City of Battle Ground
Transportation System Plan Update
Draft Final Report

Prepared for

City of Battle Ground, Washington

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LIST OF ACRONYMS

AASHTO – American Association of State Highway and Transportation Officials
ADA – Americans with Disabilities Act
ADT – Average Daily Traffic
CTR – Commute Trip Reduction
DAR – Dial-a-Ride
FAA – Federal Aviation Administration
FHWA – Federal Highway Administration
FTA – Federal Transit Administration
FY – Fiscal Year
GMA – Growth Management Act of 1990
HAC – High Accident Corridor
HAL – High Accident Location
HCM – Highway Capacity Manual
ITS – Intelligent Transportation Systems
LID – Local Improvement District
LOS – Level of Service
MEV – Million Entering Vehicles
MP – Milepost
MPO – Metropolitan Planning Organization
MTP – Metropolitan Transportation Plan
NEPA – National Environmental Policy Act
NHS – National Highway System
PDO – Property Damage Only
PCI – Pavement Condition Index
ROW – Right-of-Way
SHSP – State Highway System Plan
STF – Special Transportation Fund
STIP – Statewide Transportation Improvement Program
STP – Surface Transportation Program (federal)
SWRTC – Southwest Washington Regional Transportation Council
TAZ – Traffic Analysis Zone
TDM – Transportation Demand Management
TDP – Transit Development Plan
TIF – Traffic Impact Fee
TIP – Transportation Improvement Program
TSM – Transportation Systems Management
TSP – Transportation System Plan
UGA – Urban Growth Area
V/C – Volume-to-Capacity Ratio
VMT – Vehicle Miles Traveled
WAC – Washington Administrative Code
WSDOT – Washington State Department of Transportation
WTP – Washington Transportation Plan

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1. INTRODUCTION AND SUMMARY

1.1 INTRODUCTION

The *Battle Ground Transportation System Plan* (TSP) establishes the city's goals, policies and action strategies for developing the transportation system within the Battle Ground Urban Growth Area (UGA). The TSP is intended to serve as a blueprint or master plan to guide transportation decisions to address both short and long term needs. The TSP discusses roadway mobility and accessibility needs, identifies improvements to enhance safety, non-motorized travel (bicycles and pedestrians), and public transit, and addresses the impacts of future land development activity.

In 1995, the City adopted its first *Comprehensive Plan* under the Washington State Growth Management Act (GMA), including a *Transportation System Plan.* In 1999, the Battle Ground City Council began the first update to this Plan to reflect the rapid growth and changing circumstances now faced by the city. In the summer of 2000, a Community Visioning process began to guide development of this plan update. Out of the visioning process, the city adopted Guiding Principles, Vision Concepts and a Vision Map that form the policy foundation for both the *Comprehensive Land Use Plan* update and the *Transportation System Plan* update.

One of the Guiding Principles in the Battle Ground Community Vision for the future is that "*transportation investments should make auto travel one option among many. Future growth should occur primarily to the west and south, and will occur in all directions consistent with the 50-Year Vision. A downtown Core should be identified maintained and strengthened.*"

The *Battle Ground Comprehensive Land Use and Transportation Plan (Plan)* establishes a flexible policy framework for making decisions consistent with this vision, and describes a strategy for accomplishing the vision over a 20-year period. The Plan will be implemented through the Land Development Code and other regulations. The Plan also articulates community priorities for where the City will need to spend money on capital facilities and transportation improvements, and how such improvements could be financed in the future. A strategic action plan is a companion piece to the Plan. The action plan provides a road map on how to implement the Plan and tracks how implementation is proceeding.

Although integrated and coordinated, each element of the Plan establishes policies on a specific aspect of life in Battle Ground. The Transportation Element establishes a *Transportation System Plan (TSP)* for the City, which ensures that the transportation system is safe, efficient, balanced, environmentally sustainable, and improves livability. The GMA requires that the transportation element be consistent with county-wide policies, be based on the land use plan, include an estimate of traffic impacts on state-owned facilities, provide an inventory of existing transportation services and provide a financing plan for new improvements, among other requirements.

The TSP development process consisted of six main steps:

- Setting overarching goals and objectives,
- Analyzing existing conditions,
- Assessing future needs,
- Evaluating future alternatives,
- Creating a Draft TSP document and code revisions, and
- Finalizing the TSP.

The *Battle Ground Transportation System Plan* must reflect the transportation system that best serves the needs of residents and other users of the transportation system within the city and its surrounding urban, but unincorporated, area. The plan must also provide a range of transportation options, and allow for the balancing of state and local transportation objectives. To do so, this plan must:

- Identify and support the values of the City regarding transportation and land use;
- Incorporate local citizen participation in the transportation planning process;
- Ensure consistency with the *Clark County Transportation Plan* and the *Metropolitan Transportation Plan*, and be coordinated with federal, state and local agencies, as well as local transportation service providers; and
- Provide a framework for transportation-related decisions.

1.2 GOALS, OBJECTIVES AND ACTION STRATEGIES

As noted in the Introduction, the *Battle Ground Transportation System Plan* must identify and support the values of the City regarding transportation and land use. The *Battle Ground Comprehensive Land Use Plan*, a plan prepared with substantial public and stakeholder involvement, served as the foundation for the *Transportation System Plan* with regard to land use and community development expectations.

At the outset of the plan development process, community visioning provided an initial indication of community desires with respect to the transportation system. These desires were reviewed with the Planning Commission and City Council, and a list of overall principles to guide development of the transportation system plan was developed. These guiding principles were then incorporated into a draft set of overarching goals and objectives for the *Battle Ground Transportation System Plan*, and were subsequently reviewed and approved by the Planning Commission and the City Council. These overarching goals and the objectives for achieving them are listed below. These goals and objectives were used to guide development of the key recommendations and policy directives established for each travel mode in the TSP. Specific policies and recommendations to implement these goals and objectives are presented in the chapters for each mode.

The overarching goals and objectives for the *Battle Ground Transportation System Plan* are provided below. Goals are numbered and the supporting objectives are listed below each goal. Modal chapters include specific action strategies designed to more fully explain and/or implement the goals and objectives.

Transportation Goal 1- The City will encourage the construction of a transportation system that enhances the City's livability

Transportation Objective (TO) 1.1. <u>The City will use transportation improvements to help implement the Comprehensive Land Use Plan</u>

- ***Transportation Action (TA) 1.1.1.*** *As part of development review, the City will determine how to best integrate land uses with transportation improvements, including what land uses fit best next to arterial roads.*

TO 1.2. <u>The City will work to preserve the gateways identified in the 50-year Vision through transportation improvements</u>

- ***TA 1.2.1.*** *When possible, the City will acquire sufficient right-of-way in gateway areas specified in the City's 50-year Vision to protect the resources that make the gateways special.*

- *TA 1.2.2. The City will work with the County's transportation department and the Washington Department of Transportation to establish right-of-way and acess standards for the gateway areas.*

TO 1.3. The City will consider a system of arterials and collectors that provides both transportation and open space

- *TA 1.3.1. The City will identify and prioritize streets for urban upgrades and streetscape enhancements.*
- *TA 1.3.2. New streets will be built to standards that incorporate urban street elements and streetscape enhancements.*

TO 1.4. The City will strive to build a transportation system that supports the City's livability objectives (found in the Livability Element)

- *TA 1.4.1. The City will periodically review and amend, as appropriate, its transportation standards where changes are required to help implement the City's Livability objectives.*
- *TA 1.4.2. The City will work with the Washington Department of Transportation to improve the character of SR 502 and SR 503 in a manner consistent with the City's 50-year Vision.*

TO 1.5. Where possible, the City will build a transportation system that will also provide recreation opportunities for the residents of Battle Ground

- *TA 1.5.1. The City will identify transportation improvements that are also recreation opportunities and coordinate these with parks and recreation improvements.*

TO 1.6. The City will strive to create a transportation system that includes right-of-way areas as public gathering spaces

- *TA 1.6.1. The City will review and amend, as appropriate, its land development and construction standards to capitalize on opportunities to include public spaces in the right-of-way.*

Transportation Goal 2- A transportation system that is safe

TO 2.1. The City will work to enhance the safety of the pedestrian system

- *TA 2.1.1. The City will prioritize pedestrian improvements consistent with an emphasis on enhancing safe access to schools and other community activity centers.*
- *TA 2.1.2. Consistent with the City's street standards, all roadway improvement projects will provide for safe pedestrian access.*
- *TA 2.1.3. On new street construction or reconstruction of existing streets, the City will ensure that sidewalk surfaces and geometrics are suitable for travelers with disabilities (especially those in wheelchairs).*
- *TA 2.1.4. The City will ensure that pedestrian facilities are adequately maintained.*

TO 2.2. The City will work to enhance the safety of the bicycle system

- *TA 2.2.1. The City will prioritize bicycle improvements consistent with an emphasis on enhancing safe access to schools and other community activity centers.*
- *TA 2.2.2. Consistent with the City's street standards, all roadway improvement projects will provide for safe bicycle circulation.*
- *TA 2.2.3. The City will ensure that bicycle facilities are adequately maintained.*

TO 2.3. The City will work to enhance the safety of the motor vehicle system

- ***TA 2.3.1.*** *The City will develop programs to moderate motor vehicle speeds, where appropriate and through a variety of means including traffic calming, roadway design, education, and enforcement.*
- ***TA 2.3.2.*** *The City will establish design guidelines for traffic circles and roundabouts, and use these techniques to improve safety throughout the City.*
- ***TA 2.3.3.*** *The City will identify and implement access management improvements necessary to improve safety.*
- ***TA 2.3.4.*** *The City will identify and implement solutions for intersections and corridors where lighting does not meet standards for auto, pedestrian or bicycle safety.*
- ***TA 2.3.5.*** *The City will work with the Washington Department of Transportation to evaluate the speeds and other safety issues on SR 502 and SR 503.*

TO2.4. The City will pursue federal and state grants to improve existing rail crossings

TO2.5. The City will provide for regular and ongoing inspection, maintenance and repair of streets at existing at-grade rail crossings

- ***TA 2.5.1.*** *The City will implement improvements to at-grade railroad crossings on E. Main Street and Fairgrounds Road as identified in the Transportation System Plan.*

TO2.6. The City will avoid or minimize the number of new at-grade railroad crossings created by new roads crossing existing rail lines.

Transportation Goal 3- A transportation system with a variety of transportation options (EDA1.1.3, EA8.1.1)

TO 3.1. The City will strive to provide increasing amounts of transit service

- ***TA 3.1.1.*** *The City will work directly with C-TRAN to determine appropriate routes and levels of service and encourage the implementation of new service as necessary.*
- ***TA 3.1.2.*** *The City will establish guidelines for pedestrian access to transit to improve safety and encourage the use of transit.*
- ***TA 3.1.3.*** *The City will investigate the creation of a trolley system to provide a transportation option for people traveling around town.*
- ***TA 3.1.4.*** *The City will investigate providing park and ride lots to help increase transit ridership and take the appropriate action.*

TO 3.2. The City will work to provide a complete pedestrian network

- ***TA 3.2.1.*** *The City will implement pedestrian system improvements as identified in the Transportation System Plan.*

TO 3.3. The City will work to provide a complete bicycle network

- ***TA 3.3.1.*** *The City will implement bicycle system improvements as identified in the Transportation System Plan.*
- ***TA 3.3.2.*** *The City will work with the County to plan for bicycle routes that provide connections between Battle Ground and other parts of the County.*
- ***TA 3.3.3.*** *The City will strive to encourage provision of bicycle amenities in conjunction with land development projects.*

TO 3.4. The City will strive to develop a transportation demand management program to reduce the number of single occupancy vehicles

- ***TA 3.4.1.*** *The City will work with C-TRAN and other agencies and organization to promote carpooling.*
- ***TA 3.4.2.*** *The City will update the Development Code to require trip reduction efforts where appropriate.*

TO 3.5. The City will seek alternative means of meeting travel demand

- ***TA 3.5.1.*** *The City will cooperate with C-TRAN and other agencies and jurisdictions to develop a commuter rail line to Central and North Clark County.*
- ***TA 3.5.2.*** *The City will continue its participation in the Bi-State Transportation Task Force to explore multi-modal options for improvement in the I-5 and I-205 corridors.*
- ***TA 3.5.3.*** *The City will strive to provide a communication system that allows efficient telecommuting.*
- ***TA 3.5.4.*** *The City will work with other agencies and jurisdictions to develop strategies to decrease the number of single occupancy commute trips.*
- ***TA 3.5.5.*** *The City will work with equestrian groups to determine equestrian needs and methods to meet those needs.*
- ***TA 3.5.6.*** *The City will identify and plan for commercial pipeline needs.*

Transportation Goal 4- A transportation system that provides for the efficient movement of goods and services

TO 4.1. The City will work to improve the freeway access to the City

- ***TA 4.1.1.*** *The City will work with the Washington Department of Transportation and other jurisdictions to establish a freeway interchange at NE 219th Street.*

TO 4.2. The City will work to provide access to industrial employment and commercial centers in the City

- ***TA 4.2.1.*** *The City will identify priority access routes for industrial and employment areas and establish standards to protect the capacity of these routes while respecting critical areas.*
- ***TA 4.2.2.*** *The City will evaluate transportation needs in economic sub-areas of the City including East Main and the designated Regional Center and determine the improvements require to enhance economic development opportunities in these areas.*

TO 4.3. The City will work to balance parking and loading needs with other City goals

- ***TA 4.3.1.*** *The City will develop a parking plan for the commercial areas of town, starting with the East Main Street area.*

TO 4.4. The City will work with property owners surrounding the Cedars North Airpark and with the appropriate state and federal agencies to develop a plan for the airstrip area

- ***TA 4.4.1.*** *The City will establish criteria for locating compatible land uses and property adjacent to the Cedars North Airpark.*

TO 4.5. The City will work to implement the transportation system improvement identified in the Transportation System Plan (TSP)

- ***TA 4.5.1.*** *The City will prepare, update on a regular basis and implement its 6-Year Capital Improvement Program consistent with the TSP.*

Transportation Goal 5- A transportation system that balances accessibility and mobility

TO 5.1. The City will work to reduce the negative impacts of transportation improvements on the community

- ***TA 5.1.1.*** *The City will build roads to a maximum of five lanes.*
- ***TA 5.1.2.*** *The City will strive to make more efficient use of the existing transportation system through better access management, signaling timing, and other appropriate strategies.*
- ***TA 5.1.3.*** *The City will balance new road improvements with other City goals, including environmental and livability goals.*

TO 5.2. The City will strive to improve circulation throughout the City to reduce reliance on the major city streets

- ***TA 5.2.1.*** *The City will work closely with the Washington Department of Transportation to provide access across State Routes 502 and 503 to support the City's street grid system, signal modifications, appropriate speed zoning and corridor preservation.*
- ***TA 5.2.2.*** *The City will develop standards for frontage and backage roads to reduce traffic on major city streets and/or state highways.*
- ***TA 5.2.3.*** *The City will focus on creating a grid street system and strictly limit the use of cul-de-sacs.*

TO 5.3. The City will strive to give access priority to schools and other civic uses

- ***TA 5.3.1.*** *The City will work with the school district to develop an access management plan.*

TO 5.4. The City will work to improve access management along major city streets to improve mobility

- ***TA 5.4.1.*** *The City will refine its street standards to identify an access management strategy and to prioritize where and when access improvements should be made.*

TO 5.5. The City will work to protect future transportation routes

- ***TA 5.5.1.*** *The City will refine mapping of future transportation routes and determine the right-of-way needed to meet future travel demand.*
- ***TA 5.5.2.*** *The City will work with the County and other agencies to preserve future right-of-way as needed, and ensure consistency of planned improvements across jurisdictional boundaries.*

TO 5.6. The City will strive to minimize travel time between Battle Ground and the I-5 freeway

- ***TA 5.6.1.*** *The City will work with the County and the Washington Department of Transportation to maintain good access control along the roads connecting Battle Ground to I-5 to enhance the movement of through traffic.*

TO 5.7. The City will work to decrease intersection conflicts that increase travel time and prohibit accessibility

- ***TA 5.7.1.*** *The City will investigate the use of modern roundabouts as a method to improve intersections without additional traffic signals.*

TO 5.8. The City will seek to balance motor vehicle mobility with pedestrian, bicycle and transit accessibility

- ***TA 5.8.1.*** *The City will seek ways to improve bicycling and pedestrian accessibility and allocate appropriate funding to these improvements.*

- *TA 5.8.2. The City will seek ways to improve both transit accessibility and mobility through improvements and a partnership with C-TRAN.*

Transportation Goal 6-A transportation system that is affordable and durable

TO 6.1. The City will work to improve the durability of transportation improvements

- *TA 6.1.1. The City will examine its construction standards for transportation improvements and weigh current and future costs, safety and other factors to determine if the appropriate standards are being used.*
- *TA 6.1.2. The City will update its construction standards as new technologies improve.*
- *TA 6.1.3. The City will review its maintenance program and determine if changes need to be made to maintain the longevity of the transportation system.*

TO 6.2. The City will work to identify multiple funding sources for new projects and maintenance

- *TA 6.2.1. The City will coordinate with the state and federal government and other organizations to improve funding choices.*
- *TA 6.2.2. The City will continue to seek grants and other outside funds to match local funds.*
- *TA 6.2.3. The City will work with the State of Washington to establish a statewide street utility fee to provide additional resources for on-going roadway maintenance.*
- *TA6.2.4. The City will revise its Transportation Impact Fee ordinance and list of TIF-eligible projects consistent with the improvement recommendations of the Transportation System Plan.*

TO 6.3. The City will strive to provide an equitable balance of funding for transportation improvements

- *TA 6.3.1. The City will conduct a review of transportation spending to determine whether there is a connection between patterns of use and the source of funding, and update local funding programs as appropriate.*
- *TA 6.3.2. The City will seek out opportunities for public/private partnerships for funding transportation improvements.*
- *TA 6.3.3. The City will explore whether additional transit funding is appropriate and continue to evaluate the service provided by C-TRAN.*

Transportation Goal 7-The concurrent provision of transportation facilities

TO 7.1. The City will strive to establish a transportation concurrency system that is equitable and maintains the City's ability to grow

- *TA 7.1.1. The City will review the work done by the City of Vancouver and Clark County before establishing its new transportation concurrency system.*
- *TA 7.1.2. The City will work with a wide variety of stakeholders when establishing a transportation concurrency system.*
- *TA 7.1.3. The City will investigate the feasibility of including other travel modes in the concurrency system and develop the most appropriate system for Battle Ground.*

Transportation Goal 8- A sustainable transportation system to minimize adverse environmental impacts and encourage environmentally appropriate design and practices

TO 8.1. The City will strive to reduce the impacts of the transportation system on water quality and quantity

- *TA 8.1.1. The City will investigate alternative transportation design options that reduce stormwater runoff.*

- ***TA 8.1.2.*** *The City will work with state and federal agencies to determine how to reduce transportation impacts to water quality.*
- ***TA 8.1.3.*** *The City will make changes to the construction standards, Land Development Code, and maintenance practices as necessary to reduce impacts to water quality.*

TO 8.2. The City will strive to reduce the impacts of the transportation system on wildlife and aquatic habitat

- ***TA 8.2.1.*** *The City will work with state and federal agencies to determine how to reduce transportation impacts to wildlife and aquatic habitat.*
- ***TA 8.2.2.*** *The City will make changes to the construction standards, Land Development Code, and maintenance practices as necessary to reduce impacts to wildlife and aquatic habitat.*

TO 8.3. The City will strive to reduce air quality impacts caused by the transportation system

- ***TA 8.3.1.*** *In conjunction with RTC, the City will evaluate air quality impacts as part of its long-range transportation planning process.*

TO 8.4. The City will strive to reduce the energy consumed in the transportation system

- ***TA 8.4.1.*** *The City will focus on reducing the portion of single occupancy vehicles by offering a range of transportation choices.*

TO 8.5. The City will strive to reduce noise impacts caused by the transportation system

- ***TA 8.5.1.*** *The City will utilize natural features and land use transitions to minimize noise impacts and avoid the use of sound walls.*

1.3 TSP ELEMENTS

The *Battle Ground TSP* addresses all travel modes currently available to move people and goods within or through the Battle Ground Urban Growth Area. The transportation modes examined in this document include:

- Motor vehicles (including autos and trucks)
- Public transportation (including public transit, school buses, emergency vehicles, intercity bus, passenger rail and travel demand management strategies)
- Non-motorized transportation (including walking and bicycling), and
- Air transportation.

The TSP is organized into eight chapters beginning with this Introduction. Other chapters include the following:

- Existing conditions,
- Community growth and future transportation system demand,
- Street plan including freight mobility,
- Public transit plan including transportation demand management,
- Non-motorized transportation plan,
- Rail plan,
- Air transportation plan, and
- Plan implementation and funding.

Information presented and the key issues discussed in each chapter is summarized in the following paragraphs.

1.3.1 Existing Conditions

The TSP begins with a synopsis of recent plans, studies and policy guidelines that are relevant to the development of a transportation plan for the urban area. This review is intended to ensure that the City's TSP reflects and is consistent with state transportation planning policies and standards, and is coordinated with the plans of other local jurisdictions (e.g., Clark County and the Southwest Washington Regional Transportation Council or RTC). Transportation planning requirements as articulated by the State of Washington's Growth Management Act (GMA) and other statewide transportation planning documents and programs are first summarized, followed by an overview of existing transportation plans and policies from the City and other local agencies.

This chapter also includes an inventory and evaluation of existing transportation conditions to identify opportunities and constraints, and to provide the basis for developing short-range improvement recommendations. Inventory information was obtained from street, road and highway data maintained by the City, the Clark County Public Works Department and WSDOT, transit information from C-TRAN, the Battle Ground School District, emergency providers and intercity transit service providers; and other information from various service providers and facility managers.

The transportation system inventory includes:

- Existing street characteristics including physical features, traffic control, current traffic operations and safety with primary emphasis on the arterial and collector street systems,
- Freight transportation systems for a focus primarily on trucking and rail,
- Public transit including local, intercity and dial-a-ride bus service, passenger rail, and school bus and emergency vehicle routes,
- Transportation demand management.
- Pedestrian and bicycle systems, and
- Air transportation.

1.3.2 Future Transportation System Demand

This chapter describes the development of future traffic forecasts on the road and street system in the Battle Ground UGA. These forecasts are based on projections of future population and socio-economic growth within the UGA, consistent with both the allocations provided for in the County's Comprehensive Plan and the inventory of vacant, developable land identified during the city's critical land study and used in development of the *Comprehensive Land Use Plan.*

Included in the chapter is a summary of recent population and employment growth, a discussion of key land use and environmental issues that affect development of the city's transportation system and future demand for transportation services, future population and employment growth expectations to the planning horizon year of 2023, and a summary of the methodology used to prepare future estimates of traffic volumes along the major roadways in the rural portion of the county.

1.3.3 Street Plan

This chapter presents a discussion of existing and anticipated future (2023) roadway system needs and deficiencies, and highlights the development and evaluation of potential improvements. The policy

context of street plan is presented first, followed by the results of projected future travel demand analysis including identification of improvement needs, a discussion of improvement strategies and alternatives, and ending with a street system action plan. The action plan includes general policy guidance for street system improvement and management, along with specific policy or improvement recommendations.

1.3.4 Freight Mobility Plan

This chapter includes a discussion of freight mobility issues focusing primarily on truck access and circulation routes. This chapter also describes the existing rail system in the Battle Ground UGA and addresses issues with respect to freight rail service, and improvement needs at existing at-grade railroad crossing locations.

1.3.5 Public Transit / Transportation Demand Management Plan

This chapter presents a review of needs, deficiencies, policies and recommended actions affecting the provision of public transportation services in the Battle Ground UGA. Included is a discussion of the local and state policy context for developing and enhancing this travel mode, evaluating the existing public transportation system, and making recommendations for supporting the future provision of this service in the UGA. C-TRAN currently provides public transportation services in the UGA.

This chapter also includes a discussion of intercity bus service and passenger rail opportunities, travel demand management needs and strategies, summarizes existing school bus routes and school bus circulation issues, and identifies primary emergency vehicle routes. Transportation Demand Management (TDM) is a term used to describe a broad array of strategies, programs and technologies used to more effectively manage existing transportation resources and to potentially postpone or eliminate the need for major capacity-enhancing investments. TDM strategies and programs are aimed at reducing travel by single-occupant vehicle during peak travel periods, thus reducing the need for additional roadway capacity. TDM strategies include transit passes or other measures to increase transit use, carpools, vanpools, flexible work hours, a compressed workweek, telecommuting, videoconferencing, and other similar measures. The range of TDM strategies that may be applicable in the Battle Ground UGA are presented and discussed.

1.3.6 Non-Motorized Transportation Plan

This chapter documents the review and assessment of needs, deficiencies, policies and improvement options affecting the bicycle and pedestrian transportation systems in the Battle Ground UGA. In the urban area bicyclists are often served through the provision of bicycle lanes on city streets or trails that may be located adjacent to streets or roads. Pedestrians are typically served by sidewalks and crosswalks. In the more-typically rural portion of the UGA, bicyclists and pedestrians generally share the same facilities. Unlike urbanized areas, rural facilities for non-motorized travel usually consist of wide shoulders and/or trails.

This chapter includes an evaluation of needs and deficiencies in the existing systems, a discussion of improvement strategies for enhancing and expanding these systems, and an action plan for improvement. The action plan includes policy guidance along with specific project recommendations.

1.3.7 Air Transportation Plan

This chapter discusses the transportation system needs, policies and other issues related to the one public access airport in the Battle Ground UGA – Cedars Airpark. This small, privately-owned airport is located

southeast of the current city limits. Existing facilities, patterns of airport use, and potential land use issues in the vicinity of this airport are discussed.

1.3.8 Plan Implementation and Funding

The last chapter of the TSP addresses those issues which are most pertinent to the long-term implementation of the policies and improvement recommendations contained in the document. This chapter begins with an overview of the policy guidance provided by the TSP in the form of goals and objectives. These goals and objectives are fleshed out by the policy and project improvement recommendations that follow. This chapter includes a discussion of transportation cost and revenue forecasts and identifies a significant revenue shortfall. This shortfall will require additional financial resources to implement any projects except for the most minimal (and inadequate) level of roadway maintenance. The chapter identifies and provides estimates of future revenue potential from a variety of additional transportation system funding sources. The chapter also includes a specific project list categorized into short-, medium-, and long-term timeframes, and concludes with a summary of the ordinances needed to implement the recommendations of the TSP. The funding and implementation plan included in this chapter provides a blueprint that makes it possible for the TSP's recommendations to become a reality.

2. EXISTING CONDITIONS

An inventory and evaluation of the existing transportation system within the Battle Ground Urban Growth Area (UGA) was conducted to identify opportunities and constraints, and to provide the basis for developing short-range improvement recommendations, as well as building the foundation for the longer-range transportation system plans for each travel mode. The UGA includes both the area within the Battle Ground city limits, as well as the surrounding unincorporated area that is anticipated to develop with urban land uses over the next 20 years.

This inventory begins with a synopsis of recent plans, studies and policy guidelines that are relevant to the development of a transportation plan for the urban area. This review is intended to ensure that the City's TSP reflects and is consistent with state transportation planning policies and standards, and is coordinated with the plans of other local jurisdictions (e.g., Clark County and the Southwest Washington Regional Transportation Council or RTC). Transportation planning requirements as articulated by the State of Washington's Growth Management Act (GMA) and other statewide transportation planning documents and programs are first summarized, followed by an overview of existing transportation plans and policies from the City and other local agencies.

The physical and operational inventory of the City's transportation system was based on street, road and highway data maintained by the City, the Clark County Public Works Department and WSDOT; transit information from C-TRAN, the Battle Ground School District, emergency providers and intercity transit service providers; and other information from various service providers and facility managers.

The inventory and analysis of existing transportation system conditions includes:

- A discussion of previous transportation studies with relevance to or bearing upon the Battle Ground urban area transportation system
- Existing street characteristics including physical features, traffic control, current traffic operations and safety with primary emphasis on the arterial and collector street systems,
- Freight transportation systems for a focus primarily on trucking and rail,
- Public transit including local, intercity and dial-a-ride bus service, passenger rail, and school bus and emergency vehicle routes,
- Transportation demand management.
- Pedestrian and bicycle systems, and
- Air transportation.

Although all transportation system modes are inventoried, the street inventory is the most data intensive. It includes detailed tables and GIS-based maps describing the physical features of the state highways, county roads and city streets. Among these features are: number of lanes; posted speeds; functional classification; facility and shoulder width; on-street parking; intersection traffic control; and pedestrian and bicycle facilities.

2.1 PREVIOUS TRANSPORTATION STUDIES

Over the past several years, a number of transportation studies have been conducted in or near the City of Battle Ground that have bearing on the development of the 2000 Transportation System Plan Update. These studies have identified both existing and likely future transportation system deficiencies and phased improvements to address these deficiencies. Some of these studies have also included policies to guide and/or prioritize the implementation of transportation system improvements. Recent relevant studies include:

- 1995 Transportation System Plan,
- I-5 North Strategic Corridor Study
- SR 503 Route Development Plan

Key findings, conclusions and recommendations for each of these studies are summarized in the paragraphs below.

2.1.1 1995 Transportation System Plan

In 1995, the City of Battle Ground adopted its first *Transportation System Plan* under the Washington State Growth Management Act. This plan set forth policy guidance for the City on future transportation improvements and formed the basis for the City's Capital Facilities Plan (CFP) and the Capital Improvement Program (CIP). The 1995 *Transportation System Plan* evaluated the existing transportation network in light of projected 2013 travel demand, and presented a multi-modal plan with a list of specific improvements. Recommendations for the street and roadway system included reclassifying several streets to reflect current or likely future functional use, implementing a frontage road system, installing new signals, widening several existing roads, extending others to new connections, and constructing new roadways. Six intersections were identified for potential signalization, including one at a modified intersection consolidating the intersection of E. Main Street with NE and SE Grace Avenues. A partial one-way neighborhood collector couplet was proposed along E. Main Street, running from N Parkway Avenue to NE Grace Avenue, and SW 7th Avenue to SE Grace Avenue. Also proposed was a frontage road along the east side of SR 503, beginning at SW 7th Avenue south of Main Street and extending to NE 199th Street.

Except for widening NE 199th Street to a three-lane section, all the recommended widening, street extensions and new street construction would occur as development proceeds over a 20-year period. No project prioritization was identified. Bicycle and pedestrian improvements recommended in the 1995 *Plan* included a multi-use trail along SR 503 and the local rail line, bicycle lanes on SR 502, Rasmussen Boulevard, NE 142nd Avenue/NE Heisson Road, and `Parkway Avenue, and designation of four local streets as bicycle routes. The plan did not include recommended development code changes or funding mechanisms.

2.1.2 I-5/I-205 North Strategic Corridor Study

The I-*5/I-205 North Corridor Study* analyzed transportation needs in the north Clark County area with a focus on I-5 and I-205. The study area extended from NE 83rd Street/Padden Parkway interchange with I-205 north to the La Center/I-5 interchange, and from Ridgefield on the west to Battle Ground on the east. The study examined short- and long-term transportation needs in the corridor, including mainline and interchange improvement needs. Additionally, the study concluded that WSDOT should move forward with Access Point Decision Reports for the proposed SR 502/NE 219th Street and NE 179th

Street interchanges with I-5 and for proposed interchange modifications at the NE 134th Street interchange.

A number of issues regarding improvements in this corridor were addressed along with transportation and land use planning activities of the jurisdictions involved and programming of funds. Population and employment growth, increasing traffic volumes on I-5 and interchanges, and trips passing through Clark County have resulted in the need for improvements to this corridor. Partners in the study included the Washington Department of Transportation (WSDOT), the Regional Transportation Council (RTC), Clark County, the cities of Vancouver, Battle Ground, Ridgefield, and La Center, C-TRAN, and the Port of Ridgefield. The study also provided a broad-based public outreach effort including several open houses, newsletters, and committees.

The I-5/I-205 North Corridor Study included the following elements:

- Analysis of transportation, land use, economic, and environmental impacts of transportation design alternatives
- Recommended short and 20-year-long term improvements for the corridor, including mainline and interchange improvements
- A recommendation to move forward with the Access Point Decision Reports for the proposed SR 502/NE 219th Street interchange and modifications to the NE 134th Street interchange
- A recommendation not to include a new interchange in the 20-year plan on I-205 between NE 134th Street and NE 83rd Street
- Recommended new crossings of I-5 to provide relief to interchanges as well as to improve local circulation across I-5
- A recommendation to relocate the Salmon Creek Park-and-Ride west of I-5
- Direction on improvements that may be needed after the 20-year outlook
- Preliminary design and a Route Development Plan for I-5 and associated interchange and crossing improvements
- Short- and long-term improvement plans for the corridor
- Development of project and funding outlooks to implement recommended improvements

A variety of transportation strategies and improvement alternatives were discussed and evaluated. These resulted in improvement and design recommendations at three interchanges (NE 83rd/Padden at I-205, I-5 at SR 501/NW Pioneer Street, and I-5 at NW La Center Road), and packages of design recommendations to forward to Access Point Decision Reports for three other interchanges (NE 134th Street, NE 179th Street, and proposed NE 219th Street/SR 502). Workshops were held to develop and evaluate design options at all of the interchanges and the I-5 and I-205 mainlines. Location options for the Salmon Creek Park-and-Ride, NE 179th Street Park-and-Ride, and a potential Park-and-Ride at the proposed NE 219th Street interchange were also discussed.

As a result of an interactive evaluation process with agency and committee members and public comments, a series of short- and long-term corridor improvement recommendations were developed and reviewed by the study advisory committees.

2.1.3 SR 503 Route Development Plan

As of the date of this report, the SW Region Transportation Issues Group (TIG) of WSDOT has completed its effort to evaluate and the determine the future traffic signal, channelization and access control needs on SR 503. These recommendations can be used as policy guidance for WSDOT staff reviewing private developer proposals, local agency projects, and designing transportation improvement projects along SR 503. The plan includes specific recommendations for existing intersections and outlines the general concepts of signal location, channelization, access control and driveway placement. A more thorough evaluation of future deficiencies to determine a comprehensive list of solutions could be achieved by completing a Route Development Plan for this corridor.

2.2 STREET SYSTEM

2.2.1 Roadway Classifications and Jurisdiction

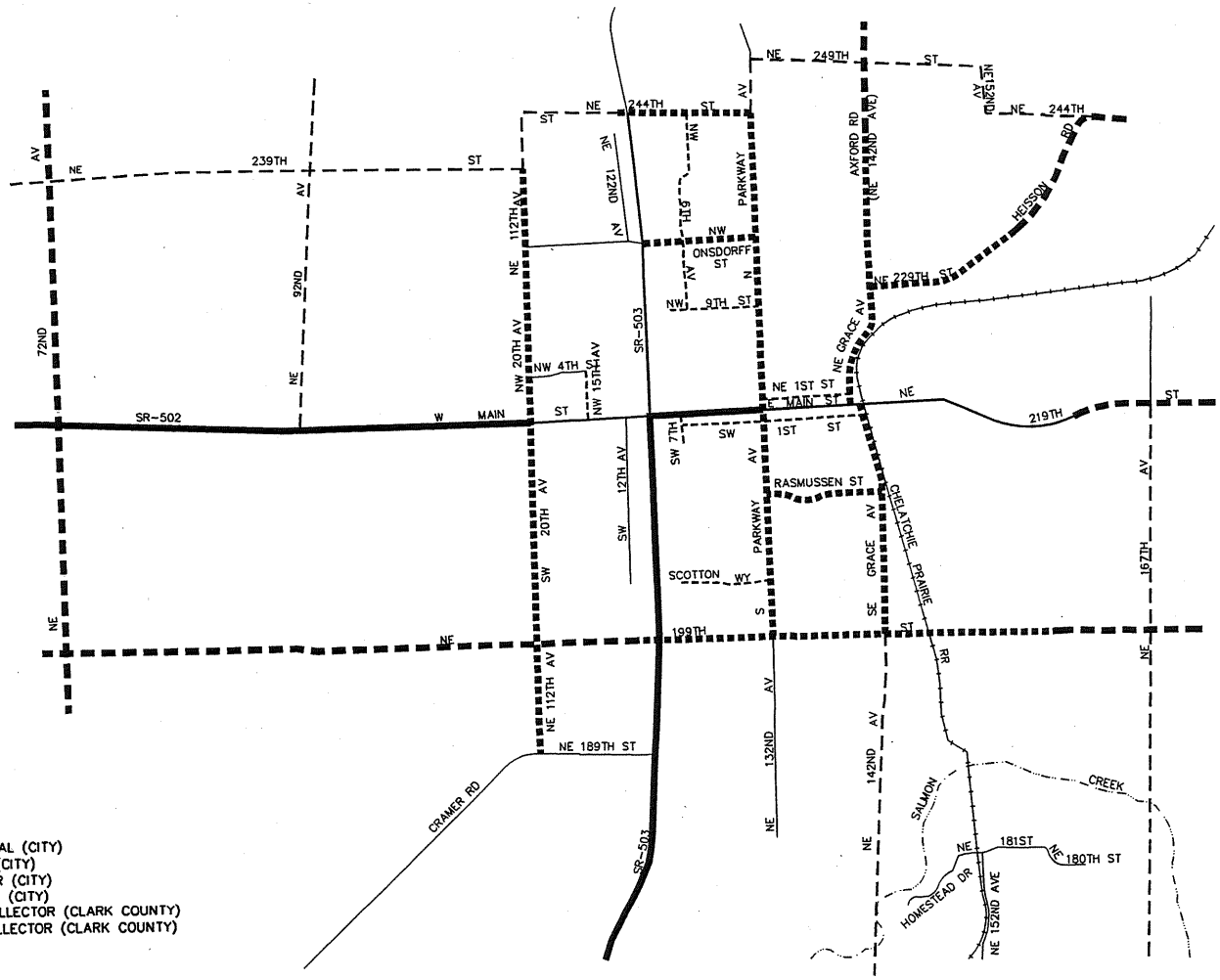
This section discusses the functional classification structure of the roadway system in the study area and identifies roadway jurisdictional responsibilities. Functional classification is a method of defining the types of trips that a given roadway is expected to accommodate in relation to the degree of property access that is also provided by that roadway. On the high end, the classification system includes roads whose primary purpose is to serve long-distance through trips where it is desirable to limit property access or intersecting streets to fewer locations, so as not to impede the higher-speed through-movement of vehicles. On the low end, the classification system includes roads whose purpose is to serve local trips on neighborhood streets where speeds and traffic volumes are typically low and property access is paramount.

Functional classification is used as a building block in planning future improvements to ensure that all types of trips are accommodated and that, through design, the proper balance is maintained between favoring through trips and providing access. The following paragraphs describe the functional classification system previously adopted by the City of Battle Ground and Clark County for key streets in the study area. Coordination between the designations of each jurisdiction is important to ensure that there is consistency in the types of traffic served by a given roadway where it crosses corporate boundaries. To that end, jurisdictional responsibilities for the key roads in the study area have also been identified.

2.2.1.1 *Functional Classification*

In general, roadways serve two functions, to provide mobility and to provide access, with the design of a roadway emphasizing one function over the other to various degrees. Higher speeds and fewer intersections are preferred for mobility, while lower speeds and more frequent intersections support access. Roadways are classified by agencies depending on what role the facility plays in the agencies' overall transportation system. Functional classifications typically include arterials, collectors, and local roadways. Arterials function to provide mobility, local roadways provide access, and collectors provide a combination of the two.

The primary streets in the study area are described below and illustrated in Figure 2-1. Each street has been given a relevant functional classification according to its intended function and role in the overall transportation system of the area. The City of Battle Ground and Clark County have adopted



KEY

N

NOT TO SCALE

Figure 2-1
Existing Functional Classification

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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classifications for the roadways under their jurisdiction. These classifications are typically similar to each other.[1] The Regional Transportation Council (RTC), the countywide agency responsible for regional transportation planning and funding, is responsible for interjurisdictional coordination of functional classification and for reporting a unified classification system to the Federal Highway Administration for funding purposes.[2] RTC only classifies roads considered to be of regional significance. Typically, these classifications are compatible with city and county classifications, although some differences in specific classifications or classification naming may occur.

Definitions of the functional classifications used in the Battle Ground study area are described below:

Principal Arterials carry traffic through an urban area and connect major elements of the area including central business districts, regional shopping centers and other major traffic generators. Principal arterials typically carry a high degree of through traffic on a minimum of roadway mileage. They frequently have some degree of access control, although direct access to major land use developments such as shopping centers may be allowed. Traffic signals are generally used for intersection traffic control, although the principal arterial segments of SR 502/W. Main Street include a number of unsignalized driveway accesses. Distances between parallel arterials may vary from less than one mile in highly developed areas to five miles or more in lightly developed rural areas.[3]

Minor Arterials carry traffic between principal arterials and lesser classified streets or directly to commercial and industrial areas, with direct access to land use development generally permitted. Traffic control is commonly a mix of signalized intersections and stop sign control used on intersecting streets of lesser classification. Minor arterials in urban areas are usually separated by less than two miles.

Major Collectors often balance land access and traffic circulation within residential neighborhoods and commercial and industrial areas. They typically form the link between the arterial street system and lesser-classified streets that provide primarily for property access and localized circulation. Major collectors may be used to handle through trips within small communities or between small communities in rural areas, but usually do not serve trips that link these communities to the regional transportation system. There is often a mix of signalized intersections and stop sign control used on intersecting streets.

Minor Collectors usually do not handle through trips and are often not continuous for any great length. Their function is to collect traffic from local streets or large parcels and funnel it to the major collector and/or arterial street system. Minor collectors are typically stop sign controlled at intersections, have lower speeds, and often provide a significant degree of property access.

Local Streets provide direct access to adjacent property and to higher classified facilities. They offer the lowest degree of mobility and usually have no bus routes. They are not intended to carry through traffic but make up a significant percentage of total roadway mileage within a community.

2.2.1.2 *Roadway Jurisdictional Responsibilities*

Many of the major roads in the study area are under the jurisdiction of agencies other than the City of Battle Ground. These agencies are responsible for the management, financing, improvement and

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[1] *City of Battle Ground Transportation Plan*, Kittelson and Associates, Inc., August 1994, and *Clark County Arterial Atlas*, Department of Community Development, January 1998

[2] *Metropolitan Transportation Plan for Clark County*, Southwest Washington Regional Transportation Council, October 1999.

[3] "Land Use and Arterial Spacing in Suburban Areas". Federal Highway Administration, 1977.

operation of roads that provide access to the City, connecting it to other locations in Clark County and to the regional transportation system. SR 502 and SR 503 are state highways under the jurisdiction of the Washington State Department of Transportation (WSDOT). SR 502 is a class 5 facility, which allows the City to control access onto this facility as opposed to SR 503 onto which access is controlled only by WSDOT. These highways serve the primary function of connecting Battle Ground to I-5 and to the Vancouver Urban Area. Connections to other destinations in northern Clark County are also provided by SR 503 to the north.

Key roads in the study area under the jurisdiction of Clark County include: NE 199th Street, NE 189th Street, NE 92nd Avenue, NE 112th Avenue, NE 132nd Avenue, NE 142nd Avenue and NE Heisson Road. Numerous other minor roads outside of the city limits, but within the Urban Growth Area (UGA), are also under the jurisdiction of Clark County. Coordination between the City of Battle Ground and Clark County is important to ensure consistency in the types and magnitude of traffic that will be traveling from city streets to county roads, and to coordinate improvements.

