Bonney Lake School District maintains student generation numbers to determine the number of students that can be expected from new residential construction. These numbers are shown in Table 4-10.

Table 4-10: Student Generation Rates, Sumner-Bonney Lake School District

School Type	Single Family	Multifamily
Elementary School	0.403	0.095
Middle School	0.140	0.043
High School	0.099	0.033

Source: Sumner-Bonney Lake School District Capital Facilities Master Plan, 2021-2027, 2021.

Enrollment Projections: The Sumner-Bonney Lake School District Capital Facilities Plan includes district-wide enrollment projections based on a Demographic Study prepared for the District. See Table 4-11.

Table 4-11: Enrollment Projections for Sumner-Bonney Lake School District

	2021	2022	2023	2024	2025	2026	2027	Change
Daffodil Valley Elementary	430	449	456	451	448	450	453	+23
Maple Lawn Elementary	569	637	624	618	611	614	626	+57
Sumner Middle School	725	702	708	741	773	796	809	+84
Sumner High School	1594	1661	1741	1768	1760	1772	1806	+212

Source: Sumner-Bonney Lake School District Capital Facilities Master Plan, 2021-2027, 2021. Retrieved from <https://www.sumnersd.org/cms/lib/WA01919505/Centricity/Domain/253/Master%20Copy%20SBLSD%20CFP%202021-2027.pdf>.

¹ Projections were calculated by Educational Data Solutions for a Demographic Study for Sumner-Bonney Lake School District

Beyond 2027, Sumner is expected to continue to grow, resulting in more students at Sumner schools by 2044, impacting school capacity. Table 4-12 shows estimated student growth between 2020 and 2044, based on the housing capacity in the district and assumed student generation rates.

Table 4-12: Sumner-Bonney Lake School District: Student Growth 2020-2044

Additional Students (1,975 new housing units in the City portion of district)	
Sumner-Bonney Lake School District	682
<i>Elementary School</i>	413
<i>Middle School</i>	156
<i>High School</i>	113

Source: Sumner-Bonney Lake School District 2022; Dieringer School District 2021; Sumner 2023; BERK 2023.

With growth in the city, the Sumner-Bonney Lake School District could see a total of approximately 682 new students from Sumner city limits. This could include 413 elementary school students, 156 middle school students, and 113 high school students. As shown in Table 4-9, all Sumner-Bonney Lake School District schools located in the City of Sumner are over or nearing capacity (as of the 2022-23 school year). Based on planned growth, it is likely the schools located in Sumner will further exceed their capacities. Growth is also expected to occur outside of city limits in the Sumner UGA, which could further impact Sumner school capacity. The reader is referred to the Sumner-Bonney Lake School District's Capital Facilities Plan for additional discussion of assumptions and LOS standards.

The City is authorized to collect mitigation fees for schools (see Appendix E). Adoption of school mitigation fees by the City Council is done under a separate action and not as part of the adoption of the Capital Facilities Plan. A summary table of impact fees is contained in Appendix E.

[Dieringer School District](#)

Enrollment and Capacity

Dieringer School District schools are close to or over capacity for the 2022-2023 school year. Lake Tapps Elementary school is 26 percent over capacity, while Dieringer Heights Elementary School and North Tapps Middle School are slightly under capacity (Table 4-13).

Table 4-13: Dieringer School District - Enrollment and Capacity

School	Capacity	2022-23 Enrollment	Percent Over/Under Capacity
Lake Tapps Elementary School	357	451	26%
Dieringer Heights Elementary School	508	472	-7%
North Tapps Middle School	536	521	-3%

Source: Enrollment: OPSI Report Card, 2023. Capacity: Dieringer School District Capital Facilities Plan, 2020.

The Dieringer School District establishes student generation rates for the purposes of facility planning, see Table 4-14.

Table 4-14: Student Generation Rates, Dieringer School District

School Type	Single Family	Multifamily
Elementary School	0.322	0.172
Middle School	0.13	0.07

Source: Dieringer School District Capital Facilities Plan, 2021-2026, 2020.

Based on Sumner's planned growth, the Dieringer School District is likely to serve more students in 2044 than it does currently (Table 4-15). There may be approximately 4 new students from housing growth in Sumner city limits including 3 elementary students and 1 middle school student.

Table 4-15: Dieringer School District: Student Growth 2020-2044

Preferred Alternative: Additional Students (10 new housing units in the City portion of district)	
Dieringer School District	4

Preferred Alternative: Additional Students (10 new housing units in the City portion of district)	
<i>Elementary School</i>	3
<i>Middle School</i>	1

Source: Sumner-Bonney Lake School District 2022; Dieringer School District 2021; Sumner 2023; BERK 2023.

4.10 Transportation Facilities

Multimodal level of service standards are required for non-motorized transportation facilities, locally owned arterials, and transit routes that serve urban growth areas, to serve as a gauge to judge system performance and to help achieve the statewide goal of environmental justice. LOS standards establish the basis for the concurrency requirements in the GMA and are used to evaluate impacts as part of the State Environmental Protection Act (SEPA). Agencies are required to show concurrency—i.e., to “adopt and enforce ordinances which prohibit development approval if the development causes the level of service on a transportation facility to decline below the standards adopted in the transportation element of the comprehensive plan, unless transportation improvements or strategies to accommodate the impacts of development are made concurrent with development” (RCW 36.70A.070(6)(b)).

Vehicle

Level of service is both a qualitative and quantitative measure of roadway and intersection operations. Vehicle level of service uses an “A” to “F” scale to define the operation of roadways and intersections as follows:

LOS A: Primarily free flow traffic operations at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delays at intersections are minimal.

LOS B: Reasonably unimpeded traffic flow operations at average travel speeds.

LOS C: Stable traffic flow operations. However, ability to maneuver and change lanes may be more restricted than in

LOS B, and longer queues may contribute to lower-than-average travel speeds.

LOS D: Small increases in traffic flow may cause substantial increases in approach delays and decreases in speed.

LOS E: Significant delays in traffic flow operations and lower operating speeds.

LOS F: Traffic flows at extremely low speeds. Intersection congestion is likely, with high delays and extensive vehicle queuing.

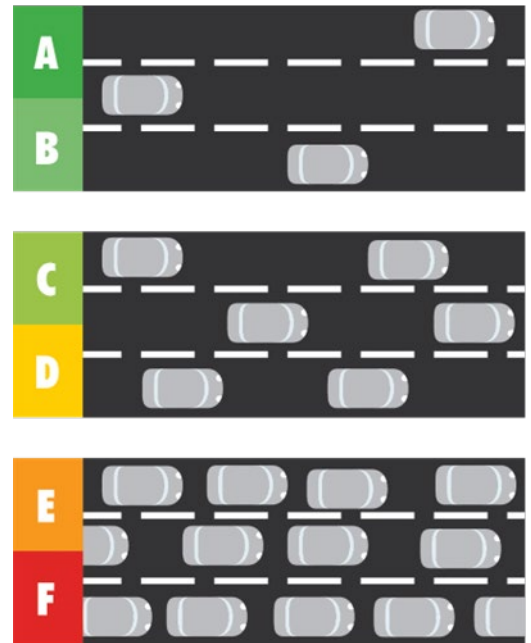


Figure 4-1: Illustration of Vehicle LOS

Sumner LOS Standards

Sumner has established intersection LOS standards. The standards are applied to the weekday PM peak hour and to other time periods as appropriate based on the type and location of development. The LOS standards are:

- Signalized, Roundabout, and All-way Stop Controlled Intersections
 - LOS D based on average performance of all traffic movements consistent with the current HCM method:
 - Exception is LOS F at the following:
 - Traffic Avenue/Main Street/Fryar Avenue (Signal)
 - Main Street/Alder Avenue (Signal)
 - Valley Avenue East/Main Street (Signal)
 - West Valley Highway East/Valley Avenue/Sumner Heights Drive (Signal)
- Two-way, Stop Controlled, Unsignalized Intersections
 - LOS D or better based on the average delay per vehicle for each approach or separate traffic movement at the intersection using the latest methodologies in the Highway Capacity Manual

- Exception allows left turns and through movements on side streets intersecting with arterials to operate below the adopted LOS D standard when the LOS affects relatively low traffic volumes and may not meet warrants for traffic signals.

State Highway LOS Standards

The City of Sumner is served by SR 167 and SR 410. SR 167 is classified as a Highway of Statewide Significance (HSS). Per WSDOT's Highway Systems Plan, the LOS standards for HSS facilities are set forth by State law. State law sets LOS D for HSS facilities in urban areas and LOS C for HSS facilities in rural areas. Since SR 167 is located within the Sumner urban area, the LOS D standard applies. GMA concurrency requirements do not apply to HSS facilities, per State legislation.

SR 410 is a State Highway of Regional Significance, Tier 2. The level of service standard for regionally significant state highways in the central Puget Sound region is set by PSRC in consultation with WSDOT and the region's cities and counties. PSRC established LOS D for SR 410 in Sumner. PSRC notes that it will measure the level of service for regionally significant state highways on a one-hour PM peak period basis. Furthermore, PSRC notes that local agencies will need to decide whether to apply concurrency to state highways of regional significance.

Traffic Operations

Traffic operations were evaluated based on intersection operations and the HCM methodology consistent with the existing conditions analysis. Intersection improvements were assumed based on the transportation improvement list outlined at the beginning of this. Traffic signal timing was optimized in consideration of changes that would occur with intersection maintenance to address growth in traffic volumes.

Overall, the analysis finds that most of the study intersections operate at LOS D or better during the weekday PM peak hour with the projected growth. Table 4-16 summarizes the existing and projected operations at intersections where further review and potential improvements may be needed. The key finding of the analysis is that the city should consider potentially changing the adopted LOS standards. The 2015 Comprehensive Plan LOS policy changed the LOS standard to F at several intersections where operations were forecast to be LOS F with little or no feasible improvement projects. Due to shifts in traffic patterns and decreases in traffic volumes, operations at some intersections have improved. In addition, feasible improvements can be identified at intersections that are projected to operate at LOS E or F.

Table 4-16: Weekday PM Peak Hour LOS Summary

Intersection	Current LOS Standard	2023 Existing			2044 Draft EIS Alternative 1/Preferred Alternative		
		LOS ¹	Delay ²	V/C ³ or WM ⁴	LOS	Delay	V/C or WM
Stewart Road SE/Butte Avenue SE	D	F	186	SB	C	33	-
E Valley Highway E/Forest Canyon Road E	D	F	>180	WB	F	>180	WB
Puyallup Street/Tacoma Avenue	D	C	19	-	F	84	-
E Valley Highway E/Elm Street E	D	D	30	NBL	F	57	NBL
Valley Avenue/Elm Street E	D	D	31	NBL	E	43	NBL
Sumner Heights Drive E/W Valley Highway E	F	C	29	-	D	41	-
Traffic Avenue/Main Street	F	D	43	-	E	58	-
Alder Avenue/Main Street	F	B	11	-	B	14	-
Valley Avenue/Main Street	F	C	23	-	C	32	-
Parker Road E/Main Street E	D	C	24	SB	F	56	SB
160th Avenue E/Main Street (60th Street E)	D	C	16	-	E	47	-
Sumner-Tapps Highway E/SR 410 WB Ramp	D	F	61	WB	A	7	0.54

Intersection	Current LOS Standard	2023 Existing			2044 Draft EIS Alternative 1/Preferred Alternative		
		LOS ¹	Delay ²	V/C ³ or WM ⁴	LOS	Delay	V/C or WM
Valley Avenue/SR 410 EB Ramp	D	F	80	-	B	12	0.87
Valley Avenue/74th Street E	D	F	110	EB	F	>180	EB

Source: Transpo, 2024.

Notes:

1. Level of service, based on 2010 Highway Capacity Manual methodology.
2. Average delay in seconds per vehicle.
3. Volume-to-capacity ratio reported for signalized intersections.
4. Worst movement reported for unsignalized intersections.

As shown in Table 4-16, the following intersections are anticipated to improve compared to existing conditions during weekday PM peak hour with the planned and funded improvements:

- **Stewart Road SE/Butte Avenue SE** - Completion of the traffic signal is anticipated to improve operations to LOS D
- **Sumner-Tapps Highway E/SR 410 WB Ramp** - The planned roundabout results in LOS A conditions
- **Valley Avenue/SR 410 EB Ramp** - The planned roundabout results in LOS B conditions

There are currently three intersections (Sumner Heights Drive E/W Valley Highway E, Alder Avenue/Main Street, and Valley Avenue/Main Street) that have a LOS F standard but are forecast to operate at LOS D or better during the weekday PM peak hour. One intersection, Traffic Avenue/Main Street, has a LOS F standard but is forecast to operate at LOS E.

The remaining intersections summarized in Table 4-16 are forecast to degrade below LOS D during the weekday PM peak hour. Most of the poor intersection operations during the weekday PM peak hour are projected along E Valley Highway and Valley Avenue. This is consistent with the observed regional cut-through traffic, which avoids congestion along SR 167 and uses routes through Sumner. Other intersections impacted by shifts in traffic and growth in the City of Sumner are the Parker Road E/Main Street E and 160th Avenue E/Main Street E intersections. Potential improvements at these intersections and the Traffic Avenue/Main Street intersection are discussed in Chapter 5.

Pedestrian

The pedestrian network has been identified through a series of Primary or Secondary Routes. Corridors identified as Primary or Secondary Routes are not indicative of a hierarchy or priority for future non-motorized transportation sidewalk facility development, rather they are used to make a distinction between routes that are more regional or that extend completely through the community (primary), and those that serve to make the second leg of the journey to connect to destinations, extend into neighborhoods, or complete a loop (secondary).

The sidewalk LOS standards shown in Figure 4-2 emphasize system completion of sidewalks, pathways, or multi-use trails on arterial and collector roadways. The LOS designations are shown in green, orange, and red.

A green LOS indicates a facility meets adopted roadway standards. An orange LOS indicates a facility has sidewalks on only one side of the roadway when both sides are the standard. A red LOS indicates no designated facilities are provided for sidewalk users and is considered unacceptable.

Figure 4-2: Pedestrian LOS Standard

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

Source: Transpo Group, 2023

The City has established level of service standards for its pedestrian network based on the methodology in Figure 4-2 and the future network identified on Figure 4-3. A green LOS is the standard for secondary routes, while an orange LOS is the standard for primary routes. The city utilizes these standards to prioritize investments in the non-motorized transportation network and identify where significant gaps in the system need to be addressed to serve the Sumner land use plan.

Applying the standards described above, the pedestrian LOS analysis is shown on Figure 4-5. The LOS is determined by comparing the 2044 future pedestrian network to the existing, planned, and funded pedestrian network. The pedestrian LOS analysis shows most of the future pedestrian network meets standard. There are some key connections to trails south of SR 410 that are missing as well as corridors such as Elm Street and 160th Avenue E that have missing sidewalks. The long-term project list identified in the Transportation Plan Chapter 5 would implement the orange LOS for primary routes and green LOS for secondary routes.

Bike

A future bike network was identified and is shown on Figure 4-4. The bike LOS was identified through an understanding of the availability of bike facilities along designated routes. Bike facilities could include sharrows, dedicated bike lanes, or protected bike lanes. A green LOS is the standard for the bike routes. Like the pedestrian LOS, Sumner utilizes these bike standards to prioritize investments in the non-motorized transportation network and identify where significant gaps in the system need to be addressed to serve the City's land use plan.

The LOS analysis for the bike network is shown on Figure 4-6. The LOS is determined by comparing the 2044 future bike network to the existing, planned, and funded bike network. The bike LOS analysis shows that bike connectivity east-west is limited and there is a lack of facilities within the east part of Sumner. The East Sumner Subarea Plan envisioned additional bike connectivity in this area as development occurred. The long-term project list identified in Table 6-6 would implement the green LOS for bike routes.

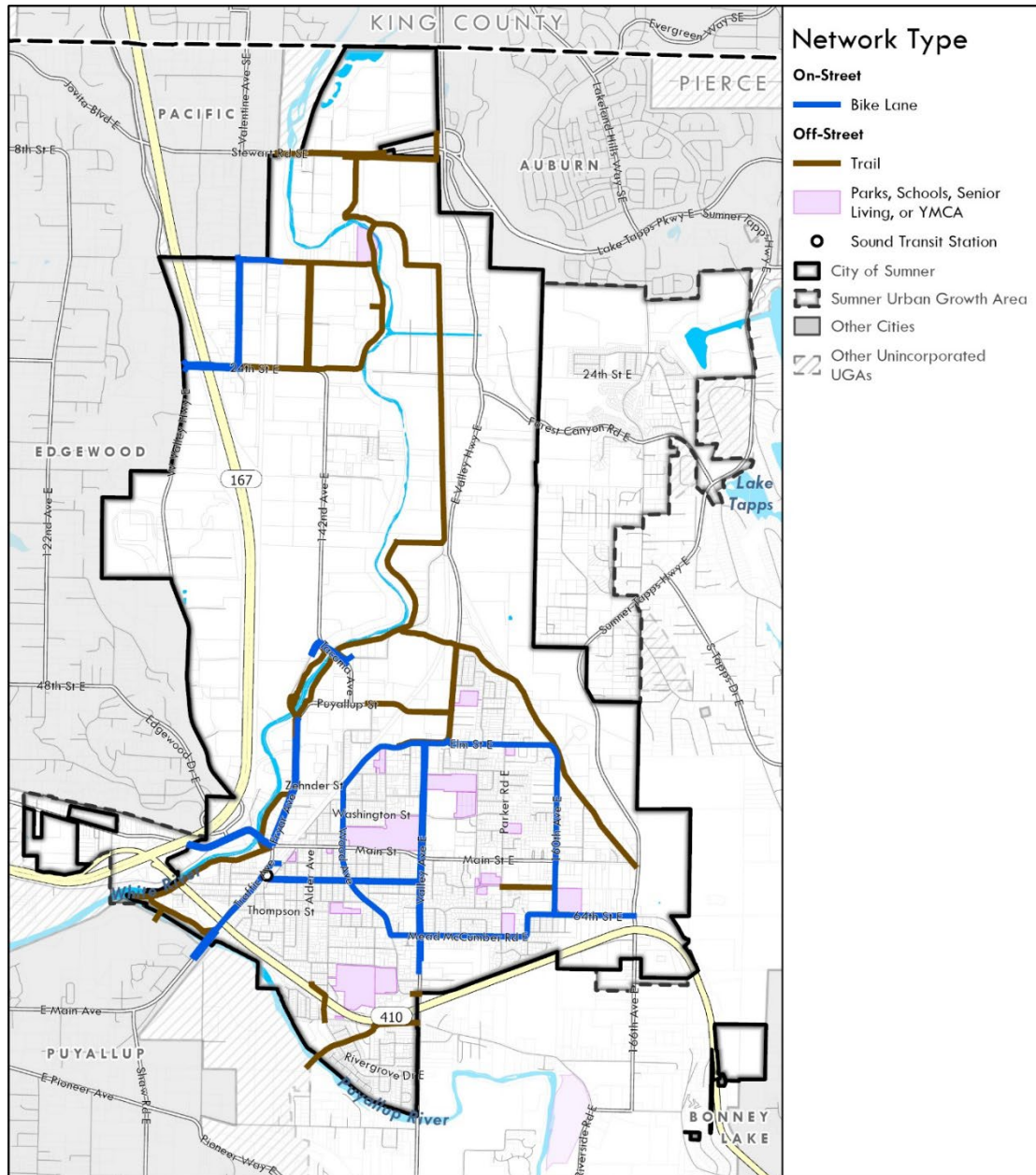
Future Pedestrian Network



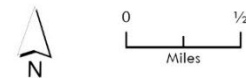
Map Date: February 2024



Figure 4-4: Future Bicycle Network



CITY OF SUMNER Future Bike Network

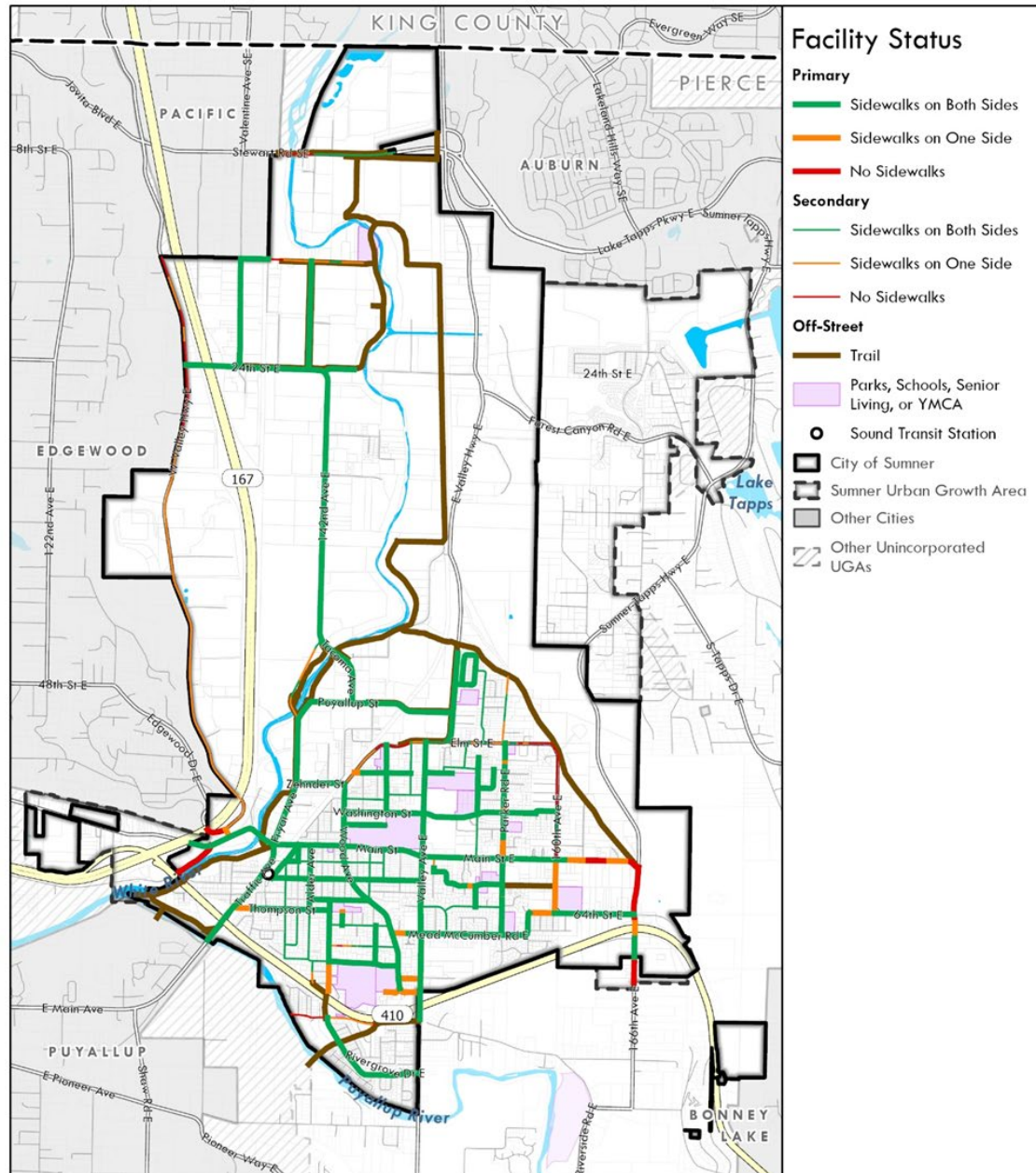


Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

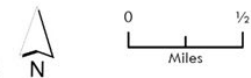
Source: City of Sumner, 2024; Transpo, 2024.

Figure 4-5: Future Pedestrian Level of Service



CITY OF SUMNER

Future Pedestrian Level of Service

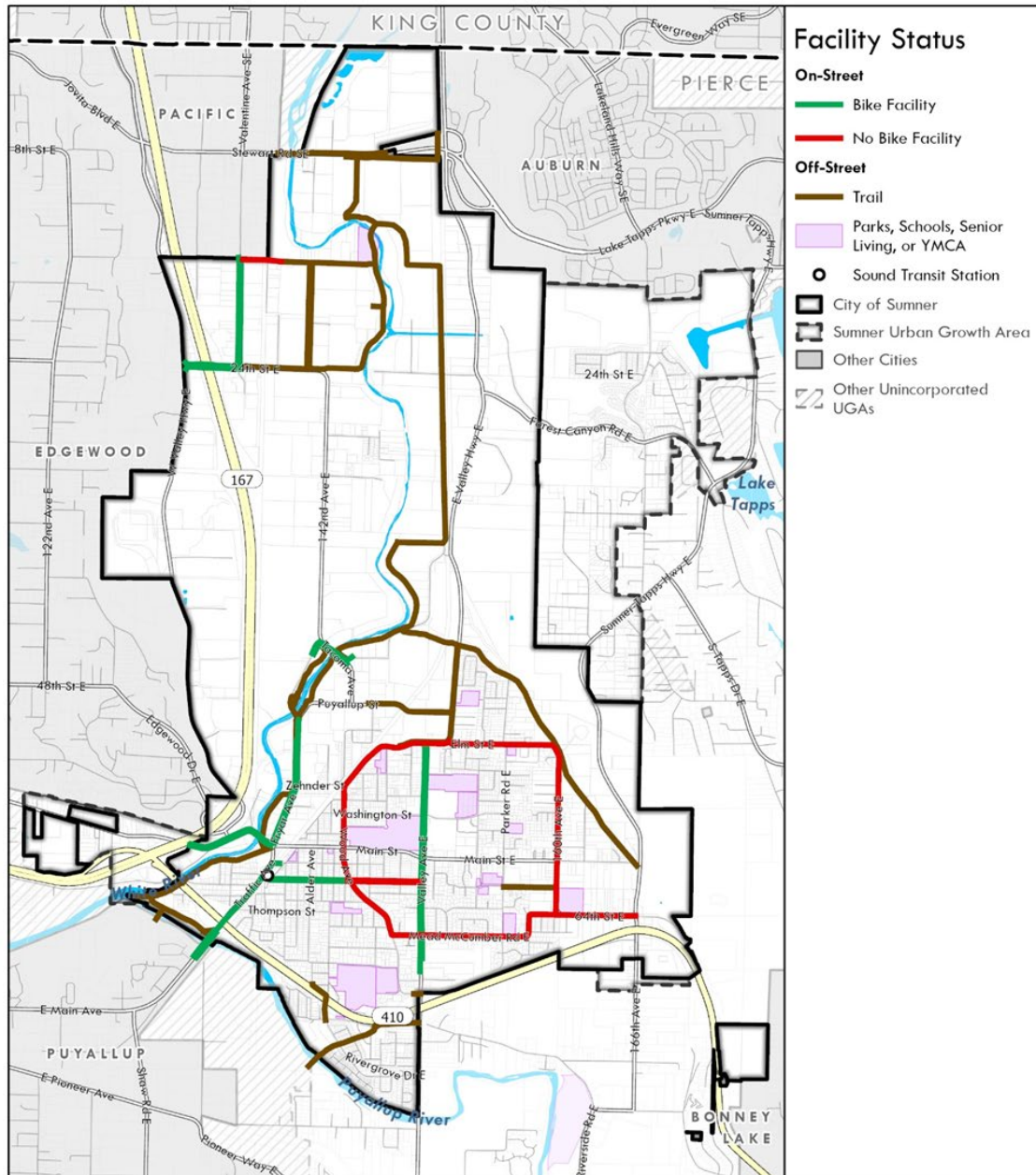


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Map Date: February 2024

Source: City of Sumner, 2024; Transpo, 2024.

Figure 4-6: Future Bike Level of Service



CITY OF SUMNER Future Bike Level of Service

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Source: City of Sumner, 2024; Transpo, 2024.

Chapter 5: Existing Deficiencies, Future Needs, and Recommendations

5.1 Introduction

The Capital Facilities Plan is required by GMA to identify deficiencies in capital facilities, which are not eligible for development impact fee support. City facilities that are deficient are those that do not now exist in number, size, or location to satisfy levels of service as set forth in City plans for its existing populations.

This chapter also identifies deficits that may occur in the future if new facilities are not added as the City grows through 2044 and recommendations to address these deficits.

5.2 General Government Facilities

Existing Deficiencies

There is currently a deficit of 1 police officer, as shown in Table 5-2. The City has also identified existing capacity issues for general government and police facilities. Space for general government is at capacity, with some staff working from temporary construction trailers. The Police Department has identified needs beyond office space provided in the current area at City Hall including secure evidence storage, prisoner holding cells, a BAC processing area, secure records storage, an exercise area, restroom, locker facilities, private interview rooms, and secure police vehicle storage and equipment storage.

Future Needs and Recommendations

There is expected to be a deficit of 6,537 square feet of general government buildings by 2044 based on the updated LOS and city population (see Table 5-1). Police facilities are expected to have a deficit of 3,812 s.f. Public Works Shops would also see a deficit by 2044 with the current facilities, but the City is in the process of replacing the existing shops with a new 83,050 square-foot facility, which exceeds 2044 needs.

Table 5-1: City Government Buildings LOS Deficits

	Required LOS (s.f./capita)	Exist. Area (s.f.)	2022 need (City Pop. 10,800)	2044 need (City Pop. 15,525)	Surplus/Deficit (s.f.)	
					2022	2044
General Government	1.36	14,577	14,577	21,114	-	(6,537)
Police	294 s.f./employee	7,654	7,654	11,466	-	(3,812)
Public Works Shops	1.80	17,136	19,440	27,945	(2,304)	(10,809)

Table 5-2: Police LOS Deficits

	Required LOS	Existing	2022 need (City Pop. 10,800)	2044 need (City Pop. 15,525)	Surplus/Deficit (s.f.)	
					2022	2044
Police Officers	2 per 1,000 population	21	22	31	(1)	(10)

10 additional police officers will also be needed to serve the 2044 population at 2 commissioned officers per 1,000 population.

If the City were to annex the UGA during the planning period, square footage and police officer needs would increase to 13,524 s.f. and 37 police officers.

5.3 Water Facilities

Existing Deficiencies

Deficiencies in the water system are identified in the 2020 Water System Plan, summarized in the excerpts below:

Distribution System

"The City plans to continue to expand the water system as development occurs. The City also has existing pipes that need replacement due to age, disrepair, or lack of capacity."

Source Improvements

"The City of Sumner's existing source water rights capacity is sufficient to meet the projected MDD through 2038. The City has filed application G2-30534 to increase the approved combined withdrawal rate from the West, South, and Central Wells from 1,250 gpm to 2,250

gpm. Pending approval of this application by 2024, the City will have sufficient production capacity to meet the source reliability criteria...”

Storage Improvements

“The City of Sumner has adequate storage capacity projected through 2038. Storage improvement projects detailed herein are not related to storage capacity, but address tank site and functionality improvements.”

Operations and Maintenance

“Although the City continues to operate and maintain the system, additional projects have been identified to increase the operational effectiveness of the system. The Water Use Efficiency Program also implements requirements for additional operations and maintenance projects.”

Future Needs and Recommendations

The Sumner Water System Plan anticipates growth to 2068 and associated strategies and investments. Growth assumptions for the 2068 high growth scenario in the Water System Plan are higher than the planned growth, and it is possible that the 2044 growth could be accommodated. Growth timing can be addressed through regular monitoring and capital planning, as the Water System Plan is updated every 6-10 years.

5.4 Sanitary Sewer

Existing Deficiencies

Table 7-3 in the 2020 Sanitary Sewer Plan describes existing gravity sewer deficiencies. There are no pump station or force main deficiencies.

Future Needs and Recommendations

The 2020 Sanitary Sewer Plan identifies projected deficiencies through 2038 (Section 7.8.4). Population and job growth to 2044 generally aligns with the projected growth rate through 2038 in the Sanitary Sewer Plan.

Chapter 10 of the 2020 Sanitary Sewer Plan lists capital projects to correct deficiencies and upgrade and expand the system. This includes a 20-year capital improvement program through 2038.

5.5 Stormwater Facilities

The 2020 Stormwater Capital Improvement Plan outlines recommended capital improvement projects based on existing deficiencies in the system.

5.6 Parks Facilities

Existing Deficiencies

No existing deficiencies for parks and recreation facilities are identified based on the 2024 Sumner resident equivalent population and minimum levels of service, as the level of service is based on 2024 conditions.

Future Needs and Recommendations

City population and job growth to 2044 is likely to result in deficits for active recreation facilities, informal recreation facilities, and parks.

The City will also need to invest \$1,652 per resident equivalent to meet the minimum LOS, which could amount to more than \$7.5 million for growth occurring through 2044.

To achieve the City's target LOS, Sumner would need to make further investments in active recreation facilities, informal recreation facilities, parks, and open space and tree canopy, in addition to targeted investments to ensure all residents have access to a park within a 10-minute walk. To meet the target level of investment of \$2,148 per resident equivalent, the City would need to invest more than \$9.8 million in the parks system through 2044.

5.7 Fire Facilities

Existing Deficiencies

Staffing at Station 113 meets the minimum recommended firefighters per the 2015 CFP. In 2022, EPFR's urban response was slightly below target levels of service.

Future Needs and Recommendations

The increase in number of calls requiring dispatch means that Station 113 may struggle to meet minimum levels of service in coming years. To meet LOS standards for first-due response units and minimum ERF through 2044, EPFR's staffing of fire stations serving the current area should be increased by at least 2 / 3 fire personnel.

For EPFR to achieve all the LOS standards necessary to accomplish critical tasking, mount an effective response force, and achieve acceptable response times, additional fire stations strategically located in the current plan area may also be required. Plans for additional stations are described in Chapter 6.

5.8 Public School Facilities

Sumner-Bonney Lake School District

Existing Deficiencies

As described in Table 4-9, Sumner High School, Daffodil Valley Elementary, and Maple Lawn Elementary are currently enrolled over their student capacity.

Future Needs and Recommendations

Based on school capacity, current enrollment, and projected additional students, the Sumner-Bonney Lake School District is expected to need to add capacity in Sumner before 2044, particularly for elementary and high school students. See Table 5-3.

Table 5-3: Sumner-Bonney Lake School District Projected Capacity Deficit/Surplus

School Type	Total Capacity (Students)	2022-2023 Total Enrollment (Students)	2044 Projected Additional Students (City only)	2044 Projected Total Students	2044 Projected Capacity Deficit/Surplus
Elementary School	935	1,126	413	1,539	(604)
Middle School	722	681	156	837	(115)
High School	1,260	1,844	113	1,957	(697)

Source: Sumner-Bonney Lake School District Capital Facilities Plan 2021-2027; BERK, 2024.

Note: The total student count and deficit/surplus accounts for existing students and growth in Sumner. It does not account for growth outside of city limits.

The Sumner-Bonney Lake School District updates its Capital Facilities Plan typically annually, which allows the district to plan for future capacity needs. The district will consider projected growth in Sumner and in other parts of the service area in planning future projects.

The 2021-2027 Sumner-Bonney Lake School District Capital Facilities Plan identifies a project in 2023 to add net capacity for 1,660 high school students at Sumner High School, which is expected to be enough capacity to serve growth through 2044 within Sumner city limits. However, Sumner High School serves areas outside of Sumner, and the district will need to consider how growth in those locations will affect capacity long-term. The school district also allows waivers from other schools, which will also affect facility planning.

No projects are identified by the district for middle school or elementary capacity increases in Sumner before 2027. The plan does anticipate districtwide needs for two more elementary

schools, a new middle school, and potentially new or expanded high school facilities beyond 2027. This facility planning is in part due to development of the Tehaleh planned community, located outside of Sumner.

Dieringer School District

Existing Deficiencies

As shown in Table 4-13, Lake Tapps Elementary school is already enrolled over capacity by 26 percent.

Future Needs and Recommendations

The Dieringer School District is also expected to need to add capacity by 2044. While growth in Sumner is expected to only add a few students (since most of Sumner is not within the Dieringer School District), there will be growth in other parts of the district that will further affect capacity. See Table 5-4.

Table 5-4: Dieringer School District Projected Capacity Deficit/Surplus

School Type	Total Capacity (Students)	2022-2023 Total Enrollment (Students)	2044 Projected Additional Students (City only)	2044 Projected Total Students	2044 Projected Capacity Deficit/Surplus
Elementary School	865	923	3	926	(61)
Middle School	536	521	1	522	14

Source: Dieringer School District Capital Facilities Plan, 2021-2026, 2020; BERK, 2024.

Note: The total student count and deficit/surplus accounts for existing students and growth in Sumner. It does not account for growth outside of city limits.

The Dieringer School District updates its Capital Facilities Plan every few years, which is an opportunity to plan for future needs. The district will consider impacts of growth in Sumner and in other parts of its service area in its capital facilities planning process. The district's 2020 plan identifies a project for a new elementary school ("Elementary #3"), adding capacity for 433 more students, which will help address elementary school needs. There are no projects identified through 2026 for capacity increases for middle schools—while growth in Sumner city limits is not expected to cause capacity issues, this growth combined with growth in other parts of the service area could cause a deficit. The district will need to address 2044 projected needs in their future Capital Facilities Plan updates.

5.9 Transportation Facilities

Existing Deficiencies

The Transportation Plan sets forth the current and future deficiencies in the city's transportation network. See the Transportation Improvement Program in **Appendix D**.

Future Needs and Recommendations

The Transportation Plan sets forth a list of 20-year Transportation Improvement Projects to address projected growth, shown in Table 6-6.

Chapter 6: Capital Facilities Plan Projects and Financial Plans

6.1 Capital Facilities Plan Projects

General Government Facilities

The City has identified several projects relating to general government facilities over the next six years (Table 6-1).

Table 6-1: General Government Facilities Capital Improvement Plan–2023-2028

Project	Funding Source	2023	2024	2025	2026	2027	2028	Total
City Hall - HVAC Replacement	Facilities Capital Fund	25,000	25,000	-	-	-	-	50,000
City Hall - Roof Replacement	Facilities Capital Fund	350,000	-	-	-	-	-	350,000
Senior Center - Exterior Painting	Facilities Capital Fund	40,000	-	-	-	-	-	40,000
		540,000	25,000	0	0	0	0	565,000

Source: Sumner 2023-2024 Budget.

The above projects do not add square footage to any facility and therefore do not impact LOS. However, the City's new public works facility, not included above, will also start construction in 2024-25, which will provide capacity above and beyond the adopted public works shops LOS for the projected 2044 population. As discussed above in Chapter 5, the City will also need to add square footage of general government facilities before 2044 to meet the adopted level of service. Additional police officers will also be needed.

The City will be considering options for increasing general government capacity that include expansion of existing facilities, acquiring land and building new facilities, or locating offices within other city facilities such as the planned Operations Facility or new events building at Heritage Park. These options need to be evaluated in a detailed facilities needs analysis that considers staffing demands, etc. Finally, funding plans for additional general government facilities will need to be considered based on the preferred options. There is not enough detail in the capital facilities plan to assess those details.

Water Facilities

The 2020 Capital Improvement Plan for water facilities (in the 2020 Water System Plan) has projects related to the distribution system, source improvements, storage, and operations and maintenance. The total for the 20 year duration of the Plan (2018-2038) is: \$32.88 million.

Appendix B contains the Water System Capital Improvement Plan and Schedule.

Sanitary Sewer

The 2020 Capital Improvement Program for sanitary sewer shows a number of projects in the 20-year planning period (2018-2038) including sewer line extension, replacement, and relocation; wastewater treatment upgrades; pump and equipment replacement; totaling \$8.81 million from 2018-2023 and \$17.75 million from 2024-2038.

Appendix C contains the 2020 Sewer Capital Improvement Plan and Schedule.

Stormwater Facilities

The 2020 Stormwater Capital Improvement Plan includes projects scheduled through 2026 and projects for after 2026. These projects include levee improvements, culvert replacements, and numerous other system improvements totaling \$82.7 million.

Table 6-2 contains the 2020 Stormwater Management Plan Capital Improvement Projects.

Table 6-2: Proposed Capital Improvement Projects, Stormwater

Capital Improvement Project	Project Priority ¹	Total Cost Year 2019	Year of Completion
CIP No. 1–Railroad Street Improvements	Medium	\$353,000	2023
CIP No. 2 – 63rd Street Court E Improvements	High	\$221,000	2022
CIP No. 3–151st Avenue E and 152nd Avenue E Improvements	Medium	\$918,000	2026
CIP No. 4–63rd Street Court E Improvements	Medium	\$293,000	2022
CIP No. 5–North 160th Avenue E Improvements	High	\$1,051,000	2022
CIP No. 6–Willow Street Interceptor and Tributary Improvements	Medium	\$2,098,000	2026
CIP No. 7–Meade McCumber Street Improvements	Medium	\$282,000	2025

Capital Improvement Project	Project Priority ¹	Total Cost Year 2019	Year of Completion
CIP No. 8–162 nd Ave E (Poole Road) Outfall Improvements	Low	\$143,000	After 2026
CIP No. 9–47th Street Court E Culvert Improvements (CEG Site E)	High	\$125,000	2024
CIP No. 10–160th Avenue E Culvert Improvements (CEG Sites H, I, 106 th Ave E)	High	\$1,451,000	2022
CIP No. 11–162nd Avenue E Culvert Improvements (CEG Sites J, K, L)	High	\$365,000	2024
CIP No. 12–East Main Street Culvert Improvements	High-Medium	\$41,000	2024
CIP No. 13–Salmon Creek Restoration	Medium	\$675,000	2024
CIP No. 14–64th Street E Culvert Improvements	High-Medium	\$675,000	2024
CIP No. 15–White River Levee Improvements	High-Medium	\$3,800,000	2024
CIP No. 16– 24 th Street Setback Levee	High-Medium	\$45,123,000	After 2026
CIP No. 17–Rivergrove Puyallup River Improvements	Medium	\$15,611,000	2026
CIP No. 18 - 24 th and 142 nd Intersection Treatment	High	\$171,000	2021
CIP No. 19 - Stewart Road Pond Repair and Enhancement (full project)	High	\$356,000	2022
CIP No. 20 - Treatment in Drainage District 11	Medium	\$98,000	2026
CIP No. 21 - Wood Ave Conveyance, Zehnder to 16 th	Low	\$157,000	After 2026
CIP No. 22 - Meade Ave improvements one block south of Main St	High-Medium	\$170,000	2023
CIP No. 23 - Sumner-Tapps Highway and 60 th Street East	High	\$100,000	2021
CIP No. 24 - SR 410/166 th Ave E I/C	Medium	\$4,427,000	2025
CIP No. 25 - Main Street and 160 th Ave	Medium	\$296,000	2023
CIP No. 26 - 62 nd St: 166 th Ave to 160 th Ave E	Medium	\$1,476,000	2022

Capital Improvement Project	Project Priority ¹	Total Cost Year 2019	Year of Completion
CIP No. 27 – Elm St: East Valley Highway to 160 th Ave East	Medium	\$1,063,000	2023
CIP No. 28 – Parker Road: 62 nd to 63 rd	Medium	\$114,765	2023
CIP No. 29 – Parker Road: Main to 50 th	Medium	\$583,000	2024
CIP No. 30 – Sidewalk Replacement Program	High-Medium	\$22,000	2024
CIP No. 31 – Volunteer Sidewalk Program	High-Medium	\$35,000	2024
CIP No. 32 – Mountain Circle Outfall Replacement	Medium	\$507,000	2024
Total Capital Asset Funds (Includes inflation) (City-funded only–exclude developer or LID-funded projects)		\$82,728,000	

Source: 2020 Stormwater Capital Improvement Plan

High = Completed 0-5 years; Medium = Completed 5-10 years; low = Completed within 10-20 years

Parks Facilities

Parks and Open Space capital projects biennium are listed in Table 6-3 and are based on the adopted 2023-24 Sumner budget. Projects outlined in the budget include replacement of Rainier View Park playground, continued funding of improvements to Seibenthaler Park and the proposed Bennet Park property, and projects to replace playground equipment, add shelters and picnic areas, totaling \$5.13 million.

The City's Parks and Open Space Plan also identified capital projects through 2030, which are outlined in Table 6-4.

Table 6-3: Improvement Plan for Parks and Open Space — 2023-2028

Facility	Funding Sources	2023	2024	2025	2026	2027	2028	Total
Seibenthaler Park	Parks & Trail Capital		1,525,000					1,525,000
Loyalty Park Improvement		250,000						250,000
Rainier View Park		795,545						795,545
Bennett Park Property			868,170					868,170
TC: Heritage Park Remediation		860,000						860,000
Trails - Fryar Ave		453,696	378,696					832,392
		2,359,241	2,771,866	0	0	0	0	5,131,107

Source: Sumner 2023/2024 Adopted Budget

Table 6-4: 2024 Parks and Trails Plan Capital Projects

Site/Project	RCO*	2024	2025	2026	2027	2028	2029	2030
Rainier View								
Covered Court (Funded)	A, D, G, H, I	\$ 937,000						
Misc Site Improvements			\$ 100,000					
Heritage								
Alley	I, J, K		\$ 2,160,000					
Park & Playground	A, G, H, I				\$ 5,415,000			
Building	K					\$ 7,000,000		
Lucy V. Ryan								
Master Plan	A, K		\$ 25,000					
Demo			\$ 185,000					
Development	A, K			\$ 100,000				
Loyalty								
Drainage & Site Improvements	A, G, H, I		\$ 109,000					
Picnic/Shade Shelter	A, G, H, I		\$ 25,000					
Expansion & Parking	A, G, H, I		\$ 700,000					
Heath Sports								
Field	A, D, E, I			\$ 3,000,000				
Lighting	A, D, I			\$ 600,000				
Fencing	A, D, I			\$ 375,000				
Pump & Sk8	A, D, I							\$ 995,000
Picnic & Pathways	A, D, I				\$ 365,000			
Seibenthaler								
Site Improvements (phases)	A, D, F, G, H, I			\$ 3,750,000			\$ 3,750,000	\$ 2,910,529
ROW Improvements					\$ 352,700			
Bennett								
Site Improvements (phases)	A, D, F, G, H, I			\$ 2,250,000			\$ 3,575,000	\$ 2,792,317
Qunell								
Master Plan	A, D, F, G, H, I		\$ 35,000					
Site Improvements	A, D, F, G, H, I				\$ 1,090,000			
New & Expanding Parks								
Master Site Plan						\$ 200,000		
Acquisition						\$ 1,000,000		
Minimum Park Standard Investment						\$ 1,000,000		
TOTALS		\$ 937,000	\$ 3,339,000	\$ 10,075,000	\$ 7,222,700	\$ 9,200,000	\$ 7,325,000	\$ 6,697,846

A RCO WWRP Local Parks
 B RCO WWRP Trails
 C RCO WWRP Habitat
 D RCO Youth Athletic Facilities
 E RCO Community Outdoor Athletic Facilities
 F RCO Land Water Conservation Fund

G RCO No Child Left Behind
 H RCO Outdoor Learning Grants
 I Sumner Park Impact Fees
 J Sumner Transportation Improvement Program
 K Dept. of Commerce Economic Development Grant

Source: Sumner 2024 Parks & Trails Plan.

Note: The cost estimates above are under review with updated Park Impact Fee analysis and may be adjusted in the final CFP per more recent information on facility type costs and specific site context.

Fire Facilities

A voter-approved bond passed in 2018 in the East Pierce Fire and Rescue district. This bond made it possible for EPFR to upgrade or re-construct five fire stations in the district. In Autumn 2021, station 118 broke ground and is near completion. Construction of Bonney Lake Fire Station (headquarters) began in Autumn 2022 and is anticipated to be completed in early 2024. Two more stations, Station 117, and Station 114 will begin construction in 2023 and fire station 124 is slated for a renovation in 2024. A Full list of EPFR projects and their status can be found on the EPFR website or below in Table 6-5.

Table 6-5: Improvement Plan for Fire and Emergency Services — 2023 - 2024

Station	Status	Cost Estimate	Estimated Date of Completion	Notes
118	Under Construction	8,367,000	2023	Construction of new 17,100 sq. foot fire station and apparatus storage area
111	Under Construction	18,950,000	2024	Construction of new 36,000 sq. foot, two-story fire station with administrative offices for EPFR headquarters and fire apparatus storage.
117	Contract Awarded	9,266,000	2024	Construction of new 16,000 sq. foot fire facility and fire apparatus storage area.
114	Contract Awarded	7,425,000	2024	demolition of existing fire station, construction of new 10,000 sq. foot fire station and apparatus storage area

Station	Status	Cost Estimate	Estimated Date of Completion	Notes
124	Invitation to Bid out	N/A	2024	Kitchen, Electrical, and Plumbing renovations for Station 124.

Source: East Pierce Fire and Rescue 2018 Capital Facilities Plan

While none of the voter-approved bonds will go directly to Station 113 renovations, additional capacity, updated facilities, and new stations elsewhere in the district can increase the overall level of service within Sumner due to equipment, staff, and dispatch overlap. Most recent data show that Station 113 was at 80%-unit reliability meaning that the station's staff responded to 80% of calls within the City of Sumner. The remaining 20% of calls were responded to from elsewhere in the fire district and updated facilities elsewhere in the district can help close the level of service deficits that are both ongoing and would be exacerbated in the coming decades without intervention.

Public School Facilities

The 2021-2027 Sumner School District Capital Facilities Plan is adopted in this plan by reference. Portion of qualifying improvements can be paid for through school mitigation fees. The fees are intended to cover the cost of development between the time of the impact and the time taxes from developed properties begin to cover costs. The City Council has elected to adopt the school mitigation fee and to determine how much the fee will be.

The district's financing plan shows various sources of funding identified for the District, including State school money and impact fees. Appendix E shows capital improvement projects planned for the next six years and their estimated costs and funding sources. The local funding sources listed in the capital projects and finance plan include bond revenue, impact fees, and other District funds. Longer-term capital projects are still in early planning phases and estimated costs and funding sources have yet to be determined.

The 2021-2026 Dieringer School District Capital Facilities Plan is also adopted in this plan by reference. The plan includes several capital projects to add student capacity and a summary of revenue sources and use of funds from 2020-2025.

Appendix E contains the summary of the Sumner Bonney-Lake School District and Dieringer School District calculations for school impact fees, which are collected through an ordinance adopted by the City.