2.2.1.3 *Access Management Classification*

Passage of the "Highway Access Management" law by the Washington State Legislature in 1991 required WSDOT to develop access management rules to be included in the Washington Administrative Code. The rules established a process and associated fees for permitting access onto state highways from private property, and identified a set of five highway access classifications for non-limited access highways. In all cases, if reasonable access is available from the general street system, then primary property access should be provided from the general street system rather than from the state highway system.

Segments of all state highways have designated access management classifications. The classifications reflect different highway environments, and consider such factors as traffic volume, speed limit, adjacent land use, functional classification, existing access density and accident history. The access management classifications establish the desired attributes for each state highway including function, operating and design characteristics, and preferred intersection spacing.[4] The specific classifications for SR 502 and SR 503 in the Battle Ground study area are listed in Table 2-1.

As noted in the table, the segment of SR 502 west of Battle Ground and the segment of SR 503 in the southern part of Battle Ground have a Class 3 designation. This classification restricts access to intersecting streets to one per 1/2 mile, and parcel access is limited to one per parcel every 330 feet. The segment of SR 502 within Battle Ground is a Class 5 facility with intersection spacing restricted to one per 1/4 mile. Parcel access is limited to one per parcel every 125 feet. Portions of SR 502 and SR 503 have the "limited access" classification. Specific standards for this classification do not exist, and private property access is only allowed from the state highway if no other access options exist.

Techniques used to manage state highway access include design and operational measures to minimize disruptions to through traffic flow and improve safety. These techniques include measures such as reducing the number of driveways, providing adequate space between driveways, establishing minimum spacing for traffic signals and intersections, managing turn movements, and managing the highway median. Access management techniques have been developed to provide a more flexible, cost-effective means of preserving highway capacity than strictly limiting access through purchasing the access rights of abutting properties.

[4] WAC 968-52 (9-22-92).

Table 2-1
SR 502 and SR 503 Access Management Classifications

Highway	Segment	Class	Posted Speed (MPH)	Typical Planned Median Treatment	Planned Intersection Spacing	Minimum Private Connection Spacing
SR 502	Dollars Corner to Battle Ground west city limits (MP 5.45 to 6.85)	3	50	Restrictive where multi-lane is warranted	0.5 mile	330 feet, one per parcel
SR 502	Battle Ground west city limits to west of SR 503 (MP 6.85 to 7.53)	5	40	Non-restricted	0.25 mile	125 feet, one per parcel
SR 502	West of SR 503 to SR 503 (MP 7.53 to 7.56)	Limited Access	40	No specific standard	No specific standard	No specific standard
SR 503	Brush Prairie to Battle Ground (MP 4.26 to 9.40)	Limited Access	35-50	No specific standard	No specific standard	No specific standard
SR 503	Battle Ground to Amboy (MP 9.40 to 20.28)	3	55	Restrictive where multi-lane is warranted	0.5 mile	330 feet, one per parcel

Source: WSDOT Southwest Region Office, 2005.

2.2.1.4 *Street Standards*

Legacy Standards

The City of Battle Ground's Legacy Standards provide guidance on the sizing and component elements for each street classification within the city. These standards went into effect in April 1999 and are designed to help create neighborhoods similar to those built during the early 1900's. The standards prescribe architectural variety, streetscapes that are pedestrian friendly and street networks that connect in a grid pattern when possible. The intent of the Legacy Standards is to create a community where it is possible for people to meet on the sidewalk in front of their homes, eliminate "fenced canyons" (unwelcoming thoroughfares which have no relationship with surrounding residential uses), and human scale architecture (designed to primarily relate to pedestrians rather than automobiles). In addition, the Legacy Standards are intended to provide a more efficient transportation system that allows people the choice of walking, biking or driving to their destination. City of Battle Ground existing street standards for each roadway classification are depicted in Table 2-2.

Table 2-2
Existing Street Standards for the City of Battle Ground

Functional Classification	Lane Width	Bicycle Lane	Sidewalk	Planter Strip	Right-of- Way	Parking	Minimum Access Intersection Spacing
Principal Arterial	11-12 ft; 14 ft center	6 ft striped both directions	6+ ft both sides	8 ft both sides	100 ft.	No Parking in shoulder except in approved bays	600 ft
Minor Arterial	11 ft; 12 ft center	6 ft striped both directions	6+ ft both sides	6 ft both sides	70 ft	No Parking in shoulder except in approved bays	500 ft
Major Collector	10 ft in	4 ft striped in both directions	5 ft both sides	5 ft both sides	60 ft; 40 ft curb to curb, except as reduced for medians	None, unless required in lieu of median/turn lane, then provide 7 ft	250 ft

Table 2-2 Continued
Existing Street Standards for the City of Battle Ground

Functional Classification	Lane Width	Bicycle Lane	Sidewalk	Planter Strip	Right-of- Way	Parking	Minimum Access Intersection Spacing
Neighborhood Collector	16 ft total	4 ft striped in both direction, except when on-street parking is required	5 ft both sides	3 ft both sides	50 ft; 32 ft curb to curb, except as reduced for neighborhood entries	7 ft wide parking shoulder on one or both sides, except when separate bicycle lanes required	250 ft
Local Street A	14 ft total	Bicycles share Roadway	4 ft both sides	4 ft both sides	50 ft; 32 ft curb to curb, except as reduced for neighborhood entries	8 ft wide parking shoulder on both sides	240 ft
Local Street B	14 ft total	Bicycles share Roadway	4 ft both sides	4 ft both sides	50 ft; 32 ft curb to curb, except as reduced for neighborhood entries	8 ft wide parking shoulder on one side	240 ft

Source: City of Battle Ground Municipal Code Chapter 12.116, *Transportation Standards* (March, 2001).

2.2.2 Street System Characteristics

This section presents a description of the existing study area street system including physical characteristics, identification of key intersections and traffic control, and location of truck routes.

2.2.2.1 *Physical Characteristics of Existing Streets*

Arterial Streets

Principal and minor arterial streets in the study area include the two state highways, as well as a number of other major city and county roads. Physical characteristics of these roads are described in the following paragraphs.

SR 502 (W. Main Street) is an east-west roadway connecting the City of Battle Ground from SR 503 to NE 10th Avenue to the west and then south to Interstate 5 via the NE 179th Street interchange. This road is classified by the City of Battle Ground as a principal arterial west of 20th Avenue and a minor arterial between SR 503 and 20th Avenue. The lower classification reflects the presence of frequent intersecting streets and driveways attributable to recent development on the west side of Battle Ground. SR 502 is classified as a State Highway by Clark County and as a principal arterial for its entire length by RTC. This section of SR 502 is also designated as a National Highway System (NHS) facility.

SR 502 has two through lanes in each direction with left turn lanes at the intersections of 20th, 15th, and 12th Avenues, and SR 503. At the intersection of SR 502 and SR 503, SR 502 has two through lanes and two left turn lanes. Currently, sidewalks and bicycle lanes are located on the north and south sides of the street between 29th Avenue and SR 503. SR 502 has frequent intersecting streets and some driveways west of SR 503 to approximately the Battle Ground city limits and again in the vicinity of NE 72nd Avenue at Dollars Corner. SR 502 is signed for 35 to 50 mph speeds in developed areas and 50 mph speeds in rural areas.

SR 503 (10th Avenue) is a north-south roadway classified by the City of Battle Ground and RTC as a principal arterial south of SR 502 and a minor arterial north of SR 502. SR 503 is classified as a State Highway by Clark County. The highway is also designated as a National Highway System (NHS) facility. SR 503 connects the City of Battle Ground to Interstate 205 and the City of Vancouver to the south and to the Lewis River and Mount Saint Helens recreational areas to the northeast.
SR 503 has two through lanes in each direction with left and right turn lanes at the intersections of NE 189th Street, NE 199th Street and SR 502/W Main Street. SR 503 narrows to a single through lane in each direction north of SR 502. SR 503 is traffic signal controlled at its intersections with NE 189th Street, NE 199th Street, SR 502/W Main Street, and NE 244th Street. Signalization of the intersection with Onsdorff Boulevard will be implemented in the summer of 2004. SR 503 has sidewalks along both sides between SR 502 and NE 199th Street. South of NE 199th Street to beyond the study area boundaries, there is a separated pedestrian pathway along the east side of the roadway. Bicycle lanes are located on both sides of the roadway from south of NE 189th Street to north of NE 244th Street. SR 503 has limited access with few driveways in the study area and is signed for 55 mph speeds in the Battle Ground UGA.

E. Main Street is the main east-west corridor in the City of Battle Ground. It is classified as a principal arterial by the City between SR 503 and Parkway Avenue and a minor arterial from Parkway to the east city limits. This street is classified as a major collector by RTC. E. Main Street has two through lanes in each direction between SR 503 and Parkway Avenue with center left turn channelization. East of Parkway Avenue, E. Main Street has a single travel lane in each direction with no left turn lanes. The roadway has sidewalks on both sides between SR 503 and NE/SE Grace Avenue, and the facility does not have bicycle facilities. E. Main Street is posted for 25 mph speeds through the central portion of Battle Ground from SR 503 to east of the Chelatchie Prairie railroad crossing near the eastern city limits.

There are frequent intersecting streets along E. Main Street, many of which are traffic signal controlled while the remainder generally have side street stop control. Traffic congestion on E. Main Street is largely attributable to the frequent driveways and the numerous intersecting streets associated with the commercial land uses along the street, as well as the proximity of Battle Ground High School.

NE 219th Street is an easterly continuation of E. Main Street connecting the central portion of Battle Ground with communities and recreational areas to the east, including the unincorporated town of Vernersborg and Battle Ground State Park. From SE Grace Avenue to the city limits, NE 219th Street is classified as a minor arterial by the City of Battle Ground. From the city limits NE 182nd Avenue it is classified as a major rural collector by Clark County and RTC. The street has a single travel lane in each direction and typically is stop sign-controlled for side streets. There is a sidewalk along a portion of the north side of this road near the eastern city limits adjacent to a subdivision near NE 16th Avenue. Otherwise there are no special facilities for non-motorized travel.

Collector Streets

Most of the remaining streets of significance in the study area are designated as major or neighborhood collectors. These include the following.

NE 92nd Avenue is a north-south rural minor collector linking SR 502 with the Daybreak Road crossing of the Lewis River. This road has a single travel lane in each direction and is stop sign-controlled at its intersection with SR 502. Future county plans call for the southerly extension of this road to link up with existing segments of this road south of NE 199th Street, thus providing a parallel north-south corridor to NE 72nd Avenue. There are no sidewalks or bicycle facilities along NE 92nd Avenue in the study area.

NW/SW 20th Avenue/NE 112th Avenue is a north-south street that is classified as a major collector by the City of Battle Ground and a rural minor collector by RTC. The road is not classified by Clark County in the UGA except for a small segment linking NE 244th Street with NE 239th Street, which is classified as a rural minor collector. 20th Avenue has a single travel lane in each direction with left turn channelization and a traffic signal at SR 502. This street is traffic sign-controlled for side streets at most intersecting streets. There is all-way stop sign control at the intersections with NE 199th and NE 189th Streets. Bicycle lanes exist on a short segment of the roadway to the north and south of SR 502. The sidewalk system on 20th Avenue is somewhat fragmented. Sidewalks are present on the west side of the street near S 11th Street, between S 6th Street and SR 502, and on some portions of the street between NW 9th Street and Onsdorff Boulevard. On the east side of the street, sidewalks are present between SW 6th Street and NW 4th Street and on portions of the facility between NW 9th Street and Onsdorff Boulevard. Speed limits along this street range from 25 mph to 50 mph depending upon location.

N/S Parkway Avenue/NE 132nd Avenue is a major north-south street through central Battle Ground running from the rural residential area south of NE 199th Street near the south end of the UGA and NE 244th Street at the north end. Parkway Avenue is classified as a major collector by the City of Battle Ground and RTC, and the segment between 244th Street and 249th Street is classified as a rural minor collector by Clark County. The facility has a single through lane in each direction with left turn channelization at its intersection with E. Main Street. Parkway Avenue is signal controlled at the intersection with E. Main Street as well as at the intersection with NE 199th Street. All other intersecting streets are stop sign-controlled on the side streets. On the west side of the street, sidewalks exist between NE 199th Street and NW 12th Street, and bicycle lanes exist between NE 199th Street and NW 6th Street. Sidewalks are located on the east side of the street from south of Rasmussen Boulevard to NW 6th Street. Parkway Avenue is posted for 25 mph speeds generally south of Onsdorff Boulevard and 35 to 40 mph to the north.

NE/SE Grace Avenue/NE 142nd Avenue is a two lane north-south road connecting the eastern portion of Battle Ground to such destinations as Battle Ground Lake State Park, Brush Prairie and Hockinson. From NE 199th Street to approximately NE 244th Street, Grace Avenue is classified as a major collector by the City. To the south and north of the city, the street is known as NE 142nd Avenue and is classified by Clark County as a rural major collector. The street is classified by RTC as a rural major collector north of NE 199th Street and as a rural minor collector to the south. Grace Avenue is stop sign-controlled at its intersections with E. Main Street and NE 199th Street. Both sides of the street have sidewalks on a short segment north of E. Main Street. There are bicycle lanes on both sides between E. Main Street and NE 229th Street, and short segments with wide shoulders on the west side of the road between E. Main Street and NE 199th Street. Posted speeds range from 25 mph to 50 mph, depending on location.

NE 244th Street is an east-west roadway that connects the northern part of Battle Ground with SR 503. From SR 503 to NE 132nd Avenue, NE 244th Street is classified as a major collector by the City of Battle Ground. West of SR 503, NE 244th Street is classified as a rural minor collector by Clark County and RTC. This street has one travel lane in each direction with no left turn channelization. NE 244th Street is signalized at its intersection with SR 503 and stop sign-controlled at its intersection with N Parkway Avenue. The only segment of NE 244th Street with non-motorized facilities is along the south side of the street near NW 6th Avenue (in the form of a sidewalk and wide shoulder). The posted speed limit is 40 mph.

N/S 1st Streets, are classified as minor collectors by the City of Battle Ground. These streets are located one block north and south of E. Main Street and run parallel to it, thus providing some local traffic circulation and relief for E. Main Street. On the south side of E. Main Street, S 1st Street runs between SW 7th and SE Grace Avenues. On the north side of E. Main Street, N 1st Street runs between N Parkway

Avenue and NE Grace Avenues. Both N 1st and S 1st Streets are used mainly by residential and local traffic. However, the section of SW 1st Avenue between Parkway Avenue and SW 5th Avenue is used heavily by school buses approaching SW 5th Avenue from the east. These streets have a single travel lane in each direction and are stop sign-controlled at intersections with S Parkway and SE Grace Avenues. Sidewalks are located (in fragments) on the north side of SE 1st Avenue between S. Parkway Avenue and SE Grace Avenue. The posted speed limit is 25 mph.

NE 199th Street serves as a major east-west corridor on the southern edge of the Battle Ground city limits. From NE 50th Ave. to NE 176th Ave. it is classified as a minor arterial by the City of Battle Ground. Portions of this street between west of SR 503 and NE 142nd Avenue are also classified as a minor arterial by Clark County, with the remainder classified as a rural major collector. The street is classified as a rural major collector by RTC. Sidewalks and bicycle lanes are located on both sides of the facility between SR 503 and SE Grace Avenue/NE 142nd Avenue. NE 199th Avenue has been identified by the Battle Ground school district, Fire District Number 11, and the Battle Ground Police Department as a frequently used travel route. This street also provides truck access to the developing industrial area east of the Chelatchie Prairie railroad between NE 199th and NE 219th Avenues.

NE 189th Street from NE Cramer Rd. to SR 503 is an east-west roadway classified as a rural major collector by RTC and Clark County. This street has one travel lane in each direction, with left and right turn lanes at the intersection with SR 503. This street is used mainly by residential and local traffic. A bicycle lane is present on a short segment of the street west of NE 112th Avenue, and a sidewalk is present on the south side of the street in the same area.

2.2.2.2 *Key Intersections / Traffic Control*

For the purposes of updating the City of Battle Ground's Transportation Plan, a set of 22 intersections were selected for detailed analysis within the study area. The selected intersections are within the City or located in the surrounding unincorporated area on key roads that provide access to the City. Fourteen of the study area intersections are on SR 502 or SR 503. These intersections are listed below and are illustrated in Figures 2-2 and 2-3. These intersections were selected based on their significance to the overall transportation system in the study area.

- Intersections within the City of Battle Ground (excluding those on state highways):
  - E Main Street at Safeway Entrance, 5th Avenue, Parkway Avenue, NE Grace Avenue and SE Grace Avenue
  - Parkway Avenue at NW Onsdorff Boulevard and SE Rasmussen Boulevard
  - NE Grace Avenue at NE 229th Street and at SE Rasmussen Boulevard
  - NW 20th Avenue at NW Onsdorff Boulevard

- Intersections in the unincorporated portions of the study are surrounding Battle Ground:
  - NE 199th Street at NE 112th Avenue, NE 132nd Avenue and NE 142nd Avenue

- State Highways:
  - SR 502 at NE 92nd Avenue, 29th Avenue, 20th Avenue, 15th Avenue, 12th Avenue, and SR 503
  - SR 503 at NE 244th Street, NW Onsdorff Boulevard, NE 199th Street and NE 189th Street

Figures 2-2 and 2-3 show the location, type of traffic control and existing lane geometry of the study area intersections. Eleven of the intersections included for detailed analysis are presently signalized. These include six that are operated and maintained by WSDOT including the intersections of SR 502 with 20th Avenue, 12th Avenue, and SR 503; and the intersections of SR 503 with NE 244th Street, NE 199th

Street, and NE 189th Street. Signalization of the intersection of SR 503 with NW Onsdorff Boulevard is anticipated to occur during the summer of 2004. There are also traffic signals at five locations that are maintained by the City of Battle Ground including the intersections of E. Main Street with the Safeway entrance, 5th Avenue, and Parkway Avenue, and NE 199th at NE 132nd Avenue and NE 142nd Avenue. The remaining intersections included in the study area are controlled by stop signs.

2.2.3 Traffic Volumes and Operations

This section describes current traffic operations in and around the City. Included is a discussion of the transportation implications associated with the City's role as the economic and educational center of a large portion of northern Clark County. This results in significantly higher traffic volumes and improvement needs that would be typical for a community of its size. Also included in this section is documentation of existing intersection and roadway segment traffic volumes based on information provided by WSDOT, City of Battle Ground, and Clark County, as well as counts taken specifically for this study. Existing intersection levels of service; traffic safety issues and roadway speeds are also presented.

2.2.3.1 *Travel Shed Characteristics*

With the growth and addition of new retail establishments and employment opportunities within the Battle Ground city limits and with the continuing growth of rural residential land uses to the north and east of the city, increasing traffic congestion has become a concern for the city. Many of the schools in the Battle Ground School District (one of the largest districts in Washington State), are located in the city center just north of E. Main Street. Since completion of the Main Street Improvement Project, much of the congestion on E. Main Street, between SR 503 and Parkway Avenue has been alleviated. However, the city continues to experience three peak travel periods during most of the year, including the typical AM and PM commuter peak hours, as well as a school peak at mid-afternoon during the school year. Schools buses, parent pick-up and drop-off and cars driven by high school students combine on these weekday afternoons to cause a steady stream of traffic along E. Main Street extending from roughly the school driveway off N Parkway Avenue to SR 503. Battle Ground also serves as the center for employment and shopping in northeastern Clark County with trips coming from far outside the city limits to businesses located within the city limits.

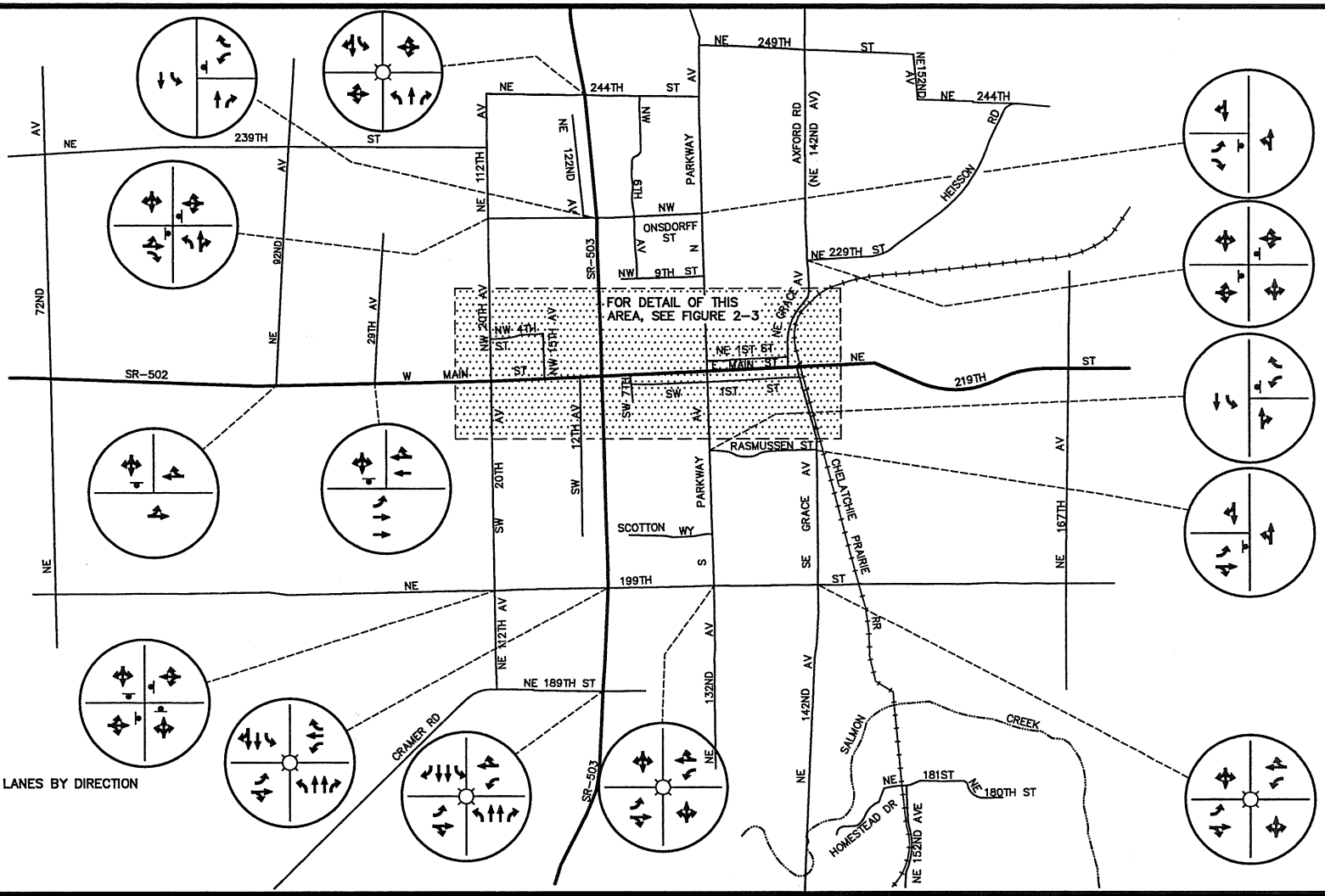
2.2.3.2 *Traffic Volumes*

Existing daily and PM peak hour traffic volumes at key intersections and on selected roadway segments in the study area are presented in this section.

Average Daily and Peak Hour Traffic Conditions

Table 2-3 lists existing daily and peak hour traffic volumes on key arterial and collector streets in the study area. PM peak hour intersection turning movements at key locations in the study area are illustrated for the larger study area in Figure 2-4 and for the central core of Battle Ground (along E and W Main Street) in Figure 2-5.

Traffic volumes used in this study were obtained from a variety of sources. Average annual daily traffic (AADT) volumes were collected from WSDOT *Annual Traffic Reports*, SWRTC on-line traffic counts, 24-hour counts conducted by Clark County, and recent traffic impact studies conducted in the City. Existing daily traffic volumes in the City are highest on SR 503 and E. Main Street, followed by SR 502. Daily traffic volumes on E. Main Street in downtown Battle Ground range from 20,500 vehicles east of SR 503 to less



LEGEND

- NUMBER OF TRAFFIC LANES BY DIRECTION
- TRAFFIC SIGNAL
- STOP SIGN

KEY

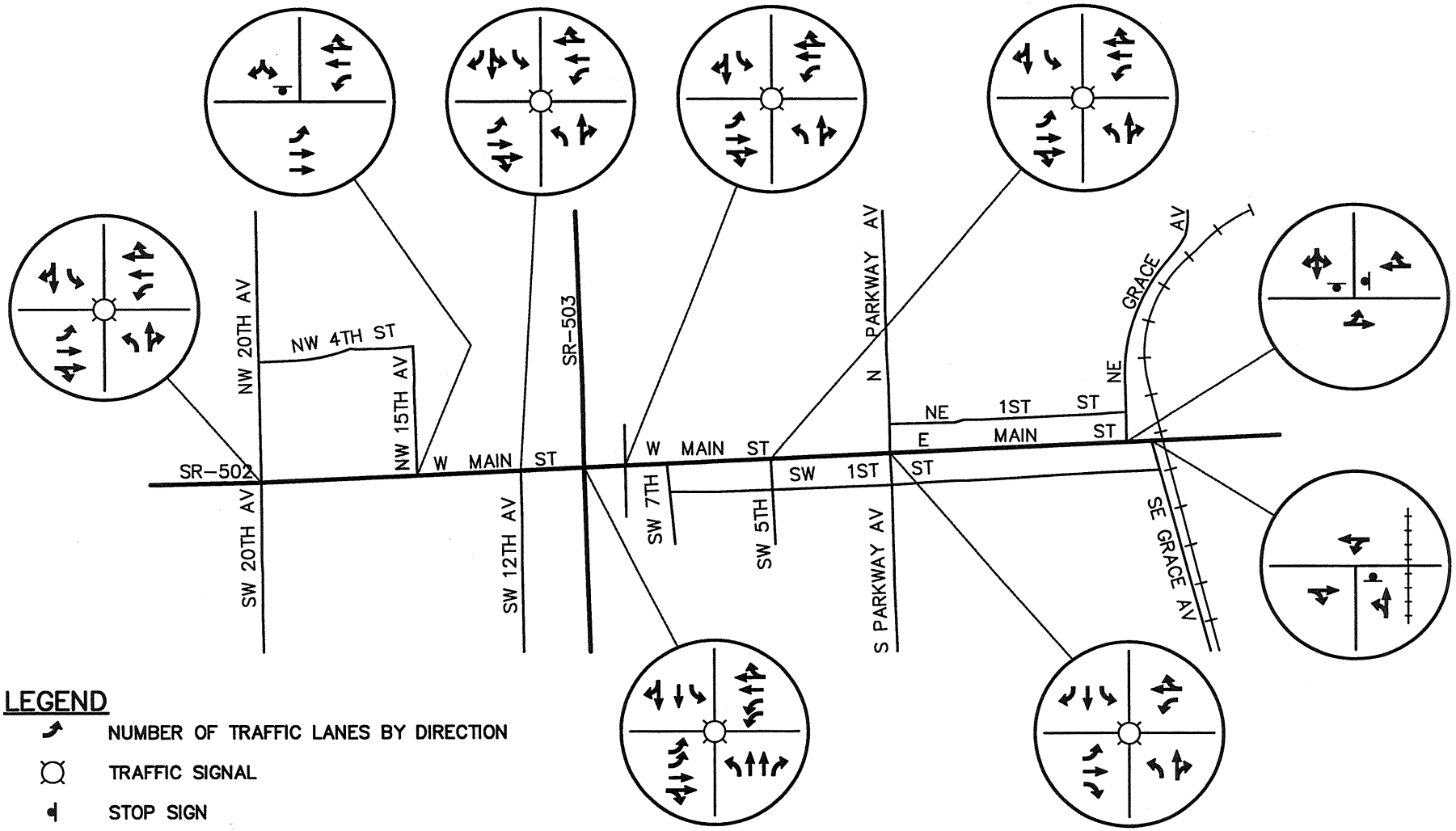
N

NOT TO SCALE

Figure 2-2
Existing Intersection Characteristics

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 08/02/05 09:55am FILENAME: P2561011P01F-02 IMAGES: BG99logo | XREF'S:



KEY

N

NOT TO SCALE

Figure 2-3
Existing Intersection Characteristics (Downtown Area)

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 08/04/04 2:37pm FILENAME: P2561011P01F-01 IMAGES: logo | XREF'S:

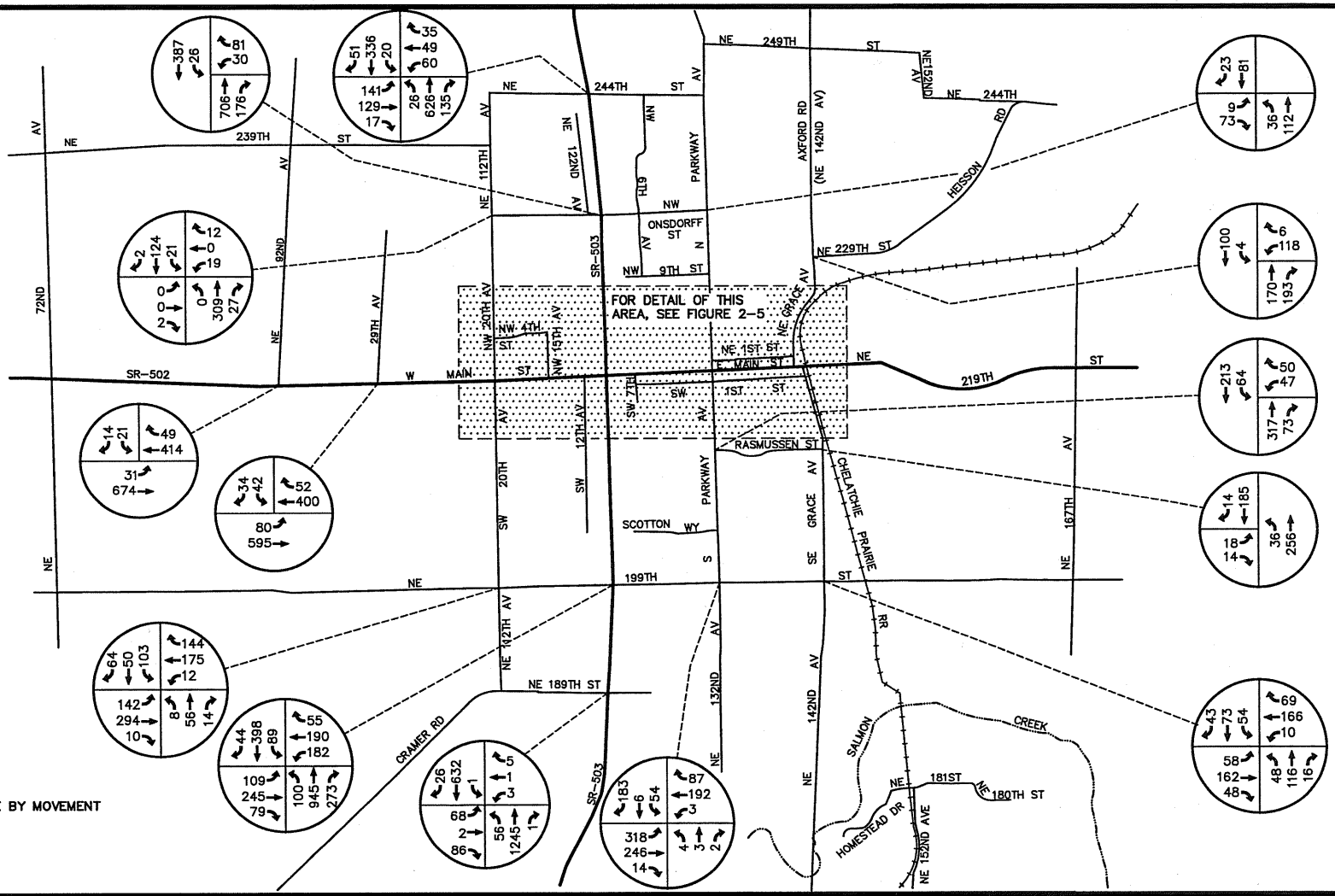
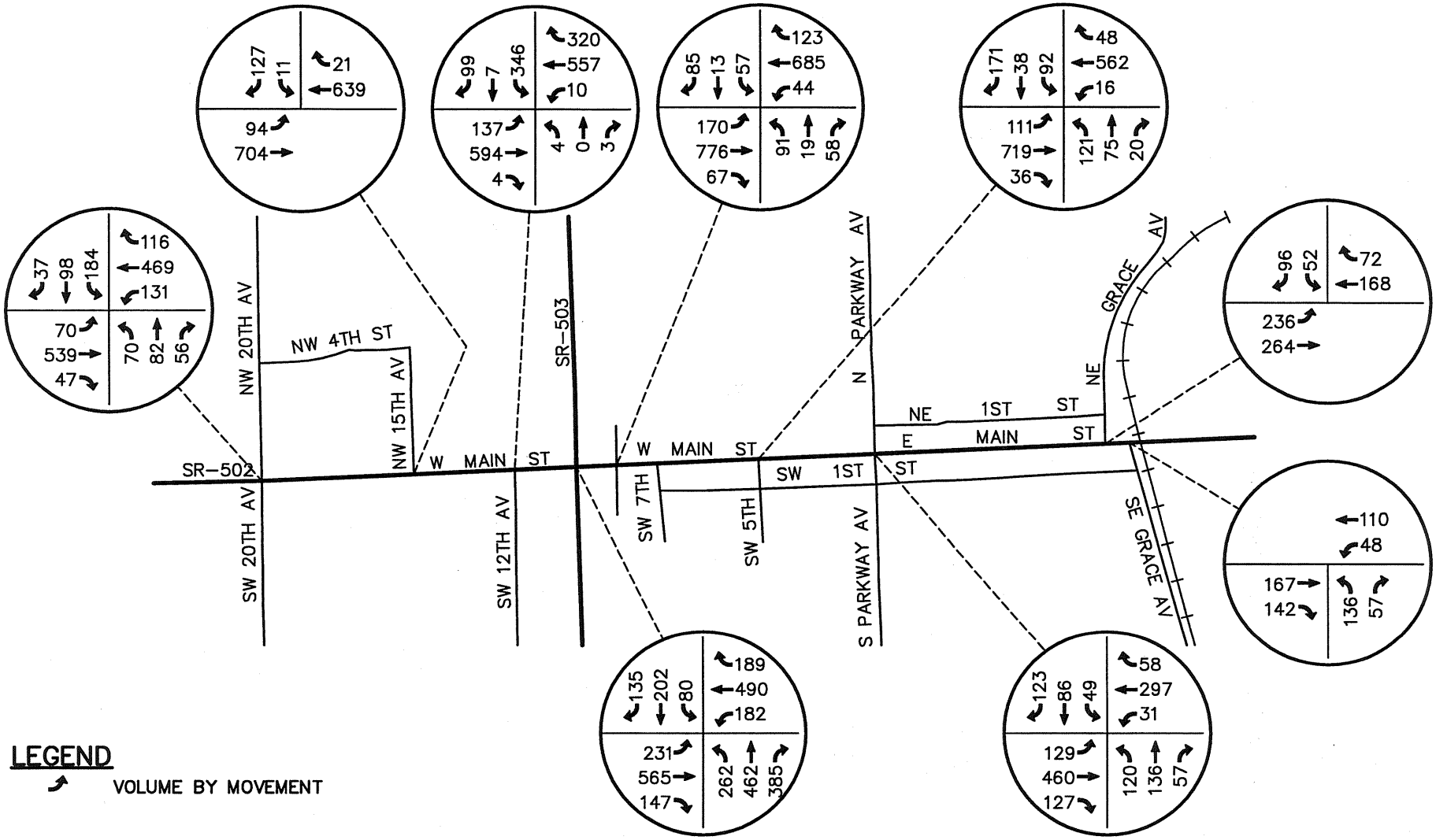


Figure 2-4
Existing PM Peak Hour Traffic Volumes

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 08/13/04 10:03am FILENAME: P2561011P01F-04 IMAGES: logo | XREF'S:



KEY

N

NOT TO SCALE

Figure 2-5
Existing PM Peak Hour Traffic Volumes (Downtown Area)

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 08/11/05 2:05pm FILENAME: P2561011P01F-03 IMAGES: BG99logo | XREF'S:

than 12,000 vehicles east of Parkway Avenue Street. Daily volumes on SR 502 are slightly lower, averaging 14,000 vehicles west of 12th Street and about 13,000 vehicles daily east of NE 72nd Avenue. NE 199th Street also carries relatively heavy traffic, with daily volumes over 11,000 vehicles east of SR 503, decreasing to 9,500 vehicles west of SR 503.

Table 2-3
2002 Daily Traffic Volumes

Roadway	Location	Average Daily Traffic Volumes	PM Peak Hour Volumes		
			EB/NB	WB/SB	Total
SR 503	South of NE 189th St.	21,900	1,110	680	1,790
SR 503	North of NE 199th St.	19.400	930	670	1,600
SR 502	West of NE 72nd Ave.	12,930	600	400	1,000
NE 199th Street	East of 72nd Ave.	8,500	500	290	790
NE 199th Street	West of SR 503	9,540	380	380	760

Source: Southwest Washington Regional Transportation Council.

While daily traffic volumes are useful for evaluating a roadway's functional classification, peak hour intersection turning movements are more useful to determine a facility's operating characteristics and identify specific improvement needs. Intersections are typically where the greatest congestion and delay occurs in the transportation system due to the number of potential conflicts and the need to assign right-of-way through the use of traffic signals, stop signs and other traffic control devices.

2.2.3.3 *Levels of Service*

While intersection turning movement counts provide an indication of traffic patterns and the general demand for intersection or roadway capacity, by themselves they do not provide a sound basis for either determining levels of congestion or comparing impacts on traffic operations for different roadway improvement options.

The concept of levels of service (LOS) was developed to provide a basis for quantifying what would otherwise be a subjective assessment of the degree of comfort that a driver feels when traveling through an intersection or along a roadway segment where volumes of traffic or roadway features may differ substantially. The quantification of levels of service takes into account traffic volumes during a given period of time, mix of vehicle types including trucks, vehicle speed, number of stops, total amount of delay, impediments caused by other vehicles and/or pedestrians, and other factors. Levels of service are expressed in grades ranging from A (free-flowing operational conditions) to F (operational breakdown). LOS B through E denote conditions of increasing platooning (or collecting of vehicles into a steady stream of traffic), decreasing speeds and increasing delay. These six grades are further defined in Appendix A.

This section discusses existing levels of service at key intersections in the Battle Ground study area. Included is a discussion of the applicable LOS standards, an assessment of existing intersection levels of service, and identification of existing deficiencies.

Level of Service Standards

Under Washington State's Growth Management Act (GMA), local communities are required to develop level of service standards to identify the maximum level of congestion acceptable to the community and the threshold to determine transportation system deficiencies and improvement needs. The level of service standards required by the GMA are implemented through local concurrency ordinances and procedures.

The concept of concurrency relates to the timing of demand for certain public services and the availability of these services to meet demand. For the transportation system, this means that adequate roadway facilities must be in place at the same time as traffic impacts associated with land development occur. Procedures to implement the concurrency requirements of GMA are described below for both the City of Battle Ground and Clark County. The requirements of these two jurisdictions are different, but both affect the Battle Ground urban area.

Battle Ground Standards

The City of Battle Ground implements the concurrency requirements of GMA through the land development review process. This process and the related level of service standards used to determine if concurrency requirements have been satisfied are described in the City's 1995 *Capital Facilities Plan.* Briefly summarized, the process includes the following steps. (1) Development applications are evaluated for conformance with currency standards as part of development review. (2) If deficiencies are identified, solutions are developed through cooperative efforts between the applicant and the City before unconditional approval of the application is given. (3) If a definite solution cannot be achieved, options include delay or denial.

Level of service thresholds currently used by the City to identify where and when adequate transportation facilities exist to serve development include level of service (LOS) D or better operations for signalized intersections, and LOS E or better for side street movements at unsignalized intersections.

Clark County Standards

Clark County's concurrency ordinance affects 290 existing intersections in unincorporated Clark County. Before a new development is approved, the concurrency ordinance requires that roads must be in place or funded for construction within three years. Developers pay impact fees to the county to help fund these capital facilities. Proposed changes to the county concurrency ordinance presently under consideration by the County would replace intersections analyzed for concurrency compliance with 34 concurrency corridors in the unincorporated area of the County. Proposed corridors within the study area include NE 72nd Avenue south of SR 502, SR 503 south of SR 502, and SR 502 west of SR 503.

Regional Standards

The concurrency requirements of GMA do not apply to state highways that are designated as "Highways of Statewide Significance". In Clark County, these include Interstate 5, Interstate 205, SR 14, and SR 501 between I-5 and the Port of Vancouver. SR 502 and SR 503 in the Battle Ground urban area have been designated as "Highways of Regional Significance" for which LOS standards are set through a coordinated process involving state, regional and local input. This coordination process is implemented by the Southwest Washington Regional Transportation Council (SWRTC). Per RTC Board Resolution 11-01-20 (December 2001), the adopted level of service standard for Regional State Highways in Clark County is LOS E in urban areas and LOS C in rural areas. Both SR 502 and SR 503 are currently classified as rural highways.

It should be noted, however, that when improvements are made to these highways, the level of service criteria in the WSDOT *Highway Design Manual* would be used as the basis of design for these improvements. The *Highway Design Manual* specifies that improvements should meet LOS B for rural arterials and LOS C for urban arterials with infrequent signal spacing.

Existing Levels of Service

Levels of service shown in this document were calculated using methodologies in the *2000 Highway Capacity Manual (HCM)* for signalized and unsignalized intersections. The variables and resulting performance measures for these facility types are described briefly below.

For signalized intersections, the LOS is related to the average control delay experienced by all vehicles before they are able to pass through an intersection. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay and is dependent on two sets of variables: the capacity of the intersection as defined by the number of lanes, lane widths, etc.; and traffic signal timing. Delay and level of service are calculated for each traffic movement or group of traffic movements at an intersection. The weighted average delay for all traffic movements determines the overall level of service at a signalized intersection. The relationship between LOS and delay is presented in Appendix A and summarized below.

Table 2-4
Intersection Level of Service Criteria

Level of Service	Signalized Intersection Average Control Delay (seconds per vehicle)	Unsignalized Intersection Average Total Delay (seconds per vehicle)
A	≤ 10	≤ 10
B	> 10 to ≤ 20	> 10 to ≤ 15
C	> 20 to ≤ 35	> 15 to ≤ 25
D	> 35 to ≤ 55	> 25 to ≤ 35
E	> 55 to ≤ 80	> 35 to ≤ 50
F	> 80	>50

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

The level of service at an unsignalized intersection is also defined in terms of control delay and is identified for each minor movement. Average total delay is the controlling measure, defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle enters the intersection from the stop-controlled approach. The range of delay values for a given level of service at an unsignalized intersection are somewhat lower than those for a similar level of service at a signalized intersection. This difference in delay values is attributable to differing driver expectations: at a signalized intersection a higher degree of control provides greater predictability to the driver, and longer delays are more easily tolerated by most drivers.

Levels of service were calculated using the most recent available traffic counts for key study area intersections as illustrated in Figures 2-4 and 2-5. Single intersection or roadway segment highway capacity software was used to evaluate levels of service at signalized and unsignalized locations. The results of LOS analysis performed for the study area intersections is summarized below in Table 2-5 for both signalized and unsignalized intersections.