Transportation Facilities

The 2024 Transportation Plan contains numerous transportation improvements and projects that will be necessary to maintain the level of service. The projects will be funded through a combination of federal, state, and local general fund monies.

Appendix D contains the Six-year Transportation Improvement Program. Table 6-6 includes a list of 20-year needs and costs from the Transportation Plan.

Table 6-6: 20-Year Transportation Improvement Projects and Costs

Map ID ¹	Title and Location	Description	Project Cost ²
SP1	E Valley Highway E/Forest Canyon Road E	Construction of a new signal or roundabout	\$3,000,000
SP2	Puyallup Street/Tacoma Avenue and overlay Puyallup Street to White River Bridge (WSDOT SUM-30)	Plane, repair, and overlay, complete intersection channelization improvements, add an eastbound left-turn pocket on Puyallup Street at Tacoma Avenue. Add a signal at the Puyallup Street/Tacoma Avenue intersection	\$2,600,000
SP3	E Valley Highway E/Elm Street E	New signal when warranted	\$1,500,000
SP4	Valley Avenue/Elm Street E	New signal when warranted	\$1,500,000
SP5	Traffic Avenue/Main Street	Add EB right-turn overlap. Convert W Main Street to one-way facility westbound.	\$150,000
SP6	Parker Road E/Main Street E	New signal when warranted	\$1,650,000
SP7	160th Avenue E/Main Street (60th Street E)	New signal or RAB when warranted	\$3,000,000
SP8	Valley Avenue/74th Street E	Add EB/WB left-turn restrictions. Shift WB left-turns to U-turning movement at Valley Avenue/SR 410 EB Ramp RAB	\$75,000
SP9	Sumner Tapps Highway/60th Street E	Signalization of the intersection. Construct EB right-turn lane	\$3,400,000

Map ID ¹	Title and Location	Description	Project Cost ²
		<i>Sport/Intersection Subtotal</i>	<i>\$16,875,000</i>
RW1	166th Avenue E Widening; SR 410 WB ramps to 64th St E (WSDOT SUM- 24)	Widen to 4-5 lanes, includes new roundabouts at WB ramp and 64th Street E	\$19,000,000
RW2	160th Avenue E; Main Street to 64th Street E	Improve and widen streets to minor arterial standards with bike paths and sidewalks	\$500,000
RW3	Valley Avenue; South City Limits to Main Street	Overlay existing roadway surface, ADA upgrades	\$1,850,750
RW4	Stewart Rd Corridor ITS improvements; SR 167 to Lakeland Hills (WSDOT SUM- 27)	Connect traffic signals and railroad crossings to coordinate signal timing	\$3,500,000
RW5	160th Avenue E; Elm St to Main Street	Improve to collector standards with curb, gutter, sidewalks on both sides, and bike facilities	\$2,900,000
RW6	Elm Street; E Valley Hwy to 160th Avenue E	Improve to collector standards with curb, gutter, sidewalks on both sides, and bike facilities	\$2,600,000
RW7	Parker Road E; 62nd Street to 63rd Street	Construct curb, gutter, and sidewalk on east side of street	\$250,000
RW8	Parker Road E; Main Street to Elm Street	Improve to collector standards with curb, gutter, and sidewalks on both sides	\$1,300,000
RW9	Zehnder Street; Pease Avenue to Wood Avenue	Railroad Crossing Improvements	\$1,000,000
RW10	162nd Avenue E Segment Extension; 64th Street to 60th Street	Construct 2-lane facility	\$3,000,000

Map ID ¹	Title and Location	Description	Project Cost ²
RW11	164th Avenue Court E Segment Extension; 160th Avenue E to existing 164th Avenue Court E	Construct 2-lane facility	\$2,000,000
RW12	Systemic Horizontal Curve and Roadway Departure Safety Improvements (WSDOT SUM-28)	East Valley Highway, West Valley Highway, Sumner-Tapps Highway/166th Avenue E, 142nd Avenue E/24th Street E. Install static and/or dynamic curve warning signs, speed feedback signs, centerline and edge lie profiled striping, rumble strips, reflective markers on-pavement as appropriate to delineate roadside objects, channelization, guardrail/roadway shouldering, and street lighting	\$903,000
-	Stewart Road SW: Butte Avenue SE to 140th Avenue Court E4	Widen to 5 lanes including a center two-way left-turn lane	-
<i>Roadway Subtotal</i>			<i>\$38,803,750</i>
NM1	West Valley Highway Sidewalks	Complete missing sidewalk facilities on the east side between 16th Street E and SR 167 SB Ramps	\$1,000,000
NM2	16th Street E Ped/Bike	Construct ped/bike facilities between Valentine Avenue and 138th Avenue E	\$2,000,000
NM3	White River Restoration Trail	#9 Ditch to area north of 16th Street	\$3,000,000
NM4	Tacoma Avenue Trail	New trail facilities between the White River and 45th Street E	\$150,000
NM5	Salmon Creek Trail	New trail between current end at 149th Avenue E and Sumner-Tapps Highway E	\$3,000,000
NM6	Edgewood Drive Sidewalks	Complete missing sidewalk facilities between SR 167 and Sumner Heights Drive E	\$550,000
NM7	Fryar Avenue Trail (WSDOT SUM-17)	West Main Street to Puyallup Street	\$7,200,000

Map ID ¹	Title and Location	Description	Project Cost ²
NM8	Zehnder Street/Elm Street Sidewalks	"Construct pedestrian and bike facilities. Bike lanes from Valley Avenue to Main Street Complete missing sidewalk facilities between Pease Avenue and Wright Avenue"	\$1,600,000
NM9	Academy Street Bike Facilities	Construct bike facilities between Wood Avenue and Valley Avenue E	\$800,000
NM10	Wood Avenue/Meade McCumber Road	Construct bike facilities between Main Street E and Valley Avenue	\$1,800,000
NM11	62nd Street Court E Trail	Construct trail east of 62nd Street Court E between Parker Road and 160th Avenue E	\$1,000,000
NM12	Main Street E Sidewalks	Construct missing sidewalk facilities between 162nd Avenue E and Sumner-Tapps Highway E	\$575,000
NM13	Puyallup River Crossing	Over White River. Two-part project: 1. Study best location for trail crossing 2. Construct ped/bike trail crossing	\$4,000,000
NM15	Construct sidewalks on one side of 72nd Street E	Between River Street and 143rd Avenue E	\$250,000
NM16	Rivergrove Pedestrian Bridge (WSDOT SUM-29)	Trail overpass connecting the vicinity of Alder Ave. to 143rd Ave. E over SR 410	\$11,200,000
NM17	Puyallup River Trail Bridge	Bridge and trail connections to the Foothills Trail. Trail overpass connecting 144th Ave E to 143rd Ave E	\$6,000,000
NM18	Mead McCumber Road/64th Street E Non-motor	Construct pedestrian and bike facilities between Valley Avenue E and Sumner-Tapps Highway	\$900,000
NM19	Sumner-Tapps Highway Sidewalks	Construct missing sidewalk facilities between Main Street E and the southern City Limits	\$1,000,000
NM20	Rainier Street Sidewalks	Construct missing sidewalk facilities between Sumner Avenue and Guptil Avenue	\$150,000

Map ID ¹	Title and Location	Description	Project Cost ²
NM21	Traffic Avenue Pedestrian Signal (WSDOT SUM-25)	Replace existing pedestrian rectangular rapid flashing beacon with pedestrian signal	\$616,753
NM22	Alder Avenue Sidewalks	Construct pedestrian and bike facilities between SR 410 and Academy Street	\$950,000
NM23	Houston Road E Sidewalks	Construct pedestrian facilities between Valley Avenue E and the west City limits	\$850,000
		<i>Non-Motorized Subtotal</i>	<i>\$49,366,753</i>
Total			\$105,045,503

Notes for Table 6-6:

BOLD indicates a **new** project that has been identified based on the transportation analysis of the land use alternatives.

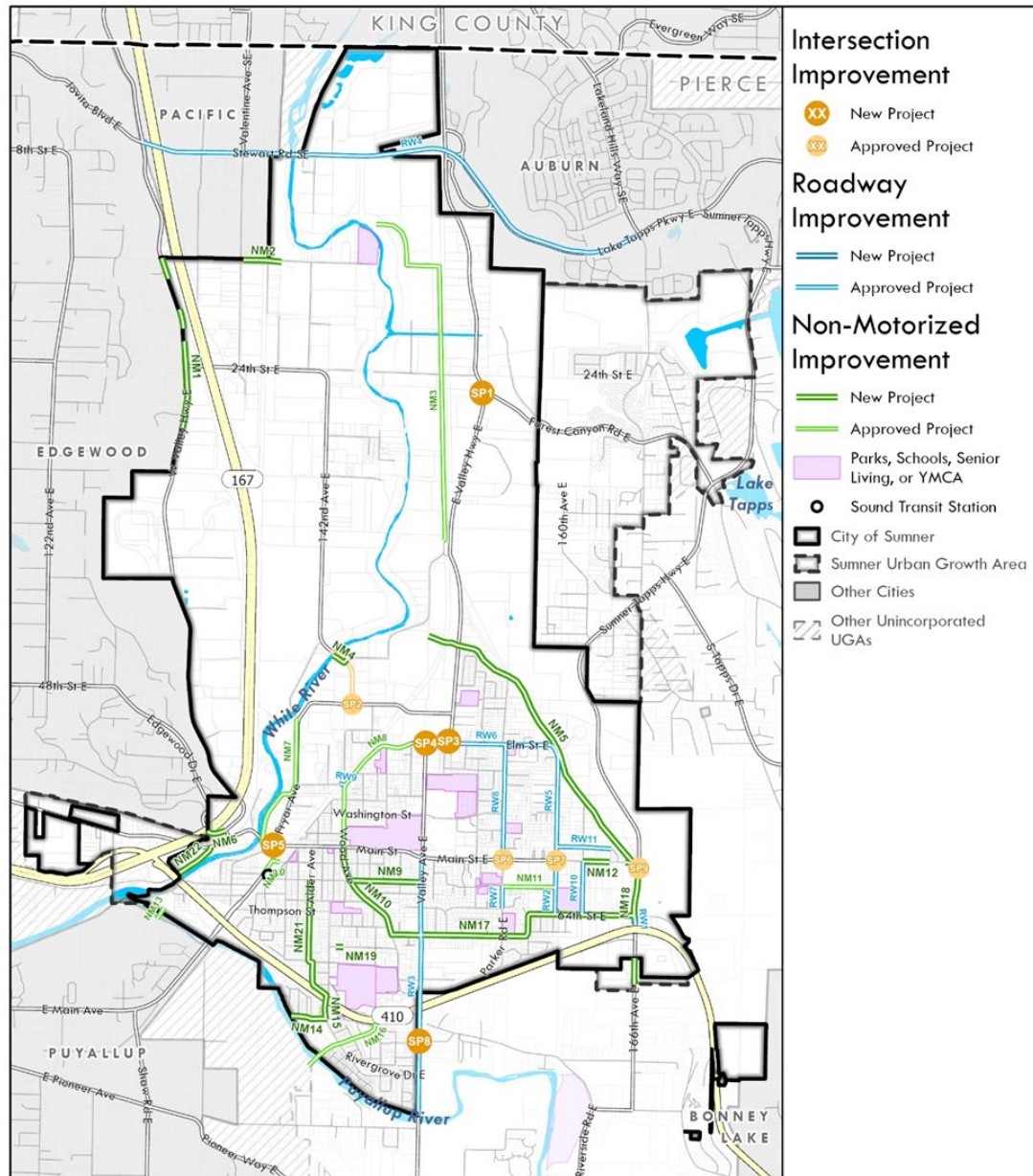
1. Map identification references to Exhibit 5-6, 20-Year Transportation Improvement Projects.

2. Project cost represents 2023 dollars. Source:
Transpo Group 2023

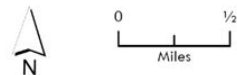
3. Identifies current WSDOT or grant funding.

4. This project is fully funded and will be completed before 2044; however, to remain eligible for transportation impact fees already set aside for the project, it is included on the 20-year project list.

Figure 6-1: 20-Year Improvement Projects



CITY OF SUMNER 20-Year Improvement Projects



Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.

Map Date: February 2024

Source: City of Sumner, 2024; Transpo, 2024.

6.2 Financial Analysis

Note: This section is to be revised to reflect new Park Impact Fee and Transportation Impact Fee pending further discussion with City Council. Key items to be revised are highlighted in yellow below.

Overview

The revenue analysis of the Capital Facilities Plan supports the financing for providing facilities and services, as required by [RCW 36.70A.070\(3\)\(d\)](#). Revenue estimates, using assumptions that are based on historical trends, are used to represent realistic expectations for revenue that may be available for capital funding.

This revenue analysis looks at the City of Sumner's capital facility revenues for municipal services. Through identifying fiscal constraints in the future, and potential gap funding options, project prioritization can be incorporated into the capital planning process.

The revenue analysis provides an approximate forecast of future revenue sources. The numbers projected in this analysis are for planning purposes and do not account for sensitivities such as local, state, and federal policy, economic trends, and other factors.

Funding the Capital Facilities Plan

Estimated future revenues are projected for the Plan's 2024 - 2044 planning period, in year of expenditure dollars. The following revenue analysis is organized according to the following categories:

- **General Capital Revenues.** Revenues under the category of general capital revenues are the revenues required by law to be used for capital projects. The general capital revenues in Sumner consist of REET 1 and REET 2.
- **Dedicated Capital Revenues.** Dedicated revenues are required to be used for certain types of capital spending, outlined by the law. The dedicated capital revenues in Sumner include transportation impact fees, park impact fees, grants, interlocal awards, and other capital contributions.
- **Operating Transfers.** Operating transfers are revenue sources that are transferred to capital improvement funds from operating funds. Although these are not dedicated sources to be relied on for capital funding, it has been the historical practice of the City to regularly make transfers into capital improvement funds for projects. Any operating transfers from the General Fund for capital projects are defined through the regular biennial budget process.

- **Potential Policy Options.** There are additional policy tools and sources available to fund capital projects.

Assumptions

The assumptions used in this analysis may not align with the City's future budget assumptions around the same revenue sources as the purpose of the two analyses is different. The City's budget estimates how much money the City will have available for spending in the coming biennium while this CFP revenue analysis estimates how much revenue, that will be specifically allocated to capital projects, the City is likely to receive in total over the next six and 20 years.

The City's 2023-2024 budget identifies revenue sources for capital projects in this timeframe. Revenues are projected for 2025 to 2044 using various methodologies, depending on trends in historical revenues and best available information. These methodologies are as follows:

- Projecting revenues based on a historical per capita rate and growing based on population growth.
- Projecting revenues based on projected housing unit growth rates.
- Projecting revenues based on a constant historical value.
- Projecting revenues based on existing revenue projections.

Projected revenue amounts are shown in year of expenditure (YOE) dollars, meaning they are adjusted for future inflation. The inflation rate used in this analysis is 3.34%, which is the ten-year historical average inflation rate for Seattle-Tacoma-Bellevue. Population growth and housing unit growth is assumed to be consistent with projections outlined in the City's Comprehensive Plan Land Use Element.

General Capital Revenues

REET 1 and 2

Real Estate Excise Tax (REET) revenues are collected on property sales at the point of sale. They are required by law to be spent on capital projects. REET is based on the total value of real estate transactions in a given year, and the amount received annually can vary significantly based on fluctuations in the real estate market and trends in the economy.

Sumner is authorized by the state to impose two separate REET levies. REET 1 and REET 2 each allow for a levy of 0.25% on the assessed value of a sale, for a total tax of 0.5% of total assessed value. All proceeds must be used for capital spending or limited maintenance, as

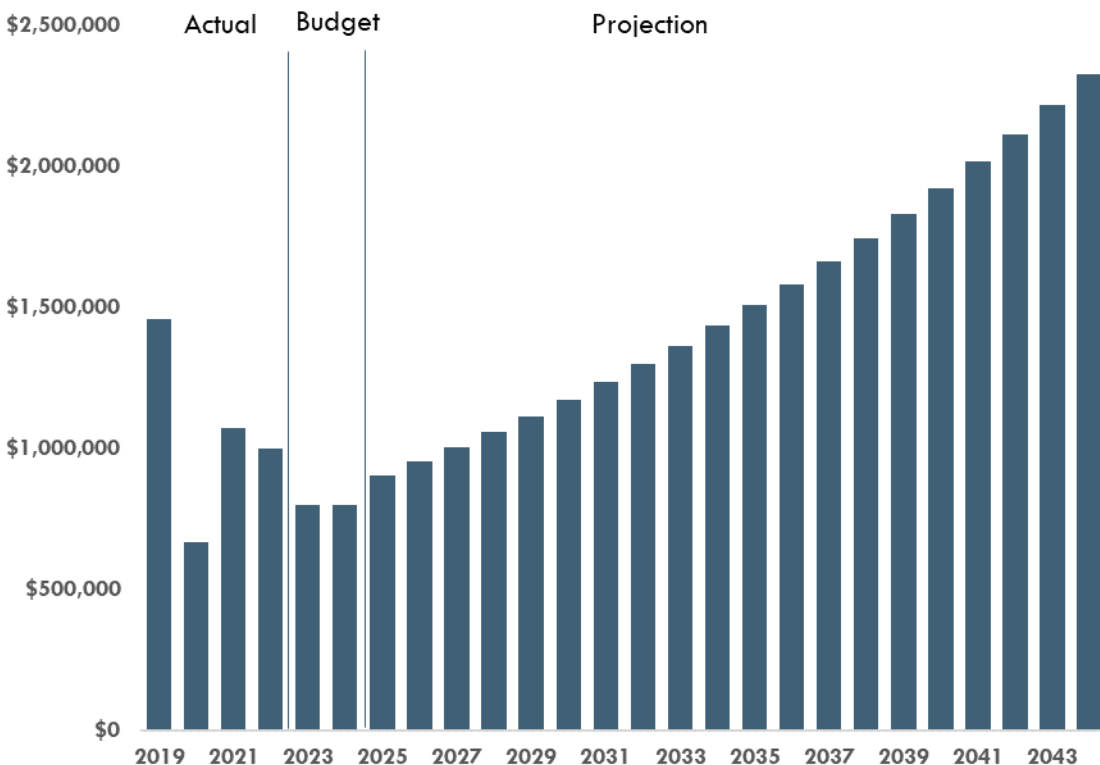
defined in [RCW 35.43.040](#). REET 2 is more restricted than REET 1, as it may not be spent on acquisition of land for parks, recreation facilities, law enforcement facilities, fire protection facilities, trails, libraries, or administrative or judicial facilities [\(RCW 82.46.035\)](#). REET 2, specifically, can only be levied by those cities and counties that are planning under GMA. For REET 2, the capital projects must be those specifically listed in [RCW 82.46.035\(5\)](#):

Public works projects of a local government for planning, acquisition, construction, reconstruction, repair, replacement, rehabilitation, or improvement of streets, roads, highways, sidewalks, streets and road lighting systems, traffic signals, bridges, domestic water systems, storm and sanitary sewer systems, and planning, constructions, reconstruction, repair, rehabilitation, or improvement of parks.

Sumner typically uses REET revenues to support City capital projects, leveraging REET funds as matches to generate successful grant applications from other sources.

REET revenues have historically averaged approximately \$840,000 annually from 2018 to 2022. The projections in Figure 6-2 are based on the historical average amount annually adjusted for inflation.

Figure 6-2: REET Revenues, 2019-2044 (YOE\$)



Notes: Projections shown above are designed to estimate expected cumulative revenues for the planning period; annual amounts shown above are not meant to reflect actual expected revenues in each specific year. Amounts are rounded to

the nearest \$1,000.

Sources: City of Sumner, 2023; City of Sumner 2023 - 2024 Biennial Budget; BERK, 2023.

Dedicated Capital Revenues

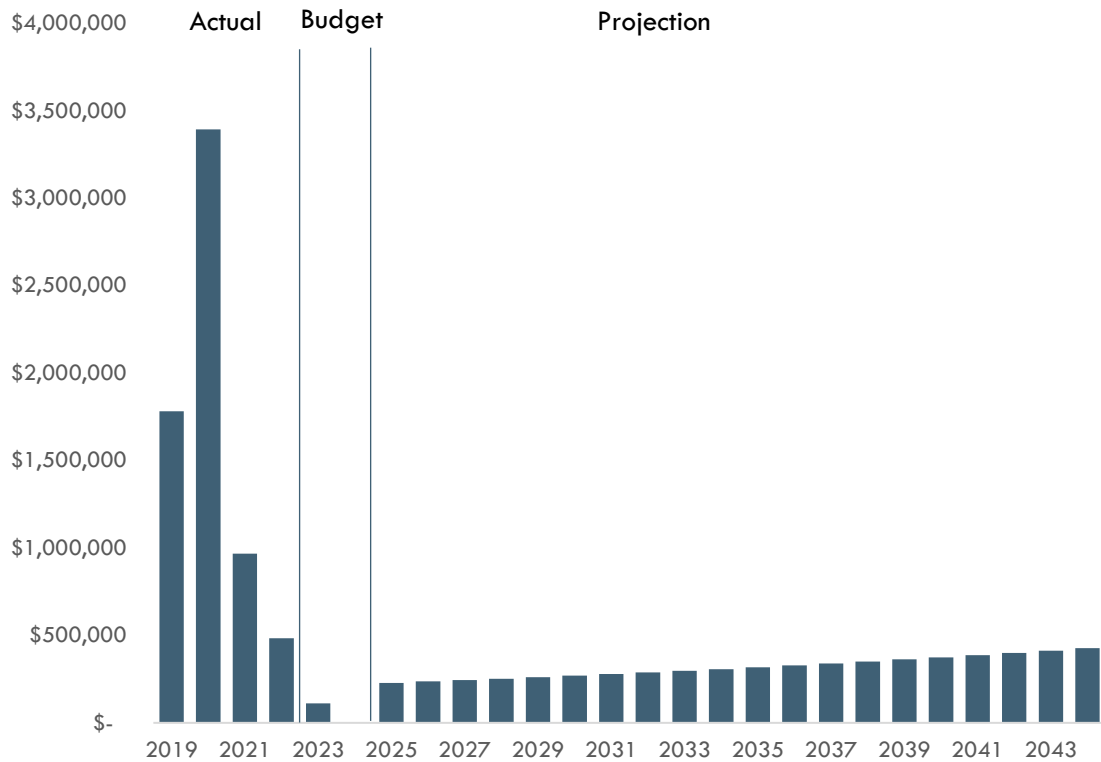
Transportation

The City has two capital funds for Transportation Projects: the Street Capital Fund and the Sidewalk Construction Fund. The Street Capital Fund accounts for capital expenditures relating to the City's transportation infrastructure. Funding sources for the Street Capital Fund include REET 1 and REET 2, impact fees, grants, and intergovernmental revenues from operating funds. The Sidewalk Construction Fund pays for sidewalk improvements and ADA-related projects. Funding sources for the Sidewalk Construction Fund include impact fees, grants, and intergovernmental revenues.

Transportation Impact Fees

Transportation impact fees are assessed on new development and used for projects to serve additional growth in the City. These revenues are collected in the Development Impact Fee Fund and transferred to the Street Capital Fund and Sidewalk Fund. Future transportation impact fee revenues are projected using the current, single-family transportation impact fees (which are adjusted for inflation across future dates), and an estimate of annual housing units added through 2044. This projection is relatively conservative because it is based on the development of housing units and does not include commercial or industrial development. The large amount of impact fee revenue collected between 2019 and 2022 reflects a higher level of development activity than is projected over the planning period. See Figure 6-3.

Figure 6-3: Transportation Impact Fee Revenues, 2019-2044 (YOE\$)



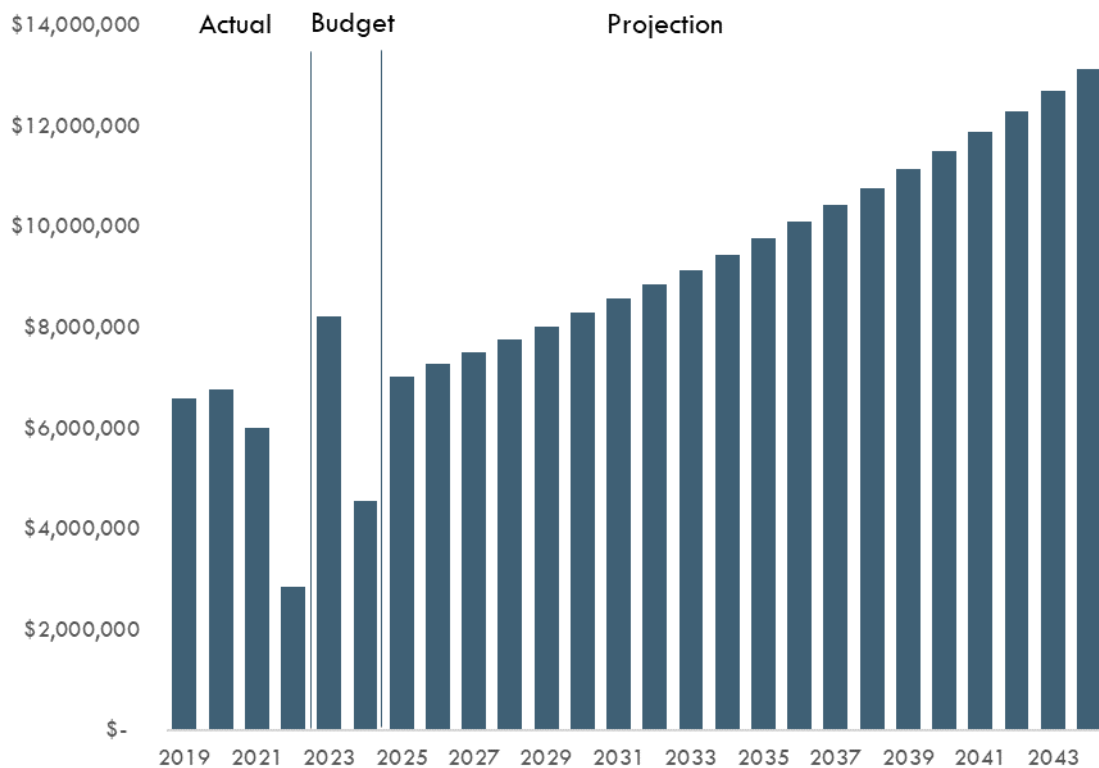
Notes: Projections shown above are designed to estimate expected cumulative revenues for the planning period; annual amounts shown above are not meant to reflect actual expected revenues in each specific year. Amounts are rounded to the nearest \$1,000.