Table 2-5
2003 PM Peak Hour Levels of Service for Key Intersections

Signalized Intersections	V/C Ratio	Average Delay (sec./vehicle)	LOS
SR 503 (NE 10th Avenue) and NE 244th Street	0.77	22.0	C
SR 503 and SR 502 (W. Main Street)	0.84	38.7	D
SR 503 (NE 10th Avenue) and NE 199th Street	0.84	31.1	C
SR 503 (NE 10th Avenue) and NE 189th Street	0.57	10.0	A
SR 502 (W. Main Street) and 20th Avenue	0.62	17.2	B
SR 502 (W. Main Street) and 12th Avenue	0.65	21.1	C
E. Main Street and Safeway Entrance/7th Avenue	0.55	23.4	C
E. Main Street and 5th Avenue	0.50	10.6	B
E. Main Street and Parkway Avenue	0.45	10.5	B
NE 199th Street and S. Parkway Avenue	0.78	9.8	A
NE 199th Street and SE Grace Avenue	0.34	9.4	A

Unsignalized Intersections	All-Way or 2-Way Stop	Critical Movement	Control Delay (sec./vehicle)	LOS
SR 503 (NE 10th Avenue) and NW Onsdorff Boulevard	Two-way	SBL	10.2	B
		WBL	28.6	D
		WBR	16.5	C
SR 502 and NE 92nd Avenue	Two-way	SBLR	19.5	C
		EBL	8.3	A
SR 502 (W. Main Street) and 29th Avenue	Two-way	EBL	8.7	A
		SBLR	19.1	C
SR 502 (W. Main Street) and 15th Avenue	Two-way	SBLR	15.9	C
		EBL	9.6	A
NE Grace Avenue and NE 229th Street	Two-way	SBL	8.0	A
		WBLR	12.0	B
NW Onsdorff Boulevard and NW 20th Avenue	Two-way	EBLTR	11.9	B
		WBLTR	8.9	A
NW Onsdorff Boulevard and N. Parkway Avenue	Two-way	NBTL	7.3	A
		EBL	7.4	A
		EBR	6.3	A
E. Main Street and NE Grace Avenue	Two-way	SBLR	19.6	C
E. Main Street and SE Grace Avenue	Two-way	NBLR	14.6	B
SE Rasmussen Blvd and S. Parkway Avenue	Two-way	SBL	8.4	A
		WBL	16.9	C
		WBR	10.9	B
SE Rasmussen Blvd and SE Grace Avenue	Two-way	NBL	1.2	A
		EBL	13.9	B
		EBR	9.4	A
NE 199th Street and NE 112th Avenue	All-way	Average	14.3	B

LOS = Level of Service, based on Transportation Research Board, *2000 Highway Capacity Manual: Special Report 209.*
V/C = volume-to-capacity ratio, also based on the *2000 Highway Capacity Manual: Special Report 209.*

Based on the adopted level of service standards in the Battle Ground UGA, all signalized intersection currently operate at acceptable levels of service. Of the 12 unsignalized intersections in the study area, all currently operate with side street movements better than the LOS E standard.

2.2.3.4 *Traffic Accidents*

Table 2-6 shows the number of reported traffic accidents at various intersections in and around the Battle Ground area in the three year period most recently available. This analysis was based on reported traffic collisions provided by Clark County and WSDOT. Accident data covers period extending from January 1, 2001 through November 30, 2003, approximately three years.

Accident rate, accident severity and accident frequency are all used as indicators of unresolved safety issues. Accident rates are calculated by dividing the average annual number accidents by the average annual daily traffic (either along a roadway segment or approaching an intersection). Intersection accident rates above 1.0 accidents per million entering vehicles, and roadway link accident rates over 1.0 accidents per million vehicle miles of travel, were used as thresholds to identify locations warranting further investigation of potential geometric or alignment deficiencies. It should be noted, however, that if a street or intersection typically carries a low volume of traffic, just a few accidents can generate an accident rate above 1.0. For this reason, accident frequency, severity and cause are also assessed to identify safety-related problems. A summary of existing accident data analysis results is presented in Table 2-6.

Table 2-6
Vehicle Collision Summary (1/2001 to 11/2003)

Intersection	Total Number of Reported Collisions	Collision Rate Per Million Entering Vehicles
E. Main Street and 5th Avenue	33	2.16
SR 503 (NE 10th Avenue) and NW Onsdorff Boulevard	17	1.59
SR 502 (W. Main Street) and SR 503 (NE 10th Avenue)	34	1.31
SR 503 (NE 10th Avenue) and NE 244th Street	13	1.05
SR 502 (W. Main Street) and 20th Avenue	16	0.89
NE 199th Street and SE Grace Avenue	5	0.76
E. Main Street and Parkway Avenue	9	0.71
SR 503 (NE 10th Avenue) and NE 199th Street	13	0.63
NE 199th Street and S. Parkway Avenue	5	0.59
SR 502 (W. Main Street) and 15th Avenue	6	0.49
E. Main Street and SE Grace Avenue	2	0.40
SR 502 (W. Main Street) and 12th Avenue	6	0.38
E. Main Street and NE Grace Avenue	2	0.30
SR 503 (NE 10th Avenue) and NE 189th Street	3	0.19
SR 502 (W. Main Street) and 29th Avenue	1	0.11

Source: Accident data provided by Washington State Department of Transportation and Clark County, Washington

As shown in Table 2-6, four of the key intersections studied in the Battle Ground UGA have accident rates greater than 1.0 accidents per million entering vehicles. The accident rate at the intersection of SR

502 with SR 503 is expected to drop given recent widening to provide two east/west through lanes in each direction. It is also anticipated that the pending intersection and signalization improvement project will help to address the accident problem at the intersection of SR 503 and NW Onsdorff Boulevard. Additionally, the city is considering modifying the signalized intersection of E. Main Street with 5th Avenue to provide for protected left turn movements, particularly in the east/west direction. This improvement should help to address the existing accident problem at this location. Safety improvement recommendations are further discussed in Chapter 4 - Street Plan.

Along state highways including SR 502 and SR 503, the Washington State Patrol collects and maintains accident-related data. This data is periodically reviewed by WSDOT as part of the agency's on-going, internal process for identifying and evaluating High Accident Corridors (HACs) and High Accident Locations (HALs). Threshold criteria for designating High Accident Corridors and High Accident Locations include: total points per mile (based on point values assigned to accidents based on severity), number of accidents per mile, and average severity per mile. The threshold for total points per mile is 35 points. The threshold for total accidents per mile is 18 points. The average severity threshold is 2.0 points per accident.

HALs are reviewed every year and updated every two years based on the most recent two years of accident data. HAL calculations form the foundation for development of the short-term, safety improvement projects funded and implemented by the WSDOT on a regular basis. HACs are calculated every two years based on five years of data. Together, these accident assessments form the basis for the short- and longer-term safety improvements that are incorporated into the biennial *State Highway System Plan*. The DOT also identifies "Risk" improvements based on an assessment of accident potential for certain locations that do not currently meet HAL or HAC criteria but which may do so in the near future.

Based on a review of the *2003-2022 State Highway System Plan*, there are no High Accident Locations (HALs) or Safety Risk locations within the Battle Ground urban area. The following highway segments have been identified as High Accident Corridors (HACs):

- SR-502 MP 4.48 to MP 5.47 (West of Mill Creek Bridge to east of NE 72nd Avenue)
- SR-503 MP 6.22 to MP 7.21 (North of NE 179th Street to north of NE 199th Street)
- SR-503 MP 9.72 to MP 10.71 (North of Battle Ground to north of NE 269th Street/Potter Road)

There are currently no specific improvement proposals to address these HACs as the societal cost per mile of accidents at these locations is lower than the statewide average. The current HAC process only designates those HACs with societal costs above statewide average for further study.

The identification of HACs and Risk improvements is important from the standpoint of longer-term planning such as is addressed in the Battle Ground TSP and in the *State Highway System Plan*. This identification is updated every two years and reviewed annually to ensure that safety improvement funding is directed to locations that evidence the most critical existing accident experience. Thus, as problem situations develop, improvement projects can be designed and evaluated to address them.

2.2.4 Traffic Speed

Existing traffic speed data is presented in Figure 2-6 including posted speed limits on all arterial and collector streets in the study area. Based on anecdotal information provided by the City's police department, most speeding in the City occurs on the north-south streets of Parkway Avenue, Grace Avenue and SR 503. An August 1999 speed survey on W Main Street (SR 502) west of 12th Avenue

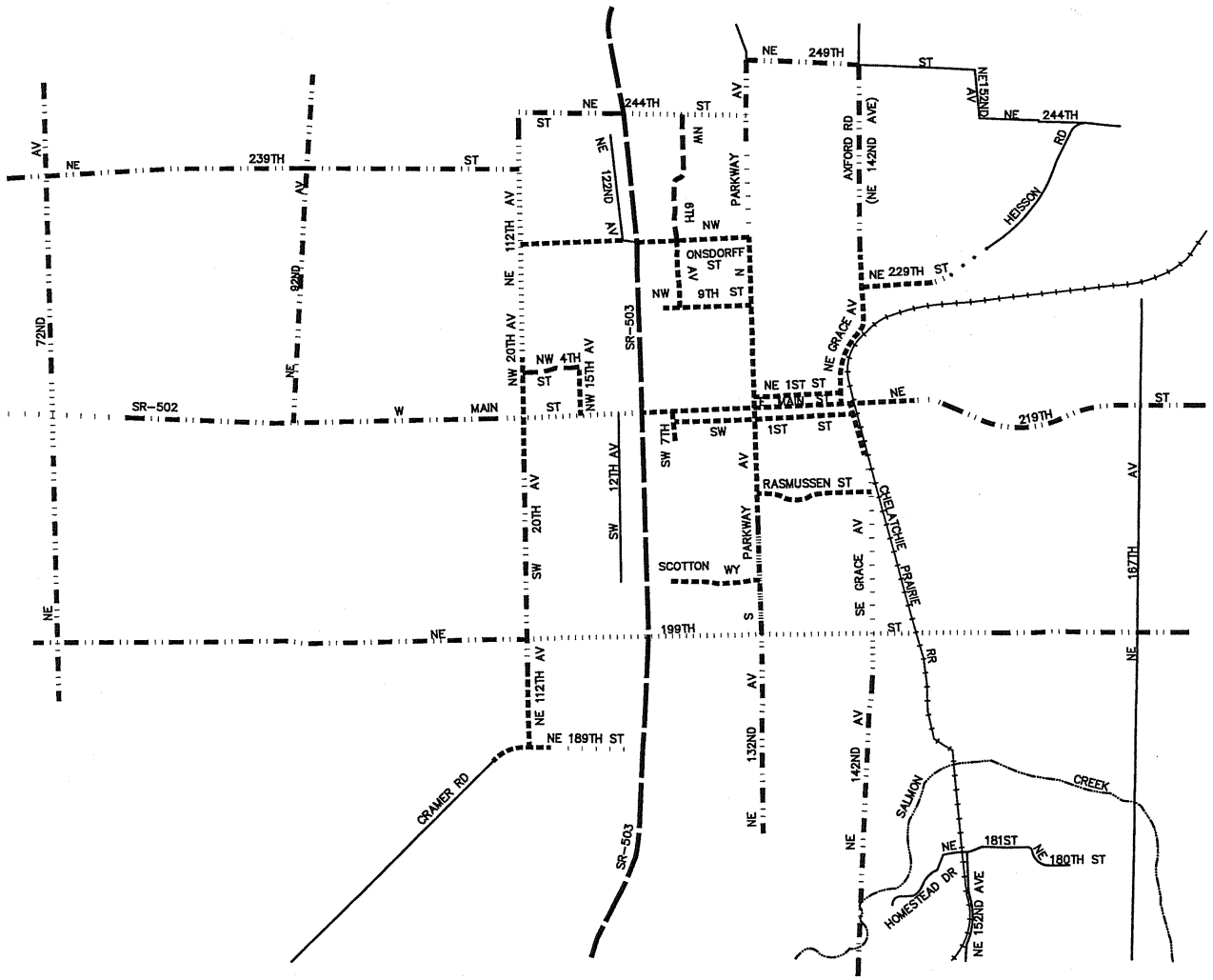


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Figure 2-6
Existing Posted Speed On Arterial And Collector Streets

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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revealed an 85th percentile speed of 40 mph, meaning that 85 percent of motorists using this facility traveled at 40 mph or less. Accordingly, the speed limit on this street was posted for 40 mph travel rising to 50 mph west of 20th Avenue.

2.3 FREIGHT SYSTEM

2.3.1 Truck Routes / Truck Freight Mobility

A key component of the Battle Ground transportation system is the provision of adequate mobility for the movement of freight. To minimize adverse impacts of truck traffic on local streets, a system of truck routes has been designated for the streets and roads within the study area. This system includes the following:

- WSDOT has designated all of its state highways as truck routes. Within the study area this includes SR 502 and SR 503.

- Clark County has designated all roadways located in urban areas with a functional classification of arterial and higher as truck routes. In rural Clark County, all roadways classified as rural major collector or above are designated truck routes. Under this criteria, non-state highway truck routes within the unincorporated portion of the study area include NE 112th Avenue, NE 132nd Avenue, 142nd Avenue/NE Axford Road, NE 244th Street, NE 239th Street, NE Heisson Road, NE 219th Street, and NE 199th Street.[5]

- NE 199th Street was recommended for designation as a City truck route in the 1995 *Transportation System Plan*, which is consistent with the County truck route designation. In addition, the 1995 *Plan* recommends a new "industrial road" parallel to and east of SE Grace Avenue, extending from NE 219th Street to NE 199th Street. This road would also be classified as a truck route.

Freight mobility issues in the study area include the high levels of truck traffic along E Main Street when the aggregate plant east of SE Grace Avenue was in operation. This traffic conflicted with vehicle and pedestrian traffic to and from the schools and commercial uses along E. Main Street. Although the site is currently used by Qwest as a maintenance center, future reuse of the site for a heavy truck-generating use may cause some of the conflicts between truck traffic, and local vehicle and pedestrian traffic to resurface.

Another freight mobility issue involves the potential for future truck traffic along NE 199th Street between SE Grace Avenue and SR 503. Almost all the land within the City east of SE Grace Avenue is zoned for industrial use, including a portion already developed. NE 199th Street connects this industrial area with SR 503 for regional access the Vancouver Urban Area and, ultimately to I-5 via either the existing interchange at NE 179th Street or the proposed new interchange at NE 219th Street. NE 199th Street is designated as a major collector in both the city and county, and truck traffic could create potential conflicts with traffic to and from schools and residential neighborhoods adjacent to the street. NE 199th Street has recently been widened from SR 503 through the intersection with SE Grace Avenue to provide one through lane in each direction, a center left turn lane, sidewalks, and bicycle lanes. Providing

[5] *Comprehensive Growth Management Plan*, Clark County, December 1994, revised June 1997, and the *Clark County Arterial Atlas*, 1998.

facilities for pedestrians and bicyclists helps to reduce potential conflicts between non-motorized travelers and heavy vehicles.

In addition to the identified truck routing issues, an on-street truck parking issue was identified by the City's police department. Currently, many of the commercial businesses along E Main Street lack on-site loading facilities, and trucks generally park in the street to load, blocking one lane of through traffic movement.

2.3.2 Freight Rail

Rail lines in the Battle Ground area are shown in Figure 2-7. The Chelatchie Prairie Railroad line runs through the City of Battle Ground east of and generally along the alignment of Grace Avenue. Clark County owns and maintains the rail line, which is leased to the Spirit of Washington/Columbia Basin Railway. The Spirit of Washington/Columbia Basin Railway runs for 33 miles from its intersection with the Burlington Northern Santa Fe railway line in Vancouver to its termination north and east of Battle Ground in Chelatchie Prairie.

The southern segment of the rail line runs from the existing train station on the south side of E. Main Street at S Grace Avenue in Battle Ground to the Vancouver rail yards. The Spirit of Washington/ Columbia Basin Railway operates two trains per week on the southern segment, mostly for freight. This segment provides rail access to the City's industrial lands east of SE Grace Avenue, and improved rail service could provide a needed stimulus for industrial development. However, funding maintenance activities is a high priority for the County at this time, and there are no plans to upgrade either the track condition or the frequency of service[6].

The north segment of the Chelatchie Prairie Railroad Line currently has no users. The Spirit of Washington/Columbia Basin Railway is proposing a passenger-only dinner train in the vicinity of Battle Ground, and there have been similar ventures in the past on this line. However, the existing condition of rail trackage in this area is marginal and there are currently no plans to update rail facilities.

2.4 PUBLIC OR QUASI-PUBLIC TRANSPORTATION

This section describes existing public and/or quasi-public transportation services in the study area. Included are services provided by C-TRAN, the existing countywide public transit service provider in Clark County; intercity bus and passenger rail service, school bus service, and emergency vehicle services and response routes.

2.4.1 Public Transit Service

Battle Ground is linked to Vancouver and the Portland Metropolitan area by the public transit services provided by the countywide transit agency, C-TRAN. C-TRAN currently provides weekday and weekend fixed route service to the City of Battle Ground connecting to a small park-and-ride lot located on the north side of E. Main Street just east of S Grace Avenue. C-TRAN also operates a paratransit service, called C-VAN, for those who are unable to use the fixed route C-TRAN service. All C-TRAN buses are also equipped with bike racks. Two fixed routes serve the City of Battle Ground, Battle Ground #7 and Battle Ground Limited #173. The two fixed routes are shown in Figure 2-7 and summarized below.

[6] Telephone Conversation with Carl Oman, Clark County (WA) Railway Coordinator, April 21, 2004.

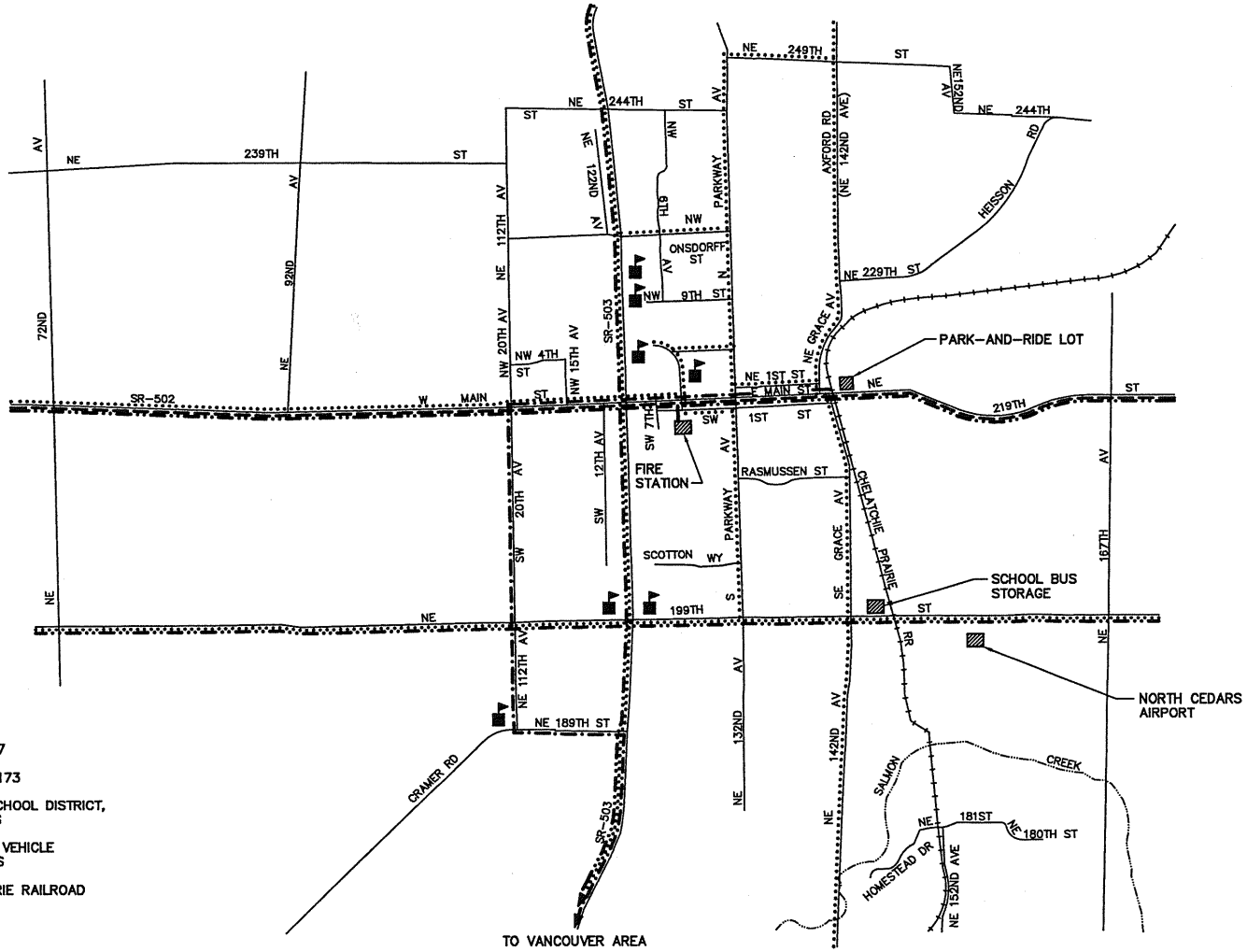

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Figure 2-7
Public/Quasi-Public Transportation Routes

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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- *Battle Ground Route #7*: provides service from the Battle Ground park-and-ride lot to the Vancouver Mall Transit Center, with buses running every 45 minutes on weekdays and every 1½ hours on weekends. Service operates between the hours of 5:45 AM through 9:20 PM on weekdays, 7:15 AM through 7:05 PM on Saturdays, and 8:45 AM through 7:05 PM on Sundays. One-way travel time on this route is approximately 35 minutes from the Battle Ground park-and-ride lot to the transit center. Route 7 makes two stops within the City of Battle Ground, including one stop at the park-and-ride lot and one stop at the intersection of W Main Street and N 12th Avenue in front of Fred Meyer.

- *Battle Ground Limited #173*: provides service from the Battle Ground park-and-ride lot to 7th Street Transit Center in downtown Vancouver, with continuing express service to downtown Portland via C-TRAN route #105. This route runs once each direction every weekday, with no weekend service. This route leaves the Battle Ground park-and-ride lot at 6:35 AM arriving at 7th Street Transit Center at 7:05 AM. In the evening, this route leaves the transit center at 5:35 PM and arrives in Battle Ground at 6:00 PM. Route #173 makes two stops in the study area, at the Battle Ground park-and-ride lot, and at Dollars Corner, located at the intersection of SR 502 and NE 72nd Avenue.

Due to projected revenue shortfalls, C-TRAN may substantially reduce service on several transit routes while eliminating other routes. In anticipation of the potential cuts, the agency drafted a Service Preservation Plan funded by a proposed 0.2 percent sales tax increase which will be voted on by Clark County residents in September 2005. The plan would preserve transit service at 2004 levels and restore service that was discontinued to some communities in 2000. In Battle Ground, the Plan would revise service on Route 7 with demand-response vehicles providing dial-a-ride service between Battle Ground and the nearest transit center. It the Service Preservation Plan is not approved by votes, Routes 7 and 173 would be eliminated, and C-TRAN would no longer provide fixed-route transit service to Battle Ground.

2.4.2 Intercity Bus Service

No intercity bus service except that provided by C-TRAN is available in Battle Ground. Privately provided intercity transit service is available door-to-door from various shuttle bus companies, primarily linking the area with the Portland International Airport, and from taxis. Greyhound Line, Inc. provides long-distance intercity bus service to it's the existing terminal in downtown Vancouver. This terminal is located on lower Main Street immediately adjacent to C-TRAN's 7th Street transit center - the major focal point for Clark County public transit service. The 7th Street transit center can be reached from Battle Ground via Route #7 with a transfer at the Vancouver Mall transit center.

According to route and schedule information that was current as of the date of this Plan, Greyhound provides daily intercity bus service along the I-5 corridor between Vancouver and destinations to both the north and south. Eight round trips are provided each day to Seattle and other destinations to the north. Five daily round trips are provided to Portland and other destinations to the south. Five round trips each day are also provided to the east connecting to Kennewick, Washington.

2.4.3 Passenger Rail Service

Access to passenger rail service, via Amtrak, can be found approximately 15 miles southwest in nearby Vancouver. The rail passenger depot located immediately north of the BNSF train bridge over the Columbia River has recently been renovated and provides on-site parking. The depot can also be reached via C-TRAN's Amtrak connection service or by taxi.

North/south passenger rail service through Vancouver is provided by the Amtrak Coast Starlight route in the California-Oregon-Washington corridor. The Coast Starlight provides one northbound and one southbound train each day. Amtrak also provides four trips per day between Portland and Seattle on its Cascades route, with a stop in Vancouver.

The intercity passenger rail line in Washington and Oregon is part of the federally designated Pacific Northwest High Speed Rail Corridor that connects Eugene, Oregon with destinations in Washington State and with Vancouver, B.C. The federal designation gives this route preference for Federal Railroad Administration funding to develop advanced technology passenger train service. The States of Washington and Oregon, in cooperation with the Province of British Columbia, are working together to incrementally improve passenger train operations in the corridor. The Washington Department of Transportation is developing Washington's portion of the corridor, with the long-range goal of *"improving speed, frequency, reliability and intermodal access of passenger rail service in the Pacific Northwest Rail Corridor."(Public Transportation and Intercity Rail Passenger Plan for Washington State, 1997-2016*, page 4-5)

2.4.4 School Bus Service

During the school year (September through mid-June) the Battle Ground School District contracts with Laidlaw Transportation to provide bus service for eligible students within the district. The School District is one of the largest in the State of Washington, covering over 300 square miles. School buses are housed on Laidlaw property near the intersection of S Grace Avenue and NE 199th Street and use many streets in Battle Ground as main travel corridors. Some of the major roads commonly used by schools buses in the Battle Ground area are illustrated in Figure 2-7. Approximately 130 bus routes are operated each school day, with many trips focused on the large high school/middle school campus complex near the city center.

Together, the high school and middle school are served by 67 bus routes each day. Buses serving the school complex from the west travel down E. Main Street and turn left onto NW 5th Avenue. Buses coming from the east travel down SW 1st Street and turn onto SW 5th Avenue, crossing E. Main Street to reach the schools. Buses use SW 1st Street because they cannot make the right turn from E. Main Street into the school entrance at NW 5th Avenue due to congestion and a tight turning radius. With over 2,000 students and an open campus policy for juniors and seniors, the high school is a particularly heavy source of traffic congestion along E. Main Street on weekday afternoons during the school year. The adjacent Lewisville Middle School also contributes to mid-afternoon traffic congestion. Of significance to the development of the *TSP* are the following observations made by school district staff[7].

Traffic generated by the school complex can causes backups along E. Main Street from SR 503 east through the intersections with 7th, 5th, 3rd and Parkway Avenues during the early afternoon, although this problem is less pronounced than it used to be since completion of the W. Main Street widening project in 2003. School bus service is provided only for students outside the City limits. Students within the city must either walk, bike, drive or get picked up by a parent or friend. In addition to the auto traffic generated by students and/or parents who reside within the city, the lack of short, well-connected, low traffic volume routes to school for pedestrians and bicyclists also contributes to school-related congestion.

The School District has implemented various actions in response to concerns about traffic congestion near the school complex. These actions include:

[7] Telephone conversation with Brenda Lester, Battle Ground School District, July 12, 2000.

- "No Parking" signs have been installed along 5th Avenue to improve bus maneuverability along this street approaching the high school.

- Parents are encouraged to drop students off at Captain Strong Elementary School (just west of the intersection of NW 9th Street and NW 6th Avenue) from which children can walk on a paved path to Lewisville Middle School and Battle Ground High School.

- Crossing guards have been hired and posted at busy foot traffic intersections including:
  - N 6th Avenue at NW Onsdorff Boulevard (7 – 8:45 AM)
  - E. Main Street at NW 5th Avenue (7-8:45 AM and 2-3:35 PM)
  - E. Main Street at NW 3rd Avenue (7-8:45 AM, lunch, and 2-3:35 PM)

- Pedestrian crossing signs have been installed in the street at major school crossing locations. According to conversations with City police officers, these signs and the presence of crossing guards have helped to reduce pedestrian and auto conflicts. They also appear to have reduced minor rear end collisions at locations where a car suddenly stops for a pedestrian and is hit by an unsuspecting motorist from behind. Crossing guards add visibility and allow students to cross only in groups, which eliminates a solid string of single crossings and helps improve the flow of traffic.

- Bus arrivals and departures are staggered as much as possible to reduce crowding.

2.4.5 Emergency Service Routes and Facilities

The City of Battle Ground contracts with Fire District #11 for fire and weekday ambulance service. Fire District #11 has a full time medic on duty from 8:00 AM to 4:00 PM, Monday through Friday. American Medical Response (AMR) from Vancouver is dispatched to cover Battle Ground at all other times.

Fire District #11 operates two facilities in the Battle Ground area. The Dollars Corner station is located near the intersection of SR 502 and NE 72nd Avenue, west of Battle Ground. The second station is located adjacent to the City's police department on SW 1st Street in downtown Battle Ground.

The main emergency routes in and around the City of Battle Ground are shown in Figure 2-7. Both the Battle Ground Police Department and Fire District #11 expressed the improved traffic conditions on E. Main Street from SR 503 to Parkway Avenue since completion of the Main Street Widening Project. They both are stationed in this area, and on occasion, traffic impedes their ability to respond from their stations in a timely manner. [8] Since completion of the Main Street Widening Project, egress and ingress to the City has improved quite a bit. The intersections of E Main Street/5th Avenue, and E Main Street/Parkway Avenue do not allow signal preemption, which is problematic for the Fire District # 11 as traffic backs up on the intersections.

2.5 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management or TDM involves using a variety of strategies to reduce travel by single-occupant vehicle during peak travel periods, and to reduce the need for additional roadway capacity. TDM strategies include, but are not limited to, use of transit, carpooling, vanpooling, working

[8] Telephone Conversation with Lieutenant Roy Butler, Battle Ground Police Department, April 21, 2004, and Chief Dan Yeager, Fire District Number 11, April 21, 2004.

flexible hours and/or a compressed workweek, and working from home with use of communications technology.

C-TRAN has been instrumental in developing and supporting the implementation of TDM programs in Clark County including the Battle Ground urban area. As a part of its mission to promote the use of alternative transportation modes and to reduce dependence on single occupant vehicle travel, C-TRAN has played a pivotal role in implementing provisions of Washington's Commute Trip Reduction (CTR) Law. The CTR requires major employers to participate in a trip reduction program if they have 100 or more full time employees at a single worksite who begin their scheduled workday between 6 and 9 AM (most construction and seasonal workers are exempted). Actions taken by C-TRAN to support CTR include employee travel surveys, carpool matching, vanpool leasing, placing advertising at schools and commercial areas to promote alternatives to driving alone, issuing grants for site improvements designed to encourage transit use, and consulting with employers to develop commute option programs. Table 2-7 lists TDM strategies that could be considered for implementation within the Battle Ground urban area. These strategies are explored in more detail in Chapter 7 of the TSP.

Table 2-7
Examples of Transportation Demand Management Strategies

Strategy	Description
Alternative Work Hours	Flex time and alternative work weeks (such as 4 10-hour days)
Bicycle Improvements	Improved bicycle planning, education and facilities
Guaranteed Ride Home	Provide a limited number of free rides home for transit and rideshare commuters
Intermodal Bicycle Services	Provision of bike lockers at transit stops; bike racks on transit vehicles
Park and Ride	Provision of commuter parking at urban-fringe transit stops
Preferential Parking	Preferential parking for rideshare vehicles
Rideshare Programs	Rideshare promotions and ride-matching
Security	Address security concerns of rideshare, transit, cycle, and pedestrian commuters
Telecommuting	Working at home to avoid commute trips
Transit Improvements	Improve public transit service
Vanpool Programs	Promotion/organization of vanpools

2.6 NON-MOTORIZED FACILITIES

This section describes existing bicycle and pedestrian facilities within the Battle Ground urban area. Included is a discussion of the types of facilities and their locations, as well as an assessment of existing needs and deficiencies.

2.6.1 Existing Bicycle Facilities

Bicycle facilities can generally be grouped into several categories: Bicycle lanes, wide shoulders, trails (also known as multi-use paths) and accessways. The Battle Ground city code defines a **bicycle lane** as *"a lane within the street right-of-way dedicated to bicycle use. Bicycle lanes may be demarked by painting, striping and/or medians".*[9] **Wide shoulders** are usually defined as roadway shoulders at least four feet wide. In both urban and rural areas they are not demarcated specifically for bicycle use. In

[9] Battle Ground City Code, Section 12.116.070.

urban areas they are not striped, and vehicles and bicyclists share the lane. Wide shoulders are striped on rural roadways and are shared by both bicycle and pedestrian traffic. **Trails** are off-street facilities intended solely for non-motorized travelers like bicyclists, pedestrians and equestrians. An **accessway** is defined as *"a pedestrian or bicycle pathway which connects to two public streets. Accessways may pass through building side or rear yards, a building complex or between lots, but not adjacent to or within the right-of-way of a public street"*.[10]

The inventory of existing bicycle facilities in the Battle Ground urban area is shown in Figure 2-8. Over the last several years, a number of the community's arterial and collector streets have been expanded to include bicycle facilities, corresponding with frontage improvements required with new residential and commercial development, as well as the completion of several capital improvement projects. The existing bicycle network provides extensive north-south connectivity on roads like SR 503, N Grace Avenue, and N/S Parkway Avenue. East-west connectivity, though not nearly as comprehensive, is provided on portions of streets like SR 502/Main Street, N Onsdorff Boulevard and NE 199th Street.

Most bicycle facilities in Battle Ground are bicycle lanes on arterial and collector streets, although wide shoulders and trails exist. Wide shoulders are located on portions of S Grace Avenue, S 7th Avenue and NE 244th Street. A multi-use path is located on the east side of SR 503 south of NE 199th Street. In spite of the numerous improvements and system additions that have been made over the past 5 years, the bicycle transportation system remains relatively fragmented. On several streets, bicycle lanes exist only on one side, and some street segments have gaps between locations where facilities are in place. Additionally, few accessways are in place in locations where bicycle (and pedestrian) traffic is circuitous.

A further discussion of the existing bicycle system, potential demand for this travel mode, deficiencies, and potential improvements is presented in Chapter 7.

2.6.2 Existing Pedestrian Facilities

Battle Ground's pedestrian facilities are typically in the form of sidewalks, trails, accessways and wide shoulders (along rural roadways). The city code defines a **sidewalk** as *"a pedestrian access adjacent to or within the right-of-way of a public road"*.[11] Similar to the bicycle network, Battle Ground's pedestrian system has expanded as a part of the roadway frontage improvements required with new development as well as completion of several capital improvement projects.
Figure 2-9 depicts pedestrian facilities on the arterial and collector street system. The map shows that the community has better north-south than east-west connectivity, and the pedestrian network is more comprehensive on the east side of the city. A majority of the streets east of SR 503 and in vicinity of E Main Street have sidewalks and crosswalks at signalized intersections. Generally, in the downtown core there are sidewalks on both sides of the street, along with crosswalks at signalized and some unsignalized intersections and wheelchair ramps at all intersections. Intersection crosswalks along E Main Street between Parkway and Grace Avenues do not have wheelchair ramps meeting ADA standards. SR 503 and portions of N/S Parkway Avenue and NW 20th Avenue have long sections of continuous walkways. The area north of Battle Ground High School in the vicinity of NW Onsdorff Boulevard also has sidewalks, crosswalks, and wheelchair ramps. Recent improvements to SR 502 (W Main Street) and NE 199th Street are contributing to improved east-west connectivity. In the remaining areas of Battle Ground, sidewalks and pedestrian facilities on the arterial and collector roadway system are sparsely located, and in general are found only near new residential and commercial development.

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[10] Ibid.
[11] Ibid.

Enhancement of pedestrian safety has been a particular focus of the city, given the concentration of academic facilities in downtown that generate substantial levels of pedestrian traffic across E Main Street during mid-day and mid-afternoon. The City and the Battle Ground School District have worked cooperatively to address pedestrian safety and congestion caused by school traffic in the downtown area. As a result, crossing guards and supplemental advisory signs have been employed along Main Street to encourage motorists to be aware of pedestrians.

A further discussion of the existing pedestrian system, potential demand for this travel mode, deficiencies, and potential improvements is presented in Chapter 7.

2.7 AIRPORTS

The privately owned, public access, North Cedars Airpark is a general aviation facility located adjacent to the southern edge of the city limits of Battle Ground, just south of NE 199th Street between NE 149th Avenue and NE 157th Avenue (see Figure 2-7). Access to the airpark is via NE 157th Avenue. This airpark is owned by the Cedars Homeowner Association and currently has 10 based aircraft. This airpark has a turf runway that is 2000 feet long by 100 feet wide, with a windsock wind indicator. This airport is used solely for general aviation and recreational purposes.

The Battle Ground Municipal Code attempts to protect land uses in the vicinity of the airport from adverse impacts associated with the operation of this airport through the application of an Airpark District[12]. This zone prescribes the clear zone at each end of the runway within which permitted uses are limited. The ordinance also restricts land uses, exterior materials or lights that would interfere with communication or visibility between aircraft and the airport.

Regularly scheduled air passenger transportation service is provided at the Portland International Airport, located approximately 20 miles to the south of the Battle Ground urban area on the south side of the Columbia River in the State of Oregon. This airport is important to the movement of people and goods by air in Battle Ground and the remainder of Clark County in that it is the only facility with regularly scheduled air passenger service and long-distance air cargo service in the north Willamette Valley and Southwest Washington.

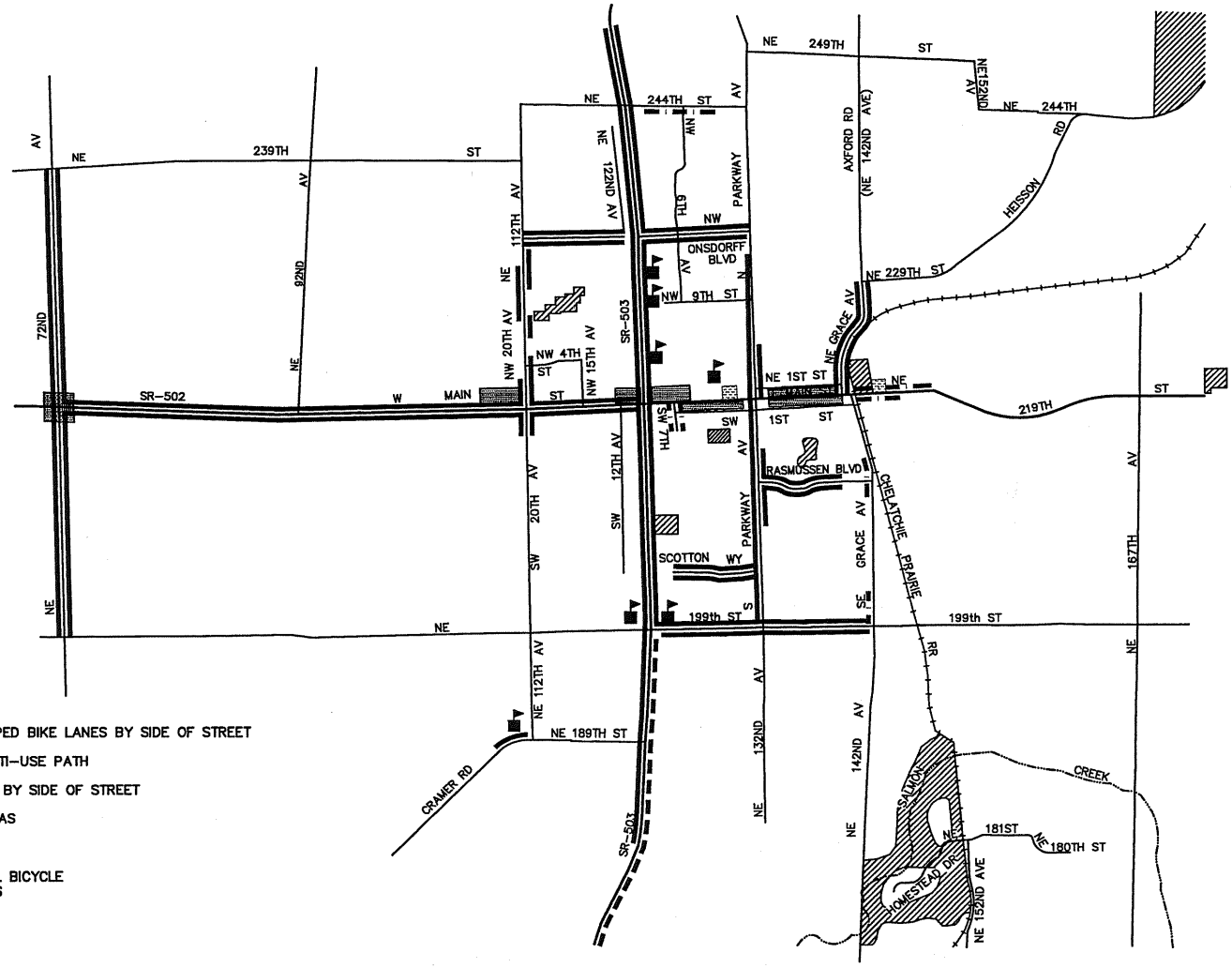
2.8 SUMMARY OF EXISTING TRANSPORTATION SYSTEM NEEDS AND DEFICIENCIES

This section summarizes existing transportation system needs and deficiencies for the Battle Ground TSP. As use of the transportation system typically knows no jurisdictional boundaries, these opportunities and constraints apply for both the study area within the city limits and the urban growth area.

2.8.1 Access to I-5

Lack of direct freeway access hinders the ability to develop the industrial area in the southeast area of the City. WSDOT has prepared an Added Access Decision Report for FHWA review and approval to identify I-5 access alternatives and impacts associated with a new interchange at NE 219th Street. Preliminary design is now underway and construction is expected to begin in 2007-2008. When constructed, this interchange would connect Battle Ground directly to I-5. Direct freeway access could further economic development in the City, including the industrial area in the City's southeast area.

[12] Battle Ground Municipal Code, Chapter 17.125.