Sources: City of Sumner, 2023; City of Sumner 2023 - 2024 Biennial Budget; BERK, 2023.

Transportation Grants

The City receives state and local grants to support transportation projects. These revenues have historically represented approximately \$659 per capita, on average, from 2018 to 2022. Projections are based on the per capita average amount, annually adjusted for inflation. See Figure 6-4.

Figure 6-4: Transportation Grant Revenues, 2019-2044 (YOE\$)



Notes:

Projections shown above are designed to estimate expected cumulative revenues for the planning period; annual amounts shown above are not meant to reflect actual expected revenues in each specific year. Amounts are rounded to the nearest \$1,000.

Sources: City of Sumner, 2023; City of Sumner 2023 - 2024 Biennial Budget; BERK, 2023.

Parks

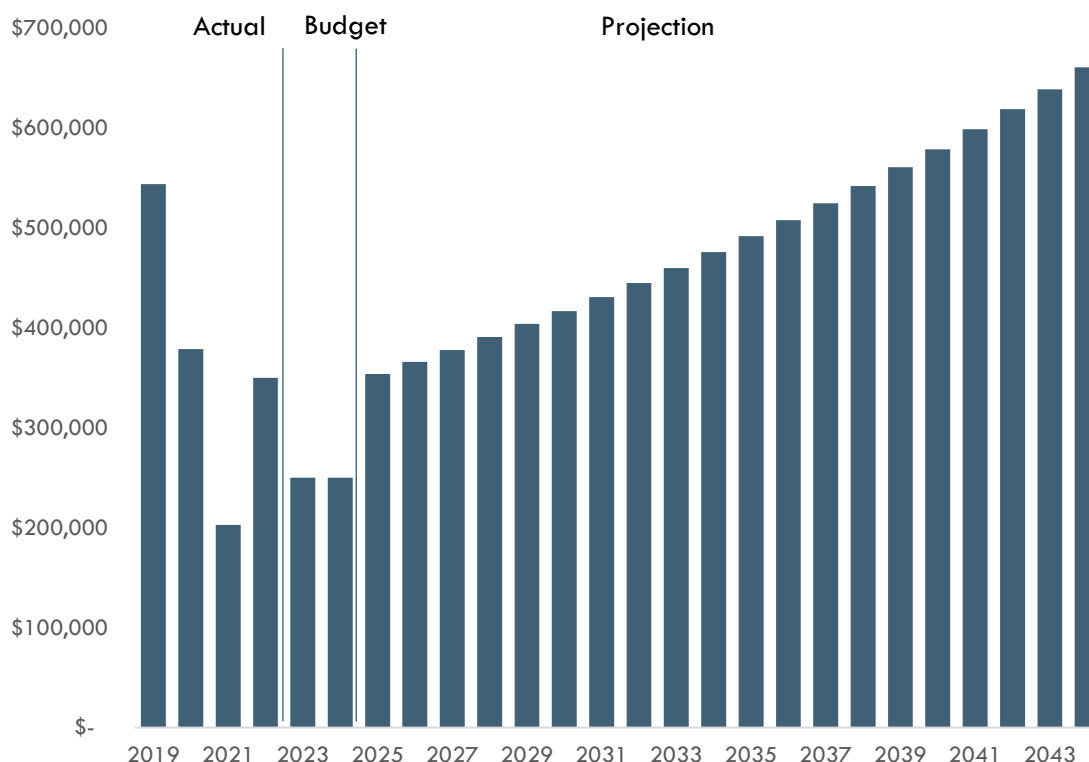
The City's Parks and Trails Capital Fund pays for parks and recreation capital projects. Funding sources for the Parks Capital Fund consist of REET 1 and 2, park impact fees, grants, and transfers in from operating funds.

Park Impact Fees

Park impact fees are collected on new residential dwelling units and on new commercial/industrial development. Park impact fees are restricted for the establishment of parks, open spaces, and recreational facilities to serve the expanding population of the city. These revenues are collected in the Development Impact Fee Fund and transferred to the Parks Capital Fund. Future parks impact fee revenues are projected using the current, single-family park impact fees (which are adjusted for inflation across future dates) and an estimate of annual housing units added through 2044. This projection is relatively conservative

because it is based on the development of housing units and does not include commercial or industrial development. The large amount of impact fee revenue collected between 2019 and 2022 reflects a higher level of development activity than is projected over the planning period. See Figure 6-5.

Figure 6-5: Park Impact Fee Revenue, 2019-2044 (YOES)



Notes: Projections shown above are designed to estimate expected cumulative revenues for the planning period; annual amounts shown above are not meant to reflect actual expected revenues in each specific year. Amounts are rounded to the nearest \$1,000.

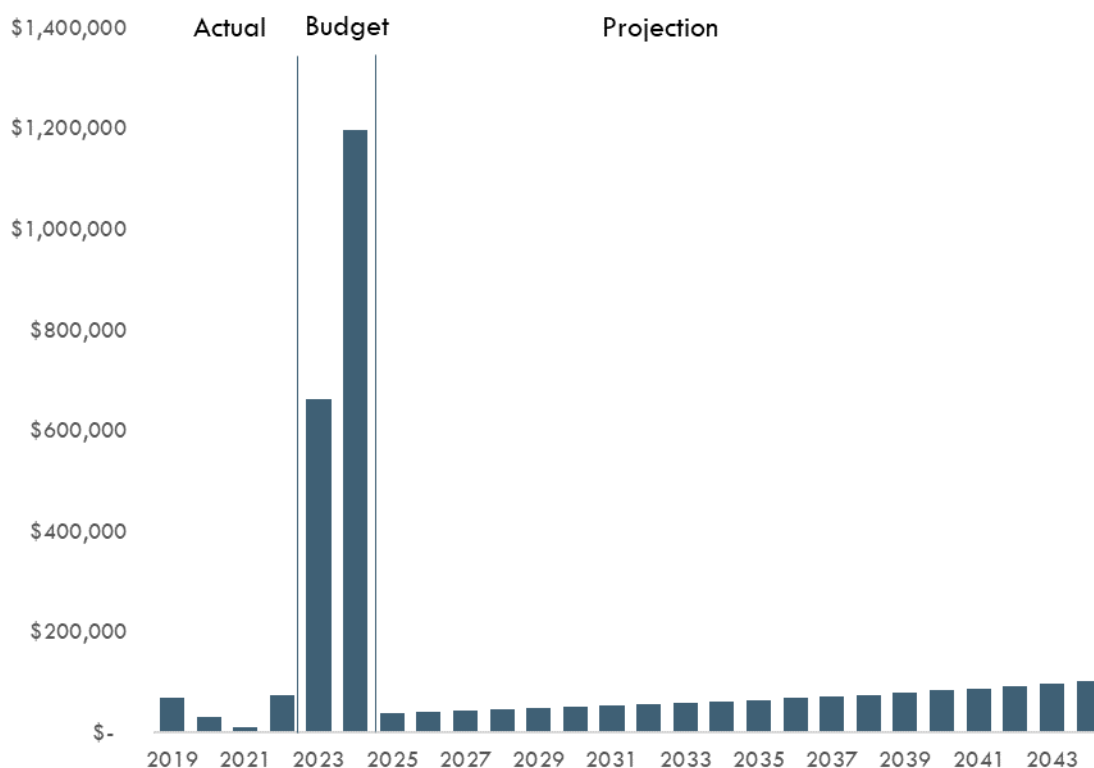
Sources: City of Sumner, 2023; City of Sumner 2023 - 2024 Biennial Budget; BERK, 2023.

Parks Grants

The City receives state and local grants to support parks projects. These revenues have historically represented approximately \$4 per capita, on average, from 2018 to 2022. Projections are based on the per capita average amount, annually adjusted for inflation. See Figure 6-6. Grant revenue can vary significantly from year to year. The City is including a large amount of grant revenue from the State and Pierce County in the 2023-2024 budget. Future projections reflect the historical average, which is smaller than this budgeted amount. The

City noted that recreation grants are competitive and that Sumner does not always score highly when projects are reviewed.

Figure 6-6: Parks Grant Revenues, 2019-2044 (YOE\$)



Notes: Projections shown above are designed to estimate expected cumulative revenues for the planning period; annual amounts shown above are not meant to reflect actual expected revenues in each specific year. Amounts are rounded to the nearest \$1,000.

Sources: City of Sumner, 2023; City of Sumner 2023 - 2024 Biennial Budget; BERK, 2023.

Six-Year Cost and Revenue Comparison

This six-year comparison looks at the total dedicated revenue sources with the City’s planned project costs for the six-year planning horizon of 2024-2029 in order to understand the difference between future dedicated capital costs and potential future revenues. This analysis is done for the six-year period rather than the 20-year period because project lists are constantly evolving, and a longer-term outlook would provide an increasingly less accurate estimate of a potential funding gap or surplus.

Table 6-7 details total estimated dedicated capital revenues and total estimated dedicated capital costs for the City over the six-year period. The City is projected to have sufficient

revenues to pay for planned capital projects over the six-year period. The project costs reflect budgeted expenditures in the City's 2023-2024 budget and do not include costs from parks and transportation planning documents.

Table 6-7: Projected Total Capital Revenues and Costs, 2024-2029 (YOE\$)

Category	Revenues and Costs
Estimated General Capital Revenues	\$5,841,000
Estimated Transportation Dedicated Capital Revenues	\$59,208,000
Estimated Parks Dedicated Capital Revenues	\$3,723,000
Total Capital Revenues Available	\$68,772,000
Total Capital Costs	\$31,202,000
Estimated Funding Surplus / (Deficit)	\$37,570,000

Notes: Projections shown above are designed to estimate expected cumulative revenues for the planning period. Amounts are rounded to the nearest \$1,000.

Sources: City of Sumner, 2023; City of Sumner 2023 - 2024 Biennial Budget; BERK, 2023.

Policy Options and Other Funding Sources

There are additional policy tools and sources available to the City to fund capital projects. These policy tools and sources include:

- **Property Tax Levy Lid Lift.** Per [RCW 84.55.050](#), cities may increase property taxes by more than one percent with a levy lid lift. A levy lid lift occurs when taxing jurisdictions with a tax rate less than their statutory maximum rate ask voters to increase their tax rate to an amount equal to or less than the statutory maximum rate, effectively lifting the lid on the levy rate. Levy lid lifts are authorized through public vote, which requires a simple majority to pass. The use of the revenue would be defined at the time of the vote but could fund capital improvements or maintenance.
- **Special Taxing Districts.** The City could establish a special taxing district to collect additional revenue for capital projects or maintenance. One option is a Metropolitan Park District (MPD), which is formed to manage, maintain, or acquire park and recreation facilities. The formation of an MPD requires voter approval. It is funded by a regular property tax levy. Another option is a Transportation Benefit District (TBD), which is funded by a vehicle license fee and/or a sales tax. TBD revenue may be used for transportation improvements included in a local, regional, or state transportation plan. Improvements can range from roads and transit service to sidewalks and transportation demand management. Construction, maintenance, and operation costs are eligible.

- **Automated Traffic Safety Cameras.** The City could use automated traffic safety cameras to detect violations.
- **Bonds.** The City has used and can use bonds to support capital facilities funding. The City anticipates issuing debt in the 2023-2024 budget to fund the Public Works Operations Facility.
- **Local Improvement District/Road Improvement District (LID/RID).** The City has the authority to create LIDs and RIDs. These are districts used to levy additional property tax to cover debt service payments on the sale of bonds purchased to finance projects within the district. Revenues from the levy must be used for local, clearly defined areas where the landowners are being assessed the additional tax benefit. LIDs, by law, can be used for water, sewer, and stormwater projects. RIDs may be used for road funding and street improvements.
- **State Infrastructure Authorities.** The City has options for creating specialized authorities to fund public infrastructure, such as Public Facility Districts and Public Development Authorities. These authorities each have specific purposes and formation requirements. In 2021, the Washington State Legislature authorized local jurisdictions to form tax increment financing (TIF) districts. Under this new authority, the City can have up to two TIF districts at any one time. As authorized, TIF districts can collect incremental increases in property taxes within a defined area to pay for public improvements.
- **Grants.** State and Federal grant programs can be pursued for competitive regional priorities for infrastructure investments. Pursuing grant opportunities requires resources, and success is not guaranteed.
- **Public-Private Partnerships.** Public-private partnerships are joint agreements between a governmental jurisdiction and private corporation (including 501(c)3s). Public-Private Partnerships have legal requirements and issues of control that must be considered on a case-by-case basis. Washington State’s constitutional restriction on public entities giving or lending funds and credit to private enterprises requires that public entities need to demonstrate that any partnership with a private entity will generate public good worth more than the value provided to the private entity.¹
- **Development Project Mitigation.** Under the Washington State Environmental Policy Act, the City can require mitigation measures from individual private development projects. These mitigation measures can take the form of fees, specified public infrastructure, or changes to project design.

Appendix "A" Glossary of Terms

Adequate public facilities. Facilities that have the capacity to serve development without decreasing levels of service below locally established minimums.

Assessed Valuation. Refers to how much the total real estate and personal property within a jurisdiction is worth. The value is established by the County Assessor at 100% of appraised market value and adjusted by the State to account for variations in assessment practices among counties.

Available public facilities. Facilities or services are in place or that a financial commitment is in place to provide the facilities or services within a specified time. In the case of transportation, the specified time is six years from the time of development.

Bonding. Is the act of issuing the debt to finance capital projects and other expenditures.

Budget. A plan of financial operation embodying an estimate of proposed expenditures for a given period and the proposed means of financing them.

Capital Program. A plan for capital expenditures to be incurred each year over a fixed period of years to meet capital needs arising from the long-term work program or otherwise. It sets forth each project or other contemplated expenditure in which the government is to have a part and specifies the full resources estimated to be available to finance the projected expenditures.

Centennial Clean Water Program ("CCWP"). In 1986, legislation was passed that provides grants to public entities for financing water pollution control activities and facilities to protect surface and underground water from pollution. In addition, a State revolving loan program was established to provide loans or combinations of grants/loans to finance public facilities.

Community Park. Those parks so designated in the City of Sumner Parks and Recreation Plan.

Concurrent or Concurrency. Means that adequate public facilities are available when the impacts of development occur. This definition includes the two concepts of "adequate public facilities" and "available public facilities" as defined above.

Councilmanic General Obligation Debt. Councilmanic bonds refer to bonds issued with the approval of the Council, as opposed to voted bonds, which must be approved by vote of the public. Councilmanic bonds must not exceed 0.75 percent of the assessed valuation and voted bonds 1.75 percent.

Debt Limit. The maximum amount of gross or net debt that is legally permitted under state law. Debt is an obligation resulting from the borrowing of money.

Development Activity. Any construction or expansion of a building, structure, or use any change in use of a building or structure, or any change in the use of land, that creates additional demand and need for public facilities.

Encumbered. To reserve, set aside, or otherwise earmark, the impact fees in order to pay for commitments, contractual obligations, or other liabilities incurred for public facilities.

Enterprise Fund. Governmental services supported mainly by rates and user fees. A fund established to account for operations: (a) that are financed and operated in a manner similar to private business enterprises - where the intent of the governing body is that the costs (expenses, including depreciation) of providing goods or services to the general public on a continuing basis be financed or recovered primarily through user charges; or (b) where the governing body has decided that periodic determination of revenues earned, expenses incurred, and/or net income is appropriate for capital, maintenance, public policy, management control, accountability, or other purposes (i.e. (water, sewer, stormwater).

Fee in Lieu of Charge ("FILO"). Charges are contributions made by developers toward future improvements of City facilities resulting from the additional demand on the City's facilities generated from the development. See also **Mitigation Fees**.

General Obligation Debt. Debt that will be repaid mainly by taxes and other general governmental revenues. This debt includes limited and unlimited general obligation bonds, capital leases, and other notes and contracts issued with the full faith and credit of the government.

Guaranty Fund. A fund established by a bond issuer that is pledged as security for the payment of one or more bond issues. Normally used for Local Improvement Districts (LID).

Impact Fee. A fee assessed on new development that creates additional demand and need for public facilities.

Infiltration of stormwater. Groundwater that seeps into the wastewater collection system through pipe cracks, faulty joints, and faulty manholes.

Inflow of stormwater. Consists of water that may enter the wastewater system through illegal connections such as roof gutters, area drains, catch basins, and unplugged clean out openings.

Infrastructure. The underlying foundation, especially the basic installations and facilities on which the continuance and growth of a jurisdiction depends, i.e., streets, and roads, sewer, and water systems.

Latecomer Fees. Fees paid by developers or future service users for their share of past improvements financed by others.

Leasing. A financing technique whereby ownership of the project or equipment remains with the financing entity, and where title may or may not transfer to the City at the end of the lease.

Levy Lid. A statutory restriction on the annual increase in the amount of property tax a given public jurisdiction can assess on regular or excess levies.

Local Improvement District ("LID"). A method of carrying out a specific improvement by allocating the costs among the benefiting properties. The project is usually financed through a long term bond issue, the repayment of which is mainly from the collection of special assessments from the benefiting properties.

Mitigation Fees. Contributions made by developers toward future improvements of City facilities resulting from the additional demand on the City's facilities generated from the development. See also **Fee in Lieu of Charge.**

Public Facilities. The capital facilities owned or operated by the City or other governmental entities.

Public Works Trust Fund ("PWTF"). A low-interest revolving loan fund that helps local governments finance critical public works needs. To be eligible for trust fund financing, the applicant must be a local government entity that has a long-term plan for financing public works needs. If the applicant is a city or county, it must be imposing the optional one-quarter percent real estate excise tax for capital purposes. Eligible projects include streets and roads, bridges, storm sewers, sanitary sewers, and water system. Loans will only be made for the purpose of repairs, replacement, reconstruction, or improvements of existing eligible public works systems to meet current standards and to adequately serve the needs of the existing populations. New capital improvement projects are not eligible. The maximum loan amount has been one million with a minimum local match of ten percent. Interest rates vary from one to three percent, depending on the match.

Real Estate Excise Tax ("REET"). A tax upon the sale of real property from one person or company to another.

Revenue Bonds. Bonds whose principal and interest are payable exclusively from earnings of an enterprise fund.

Special Assessment. A compulsory levy made against certain properties to defray part or all of the cost of a specific improvement or service deemed to primarily benefit those properties. See also **Utility Local Improvement District**.

System Improvement. Public facilities included in the Capital Facilities Plan and designed to provide service within the community, in contrast to project improvements.

Transportation Improvement Account ("TIA"). Provides funding for transportation projects through two programs: The urban program and the small cities program. Urban projects must be attributable to congestion caused by economic development or growth. They must be consistent with State, regional, and local transportation plans (including transit and rail) and be partially funded by local contributions. Through its urban program project selection process, the TIA requires multi-agency planning and coordination and public/private cooperation to further the goal of achieving a balanced transportation system in Washington State. Small cities program projects are primarily selected on the basis of pavement condition and substandard roadway width. Funding is 1-1/2 cents a gallon on the State gas tax.

Transportation Improvement Board ("TIB"). The purpose of the TIB is to administer funding for local governments for transportation projects. Revenues are from the State fuel tax, local matching funds, and private sector contributions.

Utility Local Improvement District ("ULID"). Created for improvement to sewer, water, and other utilities and differs from a LID in that all assessment revenues is pledged for payment of debt service of bonds issued to finance the improvements. See also Special Assessment.

Appendix "B" 2020 Water System Plan Capital Improvement Plan

Table 8-1 Capital Improvement Plan Schedule ⁽¹⁾													
Project Number - Description	Total Cost	Year of Completion											
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029-2038
Distribution System Improvements													
D1 - 8th Street East and East Valley Highway Loop	\$600,000		\$600,000										
D2 - Riverside Drive and 151 st Avenue	\$680,000	\$60,000	\$620,000										
D3 – Autoclave Meters and Vault	\$100,000		\$100,000										
D4 - Viewpoint Tank to 171 st Avenue Court East	\$1,040,000							\$150,000		\$890,000			
D5 - Water Main Replacement Program	\$10,000,000		\$250,000	\$750,000	\$250,000	\$750,000	\$250,000	\$750,000	\$250,000	\$750,000	\$250,000	\$750,000	\$5,000,000
Subtotal	\$12,420,000	\$60,000	\$1,570,000	\$750,000	\$250,000	\$750,000	\$250,000	\$900,000	\$250,000	\$1,640,000	\$250,000	\$750,000	\$5,000,000
Distribution System Extensions													
D7 – Extend from 149 th Avenue to East Valley Highway	\$1,024,240										\$102,424	\$409,696	\$512,120
D8 – East Valley Highway from Salmon Creek to CTI	\$3,100,000						1,550,000	1,550,000					
Subtotal	\$4,124,240	\$0	\$0	\$0	\$0	\$0	\$1,550,000	\$1,550,000	\$0	\$0	\$102,424	\$409,696	\$512,120
Water Utility Construction with City Projects													
C1 – Bridge Street Bridge	\$256,780	\$206,780	\$50,000										
C2 – Stewart Road Bridge	\$435,000							\$435,000					
C3 – Lower White River Restoration Project	\$550,000		\$125,000	\$425,000									
C4 – 64 th & Sumner Tapps Highway Intersection (Design Only)	\$50,000		\$50,000										
C5 – Operations Facility	\$1,750,000		\$500,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000					
Subtotal	\$3,041,780	\$206,780	\$725,000	\$675,000	\$250,000	\$250,000	\$250,000	\$685,000	\$0	\$0	\$0	\$0	\$0
Source Improvements													
S1 - Additional Water Rights Acquisition	\$4,845,500	\$41,000	\$200,000	\$200,000	\$744,000	\$3,660,500							
S2 - Central Well Treatment Capacity Expansion	\$2,630,000												\$2,630,000
S3 - South Well Improvements	\$770,000				\$770,000								
S4 - Dieringer Well Improvements	\$100,000												\$100,000
S5 - West Well Improvements	\$16,000									\$16,000			
S6 - Sumner Springs Improvements	\$63,000									\$63,000			
S7 - County Springs Improvements	\$500,000												\$500,000
Subtotal	\$8,924,500	\$41,000	\$200,000	\$200,000	\$1,514,000	\$3,660,500	\$0	\$0	\$0	\$79,000	\$0	\$0	\$3,230,000

Table 8-1 Capital Improvement Plan Schedule ⁽¹⁾													
Project Number - Description	Total Cost	Year of Completion											
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029-2038
Storage Improvements													
ST1 - Earthquake Control Valves and Foundation Improvements	\$2,400,000		\$270,000	\$2,130,000									
ST2 - Viewpoint BPS Improvements	\$200,000			\$200,000									
ST3 - North Tank Improvements	\$400,000						\$400,000						
ST4 - Viewpoint Tank Detention Pond	\$550,000									\$550,000			
ST5 – Springs Tank Improvements	\$340,000				\$340,000								
Subtotal	\$3,890,000	\$0	\$270,000	\$2,330,000	\$340,000	\$0	\$400,000	\$0	\$0	\$550,000	\$0	\$0	\$0
Operations and Maintenance Improvements													
O&M1 - Hydrant and Isolation Valve Upgrades - 20 Years	\$480,000		\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000					
Subtotal	\$480,000	\$0	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$0	\$0	\$0	\$0	\$0
TOTAL WATER FUND	\$32,880,520	\$307,780	\$3,060,000	\$4,035,000	\$2,434,000	\$4,740,500	\$2,530,000	\$3,215,000	\$250,000	\$2,269,000	\$352,424	\$1,159,696	\$8,742,120
Notes: 1) All OPCCs shown are in 2018 dollars. ENR CCI 10939.													

Appendix "C" 2020 Sewer Capital Improvement Plan and Schedule

Table ES-5 Opinion of Probable Project Costs, 6-Year CIP (2018-2024)		
CIP No.	Project	Opinion of Probable Project Cost
C-1	PS-2 Force Main Modifications	\$90,000 ¹
C-2	PS-2 Improvements	\$548,000 ¹
C-3	PS-10 Improvements	\$652,000 ¹
C-4	Pump Station Improvements	\$1,215,000 ¹
C-5	PS-8 AC Force Main Replacement	\$540,000 ¹
C-6	I/I Reduction and Rehabilitation	\$600,000 ²
C-7	Centrifuge Replacement	\$1,200,000 ²
C-8	WWTP O&M	\$1,200,000 ²
C-9	Solids Hauling Dump Trucks	\$500,000 ²
C-10	Portable Screw Sucker Pump	\$65,000 ²
C-11	Emergency Pipe Replacement	\$600,000 ²
C-12	Pretreatment Program Implementation	\$200,000 ²
Total Opinion of Probable Project Cost		\$7,410,000
Notes: 1) Opinion of probable project cost developed by BHC Consultants and included in Appendix G. 2) Opinion of probable project cost provided by the City.		

Table ES-6 Opinion of Probable Project Costs, 20-Year CIP (2024-2038)		
CIP No.	Project	Opinion of Probable Project Cost
C-101	PS-9 (160 th) Abandonment	\$560,000
C-102	PS-11 (16th Ave 1) Replacement	\$820,000
C-103	PS-12 (16th Ave 2) Replacement	\$800,000
C-104	PS-4 (Jansen) Replacement	\$830,000
C-105	PS-13 (Cannery) Replacement	\$910,000
C-106	PS-3 (Van Tassel) Replacement	\$1,000,000
C-107	PS-14 (Forest Canyon) Replacement	\$800,000
C-108	PS-1 (Tacoma) Replacement	\$1,000,000
C-109	PS-15 (North) Replacement	\$990,000
C-110	PS-16 (Mastro) Replacement	\$1,000,000
C-111	PS-2 (North) Replacement	\$1,610,000
C-112	PS-10 (142 nd) Replacement	\$1,830,000
C-113	I/I Reduction and Rehabilitation	\$1,400,000
C-114	WWTP O&M	\$2,800,000
C-115	Emergency Pipe Replacement	\$1,400,000
Total Opinion of Probable Project Cost		\$17,750,000

Implementation of the projects identified in Table ES-5 and Table ES-6 will allow the City to address the capacity, obsolescence, O&M, and redundancy limitations identified within the City's wastewater system based on the projected flows and loads over the 20-year planning horizon.

The opinions of probable cost herein are based on our perception of current conditions at the project location. This opinion reflects our professional opinion of current construction costs and is subject to change as the project design matures.

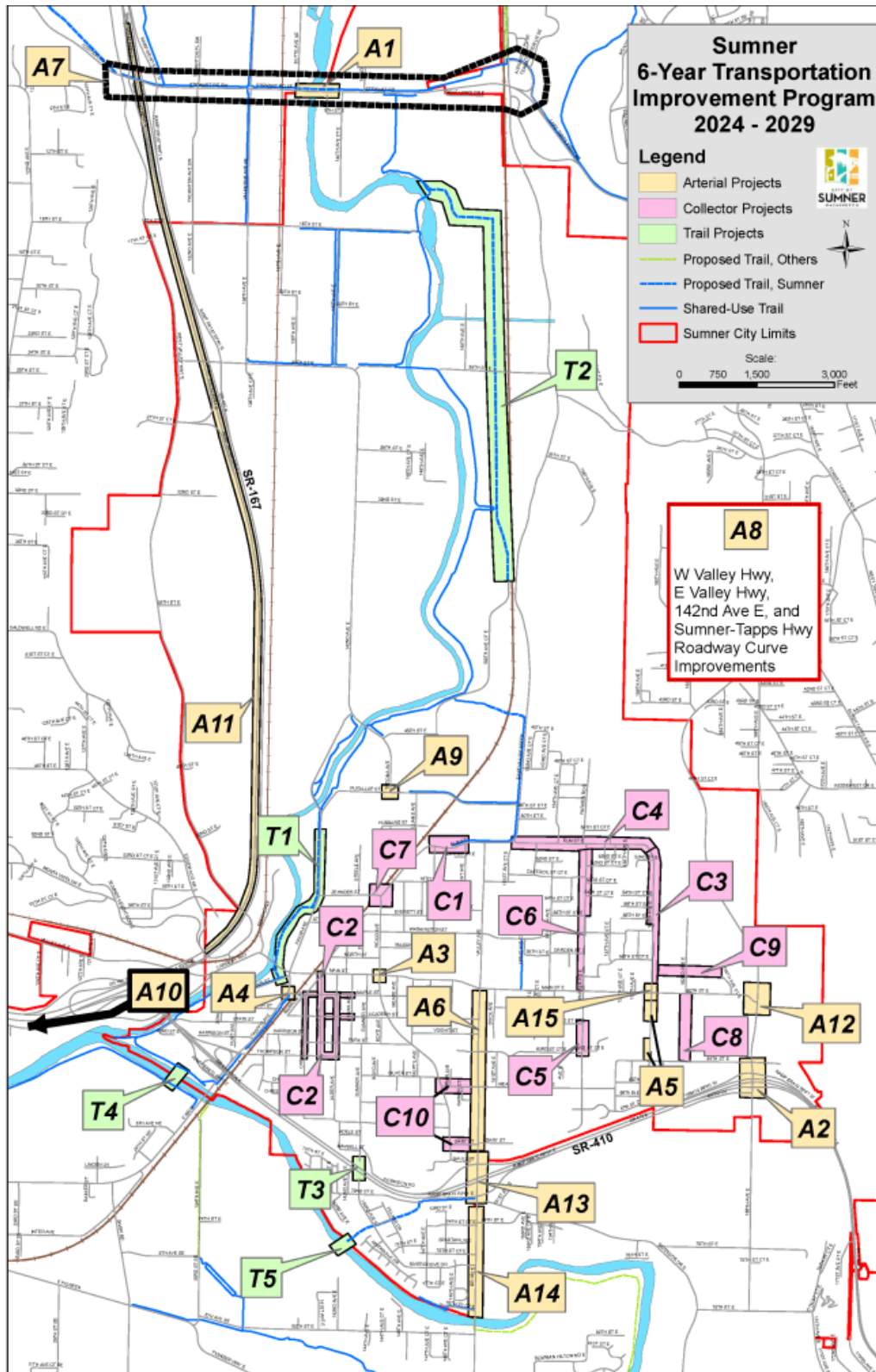
Table 10-1 6-Year CIP (2018-2024)							
CIP No.	Project	Type	Replacement	Upgrade	Expansion	Eligible for Connection Fee	Project Description
C-1	Collections Equipment	O&M		☒			▪ Purchase the following equipment: ○ ¾ Crew Cab ○ Utility truck replacement ○ 6" portable screw sucker pump ○ Camera van ○ Saw cut machine ○ Mud cart ○ Bigger roller ○ Skid steer rubber tracks ○ Small dump truck ○ 12-yard dump truck ○ Diesel gator addition ○ Articulating boom truck ○ Forklift ○ Valve exerciser
C-2	Golf Course STEP System	General			☒	☒	▪ Extension of the STEP system in the northeast of the City.
C-3	Radio System Conversions	Obsolescence	☒	☒			▪ Replace radio systems at lift stations to match current City standards.
C-4	LS-2 Electrical Control Panel	Obsolescence	☒	☒			▪ Replace panel with new above grade panel.
C-5	LS-6 Electrical Control Panel, Generator Panel, Hatch	Obsolescence	☒	☒			▪ Replace control panel, generator panel, and hatch.
C-6	LS-10 Pump Replacement	Obsolescence	☒	☒			▪ Replace one pump and two VFDs.
C-7	LS-11 Hatch Replacement	Obsolescence	☒	☒			▪ Replace hatch with ductile iron hatch.
C-8	LS-5, LS-8, and LS-9	Obsolescence	☒				▪ Replace obsolete equipment.
C-9	White River Restoration Project (LS-14 and Force Main)	General	☒				▪ Relocate sewer lines and LS-14 to accommodate White River Restoration project.

Table 10-1 6-Year CIP (2018-2024)							
CIP No.	Project	Type	Replacement	Upgrade	Expansion	Eligible for Connection Fee	Project Description
C-10	Bridge Street Bridge	General	☒				Extension of sanitary sewer infrastructure through the right-of-way disturbed during the construction of the Bridge Street Bridge Project.
C-11	410 and Traffic Avenue	Obsolescence	☒	☒			Replace asbestos concrete force main. A new bridge across SR410 in Traffic Avenue right-of-way is being built within the next several years that will substantially limit the ability to access and replace the forcemain and gravity sewer connected to the pump station from the west. Rehabilitation of this portion of the pipeline should be prioritized to occur with the bridge replacement.
C-12	64 th and Tapps Highway	Obsolescence	☒				Replacement of aging sanitary sewer collection and forcemain infrastructure in the vicinity of the 64th and Lake Tapps Highway intersection to be completed in conjunction with surface improvements planned for the area.
C-13	Insertable Flow Meter	O&M			☒		Purchase insertable flow meter to monitor flow in gravity collection system.
C-14	Pretreatment Program Implementation	O&M		☒			Consultant to implement a pretreatment program to establish local limits.
C-15	Wastewater Treatment Plant Upgrades	O&M, Obsolescence, Redundancy	☒	☒			- Access walkway onto digester roof - Replacement centrifuge dewatering scroll assembly - Equipment - Biosolids dewatering improvements - Headworks TOC analyzer - Headworks platform - Rechannel primary splitter box - Aeration basin (ORP monitor, baffles) - Dryer (Platform) - Electric swing gate - Operations building
C-16	Auto Lane Force Main Upgrade	Capacity		☒			This project replaces a 410 LF section of 2" force main extending from Auto Lane into the 4" force main within 166th Avenue East. The replacement force main will be upsized to a 4" diameter pipe. Cleanouts and valving will be installed in both the Auto Lane force main and the 166th force main allowing crews to jet the force mains.

Table 10-2 20-Year CIP (2024-2038)							
CIP No.	Project	Type	Replacement	Upgrade	Expansion	Eligible for Connection Fee	Project Description
C-101	PS-9 (160 th) Abandonment	Obsolescence	☒				▪ Abandon and demolish pump station. ▪ Install 800 feet of 8-inch PVC gravity sewer pipe to reroute flows to PS 5.
C-102	PS-11 (16 th Ave 1) Replacement	Obsolescence	☒		☒		▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Increase pump station capacity from 100 gpm to 130 gpm.
C-103	PS-12 (16 th Ave 2) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 100 gpm.
C-104	PS-4 (Jansen) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 130 gpm.
C-105	PS-13 (Cannery) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 213 gpm.
C-106	PS-3 (Van Tassel) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 250 gpm.
C-107	PS-14 (Forest Canyon) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 600 gpm.
C-108	PS-1 (Tacoma) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 400 gpm.
C-109	PS-15 (North) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 500 gpm.
C-110	PS-16 (Mastro) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 200 gpm.

Table 10-2 20-Year CIP (2024-2038)							
CIP No.	Project	Type	Replacement	Upgrade	Expansion	Eligible for Connection Fee	Project Description
C-111	PS-2 (North) Replacement	Obsolescence	☒				▪ Replace pumps and mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Replace wet well. ▪ Maintain existing firm capacity of 500 gpm.
C-112	PS-10 (142 nd) Replacement	Obsolescence	☒				▪ Replace mechanical equipment. ▪ Replace and upgrade electrical and control equipment. ▪ Maintain existing firm capacity of 2,280 gpm.
C-113	I/I Reduction and Rehabilitation	Obsolescence	☒				▪ Reduce I/I through a variety of means such as slip lining, cured-in-place pipe (CIPP), pipe replacement, manhole lining, and other methods.
C-114	WWTP O&M	Obsolescence	☒				▪ General WWTP improvements, including but not limited to roof replacements, painting, replacement of mechanical equipment, and replacement of electrical, instrumentation, and controls equipment.
C-115	Emergency Pipe Replacement	Obsolescence	☒				▪ Replace and repair broken pipes as needed.

Appendix "D" 2024 6-Year Transportation Improvement Program



Arterials

A1 – Stewart Rd (8th St) White River Bridge

Replace existing 2-lane bridge with new bridge with two unequal length spans. New structure will accommodate 4 vehicle lanes, a sidewalk, and a trail crossing.

- Location: Stewart Road at White River
- Total Cost: \$35,000,000
- Funded: Yes
- Planning: Complete
- Design: 2023
- ROW/Permit: 2023
- Construction: 2024-2027
- Remarks: Project funded by Federal STP Grant, FMSIB Grant, Pierce County, Port of Tacoma, TIB, Congressional Allocation, NHFP and City of Auburn.

A2 – 166th Ave E Widening

Widen 166th Ave E to 4-5 lanes through the identified corridor and improve lane configuration and intersection control at the two existing intersections.

- Location: SR 410 WB ramp terminals to just north of 64th St E
- Total Costs: \$18,000,000
- Funded: Partial
- Planning: Complete
- Design: 2022-2025
- ROW/Permit: 2026
- Construction: 2027
- Remarks: Design is funded by Federal STP and Port of Tacoma Grants

A3 – Main St. and Wood Ave. Intersection Improvements

Construct pedestrian improvements and upgrade signal to current standards

- Location: Main St. and Wood Ave. intersection
- Total Cost: \$3,580,000
- Funded: Yes
- Planning: Complete
- Design: Completing in 2022
- ROW/Permit: Completing in 2022
- Construction: 2022-2023

- Remarks: Funding Secured. Project schedule for construction Summer 2022.

A4 – Maple Street Pedestrian Signal and Citywide Signal Backplates

Replace existing pedestrian-activated rectangular rapid flashing beacons with signal (expected to be a High Intensity Activated Crosswalk (HAWK) signal), add retroreflective back plates to upgrade signal heads citywide.

- Location: Traffic Avenue and Maple Street Ped Signal, Backplates Various Locations Citywide
- Total Cost: \$431,000
- Funded: Yes
- Planning: Complete
- Design: Complete
- ROW/Permit: Complete
- Construction: 2023 – 2024
- Remarks: Over 90% funded by a Highway Safety Improvement Program grant.

A5 – 160th Ave. E

Improve and widen streets to minor arterial standards with bike paths and sidewalks.

- Location: Main Street to 64th St. E.
- Total Cost: \$500,000
- Funded: No
- Planning: Complete
- Design: Complete
- ROW/Permit: Complete
- Construction: 2027
- Remarks: Sidewalk on east side of 160th completing in 2021. Remaining upgrades unfunded. Installing sidewalk on west side of 160th. Project is unfunded. Sidewalks on east side of 160th were completed in 2022.

A6 – Valley Avenue

Overlay existing roadway surface, complete required ADA upgrades

- Location: From SR 410 to Main Street
- Total Cost: \$1,500,000
- Funded: Partial
- Planning: Complete
- Design: 2025

- ROW/Permit: N/A
- Construction: 2026
- Received STP grant funding for the section between SR 410 and Meade McCumber.

A7 – Stewart Road Corridor ITS Improvements

Connect traffic signals and the railroad crossing to coordinate signal timing to increase vehicular traffic flow and reduce peak-hour delay.

- Location: Stewart Road from SR 167 toward Lakeland Hills
- Total Cost: \$3,500,000
- Funded: Partial
- Planning: Complete
- Design: 2025
- ROW/Permit: 2026
- Construction: 2027
- Remarks: Received STP grant funding for design in 2025.

A8 – Systemic Horizontal Curve and Roadway Departure Safety Improvements

Install curve warning signs, speed feedback signs, rumble strips, profiled striping, reflective markers, guardrail, street lighting and shouldering to improve safety conditions on north-south roadways that have a history of vehicle departures

- Location: East Valley Highway, West Valley Highway, 142nd Ave. E, and Sumner-Tapps Highway
- Total Cost: \$903,000
- Funded: Yes
- Planning: 2023
- Design: 2024
- ROW/Permit: 2024
- Construction: 2026
- Remarks: Received HSIP funding to complete the project, reimbursing 100% of project costs

A9 – Puyallup Street and Tacoma Avenue Intersection Improvements

Evaluate intersection for an upgrade to a signal and provide sidewalks/ADA improvements.

- Location: Intersection of Puyallup Street and Tacoma Avenue
- Total Cost: \$1,500,000
- Funded: No

- Planning: Complete
- Design: 2023 - 2025
- ROW/Permit: 2026
- Construction: 2027
- Remarks: Seeking grant funding for design phase of the project.

A10 – SR 167 / I-5 Connection Project

WSDOT Gateway Program Project – The SR 167 Completion project will build the remaining four miles of SR 167 between Meridian and I-5, completing a long-planned connection to I-5. The project also includes a two mile connection from I-5 to the Port of Tacoma.

- Location: Puyallup to Fife
- Total Cost: \$1,000,000,000*
- Funded: Yes
- Planning: Complete
- Design: 2017-2025
- ROW/Permit: 2017-2025
- Construction: 2019-2030
- Remarks: WSDOT-led regional project. Sumner has agreed to commit \$500,000 as a local agency contribution to the project

A11 – SR 167

- Add southbound HOT lane
- Location: From SR 410 Interchange to 15th St SW (Auburn)
- Total Cost: Unknown*
- Funded: No
- Planning: Complete
- Design: 2023-2025
- ROW/Permit: N/A
- Construction: 2025-2027
- Remarks: This is a WSDOT-led project on a state highway. Sumner has not taken an active role in WSDOT's project and has not committed any funds to the project to date.

A12 – Sumner Tapps Highway/60th St E Intersection Improvements

Rebuild existing intersection to improve roadway geometrics and add a traffic signal to increase allowable movements

- Location: Sumner Tapps Highway and 60th St E Intersection

- Total Cost: \$3,400,000
- Funded: No
- Planning: 2026
- Design: 2027
- ROW/Permit: 2028
- Construction: 2029
- Remarks: Potential for partial funding through TIF.

A13- SR 410 / SR 162 Interchange Improvements

Construct a one-lane roundabout configuration at each of the interchange ramps.

- Location: Interchange ramps at SR 410
- Total Cost: \$6,650,000*
- Funded: Yes
- Planning: Complete
- Design: 2026
- ROW/Permit: 2028
- Construction: 2030
- Remarks: WSDOT-led project that will improve traffic flow at the existing interchange. Sumner has not taken an active role in WSDOT's project and has not committed any funds to the project to date.

A14 - Hwy. 162 Improvements

Construct one additional southbound lane on SR 162.

- Location: From southern city limits to SR410 EB On/Off Ramps
- Total Cost: \$7,400,000*
- Funded: No
- Planning: Complete
- Design: 2026
- ROW/Permit: 2028
- Construction: 2030
- Remarks: This is a WSDOT-led project on a state highway. Sumner has not taken an active role in WSDOT's project and has not committed any funds to the project to date.

A15 - Main Street and 160th Intersection Improvements

Evaluate intersection for an upgrade to a signal and provide sidewalks/ADA improvements

- Location: Main Street and 166th Ave E. Intersection
- Total Cost: \$2,000,000
- Funded: No
- Planning: 2026
- Design: 2027
- ROW/Permit: 2028
- Construction: 2029
- Remarks: This is a future project that will be evaluated in the coming years.

* Denotes that project is largely funded by WSDOT, and City has either committed a small percentage contribution or no contribution to date.

** Denotes that project is largely funded by City of Pacific, and Sumner has either committed a small percentage contribution or no contribution to date.

Collector Street Program

C1 - Elm Street Sidewalk Improvements

Extend the sidewalk on the north side of Elm Street to connect to Bonney Ave and Seibenthaler Park

- Location: Bonney Ave to Wright Ave
- Total Cost: \$550,000
- Funded: Yes
- Planning: Complete
- Design: 2023
- ROW/Permit: 2023
- Construction: 2024
- Remarks: Project funded by TIB grant.

C2 - Alder & Kincaid Utility Improvements Phase 2

Replacement of aging utilities in support of the Town Center Plan redevelopment.

- Location: Cherry Ave, Maple St and Academy St
- Total Cost: \$3,000,000
- Funded: Yes
- Planning: Complete
- Design: 2023
- ROW/Permit: N/A
- Construction: 2024-2025

- Remarks: Budget includes roadway restoration.

C3 – 160th Ave. E.

Improve 160th Ave. E. to Collector St. standards with curb, gutter and sidewalks on each side. Portions may be completed as parts of development prior to this time.

- Location: Elm St. to Main St.
- Total Cost: \$2,700,000
- Funded: partial by developers
- Planning: Complete
- Design: 2025
- ROW/Permit: 2026
- Construction: 2027
- Remarks: Project partially completed by developers.

C4 – Elm St.

Improve Elm St. to Collector St. standards with curb, gutter and sidewalks on each side. Work will include storm drainage facilities and utility replacement

- Location: E. Valley Highway to 160th Ave. E.
- Total Cost: \$2,400,000
- Funded: partial by developers
- Planning: Complete
- Design: 2025
- ROW/Permit: 2026
- Construction: 2027
- Remarks: Project partially completed by developers.

C5 – Parker Rd E

Construct curb, gutter and sidewalk on east side of the street

- Location: 62nd St. to 63rd St.
- Total Cost: \$250,000
- Funded: Partial
- Planning: Complete
- Design: 2025
- ROW/Permit: 2026
- Construction: 2027

- Remarks: Funding will likely come from a combination of developer-built improvements, Street and Storm funds.

C6 – Parker Rd E

Reconstruct Parker Road to Collector St. standards with curbs, gutters, sidewalks, and drainage utilities. Portions have been completed by developer projects and sidewalk grants.

- Location: From Main St. to Elm St.
- Total Cost: \$1,300,000
- Funded: Partial
- Planning: Complete
- Design: 2025
- ROW/Permit: 2026
- Construction: 2027
- Remarks: Funding will likely come from a combination of developer-built improvements, Street and Storm funds.

C7 – Zehnder St

Railroad Crossing Improvements to at-grade BNSF rail crossing

- Location: From Pease Ave to Wood Ave
- Total Cost: \$1,000,000
- Funded: No
- Planning: 2025
- Design: 2025
- ROW/Permit: 2026
- Construction: 2027
- Remarks: Identified Road-Rail conflict point where upgrades could be beneficial.

C8 – 162nd Ave. E Segment Extension

Construct new 2-lane roadway section with sidewalks

- Location: 64th St. E to 60th St. E
- Total Cost: \$3,000,000
- Funded: No
- Planning: 2026
- Design: 2027
- ROW/Permit: 2028
- Construction: 2029

- Remarks: Element of East Sumner Neighborhood Plan, likely completed by development or LID.

C9 – 164th Ave. Ct. E Segment Extension

Construct new 2-lane roadway section with sidewalks

- Location: 160th Ave. E to Existing 164th Ave. Ct. E
- Total Cost: \$2,000,000
- Funded: No
- Planning: 2026
- Design: 2027
- ROW/Permit: 2028
- Construction: 2029
- Remarks: Element of East Sumner Neighborhood Plan, likely completed by development or LID.

C10 – Meade McCumber & Gary Street Sidewalk Improvements

Complete the sidewalk gaps at these two locations

- Location: Wood Ave to Valley Ave
- Total Cost: \$650,000
- Funded: No
- Planning: Complete
- Design: 2026
- ROW/Permit: 2027
- Construction: 2028
- Remarks: This is a future project that will be evaluated in the coming years.

Trail Projects

T1 – Fryar Ave. Trail

- Location: West Main St. to Puyallup St.
- Complete trail connection through town.
- Total Cost: \$7,200,000
- Funded: Partial
- Planning: Complete
- Design: Completing in 2023
- ROW/Permit: 2024
- Construction: 2025

- Remarks: Design and ROW partially funded by federal grant. No construction funding identified.

T2 - White River Restoration Trail

- Location: #9 Ditch to area north of 16th Street
- Construct 8000 LF trail in conjunction with adjacent development
- Total Cost: \$3,000,000
- Funded: Partial
- Planning: Complete
- Design: Completing 2023
- ROW/Permit: N/A
- Construction: 2026
- Remarks: Partially funded by developers

T3 - Rivergrove Pedestrian Bridge

Construct trail bridge to provide a new trail connection between Sumner Town Center and the Rivergrove neighborhood over SR 410.

- Location: Trail overpass connecting the vicinity of Alder Ave. to 143rd Ave. E
- Total Cost: \$11,200,000
- Funded: Partial
- Planning: Complete
- Design: 2025
- ROW/Permit: N/A
- Construction: 2026
- Remarks: Design funding provided by ST3 grant. No construction funding identified.

T4 - Puyallup River Crossing

Provides improved connection with the Puyallup and Foothills trail system

- Location: From Sumner Wastewater Treatment Facility to Puyallup trail
- Total Cost: \$4,000,000
- Funded: No
- Planning: 2027
- Design: 2028
- ROW/Permit: 2029
- Construction: 2030
- Remarks: Potential joint project with Puyallup. Eligible for federal CMAQ funding.

T5 – Puyallup River Trail Bridge

Construct a trail bridge and trail connections to provide a connection to the Foothills Trail per the Sumner Parks and Trails Plan.

- Location: Trail overpass connecting 144th Ave E to 143rd Ave E
- Total Cost: \$6,000,000
- Funded: No
- Planning: 2027
- ROW/Permit: 2028
- Design: 2029
- Construction: 2030
- Remarks: Identified in Draft Parks and Trails Plan. No funding source secured

Recurring Annual Programs

R1 – Street Overlay Program

Overlay and rebuild existing streets throughout the City.