LEGEND

- ON-STREET STRIPED BIKE LANES BY SIDE OF STREET
- OFF-STREET MULTI-USE PATH
- WIDE SHOULDERS BY SIDE OF STREET
- COMMERCIAL AREAS
- PARKS
- OTHER POTENTIAL BICYCLE TRIP ATTRACTORS
- SCHOOLS

KEY

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Figure 2-8: Existing Bicycle Facilities

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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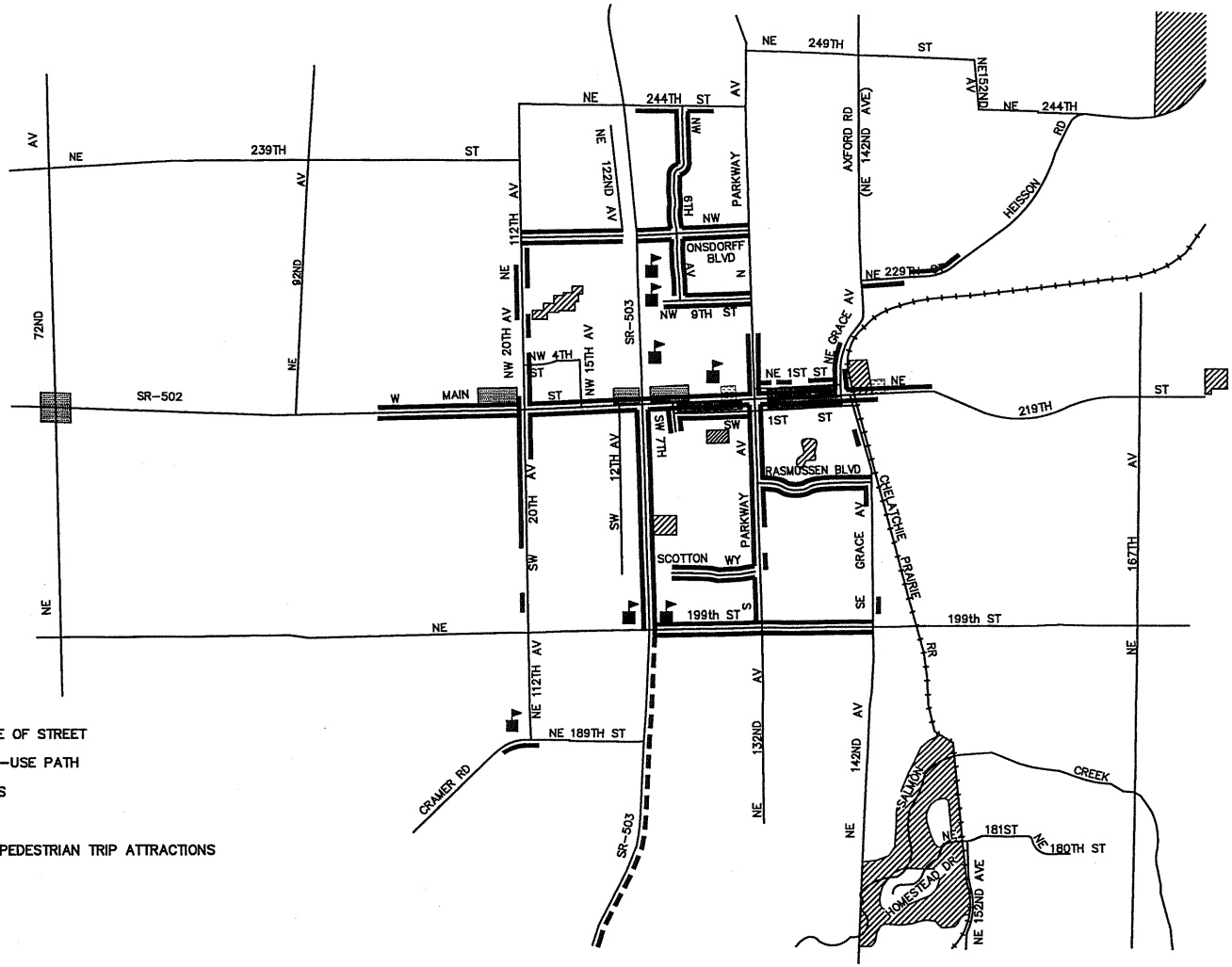

LEGEND

- SIDEWALKS BY SIDE OF STREET
- OFF-STREET MULTI-USE PATH
- COMMERCIAL AREAS
- PARKS
- OTHER POTENTIAL PEDESTRIAN TRIP ATTRACTIONS
- SCHOOLS

KEY

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NOT TO SCALE

Figure 2-9:
Existing Pedestrian Facilities

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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2.8.2 Congestion and Traffic Safety

Based on analysis of existing PM peak hour traffic volumes at key intersections in the Battle Ground UGA and including the lane channelization associated with recently completed roadway improvements along W Main Street and NE 199th Street, no intersection congestion problems exceeding the City's existing LOS standard (LOS D) were identified. Additionally, of the 12 unsignalized intersections in the study area, all currently operate with side street movements better than the LOS E standard.

Four of the key intersections studied in the Battle Ground UGA have accident rates greater than 1.0 accidents per million entering vehicles. These locations include: SR 502/SR 503, SR 503/NW Onsdorff Boulevard, E Main Street/5th Avenue, and SR-503/NE 244th Street. The accident rate at the intersection of SR 502 with SR 503 is expected to drop given recent widening to provide two east/west through lanes in each direction. It is also anticipated that the pending intersection and signalization improvement project will help to address the accident problem at the intersection of SR 503 and NW Onsdorff Boulevard. Additionally, the city is considering modifying the signalized intersection of E. Main Street with 5th Avenue to provide for protected left turn movements, particularly in the east/west direction. This improvement should help to address the existing accident problem at this location. Safety improvement recommendations are further discussed in Chapter 4 - Street Plan.

Along state highways including SR 502 and SR 503, the Washington State Patrol collects and maintains accident-related data; identifies High Accident Corridors (HACs), High Accident Locations (HALs), and Safety Risk locations; and evaluates improvement needs. According to the *2003-2022 State Highway System Plan*, there are no High Accident Locations (HAL's) or Safety Risk locations within the Battle Ground urban area. The following highway segments have been identified as High Accident Corridors (HACs):

- SR-502 MP 4.48 to MP 5.47 (West of Mill Creek Bridge to east of NE 72nd Avenue)
- SR-503 MP 6.22 to MP 7.21 (North of NE 179th Street to north of NE 199th Street)
- SR-503 MP 9.72 to MP 10.71 (North of Battle Ground to north of NE 269th Street/Potter Road)

There are currently no specific improvement proposals to address these HACs as the societal cost per mile of accidents at these locations is lower than the statewide average. The current HAC process only designates those HACs with societal costs above statewide average for further study.

2.8.3 Lack of Bicycle/Pedestrian System Connectivity

Battle Ground's bicycle and pedestrian network provides enhanced north-south connectivity, but east-west routes have fewer connections. In spite of the numerous improvements and system additions that have been made over the past 5 years, the bicycle and pedestrian transportation system remains relatively fragmented. On several streets, bicycle lanes and sidewalks exist only on one side, and some street segments have gaps between locations where facilities are in place. Additionally, few accessways are in place in locations where bicycle and pedestrian traffic is circuitous. Facilities for non-motorized travelers are mostly located in the central portions of the city while facilities on the outer portions are sparsely located and are generally found only near new residential and commercial development.

2.8.4 Right-of-way Limitations

Narrow public rights-of-way limit the ability to improve existing roadways without the purchase of additional right-of-way in much of the City, particularly the old downtown area in the east end of town.

2.8.5 Lack of Local Street System Connectivity

Many local streets in the City are dead ends, terminating in cul-de-sacs or at barricades pending further residential development. In a few locations connections are provided for pedestrian and bicycle traffic. There may be opportunities to increase local street connectivity in residential subdivisions where additional phases will be built through the design review process, and proposed implementation code changes are likely to include requirements for increased connectivity, both for vehicular and non-motorized travel. Over the long-term, implementation of provisions in the City's Legacy Street Standards should help to improve street connectivity.

2.8.6 Freight Mobility

Freight mobility issues in the study area include heavy truck traffic created by the operation of several manufacturing plants and a dairy. In the recent past, truck traffic conflicted with vehicle and pedestrian traffic to and from the schools and commercial uses along E. Main Street. Another freight mobility issue concerns the potential for future truck traffic along NE 199th Street between SE Grace Avenue and SR 503. Almost all the land within the City east of SE Grace Avenue is zoned for industrial use, including a portion already developed. NE 199th Street connects this industrial area with SR 503 for regional access to the Vancouver Urban Area and to I-5. Truck traffic could create potential conflicts with traffic to and from schools and residential neighborhoods. Trucks parking in the residential areas in the northwest quadrants of the city to serve commercial uses were also identified as a traffic issue regardless of a City Ordinance prohibiting trucks parking in undesignated areas. Some of the commercial uses lack on-site loading facilities, and trucks generally park in the street to load.

2.9 PENDING / PLANNED IMPROVEMENT PROJECTS

This section documents the planning and pending transportation system improvements in and around the Battle Ground UGA, as indicated by the City of Battle Ground, Clark County and WSDOT. Planned improvements range from short-term projects that would be implemented within the next six years, to longer term projects that are anticipated to be complete within the next 20 years.

City and County improvements are taken from their six-year Capital Improvement Plans, while improvements planned by WSDOT are from the *State Highway System Plan*, which is a 20-year planning document. No improvements in the study area are included in the State's current two-year list of funded projects. Figure 2-10 illustrates the general location of improvements planned within and near the Battle Ground urban area by the City, Clark County and WSDOT. These improvements are listed in Appendix C. WSDOT project funding is updated biennially, so although there are no projects currently on the State's two-year list, projects could be added within the six-year timeframe of the City and County CIPs. For this reason, all State projects listed in the financially-constrained 20-year plan that would affect the study area are included in Figure 2-10 and Appendix C.

Some $68 million in capital expenditures for the Battle Ground transportation system is included in the City and County six-year capital improvement programs. WSDOT does not assign project costs until improvements are programmed in the two-year list.

2.9.1 City of Battle Ground Capital Improvements Program

Battle Ground's 2005-2010 Capital Improvement Program identifies 20 projects and an investment of nearly $19 million in the City's transportation network. Battle Ground has an ambitious agenda for planned transportation improvements that will affect many facilities in the City designated as arterial or

major collectors. Extensions of SW Rasmussen Boulevard, SW 7th Avenue and SW 6th Avenue are planned. Roadway widening, including installation of bike lanes and sidewalks, is planned for N/S Parkway Avenue, SE Grace Avenue, NW/SW 20th Avenue and NE Heisson Road. SW 4th Street, SE 1st Street and NE 1st Street will also be improved to provide parallel alternative routes to E Main Street for bicycle and pedestrian travel.

2.9.2 Clark County Capital Improvements Program

The County's 2005-2010 Transportation Improvement Program includes seven projects with immediate benefit for Battle Ground although most of them are located outside of the City's Urban Growth Area. County projects include extending and improving NE 179th Street to connect with SR 503, and improvements to NE 142nd Avenue south of NE 199th Street. Intersection improvements are also planned for NE 239th Street at 72nd Avenue and 82nd Avenue, as well on NE 244th Street at Heisson Road.

2.9.3 Washington State Department of Transportation

Capital improvements for State facilities run on a two-year funding cycle, with projects selected from the 20-year *Highway System Plan*. The *2003-2022 State Highway System Plan* lists a major improvement project in the Battle Ground area. The I-5/SR 502 Interchange Project is intended to ease congestion and improve safety both northbound and southbound on I-5, improve safety at the NE 179th Street interchange by reducing congestion, improve safety on I-5 by reducing weaving between the junction of I-5 and I-205 and the existing exit, and help improve access to Battle Ground. When constructed, this new interchange will provide an additional access point from SR 502 to I-5. The new SR 502 connection also will reduce travel times by shortening the route and provide a more direct connection to I-5, a controlled access highway. The new connection from I-5 to SR 502 also will improve mobility along I-5 through north Clark County and safety at the I-5/NE 179th interchange will be further improved by reducing the number of vehicles on the northbound off ramp.

Other improvements identified for the Battle Ground area in the Highway System Plan including widening of SR 503 to six lanes from SR 500 to SR 502, widening and/or installation of intermittent passing lanes on SR 503 north of Battle Ground, and widening of SR 502 to four lanes from west of Battle Ground to connect with NE 10th Avenue and, ultimately, with the new interchange on I-5 at NE 219th Street.

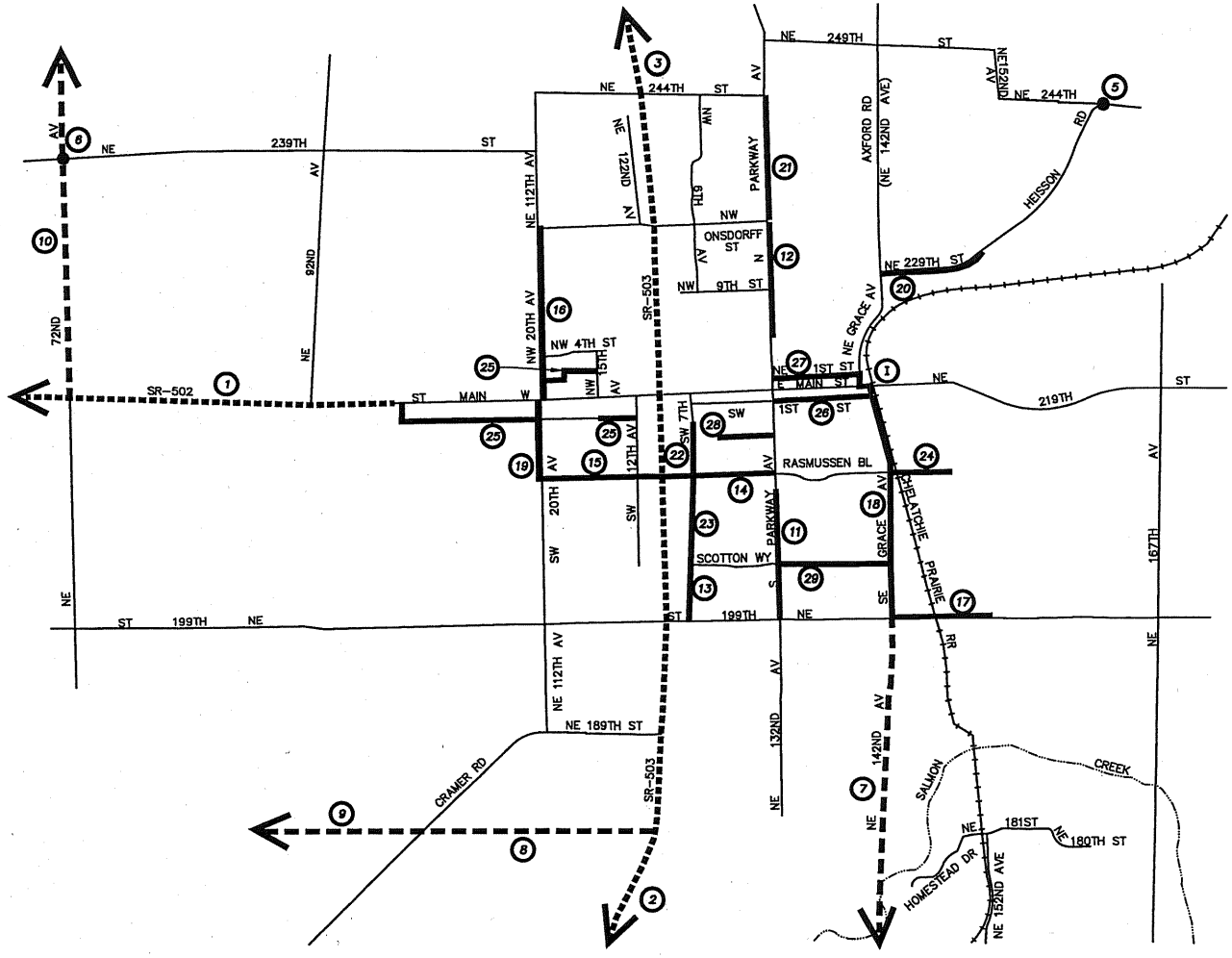

Figure 2-10
Planned / Programmed Roadway Improvements

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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3. FUTURE TRANSPORTATION SYSTEM DEMAND

3.1 INTRODUCTION

This chapter describes the development of future traffic forecasts on the road and street system in the Battle Ground UGA. These forecasts are based on projections of future population and socio-economic growth within this area, consistent with the forecasts prepared for the Clark County *Comprehensive Land Use and Transportation Plan.* Included in the chapter is a discussion of recent population and employment growth, land use and environmental issues that affect the growth, development and ultimate transportation demand in the UGA, future population and employment growth expectations to the planning horizon year of 2023, and a discussion of the travel forecasting methodology used to develop future estimates of traffic volumes along the major roadways in the UGA.

3.2 RECENT DEMOGRAPHIC CHARACTERISTICS

The City of Battle Ground is the fastest growing City in Clark County and serves as a hub community for numerous small communities and surrounding rural areas in the central and northern potions of the county. Between 1990 and 2000, the city grew by slightly over 155 percent. This compares with growth of approximately 45 percent in Clark County as a whole and 21 percent for the State of Washington. In 2004, the population of Battle Ground was estimated to be 14,220.

Table 3-1
1990-2000 Population Growth
City of Battle Ground, Clark County and State of Washington

Area	1990	2000	Percent Growth (1990 – 2000)
City of Battle Ground	3,758	9,605	155.6%
Clark County Total	238,053	345,238	45.0%
State of Washington	4,866,692	5,894,121	21.1%

Sources: City of Battle Ground, US Department of Census, PL 171 Redistricting Data

Although the City of Battle Ground included less than 3 percent of the countywide population during the 2000 census, it serves as an important regional center for business and commerce for surrounding small cities and rural communities including: Brush Prairie, Hockinson, Dollars Corner, Heisson, Fargher Lake, Amboy, Yacolt, Chelatchie, and Venersborg. In its role as a regional center, Battle Ground attracts significant traffic for shopping, school, personal business and some employment – far in excess of its own population size.

While Battle Ground is primarily a residential community, there has also been significant growth in employment between 1990 and 2000. In 1990 there were an estimated 1,422 jobs within the city. By 2,000 this has grown to approximately 4,100 employees.

3.3 LAND USE AND ENVIRONMENTAL ISSUES

Battle Ground is clearly the major growing residential and commercial center for the central and northeastern portions of Clark County. Within its four and one-quarter square miles, there is a full range of land use types that influence both existing traffic patterns and demand for transportation services, and the future growth in traffic which must be accommodated on the local, state and county roadway systems. In addition, the land uses within the city and its surrounding Urban Growth Area (UGA) are influenced and often constrained by the existing natural environment, particularly wetlands and stream corridors. The following paragraphs discuss the land use and environmental issues that are unique to the urban area and which influence land use development, and consequently the future growth and operation of the community's transportation system.

3.3.1 Land Use

The Battle Ground city center is focused around a commercial district located along SR-502 and E. Main Street between approximately 20th Avenue and SE Grace Avenue. This district serves not only residents living in Battle Ground, but also it's surrounding environs. This area is characterized both by large retail and service-oriented enterprises to the west and an older "store front" commercial center to the east hosting restaurants, service-oriented businesses, specialty retailers and government buildings. The Battle Ground School District maintains its main campus along and to the north of E. Main Street including a high school, middle school and two primary schools.

Battle Ground's residential neighborhoods are spread throughout the city. With the exception of the older neighborhoods, generally between Parkway Avenue and Grace Avenue to the north and south of E. Main Street, most of Battle Ground's neighborhoods have been developed fairly recently. Battle Ground's newest and fastest growing neighborhoods are in the northern, northwestern, and southeastern areas of the city.

There are also a variety of industrial land uses in the UGA focused primarily in the southeast corner, although there are some industrial uses along E. Main Street and on SR-502 to the west of town. These uses include primarily light manufacturing and warehousing facilities. An industrial park is in the process of development near SE Grace Avenue and NE 199th Street. This area will also have access to SE Grace Avenue via a proposed new extension of SE Rasmussen Boulevard across the railroad tracks, and ultimately to E. Main Street via a northerly extension of the sites internal roadway system.

Land in the Urban Growth Area, outside of the existing City limits, contains mostly residential or agricultural uses. While most residences in the unincorporated UGA are characterized by rural development patterns, there are some residential subdivisions such as Maple Grove. More intensive development is constrained by a lack of adequate sewer, water, and transportation facilities and by current land use regulations that limit densities.

3.3.2 Environmental Issues

Growth and development in both land use and transportation demand is strongly influenced by the existing environmental conditions within the city and it's surrounding UGA. Many of the presently undeveloped areas contain critical habitat and wetland areas that will need to be preserved or mitigated as land develops. Critical habitat areas include the East Fork of the Lewis River, and Woodin and Salmon Creeks. The federal Endangered Species Act of 1973 was passed to protect plant and animal species that could be adversely impacted by development activity.

Clark County's *Comprehensive Plan* establishes countywide policies for the conservation and protection of natural resources consistent with the requirements of the state's Growth Management Act. The Plan provides for the protection of critical areas within the unincorporated area of the county. The City of Battle Ground also adopted a Critical Areas Ordinance (CAO) in 2004 to protect the functions and values of sensitive natural resources. The purpose of the CAO was to identify and provide protections for critical aquifer recharge areas, wetlands, frequently flooded areas, geologic hazard zones, and fish and wildlife habitat.

The City's *Wetland Management Framework Plan (1997)* identified a relatively large proportion of the remaining undeveloped area within the City that is constrained by the presence of wetlands. In many locations, wetlands not only affect the viability of developing land for urban uses, they also constrain the ability to widen existing roadways to provide turn lanes, bicycle/pedestrian facilities or additional travel lanes. As population and development in the City of Battleground increases, the balance between wetland protection and development may become an issue of considerable concern for the City.

In addition to the preservation of natural resources including habitat and wetlands, the City of Battle Ground also seeks to protect people and property from injury that could be caused by flood events. The City is specifically concerned with events that affect frequently flooded areas. Frequently flooded areas are defined as areas in the floodplain subject to a one percent or greater chance of flooding in any given year including but not limited to, areas such as streams, lakes, and wetlands. Development in floodplains reduces the natural water storage capacity and increases the amount of runoff that storm events cause, which could lead to damage of public and private property.

3.4 POPULATION AND EMPLOYMENT GROWTH FORECASTS

To forecast future travel demand for the TSP, it was first necessary to establish horizon year population and employment forecasts for the Battle Ground study area. This study area includes both the 20-year Urban Growth Area (UGA) and the longer-term future urban area for development beyond 2023. Each county in Washington receives a range of estimates from the state economist, who prepares statewide population and employment growth forecasts for a 20-year future planning period. The statewide allocation process considers a wide range of demographic, economic and geographic data, such as historic and projected birth rates and family sizes, emigration and immigration rates, economic diversity, buildable land area, extent and needs of basic infrastructure, etc. The countywide allocations serve as the foundation for long-term land use and transportation planning activities carried out by local governments.

After receiving its 20-year allocation, each county then subdivides the future growth allocation based on existing city, urban growth areas, and rural area development expectations within the county. Further refinement of the state projections are made at the local level to reflect expectations for housing size and distribution and a split between retail and other employment categories. The growth expectations for the Battle Ground UGA are depicted in Table 3-2. As indicated, households and population within the UGA are expected to double between 2000 and 2023, the target year for development of local transportation plans in Clark County. Projections in Table 3-2 assume no change in the County's existing household population density of 2.69 people per residence. Retail employment is expected to grow by over 170 percent to reflect both existing trends in retail development in the Battle Ground area and to acknowledge the areas key role as a regional commercial center for central and northern Clark County. Other employment (including office, industrial, government, etc.) is expected to increase by 95 percent, roughly consistent with population growth.

Table 3-2
Population and Employment Projections for the Battle Ground Urban Growth Area

	2000	2023	Percent Growth (2000-2023)
Households	4,792	9,588	100%
Population	12,890	25,792	100%
Retail Employment	1,668	4,542	172%
Other Employment	3,907	7,612	95%
Total Employment	5,575	12,154	118%

Sources: City of Battle Ground and Southwest Washington Regional Transportation Council, 2005.

Population and employment forecasts for the Battle Ground UGA are further divided into Traffic Analysis Zones (TAZs) to be used in the preparation of detailed traffic forecasts for the streets and highways in the study area. This forecasting process is described in greater detail below.

3.5 FUTURE TRAFFIC FORECASTS

Using the population and employment forecasts developed for the Battle Ground UGA, travel demand forecasts were prepared using the RTC regional travel forecasting model, after refining the model to more closely reflect Battle Ground's existing and potential future transportation system. The modeling process is described in more detail below.

3.5.1 Travel Model Development

The analysis of future traffic volumes and roadway improvement needs was based on the forecasts developed using a subarea travel demand model prepared specifically for the Battle Ground UGA. Parametrix worked closely with the Southwest Washington Regional Transportation Council (RTC) to develop and use this subarea model. Analysis included three key steps:

- Population and employment forecasts that were prepared at the regional level were modified to reflect a refined system of traffic analysis zones (TAZs) and to ensure consistency with the population and employment forecasts allocated to the Battle Ground UGA by the County as part of its *Comprehensive Plan* update process. This refined level of detail for population and employment data allowed the subarea model to develop more detailed travel forecasts on the roadway system than is possible using the regional-level model. Boundaries of the new TAZs reflect built or planned barriers, including streets, waterways and land use categories. A map of the refined TAZ structure and a table documenting 2000 and 2023 population and employment assumptions is included in Appendix D.

- The regional model's roadway network was enhanced with additional street links to provide a greater level of detail within the UGA and provide the basis for further evaluation of improvement options. The future base network includes projects anticipated in local, regional and state plans as well as the basic roadway network that must be developed to serve future land development where no roadway infrastructure is currently in place. Throughout this task, care was taken to ensure that the model's roadway network and centroid connections linking TAZs to the network were adequate

for the analysis process. The development of a refined roadway network is described in greater detail in Table 3-3 below.

- Using the formulae in the regional model, subarea level travel forecasts were developed for the refined street system in the Battle Ground UGA. These forecasts were post-processed using the approach proscribed in "*NCHRP 255: Highway Traffic Data for Urbanized Area Project Planning and Design*" which had been modified as needed to reflect localized traffic patterns. The post-processing of model data resulted in future turning movement projections for the key intersections identified for analysis in the study area.

3.5.2 Future Roadway Network Assumptions

This section summarizes improvements to the roadway system serving the Battle Ground UGA that are planned by the City, Clark County and WSDOT, identified in the *Metropolitan Transportation Plan,* and included in the regional travel demand model as the foundation for future baseline conditions analysis. Typically, these improvements include only those projects that are reasonably anticipated to be funded over the 20-year planning period. However, as much of the anticipated growth and development in the Battle Ground UGA is anticipated to occur in areas that presently do not have urban services including roads, the baseline roadway network also includes many new roads or extensions of existing roads to access these areas.

The planned and/or pending roadway improvements reflected in the Battle Ground subarea model include the following as show in Table 3-3. Unless otherwise noted, all roadway improvements are assumed to include one travel lane in each direction with left turn channelization at key intersections. New street construction or the extension of existing streets will be primarily to serve new development or to make improved local circulation connections to reduce the level of local traffic on SR 502 and SR 503.

Table 3-3
Street and Highway Improvements Assumed in Battle Ground Traffic Analysis Model

Street/Highway	From	To	Improvement
I-5	At NE 219th Street		Construct new interchange (2007-2008)
I-5	NE 179th Street	NE 219th Street	Add auxiliary lane (2007-2008)
SR 502	West of 20th Avenue	I-5	Widen for two travel lanes in each direction with left turns (2009-2013)
NE 9th Street	East of N Parkway	NE 142nd Avenue	Establish connection to NE 229th Street
	NE 102nd Avenue	NE 92nd Avenue	Two-lane road with lefts
NW/NE Onsdorff Boulevard	N Parkway Avenue	NE 142nd Avenue	Two lane road with lefts
	NW 20th Avenue	NE 239th Street	Two lane road with lefts, full four-legged and signalized intersection at SR 503 and direct connection with 239th Street
SE Rasmussen Boulevard	SE Grace Avenue	NE 167th Avenue	Two lane road with lefts
	West of S Parkway Avenue	SW 20th Avenue	Two lane road with lefts, full signalized intersection at SR 503
SE/SW Scotton Way	S Parkway Avenue	SE Grace Avenue	Two lane road with lefts
	West of S Parkway Avenue	SW 29th Avenue	Two lane road with lefts, full signalized intersection at SR 503
NW/SW 29th Avenue	NW 15th Street	NE 239th Street	Two lane road with lefts
	W Main Street	SW Rasmussen Blvd	Two lane road with lefts

Table 3-3 Continued
Street and Highway Improvements Assumed in Battle Ground Traffic Analysis Model

Street/Highway	From	To	Improvement
NE 189th Street	East of SR 503	NE 142nd Avenue	Two lane road with lefts
NE 179th Street	West of SR 503	NE 142nd Avenue	Two lane road with lefts, full four-legged intersection at SR 503 with signalization of new westerly leg and modifications of easterly leg.
NW/SW 15th/16th Avenue	NE 244th Street	NW Onsdorff Blvd	Two lane road with lefts
	W Main Street	NE 179th Street	Two lane road with lefts
NW/SW 2nd/3rd Avenues	NW 7th Street	NE 244th Street	Two lane road with lefts
	SW 13th Street	NE 179th Street	Two lane road with lefts
NW/SW 5th/6th/7th Avenues	NW 7th Street	NE 179th Street	Two lane road with lefts, traverse of school property north of E Main Street and mobile home park south of E. Main Street is dependent on property redevelopment

New roads would also be developed in numerous other locations to provide improved local access and circulation consistent with the development of currently vacant or underdeveloped properties as proposed in the *Comprehensive Plan.*

3.5.3 Future Traffic Projections for Battle Ground UGA

Based on the population and employment forecasts for the Battle Ground UGA and the roadway network connections assumed to be in place, significant growth in traffic volumes is anticipated. Table 3-4 summarizes the anticipated growth in vehicle trips within the UGA between 2000 and 2023, and compares that growth with the anticipated growth in population and employment.

Table 3-4
Growth in Vehicle Trips within Battle Ground Urban Growth Area

	2000	2023	Percent Growth (2000 – 2023)
PM Peak Vehicle Trip Ends	3,482	7,839	125%
Population Growth	12,890	25,792	100%
Employment Growth	5,575	12,154	118%

4. STREET PLAN

4.1 OVERVIEW

This chapter discusses the recommended street system plan for the City of Battle Ground. The chapter begins with a discussion of the policy framework that establishes the parameters for planning the City's street system along with the regulations that must be addressed as street improvements are recommended. Projected 2023 future baseline traffic operations at area study area intersections are also summarized along with an inventory of intersections that are not operate within the City's level of service standards unless improvements are made. The chapter also discusses Battle Ground's neighborhood traffic calming efforts along with the recommended access management and street standards. The text concludes with the recommended goals, actions and strategies that would guide future street system planning, along with a list of specific recommended roadway improvement projects.

4.2 CONSISTENCY WITH PLANS AND POLICIES

This section summarizes relevant plans, policies and other issues that influence the development, operations and maintenance of the street and highway system within the Battle Ground urban area. Included is a discussion of city plans and policies, followed by a synopsis of relevant county and regional plans and policies. State policies related to the state highway system in the Battle Ground UGA are also discussed.

4.2.1 Local Plans and Policies

4.2.1.1 *City of Battle Ground Transportation System Plan*

The City's 1995 *Transportation System Plan* formed a starting point for development of the TSP Update. The prior TSP recommended a street and roadway functional classification system and identified appropriate street standards. At the time this plan was developed several streets were determined to be "overclassified" major or minor arterial designations has been previously identified and some of these were recommended for collector roadway designation as this would be more consistent with the role served by the facility. At the time of 1995 TSP adoption, roadways recommended for reclassification from major arterial to collector included NE 239th Street, NE 244th Street, NE Grace Avenue, SE Grace Avenue, NE Heisson Road, NE 112th Avenue, Parkway Avenue and NE 199th Street. To ensure consistency across jurisdictional boundaries, adoption of Clark County roadway standards was recommended, including standard cross-sections for collector arterial and primary industrial roadways, which are not included in the City's adopted street standards.

4.2.1.2 *Battle Ground Municipal Code*

The Battle Ground Municipal Code was recently amended to include updated street standards that were modeled after Clark County's street standards. Both City and County street standards now share common right-of-way dimensions for arterials and collectors, with slightly different widths for sidewalks, bike lanes and planter strips. City and County neighborhood collector and local street standards vary slightly in total right-of-way, as well as paved width. City street standards include detailed design criteria for elements such as allowable access and access spacing, dimensions, planter strips, sidewalks, street lighting, and parking/shoulder widths. Specifications for alleys are included in the City street standards,

including appropriate locations and dimensional requirements. A summary of the component elements of the City's existing street standards is presented in Chapter 2.

4.2.1.3 *Legacy Standards*

The Legacy Standards adopted by the Battle Ground City Council went into effect in April 1999. The standards prescribe architectural variety, streetscapes that are pedestrian friendly and street networks that connect in a grid pattern when possible. The intent of the Legacy Standards is to create a community where it is possible for people to meet on the sidewalk in front of their homes, eliminate "fenced canyons" (unwelcoming thoroughfares which have no relationship with surrounding residential uses), and human-scale architecture (designed to primarily relate to pedestrians rather than automobiles). In addition, the Legacy Standards are intended to provide a more efficient transportation system that allows people the choice of walking, bicycling or driving to their destinations. As identified in the City's Municipal Code, the standards are intended to manage growth to create a built environment that will have a positive effect long into the future, and demonstrate the City's respect for its natural setting.

4.2.2 County Plans and Policies

4.2.2.1 *Clark County Comprehensive Plan*

The Clark County *Comprehensive Plan Transportation Element* includes several goals, supporting policies and implementation strategies related to development, operations and maintenance of the street and highway system. General policies relating to Battle Ground's street system include establishing regional level-of-service standards for arterials and public transportation that ensure preservation of the region's mobility while balancing financial, social and environmental costs; and establishing major inter-modal transportation corridors that preserve mobility for interstate commerce and freight movement. The Plan also directs the County and local municipalities to establish consistent roadway, level of service and functional classification standards to the greatest extent possible.

One of the goals in the Transportation Element is to *"develop a regionally-coordinated transportation system that supports and is consistent with the adopted land use plan"*. A supporting policy states that LOS standards for the regional arterial system should direct growth to urban centers. Another goal directs Clark County to *"develop a multi-modal transportation system"*. A supporting policy calls for accommodating alternative travel modes when making physical roadway improvements. The Plan also contains a goal to *"optimize and preserve the investment in the transportation system"*. Related policies include implementing access management spacing standards to new developments locating adjacent to arterial and collector streets; utilizing transportation system management techniques like signal coordination and optimization; establishing a timely maintenance and preservation program; and providing an interconnected street system to eliminate the need for arterial and collector streets to be used for local trips. Supporting implementation strategies include establishing a Pavement Management System, incorporating intelligent transportation system techniques and requiring new developments to access collector and local streets instead of arterials. The goal of providing *"a safe transportation system"* is supported by a policy that references the need to include interim safety improvements where a significant safety problem has been identified but financing for the full improvements is not available. The policy of pursuing the acquisition of advance right-of-way for planned transportation improvements supports the goal of developing *"a balanced finance program, which ensures that new development pays the costs of its impacts and that adequate public financing is pursued and available"*.

4.2.3 Metropolitan Transportation Plan

The *Metropolitan Transportation Plan* (MTP) is prepared and adopted by the Southwest Washington Regional Transportation Council (RTC) for the urbanized portions of Clark County including the Battle Ground urban growth area. The MTP is a long-range plan that identifies how the mobility and accessibility needs of people and freight within the regional will be addressed. The MTP is supportive of local economic development goals, identifies the acceptable level of mobility for personal and freight traffic, attempts to balance multiple modes of transportation by addressing the needs of each, considers safety as a prime concern, recommends strategies that are intended to minimize and/or mitigate adverse environmental impacts, and strives to be both cost-effective and financially responsible in that recommended improvements are prioritized to acknowledge fiscal constraints.

The MTP provides guidance for the development of local Transportation System Plans through the development of regional and sub-regional population and employment growth estimates, the development of policy directives, the listing of specific regionally-prioritized improvements, and the identification of implementation strategies that should be addressed by all jurisdictions. More specifically, the MTP recommends that *"the County, local municipalities and MPO/RTPO shall, to the greatest extent possible, establish* ***consistent roadway standards, level of service standards*** *and* ***methodologies,*** *and* ***functional classification schemes*** *to ensure consistency throughout the region".*

4.2.4 State Plans and Policies

4.2.4.1 *Growth Management Act*

The Washington State Growth Management Act (GMA) contains a number of policies pertaining to the development and revision of city and county Comprehensive Plans. Although many of the policies are general in nature, the GMA addresses specific elements in a number of areas. Section 36.70A.070 outlines the mandatory elements that must be included in county and city comprehensive plans. Among the requires are *"level of service standards for all locally owned arterials and transit routes to serve as a gauge to judge performance of the system"*, as well as *"forecasts of traffic for at least ten years based on the adopted land use plan to provide information on the location, timing, and capacity needs of future growth"*. Section 36.81.121 (that was amended by GMA) mandates that six-year plans be established to guide financial investments and priorities for local transportation projects. *"The program shall include proposed road and bridge construction work and other transportation facilities and programs deemed appropriate"*. Coordination with other agencies during the development of a local transportation plan is covered in Section 47.80.030. Coordination is needed to ensure that plans for local transportation system do not conflict with those of neighboring agencies. This is intended to *"ensure the preservation of the existing regional transportation system, including requirements for operational improvements, resurfacing, restoration, and rehabilitation of existing and future major roadways"*, and will also *"make the most efficient use of existing transportation facilities to relieve vehicular congestion and maximize the mobility of people and goods".*

4.2.4.2 *Washington Transportation Plan*

The *Washington Transportation Plan* (WTP) is a statewide multimodal transportation plan that addresses transportation facilities owned and operated by the state, including state highways, the Washington State Ferries, and state-owned airports. It also addresses facilities and services that the state does not own, but has an interest in, including public transportation, freight rail, intercity passenger rail, marine ports and navigation, non-motorized transportation, and aviation.

The document is currently being updated and will be adopted by the Washington State Transportation Commission in 2005. When adopted, the WTP will cover the 2007-2026 time period and will serve as an investment proposal to the state legislature in 2007. This plan is important for the City of Battle Ground in that it identifies statewide policies, programs and financial opportunities for enhancement of the transportation system within the Urban Growth Area.

4.2.4.3 *State Highway System Plan*

While the WTP provides overall policy guidance for development of the street and highway system in the state, specific state highway needs are identified in the State Highway System Plan (HSP), 2003-2022 (WSDOT; February, 2002). The HSP is a primary element of the WTP and is updated every two years to guide WSDOT in prioritizing and budgeting for highway projects. The document is currently being updated concurrently with the remaining elements of the WTP. The current 2003-2022 Washington State Highway System Plan discusses a variety of transportation funding issues related to the state highway system and identifies specific projects to address existing and likely future mobility, safety, enhancement and environmental preservation projects. For the Battle Ground area, several proposed highway improvements have been identified as discussed in Chapter 2.

4.3 SUMMARY OF EXISTING NEEDS AND DEFICIENCIES

Chapter 2 provides a more detailed discussion of the existing street and highway system including an analysis of existing system needs and deficiencies. In summary, key issues or deficiencies that should be addressed in the street improvement plan focus on current traffic operational challenges, safety and overall street system development.

From an operations standpoint, all key intersections within the study area currently function within the city's level of service standards for signalized and unsignalized intersections. While there does not appear to be any deficiencies at these intersections, there are other general needs on the street system as a whole:

- Lack of direct freeway access hinders the ability to develop the industrial area in the southeast area of the City. WSDOT however is planning to construct a new interchange on I-5 at NE 219th Street that will provide direct access between Battle Ground and the region's freeway system.

- Street system connectivity is another issue of concern. Many local streets within the City of Battle Ground are cul-de-sacs that provide little, if any, connectivity between neighborhoods and other destinations for both vehicular and non-motorized travel modes.

- Providing new connections and adding roadway capacity in some areas is precluded by limited right-of-way. This is especially evident in the old downtown area and in the east end of the city.

It was also noted that four study area intersections currently have accident rates that exceed the thresholds established for judging whether safety improvements are needed. The intersections include E Main Street/5th Avenue, SR 502/SR 503, SR 503/NW Onsdorff Boulevard and SR 503/NE 244th Street. While recent and pending improvements would likely reduce the number of collisions in these areas, additional measures would likely be necessary and are discussed later in this chapter.

4.4 FUTURE BASELINE TRAFFIC VOLUMES

As discussed in Chapter 3, future baseline traffic volume projections were developed for the Battle Ground UGA using a subarea travel demand model developed from the regional model specifically for this TSP. Model output was post-processed using nationally accepted procedures to ensure that future turning movement projections reflected not only current travel patterns but also appropriate changes to account for new roadway connections as described in Table 3-3; changes to intersection traffic control and channelization including assumed new traffic signals on W. Main Street at 15th and 29th Avenues, and on SR 503 at NW Onsdorff Boulevard, SW Rasmussen Boulevard and SW Scotton Way; and localized changes to property access. The future forecasted turning movements are presented in Figures 4-1 and 4-2. They were used to evaluate anticipated future traffic operations and needed improvements at critical intersections throughout the city.

4.5 FUTURE BASELINE LEVELS OF SERVICE AND DEFICIENCIES

The analysis of future (2023) baseline traffic volumes to determine deficiencies and improvement needs is based on the assumed roadway network described in Chapter 3. In addition, several assumptions were made with respect to traffic control and intersection configurations at the key study area intersections. These assumptions were necessary to ensure that the intersection included all legs anticipated to be in place by 2023 and the minimum level traffic control required to make the intersection minimally functional. Specific intersection assumptions included in the level of service analysis documented in Table 4-1 included:

- SR 503 at NW Onsdorff – west leg assumed to be added and intersection signalized
- SR 503 at SW Rasmussen – east and west legs assumed to be added and intersection signalized
- SR 503 at SW Scotton – east and west legs assumed to be added and intersection signalized
- SR 502 at NE 92nd Avenue – south leg assumed to be added and intersection unsignalized
- SR 502 at 29th Avenue – assumed to be signalized
- SR 502 at 15th Avenue – south leg assumed to be added and intersection signalized
- SR 502 at 12th Avenue – signal assumed to be removed and replaced with stop-control and right-in/right-out operations on the 12th Avenue approaches.

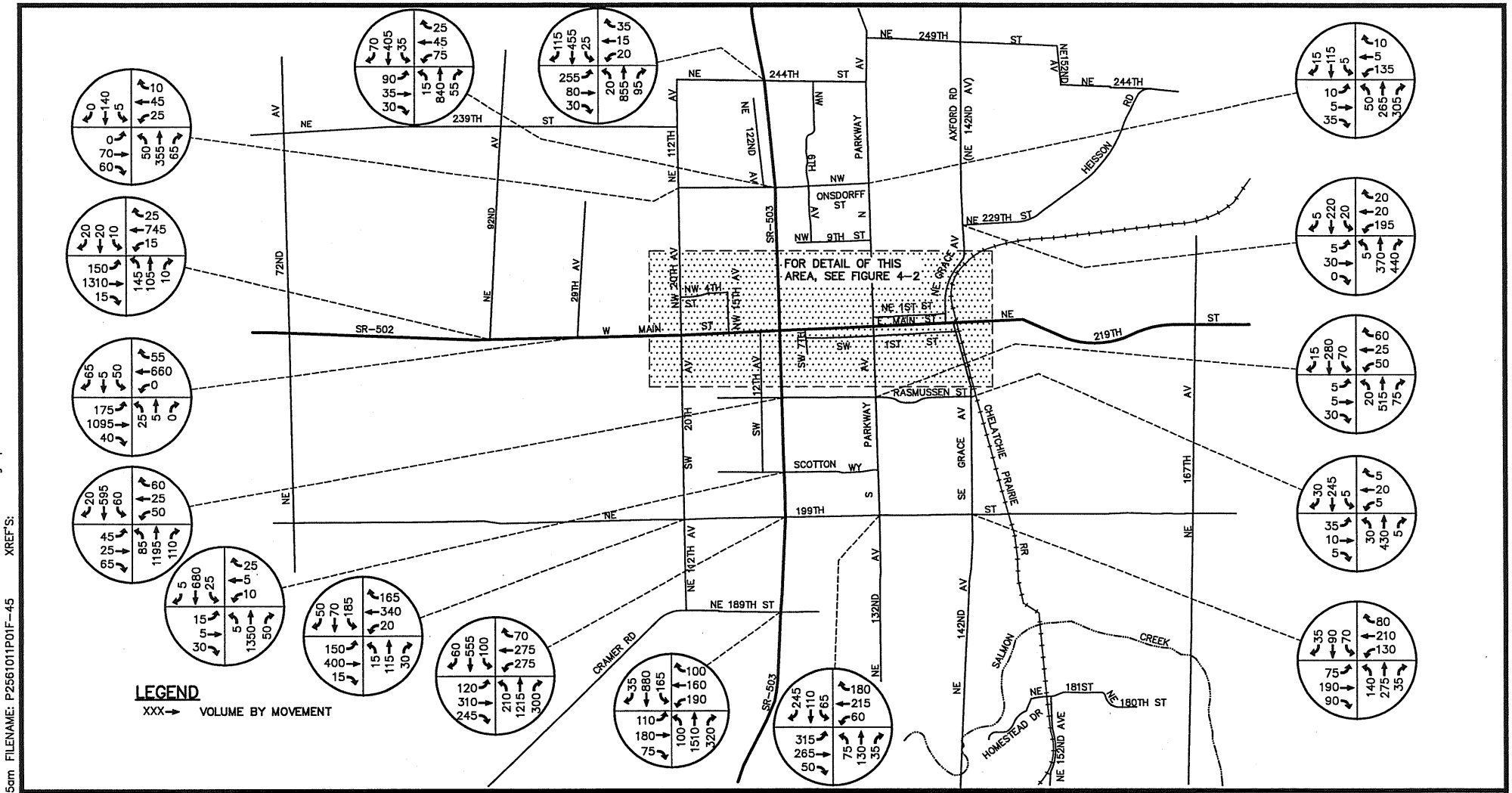
Table 4-1 summarizes projected operations at study area intersections for the 2023 future baseline scenario. Under 2023 PM peak hour future baseline conditions, a total of five intersections (including one signalized intersections and four unsignalized intersections) are expected to exceed the City's level of service standards. The one signalized intersection anticipated to exceed the LOS D standard (for signalized intersections) is the intersection of SR 503 intersections with NE 199th Street which is anticipated to operate at LOS E. Operations at four unsignalized intersections are expected to exceed the City's LOS E standard (for side street traffic operations). The northbound and southbound approaches of NE 92nd Avenue at SR 502 would experience extensive delays, as would the offset Grace Avenue intersections with E Main Street where the longest delays and queuing occurring on the southbound Grace Avenue approach. At the intersection of NE Grace Avenue and NE 229th Street, delays and queuing on the eastbound approach would be within acceptable levels, but higher volumes on the westbound approach would create unacceptable delays. The intersection of NE 199th Street and NE 112th Avenue would also exceed the City's LOS standard, with the longest delays occurring on the eastbound and westbound approaches.