- Annual Costs: \$150,000
- Funded: Yes
- Remarks: Street Operating General Fund Budget

R2 – Roadway Paint Line Application

Program to repaint lane lines within the City

- Total Costs: \$40,000
- Funded: Yes
- Remarks: Street Operating General Fund Budget

R3 – Pavement Repairs

Repair spot surface and subgrade failures through dig-outs throughout the City.

- Total Costs: \$66,150
- Funded: Yes
- Remarks: Street Operating General Fund Budget

R4 – Roadway Plastic Marking Application

Program to replace crosswalk, stop bar, and arrow markings within the City

- Total Costs: \$56,100
- Funded: Yes
- Remarks: Street Operating General Fund Budget

R5 – Chip Seal Application

Program to apply a chip seal treatment to asphalt roads throughout the City.

- Total Costs: \$136,500
- Funded: Yes
- Remarks: Street Operating General Fund Budget

R6 – Crack Seal Application

Maintain roads with crack seal throughout the City

- Total Costs: \$78,750
- Funded: Yes
- Remarks: Street Operating General Fund Budget

R7 – Neighborhood Traffic Control Program

Modify residential streets to enhance pedestrian safety, slow traffic, and minimize cut-through traffic on collector and local roadways.

- Total Cost: \$28,000
- Funded: Yes
- Remarks: Street Operating General Fund Budget

R8 – ADA Transition Plan

Address the projects identified in the ADA Transition Plan

- Total Cost: \$40,000
- Funded: Yes
- Remarks: Sidewalks Construction Capital Fund Budget

R9 – Sidewalk Maintenance Program

Replace/rebuild existing failing sidewalks due to damage caused by street trees.

- Total Cost: \$250,000
- Funded: Yes
- Remarks: Sidewalks Construction Capital Fund Budget. Formerly the Volunteer Sidewalk Program.

R11 – Safe Routes to School

Fill in gaps in sidewalks, provide repairs to existing ADA ramps, and replace ramps that do not meet current code. Continue educational components and install speed feed back signs.

- Total Cost: N/A
- Funded: No
- Remarks: City will fund local match as needed. Continue to apply for SRTS Grants.

*Project is largely funded by WSDOT, and City of Sumner has either committed a small percentage **contribution or no contribution to date.**

****Project is largely funded by City of Pacific, and the City of Sumner has either committed a small percentage contribution or no contribution to date.**

TRANSPORTATION PROJECTS COMPLETING IN 2023

Stewart Rd (8th St.) Railroad Crossing

Widen Stewart Rd from 2 lanes to 4/5 lanes, widen the Union Pacific Railroad Crossing, Install a new signal at Butte Avenue

- Location: Valentine Ave to Butte Ave (in the City of Pacific)
- Total Cost: \$6,000,000
- Estimated Completion: 2023
- Remarks: Project was run by City of Pacific. City of Sumner contributed \$700,000 of TIF funds to the project.

Alder & Kincaid Utility Improvements Phase 1

Replacement of aging utilities in support of the Town Center Plan redevelopment

- Location: Park St. to Main St.
- Total Cost: \$6,000,000
- Estimated Completion: 2023
- Remarks: Project includes Heritage Park woonerf construction.

Academy Street: Bicycle Lanes

Improve and reconfigure existing Academy Street to accommodate dedicated bicycle lanes.

- Location: Narrow St. to Wood Ave
- Total Cost: \$875,000
- Estimated Completion: 2023

- Remarks: Design funding provided by ST3 grant.

Appendix "E" School Districts Impact Fees

Table 8. Single Family Impact Fee Calculation

SITE ACQUISITION COSTS (A)	COST PER ACRE	NUMBER OF ACRES	NUMBER OF STUDENTS	STUDENT FACTOR	TOTAL COST
Elementary	\$500,000	15	550	0.403	\$5,495.45
Middle School	\$500,000	25	750	0.140	\$2,333.33
Senior High	\$3,100,000	2	400	0.099	\$1,534.50
Total					\$9363.29
CONSTRUCTION COSTS (B)	FACILITY COST		NUMBER OF STUDENTS	STUDENT FACTOR	TOTAL COST
Elementary	\$50,0000.00		550	0.403	\$36,636.36
Middle School	\$14,040.00		155	0.140	\$12,681.29
Senior High	\$60,000,000		545	0.099	\$10,899.08
Total					\$60,216.74
TEMPORARY FACILITY COSTS (C) (Double-Wide)	PURCHASING COST		NUMBER OF STUDENTS	STUDENT FACTOR	TOTAL COST
Elementary	\$600,000		23	0.403	\$10,513.04
Middle School	\$600,000		30	0.140	\$2,800.00
Senior High	\$600,000		30	0.099	\$1,980.00
Total					\$15,293.04
STATE MATCHING CREDIT (D)	BOECKH INDEX	SQ FT PER STUDENT	STATE MATCH	STUDENT FACTOR	TOTAL COST
Elementary	\$242.26	90	0.5851	0.403	\$5,141.14
Middle School	\$242.26	117	0.5851	0.140	\$2,321.80
Senior High	\$242.26	130	0.5851	0.099	\$1,824.28
Total					\$9,287.22
	PRESENT VALUE FACTOR	BOND LEVY RATE	ASSESSED VALUE OF UNIT	BOND INTEREST	TOTAL CREDIT
TAX PAYMENT CREDIT (TC)	9.767809	\$2.353	\$503,812	3.477%	\$11,334.24
NET COST (A+B+C-D)-TC					\$64,251.60
DISCOUNT IS 50%, RATE IS 0.50 IMPACT FEE PER UNIT (NET COST-TC)*DISCOUNT RATE)					\$32,125.80
LESS OTHER CREDITS (FC)					0
NET IMPACT FEE PER UNIT					\$32,125.80

Note: High School Site Acquisition reflects property needs at SHS.

Table 9. Multi-family Family Impact Fee Calculation

SITE ACQUISITION COSTS (A)	COST PER ACRE	NUMBER OF ACRES	NUMBER OF STUDENTS	STUDENT FACTOR	TOTAL COST
Elementary	\$500,000	15	550	0.095	\$1,295.45
Middle School	\$500,000	25	750	0.043	\$716.67
Senior High	\$3,100,000	2	400	0.033	\$511.50
Total					\$2,523.62
CONSTRUCTION COSTS (B)			NUMBER OF STUDENTS	STUDENT FACTOR	TOTAL COST
Elementary	\$50,000,000		550	0.095	\$8,636.36
Middle School	\$14,040,000		155	0.043	\$3,894.97
Senior High	\$60,000,000		545	0.033	\$3,633.03
Total					\$16,164.36
TEMPORARY FACILITY COSTS (C)	PURCHASING COST		NUMBER OF STUDENTS	STUDENT FACTOR	TOTAL COST
Elementary	\$600,000		23	0.095	\$2,478.26
Middle School	\$600,000		30	0.043	\$860.00
Senior High	\$600,000		30	0.033	\$660.00
Total					\$3,998.26
STATE MATCHING CREDIT (D)	BOECKH INDEX	SQ FT PER STUDENT	STATE MATCH	STUDENT FACTOR	TOTAL COST
Elementary	\$242.26	90	0.5851	0.095	\$1,211.93
Middle School	\$242.26	117	0.5851	0.043	\$713.13
Senior High	\$242.26	130	0.5851	0.033	\$608.09
Total					\$2,533.15
	PRESENT VALUE FACTOR	BOND LEVY RATE	ASSESSED VALUE OF UNIT	BOND INTEREST	TOTAL CREDIT
TAX PAYMENT CREDIT (TC)	9.7705	\$2.353	\$552,298	3.477%	\$12,428.49
NET COST (A+B+C-D)-TC					\$7,724.60
DISCOUNT IS 50%, RATE IS 0.50 IMPACT FEE PER UNIT (NET COST-TC)*DISCOUNT RATE)					\$3,862.30
LESS OTHER CREDITS (FC)					0
NET IMPACT FEE PER UNIT					\$3,862.30

Note: High School Site Acquisition reflects property needs at SHS.

School Impact Fee Calculation 6/20				DISTRICT Dieringer School District			
School Site Acquisition Cost:							
((AcresxCost per Acre)/Facility Capacity)xStudent Generation Factor							
	Facility	Cost/	Facility	Student	Student		
	Acreage	Acre	Capacity	Factor	Factor	Cost/	Cost/
				SFR	MFR	SFR	MFR
Elementary #3	12.00	\$438,613	433	0.322	0.172	\$3,909	\$2,091
Middle				0.130	0.070		
					TOTAL	\$3,909	\$2,091
School Construction Cost:							
((Facility Cost/Facility Capacity)xStudent Generation Factor)x(permanent/Total Sq Ft)							
		Facility	Facility	Student	Student		
		Cost	Capacity	Factor	Factor	Cost/	Cost/
				SFR	MFR	SFR	MFR
Elementary #3		\$25,275,000	433	0.322	0.172	\$18,796	\$10,040
				0.130	0.070		
					TOTAL	\$18,796	\$10,040
Temporary Facility Cost:							
((Facility Cost/Facility Capacity)xStudent Generation Factor)x(Temporary/Total Square Feet)							
	%Temp/	Facility	Facility	Student	Student	Cost/	Cost/
	Total Sq.Ft	Cost	Size	Factor	Factor	SFR	MFR
				SFR	MFR		
Elementary		\$0	0	0.322	0.172		
Middle		\$0	0	0.130	0.070		
					TOTAL	\$0	\$0
State Matching Credit:							
Boeckh Index X SPI Square Footage X District Match % X Student Factor							
	Boeckh	SPI	District	Student	Student		
	Index	Footage	Match %	Factor	Factor	Cost/	Cost/
				SFR	MFR	SFR	MFR
Elementary							
Middle							
					TOTAL	\$0	\$0
Tax Payment Credit:							
Average Assessed Value 2020						SFR	MFR
						\$653,162	\$480,235
Capital Bond Interest Rate (est) 5/20						0.40%	0.40%
Net Present Value of Average Dwelling						\$6,390,194	\$4,698,367
						10	10
Property Tax Levy Rate 2020						\$2.2460	\$2.2460
Present Value of Revenue Stream						\$14,352	\$10,553
Fee Summary:				Single	Multiple		
				Family	Family		
Site Acquisition Costs				\$3,909.23	\$2,090.76		
Permanent Facility Cost				\$18,795.73	\$10,039.95		
Temporary Facility Cost				\$0.00	\$0.00		
State Match Credit				\$0.00	\$0.00		
Tax Payment Credit				(\$14,352.38)	(\$10,552.53)		
FEE				\$8,353	\$1,578		
FEE WITH DISCOUNT OF 50%				\$4,176			
FEE WITH DISCOUNT OF 50%					\$789		

Note that the adopted fees for Sumner-Bonney Lake School District as of 2023 are as follows:

- Single Family: \$4791.83
- Mobile Homes: Same as above
- Multi-Family: \$2351.32
- Zero lot line houses: Same as above

Appendix "F" City Council Final Ordinance [to be included after adoption]

Comprehensive Plan Capital Facilities Element and Utilities Element

- **Draft November 1, 2024**

Capital Facilities

Introduction

The Growth Management Act (GMA) requires that comprehensive plans include a Capital Facilities Element, which addresses the capital facility needs sufficient to support the designated land use intensities. The following policies establish the levels of service for the necessary capital facilities and the policy directives that implement the specific capital facility items. Public services have also been included because of their close ties to capital facility plan development. Comprehensive analysis of Sumner's facilities is provided in the city's Capital Facilities Plan, the Draft EIS, and Final EIS, and in the various capital facility plans prepared for Sumner addressing sewer, water, and stormwater drainage.

Goals, Policies, and Objectives

1. Provide effective, efficient, affordable, and quality capital facilities and public services at the level necessary to support a growing community.

- 1.1. Consider access, as well as economic, social, environmental, and health impacts when locating community facilities and services, including civic places like parks, schools, and other public spaces.***
- 1.2. Encourage planning and coordination of emergency management and public safety programs.***

Note: These policy updates are in response to the required regional VISION 2050 policies.

2. Consider present and future impacts of capital facilities and public services decisions on underserved populations to improve quality of life for all Sumner residents and address past inequities.

- 2.1. Ensure impacts and burdens associated with capital facilities and public services are equitably distributed throughout the City.***
- 2.2. Prioritize improvements that will improve public facilities and services in communities where there are lower levels of service, populations with limited incomes, and/or populations at greater risk of disparate impacts, such as poor health outcomes.***
 - 2.2.1. Through cooperative and coordinated planning with other jurisdictions and districts, ensure efficient and equitable siting of essential regional capital facilities.***

- 2.3. Actively seek input on public facility and service proposals from communities where there are lower levels of service, populations with limited incomes, and/or populations at greater risk of disparate impacts, such as poor health outcomes. Provide engagement materials in the languages most commonly spoken in Sumner.

Note: These policy updates respond to State and County requirements to address underserved populations.

3. Consider the impacts of climate change and incorporate climate resiliency measures in capital facilities projects.

- 3.1. Reduce the City's carbon footprint by incorporating, where practicable, ~~Consider the use~~ of green development practices in all buildings the City constructs, remodels and renovates.
- 3.2. The City should meet a LEED® Silver certification for new construction or additions or major renovations of City facilities over 5,000 gross square feet in area only when long term economic benefits may be realized, including the reduction of operating costs, enhanced asset value, optimized building performance and a healthier workplace for its employees.
- 3.3. Implement energy-saving technologies in all City facilities as facilities are built or remodeled, such as energy efficient lighting, water-conserving appliances.
- 3.4. Leverage the City's purchasing power related to capital improvement projects to help expand the markets for green building products, including recycled-content materials and clean, renewable energy technologies.
- 3.5. Initiate programs to replace and upgrade stormwater systems to accommodate future increased conveyance requirements due to climate change and urban flooding.
- 3.6. Support the planting of trees along street edges and parking lots and large expanses of asphalt to create a pleasing environment and to increase energy efficiency by reducing heat absorbed by asphalt that increases ambient temperatures.

Note: Moved from Utilities Element.

- 3.7. Facilitate and encourage conservation of resources to delay the need for additional facilities.

Note: Moved from Utilities Element.

- 3.8. Facilitate the conversion to cost-effective and environmentally sensitive alternative technologies and energy sources.

Note: Moved from Utilities Element.

- 3.9. Support the development of ~~a widespread gaseous fuel infrastructure to provide more for alternative fuels options to that reduce vehicular pollution. One example is conversion of the City's fleet to cleaner fuels.~~

Note: Moved from Utilities Element.

- 3.10. Install generators for all identified critical facilities without adequate generators.

Note: This policy is suggested to meet climate change resiliency requirements, per HB 1181.

- 3.11. Construct a floodwall or setback levee on the Puyallup River in the Rivergrove Drive neighborhood in order to reduce the flooding on adjacent properties.

Note: This policy is suggested to meet climate change resiliency requirements, per HB 1181.

4. Ensure new public facilities and services to support new development are provided concurrent with the development.

- 4.1. Develop procedures to ensure that public facilities and services necessary to support development and established Levels of Service are available at the time of development.
- 4.2. Work with other service providers and adjacent jurisdictions to coordinate service provision and improvements to capital facilities.
- 4.3. Coordinate with adjacent jurisdictions through joint planning to ensure service provision and development is consistent with the goals of this plan.
- 4.4. Generally make new development responsible for providing the services necessary to support the demands created by the development.
- 4.5. Encourage infill development which takes advantage of existing public facility capacity.
- 4.6. Establish and maintain a current 6-year capital improvement plan to finance the necessary capital improvements identified in the applicable capital facility plans.
- 4.7. Provide for regular monitoring of capital facility and public service needs and make appropriate amendments to capital facility plans.
 - 4.7.1. Update, as necessary, the capital facility plans used in the preparation of the Comprehensive Plan to reflect the final land use designations and assumptions. Utilize the Capital Facilities Plan to make capital budget decisions and development of the city's biennial budget.
 - 4.7.2. Communicate with other service providers on population projections and growth in order to maintain accurate coordination of service provision.
 - 4.7.3. Update the Capital Improvement Program periodically at least every two years.

Note: It is not a requirement to update CIP every 2 years (updating CFP every 6 years is ok). CIP is often updated with the City's budget. Some agencies do a CIP more frequently than every 6 years so they can be responsive to grants, and also when they update impact fees.
 - 4.7.4. Monitor implementation of the Capital Facility Plan and Capital Improvement Program against the rate of growth and development to determine if adequate public facilities are being provided. If adequate facilities and services are not available, the land use element shall be adjusted accordingly.

5. Ensure adequate funding is available to meet capital facility and public service needs.

- 5.1. Explore funding from a mix of sources, changes to regulatory, pricing, taxing, and expenditure practices, and other fiscal tools to meet capital facility and public service needs.
- 5.2. Seek broad funding for the construction, maintenance, and replacement of water services and facilities, stormwater system improvements, and sanitary sewer services and facilities, as needed, to ensure reliable service.

Note: These policy updates are based on the regional VISION 2050 requirements and consolidate existing policies.

- 5.3. If funding is insufficient, adjustments should be made to the levels of service, Land Use Element, revenue sources, or any combination thereof.

Note: State Department of Commerce requires "policy or procedures to reassess the Land Use Element if probable funding falls short of existing needs."

Parks

6. Maintain a safe, attractive, *equitable*, enjoyable, and diverse park system that meets the needs of the City's residents, businesses, and visitors consistent with the City's adopted Parks and *TrailsOpen Space Plan*.

- 6.1. Implement the facilities and improvements identified in the adopted Parks and Trails Plan.
- 6.2. Maintain the following minimum levels of service for the parks system (based on 2024 conditions):

Investment: Maintain a level of investment per capita (resident equivalent) that is consistent with the current value of the system per person. The 2024 value is \$1,652 per resident equivalent, as may be adjusted periodically for system value, inflation, or annexation.

Recreation Facilities: Provide for a mix of parks and recreation facilities at a level consistent with the community's current level of facilities:

Active Recreation Facilities (fields, courts, skate parks, and similar): Sumner facility per 1,000 resident equivalents consistent with the 2024 ratio of 0.4 facilities per 1,000.

Informal Recreation Facilities (playgrounds, picnic shelters, open lawn areas, and similar): Sumner facility per 1,000 resident equivalents consistent with the 2024 ratio of 3.4 facilities per 1,000.

Parks: Sumner park acres per 1,000 resident equivalents consistent with the 2024 ratio of 3.2 acres per 1,000.

- 6.3. Aim towards the following target levels of service for the parks system:

Investment: Achieve a level of investment per capita (resident equivalent) that is consistent with a 30% increase in the current value of the system per person. The 2024 value is \$2,148

per resident equivalent, as may be adjusted periodically for system value, inflation, or annexation.

Recreation Facilities:

Active Recreation Facilities (fields, courts, skate parks, and similar): 0.5 facilities per 1,000 resident equivalents.

Informal Recreation Facilities (playgrounds, picnic shelters, open lawn areas, and similar): 4.4 facilities per 1,000 resident equivalents.

Parks: 5.4 acres per 1,000 resident equivalents.

Open Space (including increases to tree canopy cover): 3.8 acres per 1,000 resident equivalents.

Access: 10-minute maximum walk to a park for all Sumner residents.

Police

7. *Provide and maintain a police system sufficient to meet the community's public safety needs. This system may include normal police functions, responding to calls for service, community policing, care and custody of prisoners, and animal control.*

7.1. Level of Service:

- Maintain a ratio of at least two (2) commissioned officers per 1,000 population
- ~~Establish and~~ Maintain a ratio of not less than 1 commissioned patrol officer for every 1000 calls for service per year. Patrol Officers should have at least 40% of their patrol shift available for proactive policing activities.
- Provide one sergeant for every ~~6-7~~ 5 commissioned patrol officers.
- Provide and maintain one detective position at a ratio of 1/400 part A offenses.

7.2. Provide support to Sumner Schools through the continued School Resource Officer program ~~and instruction of Life Skills curriculum.~~

Note: This program is no longer offered in Sumner.

7.3. ~~Could include "Crime Prevention through Environmental Design" components~~ Consider including environmental design best practices for safety and vandalism prevention in site design guidelines for new development.

7.4. Maintain public safety staffing to support community events such as parades, festivals, concerts, community gatherings, etc. that promote Sumner's sense of community.

Fire

8. *Through the inter-local agreement with East Pierce Fire and Rescue, provide and maintain suppression, prevention, education, and medical response, including advanced life support (ALS)*

response system. *Refer to the EPFR capital facilities plan for a complete list of levels of service and planning assumptions.*

- 8.1. Support implementation of the EPFR capital facilities plan (refer to the plan for a complete list of levels of service and planning assumptions).
- 8.2. East Pierce Fire & Rescue shall strive to maintain sufficient personnel and equipment, strategically located such that the first-due response units arrive at fire and emergency medical incidents in urban areas served by staffed fire stations (as characterized by the City of Sumner) within 8 minutes, 30 seconds ~~5 minutes~~ to the 90th percentile.
- 8.3. East Pierce Fire & Rescue shall strive to maintain sufficient personnel and equipment, strategically located to provide a minimum acceptable (effective) response force capable of arriving at emergency incidents within 13 minutes, 30 seconds ~~10 minutes~~ to the 90th percentile. "Sufficient personnel" is further defined in the EPFR Capital Facilities Plan.

Note: The above benchmarks are updated per EPFR unit data for 2023.

Library

9. *Through the Pierce County Library District, provide a library and access to library services consistent with the Pierce County Library Systems Capital Facilities Plan.*

- 9.1. The City of Sumner adopts by reference the Pierce County Library Systems Capital Facilities Plan as adopted and periodically amended, including any level of service guidelines contained therein.

General Facilities

10. *Provide sufficient City facilities to meet the needs of City operations.*

- 10.1. Establish and provide the following Level of Service for City government buildings:
- General Government 1.~~36~~ 13 s.f./capita
 - Police 294 s.f./employee ~~0.44 s.f./capita~~
 - City Shops (buildings only) 1.8 s.f./capita
- 10.2. Seek innovative and shared financing for City facilities, including lease arrangements and impact fees.
- 10.3. Maintain services and a rate structure adequate to keep the cemetery self-sufficient.

Water, Sewer, and Stormwater

11. *Maintain an efficient water system to meet the needs of the community's residential, commercial and industrial community as set forth in the City's most recently adopted Water System Plan.*

- 11.1. Establish the following Levels of Service for water supply:

Demand:

- Residential Demand ~~60.3 gpd/capita¹~~ 72.73 gpd
- Employee Demand ~~58.3 gpd/employee plus 252,000 gpd¹⁺~~ 25.28 gpd/employee¹

Fire Flow:

<u>USE</u>	<u>MIN. FLOW (GPM)</u>	<u>REQUIRED DURATION (HOURS)</u>
<u>Medium and low density residential</u>	<u>1,000</u>	<u>2</u>
<u>High density residential and commercial</u>	<u>1,500</u>	<u>2</u>
<u>Industrial</u>	<u>3,500</u>	<u>3</u>
<u>Several existing buildings</u>	<u>4,500</u>	<u>4</u>

~~USE~~ ~~MIN. FLOW (GPM)~~ ~~REQUIRED DURATION (HOURS)~~

~~Medium and low~~

~~density residential~~ ~~1,000~~ ~~2~~

~~High density~~

~~residential and~~

~~commercial~~ ~~1,500~~ ~~2~~

~~Industrial~~ ~~3,500~~ ~~3~~

~~Several existing~~

~~buildings~~ ~~4,500~~ ~~4~~

Reliability:

WATER SYSTEM - RELIABILITY LOS

<u>Criteria</u>	<u>Level of Service</u>			
	<u>A</u>	<u>B</u>	<u>C</u>	<u>E</u>

¹ Per the Sumner Water System Plan.

Conveyance Reliability; Loop (min. 6" pipe) System	95% + of services on loop lines	90% + of services on loop lines	80% + of services on loop lines	Less than 80% of services on loop lines
Source Reliability;	Meets peak day w/largest supply out	Meets peak day w/all supplies on	Meets 95% of peak day - use storage	Water restriction required
Distribution System Reliability; Isolation valves a min of 660 ft.	95% + of services meet this these criteria	90% + of services meet this these criteria	80% + of services meet this these criteria	<80% of services meet this these criteria
Power Backup for Supply Pumps;(standby generators)	100% of pumps with backup gen.	Sufficient backup for meeting MMADF	Sufficient backup for avg. daily flow	Less backup than needed for ADF
Emergency Response by Repair Crew	< 4 hrs. on 24-7 basis	< 8 hrs. on 24-7 basis	< 24 hrs. on a 24-7 basis	> 24 hrs on a 24-7 basis

The minimum LOS for reliability is "B" as outlined above.

- 11.2. Deliver a high degree of water quality which satisfies federal, state and local regulations as follows:

LOS "A": Water quality meets both Primary and Secondary Public Health Standards.

LOS "B": Water quality meets only Primary Drinking Water Standards.

For water quality, Sumner chooses a LOS "A".

- 11.3. Require water services for new development, unless otherwise allowed by state or county regulations.

Note: Policy added to comply with VISION 2050 guidelines.