Table 4-1
2023 PM Peak Hour Levels of Service for Key Intersections (1)

Signalized Intersections	V/C Ratio	Average Delay (sec./vehicle)	LOS
SR 503 (NE 10th Avenue) and NE 244th Street	0.91	34.9	C
SR 503 and NW Onsdorff Boulevard	0.67	10.1	B
SR 503 and SR 502 (W. Main Street)	1.09	52.8	D
SR 503 and Rasmussen Boulevard	0.63	12.1	B
SR 503 and Scotton Way	0.53	6.6	A
SR 503 and NE 199th Street	1.12	70.3	E
SR 503 and NE 189th Street	0.97	45.8	D
SR 502 and 29th Avenue	0.49	8.9	A
SR 502 and 20th Avenue	0.84	29.6	C
SR 502 and 15th Avenue	0.75	33.3	C
E. Main Street and Safeway Entrance/7th Avenue	0.67	14.1	B
E. Main Street and 5th Avenue	0.88	40.6	D
E. Main Street and Parkway Avenue	0.91	46.1	D
NE 199th Street and S. Parkway Avenue	0.93	30.9	C
NE 199th Street and SE Grace Avenue	0.63	12.0	B

Unsignalized Intersections	All-Way or 2-Way Stop	Critical Movement	Control Delay (sec./vehicle)	LOS
SR 502 and NE 92nd Avenue	Two-way	SBLTR	>999.0	F
		NBLTR	>999.0	F
SR 502 and 12th Avenue	Two-way	NBR	16.2	C
		SBR	17.3	C
NE Grace Avenue and NE 229th Street	Two-way	EBLTR	25.1	D
		WBLTR	130.6	F
NW Onsdorff Boulevard and NW 20th Avenue	All-way	EBLTR	8.3	A
		WBLTR	8.3	A
		NBLTR	9.4	A
		SBLTR	8.8	A
NW Onsdorff Boulevard and N. Parkway Avenue	Two-way	NBL	15.8	C
		NBTR	39.4	E
		SBL	43.8	E
		SBTR	14.4	B
E. Main Street and NE Grace Avenue	Two-way	SBLR	924.2	F
E. Main Street and SE Grace Avenue	Two-way	NBLR	130.9	F
SW Rasmussen Boulevard and S. Parkway Avenue	Two-way	EBL	36.6	E
		EBTR	12.9	B
		WBL	43.3	E
		WBTR	20.5	C
SE Rasmussen Boulevard and SE Grace Avenue	Two-way	EBL	22.1	C
		EBTR	15.4	C
		WBL	19.1	C
		WBTR	17.5	C
NE 199th Street and NE 112th Avenue	All-way	Average	202.1	F

LOS = Level of Service, based on Transportation Research Board, *2000 Highway Capacity Manual: Special Report 209.*
V/C = volume-to-capacity ratio, also based on the *2000 Highway Capacity Manual: Special Report 209.*
(1) Analysis assumes that speeds on SR-503 would be reduced to 40 mph between NE 199th Street and NE Onsdorff Blvd.



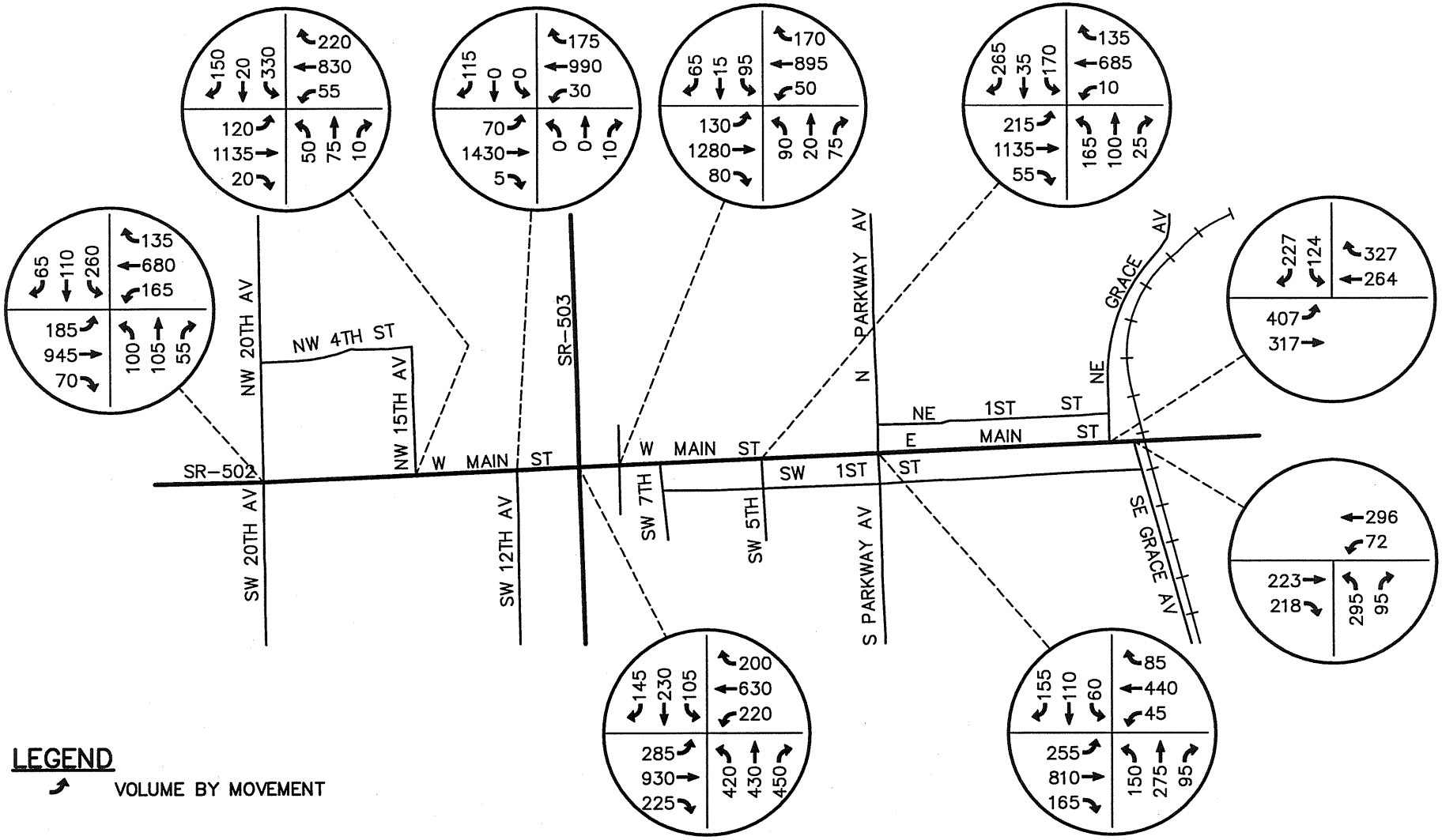
KEY

N
NOT TO SCALE

Figure 4-1
2023 PM Peak Hour
Traffic Volumes

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 08/02/05 08:35am FILENAME: P2561011P01F-45 IMAGES: BG99logo | XREF'S:



KEY

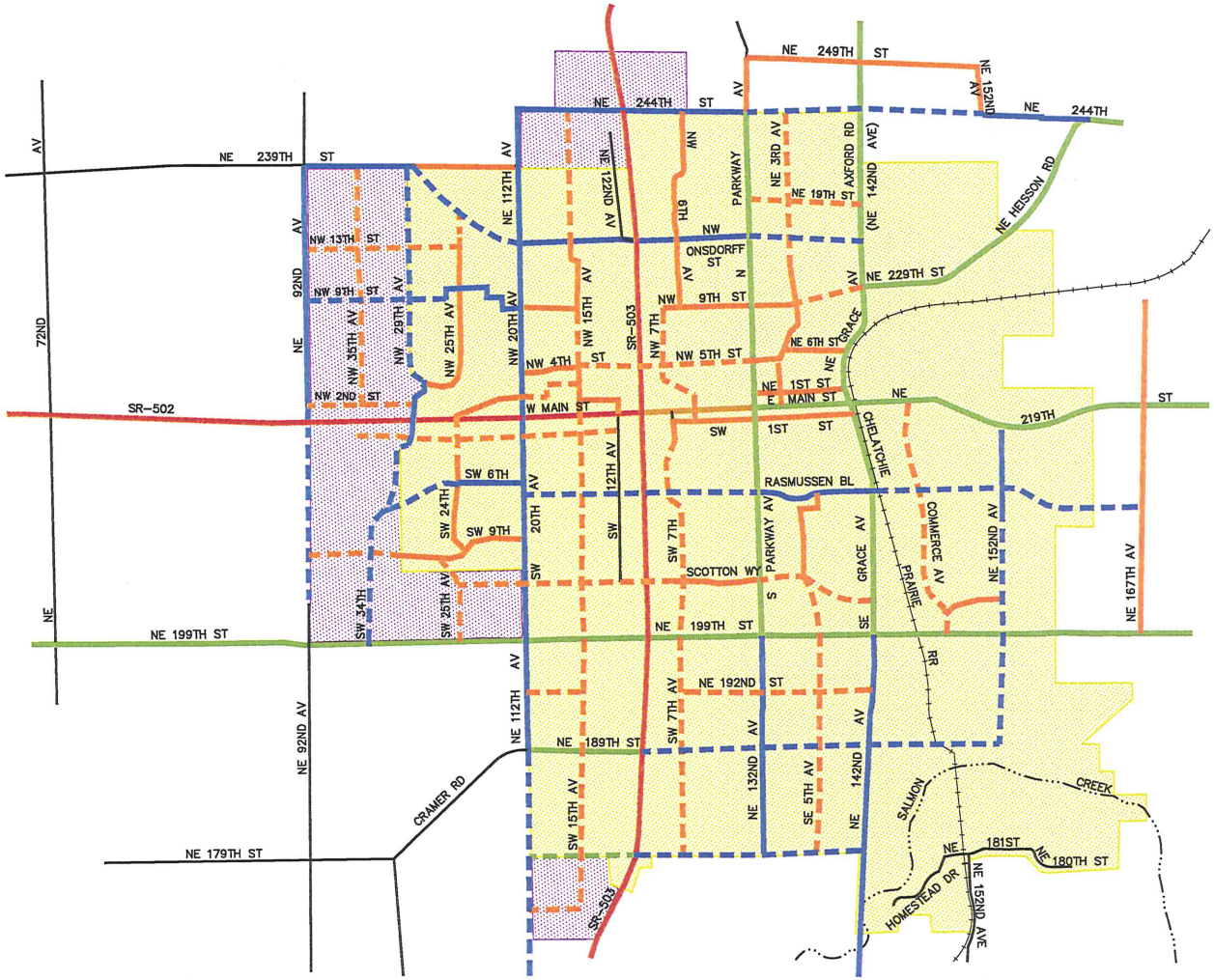
N

NOT TO SCALE

Figure 4-2
2023 PM Peak Hour Traffic Volumes (Downtown Area)

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 08/02/05 08:38am FILENAME: P2561011P01F-46 IMAGES: BG99logo | XREF'S:



LEGEND

- STATE HIGHWAYS
- PRINCIPAL ARTERIAL
- MINOR ARTERIAL
- MAJOR COLLECTOR
- NEIGHBORHOOD COLLECTOR
- EXISTING STREET
- PROPOSED STREET
- 20 YEAR URBAN GROWTH AREA
- FUTURE URBAN GROWTH AREA

KEY

N

NOT TO SCALE

Figure 4-3
Recommended Street Functional Classification System

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 10/14/05 2:19pm FILENAME: P2561011P01F-47 IMAGES: B99logo | XREF'S:

4.6 DEVELOPMENT OF THE ROADWAY SYSTEM

Battle Ground has experienced significant growth over the past decade and continued rapid growth into the future is anticipated. To accommodate this growth, new street construction and the extension of existing streets has been undertaken consistent with the recommendations in the 1995 Transportation System Plan. However, this Plan did not envision the extent of growth that is now anticipated, nor does it provide for the larger Urban Growth Area recommended in the Comprehensive Plan upon which this TSP update is predicated. Accordingly, it is necessary to address future street improvement needs beyond the improvements identified which focus on capacity enhancements to the existing street and highway system. This section will discuss the development of a "backbone" street system for those portions of the Urban Growth Area that are expected to be developed to accommodate urban-type development over the next 20 years. Street classifications for this expanded roadway system by function are also discussed.

The backbone street system developed for this TSP included both major and minor streets in the developing portions of the UGA. These streets are intended to serve the land uses anticipated for the 50-year vision and, more specifically, for the area located within the 20-year plan boundaries (the UGA). Development of the street system was based on several factors including:

- The need to provide adequate transportation capacity and access to serve the various land uses and the expected population/employment density of the study area.

- The need to develop an interconnected street system that disperses traffic over a system of roads, rather than concentrates it onto a few roads. A key elements of this objective is the system of "frontage" roads that parallel SR 502 and SR 503 to accommodate local trips without forcing traffic onto the congested state highway system.

- The need to build on the existing street system and to acknowledge the improvement recommendations in prior plans such as the 1995 Battle Ground TSP and the Clark County Arterial Street Plan.

- Consideration of major environmental constraints including wetlands, floodways and flood fringe areas, stream crossings and steep slopes. GIS-based review was also done of potential major conflicts between the proposed street system utility rights-of-way, schools, parks, cemeteries, public buildings, and electrical sub-stations.

The recommended street system plan also considers the guidance provided by several standard roadway planning references including the guide for arterial street spacing published by FHWA. This document defines roadway functions, spacing and cross-sections based on average population density. It is a useful, time-tested guide for laying out a roadway system in urbanizing areas.

4.6.1 Classification of the Roadway System

To provide for the optimal movement of people and freight while balancing mobility with the need for property access, it is important to establish a roadway system that includes facilities of all types and functions. This section discusses the concept of street functional classification and identifies recommendations both to modify the City's current classification system and to develop classifications for the new streets proposed as part of the city's backbone transportation system.

4.6.1.1 *What is Functional Classification?*

Functional classification provides a systematic basis for determining future right-of-way and improvement needs, and can also be used to provide general guidance to appropriate or desired vehicular street design characteristics. A street's functional classification is based on the relative priority of traffic mobility and access functions that are served by the street. At one end of the spectrum of mobility and access are freeways, which emphasize moving high volumes of traffic, allowing only highly controlled access points. At the other end of the spectrum are residential cul-de-sac streets, which provide access only to parcels with direct frontage and allow no through traffic. Between the ends of this spectrum are local streets, collectors and arterials, each with an increasingly greater emphasis on mobility. Classifications can be further stratified into major and minor arterials and collectors.

Presently the City of Battle Ground includes six classes of publicly-maintained streets in its functional classification system, four of which are significant for the TSP including principal arterial, minor arterial, major collector, neighborhood collector. The other two street classifications are Local Street A and Local Street B. All six classifications are depicted in Table 2-2 which describes the key features of each.

Non-vehicular modes also need to be considered in functional classification designations. The City's existing cross-sections for all publicly-maintained arterial and major collector roadways include bicycle and pedestrian facilities on both sides. The existing neighborhood collector street cross-section require sidewalks on both sides but bicycle lanes do not need to be provided along street segments where on-street parking is required. Local Streets A and B are not required to have either bicycle lanes but sidewalks are required.

4.6.1.2 *Considerations in Functional Classification System Development*

When developing a functionally classified roadway system, several factors must be taken into considerations including:

- The spacing of different street classifications. Typically principal arterials are designated every one to five miles depending on residential or employment density. Minor arterials can be designated on 1/2 mile spacing with collector roads filling in between to link neighborhoods with the arterial road system.

- Existing street classification. Predictability and long-term stability of a community's plans for growth and development is an asset to the local economy and to the quality of life in neighborhoods. Changes to existing street classifications should be carefully evaluated to ensure that change is warranted (e.g., changes in volumes or the type of traffic a street is carrying, etc.).

- Consistency with the plans and classifications of surrounding jurisdictions – Consistency in functional classifications is important to ensure that traffic crossing a jurisdictional boundary does not encounter a radically different roadway cross-section or that through traffic in one jurisdiction is not directed onto a minor street in another.

- Current patterns of traffic and use of the street – Existing levels of traffic and the types of trips served (including trip length and destinations) are evaluated to ensure that the street classification is consistent. For example, a roadway that serves longer-distance, higher speed through trips would appropriately be classified as an arterial. A street that serves to connect a residential subdivision to a shopping center may be more appropriately classified as a collector.

- Expected future patterns of traffic and use of the street – Consistent with the evaluation of current patterns and traffic and street use, an evaluation should also be made of likely or expected patterns in the future as the proposed land uses adjacent to the road develop.

Figure 4-3 illustrates the recommended functional classification system within the Battle Ground UGA.

4.6.1.3 *Consistency with County and MTP Classifications*

It is important to ensure as much consistency as possible between the City of Battle Ground's functional classification system and street standards, and those of the County for the surrounding rural area. Additionally, consistency with the functional classifications identified in the *Metropolitan Transportation Plan* (MTP) as prepared by RTC should also be maximized to reduce the potential for conflicts and maximize the efficient use of the multi-jurisdictional roadway system. Table 4-2 presents a summary comparison between the recommended street functional classifications for the Battle Ground UGA, the County's rural classification plan, the classification plan identified in the MTP, and the federal classification adopted in 2003.

Table 4-2
Comparison of Functional Classifications, Battle Ground, Clark County and MTP

Street	Battle Ground	County	MTP	Federal
SR 503 south of SR 502	State Highway	State Highway	Principal Arterial	Expressway
SR 503 north of SR 502	State Highway	State Highway	Minor Arterial	Expressway
SR 502 west of SR 503	State Highway	State Highway	Principal Arterial	Principal Arterial
NE 249th Street	*Not classified*	Rural Minor Collector	Minor Collector	Collector
NE 244th Street	*Major Collector*	Rural Major Collector	Minor Collector	Collector
NE 239th Street	*Major Collector*	Rural Minor Collector	Minor Collector	Minor Collector
NW/NE Onsdorff Boulevard	Major Collector	Not classified	Major Collector	N/A
NE 229th Street/NE Heisson Road	*Minor Arterial*	Rural Major Collector	Major Collector	Minor Arterial
E Main Street west of Parkway	*Principal Arterial*	Not classified	Major Collector	Minor Arterial
E Main Street east of Parkway	*Minor Arterial*	Rural Major Collector	Major Collector	Minor Arterial
NE 199th Street	*Minor Arterial*	Rural Major Collector	Major Collector	Minor Arterial
NE 189th Street	*Minor Arterial*	Not classified	Major Collector	Minor Arterial
NE 179th Street	*Minor Arterial*	Rural Major Collector	Major Collector	Minor Arterial
NE 92nd Avenue	*Major Collector*	Rural Minor Collector	Minor Collector	Major Collector
20th Avenue/NE 112th Avenue	*Major Collector*	Rural Minor Collector	Minor Collector	Collector
Parkway Avenue/NE 132nd Ave	*Minor Arterial*	Rural Minor Collector	Major Collector	Minor Arterial
Grace Avenue north of NE 199th Street	*Minor Arterial*	Not classified	Major Collector	Minor Arterial
NE 142nd Avenue south of NE 199th Street	Major Collector	Rural Major Collector	Minor Collector	Major Collector
NE 167th Avenue	Minor Collector	Rural Minor Collector	Minor Collector	Major Collector

Note: MTP means Metropolitan Transportation Plan, prepared by RTC, December 2003.

As indicated in this table, several existing streets and/or street extensions in the Battle Ground UGA are recommended for classifications that differ from the existing or proposed classifications or either the County or the RTC. A discussion of the more significant differences and a rationale for the recommended Battle Ground classification is presented below:

- *NE 244th Street* – this street would serve as the northern boundary or would dissect proposed employment or mixed-use residential zones near the northern edge of the UGA. With the expected growth in traffic volumes anticipated along NE 244th Street (particularly west of SR 503) and the recommended direct connection from N Parkway to NE 142nd Avenue, reclassification from the minor collector designation adopted by RTC to major collector is appropriate.

- *NE 239th Street* – this street would also form a portion of the UGA boundary and would service mixed use residential and industrial park land uses connecting to the Ridgefield area on the west and to SR 502 (via NE 244th Street) on the east. This street is currently classified as a rural minor collector by the County and a minor collector by RTC. Because of the land uses it is expected to service, the volumes it would carry and because the street would provide a parallel, higher speed, east/west alternative to SR 502, its classification as a major collector is appropriate.

- *E. Main Street* – this street is a major thoroughfare through the heart of Battle Ground. It is currently classified (east of the city limits) by RTC as a major collector and a rural major collector by the County. The street connects the original downtown and older commercial area as well as the significant industrial land resources in east Battle Ground with the SR 503 and I-5 corridors. The existing street cross-section between SR 503 and Parkway Avenue is five lanes which is consistent with the City's existing standards for a principal arterial street, as well as the 1995 TSP. The portion of E Main Street east of Parkway Avenue is currently by the city classified as a minor arterial due to its narrower right-of-way and cross-section. Due to the importance of E. Main Street in the city's circulation system and its role as a carrier of through traffic volumes, it is recommended that the existing city street classifications remain unchanged.

- *NE 199th Street* – Paralleling E. Main Street and serving as one of the major truck routes in the city, NE 199th Street connects not only destinations across the southern edge of the Battle Ground UGA, but also connects through trips from areas to the east of Battle Ground with SR 503 and I-5. Accordingly, it is recommended that this street be classified as a minor arterial, rather than the County designation as a rural major collector and RTC classification as a major collector.

- *NE 92nd Avenue, north of SR 502* – This facility is designated as a minor collector by RTC and a rural minor collector by the County, but is proposed as a major collector for the Battle Ground TSP. This road will serve as the western boundary of the UGA and will serve mixed use employment and residential areas providing north/south connectivity similar to NE 20th Avenue which is also proposed for major collector status.

- *NW/SW 20th Avenue/NE 112th Avenue* – This street was identified as a major collector roadway in the 1995 Battle Ground TSP, a designation that is not recommended for change. RTC identifies this street as a minor collector and the County classifies this street as a rural minor collector.

- *N/S Parkway Avenue and N/S Grace Avenue*– These streets were identified as major collectors in the 1995 Battle Ground TSP, but have been subsequently identified as minor arterials in the federal classification adopted in 2003. Designation as a minor arterial is recommended with the proposed 60-foot cross-section "Option A" to the city's street standards which is discussed later is this chapter.

- *NE 229th Street/Heisson Road* – This street was also designated as a major collector in the 1995 City TSP and in the regional MTP. However, in 2003 the street was designated as a minor arterial in the federal classification system. It is recommended in this TSP that the street be reclassified as a minor arterial consistent with the proposed Option A street cross-section.

- *NE 179th and NE 189th Streets*– within the Battle Ground UGA, these streets have been classified as major collectors in the 1995 city TSP and the regional MTP. As with NE 229th/Heisson Road, the street was included in the federal classification system in 2003 as a minor arterial. It is recommended that the city reclassify this street for consistency with the federal designation and implement the proposed Option A street cross-section.

4.6.2 Recommended Changes to Existing City Street Standards

Chapter 2 includes a short discussion of the city's existing street standards which include not only a classification system for all city streets but also recommended street cross-sections within the public right-of-way. To retain flexibility and ensure eligibility for state and federal funding, several streets proposed for classification as minor arterials, are proposed to be constructed within a narrower right-of-way than the existing 70-foot requirement. This alternative standard, Option A, provides for a slightly narrower bike lane, planter strip and sidewalk to be accommodated within 60-feet of public right-of-way. This cross-section would include (from one side of the street to the other): 5-foot sidewalk, 3-foot planting strip, 5-foot bike lane, 11-foot travel lane, 12-foot planted median or center turn lane, 11-foot travel lane, 5-foot bike lane, 3-foot planting strip, and 5-foot sidewalk. It is recommended that this alternative classification be adopted and incorporated into the City's street standards.

4.6.3 Access Management

The term access management refers to the process of balancing the need for access to parcels of land adjacent to roadways with the need for safe and efficient through movement of vehicular traffic on the roadway. Access management can be carried out by a variety of means. These include:

- Median controls (e.g., raised concrete dividers along the centerline of a street to preclude left turns),
- Driveway spacing and/or driveway consolidation (so that there are fewer driveways serving one parcel or multiple parcels),
- Requiring that driveways be placed on lower order streets where a parcel abuts both higher and lower order streets, and
- Intersection spacing to reduce the number of conflict points or signal-controlled locations along a street as the frequency of these locations can reduce the benefits of effective signal timing progression.

Access management is one of the tools that implements a functionally-classified roadway system. Typically, when access controls are in place, the frequency of driveways and intersecting streets is more restrictive along state highways and major arterials where the movement of traffic takes a higher priority. Access controls are less restrictive along collector streets where there is greater balance between access and mobility. Access controls are restricted only by safety considerations along local streets where property access is the primary function of the street.

Access management standards for state highways within the City of Battle Ground (SR 502 and SR 503) are discussed in detail in Chapter 2. According to WSDOT classifications, intersection spacing is limited to one intersection per mile on SR 502 and the portion of SR 503 south of SR 502. Private driveway

spacing is limited to one driveway per parcel and/or one connection to adjacent property every 1,320 feet. On SR 503 north of SR 502, intersection spacing is limited to one intersection per 1/2 mile, and private driveway spacing is limited to one driveway per parcel or every 600 feet. For all portions of SR 502 and SR 503, if reasonable access is available from the general street system, then primary property access should be provided from the general street system rather than from the state highway system.

The Battle Ground Municipal Code has provisions related to access management that are intended to ensure that the traffic-moving function of higher order arterial and collector streets is not unduly compromised by frequent property access or side street intersections. Access management enhances safety and provides maximum capacity for accommodating the higher volumes of traffic typically using the arterial and collector street system. The current code includes provisions that address intersection spacing, driveway location and access design, intersection design, provision of shared driveways between parcels, internal vehicle circulation between parcels off the city street, and the use of medians to limit vehicle movement at driveways or intersecting streets to right-in/right-out operations where necessary.

It is recommended that the City utilize access management, including access location and spacing, as a strategy to increase the capacity and safety of the transportation system. Access management strategies that could be implemented based on individual assessments of need during street design engineering or land development review might include: raised medians, access management plans, driveway consolidations, driveway relocation and closure of driveway access.

4.7 NEIGHBORHOOD TRAFFIC MANAGEMENT/TRAFFIC CALMING

4.7.1 Overview and Needs Assessment

Traffic calming refers to various design features and strategies intended to reduce the speed and overall volume of traffic on particular roadways, typically through or near residential areas. Pedestrians, residents, business customers and property owners can also benefit from implementation of traffic calming improvements in that they can result in slower traffic, fewer cars, less noise and create a more inviting environment for walking or bicycling.

Traffic calming typically consists of the progressive application of *education*, *enforcement* and *engineering*. Education can involve mailings and flyers providing information and photos or drawings of various devices, their benefits and costs. Enforcement can include passive techniques such as portable vehicle-actuated devices that display the speed of passing motorists, to citations issued by officers or by photo radar. Engineered traffic calming techniques range from very restrictive devices such as full or partial street closures, to moderately restrictive devices such as speed humps and traffic circles or roundabouts, to minimally restrictive applications like warning signs. Some devices focus on reducing speeds, while others reduce traffic volume. According to the Congress for the New Urbanism, physical changes to the roadway are generally more self-enforcing (and likely more effective) than education and traditional enforcement efforts and they may not require continual intervention.

Traffic calming has both advantages and disadvantages, and tradeoffs may need to be made. For example, residential property values may increase with slower speeds in neighborhoods, reducing the potential for crashes involving injuries or fatalities to motorists or pedestrians, but emergency vehicle response time may increase. Another typical tradeoff is between traffic noise and traffic speed; however, techniques that produce "reasonable" speeds of 25-30 mph will minimize noise of acceleration and deceleration from drivers trying to make up for slower travel speeds. Because many of the concerns that residents have about traffic problems in neighborhoods rest with perceptions, it is very important that

devices enhance the neighborhood and that the positive impacts are clearly seen as off-setting any negative impacts that are experienced.

The Battle Ground Municipal Code requires that new developments include some form of traffic calming measures on the surrounding street system. All new residential streets must include at least one of the "developer options", which comes from a list of traffic calming devices in the City Code. Table 4-3 describes traffic calming measures that developers may include in the design of new streets.

Table 4-3
Traffic Calming Measures – City and Developer Options

Traffic Calming Measure	Description
Neighborhood Entry	Travel lanes separated by a landscaped median and lined with street trees to provide a transition between collector streets and local streets
Narrower Street	Limit the expanse of pavement visible to motorists and can be effective in slowing traffic, especially when lined with trees or on-street parking
Traffic Circles	Circular raised islands centered within intersections (can be landscaped or surfaced with special paving)
Curb Extensions/Bulb-outs/ Neck-downs	Placed at mid-block locations or intersections which narrow the street to provide visual distinction and reduce pedestrian crossing distances
Signs and Neighborhood Gateways	Signs such as "Residential Street", "Local Access Only", or monuments that identify neighborhood districts used in conjunction with other techniques
Special Paving	Alternative road surfaces (including brick, colored concrete or special pavers) used at crossings, intersections or along the sides of a street to break up the visual expanse of pavement and define areas for pedestrian travel
Chicanes	Alternately placed curb extensions into the street that force motorists to drive in a serpentine pattern (can be used to keep through-trucks versus special delivery off local neighborhood streets
Off-set Intersections	Discourage through traffic alternate streets provide a more direct route (recommended only for local streets)

Source: Battle Ground Municipal Code, Section 12.116.080.

In addition to the traffic calming techniques described in Table 4-3, the City has the option of implementing additional measures, including:

- Neighborhood speed watch programs
- One-way entry and exits (curb bulb outs to close one lane of traffic at an intersection)
- Forced turns and partial diverters
- Diagonal diverters
- Speed humps and speed tables
- Cul-de-sac streets

While the intent of traffic calming measures is usually to reduce traffic speeds or volumes, many of these measures may also have benefits for creating a more pedestrian-friendly environment. Some of the traffic calming strategies that are particularly effective in enhancing pedestrian circulation include:

- *Pedestrian Refuges* provide a place of refuge when mistake is made crossing the street. It permits crossing one direction of traffic at a time.
- *Curb Extensions* reduce crossing distance and increase crossing opportunities by permitting use of shorter gaps in traffic.
- *Overhead Warnings* to alert motorists.

- *Marked Crossings* (parallel to traffic rather than perpendicular) to alert motorists to high use crossings
- *Advance Warning Sign* to alert motorists of approach to crossing; "Fines Double" Warnings
- *Flashing Beacons* to alert motorists and provide positive indication for enforcement. These are turned on and off by City computers through pagers.

Each of the traffic calming strategies identified above has appropriate applications that address one or more of the concerns typically expressed by residents. To implement a traffic calming program, the City of Battle Ground should involve affected neighborhoods in considering all of the aspects in the "toolbox" of potential strategies to determine what action(s) will be most effective in addressing the perceived problem and what will be the most effective to the affected community.

Traffic calming design involves both science and art. The following are guidelines for traffic calming best practices:

- Traffic calming planning should include adequate public involvement.
- Involve experts familiar with the latest traffic calming resources and design standards.
- Planners should consider a variety of traffic calming devices, rather than relying on a single type, such as speed humps or rumble strips.
- Traffic calming projects should support multiple objectives, including enhanced street aesthetics, improved walking and cycling conditions, as well as controlling traffic speeds.
- Stop signs should not be used as traffic calming devices. Many studies have shown that average travel speeds can actually increase between stop signs if it is perceived that there are too many of these devices.
- Devices that are new to an area should be implemented on a trial basis with adequate signing. For example, the first traffic circles in an area should have signs showing the path vehicles should follow. After a few years such signs become unnecessary.

4.7.2 Traffic Calming Program

This section outlines the process for implementing a neighborhood traffic management or traffic calming program in the City of Battle Ground, based on materials drawn from communities throughout the Pacific Northwest and the rest of the country. Typically, this process is based on the submission of requests from citizens to address specific neighborhood traffic management problems. It is recommended that the process be undertaken annually in conjunction with the City's budgeting cycle to ensure that the highest priority projects can be identified and funded. A traffic calming program would address only non-arterial or collector streets and would not be implemented on either County roads or state highways.

Step 1 (Petitioners and City): Determine eligibility. Following submission of a request, staff determine eligibility. Criteria that have been used elsewhere to determine eligibility of a street for traffic calming-type improvements include such factors as:

- The street has a posted speed of 30 mph or less
- 85 percent of daily traffic on the street exceed the posted speed limit by 5 mph OR cut-through traffic is at least 25 percent of all traffic based survey data
- Alternate primary emergency response routes are available
- The street has no more than two lanes
- The street has a functional classification of minor collector or lower

Step 2: (Petitioners): Collect support. An initial ballot identifying the problems and potential traffic calming solutions should be distributed and collected from all residences on the affected street or nearby parallel streets which may be impacted by installation of traffic calming devices. In order to be advanced to the City Council, a majority of affected residents must favor traffic calming.

Step 3: (City and/or Designated Committee/Board): Prioritize requests. A citizen group such as a Traffic Commission or other body evaluates and prioritizes proposed traffic calming projects. Priority is established based on factors including existing traffic volumes and 85th percentile speeds, availability of alternate emergency vehicle routes, potential for negative impacts on adjacent streets (primarily traffic diverted from the subject street), and how effectively the identified problem(s) can be resolved through the use of traffic calming techniques.

Step 4: (City Staff): Evaluate Problem and Determine Appropriate Solution(s). Evaluate data and field conditions and design a proposed traffic calming project. Staff should incorporate the following guidelines in developing the project:

- Provide an avenue for ongoing public input.
- Involve experts familiar with the latest traffic calming resources and design standards, through either direct involvement as consultants or advisors, or review of the literature by staff.
- Consider a variety of devices, rather than relying on one type of device such as speed humps or traffic circles. Reinforce the understanding that stop signs are not appropriate traffic calming devices.
- Support multiple objectives, including enhanced street aesthetics, improved walking and cycling conditions, as well as maintaining appropriate traffic speeds.
- Locate traffic calming devices at an adequate distance from intersections, driveways and horizontal curves, considering sight distance, turning movements and other constraints. Avoid installing traffic calming devices on slopes greater than five percent to the extent possible, and do not install devices on slopes greater than eight percent.
- New devices should be implemented on a trial basis with adequate signing. For example, the first traffic circles in an area should have signs showing the path vehicles should follow. After a few years such signs become unnecessary.
- Avoid traffic calming devices that will reduce speeds by more than 15 mph. As an example, if the 85th percentile speed is greater than 35 mph, devices with 20 mph design speeds – such as 14-foot speed humps – should not be used.

Step 5: (City Council): Project Approval. Final approval of the recommended project and authorization of funding for implementation.

4.7.3 Traffic Calming Recommendations

It is recommended that the City implement a formal traffic calming program based on the requirements and measures described in the Municipal Code with the objectives of lowering vehicular speeds, providing a human-scale environment, facilitating pedestrian crossings and minimizing adverse impacts on the character and livability of neighborhoods and business districts while still allowing for emergency vehicle access. This program should be comprised on two primary elements:

- Identify and provide for traffic calming street improvements focused on non-arterial or collector streets to achieve program objectives.

- Utilize design techniques for local streets, such as reduced widths and lengths, curb extension and other traffic calming measures to achieve the objectives identified above.

4.8 RECOMMENDED ACTION PLAN

This section discusses the recommended action plan for improving Battle Ground's street system in the coming decades. This section begins with the recommended goals, objectives and action strategies that will serve as a guide for implementing street system improvements. The section maps a recommended functionally-classified roadway system and includes a list of specific projects to augment roadway and intersection capacity, and to build the new or extended roadway system needed to provide for community mobility and accessibility. The section concludes with a discussion of safety improvements and on-going roadway system management activities.

4.8.1 Goals, Objectives and Action Strategies

Transportation Goal 1. The City will encourage the construction of a transportation system that enhances the City's livability

Transportation Objective (TO) 1.1. The City will use transportation improvements to help implement the Comprehensive Land Use Plan

Transportation Action 1.1.1. *As a part of development review, the City will determine how to best integrate land uses with transportation improvements, including what land uses fit best next to arterial roads.*

TO1.2. The City will work to preserve the gateways identified in the 50-year Vision through transportation improvements

TA1.2.1. *When possible the City will acquire sufficient right-of-way in gateway areas specified in the 50-year Vision to protect the resources that make the gateways special.*

TA1.2.2. *The City will work with the County's transportation department and the Washington Department of Transportation to establish right-of-way and access standards for the gateway areas.*

TO1.3. The City will consider a system of arterials and collectors that provides both transportation and open space

TA1.3.1. *The City will identify and prioritize streets for urban upgrades and streetscape enhancements.*

TA1.3.2. *New streets will be built to standards that incorporate urban street elements and streetscape enhancements.*

TO1.4. The City will strive to build a transportation system that supports the City's liveability objectives (found in the Livability Element)

TA1.4.1. *The City will periodically review and amend, as appropriate, its transportation standards where changes are required to help implement the City's Livability objectives.*

TA1.4.2. *The City will work with the Washington Department of Transportation to improve the character of SR 502 and SR 503 in a manner consistent with the City's 50-year Vision.*

TO1.5. Where possible, the City will build a transportation system that will also provide recreation opportunities for the residents of Battle Ground

TA1.5.1. *The City will identify transportation improvements that are also recreation opportunities and coordinate those improvements with parks and recreation improvements.*

TO1.6. The City will strive to create a transportation system that includes right-of-way areas as public gathering spaces

TA1.6.1. *The City will review and amend, as appropriate, its land development and construction standards to capitalize on opportunities to include public spaces in the right-of-way.*

Transportation Goal 2. A transportation system that is safe

TO2.3. The City will work to enhance the safety of the motor vehicle system

TA2.3.1. *The City will develop programs to moderate motor vehicle speeds where appropriate and through a variety of means, including traffic calming, roadway design, education and enforcement.*

TA2.3.2. *The City will establish design guidelines for traffic circles and roundabouts and use these techniques to improve safety throughout the City.*

TA2.3.3. *The City will identify and implement access management improvements necessary to improve safety.*

TA2.3.4. *The City will identify and implement solutions for intersections and corridors where lighting does not meet standards for auto, pedestrian or bicycle safety.*

TA2.3.5. *The City will work with the Washington Department of Transportation to evaluate the speeds and other safety issues on SR 502 and SR 503.*

Transportation Goal 3. A transportation system with a variety of transportation options (EDA1.1.3, EA8.1.1)

TO3.5. The City will seek alternative means of meeting travel demand

TA3.5.2. *The City will continue its participation in the Bi-State Transportation Task Force to explore multi-modal options for improvement in the I-5 and I-205 corridors.*

Transportation Goal 4. A transportation system that provides for the efficient movement of goods and services

TO4.1. The City will work to improve the freeway access to the City

TA4.1.1. *The City will work with the Washington Department of Transportation and other jurisdictions to establish a freeway interchange at 219th.*

TO4.2. The City will work to provide access to industrial employment and commercial centers in the City

TA4.2.1. *The City will identify priority access routes for industrial and employment areas and establish standards to protect the capacity of these routes while respecting critical areas.*

TA4.2.2. *The City will evaluate transportation needs in economic sub-areas of the City including East Main and the designated Regional Center and determine the improvements required to improve economic development opportunities in these areas.*

TO4.3. The City will work to balance parking and loading needs with other City goals

TA4.3.1. *The City will develop a parking plan for the commercial areas of town, starting with the East Main Street area.*

TO4.5. The City will work to implement the transportation system improvements identified in the Transportation System Plan

TA 4.5.1. The City will prepare, update on a regular basis, and implement its 6-year Capital Improvement Program consistent with the TSP.

Transportation Goal 5. A transportation system that balances accessibility and mobility

TO5.1. The City will work to reduce the negative impacts of transportation improvements on the community

TA5.1.1. The City will build roads to a maximum of five lanes.

TA5.1.2. The City will strive to make more efficient use of the existing transportation system through better access management, signal timing and other appropriate strategies.

TA5.1.3. The City will balance new road improvements with other City goals, including environmental and livability goals.

TO5.2. The City will strive to improve circulation throughout the City to reduce reliance on the major city streets

TA5.2.1. The City will work closely with the Washington Department of Transportation to provide access across State Routes 502 and 503 to support the City's street grid system, signal modifications, appropriate speed zoning, and corridor preservation.

TA5.2.2. The City will develop standards for frontage and backage roads to reduce traffic on major city streets and/or state highways.

TA5.2.3. The City will focus on creating a grid street system and strictly limit the use of cul-de-sacs.

TO5.3. The City will strive to give access priority to schools and other civic uses

TA5.3.1. The City will work with the school district to develop an access management plan.

TO5.4. The City will work to improve access management along major city streets to improve mobility

TA5.4.1. The City will refine its street standards to identify an access management strategy and prioritize where and when access improvements should be made.

TO5.5. The City will work to protect future transportation routes

TA5.5.1. The City will refine mapping of future transportation routes and determine the right-of-way needed to meet future travel demand.

TA5.5.2. The City will work with the County and other agencies to preserve future right-of-way as needed and ensure consistency of planned improvements across jurisdictional boundaries.

TO5.6. The City will strive to minimize travel time between Battle Ground and the I-5 freeway

TA5.6.1. The City will work with the County and the Washington Department of Transportation to maintain good access control along the roads connecting Battle Ground to I-5 to enhance the movement of through traffic.

TO5.7. The City will work to decrease intersection conflicts that increase travel time and prohibit accessibility

TA5.7.1. The City will investigate the use of modern roundabouts as a method to improve intersections without additional traffic signals.

TO5.8. The City will seek to balance motor vehicle mobility with pedestrian, bicycle and transit accessibility

TA5.8.1. *The City will seek ways to improve bicycling and pedestrian accessibility and allocate appropriate funding to these improvements.*

TA5.8.2. *The City will seek ways to improve both transit accessibility and mobility through improvements and partnership with C-TRAN.*

Economic Development Goal 1. The City encourages a strong, independent and broad-based economy in the City

EDO1.1. The City will work to remain the economic activity center for central Clark County

EDA1.1.1. *The City will plan for an adequate multimodal transportation network to allow access to regional services* (TG3).*

Economic Development Goal 2. The City encourages regional economic development strategies

EDO2.1. The City will maintain a strong working relationship with other public and private entities that will influence the implementation of Battle Ground's 50-year vision (EA5.1.3)

EDA2.1.2. *The City will work with Clark County to address transportation and other infrastructure issues that will help Battle Ground achieve its short-term and long-term economic development goals.*

4.8.2 Recommended Changes to Functional Classification

Based on an assessment of the existing and potential future use of the roadway system in the Battle Ground UGA, several changes in the City's existing functional classification system are proposed. These changes are illustrated in Table 4-4. The full system of functionally-classified roads is illustrated in Figure 4-3.

Table 4-4
Recommended Changes to Battle Ground Functional Classification

Street	Old Classification	New Classification	Discussion
SR 503, south of SR 502	Principal arterial	State Highway	Indicates both jurisdictional responsibility and nature of traffic using this facility which distinguishes it from city streets or county roads.
SR 502, west of 20th Avenue	Principal Arterial	State Highway	Indicates both jurisdictional responsibility and nature of traffic using this facility which distinguishes it from city streets or county roads.
SR 502, east of 20th Avenue	Minor Arterial	State Highway	Indicates both jurisdictional responsibility and nature of traffic using this facility which distinguishes it from city streets or county roads.
NE 199th	Major Collector	Minor Arterial	Responds to significance of this street as a through route connecting Battle Ground and areas east with SR 503 and I-5. Major truck route serving Battle Ground's existing industrial land resources.
NE 92nd Avenue	Minor Collector	Major Collector	Serves as western edge of UGA and provides access to mixed use employment and residential areas.

Table 4-4 Continued
Recommended Changes to Battle Ground Functional Classification

Street	Old Classification	New Classification	Discussion
N/S Parkway Avenue	Major Collector	Minor Arterial	Provides significant traffic distribution function within UGA
N/S Grace Avenue	Major Collector	Minor Arterial	Provides significant traffic distribution function with UGA
NE 229th Street/ NE Heisson Road	Major Collector	Minor Arterial	Provides significant traffic route to/from UGA and rural areas to the east and north
NE 189th Street	N/A	Minor Arterial	Future significant traffic distribution function
NE 179th Street	Rural Major Collector	Minor Arterial	Future significant traffic distribution function

4.8.3 Recommended Level of Service Standards

Based on the assessment of future land use and its associated growth in traffic congestion and roadway improvement requirements, it is recommended that the City endorse Level of Service (LOS) D as the operating standard for signalized intersections and Level of Service E for stop-controlled side streets at unsignalized intersections. It should be noted that this standard is not consistent with the existing state and regional standards for SR 502 and SR 503 in the Battle Ground UGA. WSDOT and RTC have designated these highways as rural facilities with a LOS C standard. It is recommended that WSDOT and RTC consider modifying their LOS C standards for these highways in the UGA to be consistent with the City's standard.

4.8.4 Recommended Street System Improvements

This section presents recommendations to enhance and expand the existing street and highway system in the Battle Ground UGA. Included are projects that address the congestion problems that were identified by the 2023 intersection traffic operations analysis; projects that expand upon or improve existing streets; and recommended new street construction to provide access and circulation in the portions of the UGA that are expected to be developed over the next 20 years.

4.8.4.1 *Improvements to Address Congestion*

Stated previously, one signalized and four unsignalized intersections are expected to exceed Battle Ground's level of service standards under 2023 baseline conditions. The signalized intersection is located on SR 503, and the unsignalized intersections are located throughout the city. A variety of street improvements are recommended to bring the deficient intersections into compliance. Improvements include signalization, modifying intersection traffic control and adding lane capacity. Table 4-5 outlines the recommended improvement projects that would enable the intersections to operate within City level of service standards. This table also includes the intersection improvements assumed to be in place for the level of service analysis as described earlier in this chapter.

Table 4-5
Recommended Intersection Improvements

Project No.	Street	Limits	Improvement
A	SR 503 and NW Onsdorff Blvd	At intersection	Add fourth (westerly) leg of intersection and signalize
B	SR 503 and SW Rasmussen Blvd	At intersection	Add east and west legs of intersection, signalize
C	SR 503 and SW Scotton Way	At intersection	Add east and west legs of intersection, signalize
D	SR 503 and NE 199th Street	At intersection	Add eastbound right turn lane
E	SR 502 and NE 92nd Avenue	At intersection	Signalize
F	SR 502 and 29th Avenue	At intersection	Add fourth (southerly) leg of intersection and signalize
G	SR 502 and 15th Avenue	At intersection	Add fourth (southerly) leg, add second southbound left turn lane; signalize
H	SR 502 and 12th Avenue	At intersection	Remove signal and restrict 12th Avenue movements to right-in/right-out
I	E Main Street and NE/SE Grace Avenue	On E. Main Street between north and south legs of Grace	Realign intersection to four-legged configuration and signalize
J	NE 199th Street and NE 112th Avenue	At intersection	Add southbound right turn lane and signalize
K	NE Grace Avenue and NE 229th Street	At intersection	Add northbound right turn lane and convert intersection to all-way stop
L	NE Onsdorff Blvd and N Parkway	At intersection	Install all-way stop or modern roundabout

Recommended improvements at the existing signalized intersection include adding a dedicated turn lane where none exists. The intersections of SR 502 at NE 92nd Avenue as well as NE 199th Street at NE 112th Avenue would need to be signalized in order to bring operations within city standards (an additional southbound right turn lane would also be necessary at the NE 199th Street/NE 112th Avenue intersection). Operations at NE Grace Avenue at NE 229th Avenue could be improved by adding stop signs to all approaches and by adding a northbound right turn lane. To bring the intersections of E Main Street at NE/SE Grace Avenue into compliance, the north and south legs of Grace Avenue would need to be realigned to eliminate the existing off-set and the intersection would need to be signalized.

Table 4-6 summarizes anticipated intersection operations with implementation of the recommended improvements listed in Table 4-5. Providing additional turn lanes at the intersections of SR 503 at SR 502 and NE 199th Street would bring operations within the City standards. Operations would also improve through signalization and land channelization modifications at the intersections of SR 502 with 92nd Avenue, E Main Street with NE/SE Grace Avenue, and NE 199th Street with NE 112th Avenue. Restricting access on NW/SW 12th Avenue to right-in/right-out movements at SR 502 would improve operations on the 12th Avenue approaches. At the intersection of NE Grace Avenue and NE 229th Street, implementation of all-way stop-control and adding a northbound right turn lane would enable the intersection to operate within City standards.

Table 4-6
2023 PM Peak Hour Levels of Service for Recommended Improvements at Key Intersections (1)

Signalized Intersections		V/C Ratio	Average Delay (sec./vehicle)	LOS
SR 503 and NE 199th Street (1)		0.95	51.4	D
SR 502 and NE 92nd Avenue		1.05	44.3	D
E. Main Street and NE/SE Grace Avenue		0.80	17.6	B
NE 199th Street and NE 112th Avenue		0.78	23.9	C
Unsignalized Intersections	**All-Way or 2-Way Stop**	**Critical Movement**	**Control Delay (sec./vehicle)**	**LOS**
SR 502 and 12th Avenue	Two-way	SBR	17.3	C
		NBR	15.3	C
NE Grace Avenue and NE 229th Street	All-way	Average	15.1	C

LOS = Level of Service, based on Transportation Research Board, *2000 Highway Capacity Manual: Special Report 209.*
V/C = volume-to-capacity ratio, also based on the *2000 Highway Capacity Manual: Special Report 209.*
(1) Analysis assumes that speeds on SR-503 would be reduced to 40 mph between NE 199th Street and NE Onsdorff Blvd.

4.8.4.2 *Improvements to Existing Streets and Highways*

Table 4-7 summarizes recommended improvements to existing streets and highways to address a variety of needs. Projects identified for WSDOT are included in the 2003-2022 State Highway System Plan for state facilities in or near the Battle Ground UGA. Projects identified for Clark County are included in the County's 2005-2010 Transportation Improvement Program. Improvements identified for the City of Battle Ground include all recommended enhancements to the existing urban street system that are not included in Table 4-5 for specific intersections. Some of these improvements augment and support the intersection-specific improvements that are recommended to address potential future traffic congestion. Others are identified as a necessary part of incorporating a rural county road into a more urban environment. Improvements would typically include widening to the cross-section identified in the City's street standards for the appropriate functional classification. Also included would be sidewalks, bike lanes, storm drainage, lighting, and landscaping.

Table 4-7
Recommended Improvements to Existing Streets and Highways

Project No.	Location	Limits	Improvement Recommended
WSDOT Highway Improvements			
1	SR 502	Duluth to Battle Ground west city limits	Widen to 4 lanes with two-way left turn channelization
2	SR 503	SR 500 to SR 502/Main Street	Widen to 6 lanes
3	SR 503	SR 502/Main Street to NE 132nd Avenue	Intermittent passing lanes or widen to 4 lanes
4	I-5/SR 502	I-5/SR 502 Interchange Project	New interchange on I-5 in the vicinity of SR 502, locally known as NE 219th Street

Table 4-7 Continued
Recommended Improvements to Existing Streets and Highways

Project No.	Location	Limits	Improvement Recommended
Clark County Road Improvements			
5	NE Heissen Rd./NE 244th St.	At intersection	Improve to 2-lane rural major collector standard
6	NE 72nd Avenue and NE 239th Street	At intersection	Upgrade intersection
7	NE 142nd Avenue	NE 199th Street to NE 159th Street	Improve to 2-lane rural minor collector standard, south of City of Battle Ground UGB
9	NE 179th Street	NE 50th Avenue to NE Cramer Road	Improve to provide 1 lane in each direction with turn lane
10	NE 72nd Avenue	SR 502 to NE 259th Street	Upgrade roadway
Battle Ground Street Improvements			
11	S Parkway Avenue	SW 10th Street to NE 199th Street	Widen to 3 lanes with median, storm drainage, bicycle and pedestrian facilities, lighting, landscaping
12	N Parkway Avenue Phase 2	NW 5th Street to NW Onsdorff Boulevard	Widen to 3 lanes with median, storm drainage, bicycle and pedestrian facilities, lighting, striping and landscaping
16	NW 20th Avenue	SR 502 to NW Onsdorff Boulevard	Widen to 3 lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping
17	NE 199th Street Phase 2	SE Grace Avenue to east city limits	Widen to 3 lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping
18	S Grace Avenue	E Main Street to NE 199th Street	Widen roadway and add sidewalks, storm drainage, striping, lighting, landscaping, bike facilities
19	SW 20th Avenue	SR 502 to SW Rasmussen Boulevard	Widen to 3 lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping
20	NE Heisson Road	NE 142nd Avenue to east city limits	Widen to 3 lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping
21	N Parkway Avenue Phase 3	N Onsdorff Boulevard to NE 244th Street	Widen existing road to 3 lanes, bicycle and pedestrian facilities, storm drainage, lighting and landscaping
26	SE 1st Street	S Parkway Avenue to SE Grace Avenue	Widen road, pedestrian facilities, storm drainage, lighting, landscaping
27	NE 1st Street	N Parkway Avenue to NE Grace Avenue	Widen road, pedestrian facilities, storm drainage, lighting, landscaping
28	SW 4th Street	S Parkway Avenue to west terminus	Widen road, pedestrian facilities, storm drainage, lighting, landscaping
35	NE 244th Street	NE 112th Avenue to SR 503	Improve to urban three-lane section with sidewalks and bike lanes
36	NE 244th Street	SR 503 to N Parkway Avenue	Improve to urban three-lane section with sidewalks and bike lanes
37	NE 112th Avenue	NE 244th Street to NE 239th Street	Improve to urban three-lane section with sidewalks and bike lanes
38	NE 239th Street	NW Onsdorff Blvd to NE 112th Avenue	Improve to urban two-lane section with sidewalks and bike lanes
39	NE 199th Street	SW 20th/NE 112th Avenue to SR 503	Improve to urban three-lane section with sidewalks and bike lanes

Table 4-7 Continued
Recommended Improvements to Existing Streets and Highways

Project No.	Location	Limits	Improvement Recommended
Battle Ground Street Improvements Continued			
40	SW 12th Avenue	SR 502 to SW Scotton Way	Improve to urban two-lane section with sidewalks and bike lanes
56	SW 20th Avenue	SW Rasmussen Blvd to NE 199th Street	Improve to urban three-lane section with sidewalks and bike lanes
57	SW 20th/NE 112th Avenue	NE 199th Street to NE 189th Street	Improve to urban three-lane section with sidewalks and bike lanes
58	NE 189th Street	NE 112th Avenue to SR 503	Improve to urban three-lane section with sidewalks and bike lanes
59	NE 132nd Avenue	NE 199th Street to NE 179th Street	Improve to urban three-lane section with sidewalks and bike lanes
90	NE 199th Street	NE 92nd Avenue to SW 20th/NE 112th Avenue	Improve to urban three-lane section with sidewalks and bike lanes
91	NE 92nd Avenue	NE 239th Street to SR 502	Improve to urban three-lane section with sidewalks and bike lanes
92	NE 239th Street	NE 92nd Avenue to NW Onsdorff Blvd	Improve to urban three-lane section with sidewalks and bike lanes

4.8.4.3 *New Roadway Improvements*

Table 4-8 presents the recommended list of new major and neighborhood collector roadway projects that will be needed to provide access and general traffic circulation in the Battle Ground UGA as land develops over the next 20 years. A more detailed discussion of the recommended timing of each improvement is included in Chapter 9 where the costs, potential funding and priorities of these improvements are presented.

Table 4-8
Recommended New Roadways

Project No.	Location	Limits	Improvement Recommended
Clark County Road Improvements			
8	NE 179th Street	NE Cramer Road to SR 503	Construct new 2-lane rural major collector
Battle Ground Street Improvements			
13	SW 6th Avenue	SW Scotton Way to NE 199th Street	Construct new access road, storm drainage, bicycle and pedestrian facilities, lighting and landscaping
14	SW Rasmussen Boulevard Phase 1	SR 503 to SW Parkway Avenue	Construct new 3-lane road, storm drainage, bicycle and pedestrian facilities, lighting, landscaping
15	SW Rasmussen Boulevard Phase 2	SW 20th Avenue to SR 503	Construct new 3-lane road, storm drainage, bicycle and pedestrian facilities, lighting, landscaping and new signal at SR 503
22	SW 7th Avenue (Phase 1)	South terminus to SW Rasmussen Boulevard	Construct new road, storm drainage, pedestrian facilities, lighting, landscaping
23	SW 7th Avenue (Phase 2)	SW Rasmussen Boulevard to SW Scotton Way	Construct new road, storm drainage, pedestrian facilities, lighting, landscaping

Table 4-8 Continued
Recommended New Roadways

Project No.	Location	Limits	Improvement Recommended
Battle Ground Street Improvement Continued			
24	SE Rasmussen Boulevard	SE Grace Avenue to SE Commerce Avenue	Construct new road, storm drainage, pedestrian facilities, lighting, landscaping
25	NW/SW 1 Streets	Frontages parallel to W Main Street	Construct new road, storm drainage, pedestrian facilities, lighting, landscaping
29	SW Scotton Way Extension	East terminus to SE Grace Avenue	Construct new road, storm drainage, pedestrian facilities, lighting, landscaping
30	NW 15th Avenue	NW 9th Street to NW 4th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
31	SE 5th Avenue	SE Scotton Way to NE 199th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
32	SW 15th Avenue	SR 502 to NE 199th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
33	SE Commerce Avenue	SE Rasmussen Blvd to existing terminus	Construct new urban neighborhood collector with bike lanes and sidewalks
34	SW Scotton Way	SR 503 to West terminus	Construct new urban neighborhood collector with bike lanes and sidewalks
41	NE 244th Street	N Parkway Avenue to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks
42	NE 3rd Avenue	NE 244th Street to NE 9th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
43	NE 19th Street	N Parkway Avenue to NE 142nd Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
44	NE Onsdorff Blvd	N Parkway Avenue to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks
45	NE 10th Street	NE 3rd Avenue to NE Grace Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
46	NW Onsdorff Boulevard	NE 239th Street to NE 20th Avenue	Construct new urban major collector with bike lanes and sidewalks.
47	NW 29th Avenue	NE 239th Street to NW 3rd Street	Construct new urban major collector with bike lanes and sidewalks.
48	SW 24th Avenue	SR 502 to SW 6th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
49	SW Scotton Way	SW 20th Avenue to SR 503	Construct new urban neighborhood collector with bike lanes and sidewalks
50	SW 15th Avenue	NE 199th Street to NE 189th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
51	SW 7th Avenue	NE 199th Street to NE 189th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
52	NE 192nd Street	SW 7th Avenue to NE 142nd Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
53	SE Commerce Avenue	NE 219th Street to SE Rasmussen Blvd	Construct new urban neighborhood collector with bike lanes and sidewalks
54	SE Rasmussen Boulevard	SE Commerce Avenue to NE 167th Avenue	Construct new urban major collector with bike lanes and sidewalks.
55	SE 5th Avenue	NE 199th Street to NE 192nd Street	Construct new urban neighborhood collector with bike lanes and sidewalks
60	NW 16th Avenue	NE 244th Street to NW Onsdorff Boulevard	Construct new urban neighborhood collector with bike lanes and sidewalks

Table 4-8 Continued
Recommended New Roadways

Project No.	Location	Limits	Improvement Recommended
Battle Ground Street Improvements Continued			
61	NW 25th Avenue	NW Onsdorff Boulevard to NW 15th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
62	NW 13th Street	NW 29th Avenue to NW 25th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
63	NW 4th Street	East of NE 15th Avenue to SR 503	Construct new urban neighborhood collector with bike lanes and sidewalks
64	NW 5th Street	SR 503 to N Parkway Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
65	NW 7th Avenue	NW 9th Street to W Main Street	Construct new urban neighborhood collector with bike lanes and sidewalks
66	NE 152nd Avenue	SE Rasmussen Blvd to NE 199th Street	Construct new urban major collector with bike lanes and sidewalks.
67	NE 152nd Avenue	NE 199th Street to NE 189th Street	Construct new urban major collector with bike lanes and sidewalks.
68	NE 189th Street	NE 142nd Avenue to NE 152nd Avenue	Construct new urban major collector with bike lanes and sidewalks.
69	NE 189th Street	NE 132nd Avenue to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks.
70	SE 5th Avenue	NE 192nd Street to NE 179th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
71	NE 189th Street	SR 503 to NE 132nd Avenue	Construct new urban major collector with bike lanes and sidewalks.
72	SW 7th Avenue	NE 189th Street to NE 179th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
73	NE 179th Street	SR 503 to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks.
74	SW 15th Avenue	NE 189th Street to NE 179th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
75	NE 112th Avenue	NE 189th Street to NE 176th Street	Construct new urban major collector with bike lanes and sidewalks.
76	NE 192nd Street	SW 20th Avenue to SW 15th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
77	NE 244th Street	NE 142nd Avenue to NE 152nd Avenue	Construct new urban major collector with bike lanes and sidewalks.
78	NW 35th Avenue	NE 239th Street to NW 2nd Street	Construct new urban neighborhood collector with bike lanes and sidewalks
79	NW 13th Street	NE 92nd Avenue to NW 29th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
80	NW 9th Street	NE 92nd Avenue to western terminus	Construct new urban major collector with bike lanes and sidewalks.
81	NE 92nd Avenue	SR 502 to NE 199th Street	Construct new urban major collector with bike lanes and sidewalks.
82	SW 34th Avenue	SR 502 to NE 199th Street	Construct new urban major collector with bike lanes and sidewalks.
83	SW 6th Street	SW 34th Avenue to SW 24th Avenue	Construct new urban major collector with bike lanes and sidewalks.
84	SW 9th Street	NE 92nd Avenue to SW 34th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks

Table 4-8 Continued
Recommended New Roadways

Project No.	Location	Limits	Improvement Recommended
Battle Ground Street Improvements Continued			
85	NW 2nd Street	NE 92nd Avenue to NW 29th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks
86	SW 1st Street	SW 35th Avenue to SW 29th Avenue	Construct new frontage road on south side of highway
87	SW 25th Avenue	SW 9th Street to NE 199th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
88	NE 112th Avenue	NE 179th Street to NE 176th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
89	SW 15th Avenue	NE 179th Street to NE 176th Street	Construct new urban neighborhood collector with bike lanes and sidewalks
93	SW Scotton Way	SW 25th Avenue to SW 20th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks

Note: Includes only roads of collector or arterial status. Local streets are assumed to be constructed as part of land development projects consistent with the recommended arterial and collector street system.

4.8.4.4 *Safety Improvements*

Table 2-6 presents a summary of crash data at several major intersections in the Battle Ground UGA that are currently experiencing a higher than average crash rate. Preliminary analysis of these locations is included in Table 4-9 which is based on a review of the predominately type(s) of crashes and an assessment of likely contributing causes at all of the identified high crash locations. Table 4-9 also includes preliminary recommendations for intersections that would not be improved as a result of a recommended capacity enhancement.

Table 4-9
Safety Needs Assessment at High Crash Locations in Battle Ground

Intersection	Accident Rate (per MEV)	Contributing Causes	Need and Potential Solutions
E. Main Street and 5th Avenue	2.10	• Turning Left • Stopped for light or in traffic, rear-ended	• Provide Protected left turn movements particularly east/west direction • Signal coordination on E. Main Street
SR 503 (10th Avenue) and N. Onsdorff Boulevard	1.63	• Entering at an angle: o turning left o turning right • Evasive maneuvers	• Pending Intersection and signalization improvements will help address accident problem • Signal coordination on SR 503
SR 502 (W. Main Street) and SR 503 (10th Avenue)	1.30	• Stopped for light or in traffic, rear-ended • Left turn then going straight collision	• This rate should drop given recent widening to provide 2 lanes in each direction
SR 503 (10th Avenue) and NE 244th Street	1.06	• Both going in same direction - one stopped, rear end • From opposite direction- one left turn, one straight • Entering at angle	• Modifications to signal timing change intervals (i.e. yellow and/or all red phase) • Signal coordination on SR 503

Note: MEV means Million Entering Vehicles

As discussed in Chapter 2, four intersections currently experience accident rates greater than 1.00 accidents per million entering vehicles. A rate of 1.00 has been identified as the threshold for determining when an intersection would need further evaluation and potential measures to improve safety. Intersections with high accidents are located on two primary roadways in Battle Ground – SR 502/Main Street and SR 503. Recent improvements to the SR 502/SR 503 intersections are expected to reduce the risk of collisions, and pending improvements on SR 503 at N Onsdorff Boulevard (including signalization) would also address safety issues. At the intersection of SR 503 and NE 244th Street, modifications to signal phasing would allow for safer left turn movements that currently contribute to the intersection's high accident rate. Signal phasing modifications area also recommended on E Main Street at 5th Avenue to provide for safer turns. Refinement planning and preliminary engineering will be necessary to confirm the feasibility of each recommendation in Table 4-9.

In addition to the foregoing projects, the City should make efforts to enhance street system safety through the following actions:

- Regularly monitor crash data on transportation facilities within the City, and assess and update the list of high crash locations as appropriate. At a minimum, a reassessment of crash data should be conducted once every three years or after a significant change in the roadway system has occurred (a significant change is one which would cause a rerouting of traffic that causes a substantive increase or decrease in traffic volumes). Intersection accident rates should be calculated based on Million Entering Vehicles (MEV) according to the following formula. Accidents resulting from DUI or which do not have engineering solutions (such as road racing) should be excluded from the data analysis.

  Crash rate / MEV = (# of accidents/years of data) x 1,000,000 / (total weekday traffic volume x 261 weekdays in a year)

- Maintain an inventory of traffic control devices (e.g., traffic signals, signs, striping and pavement marking) to ensure that these devices can be managed and kept in good repair.

- Require maintenance of sight-distance areas adjacent to intersections and driveways, to keep clear of fencing, landscaping, foliage, etc. that could obstruct the view of motorists, bicyclists, and pedestrians.

- Actively enforce motor vehicle codes related to transportation safety.

- Promote traffic safety education and awareness, emphasizing the responsibilities required of motor vehicle drivers, in order to reduce the per capita number of motor vehicle accidents.

5. FREIGHT MOBILITY PLAN

5.1 OVERVIEW

Freight mobility is critical to maintaining the economic competitiveness of Battle Ground and the remainder of Clark County. Freight mobility is dependent on a number of transportation modes, including truck, air, and rail. This chapter presents a n overview of the local and regional policy context for developing and maintaining this travel mode, a review and assessment of needs and deficiencies, and a discussion of recommended freight mobility policies and improvement recommendations for enhancing the freight transportation system within the Battle Ground Urban Growth Area. Freight transportation modes discussed in this chapter include trucking and rail. Issues related to air freight are discussed in the general context of air transportation in Chapter 8.

5.2 TRUCK FREIGHT

In the Battle Ground UGA, freight mobility is largely dependent on the movement of goods by truck. Key transportation issues affecting freight mobility include:

- Adequacy of access to specific freight-dependent industrial, commercial, or resource-based destinations in the UGA;

- Adequacy of the state highway and county road system to accommodate through truck traffic between major destinations within the UGA, as well as through the UGA to other destinations in Clark County, the Portland Metropolitan area or the Pacific Northwest; and

Roadway adequacy is measured both in terms of capacity to serve current and future truck-related demand (as measured by levels of congestion on key routes that are used by trucks), the safety of the roadway system (particularly for larger vehicles with more limited operating characteristics than automobiles), and the sufficiency of access to significant truck trip generators including truck parking and loading zone needs.

This chapter includes a discussion of the planning and policy context for developing and maintaining the truck freight system, an evaluation of needs and deficiencies, and a discussion of the recommended truck freight mobility action plan (including goals, objectives, policies and specific improvement projects).

5.2.1 Consistency with Other Plans and Policies

Development of the truck freight portion of this TSP has been influenced by several state and local plans and policies including the Growth Management Act, the *Washington State Highway System Plan*, the state Freight and Goods Transportation System designation, the Clark County *Metropolitan Transportation Plan*, and the Clark County *Comprehensive Plan*. Key goals and policies in these plans and programs that relate to and affect the development of the *Battle Ground TSP* are described below.

The Washington State Growth Management Act (GMA) contains a number of policies pertaining to the development and revision of city and county Comprehensive Plans. Although many of the policies are general in nature, the GMA addresses specific elements in a number of areas. Section 35.77.010(3) of the Revised Code of Washington was amended by GMA and requires cities and counties to develop six-year plans for the expenditure of funds for transportation facilities. *"Each six-year transportation program . .*

. *shall contain information as to how a city or town shall act to preserve railroad right-of-way in the event the railroad ceases to operate in the city's or town's jurisdiction"*.[13] The section also addresses the need to preserve corridors for non-motorized transportation: GMA also identifies the need for "*consideration of many types of transportation (air, water, rail, and land--including roadways, transit, ferries, non-motorized, and freight)*".

The 2003 Washington *State Highway System Plan* has also recognized the importance of good freight mobility to the State's economy and includes a policy to "*Reduce barriers that delay the effective and reliable movement of freight"* and to "*Make the most efficient use of existing transportation facilities to relieve vehicular congestion and maximize the mobility of people and goods."* Through these policies, local and regional governments are encouraged to improve planning coordination between public investments in highways and other investments (in both public and private) in the freight movement infrastructure.

WSDOT adopted a Statewide Freight and Goods Transportation System (FGTS) in 1995 that categorizes highways and local roads according to the tonnage of freight they carry. The FGTS was updated prior to the 1998 legislative session and includes SR 503 from SR 500 to SR 502 (designated as a T2 facility carrying approximately 5.2 million tons of freight annually). Washington State also created the Freight Mobility Strategic Investment Board (FMSIB) with a mission to create a comprehensive and coordinated state program to facilitate freight movement between and among local, national and international markets that enhances trade opportunities. The Board is also charged with finding solutions that lessen the impact of the movement of freight on local communities. The Board will propose policies, projects, corridors and funding to the legislature to promote strategic investments in a statewide freight mobility transportation system.

The first *Regional Transportation Plan* (RTP) for Clark County was adopted in December 1982. An *Interim Regional Transportation Plan*, which acted as a framework for development of Growth Management Act (GMA) transportation elements, was adopted in September 1993. The first Metropolitan Transportation Plan (MTP) for Clark County was prepared to comply with the requirements of the federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and was adopted in December 1994. Significant updates were adopted in 1996 and 1999 and minor amendments to the Plan adopted in 1997, 1998, April 1999, December 2000, and December 2003.

At the regional level, the Metropolitan Transportation Plan (MTP) outlines how transportation system and services will provide for the mobility and accessibility of people and freight within and through the Clark County region including the Battle Ground UGA. Goals of the MTP include:

- Supporting community economic development.
- Increasing the accessibility and mobility options available to people and for freight;
- Enhancing the integration and connectivity of the transportation system, across and between modes, for people and freight.

Economic development stimulus is also a significant focus in the update to the 2004 *Comprehensive Growth Management Plan* for Clark County. This Plan outlines goals and policies for the county and its incorporated cities that focus on providing for the mobility of peoples and goods consistent with the anticipated growth in population and employment. The Plan also identifies a need to establish major

[13] *Washington State Growth Management Act*, Section 35.77.010(3).

intermodal transportation corridors to preserve mobility for interstate commerce and freight movement, as well as promoting intermodal connections to rail and truck facilities.

5.2.2 Needs and Deficiencies

The truck freight transportation system consists of streets and highways where the demand for access and circulation by large vehicles is expected to be the highest. The foundations of the freight movement system are the critical "backbone" highways and roads identified by the Federal Highway Administration as the National Highway System. National Highway System Routes are intended to include the most significant highways in the United States for the movement of people and freight. Within the Battle Ground UGA, this system includes SR 502 from I-5 to SR 503, and SR 503 from SR 500 to SR 502. Most truck traffic in the region and the state moves on the National Highway System. In addition, the Washington State Department of Transportation has designated SR 503 as a T2 freight mobility corridor.

Clark County has designated all roadways classified as arterials or above and located within urban areas as truck routes. In rural areas, the county has designated all of its collector facilities and above as truck routes. Under this criteria, non-state highway truck routes within the unincorporated portion of the study area include NE 72nd Avenue, NE 112th Avenue, NE 132nd Avenue, NE 142nd Avenue/NE Axford Road, NE 244th Street, NE 239th Street, NE Heisson Road, NE 219th Street, and NE 199th Street, are classified as truck routes by the county.[14] The county has placed restrictions on selected sections of the county system where pavement conditions require weight limits. The inventory of restricted sections is updated annually, and restrictions are removed from the list once the surface has been upgraded.

Highway freight transportation needs were addressed in a regional freight transportation study undertaken during 1993 to identify regional freight transportation issues and to investigate data availability and needs regarding freight transportation. The results of the study are documented in *Southwest Washington Regional Freight Transportation Study, Final Report* (December, 1993; RTC/JHK & Associates). The report reviewed freight transportation issues and needs, evaluated freight transportation movement in the region, and compiled available data on freight transportation. A summary of the existing conditions is described below.

- Truck traffic within the urban area of Clark County is generally related to four activities:
  - Commercial and industrial site deliveries;
  - Solid waste disposal;
  - Resource extraction industries (rock quarrying and logging); and,
  - Construction activity.

- Most of the freight truck activity occurs between 6:00 AM and 4:00 PM with the highest truck traffic volumes found near midday. During the morning peak traffic period (AM peak) trucks account for approximately 5 to 10 percent of the total traffic volume on primary truck routes. During the evening peak traffic period (PM peak) the volume of truck traffic generally decreases and accounts for less than 5 percent of the total traffic.

- The study also noted that there is a shortage of data relating to freight transportation and indicated a need for more information to improve the ability of local and regional agencies to adequately plan for freight mobility.

[14] *Comprehensive Growth Management Plan*, Clark County, December 1994, revised June 1997, and the *Clark County Arterial Atlas*, 1998.

As traffic congestion continues to increase in more locations and for longer periods, the freight industry will experience longer shipping schedules and delays. This will likely increase the cost of transporting the goods. Along with much of Clark County, in recent years the Battle Ground area has proved to be attractive to new commercial and light industrial business as land is reasonably priced for development in an attractive setting within a metropolitan area. Power is affordable and the City's location on the Pacific Rim, with easy access to Portland International Airport and the major rail hubs located in Vancouver has contributed to its growth and development.

Freight mobility issues in the study area include heavy truck traffic created by the operation of several manufacturing plants and a dairy along or immediately east of SE Grace Avenue. In the recent past, truck traffic conflicted with vehicle and pedestrian traffic to and from the schools and commercial uses along E. Main Street. Currently, there is a dry wall manufacturing plant off of SE Grace Avenue that operates large trucks utilizing NE 199th Avenue and E. Main Street as routes. A glass manufacturing plant off of NE 199th Street operates large and small freight trucks. A plastic manufacturing company utilizes E. Main Street for operating its large trucks as well as Anderson Dairy that is located on E. Main and NE 3rd Avenue.

Another freight mobility issue concerns the potential for future truck traffic along NE 199th Street between SE Grace Avenue and SR 503. Almost all the land within the City east of SE Grace Avenue is zoned for industrial use, including a portion already developed. NE 199th Street connects this industrial area with SR 503 for regional access to the Vancouver Urban Area and to I-5. Although NE 199th Street is major arterial, truck traffic could create potential conflicts with traffic to and from schools and residential neighborhoods. NE 199th Street in recent past had one travel lane in each direction. NE 199th Street has recently been widened from SR 503 through the intersection of SE Grace Avenue to provide sidewalks, bicycle lanes and a center left turn lane.

The budget constraints at the federal, state, and local levels of government will limit the amount of funding for roadway improvements including those for upgrading pavement conditions on restricted truck routes. This will place more burden on the remaining truck route system.

5.2.3 Recommended Action Plan

5.2.3.1 *Freight Goals, Objectives and Action Strategies*

Transportation Goal 3. A transportation system with a variety of transportation options (EDA1.1.3, EA8.1.1)

TO3.5. <u>The City will see alternative means of meeting travel demand</u>

TA3.5.6. The City will identify and plan for commercial pipeline needs.

Transportation Goal 4. A transportation system that provides for the efficient movement of goods and services

TO4.1. <u>The City will work to improve the freeway access to the City</u>

TA4.1.1. The City will work with the Washington Department of Transportation and other jurisdictions on the 219th interchange project.

TO4.2. The City will work to provide access to industrial employment and commercial centers in the City

TA4.2.1. *The City will identify priority access routes for industrial and employment areas and establish standards to protect the capacity of these routes while respecting critical areas.*

TA4.2.2. *The City will evaluate transportation needs in economic sub-areas of the City including East Main and the designated Regional Center and determine the improvements required to improve economic development opportunities in these areas.*

TO4.3. The City will work to balance parking and loading needs with other City goals

TA4.3.1. *The City will develop a parking plan for the commercial areas of town, starting with the East Main Street area.*

Economic Development Goal 1. The City encourages a strong, independent and broad-based economy in the City

EDO1.1. The City will work to remain the economic activity center for central Clark County

EDA1.1.1. *The City will plan for an adequate multi-modal transportation network to allow access to regional services* (TG3).*

Economic Development Goal 2. The City encourages regional economic development strategies

EDO2.1. The City will maintain a strong working relationship with other public and private entities that will influence the implementation of Battle Ground's 50-year vision (EA5.1.3)

EDA2.1.2. *The City will work with Clark County to address transportation and other infrastructure issues that will help Battle Ground achieve its short-term and long-term economic development goals.*

5.2.3.2 *Proposed City Freight Routes*

To minimize adverse impacts of truck traffic on local streets, a system of truck routes has been designated for the streets and roads within the study area. This system includes the following that are illustrated in Figure 5-1:

WSDOT has designated all of its state highways as truck routes. Within the study area this includes SR 502 and SR 503. The County has designated all arterial roads in urban growth areas and all collector and arterial roads in rural areas as truck routes. In the Battle Ground UGA this includes NE 92nd Avenue north of SR 502, NE 199th Street west and east of the UGA boundary, NE 142nd Avenue south of the UGA, NE 219th Street east of the UGA, NE Heisson Road east of the UGA, NE 142 Avenue north of NE 244th Street, NE 249th Street between NE 132nd Avenue and NE 152nd Avenue, a small segment of NE 152nd Avenue between NE 244th and 249th Avenues, and NE 244th Avenue east of NE 152nd Avenue

Within the Battle Ground UGA, several streets under the jurisdiction of the City and the County are proposed as additional truck routes to offload the increasingly congested transportation system:

- Main Street from the eastern to the western boundaries of the UGA;
- SE Grace Avenue/NE 142nd Avenue from NE 219th Street to the southern boundary of the UGA;

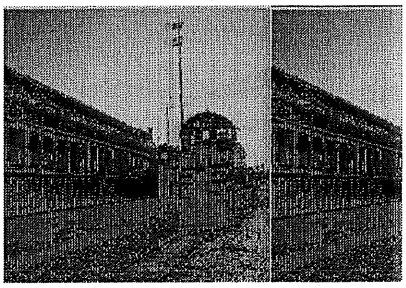
- NE 199th Street from the eastern to the western boundaries of the UGA. NE 199th Street was recommended for designation as a City truck route in the 1995 *Transportation System Plan*, which is consistent with the County truck route designation; and
- Commerce Way from NE 219th Street to NE 199th Street through the industrial park currently under development east of the Chelatchie Prairie Railroad.

5.3 RAIL TRANSPORTATION

Rail service in Clark County is operated by the Burlington Northern Santa Fe Railroad (BNSF), AMTRAK, the Union Pacific Railroad (UP), the Lewis and Clark Railway Company (LINC), and the Battle Ground, Yacolt, and Chelatchie Prairie Railroad Association (BYCX). Only one of these railroads operates in the Battle Ground UGA – the Clark County Railroad. Key characteristics of this railroad are described below, along with a summary of needs and deficiencies related to the existing rail system in the Battle Ground UGA.

5.3.1 Needs and Deficiencies

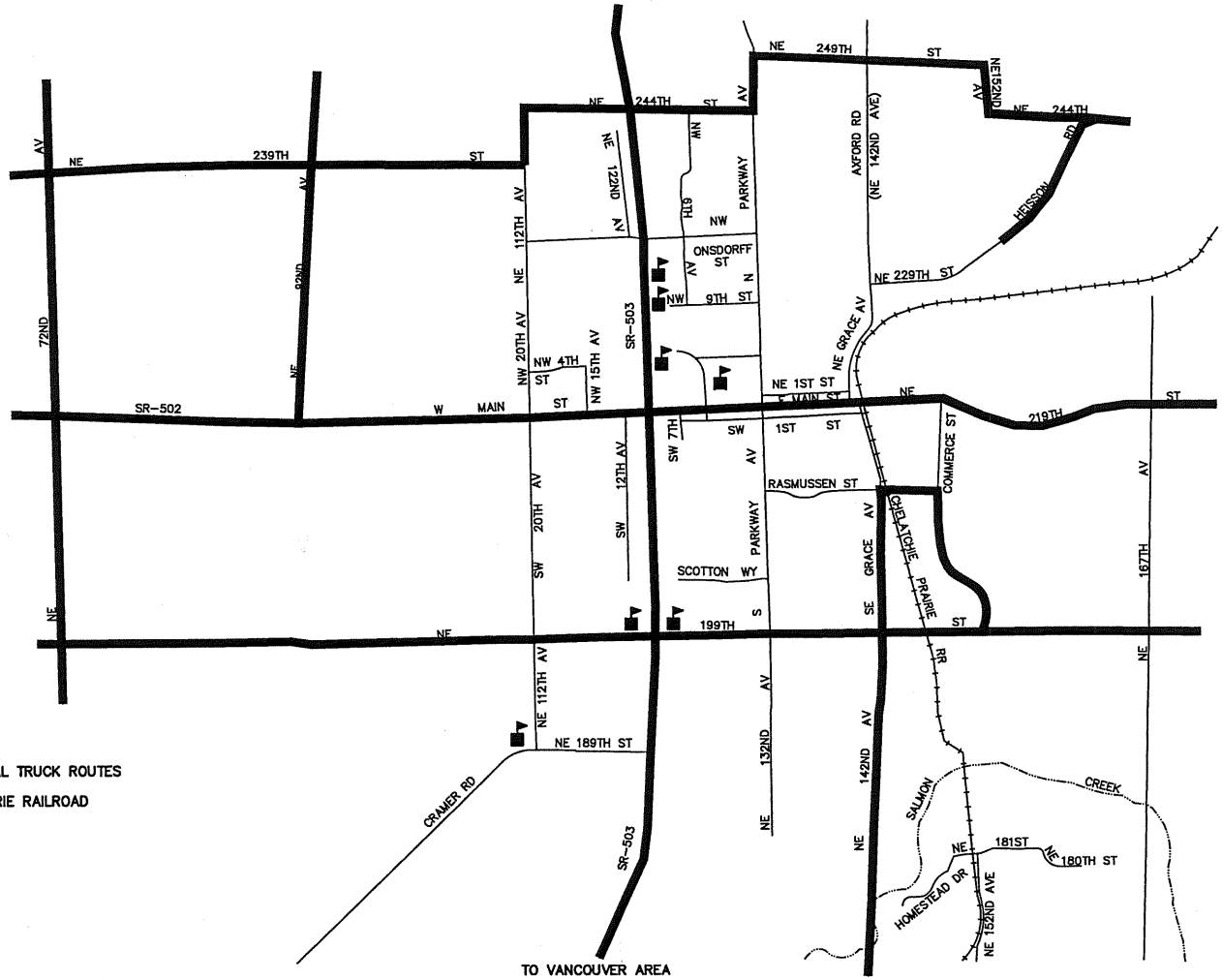
Clark County Railroad is owned by the county but leased to two different outside operators; the Chelatchie Prairie Railroad (BYCX) and the Lewis and Clark Railroad (LINC). The 30-mile line extends from the BNSF mainline in north Vancouver, diagonally through the county from the Rye yard to Chelatchie Prairie. Spirit of Washington/Columbia Basin Railway operates two trains per week on the southern segment (LINC), mostly for freight. Freight cargo deliveries of plasterboard, plastics, chemicals and machinery can be made to local industries. This segment accesses the City's industrial lands, and improved rail service could provide a needed stimulus for industrial development. Funding maintenance activities is a high priority for the County at this time; however there are no plans to upgrade either the track condition or the frequency of service[15].



BYCX formerly operated a passenger excursion program on the "North Line" which is north of Battle Ground. Formerly known as the Chelatchie Prairie Railroad, a tourist passenger service used to run from Battle Ground to Moulton Falls Park but operations ceased in 1997 due to damage caused by heavy rains. The Spirit of Washington/Columbia Basin Railway is proposing a passenger-only dinner train in the vicinity of Battle Ground, and there have been similar ventures in the past years on the line. The current condition of this line is marginal and at this time there are no plans to update rail facilities due to a lack on funding.