- 11.3.1. Encourage the design, siting, construction, operation, and relocation or closure of water infrastructure in a manner that is cost effective, environmentally sensitive, appropriate to the location and need, minimizes and mitigates impacts on adjacent land uses, and prioritizes action to protect vulnerable populations.

Note: Recommended policy based on best practices.

- 11.4. Require all new development to avoid or mitigate adverse impacts to functioning water systems.

Water Conservation

- 11.5. Implement a water conservation programs for residential, commercial, and industrial users consistent with the Sumner Water Plan.

- 11.5.1. Require new and existing businesses to use water at or below the average per capita employee level: and businesses that use higher than average rates of water shall be required to mitigate their impacts. Those businesses not able to meet the goal shall be encouraged to conserve, re-use water, or develop new water sources:

- 11.5.2. Implement water service technologies, such as "smart meters," that assist customers in monitoring and reducing water usage.

- 11.5.3. Support existing public education and outreach campaigns to address and promote water conservation.

~~X.X. Seek to expand the City watershed protection by acquiring additional land around the existing watershed.~~

Note: Deleted, as this policy is more fitting in surface water policies.

~~X.X. In conjunction with developing additional water sources, develop a well head and groundwater protection program.~~

Note: Recommend deleting - water sources cannot be developed and the well head and groundwater protection programs are required by doh and included in the city's general water plan.

~~X.X. Provide broad funding for water services and facilities.~~

Note: Moved to new funding Goal 5.

Sanitary Sewer

- 12. Provide a sanitary sewer system adequate to meet the demands of the community, that ensures public health and safety, and protects the environment.**

Note: Moved sanitary sewer up in order to write water and sewer policies together.

- 12.1. Establish and provide for a Level of Service as defined in the adopted Sanitary Sewer Plan.

12.2. Require sanitary sewer services for new development, unless otherwise allowed by state or county regulations.

Note: Policy added to comply with VISION 2050 guidelines.

12.2.1. Encourage the design, siting, construction, operation, and relocation or closure of sanitary sewer infrastructure in a manner that is cost effective, environmentally sensitive, appropriate to the location and need, minimizes and mitigates impacts on adjacent land uses, and prioritizes action to protect vulnerable populations.

Note: Policy added based on best practices.

12.2.2. Require all new development to avoid or mitigate adverse impacts to functioning sanitary sewer systems.

Septic Systems

12.3. Ensure existing on-site septic systems may continue to serve existing residents as long as they are properly functioning, well maintained, and remain in compliance with Tacoma-Pierce County Health Department requirements.

Note: Policy added to comply with VISION 2050 guidelines.

12.3.1. Require all new development to avoid or mitigate adverse impacts to functioning septic systems.

12.4. Encourage homeowners to connect to the sanitary sewer system where available.

12.5. Require homeowners to connect to the sanitary sewer system if existing onsite septic systems fail to maintain compliance with Tacoma-Pierce County Health Department requirements.

~~X.X.X. Work with the Tacoma-Pierce County Health Department to eliminate the development of new residential and commercial uses on-site and community sewage systems within the Planning Area. The intent would be the elimination of all new permanent septic systems, but would allow for interim on-site approved septic systems where sewer facilities are not available.~~

Note: Deleted – summarized and covered in 9.2.1.

~~X.X.X. Prohibit on-site or community sewage systems supporting new industrial development. Recreational uses may be exempt from this policy.~~

Note: Deleted – summarized and covered in 9.2.1.

~~X.X.X. Seek broad funding for providing sanitary sewer services and facilities.~~

Note: Moved to new funding Goal 5.

13. Seek cooperative planning approaches among jurisdictions, agencies, federally recognized tribes, adjacent regions, and special purpose districts to address regional issues of water and sanitary sewer, future development needs, regional issues, and emergency response.

Note: Policy added to comply with VISION 2050. Note that these policies are edited from the Utilities section of the Plan.

- 13.1. Coordinate emergency response across jurisdictions to ensure adequate water and sanitary sewer service, with priority given to minimal service disruptions for historically underserved populations.
- 13.2. Ensure that the City's Emergency Response Plan is coordinated with regional jurisdictions and the City's Public Works Department to include local measures for communicating and addressing emergencies.
- 13.3. Coordinate and prioritize messaging that is in plain language, short, culturally appropriate, in language prevalent in the area, and in multiple formats, such as audio, large print and captioning.

14. Implement strategies, appropriate regulations, and new technologies that balance cost and benefits for the City, health and safety, and promote affordability and equitable access to water and sanitary sewer services to all communities.

Note: Policy added to comply with VISION 2050. Note that these policies are edited from the Utilities section of the Plan.

- 14.1. Promote incentive programs, strategies, and appropriate regulations to provide equitable access of water and sanitary sewer services to underserved areas, with particular priority investments to address disparities in underserved communities.
- 14.2. Provide utility bill or deposit assistance or subsidies to supplement tenant-based rental assistance to increase protection for vulnerable households.
- 14.3. Prioritize use of new technologies, programs, and applications that increase the reliability, affordability, and accessibility of water and sanitary sewer services and pay options.

15. In conjunction with existing system providers, provide surface and storm drainage collection and discharge systems to protect water quality, public and private property, and the natural environment.

- 15.1. Establish and maintain the Level of Service as the 25-year storm event, except in those areas where the 100-year storm design is appropriate to protect the natural environment.
- 15.2. Require new development to provide for facilities to reduce water quantity and quality impacts associated with new development.
 - 15.2.1. Encourage the design, siting, construction, operation, and relocation or closure of storm drainage infrastructure in a manner that is cost effective, environmentally sensitive,

appropriate to the location and need, minimizes and mitigates impacts on adjacent land uses, and prioritizes action to protect vulnerable populations.

Note: Recommended policy based on best practice.

15.2.2. Encourage the use of low impact development (LID) and stormwater best management practices to manage stormwater runoff where feasible.

~~X.X. Seek broad funding for stormwater system improvements.~~

Note: Moved to new funding Goal 5.

15.3. Coordinate with Pierce County on stormwater matters of common interest such as protection and preservation of water quality and resources in watersheds shared by both the City and County. Participate in coordinated regional watershed-based efforts with goals of achieving local drainage health, protection, preservation of water quality, and resources in watersheds.

Note: Recommend revising to include more general regional planning efforts for watershed health.

15.4. Continue to implement storm drainage, erosion control and critical area ordinances to help reduce off-site impacts of development and protect stream channels, aquatic resources, habitat and wetlands. The regulations shall reflect the requirements and manuals of state and federal agencies as appropriate. Review, develop, and implement design and development standards to meet the City's goals to improve water quality and reduce flooding, as well as reflect the requirements and manuals of state and federal agencies, as appropriate.

Note: Recommended policy update, as City's goal/focus or state/federal requirements may change.

~~X.X.X. Ensure that existing and future public and private stormwater and other water quality protection infrastructure is properly maintained and operated.~~

Note: Recommend deleting - this is more of an operational practice within the Public Works Department.

~~X.X.X. Identify locations for regional surface water facilities in areas of anticipated redevelopment in Downtown. Promote the establishment of regional surface water management facilities to support infill development and preclude the need for individual on-site ponds and facilities; provide development incentives, encourage efficient use of land, and reduce overall facility maintenance costs.~~

Note: Recommend deleting - this policy is too specific for the Comprehensive Plan Update and can be covered in regulations and operations.

Solid Waste

16. Consistent with adopted Solid Waste Management Plans, provide solid waste collection and disposal services to the community.

16.1. Support recycling within the community through a curb-side program, education and using recycled products for City purposes wherever feasible.

16.2. Implement programs for waste reduction in accordance with the adopted Solid Waste Plan.

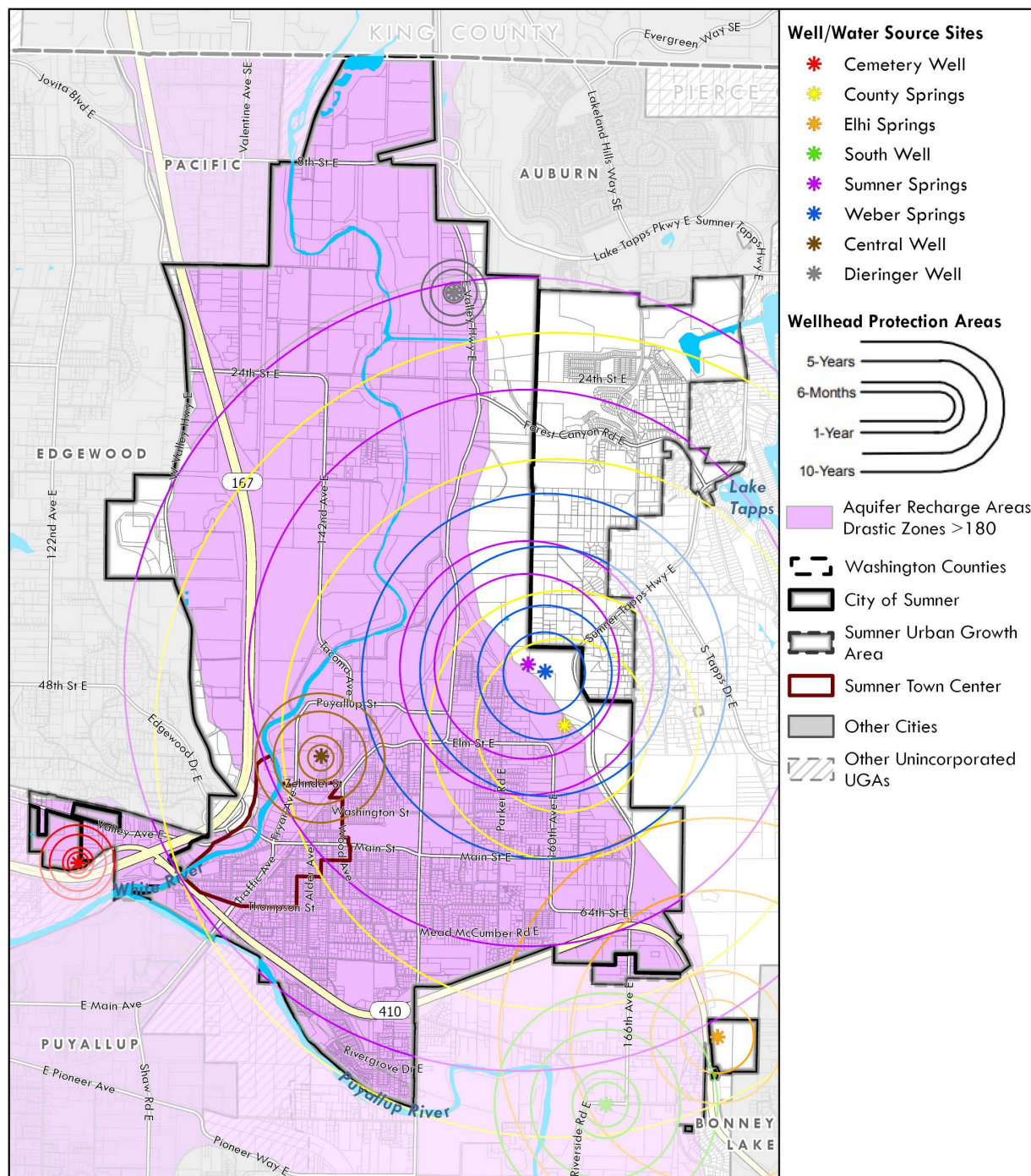
Schools

17. Support the Sumner-Bonney Lake and Dieringer School Districts in providing the best education for all students in the Districts.

- 17.1.*** Coordinate and communicate with the appropriate school districts on issues of mutual interest, including school facility location, impacts of new development, impacts of school facilities and activities on the community, parks and recreation programs, population and growth projections, and school involvement in the community.
- 17.2.*** Based on the Sumner-Bonney Lake School District Capital Facilities Plan establish impact fees to mitigate the demands on the school systems of new development.
- 17.3.*** Promote working with school districts on school siting and design to support safe, walkable access, including strategies to provide adequate urban capacity for new schools and to avoid serving urban students with schools in the rural area.

Note: Above policy based on VISION 2050 guidelines. Also, adopted goal and policies on concurrency moved to top of element (Goal 4 and supporting policies).

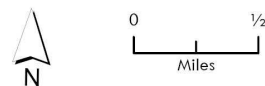
Figure 17-1: Water Resources



CITY OF SUMNER

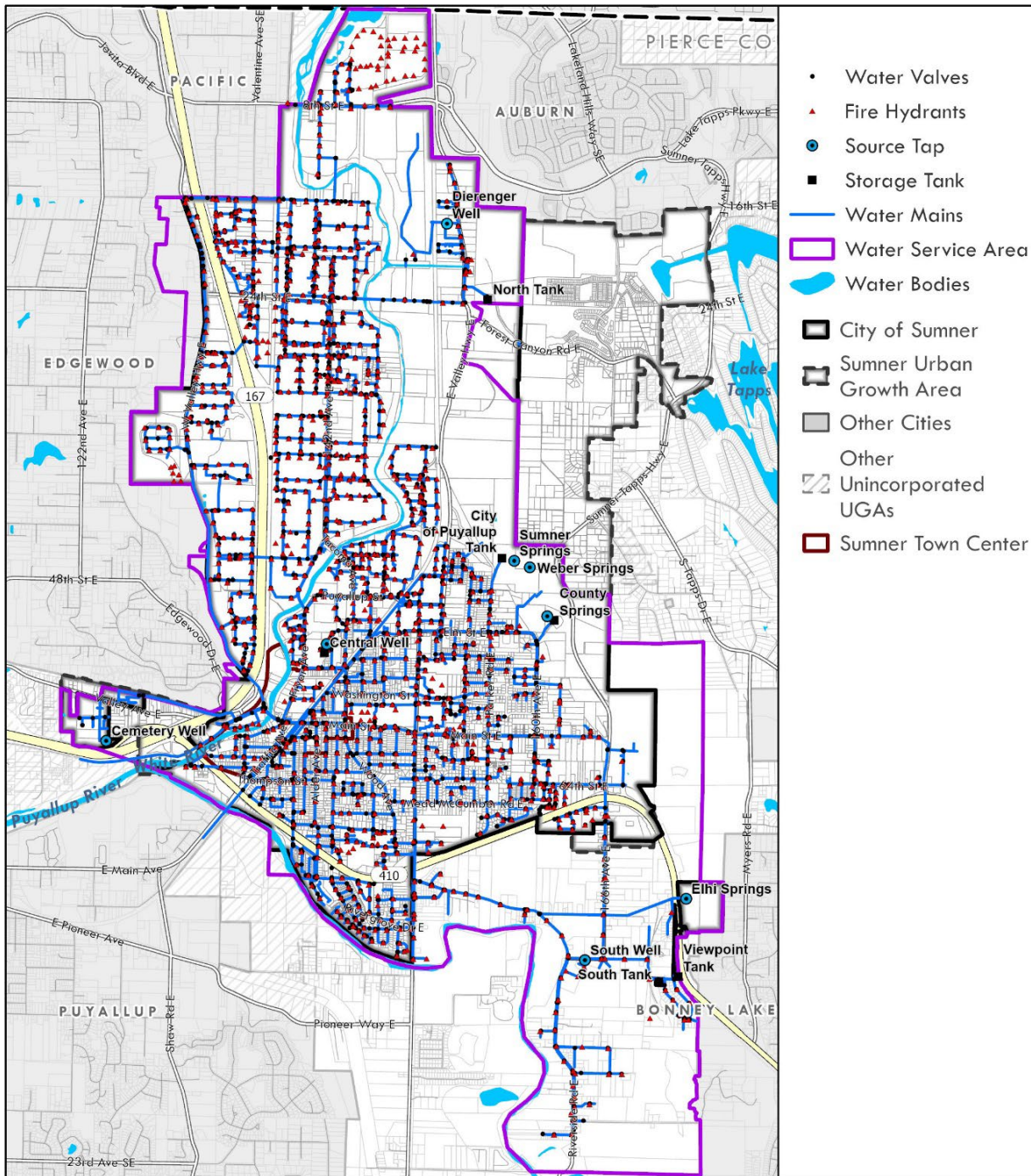
Aquifer Recharge Areas and Groundwater Resources

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: August 2023

Figure 17-2: Water Utility and Infrastructure



CITY OF SUMNER Water Utility & Infrastructure Area

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: November 2023

LEGEND:

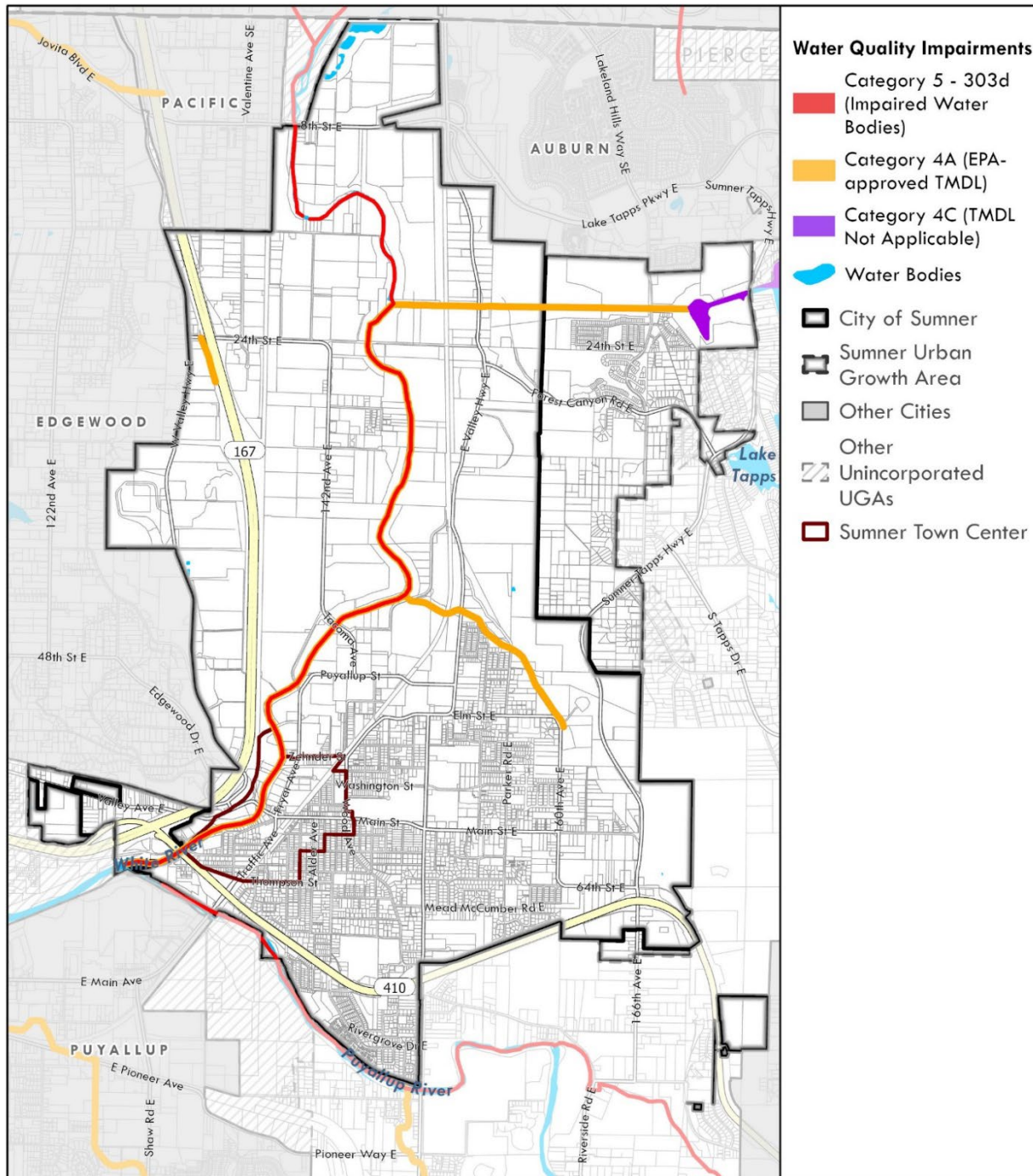
- Subbasin Boundary
- Intermittent Pond
- Water Bodies
- City of Sumner
- Sumner Urban Growth Area
- Other Cities
- Other
- Unincorporated UGAs
- Sumner Town Center

City of Sumner
Public Works Department

Stormwater Subbasin Boundaries



Figure 17-4: Impaired Water Bodies



CITY OF SUMNER

Impaired Water Bodies

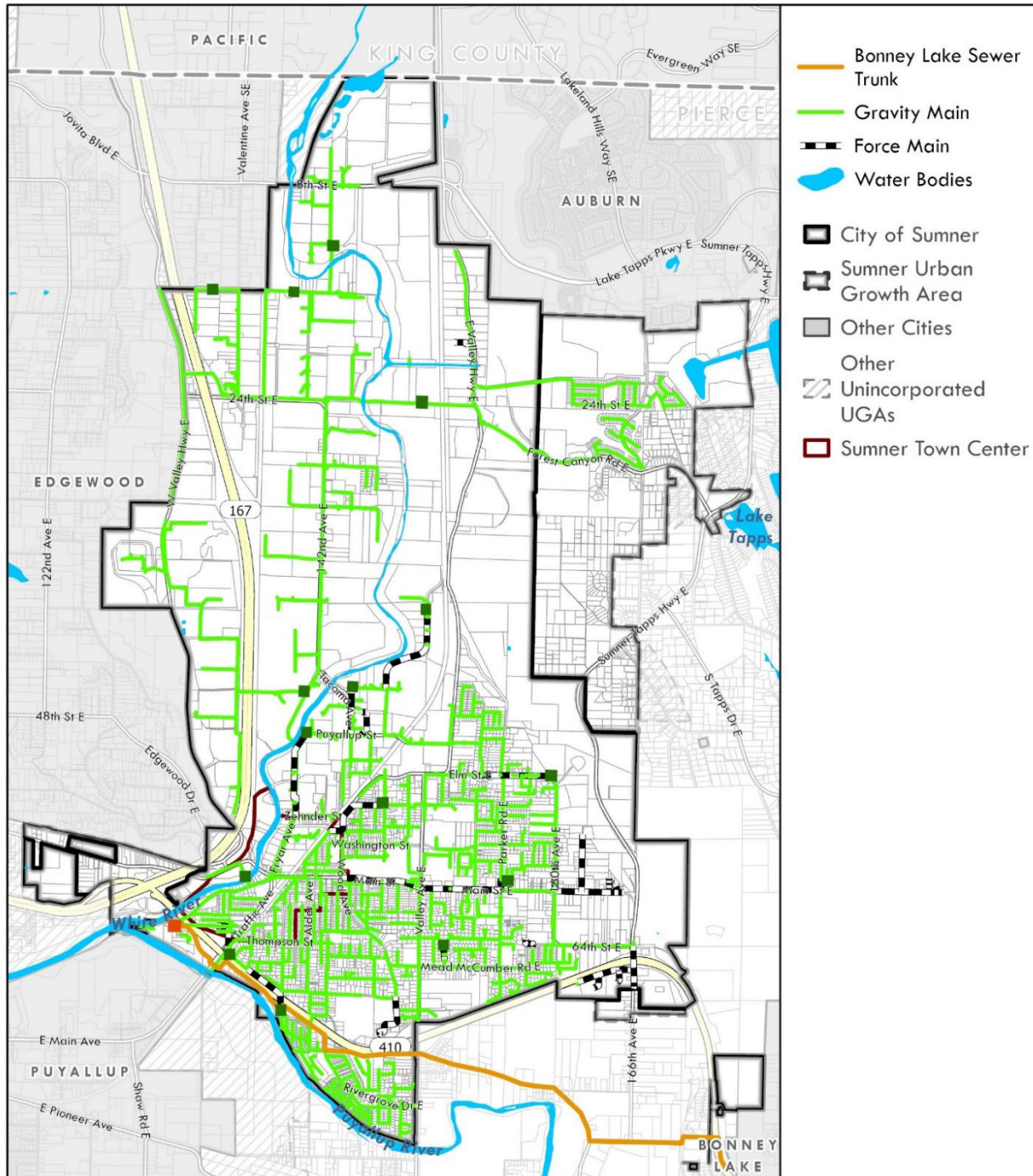
Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



CITY OF
SUMNER
WASHINGTON

Map Date: November 2023

Figure 17-5: Sewer System



CITY OF SUMNER Sewer System

Disclaimer: Map features are approximate only. The City of Sumner does not guarantee the accuracy of this map nor assume any liability from the use of or reliance on the information herein.



Map Date: November 2023

Utilities

Introduction

The Growth Management Act (GMA) requires that a utility element address "the general location, proposed location, and capacity of all existing and proposed utilities, including, but not limited to electrical lines, telecommunication lines, and natural gas lines." City-provided utilities, like water and sewer, are addressed in the Capital Facilities chapter. Private entities provide utilities such as natural gas, electric, standard telephone, and cellular telephone services and these are addressed in this Element. ~~Issues identified through the course of environmental review include coordinated land use and facility planning, coordination of utility construction, conservation of resources, and potential health effects. A discussion of these issues is found in the Draft and Final Environmental Impact Statement. The Utilities Element establishes policies for providing, supporting, and partnering with providers to ensure that Sumner will be adequately served and will have access to new technology and more efficient services over time. In addition to ensuring adequate utility services, State legislation requires jurisdictions to address climate change and greenhouse gas reduction in their policies and regulations. Policies related to utilities and climate change are included in this element and elsewhere in the Comprehensive Plan. Goals, policies, and objectives regarding utilities are provided below as well as existing and proposed facility maps where available.~~

Goals, Policies, and Objectives

1. Facilitate the development of natural gas and alternative energy utilities at the appropriate levels of service to accommodate the growth that is anticipated to occur in Sumner.