While the City of Battle Ground has no direct control over the operation or improvement of the Clark County Railroad's rail trackage and right-of-way, the City is impacted by the need for safe rail crossings on its roadway system. Table 5-1 lists the three rail crossings of the County railroad located in the UGA and includes a description of the features at each crossing and an general assessment of crossing condition.

[15] Telephone Conversation with Carl Oman, Clark County (WA) Railway Coordinator, April 21, 2004.



KEY

N
NOT TO SCALE

Figure 5-1
Recommended Truck Routes

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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Table 5-1
Railroad Crossings in Battle Ground Urban Growth Area

Roadway	Street Classification[1]	Type of Crossing	Warning Devices	Crossing Condition	Other Comments
NE 199th Street	Urban Major Collector	At-grade	Gates and flashers, advance warning signs and markings	Good	Close proximity to newly signalized intersection at S. Grace Avenue
E. Main Street	Urban Minor Arterial	At-grade	X bars, no flashers or advance signage	Good	WB X-bar blocked by vegetation
Fairgrounds Road	Local	At-grade	X bars, no flashers, advance signs only NB on Grace, none on Fairgrounds	Good	Local road that accesses residences, fairgrounds and park-and-ride lot

[1] Street classification in this table refers to categories that existed prior to adoption of the *TSP*.
Source: Field reconnaissance.

Two deficiencies of note are identified in the table above:

- E. Main Street – this minor arterial railroad crossing has only minimal warning signage and no pavement markings or flashers. In the westbound travel direction, the railroad crossing X-bar located immediately before the track is not visible until a motorist is less than 100 feet from the crossing. Vegetation at this location should be trimmed. Consideration should also be given to installation of advance signage warning several hundred feet in advance of the track crossing in both the eastbound and westbound directions.
- Fairgrounds Road – this local street also has only minimal advance warning signage that is located along northbound N Grace Avenue prior to the intersection with Fairgrounds Road. No advance signage is provided in the southbound direction on N. Grace Avenue or on Fairgrounds Road itself. Advance signage should be installed on southbound N. Grace Avenue and on northbound Fairgrounds Road.

5.3.2 Recommendations

The City of Battle Ground has no direct responsibility for the development, operations or maintenance of the Clark County Railroad or for the provision of freight or commuter rail service in the region. However, there are specific actions that the City can take to ensure safety around existing rail trackage, general land use compatibility with the existing freight rail corridor. The TSP includes one goal and several supporting policies that pertain directly to rail service or indirectly by supporting the coordinated planning that will be essential to any rail service improvements.

5.3.2.1 *Rail Freight Goals, Policies and Action Strategies*

Transportation Goal 2.A transportation system that is safe

TO2.4. The City will pursue federal and state grants to improve existing rail crossings

TO2.5. The City will provide for regular and ongoing inspection, maintenance and repair of streets at existing at-grade rail crossings

TA2.5.1. The City will implement improvements to at-grade railroad crossings on E. Main Street and Fairgrounds Road as identified in the Transportation System Plan.

TO2.6. The City will avoid or minimize the number of new at-grade railroad crossings created by new roads crossing existing rail lines.

6. PUBLIC TRANSIT AND TRAVEL DEMAND MANAGEMENT PLAN

6.1 OVERVIEW

This chapter documents a review and assessment of needs, deficiencies, policies and improvement options affecting the public transit system within the Battle Ground Urban Growth Area (UGA). Included is a discussion of the local and regional policy context for developing and maintaining this travel mode, an evaluation of needs and deficiencies in the existing system, a discussion of various improvement strategies for enhancing and expanding this system, and recommendations for the City of Battle Ground. Public transit service in the Battle Ground area is currently provided by C-TRAN and is supported by the city through requirements in the land development process to accommodate and/or provide amenities to encourage the use of transit. This chapter also addresses intercity bus and passenger rail services and recommendations.

6.2 PUBLIC TRANSIT

6.2.1 Consistency With Other Plans and Policies

This section summarizes relevant plans and policies in place in Battle Ground and Clark County that affect the development, maintenance and operation of the public transportation system and passenger rail in the Battle Ground urban area. Included is a discussion of local (city) plans and policies, followed by a synopsis of relevant countywide plans and policies. State policies related to the development of the public transportation system are also presented.

6.2.1.1 *Local Plans and Policies*

The City's *Comprehensive Plan* goals, objectives and actions and the City's Development Code each contain provisions for the development and improvement of the public transportation system. These plans are discussed in greater detail below.

City of Battle Ground Comprehensive Plan Goals, Policies and Actions

The Battle Ground *Comprehensive Plan* goals, objectives and actions are separated into ten general categories including livability, land use, housing, transportation, and growth management among others. While the transportation section contains most of the public transportation directives, other sections also address transit, trip reduction and rail needs. The Environment section has a goal to encourage the protection and improvement of air quality within the City and the Area of Influence. A supporting policy directs the City to encourage and provide facilities for the use of alternative modes of transportation to reduce air pollution. This policy is further supported by an action to develop a transportation plan that promotes and encourages the use of alternative travel modes. Within the Economic Development section is a goal for the City of Battle Ground to encourage a strong, independent and broad-based economy. Supporting actions include planning for an adequate multi-modal transportation network to allow access to regional services; and identify tourism opportunities and work to develop the tourism facilities needed to capture these opportunities (this action can be applied to enhancing the existing dinner train service provided on portions of the Chelatchie Prairie Railroad).

The Transportation section contains several directives pertinent to the city's public transportation network. Goals and objectives refer to providing an easily navigable transportation system that offers several mode choices and is environmentally friendly. Action items supporting these goals and objectives include:

- Working with C-TRAN (and other agencies as needed) to
    - Determine appropriate routes and levels of service and encourage implementation of new service as necessary
    - Improve transit accessibility and mobility
    - Promote carpooling
    - Develop a commuter rail line to Central and North Clark County
- Establishing guidelines for pedestrian access to transit to improve safety and encourage transit use
- Investigating the creation of a trolley system
- Providing park-and-ride lots to help increase transit use
- Updating the development code to require trip reduction efforts where appropriate
- Developing strategies to decrease the number of single occupancy commute trips

Battle Ground Municipal Code

Requirements relating to public transportation in the Battle Ground Municipal Code deal primarily with providing connections to transit facilities for non-motorized travelers, specifically bicyclists and pedestrians. A street may have plenty of bus stops and a transit route with frequent service, but that could be off-set by unsafe or uncomfortable accommodations to facilitate bicycle/pedestrian travel between the transit route and other destinations.

Chapter 12 of the Battle Ground Municipal Code contains provisions for providing transit amenities, and they are mostly in the form of bicycle and pedestrian facilities. Section 12.116.020 defines a "transit facility" as *"any street improvement which supports transit service (e.g. bus pull-out, waiting area, shelter, kiosk)"*. The code also states that the design and location of "transit facilities" are subject to city standards and C-TRAN requirements. Specific Code requirements pertaining to bicycle/pedestrian facilities, including sidewalk and bicycle lane standards, are discussed in detail in Chapter 7.

Pedestrian and bicycle access to transit can also be enhanced through the use of traffic calming. Traffic calming improves neighborhood livability and the pedestrian environment by reducing vehicle speeds, vehicle noise, visual impacts and through traffic volumes. Traffic calming measures are required on all new local residential streets but are not required on arterial or collector streets where buses travel. However the Section 12.116.080 of the Code includes several measures that could potentially be used on higher order streets to enhance pedestrian and bicycle travel to/from transit stops. Techniques include intersection curb extensions which reduce the pedestrian crossing distance; and special paving like bricks or colored concrete which break up the visual expanse of pavement and define areas of pedestrian travel.

6.2.1.2 *County Plans and Policies*

The Clark County *Comprehensive Plan* contains policies pertaining to the development of public transportation, transportation demand management and passenger rail. This section highlights the policies that affect development of these facilities in the Battle Ground urban area.

Clark County Comprehensive Plan

The *Transportation Element* of the Clark County *Comprehensive Plan* contains several goals with supporting policies and implementation strategies intended to promote a shift from a transportation system based on single-occupant autos to a multi-modal network including transit. Several of the document's "framework policies" directly and indirectly pertain to public transit. These policies include:

- Integrating the regional land use planning structure within a larger public transportation network (e.g. transit corridors, commercial nodes)
- Encouraging mixed use development to be located within easy walking distances of public transit stops
- Coordinating with C-TRAN, WSDOT and RTC to allow park-and-ride facilities along regional transportation corridors

One of the goals of the *Transportation Element* is to *"develop a multi-modal transportation system"*. This goal is supported by policies like including all travel modes when identifying and designing future roadway improvements; considering high capacity transit when developing transit options; and ensuring that the public transportation system serves those who are transportation-disadvantaged. Implementation strategies that support this goal include developing infrastructure to interface with inter-city bus, rail and airline facilities; and coordinating with C-TRAN to integrate transit facilities (like bus pullouts and shelters) in the design of all developments. The goal to *"optimize and preserve the investment in the transportation system"* is supported by a policy to support and promote Transportation Demand Management (TDM) programs to reduce the peak hour travel demand by single-occupant vehicles. The document also contains a policy to assign higher priority to sidewalk projects that are located in transit corridors. This policy supports the goal to *"provide a safe transportation system"*.

6.2.1.3 *Metropolitan Transportation Plan for Clark County*

The *Metropolitan Transportation Plan* (MTP) for Clark County was published by the Southwest Washington Regional Transportation Council in December 2002 and updated in 2003. Policies within the document pertaining to public transportation, transportation demand management and rail are directed at both local and regional agencies. One policy directs Clark County, the Metropolitan Planning Organization (MPO) the Regional Transportation Planning Organization (RTPO), the State of Washington, bi-state municipalities and C-TRAN to *"establish a truly regional transportation system which reduces reliance on single occupancy vehicle transportation through development of a balanced transportation system which emphasizes transit, high capacity transit, bicycle and pedestrian improvements and transportation demand management"*. Another policy directs the State, MPO/RPTO, County and municipalities, *"through transportation system management strategies, to optimize the use of and maintain existing roads to minimize the construction costs and impact associated with roadway facility expansion"*. Clark County, local municipalities, C-TRAN and the MPO/RPTO are also directed to *"work together with the business community to develop a transportation demand management strategy to meet the goals of state and federal legislation relating to transportation"*. The MTP also states that these agencies *"shall work cooperatively to consider the development of transportation corridors for high capacity transit and adjacent land uses that support such facilities"*.

6.2.1.4 *State Plans and Policies*

Statewide plans and policies that affect public transportation, transportation demand management and passenger rail Battle Ground include the state Growth Management Act and the *Public Transportation and Intercity Rail Passenger Plan for Washington State*

Growth Management Act

The Washington State Growth Management Act (GMA) contains a number of policies pertaining to the development and revision of city and county Comprehensive Plans. Although many of the policies are general in nature, the GMA addresses specific elements in a number of areas. Among the required

elements of comprehensive plans are level of service standards *"for all locally owned arterials and transit routes to serve as a gauge to judge performance of the system"*.[16] This requirement is intended to increase the efficiency of transit and to make this mode more attractive to the traveling public.

Public Transportation and Intercity Rail Passenger Plan for Washington State

The *Public Transportation and Intercity Rail Passenger Plan for Washington State* is a 20-year plan (1997-2016) for preserving the existing public transportation systems while improving mobility for a growing population. The Plan's intent is to provide more public transportation choices for Washington residents, in which connections between modes are efficient and easy to use. The document identifies the state's role in public transportation, describes the present condition of public transportation in the state and also evaluates the issues facing the public transportation system.

The Plan contains 22 policy statements to guide planning for the state's public transportation. Selected policies are listed below:

- Public transportation should enhance the quality of life for all persons, particularly those with special needs for whom the lack of transportation would otherwise be a barrier to services and social interaction.
- Public transportation should be fully integrated into local, regional, and state transportation and land use efforts to ensure efficient coordination of resources.
- Public transportation should be financed by a mix of federal, state, local, user and private sector resources.
- Public transportation should reduce barriers to travel, enhance access to employment and commercial activities, and stimulate local economies.

Based on the policy statements, 12 public transportation and two passenger rail objectives were identified. Public transportation objectives include preserving existing service levels; building partnerships between federal, state, regional, local and private sector agencies to improve public transportation planning; and addressing public transportation policy in regional and local transportation plans. Passenger rail objectives include preserving existing service and improving the speed, frequency, reliability and intermodal access of passenger rail service in the Pacific Northwest Rail Corridor and improving the quality of intercity rail service in other corridors statewide.

6.2.2 Public Transportation System Needs

As noted in Chapter 2, C-TRAN provides fixed route transit service along two lines connecting the Battle Ground area with Vancouver, and ultimately with the remainder of the Portland-Vancouver Metropolitan Area. C-TRAN also offers paratransit dial-a-ride service within the Battle Ground UGA to special needs customers, vanpools, commute trip reduction activities including ridematching, and other services. There is currently one park-and-ride lot located within the UGA on the east side of the UGA near Fairgrounds Road. Park-and-ride service is also available to Battle Ground residents from lots adjacent to the I-5 interchanges at NE 179th Street and NE 134th Street. However, both of these lots are experiencing heavy use and opportunities to accommodate any significant growth in park-and-ride demand from the Battle Ground area are limited.

[16] Washington State Growth Management Act, Section 36.70A.070(6)(B).

Due to the revenue reduction experienced after passage of state Initiative 695, C-TRAN initiated substantial service reductions throughout Clark County in July of 2000. The agency's 2003-2009 Transit Development Plan anticipates that annual fixed route service hours will experience an additional decrease of more than 35 percent from 2003 to 2006 without additional funding to make up for the revenue lost from the Motor Vehicle Excise tax after I-695. C-TRAN is developing a 20-year Strategic Plan that will address both future funding options and the desired mix of transit services to meet growth in community demand.

6.2.3 Public Transit Service Strategies

Future transit service to/from and within the Battle Ground UGA will be dependent upon both funding capability and community demand. However, with a projected 2023 population of over 35,000 persons and employment of over 17,000, the community will have sufficient size to warrant consideration of expanded services. Expanded service could include not only increased opportunities to connect with the Vancouver and greater Portland Metropolitan areas, but also to provide for internal circulation with the UGA itself.

Intercity service options for connecting Battle Ground with Portland/Vancouver could include an array of High Capacity Transit alternatives building upon the systems that have been recommended for the greater Vancouver area. These include expanded express bus service and the extension of light rail transit into Clark County from its current termini at the Portland International Airport (in the I-205 corridor) and the Expo Center (in the I-5 corridor). The expansion of high capacity transit service into the Battle Ground UGA will require additional fixed facilities such as new or larger park-and-ride lots and/or transit centers. Transit centers would service as intermodal facilities providing for the transfer of passengers to transit from a variety of other modes. A Battle Ground transit center or centers should be located and designed to provide for auto parking, passenger drop-off and easy access by pedestrians and bicyclists.

Local transit circulation could include a variety of options such as a downtown/commercial area circulator (that would also serve the major concentration of schools in the heart of the city and the public library), and/or routes that linked neighborhoods with these commercial and business areas. Enhanced paratransit service for the elderly and disabled community should also be considered.

6.2.4 Public Transportation System Action Plan

This section describes the policy plan for improved transit service within the Battle Ground UGA and identifies a series of specific actions that can be taken over the 20 year planning horizon of this document.

6.2.4.1 *Goals, Objectives and Action Strategies*

Through the community visioning process and numerous follow-on work sessions with the City Planning Commission, an interim set of transportation system goals, objectives and action strategies was endorsed in 2001. Goals and objectives that are particularly pertinent to development and enhancement of the public transit system include the following:

Transportation Goal 3. A transportation system with a variety of transportation options (EDA1.1.3, EA8.1.1)

TO3.1. <u>The City will strive to provide increasing amounts of transit service</u>

TA3.1.1. *The City will work directly with C-TRAN to determine appropriate routes and levels of service and encourage the implementation of new service as necessary.*

TA3.1.2. The City will establish guidelines for pedestrian access to transit to improve safety and encourage the use of transit.
TA3.1.3. The City will investigate the creation of a trolley system to provide a transportation option for people traveling around town.
TA3.1.4. The City will investigate providing park and ride lots to help increase transit ridership and take the appropriate action.

TO3.5. The City will seek alternative means of meeting travel demand
TA3.5.1. The City will cooperate with C-TRAN and other agencies and jurisdictions to develop a commuter rail line to Central and North Clark County.
TA3.5.2. The City will continue its participation in the Bi-State Transportation Task Force to explore multi-modal options for improvement in the I-5 and I-205 corridors.

Transportation Goal 5. A transportation system that balances accessibility and mobility

TO5.8. The City will seek to balance motor vehicle mobility with pedestrian, bicycle and transit accessibility
TA5.8.2. The City will seek ways to improve both transit accessibility and mobility through improvements and partnership with C-TRAN.

Environmental Goal 8. The City will encourage the protection and improvement of air quality within the City and the Area of Influence

EO8.1. The City will encourage and provide facilities for the use of alternative modes of transportation to reduce air pollution
EA8.1.1. The City will develop a transportation plan that promotes and encourages the use of alternative modes of travel (TRANSPORTATION GOAL 3).

6.2.4.2 *Recommendations*

It is recommended that the City work closely with C-TRAN, Clark County, the City of Vancouver and the Regional Transportation Planning Commission to explore a variety of transit service options that could enhance this travel mode to/from and within the Battle Ground UGA. This coordination effort must be on-going with a regular assessment of actual and latent travel demand in the UGA that could be attracted to both intercity and local transit services.

It is recommended that Battle Ground continue with its current efforts to coordinate review of land development activity under SEPA with C-TRAN to ensure that opportunities to build transit-accessible development are maximized. Transit accessibility can be measured both in terms of building and site orientation to provide easy access to buildings for transit riders, and in terms of providing the necessary bike lane and sidewalk facilities to ensure that access to transit service is safe and convenient.

6.3 TRANSPORTATION DEMAND MANAGEMENT

6.3.1 TDM Needs

Transportation Demand Management or TDM is a general term that describes any action that helps to improve the performance and efficiency of the transportation system by reducing reliance on the single occupant vehicle during peak travel periods. TDM measures can be effective in helping to reduce vehicle

miles of travel, and involve a wide range of potential strategies including the use of transit, carpooling, vanpooling, working flexible hours and/or a compressed work week, bicycling, walking, working from home using communications technology, and preferential parking for rideshare vehicles. Most TDM strategies rely on voluntary participation and often incentives are provided to make the use of these strategies more attractive. TDM measures can also include land use actions such as higher density or mixed use development and growth management (Smart Growth) strategies.

Table 2-7 in Chapter 2 lists a variety of TDM strategies that either are or could be considered for implementation within the Battle Ground UGA. TDM strategies can help to preserve transportation system capacity and these strategies will become increasingly important as travel demand in the area continues to grow but transportation investments are not able to keep pace. Many local jurisdictions in Washington State have implemented the 1991 state Commute Trip Reduction law as a TDM approach. This law requires that local jurisdictions with major employers adopt a Commute Trip Reduction Ordinance and that employers who have 100 or more employees arriving at work between 6 a.m. and 9 a.m. should establish a commute trip reduction program for their employees. The law establishes goals to reduce commute trips by employees over time. No such employers are currently located in Battle Ground, but one or more could locate in the area over the 20-year planning period. As indicated in RTC's *Metropolitan Transportation Plan*, TDM strategies will become increasingly important as travel demand in the county continues to grow and transportation investments do not keep pace. TDM strategies can help to preserve transportation system capacity and MTP supports the development and use of TDM strategies throughout the Clark County region.

6.3.2 TDM Action Plan

6.3.2.1 *Goals, Objectives and Action Strategies*

Transportation Goal 3. A transportation system with a variety of transportation options (EDA1.1.3, EA8.1.1)

TO3.4. <u>The City will strive to develop a transportation demand management program to reduce the number of single occupancy vehicles</u>

TA3.4.1. *The City will work with C-TRAN and other agencies and organizations to promote carpooling.*

TA3.4.2. *The City will update the Development Code to require trip reduction efforts where appropriate.*

TO3.5. <u>The City will seek alternative means of meeting travel demand</u>

TA3.5.3. *The City will strive to provide a communication system that allows efficient telecommuting.*

TA3.5.4. *The City will work with other agencies and jurisdictions to develop strategies to decrease the number of single occupancy commute trips.*

6.3.2.2 *TDM Recommendations*

It is recommended that the City promote the use of alternative commute options to reduce motor vehicle travel generated by residents and employment sites in cooperation with regional efforts as administered by C-TRAN or other jurisdictions.

6.4 SCHOOL BUS TRANSPORTATION

While the City of Battle Ground is not specifically responsible for the operation or management of school transportation within the UGA, it nevertheless can influence how this service is provided. A specific objective and action strategy recommended by the TSP for school transportation is presented below.

Transportation Goal 5. A transportation system that balances accessibility and mobility

TO5.3. The City will strive to give access priority to schools and other civic uses

TA5.3.1. *The City will work with the school district to develop an access management plan.*

6.5 PASSENGER RAIL

Passenger rail is currently not provided in the Battle Ground UGA but is available in Vancouver, approximately 15 miles to the south and west. North/south passenger rail service is provided by the Amtrak Coast Starlight route in the California-Oregon-Washington corridor. The Coast Starlight provides one northbound and one southbound train each day as it passes through Vancouver. East/west passenger rail service is also provided from Vancouver, linking to destinations in Utah and beyond.

Vancouver is also served by a regional rail corridor that connects Eugene, Oregon with Vancouver, BC. The Pacific Northwest Rail Corridor is one of only five designated high-speed corridors in the nation that pre-qualifies the region for federal high-speed rail funding. In late 1995, the Washington State Department of Transportation (WSDOT) and project partners published *Options for Passenger Rail in the Pacific Northwest Rail Corridor* report. An Environmental Impact Statement on corridor improvements was completed and construction on some rail system improvements began in 1998. Custom-built Talgo trains are now in service on Amtrak's Pacific Northwest Rail Corridor service. Plans are underway to upgrade the Vancouver Amtrak station facility and site as part of the Eugene to Vancouver B.C. passenger rail service improvements in preparation for high-speed rail service in the corridor.

It is recommended that the City work in cooperation with C-TRAN and other agencies to ensure that multi-modal, regional access is provided to the Vancouver Amtrak station to accommodate the intercity, rail service travel needs of the areas residents.

7. NON-MOTORIZED TRANSPORTATION SYSTEM PLAN

7.1 OVERVIEW

This chapter identifies existing and future recommendations to serve pedestrians and bicyclists in the City of Battle Ground. Included is a summary of existing and future deficiencies, a discussion of the strategic approach used in developing a community bicycle and pedestrian system, community goals with respect to non-motorized circulation, criteria for the evaluation and prioritization of facilities, and specific recommendations.

7.2 CONSISTENCY WITH PLANS AND POLICIES

This section summarizes relevant plans and policies in place in Battle Ground and Clark County that affect the development, maintenance and operation of the non-motorized transportation system in the Battle Ground urban area. Included is a discussion of local (city) plans and policies, followed by a synopsis of relevant countywide plans and policies. State policies related to the development of the non-motorized transportation system are also presented.

7.2.1 Local Plans and Policies

The City's *Comprehensive Plan* goals, objectives and actions; the *Comprehensive Parks, Recreation and Open Space Plan*; and the City's Development Code each contain provisions for the development and improvement of bicycle/pedestrian facilities. These plans are discussed in greater detail below.

7.2.1.1 *City of Battle Ground Comprehensive Plan Goals, Objectives and Actions*

The Battle Ground *Comprehensive Plan* goals, objectives and actions are separated into ten general categories including livability, land use, housing, transportation, and growth management among others. While the transportation section contains most of the non-motorized transportation directives, other sections also address bicycle and pedestrian needs. The Livability and Economic Development sections have objectives and actions stressing the need to provide an appropriate balance between pedestrian orientation and auto access, and the need to promote the design of public spaces that improve the pedestrian environment. The Parks, Recreation and Open Space section contains several goals and supporting objectives and actions referring to trail systems. These goals include proving a safe and accessible community-wide trail system and encouraging efforts to preserve and enhance trail opportunities. Supporting objectives and actions include identifying key trail connections to parks, public uses and commercial areas; and establishing a maintenance level of service for trails.

The Transportation section contains several directives pertinent to the city's bicycle/pedestrian network. Objectives specifically refer to providing a complete bicycle and pedestrian system and also to enhancing safety. Action items pertaining to safety and an interconnected network include:

- Focusing bicycle/pedestrian safety improvements on routes used by children traveling to/from school;
- Developing guidelines to improve safety for bicyclists and pedestrians of all ages; and
- Creating a plan for bicycle and pedestrian routes (including bicycle lanes, sidewalks, and multi-use paths) within the City and throughout areas of future growth.

The Transportation section also references the need to provide non-motorized facilities for recreational use. One of the action items directs the City to identify transportation improvements that also serve as recreational opportunities and to coordinate these improvements with park improvements. Related to this topic, another action item calls for coordination with equestrian groups to identify their needs.

7.2.1.2 *City of Battle Ground Comprehensive Parks, Recreation and Open Space Plan*

The Battle Ground *Comprehensive Parks, Recreation and Open Space Plan* contains a mission statement along with supporting goals, policies and actions. The mission statement is to *"Maximize the quality of life in Battle Ground by providing parks, open space, trails, and recreational opportunities and facilities, and by planning to acquire, restore, enhance, preserve, develop and manage these facilities and natural resources in such a manner as to afford the maximum benefit to the community"*.

Many of the Plan's goals, policies and actions pertain to Battle Ground's non-motorized transportation system because parks, open spaces and trails provide opportunities for bicycle and pedestrian travel. While these amenities are used for recreation, they also serve utilitarian purposes. Many of the goals, objectives and actions in the document were taken from those listed in the City's *Comprehensive Plan*. Goals, objectives and actions relevant to the bicycle/pedestrian system typically encourage cooperative efforts to preserve and enhance open space including trails, to provide a safe and accessible community-wide trail system that meets both recreational and transportation needs (including connections to parks, schools and other community destinations), to make regional trail connections, to provide for the disabled community, and to maintain the trail system in good condition.

7.2.1.3 *Battle Ground Municipal Code*

Chapter 12 of the Battle Ground Municipal Code contains a number of provisions regarding bicycle and pedestrian amenities. Section 12.116.070.F states that *"sidewalks, trails, accessways and bicycle lanes shall be installed in conjunction with either the construction of an adjacent public street or the construction of a building structure . . . Utility poles and other conflicting structures shall be relocated outside the sidewalk limits"*. In cases where objects are currently situated within the sidewalk zone, Section 12.116.040 requires that they be relocated outside of the zone when the facilities are upgraded.

The Code also has specific standards and provisions for bicycle lanes, sidewalks, accessways and trails. Standards for on-street bicycle facilities and sidewalks are determined by the street's functional classification, and are listed in Table 7-1. Bicycle lanes are to be installed when arterial or collector streets are constructed or reconstructed. Sidewalks must be constructed along all public and private street frontage for all land development projects subject to site plan review, either at the construction stage for development that has gone through development review, or with preliminary plat or short plat approval.

The Code's accessway requirements are intended to provide enhanced connectivity for non-motorized travel modes. Section 12.116.070.B states that *"an accessway shall be provided between streets when the length of the block between the two subject streets exceeds six hundred feet, to provide direct and convenient pedestrian circulation"*. Accessways must also connect cul-de-sacs with nearby streets if the nearby street is within 250 feet of the cul-de-sac and if unobstructed right-of-way exists for an accessway to be created.

The easement for a trail must be at least 15 feet wide, with the trail itself being at least 8 feet wide and made of concrete or other surfacing that meets ADA requirements. Trails may also be installed on one

side of a public street in lieu of a sidewalk, provided that trail is developed in conjunction with a parkway, park or other open space; and if there is a continuous pedestrian pathway on the other side of the street.[17] The City Code defines a parkway as *"a linear park or open space area adjacent to a public street. Parkways typically include trails and landscaping and may be used to satisfy the city's open space and park dedication standards when required as a condition of development approval"*.[18]

Table 7-1
Battle Ground Municipal Code On-Street Bicycle Facility and Sidewalk Requirements

Street Classification	Bicycle Facility Requirements	Sidewalk Requirements
Principal Arterial	6-foot wide striped lanes (both directions)	Minimum 6-foot wide sidewalks with 8-foot wide planter strips (both sides)
Minor Arterial	6-foot wide striped lanes (both directions)	Minimum 6-foot wide sidewalks with 8-foot wide planter strips (both sides)
Major Collector	4-foot wide striped lanes (both directions)	5-foot wide sidewalks with 5-foot wide planter strips (both sides)
Minor Collector	4-foot wide striped lanes (both directions), except when on-street parking is required (bicycles share street)	5-foot wide sidewalks with 5-foot wide planter strips (both sides)
Local Street	Bicycles share roadway	4-foot wide sidewalks wide 4-foot wide planter strips (both sides)

Source: Battle Ground City Code, Sections 12.116.040.A-C.

7.2.1.4 *Legacy Standards*

The Legacy Standards adopted by the Battle Ground City Council went into effect in April 1999. The standards prescribe architectural variety, streetscapes that are pedestrian friendly and street networks that connect in a grid pattern when possible. The intent of the Legacy Standards is to create a community where it is possible for people to meet on the sidewalk in front of their homes, eliminate "fenced canyons" (unwelcoming thoroughfares which have no relationship with surrounding residential uses), and human-scale architecture (designed to primarily relate to pedestrians rather than automobiles). In addition, the Legacy Standards are intended to provide a more efficient transportation system that allows people the choice of walking, bicycling or driving to their destinations. Embedded through the City Code, the standards are intended to manage growth to create a built environment that will have a positive effect long into the future, and demonstrate the City's respect for its natural setting.

7.2.2 County Plans and Policies

The Clark County *Comprehensive Plan*'s *Transportation Element* includes several goals, supporting policies and implementation strategies related to the development of the bicycle and pedestrian system. Additionally, the County's *Regional Parks, Recreation and Open Space Plan* also addresses the need for non-motorized transportation facilities. These plans are discussed in greater detail below.

[17] Battle Ground City Code, Section 12.116.070.C.1-3.
[18] Battle Ground City Code, Section 12.116.020.

7.2.2.1 *Clark County Comprehensive Plan*

The Transportation Element of the Clark County Comprehensive Plan contains several goals with supporting policies and implementation strategies intended to promote a shift from a transportation system based on single-occupant autos to a multi-modal network. One of the goals is to *"develop a multi-modal transportation system"*. Supporting policies and implementation strategies pertaining to bicycle and pedestrian transportation include accommodating alternative travel modes with roadway capacity increases, assigning high priority to non-motorized facilities in right-of-way acquisition efforts, and providing a safe and secure walkway network within urban areas and rural centers. The goal of providing *"a safe transportation system"* is supported by policies and implementation strategies like establishing a street maintenance system for non-motorized modes; and assigning high priority to sidewalk construction projects in transit corridors, near school facilities, and major activity centers. Another goal of the Transportation Element is to *"develop a balanced finance program, which ensures that new development pays the costs of its impacts and that adequate public financing is pursued and available"*. Supporting bicycle/pedestrian policies and implementation strategies include establishing funding guidelines and priorities for the distribution of transportation funding among competing needs including pedestrian safety.

7.2.2.2 *Clark County Regional Parks, Recreation and Open Space Plan*

The Clark County *Regional Parks, Recreation and Open Space Plan* was completed in 2000, and is the second plan update under the Washington State GMA. The plan focuses on regional services and facilities including parks, trails, greenways and habitat lands. The document contains an objective pertaining to regional trails which directs the County to *"Promote, develop, operate, and maintain a comprehensive trail/bicycle system throughout Clark County that provides non-motorized travel (walking, bicycling, skating, and horseback riding) to meet county recreation, fitness, and commuting needs"*. The *Regional Parks, Recreation and Open Space Plan* incorporates the policies and recommendations of the County's *Trails and Bikeway System Plan*, adopted in 1993. The *Trails and Bikeways Plan* established nine general and 31 specific planning policies to guide the acquisition, design and development of trails and bikeways. Selected general policies are listed below:

- *"Develop a network of trails and bikeways throughout the county that will interconnect population centers, community facilities, work places, neighborhoods, recreational opportunities and natural greenspaces"*.
- *"Plan and coordinate the development of trails and bikeway links within Clark County and surrounding jurisdictions and become the facilitator for other provider and volunteer efforts"*.
- *"Acquire open greenspace and natural corridors for trail development"*.
- *"Work closely with corporate business, private developers, and public agencies to incorporate trails and bikeways, where feasible"*.
- *"Promote sensitive planning solutions and design and development support services such as education, enforcement, and maintenance to reduce personal safety hazards"*.

7.2.3 Metropolitan Transportation Plan

The *Metropolitan Transportation Plan* (MTP) is prepared and adopted by the Southwest Washington Regional Transportation Council (RTC) for the urbanized portions of Clark County including the Battle Ground urban growth area. The MTP is a long-range plan that identifies how the mobility and accessibility needs of people and freight within the regional will be addressed. With respect to the non-

motorized transportation system the MTP attempts to create a regional system to reduce reliance on the single-occupant auto by emphasizing (among other non-auto modes) the implementation of bicycle and pedestrian improvements. The MTP focuses on establishing a balanced transportation system and identifies safety as a primary concern.

7.2.4 State Plans and Policies

Statewide plans and policies that affect the development of non-motorized transportation in the Battle Ground urban area include: the state Growth Management Act, the state Bicycle and Pedestrian Plan, and the Safe Routes to Schools programs.

7.2.4.1 *Growth Management Act*

The Washington State Growth Management Act (GMA) contains a number of policies pertaining to the development and revision of city and county Comprehensive Plans. Although many of the policies are general in nature, the GMA addresses specific elements in a number of areas. Section 35.77.010(3) was updated by GMA and requires cities and counties to develop six-year plans for the expenditure of funds for transportation facilities. The section also addresses the need to preserve corridors for non-motorized transportation: *"Each six-year transportation program . . . shall contain information as to how a city or town shall act to preserve railroad right-of-way in the event the railroad ceases to operate in the city's or town's jurisdiction".*[19]

7.2.4.2 *WSDOT Bicycle and Pedestrian Plan*

The WSDOT *Bicycle and Pedestrian Plan* has two primary objectives: To improve bicycle and pedestrian safety; and to increase the use of bicycling and walking for transportation purposes, principally utilitarian and commuting trips and connections to intermodal facilities. The plan outlines 30 "action strategies" as means to achieve the objectives, and the majority of the strategies place the state in an advocacy role. The action strategies are grouped into four categories based on which agency (local, regional or state) bears the primary responsibility for their implementation. The categories include:

- Strategies that are a local responsibility, but are in the state's interest;
- Strategies requiring cooperation among state and/or local agencies;
- Strategies that are strictly a state agency's responsibility; and
- Strategies performed by volunteer groups that are in the state's interest.

Non-motorized transportation action strategies specifically applicable to the City of Battle Ground fall within the first category, which assigns full responsibility to the local jurisdiction. The Bicycle/Pedestrian Plan lists several strategies that are intended to be spearheaded by local agencies that focus on developing a bicycle and pedestrian system plan to prioritize funding, to ensure bicycle and pedestrian access to multi-modal transportation facilities (like transit centers or park-and-ride lots) or other major activity centers, and to work with school districts to ensure safe routes to school and appropriate education about bicycle/pedestrian for young motorists.

7.2.4.3 *WSDOT Safe Routes to Schools Programs*

Since 1999, the Washington State Department of Transportation (WSDOT) has administered the Traffic Safety Near Schools program, which has since provided $5 million in funding for over 70 statewide

[19] *Washington State Growth Management Act*, Section 35.77.010(3).

projects to improve bicycle and pedestrian safety near schools. The program however was not included in the 2003-2005 legislative budget, and over 90 projects are currently on the waiting list. In addition, the Washington State Traffic Safety Commission currently administers a $2 million School Zone Safety program that funds safety education and small traffic safety improvements. This program is funded by fines from traffic violations occurring in school zones.

Although limited funding is provided by these programs, criteria exist in order for a potential project to make the waiting list. Eligible projects for these programs typically include:

- Sidewalks and pathways designed to make bicycling and walking to school safer and more attractive;
- Street safety and design improvements near schools and school routes;
- Community health/activity encouragement initiatives linked to walking and bicycling;
- School zone and school route law and safety enforcement programs; and
- Health and physical education training that link to the long-term, broad-scale community health benefits from increased levels of childhood physical activity.

7.3 EXISTING NEEDS

In recent years, the inventory of bicycle facilities (including bicycle lanes, wide shoulders and trails) has increased throughout the Battle Ground area, as shown in Figure 2-8 in Chapter 2. Several of the community's arterial and collector streets have been expanded to include bicycle facilities, corresponding with frontage improvements required with new residential and commercial development as well as the completion of several capital improvement projects. The existing bicycle network provides extensive north-south connectivity while east-west connectivity is not nearly as comprehensive. Most bicycle facilities in Battle Ground are in the form of bicycle lanes on arterial and collector streets, although wide shoulders and trails exist. While new developments associated with Battle Ground's recent growth have resulted in more bicycle facilities along major roads, the system remains relatively fragmented. On several streets, bicycle lanes exist only on one side, and some street segments have gaps with no bicycle facilities at all. Although much of the newer residential development has contributed to an extensive network of cul-de-sac streets, few accessways exist in the Battle Ground area.

Similar to the bicycle network, Battle Ground's pedestrian system has expended corresponding with roadway frontage improvements required with new development as well as completion of several capital improvement projects (as shown on Figure 2-9 in Chapter 2). The community has better north-south than east-west connectivity, and the pedestrian network is more comprehensive on the east side of the city. A majority of the streets east of SR 503 and in the vicinity of E Main Street have sidewalks and crosswalks at signalized intersections. Some intersection crosswalks in the downtown core do not have wheelchair ramps meeting ADA standards.

Traditionally, places like schools, parks and commercial nodes tend to generate and attract higher levels of bicycle/pedestrian traffic. The tendency for these areas to generate and attract bicycle and pedestrian trips typically increases when housing is within reasonable bicycling or walking distance.

Bicycle and pedestrian traffic is currently generated by three concentrations of school campuses in the urban area; one in central Battle Ground in the northeast quadrant of the SR 502/SR 503 intersections; one in the northeast quadrant of the SR-503/NE 199th Street intersection; and the third near the intersection of NE 189th Street/NE 112th Avenue. The campuses in central Battle Ground consist of Captain Strong and Chief Umtuch elementary schools, Lewisville Middle School and Battle Ground High School. Athletic fields north of the high school campus near E Main Street also draw pedestrian and

bicycle traffic, especially during summer months. The second concentration of schools includes Maple Grove elementary and middle schools, which are also located within close proximity to Gardner Oaks Park along NE 199th Street. The third concentration of schools along NE 112th Avenue includes Meadow Glade Elementary School and Columbia Academy.

In addition to existing schools, other major bicycle/pedestrian generators in the city include the commercial development along W/E Main Street; existing city parks at various locations in the community; the Fort Vancouver Regional Library on E Main Street just west of Parkway Avenue; and, potentially, the C-TRAN park-and-ride lot on East Main Street near Grace Avenue. These major bicycle and pedestrian generators are also shown in Figures 2-8 and 2-9 in Chapter 2. For the most part, few or no separate bicycle facilities are available to access these major existing bicycle trip generators.

There are several parks scattered throughout the Battle Ground area that also generate and attract (or have the potential to generate and attract) bicycle/pedestrian traffic. In the northeast quadrant, Central Park and Fairgrounds Park are located along E Main Street near the downtown commercial core. In the southeast quadrant, Hidden Glen and Kiwanis parks are located north of Rasmussen Boulevard, and Gardner Oaks Park is located south of Rasmussen Boulevard near SR 503. The Remy Property is an undeveloped land parcel in the city's southwest quadrant near the intersection NE 112th Avenue/SW 6th Street. The undeveloped Florence Robinson Park is situated in the northwest quadrant near the intersection of NW 20th Avenue/NW 9th Street.

SR 502/Main Street serves as the primary commercial spine in Battle Ground. West of SR 503, newer commercial entities like gas stations and banks straddle the thoroughfare, and these newer developments are geared more toward auto transportation. SR 502 west of SR 503 was recently improved to include increased capacity for autos, but also includes bicycle lanes and sidewalks. The built environment and streetscape east of SR 503 along W/E Main Street is older, reflecting a more pedestrian-scale development in Battle Ground's traditional downtown core. This area is characterized by buildings fronting the sidewalk with parking situated in the rear of the property. While the portion of W/E Main Street does not have bicycle facilities, two nearby parallel streets – NE 1st Street and SW/SE 1st Street – provide an alternative route for cyclists. In general, the businesses along SR 502/W Main Street are the primary commercial entities that generate bicycle and pedestrian trips.

7.4 IMPROVEMENT OPPORTUNITIES

7.4.1 Planned/Pending Improvements

Several agencies, including the Washington State Department of Transportation (WSDOT), Clark County and the City of Battle Ground have outlined future projects intended to improve the transportation system in vicinity of the Battle Ground area. Many of the projects refer to roadway capacity increases like adding center turn lanes or additional general purpose lanes. While most projects will enhance auto mobility, they will also contribute to a more comprehensive non-motorized transportation system. Most agencies require provisions for bicycle and pedestrian amenities to be provided when arterial and major collector roads are constructed or reconstructed. Within the Battle Ground area, sidewalks and bicycle lanes are required on all new or reconstructed arterials and collector streets. Sidewalks are not required on rural roadways, whereas wide shoulders are required in order to accommodate bicyclists and pedestrians. Each of the projects listed in the tables below is assumed to include bicycle and pedestrian facilities, though the type of facilities depends on the project location. Table 7-2 lists planned roadway projects in vicinity of the Battle Ground UGA that will include bicycle and pedestrian amenities. The planned bicycle improvements are illustrated in Figure 7-1 and the planned pedestrian improvements are illustrated in Figure 7-2.

SR 502 and SR 503 are the only state-owned roadways in the Battle Ground area. WSDOT's *2003-2022 State Highway System Plan* highlights projects for these roadways, which will primarily include wide shoulders for bicycle and pedestrian use. Worth noting is that non-motorized travel connections between Battle Ground and destinations to the west and south will be enhanced when improvements to SR 502 and SR 503 are complete.