~~X.X. Promote when reasonably feasible, co-location of new public and private utility distribution facilities in shared trenches and coordination of construction timing to minimize construction-related disruptions to the public and reduce the cost to the public of utility delivery. The City shall provide timely effective notice to utilities to encourage coordination of public and private utility trenching activities for new construction and maintenance and repair of existing roads.~~

Note: Co-location and coordination of utility covered in new 5.0 below.

- 1.1.** Assist service providers to ensure land will be made available for the location of natural gas lines, including location within transportation corridors.
- 1.2.** ~~Promote~~ Accommodate the extension of natural gas distribution lines to and within the Urban Growth Area. ~~The City shall coordinate~~ Coordinate land use and facility planning with service providers to allow eventual siting and construction of natural gas distribution lines within rights-of-way which are being dedicated or within roads which are being constructed or reconstructed.

Note: Many people in the City are still using natural gas, so the recommendation is to keep these policies.

- 1.2.1. Periodically review and amend existing regulations, including sensitive area regulations, as necessary to allow maintenance, repair, installation, and replacement of gas lines.
- 1.2.2. When requested provide the natural gas utility with updates of population, employment, and development projections. The City will seek to jointly evaluate actual patterns and rates of growth and compare such patterns and rates to demand forecasts.

~~X.X. Encourage communication among the City, Washington Utilities and Transportation Commission (WUTC), and utilities regulated by the WUTC, regarding service provision concurrently or in advance of demand.~~

Note: Regional planning covered in new Policy 6 below.

- 1.3. Encourage system design practices intended to minimize the number and duration of interruptions to customer service.

~~X.X. Coordinate with the utility provider to determine if a Memoranda of Understanding outlining expectations of the provider as well as the City would be beneficial.~~

Note: This policy not needed, since that information is always covered in a franchise agreement.

- 1.4. Facilitate conversion from natural gas to cost-effective and environmentally sensitive alternative technologies and energy sources.

- 1.4.1. Review design and development standards to determine improvements to encourage alternative energy sources.
- 1.4.2. Develop strategies to enhance existing public education and outreach campaigns to promote sustainable practices and alternative energy.
- 1.4.3. Promote existing state-level policies and initiatives, funding programs, and incentive programs for renewable energy technologies.

Note: Consultant Parametrix recommends these new policies based on best practices. These policies don't mandate any change but call for facilitating the transition to alternative energy sources.

2. Plan and allow for regional and local improvements to electric facilities sufficient to support projected growth and desired land use patterns in Sumner and coordinate service plans for facility development.

- 2.1. Make decisions with respect to electric utility facilities so that safe, adequate, and efficient availability of electrical service in other jurisdictions is not negatively affected.
- 2.2. Accommodate facilities needed to support residential areas and sufficient to support economic development in Sumner.

~~X.X. Accommodate additions and improvements to electric utilities in a manner consistent with the needs and resources of Sumner as well as other jurisdictions. In addition, the City recognizes that decisions regarding utility corridors and facilities cannot be made solely on the basis of local considerations if multi-jurisdictional or regional interests would be affected.~~

Not: Covered above in Policy 2.1.

~~X.X. Encourage Puget Sound Energy to make additions to and improvements of electric utility facilities that provide adequate capacity for future planned growth.~~

~~X.X.X. When requested, provide the electric utility with annual updates of population, employment and development projections. The City of Sumner and the electric utility will seek to jointly evaluate actual patterns and rates of growth, and compare such patterns and rates to electrical demand forecasts.~~

~~X.X.X. Provide early notification of any annexation requests or proposals to coordinate improvements and service.~~

Note: Planning with private utilities covered in new Policy 6 below.

~~X.X. Recognize the need for electric utility facilities that are sufficient to support economic development.~~

Note: Covered in Policy 2.2.

~~X.X. Coordinate the formulation and periodic update of the utility element (and relevant implementing development regulations) with adjacent jurisdictions.~~

Note: Coordination addressed in new Policy 6.

~~X.X. Coordinate and seek to cooperate, with other jurisdictions in the implementation of multi-jurisdictional electric facility additions and improvements. Such coordination and cooperation should include efforts to coordinate the procedures for making specific land use decisions to achieve consistency in timing and substantive requirements.~~

Note: Coordination addressed in new Policy 6.

~~X.X. Encourage the joint use of utility corridors, provided that such joint use is consistent with limitations as may be prescribed by applicable law and prudent utility practice.~~

Note: Co-location and joint use covered in new Policy 5.

~~X.X. Provide timely and effective notice to utilities of the construction, maintenance or repair of streets, roads, highways or other facilities, and coordinate such work with the serving utilities to ensure that utility needs are appropriately considered.~~

Note: Covered in Policy 5.2.

~~X.X. Work with the utility to appropriately place electric utility facilities on public rights-of-way.~~

Note: Covered in Policy 5.1.

~~X.X. Coordinate with the utility provider to determine if a Memoranda of Understanding outlining expectations of the provider as well as the City would be beneficial.~~

Note: Redundant.

~~X.X. Encourage underground utility networks in new developments in the City. In addition, where significant work in existing rights-of-way will occur, the City could investigate with service providers the possibility of buried lines where existing overhead lines are presently located. Undergrounding of distribution lines would be in accordance with Puget Sound Energy applicable tariffs on file with the WUTC.~~

Note: Reworded in 2.3.

2.3. Encourage underground utility networks in new developments in the City, and in locations where significant work in the right-of-way has the potential to accommodate undergrounding. Where appropriate, require undergrounding of utilities in targeted areas such as Town Center and in other areas as appropriate for the type, size and location of the development.

2.4. Undergrounding of distribution lines ~~would~~ should be in accordance with approved franchise agreements and Puget Sound Energy applicable tariffs on file with the WUTC.

3. ~~Coordinate with communication utilities to ensure adequate telephone services and high-speed technology services in the community. Coordinate with telecommunication services to provide new and cost-effective emerging information and technologies and provide the community equitable access to options and reliable service.~~

Note: Updated policy intent is to highlight the city's role in advancing telecomm in the community.

~~X.X. Allow for improvements and additions to communication facilities needed to accommodate growth.~~

Note: Redundant.

~~X.X.X. When requested, provide telephone service providers with annual update of population, employment and development projections to ensure appropriate service will be available as needed.~~

~~X.X. Strive to notify telephone service providers and residents of construction work in the public rights-of-way which may affect telephone system equipment.~~

Note: Covered in new Policy 5.2.

~~X.X. Encourage underground utility networks in new developments in the City. In addition, where significant work in existing rights-of-way will occur, the City could investigate with service providers the possibility of buried lines where existing overhead lines are presently located.~~

Note: Covered in Policy 2.3 and new Policy 5.2.

3.1. Maintain appropriate telecommunication facility regulations in the Zoning Code and ensure that proposal review considers setbacks, land use compatibility, aesthetics, fencing and vegetative buffering, and other concerns, consistent with State laws.

~~X.X. Coordinate with the utility provider to determine if a Memoranda of Understanding outlining expectations of the provider as well as the City would be beneficial.~~

Note: Redundant.

3.2. Allow telecommunication utilities only where impacts of their infrastructure size and appearance can be mitigated or relocated to nonresidential areas while prohibiting new cellular towers in residential areas.

3.3. Encourage utility partnerships to take advantage of the City's fiber optic network to facilitate service delivery and encourage other broadband services throughout the City.

Note: The City is in the process of developing a fiber optic network that will provide a trunk line connection through the mic and to other adjacent networks.

~~**X. Ensure environmentally sensitive, safe and reliable service, and conservation of energy.**~~

Note: These policies deleted, since they are covered under other comp plan elements, such as Capital Facilities and Transportation.

~~X.X. Facilitate and encourage conservation of resources to delay the need for additional facilities.~~

~~X.X. Facilitate the conversion to cost-effective and environmentally sensitive alternative technologies and energy sources.~~

~~X.X. Support development of a widespread gaseous fuel infrastructure to provide more options to reduce vehicular pollution. One example is conversion of the City's fleet to cleaner fuels.~~

~~X.X. Conserve the use of energy in the City's own facilities.~~

~~**X. Facilitate the provision of reliable utility service in a way that balances potential safety and health impacts and allows for a fair and reasonable price for the utility's product.**~~

Note: Policies here deleted, as City has minimal role in EMF, and safety issues and cost-effectiveness are addressed more broadly for all utilities in new Policy 7 below.

~~X.X. Encourage active City and utility participation in the development of regional and statewide policies regarding exposure to EMF (electromagnetic fields).~~

~~X.X. Review periodically, the state of scientific research on EMF, and make changes to policies if the situation warrants.~~

~~X.X. Review potential power density, height and setback standards and consider an ordinance which regulates communication towers to address potential health effects.~~

4. Adopt incentives, strategies, actions, and regulations that encourage equitable development and access to utilities.

Note: Policies below add a consideration of vulnerable populations, as required by the State.

4.1. Promote equitable access of utility services to all residents, prioritizing services and access to historically underserved communities.

- 4.1.1. Connect residents to State and local resources such as utility bill or deposit assistance programs and subsidies to supplement tenant-based rental assistance, in order to increase protection for vulnerable households.
- 4.1.2. Support programs that assist low-income households with utility- related home repairs, weatherization, and other energy-efficient improvements to owner-occupied and rental housing.
- 4.2. Prioritize design, siting, construction, operation, and relocation or closure of utility systems in a manner that is cost effective, environmentally sensitive, and minimizes and mitigates impacts to vulnerable populations and communities that have been disproportionately affected by noise, air pollution, or other health impacts.

5. Promote, when reasonably feasible, co-location or joint use of public and private utility in shared trenches, conduits, or poles so that utilities may encourage expansion, maintenance, and upgrading to minimize disruptions to the public, reduce cost to the public of utility delivery, and consistency with limitations as may be prescribed by applicable law and prudent utility practice.

Note: Above goal carries forward the “co-location” theme in existing policies.

- 5.1. Work with the utility to appropriately place utility facilities on public rights-of-way when reasonably feasible.
- 5.2. Provide timely effective notice to utilities to encourage coordination of construction, maintenance, or repairs to roadways or other facilities.

6. Seek cooperative planning approaches among jurisdictions, agencies, federally recognized tribes, adjacent regions, and private utility providers to address regional issues of utility needs and resources and emergency response.

- 6.1. Coordinate land use decision-making with utility providers to ensure consistency in timing and standards.
- 6.2. Prioritize utilities-related actions to ensure adequate service and minimal service disruptions for historically underserved populations.
- 6.3. Assist local utilities in their planning and emergency responses by providing updates on population, demographics, and employment, if needed.

Note: Above policy carries forward the “coordination” theme in existing policies and guidance from Puget Sound Regional Council, and adds an equity consideration as required by the State.

- 6.4. Ensure that the City’s Emergency Response Plan is coordinated with regional jurisdictions and utility providers to include local measures for communicating and addressing utility outages and emergencies.
- 6.5. Coordinate and prioritize messaging that is in plain language, short, culturally appropriate, in languages prevalent in the area, and in multiple formats, such as audio, large print, and captioning.

7. *Implement new technologies that balance costs and benefits for the City, health and safety, aesthetics, protection of the environment and economy, and promote affordability and equitable access of utilities to all communities.*

- 7.1. *Prioritize the provision of cost effective, energy-efficient new technologies to underserved populations.*
- 7.2. *Prioritize the use of new technologies, programs, and applications that increase the reliability, affordability, and accessibility of utility services and pay options.*



MEMORANDUM

DATE: November 12, 2024
TO: Mayor Hayden and City Council
FROM: Ryan Windish, Community & Economic Development Director
RE: **2024 Comprehensive Plan Update – City Council Edits to Elements from 10/16 and 10/28**

City Council met on October 16, 2024 and October 28, 2024 to discuss the *Draft 2024 Comprehensive Plan* and specific Elements. A number of edits were agreed to during these discussions and the following is a summary of changes to each element and policies as recorded by staff.

These updates will be incorporated into the *Draft 2024 Comprehensive Plan* for the upcoming Public Hearing and preparation of the *Final Environmental Impact Statement* (FEIS).

COUNCIL 10/16/24 and 10/28/24 – EDITS:

1. Community Vision

- Environment – Page 4
 - Along with the desire to protect valuable resources and sensitive areas, City plans and ordinances ensure protection of property rights. Fair compensation practices are in place to compensate owners if property rights are taken for public use. Consideration is also given to environmental justice implications of proposed projects and policies, such as disproportionate exposure of underserved and low income communities of color and the poor to pollution, noise and other environmental and health hazards.

2. Governance and Permit Process

- Policy 2.2:
In the decision process regarding distribution of City resources and services, consider impacts to and needs of historically underserved populations and groups vulnerable to displacement.
- Goal 6.0:
Communicate regularly with developers, landlords, business, industry and residents with regard to policies and regulations which could affect development.
- Policy 6.3:
Support and create communication avenues that reach ~~historically~~ underserved communities, such as providing City information in multiple languages and partnering with community organizations that serve these communities.
- Policy 9.1:
Consider accessibility in public notices, publications and website content so that permit information is available to all segments of the community, including traditionally underserved populations.

3. Community Character

- Policy 1.6 typo correction:
~~Preserve the single-family residential scale and historic~~ Maintain a small-scale residential character along residential streetscapes through various means such as floor area ratio, small lots, and setback requirements.
- Policy 2.1.2:
In the East Sumner Urban Village, allow encourage mixed use development ground floor multifamily (except fronting on East Main and 160th Avenue East) in order to expand the range of housing types available in the city, and to support commercial development in that area; and

- Policy 2.1.3 typo correction:
~~X.X. Define neighborhoods and districts by walking distance to neighborhood centers and other community facilities.~~
Note: ~~Police Policy~~ deleted, since Sumner no longer defines neighborhoods in this way. However, policies below carry forward the goal of establishing services and transit within walking distance of residents.
- Policy 4.1.1
Gateway intersections were identified in the 2003 Urban Design Concept Plan and in later years by the City Council include the following:
 - Traffic Avenue at SR410
 - Traffic Avenue at Old Cannery Bridge (now Cannery Way Bridge)
 - Valley Avenue at SR410/Orting Highway
 - 166th Avenue East at SR410
 - East Valley Highway at Elm Street
 - 24th Street at SR167 interchange (2024)
 - Tacoma Ave at Puyallup Ave in MIC (2024)

4. Family and Human Services

- Policy 1.1.6
Accessibility. Support local programs that are affordable, physically accessible, and ~~culturally sensitive.~~ help meet the needs of communities affected by poverty, exclusion and discrimination, and other historically underserved communities.
- Policy 1.2.7
Advocate ~~Fund for~~ Support the presence of school resource officers in our schools and other school safety programs.
- Policy 1.2.8
~~Advocate to maintain or develop~~ Support programs that provide after school and evening activities for youth.
- ~~Policy 1.2.9~~
~~Support funding for the Sumner-Bonney Lake recreation program or pursue other options for providing these services.~~
- Policy 2.2.2
Support programs and regulations that increase access to housing for historically underserved populations and people of diverse backgrounds, ethnicity and socioeconomic levels.
- Policy 2.4.1:
~~Support~~ Continue to fund the Sumner Senior Center programs. Support the Sumner Senior Center and its programs.
- Policy 2.5.3 Delete, covered in 1.2
~~Support programs that promote recreation for the Sumner-Bonney Lake areas.~~
- Policy 2.5.4
Encourage involvement of Sumner staff, officials and the business community in outreach to Sumner-Bonney Lake and Dieringer Schools ~~Districts that to further career exploration activities for youth that~~ may include mentoring, reading programs, and job shadowing.
- Policy 3.2
Support access to human services in the judicial system.

5. Economic Development and Employment

- Policy 1.3:
~~Work with the Sumner Downtown Main Street Association, Chamber of Commerce, Tacoma Regional Convention & Visitor Bureau, Port of Tacoma, and the Tacoma-Pierce County Economic Development Board local Destination Marketing Organizations (DMOs), such as downtown associations and regional visitor bureaus,~~ to promote and market the economic development potential and amenities of the City and recruit new businesses.
- Policy 1.11:
Maintain and enhance a partnership with ~~many~~ stakeholders downtown including ~~Sumner Downtown Promotion Main Street Association~~ downtown associations, transit providers, business owners, ~~or similar organization,~~ property owners, residents, ~~Sound Transit,~~ and others.
- Policy 1.13:
~~Create a document that compiles initiatives and activities that can be undertaken to promote economic development in the Downtown including infrastructure improvements, events, and housing initiatives.~~

Note: This “document” is covered by the Town Center Plan and the Main Street Visioning Plan.

- Policy 1.14 ~~FROM JASON: need to make permissive **not identified by council** I DON'T KNOW WHAT GOOD WORDING WOULD BE. RYAN?~~

~~To achieve successful programs and projects, institute public and private performance standards that are flexible, dynamic, and enforceable, but which also provide incentives. Monitor the success of programs and projects based on common by instituting public and private key performance indicators measures and adjust as needed.~~

- Policy 2.7:
~~Monitor demographic trends to ensure City policies and direction correspond~~ City policies and direction are consistent with the needs of the local populations, with an emphasis on communities affected by poverty, exclusion and discrimination, and other historically underserved communities.
- Policy 5.1:
As part of the Sumner's Comprehensive Emergency Management Plan, identify potential measures that could support a sustainable economic recovery for businesses after a disaster.
- Policy 6.1.3:
Invest Support investment in resources and programs that enhance public safety downtown.
- Policies 6.2 and 6.2.3

~~6.2 —Every 5 years, No less frequent than during the 10-year periodic update to the Comprehensive Plan determine whether a parking study should be completed to evaluate needs for parking in the Town Center in conjunction with interested parties, examine the needs for downtown parking within the Town Center and develop methods for providing attractive, safe, accessible, effective and well-utilized parking. Modify and adjust on and off-street parking which serves retailers, other businesses, residents, and major employers downtown shall be implemented based on the 5-year parking study.~~

6.2.3 Implement short-term, medium-term, and long-term parking strategies as indicated by the 5-year most recent parking study.

- Policy 7.4:
Partner with Encourage partnerships between the local School District, Community College, and SPMIC employers to create paid internship programs for students interested in Manufacturing, Food Processing, or Warehousing employment.
- Policy 9.4:
Encourage a modest-level of small-footprint businesses in the SPMIC that provide close-by services for workers, such as food establishments, medical services and daycare childcare.

6. Land Use Element

- Policy 6.4:
Mitigate Where feasible, mitigate the environmental health effects of climate change, including air quality, stormwater, and heat impacts, through the acquisition of parks and open space and tree planting, prioritizing overburdened communities.
- Policy 7.3.2 Remove strikeout error on original text:
General Commercial: This designation is applied to areas outside of the downtown area and urban villages where retailing, commercial, and office uses serving a larger market are promoted. While the uses accommodate automobiles to a greater degree, buildings with a street orientation, screened parking, and ample landscaping ensure more attractive commercial areas. Primary uses include retail businesses, automotive sales, professional offices, medical services and clinics, hotels, theaters, restaurants, personal service shops. Secondary uses include convenience stores, utilities subject to compatibility criteria, and light manufacturing, assembling, and repairing where accessory to retail uses. General commercial uses may occur in different forms to encourage specific uses. For example, retail or commercial uses near large employment centers may be limited to commercial uses to support workers. Limited multi Multi-family residential uses may be incorporated (e.g. on second floors above retail) where it can be integrated into the proposed development and is compatible with the surrounding neighborhood. Existing general commercial areas will be encouraged to incorporate pedestrian-oriented elements and positive design features such as additional landscaping, reduced front setbacks, screened parking, and pedestrian scale street fronts, lighting and signage. New development in general commercial areas will require design review to ensure these goals are met. Areas with this designation should provide an appropriate mix and a balance in the accommodation of facilities for all transportation modes including transit, bicycle and pedestrian modes pedestrians is achieved.

7. Housing Element

Policy 2.5:

Plan for an adequate supply of land ~~in appropriate land use designations and zoning categories~~ to accommodate projected ~~housing needs for all income bands household growth.~~

Policy 2.5.14:

~~Implement, where feasible, the strategies in the 2021 Sumner-Bonney Lake Housing Action Plan or as amended in the future.~~

Policy 2.6:

~~Collaborate with other Pierce County jurisdictions on housing affordability through the South Sound Housing Affordability Partnership (SSHA³P) or similar housing agencies.~~

Policy 6.2

~~Consistent with state and federal law, consider supporting tenant protections such as tenant relocation assistance, just cause eviction protections, and notice of intent to sell, consistent with State law.~~

8. Environment Element

Policy 9.2.2:

~~Require street trees and on-site landscaping in all new developments as appropriate to the development.~~

CA – CONSENT AGENDA	ES – EXECUTIVE SESSION	NB – NEW BUSINESS
UB – UNFINISHED BUSINESS	P – PRESENTATION	PH – PUBLIC HEARING PR – PROCLAMATION

12/10 EE Breakfast

NOVEMBER 18 (RCM)

P Councilmember Swearing In
PH Budget
CA West Valley Highway Sidewalks - Design Consultant Agreement
CA South Tank Re-painting Construction Contract Award
CA Resolution XXXX – Parklet Policy
NB 2025 Legislative Priorities
NB Ordinance No. XXXX - Utility Rates
NB Ordinance No. XXXX – Utility Code Billing Updates
NB Ordinance No. XXXX – Multifamily Residential Infill (HB 1042)
NB Ordinance No. XXXX – Permit Review and Timeline (HB 1293 & 5290)
NB Ordinance No. XXXX - Zoning Code Amendment for Group Homes

NOVEMBER 18 (SSS @ 6:15PM)

- Budget Wrap-up
- Final Budget Amendment

NOVEMBER 25 (SS – CANCELLED)**DECEMBER 2 (RCM)**

PH Budget (Final)
PH Comp Plan
PH Final Budget Amendment
PH Library Development Agreement
NB Ordinance No. XXXX - Traffic Impact Fees
NB Ordinance No. XXXX - Park Impact Fees

DECEMBER 9 (SCM)

NB Operations Facility Contract
UB Budget Adoption
UB Final Budget Amendment
UB Library Development Agreement
CA White River Restoration Project Plant Procurement Contract Award

DECEMBER 9 (SS @ 6:10PM)

- Comp Plan Review Questions/Wrap Up

CITY COUNCIL AGENDA CALENDAR**Updated November 4, 2024**

CA – CONSENT AGENDA	ES – EXECUTIVE SESSION	NB – NEW BUSINESS
UB – UNFINISHED BUSINESS	P – PRESENTATION	PH – PUBLIC HEARING
		PR – PROCLAMATION

DECEMBER 16 (RCM)**JANUARY 6, 2025 (RCM)**

UB Comp Plan Adoption

CA Resolution No. XXXX – Setting Hearing Date for MFTE Area

JANUARY 13, 2025 (SS)

- Pierce Transit Long Range Plan Presentation
- Ordinance No. XXXX – Zoning Code Amendment – BESS
- 2025 Comprehensive Plan Update

JANUARY 21, 2025 (Tuesday) (RCM)

PH Resolution No. XXXX - MFTE Area

January 27, 2025 SS

- Transportation Benefit District

Pending

MISC.	MISC.	MISC.
Short Term Rentals	Ordinance – Refuse Collection (Code Enforcement)	Resolution No. 1673 - Commerce Grant Acceptance Cemetery Facility
CA State Homeland Security Program Grant Acceptance for Small Unmanned Aerial System	Public Memorial Policy	Water Cross Connection Control Code Update
Ordinance Insurance Requirements	Heritage Park Right of Way Vacation	Ordinance No. XXXX – Water Service Code Amendment
Sign Code Update (off premise)	School Impact Fee Update	

NOVEMBER 2024

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2
4	5	6	7	8	9
6:00PM Regular Council Meeting (Hybrid) 6:15PM Special Study Session (Hybrid)	4:00PM Public Works Committee		6:00PM Planning Commission (Hybrid)		
11	12	13	14	15	16
<i>Holiday – City Hall Closed</i>	6:00PM Study Session (Hybrid)	6:00PM Design Commission (Hybrid)	4:00PM Finance Committee (Hybrid) 4:30PM Forestry/Parks Commission (Hybrid)		
18	19	20	21	22	23
6:00PM Regular Council Meeting (Hybrid) 6:15PM Special Study Session (Hybrid)		4:00PM Public Safety (Hybrid)			
25	26	27	28	29	30
6:00PM CANCELLED Study Session		5:00PM CD Committee (Hybrid)	<i>Holiday – City Hall Closed</i> 6:00PM - CANCELLED Cultural Arts Commission		

Meeting dates and times may change. Please contact City Hall to confirm this information prior to any meeting you plan to attend. **These meetings are accessible to persons with disabilities.** For individuals who require special accommodations, please contact City Hall at (253) 299-5500, 24 hours in advance.

Name: Michelle Converse, CMC

Title: City Clerk

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