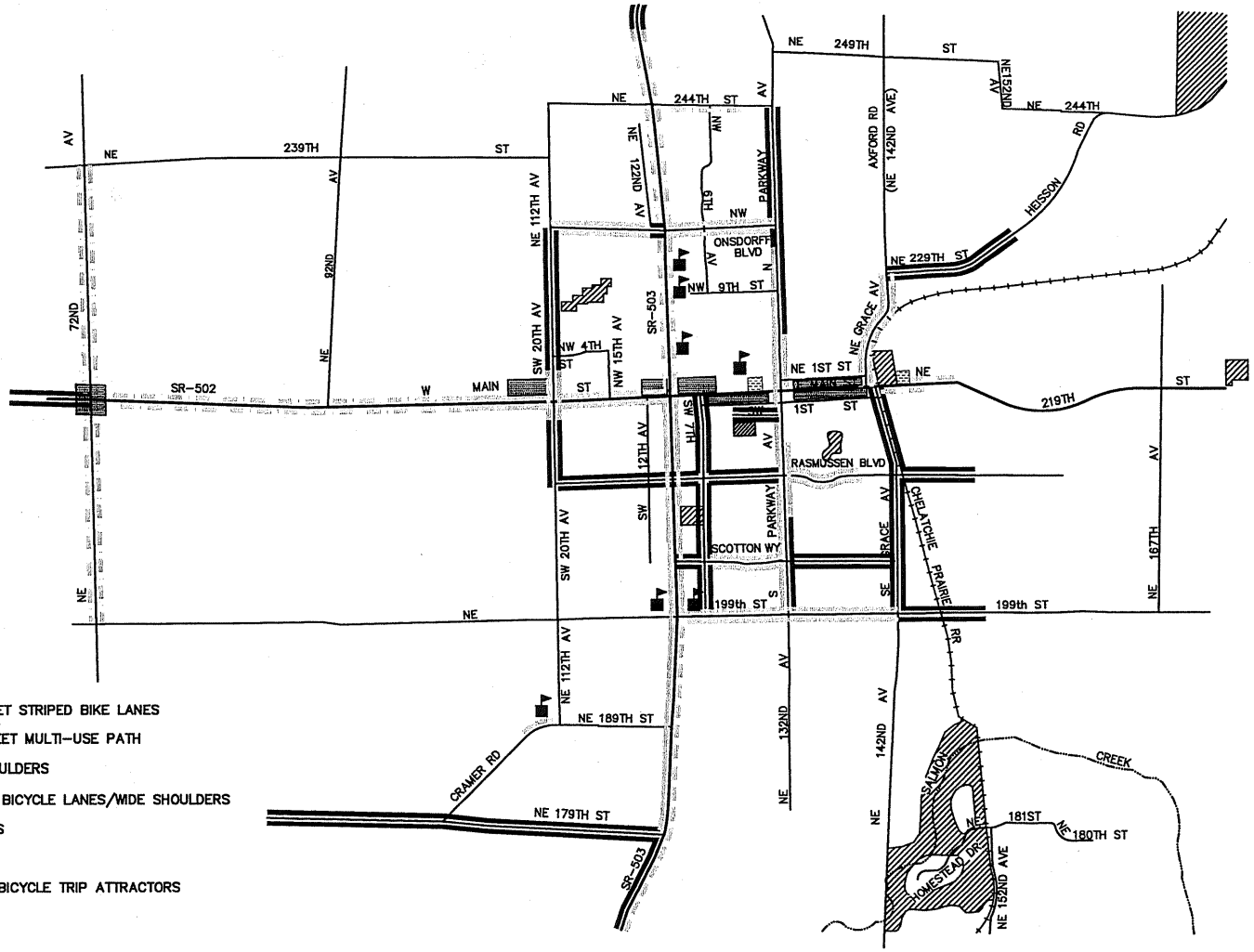
The Metropolitan Transportation Plan (MTP) for Clark County was published by the Southwest Washington Regional Transportation Council in December 2002. Specific to the Battle Ground area, listed projects include improvements to SR 502 and NE 179th Street. Because of the relatively rural location of the listed projects, it is assumed that the roadway improvements will include wide shoulders to accommodate bicycles and pedestrians.

The Clark County 2005-2010 Six-Year Transportation Improvement Program (TIP) includes several projects in vicinity of Battle Ground. The TIP uses objective criteria to evaluate and prioritize road improvements from a list of recommended projects. The TIP assigns available revenues to the highest-ranking projects to achieve the goals of the County Comprehensive Plan and to realize the vision set by the community and the Board of County Commissioners. Projects include new roadways, widenings, bridges and bicycle/pedestrian facilities. In addition, ongoing programs including neighborhood traffic management, roadway preservation and advanced right-of-way purchases are listed in the TIP.

The Battle Ground *Comprehensive Parks, Recreation and Open Space Plan* states that the City will continue to coordinate with Clark County, WSDOT and other service providers to help actively seek acquisition and development of a unified and interconnected trail system. The document includes several proposed trail segments in various areas within the city's UGA. The trails proposed in the plan represent conceptual routes and do not include specific alignments. Trails would potentially be located along roadways, along stream corridors and potentially along the Lewis and Clark Railroad alignment.

The City of Battle Ground 6 Year Transportation Improvement Program spans the 2005-2010 time period. Each of the Plan's listed projects will – to differing degrees – enhance the city's bicycle and pedestrian network. Some arterial and collector streets are planned to be upgraded to include more vehicle lanes along with sidewalks and bicycle lanes, while new roads will also be built which will include facilities for non-motorized travel. Worth noting is that improvements are planned for NE 1st Street and SW/SE 1st Street. Both facilities are located one block from the portion of W/E Main Street that currently lacks bicycle facilities. Right-of-way issues preclude adding bicycle facilities to W/E Main Street, and both NE and SW/SE 1st Streets currently serve as parallel alternatives.

While the improvements to these facilities do not specifically include bicycle lanes or wide shoulders, the environment for bicyclists on these streets is expected to become more comfortable. On-street parking will be clearly delineated which will free up space in the current travel lanes where parked vehicles sometimes encroach. Sidewalks will also be added to these streets, enhancing the pedestrian environment as well. The TIP also has a provision for city-wide pedestrian improvements like enhancing access to schools and upgrading substandard pedestrian facilities to comply with ADA standards.



LEGEND

- EXISTING ON-STREET STRIPED BIKE LANES
- EXISTING OFF-STREET MULTI-USE PATH
- EXISTING WIDE SHOULDERS
- PLANNED/PENDING BICYCLE LANES/WIDE SHOULDERS
- COMMERCIAL AREAS
- PARKS
- OTHER POTENTIAL BICYCLE TRIP ATTRACTORS
- SCHOOLS

KEY

N

NOT TO SCALE

Figure 7-1: Planned/Pending Bicycle System Improvements

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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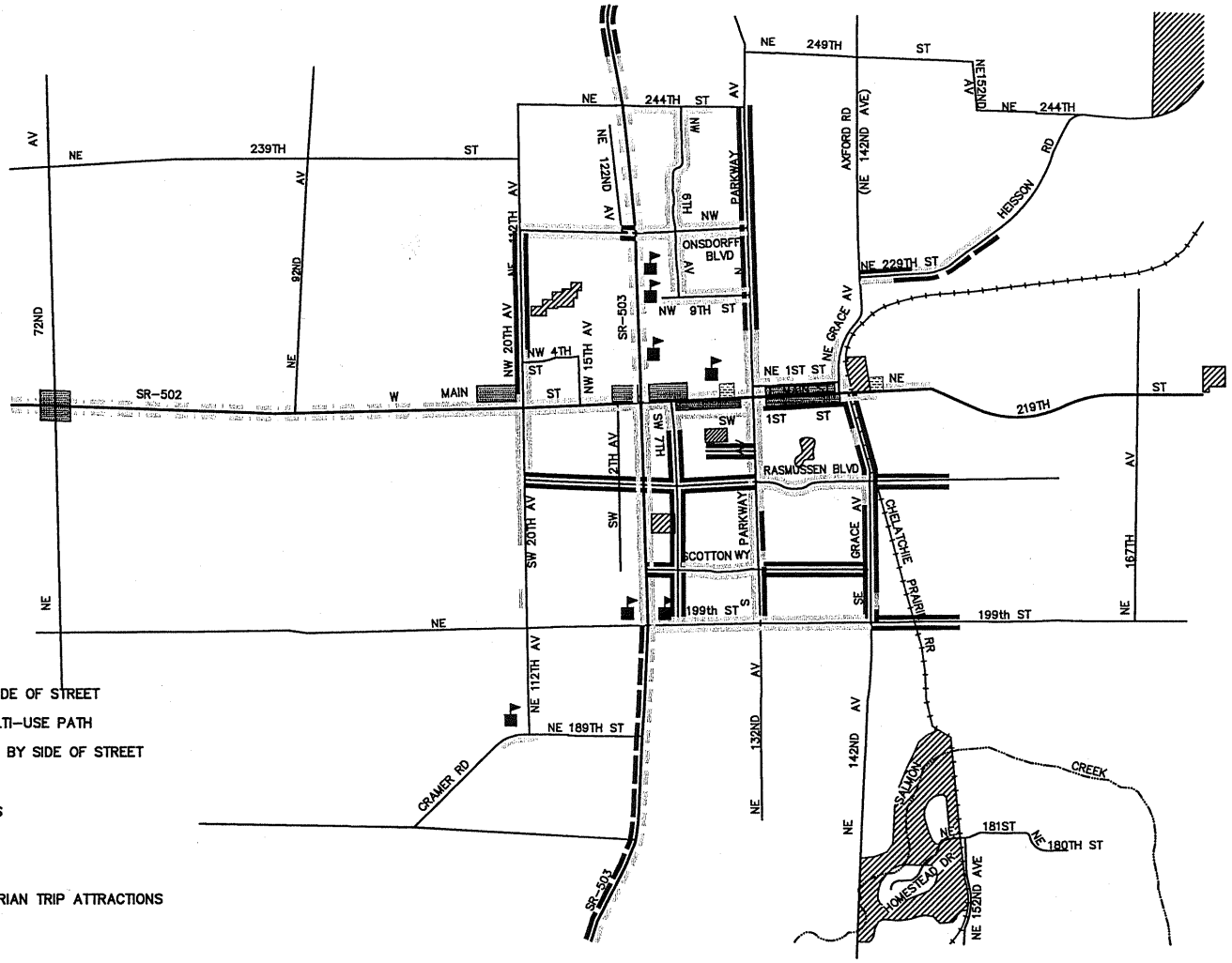

LEGEND

- EXISTING SIDEWALKS BY SIDE OF STREET
- EXISTING OFF-STREET MULTI-USE PATH
- EXISTING WIDE SHOULDERS BY SIDE OF STREET
- PLANNED SIDEWALKS
- PLANNED WIDE SHOULDERS
- COMMERCIAL AREAS
- PARKS
- OTHER POTENTIAL PEDESTRIAN TRIP ATTRACTIONS
- SCHOOLS

KEY

N
NOT TO SCALE

Figure 7-2:
Planned/Pending Pedestrian System Improvements

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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Table 7-2
Planned/Pending Bicycle and Pedestrian Improvements in Vicinity of Battle Ground

Roadway	Segment	Project Description	Agency Lead	Year of Construction
SR 502	NE 179th St./I-5 to west city limits	Widen to 4 lanes with two-way left-turn channelization	WSDOT	2003-2022
SR 503	SR 502/Main St to SR 500	Widen to 6 lanes	WSDOT	2003-2022
SR 503	NE 132nd Ave. to SR 502/Main St.	Intermittent passing lanes or widen to 4 lanes	WSDOT	2003-2022
NE Heisson Rd. at NE 244th St.	At intersection	Improve intersection	Clark County	2005-2010
NE 72nd Ave. at NE 239th St.	At intersection	Intersection improvements, including signal; not programmed.	Clark County	2005-2010
NE 142nd Ave.	NE 199th St. to NE 159th St.	Construct a 2-lane rural minor collector standard, south of Battle Ground UGA; north of UGA determined by City's Master Plan; not programmed.	Clark County	2005-2010
NE 179th St.	NE Cramer Rd. to SR 503	Construct a 2-lane rural major collector standard	Clark County	2005-2010
NE 179th St.	NE 50th Ave. to Cramer Rd.	Provide 1 lane in each direction with turn lane	Clark County	2005-2010
NE 72nd Ave.	NE 259th St. to SR 502	Construct a 2-lane rural major collector standard	Clark County	2005-2010
S Parkway Ave.	SW 10th St. to NE 199th St.	Widen and add sidewalks to east side, redesign centerline profile, storm drainage, lighting, striping, signing, landscaping, bike lanes	Battle Ground	2005
N Parkway Ave. (Phase 2)	NW 5th St. to NW Onsdorff Blvd.	Widen and add sidewalks to both sides, storm drainage, lighting, striping, landscaping, signing, bike lanes	Battle Ground	2006
SW 6th Ave.	NE 199th St. to SW Scotton Way	Construct new road, storm drainage, sidewalks, landscaping, signing, bike lanes	Battle Ground	2006
Rasmussen Blvd. (Phase 1)	SR 503 to S Parkway Ave.	Construct new road, lighting, storm drainage, sidewalks, landscaping, signing, bike lanes	Battle Ground	2006
Rasmussen Blvd. (Phase 2)	SW 20th Ave. to SR 503	Construct new road, lighting, storm drainage, sidewalks, striping, landscaping, signing, bike lanes, install traffic signal at intersection of SR 503/Rasmussen Blvd.	Battle Ground	2006
NW 20th Ave.	SR 502 to NW Onsdorff Blvd.	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing, bike facilities	Battle Ground	2007
NE 199th Street	S Grace Avenue to east city limits	Widen to three lanes and add sidewalks, storm drainage, striping, lighting, landscaping, bike facilities	Battle Ground	2007
S Grace Ave.	E Main St. to NE 199th St.	Widen roadway and add sidewalks, storm drainage, striping, lighting, landscaping, bike facilities	Battle Ground	2008

Table 7-2 Continued
Planned/Pending Bicycle and Pedestrian Improvements in Vicinity of Battle Ground

Roadway	Segment	Project Description	Agency Lead	Year of Construction
SW 20th Ave.	SR 502 to SW Rasmussen Blvd.	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing, bike facilities	Battle Ground	2007
Grace Ave./E Main St. Intersection	At intersection	Install traffic signals at N and S Grace Ave., pedestrian crossing	Battle Ground	2008
Heisson Rd.	East city limits to NE 142nd Ave.	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing, bike facilities	Battle Ground	2008
N Parkway Ave. (Phase 3)	NE 244th St. to NW Onsdorff Blvd.	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing, bike lanes	Battle Ground	2008
SW 7th Ave. (Phase 1)	South terminus to SW Rasmussen Blvd.	Construct new road, storm drainage, striping, lighting, landscaping, sidewalks, signing	Battle Ground	2008
SW 7th Ave. (Phase 2)	SW Rasmussen Blvd. to NE 199th St.	Construct new road, storm drainage, striping, lighting, landscaping, sidewalks, signing, signal	Battle Ground	2008
SE Rasmussen Blvd.	SE Grace Ave. to Commerce Ave.	New construction, railroad crossing, bike facilities, street lighting, storm drainage, striping, landscaping, signing and sidewalks	Battle Ground	2009
NW/SW 1st Sts.	Frontage roads parallel to W Main St.	New construction completing frontage roads on north and south sides of road	Battle Ground	2009
SE 1st St.	S Parkway Ave. to SE Grace Ave.	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing	Battle Ground	2009
NE 1st St.	N Parkway Ave. to NE Grace Ave.	Widen and add sidewalks, storm drainage, striping, signing	Battle Ground	2009
SW 4th St.	S Parkway to west terminus	New construction includes bike facilities, street lighting, storm drainage, striping, landscaping, signing and sidewalks	Battle Ground	2009
Scotton Way Extension	East terminus to S Grace Avenue	Construct new road, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2009

Sources: WSDOT *2003-2022 State Highway System Plan*; Southwest Washington Regional Transportation Council, *Metropolitan Transportation Plan for Clark County*, 2002; *Clark County 2005-2010 Six-Year Transportation Improvement Program* and conversation with Matt Hall, Clark County (June 10, 2004); Battle Ground 6 Year Transportation Improvement Plan.
Note: n/a = information not available; RTC = Southwest Washington Regional Transportation Council.

7.5 FUTURE CONSTRAINTS AND DEFICIENCIES

Implementation of the pending and planned improvements described above would help achieve a more comprehensive bicycle and pedestrian network throughout the Battle Ground area. As in the case of existing conditions, most non-motorized facilities would be located in the northeast and southeast quadrants, where most future development is expected to take place. North-south connectivity would be

greatly improved. With the planned and pending improvements in place, generally continuous bikeways and walkways would be provided on roads like SR 503, SW 6th/7th Avenues, N/S Parkway Avenue and NE/SE Grace Avenue. On the west side of the city, NE 112th/20th Avenue would have continuous bicycle lanes and sidewalks between SW Rasmussen Boulevard and NW Onsdorff Boulevard.

Even with the planned and pending improvements in place however, east-west connectivity would remain as a primary bicycle and pedestrian issue. Only a few east-west streets are slated for new or improved bicycle/pedestrian amenities, including SE Rasmussen Boulevard and NE 179th Street. NE 1st Street and SW/SE 1st Street would greatly enhance non-motorized transportation in the downtown core, as these streets would provide an alternative to W/E Main Street that has limited amenities. That aside, general east-west connectivity would still be a problem. SR 503 currently serves (and is expected to remain) as a barrier for east-west travel through and within the City of Battle Ground. The few crossings within and near the city make east-west non-motorized travel difficult, as bicyclists and pedestrians must often travel longer distances to reach safe crossing points. The extensions of SW Rasmussen Boulevard and NW Onsdorff Boulevard to provide continuous travel across SR-503 between NW 20th Avenue and N Parkway Avenue are expected to partially alleviate the connectivity issue, as the new streets would help link neighborhoods on the east and west sides of the city. The few east-west connections between the northwest and northeast quadrants would still hinder non-motorized travel, especially with the concentration of school campuses just east of SR 503. Students traveling between these schools and the neighborhoods in the northwest quadrant would still either have to travel north to NW Onsdorff Boulevard or south to SR 502/W Main Street to find a designated crossing.

Pedestrian safety is a concern among city leaders, with the concentration of academic facilities in downtown generating substantial levels of pedestrian traffic across E Main Street during the mid-afternoon. The City and the Battle Ground School District have worked cooperatively to address pedestrian safety and congestion caused by school traffic in the downtown area. As a result, crossing guards and supplemental advisory signs have been employed along E Main Street to encourage motorists to be aware of pedestrians.

Accommodating persons with disabilities is another issue. Mentioned earlier, most intersections in the downtown core have crosswalks and curb ramps, but several curb ramps to not meet current ADA standards. Adequate ramps along with pedestrian detection devices (like push buttons) at signalized intersections are needed to ensure mobility and access for persons with disabilities. In summary, although the currently planned bikeways and walkways will improve non-motorized travel in Battle Ground, the system would still be somewhat fragmented, providing obstacles for bicyclists, pedestrians, and persons with disabilities.

7.6 STRATEGIES FOR IMPROVEMENT

A number of strategies were developed to provide the basis for a discussion of policies and priorities to be used in guiding Battle Ground's bicycle and pedestrian facility improvements in the coming decades. In part, these strategies were derived from existing policies and an assessment of current deficiencies, current improvement programs and the anticipated projects listed in Table 7-2. Many of the projects have specific completion dates while others are based on a more general time frame. While it is recognized that the projects may not be implemented exactly when planned, the list provides a starting point for discussion of bicycle/pedestrian improvements and priorities.

An ideal environment for bicyclists and pedestrians would include bicycle and walking facilities on all of the City's arterial and collector streets in addition to a comprehensive multi-use path network providing alternate routes to congested roadways. Both physical and financial constraints limit the ability of the

City to provide these facilities on all arterial and collector streets. For instance, the right-of-way on W/E Main Street between SR 503 and NE/SE Grace Avenue is limited by developed lands that prohibit roadway widening for bicycle lanes. In this case, the impacts of installing bicycle facilities would far outweigh the benefits. In instances like these, parallel alternative routes were identified that would better accommodate non-motorized travelers. The City of Battle Ground is also operating on a limited budget that does not allow for the implementation of all desired bicycle/pedestrian projects at one time. For this reason, tools were identified that would aid in the project prioritization process.

Upon identifying deficient (or non-existing) bicycle/pedestrian facilities, several strategies were identified that provided various alternatives for how the non-motorized transportation network could be improved. Each of the strategies defines a specific approach for implementing projects, and places emphasis on different policy objectives. The intent of developing and discussing these strategies was to ensure that all community needs and desires were adequately addressed by the planning process, and to generate criteria for the prioritization of improvement recommendations and associated funding. Specifically, seven strategies for enhancing the bicycle/pedestrian system were evaluated.

Strategy #1: Do Nothing
This strategy would focus primarily on providing routine maintenance to ensure that the existing bicycle and pedestrian system can sufficiently accommodate its users. Safety improvements would be made to the existing system including curb ramps meeting ADA standards where ramps are currently substandard. A maintenance schedule would also be established for on-street and off-street bicycle/pedestrian facilities. Maintenance activities include street sweeping, crack repair, pavement overlays and trimming of trees and bushes that encroach upon bicycle and pedestrian rights-of-way. Expansion of the non-motorized transportation system would be minimal under this strategy.

Strategy #2: Focus on Schools and Civic Facilities
This strategy would focus bicycle and pedestrian project prioritization around the three concentrations of school campuses. The concentrations are located in central Battle Ground near SR 503 at SR 502/W Main Street, SR 503 at NE 199th Street, and NE 112th/SW 20th Avenue at NE 189th Street. At the campus concentrations near SR 503, improvements would be aimed at providing better east-west connections between SR 503 and the individual school campuses in an effort to address connectivity issues. This strategy would also include improvements on W/E Main Street (and parallel routes) to provide safe pedestrian crossings and adequate facilities for bicycle travel. Non-motorized improvements near Columbia Academy and Meadow Glade would include bicycle lanes and sidewalks on NE Cramer Road, NE 189th Street and NE 112th/SW 20th Avenue.

Strategy #3: Focus on Existing and Future Activity Centers
The City's Comprehensive Plan identifies several existing and future activity centers. Activity centers include mixed-used residential and employment areas, high density housing, the downtown core, and the regional center which would stretch along SR 503 from approximately NE 199th Street to NW Onsdorff Boulevard (the regional center would also stretch along SR 502/Main Street from NW 29th Avenue to NW/SW 5th Avenue. Most of the mixed-used residential and mixed-used employment areas would be located on the outer fringes of the urban growth area, mostly within the northwest, southwest and southeast quadrants. Bicycle lanes, sidewalks and trails would be located along streets and right-of-ways that provide internal circulation within the activity centers, link these centers with residential areas, and with other activity nodes.

Strategy #4: Focus on Providing Connections to Transit
C-TRAN currently operates two transit routes along SR 502/W Main Street and SR 503. Under this strategy, project prioritization would focus on providing safe and convenient connections between

surrounding areas and the two transit corridors. Specifically, improvements would be targeted along streets and potential multi-use path alignments intersecting SR 502/W Main Street. SR 503 is a limited-access roadway with few transit stops and intersecting streets. Improvements along this corridor would be focused on providing additional bicycle/pedestrian connections between the highway and the residential and employment centers to the immediate east and west. Further analysis would be required to examine the feasibility of additional crossings on SR 503.

Strategy #5: Fill in Gaps on the Existing and Planned Bicycle/Pedestrian System
Most of the planned and pending roadway improvements are expected to fill many of the gaps that currently exist on Battle Ground's bicycle and pedestrian network. "Gaps" are defined as short street segments lacking sidewalks, bicycle lanes or wide shoulders. A gap (or "missing link") typically falls between two street segments having sufficient facilities for non-motorized travel. Implementing this strategy would result in a more complete bicycle/pedestrian network. Improvements would likely be targeted in areas where fragmented facilities exist, which are generally located in the more central portions of the city. There would be fewer improvements on the outskirts of Battle Ground, as there are very few facilities in these areas that would create gaps in the system.

Strategy #6: Focus on Existing and Future Parks
Project prioritization under this strategy would be focused on providing connections to the developed and undeveloped parks identified in the Battle Ground *Comprehensive Parks, Recreation and Open Space Plan*. The document identifies several existing and planned parks in each of the City's four quadrants, though most are located on the eastern side of the city. Bicycle lanes, sidewalks and trails would connect these parks with surrounding residential and employment areas to better accommodate non-motorized travelers.

Strategy #7: Focus on Expanding the Trail Network
The Battle Ground *Comprehensive Parks, Recreation and Open Space Plan* outlines several potential trail (multi-use path) alignments throughout the city. Under this scenario, funding for non-motorized facilities would be directed toward these projects in an effort to create a more comprehensive off-street bicycle/pedestrian network. Improving the on-street network would occur in the form of roadway frontage improvements required with new development. The Parks Plan identifies trail alignments that would pass through and around parks, along stream corridors and along the Lewis and Clark Railroad alignment. In addition to implementing the multi-use path network recommended in the Plan, this strategy would also provide for safe bicycle/pedestrian crossings where trails intersect streets. Crossing provisions could include curb ramps, crosswalks, bicycle loop detectors and pedestrian push buttons.

Table 7-3 lists the improvement strategies listed above along with the relevant policies that they are intended to address. The strategies directly and indirectly relate to the bicycle/pedestrian system policies dictated by the WSDOT *Bicycle and Pedestrian Plan*; Clark County *Comprehensive Plan* and the Clark County *Regional Parks, Recreation and Open Space Plan*. The policies also come from the Battle Ground *Comprehensive Plan* and the City's *Comprehensive Parks, Recreation and Open Space Plan*. Each strategy was evaluated in terms of how effectively it might meet the various bicycle/pedestrian system goals and objectives. The results of this evaluation are presented in the following table.

Table 7-3
Evaluation of Bicycle/Pedestrian System Development Strategies

	Objectives				
Strategy	**Recreational**	**Safety**	**Complete System**	**School Access**	**Intermodal Access**
1-Do Nothing	O	*	O	O	O
2-Access Schools and Civic Facilities	*	**	**	***	*
3-Access Activity Centers	**	*	**	*	**
4-Connections to Transit	O	*	*	O	**
5-Fill in Gaps in Existing/Planned System	*	**	**	*	*
6-Access Parks	***	**	**	**	**
7-Emphasize Trails	***	*	*	*	*

O Does not meet criteria
* Partially meets criteria
** Mostly meets criteria
*** Fully meets criteria

7.7 RECOMMENDED ACTION PLAN

Recommended improvements for Battle Ground's bicycle and pedestrian network are focused on arterial and collector streets as well as off-street trails. An ideal bicycling environment would include some type of bicycle facilities on all arterial and collector streets. An ideal pedestrian environment would include facilities for foot traffic on all streets. Off-street trails would serve both modes, as these facilities can be located where street connections cannot be made as well as where street connections are not planned. This section not only recommends specific bicycle and pedestrian improvement projects, but also provides a means for prioritizing the projects based on the improvement strategies discussed above. In addition, this section also outlines a set of general policies intended to guide the overall development and improvements of Battle Ground's bicycle and pedestrian network.

7.7.1 Bicycle and Pedestrian Circulation Goals and Objectives

Through the community visioning process and numerous follow-on work sessions with the City Planning Commission, an interim set of transportation system goals, objectives and action strategies was endorsed in 2001. Goals and objectives that are particularly pertinent to development and enhancement of the bicycle circulation system include the following:

Transportation Goal 1- The City will encourage the construction of a transportation system that enhances the City's livability.

Transportation Objective 1.5. Where possible, the City will build a transportation system that will also provide recreation opportunities for the residents of Battle Ground

Transportation Action 1.5.1. *The City will identify transportation improvements that are also recreation opportunities and coordinate those improvements with parks and recreation improvements.*

Transportation Goal 2- A transportation system that is safe

TO2.1 The City will work to enhance the safety of the pedestrian system

TA2.1.1. *The City will prioritize pedestrian improvements consistent with an emphasis on enhancing safe access to schools and other community activity centers.*

TA2.1.2. *Consistent with the City's street standards, all roadway improvement projects will provide for safe pedestrian access.*

TA2.1.3. *On new street construction or reconstruction of existing streets, the City will ensure that sidewalk surfaces and geometrics are suitable for travelers with disabilities (especially those in wheelchairs).*

TA2.1.4. *The City will ensure that pedestrian facilities are adequately maintained.*

TO2.2. The City will work to enhance the safety of the bicycle system

TA2.2.1. *The City will prioritize bicycle improvements consistent with an emphasis on enhancing safe access to schools and other community activity centers.*

TA2.2.2. *Consistent with the City's street standards, all roadway improvement projects will provide for safe bicycle circulation.*

TA2.2.3. *The City will ensure that bicycle facilities are adequately maintained.*

Transportation Goal 3. A transportation system with a variety of transportation options (EDA1.1.3, EA8.1.1)

TO3.2. The City will work to provide a complete pedestrian network

TA3.2.1. *The City will implement pedestrian system improvements as identified in the Transportation System Plan.*

TO3.3. The City will work to provide a complete bicycle network

TA3.3.1. *The City will implement bicycle system improvements as identified in the Transportation System Plan.*

TA3.3.2. *The City will work with the County to plan for bicycle routes that provide connections between Battle Ground and other parts of the County.*

TA 3.3.3. *The City will strive to encourage provision of bicycle amenities in conjunction with land development projects.*

TO3.5. The City will seek alternative means of meeting travel demand

TA3.5.5. *The City will work with equestrian groups to determine equestrian needs and methods to meet those needs.*

Transportation Goal 5. A transportation system that balances accessibility and mobility.

TO5.8. The City will seek to balance motor vehicle mobility with pedestrian, bicycle and transit accessibility

TA5.8.1. *The City will seek ways to improve bicycling and pedestrian accessibility and allocate appropriate funding to these improvements.*

Land Use Goal 2 Human-scaled architectural design and spatial relationships

LO2.4 Promote new development that provides an appropriate balance between pedestrian orientation and automobile access

LA2.4.1. The City will review the development code and public facilities code for consistency and make changes as necessary.
LA2.4.2. The City will periodically review new developments to insure that the development requirements are resulting in pedestrian oriented development.
LA2.4.3. The City will work to provide or require non-motorized connections between commercial and residential areas to minimize distance for non-motorized travelers.

LO2.6. Promote the design of public and recreation spaces and rights-of-way that improve the pedestrian environment and increase the opportunity for social interaction
LA2.6.1. The City will investigate establishing standards for public projects to insure that these projects improve the pedestrian environment.
LA2.6.2. The City will work to provide a pedestrian-oriented streetscape including sidewalks with strips; as well as street furniture and adequate space for human activity in retail, commercial and mixed use areas.

Parks Goal 4.The City will seek to provide a safe and accessible community-wide trail system.

PO4.2. The City will work to establish a trail system that connects parks, residential areas and commercial areas and helps serve the transportation needs of the residents of Battle Ground
PA4.2.1. The City will identify key connections that will enable residents to travel safely throughout the City separated from motorized vehicle traffic (TA1.6.1).
PA4.2.2. The City will include trail connections to parks, public uses and commercial areas in its transportation system plan (TA2.1.1, TA2.2.1).
PA4.2.3. The City will maintain public trails.

7.7.2 Improvement Recommendations

7.7.2.1 *Prioritization of Improvements*

Based on the strategies listed earlier in this chapter and the degree to which they would meet the objectives outlined in Table 7-3, it was determined that the prioritization of bicycle and pedestrian system improvements should be based on proximity to schools, civic facilities and parks, and the ability of the projects to connect these places with other bicycle/pedestrian facilities and destinations. While all of the improvement strategies should be considered when developing the City's non-motorized network, enhancing access to schools, activity centers and parks would serve as the best tool for prioritizing projects, as these strategies could serve the greatest number of people.

The strategy to prioritize bicycle/pedestrian projects that are near schools, civic facilities and parks would initially bring improvements to the system near the three concentrations of school campuses within the city as well as to the developed and undeveloped parks identified in the Battle Ground *Comprehensive Parks, Recreations and Open Space Plan*. The school campus concentrations are located at SR 503 near SR 502/W Main Street, SR 503 at NE 199th Street and NE 112th/20th Avenue at NE 189th Street. Improvements in these areas would be aimed at providing better east-west connectivity for non-motorized travelers, especially across SR 503. A more complete sidewalk network would be provided near Columbia Academy and Meadow Glade, and improved pedestrian crossings would be provided on W/E Main Street. Bicycle lanes, sidewalks and trails would also be provided to better connect the City's existing and future parks with residential and employment areas.

7.7.2.2 *Recommendations*

Recommended improvements to enhance the existing bicycle and pedestrian system in the Battle Ground UGA include the addition of sidewalks and bike lanes along existing or new streets, and the development of various off-street trail projects that would connect multiple destinations in the UGA. Tables 4-7 and 4-8 in Chapter 4 – Street Plan list the recommended improvements to the arterial and collector street system in the UGA. Table 4-7 describes recommended improvements to the existing street and roadway system to bring these roads up to urban street standards including, as appropriate, curbs, gutters, sidewalks, bike lanes, illumination and other features. Table 4-8 identifies recommendations for new roads to provide street system connectivity and property access in newly developing portions of the UGA. These roads would also be built to urban standards appropriate to their functional classification.

Prioritization of the recommended on-street bicycle/pedestrian projects in Tables 4-7 and 4-8 take into account the prioritization methodology discussed above. Most of the recommended short-term projects are included in the City's 2004-2009 *6-Year Transportation Improvement Program.* Other short-term projects would be located near the existing school campus concentrations as well as activity centers and parks in the more central parts of the city. The medium- and long-term projects are located farther away from central Battle Ground and would be completed in conjunction with (or in anticipation of) new development.

The recommended off-street bicycle and pedestrian projects are generally consistent with the proposed trails outlined in the Battle Ground *Comprehensive Parks, Recreation and Open Space Plan.* While several trails would be constructed on newly-established corridors (e.g. along streams), several facilities are proposed to be located parallel to existing and planned roadways. It should be noted that some of the recommended trail segments in the Parks Plan are located along streets where bicycle lanes and sidewalks are recommended in the TSP. It is assumed that the decision to construct a trail or bicycle lanes/sidewalks would be based on several factors like right-of-way, cost, safety to users and the ability of the facility to provide streamlined connections to other nearby facilities. Ultimately, in cases where both trails and bicycle lanes/sidewalks are proposed, it is recommended that either form of facility be constructed based on the issues listed above.

Several off-street trails are included in the Parks Plan that would enhance connectivity to schools, parks and activity centers. A description of the trails and their recommended time-frame for construction (as recommended by the TSP) are listed below.

Short-Term Trail Recommendations:

- A trail roughly following SW/SE 5th Street between SR 503 and the Lewis and Clark Railroad alignment. This trail would provide access to Kiwanis Park and Woodin Creek.
- A trail roughly following SW 4th Street from S Parkway Avenue, through Kiwanis Park and along the drainage corridor connecting to the Maple Grove School campus.

Medium-Term Trail Recommendations:

- A trail extending along Woodin Creek from the general location of SE 8th Street to NE 199th Street

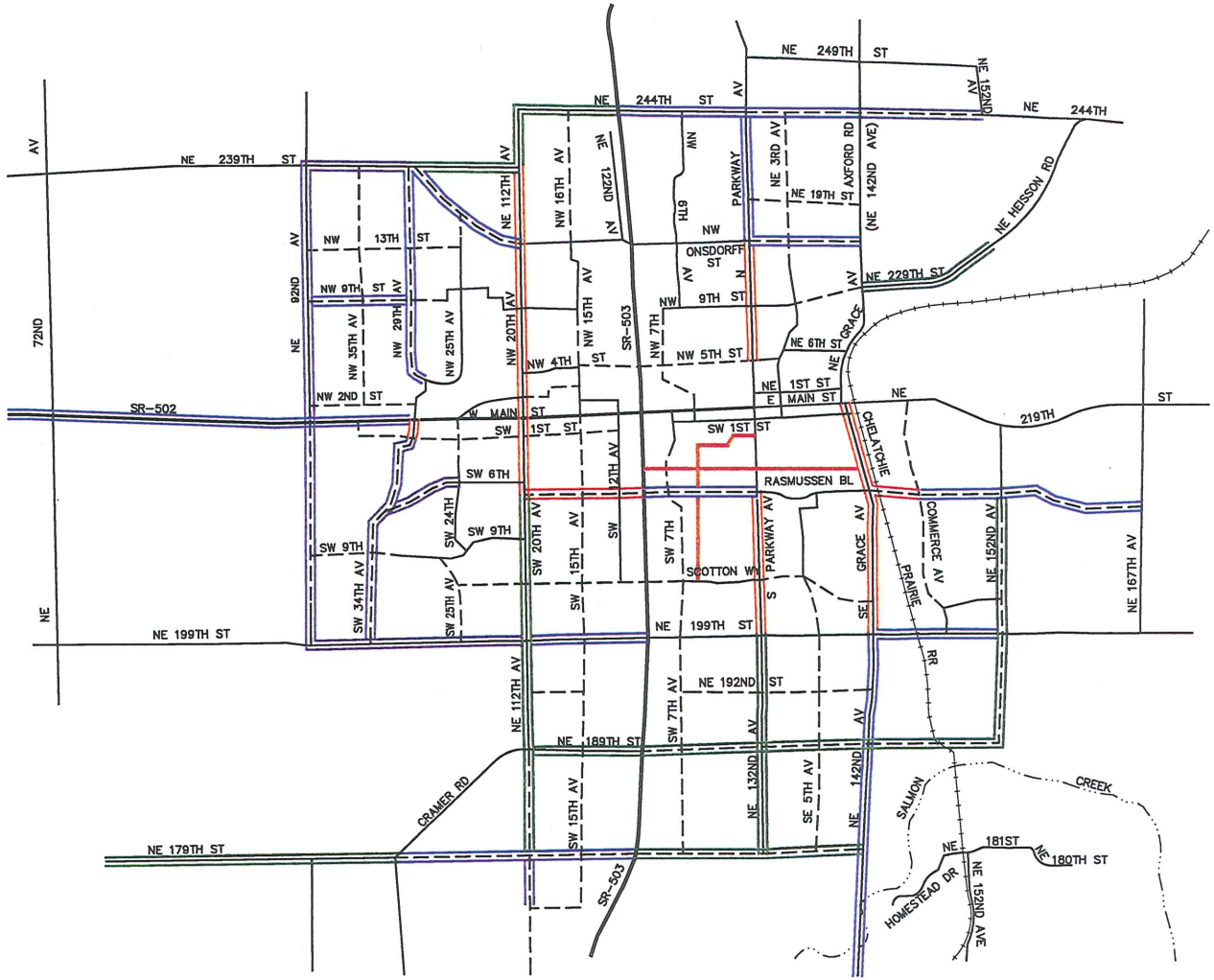
Long-Term Trail Recommendations:

- A trail along the Lewis and Clark Railroad right-of-way. Within the urban growth area, the right-of-way parallels NE/SE Grace Avenue and NE Heisson Road between Cedar's Golf Course and

the East Fork Lewis River regional trail system. This trail would provide connections to the Salmon Creek regional trail system and Battle Ground Lake State Park.

Figure 7-3 depicts the recommended on-street bicycle system. It should be noted that the projects shown in this figure only include arterial and major collector streets, as the City's street standards allows for either bike lanes or on-street parking along minor collector streets. When viewed in conjunction with existing on-street bicycle facilities (see Figure 2-8) a relatively comprehensive system for bicycle circulation emerges.

Figure 7-4 illustrates the recommended pedestrian system that includes arterial, major collector and minor collector streets.



LEGEND

- SHORT – RANGE (0–5 YEARS)
- MEDIUM – RANGE (6–10 YEARS)
- LONG – RANGE (11–20 YEARS)
- BEYOND 20 YEARS

NOTES:

1 INCLUDES IMPROVEMENTS ONLY ON ARTERIAL AND MAJOR COLLECTOR STREETS AS BIKE LANES ARE NOT SPECIFICALLY REQUIRED ON MINOR COLLECTORS.

2 SOLID RED LINES SHOW OFF-STREET URBAN TRAILS TO BE BUILT IN THE SHORT TERM.

KEY

N

NOT TO SCALE

Figure 7-3
Recommended Bicycle System Improvements

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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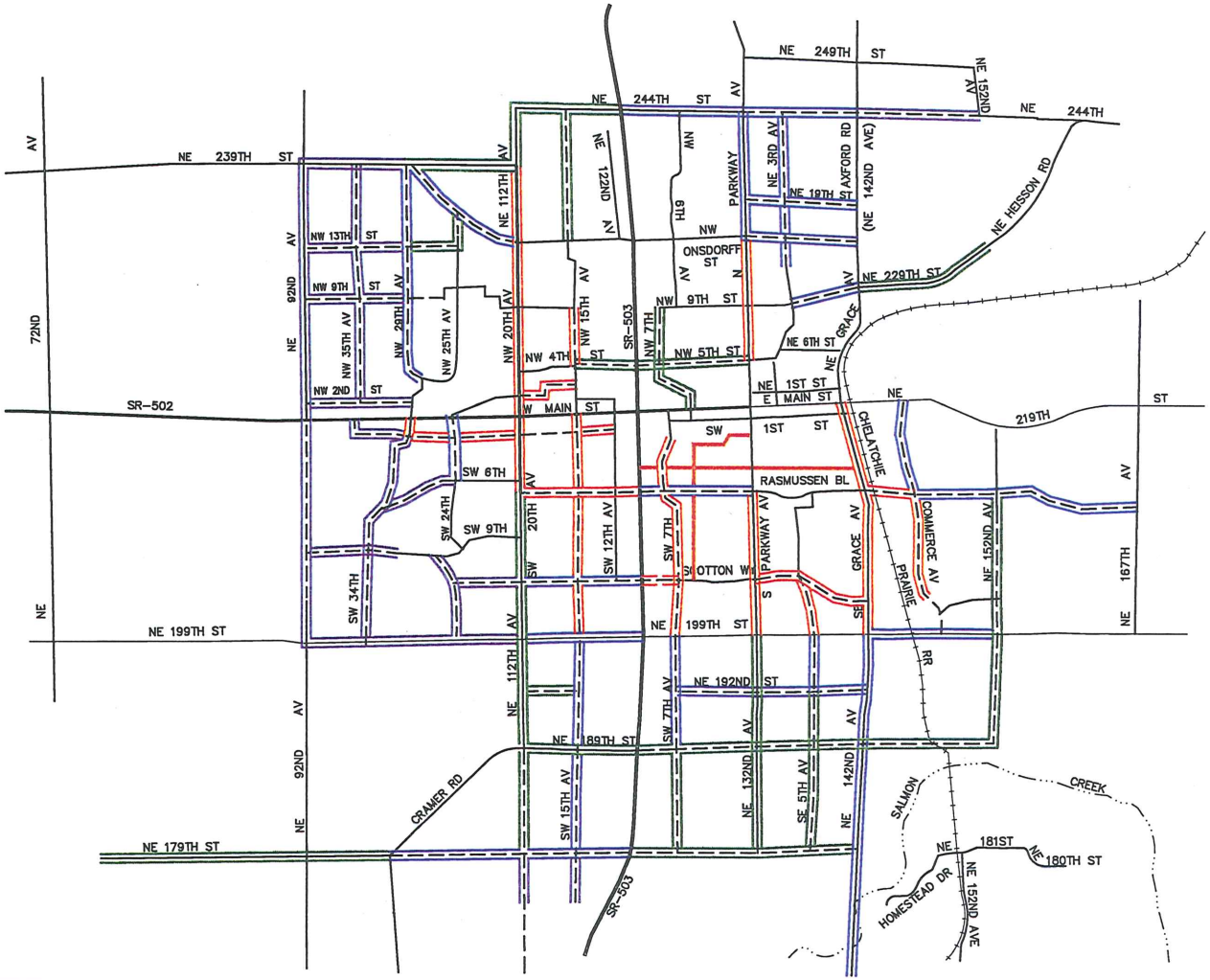


LEGEND

- SHORT – RANGE (0–5 YEARS)
- MEDIUM – RANGE (6–10 YEARS)
- LONG – RANGE (11–20 YEARS)
- BEYOND 20 YEARS

NOTE:
SOLID RED LINES SHOW OFF–STREET URBAN TRAILS TO BE BUILT IN THE SHORT TERM

KEY

N
NOT TO SCALE

Figure 7-4
Recommended Pedestrian System Improvements

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

DATE: 09/20/05 1:22pm FILENAME: P2561011P01F-51 IMAGES: BG99logo | XREF'S:

8. AIR TRANSPORTATION PLAN

8.1 OVERVIEW

This chapter documents a review and assessment of needs, deficiencies, policies and improvement options affecting the aviation system within the Battle Ground Urban Growth Area (UGA). Included is a discussion of the local and regional policy context for developing and maintaining this travel mode, an evaluation of needs and deficiencies in the existing aviation system, and a discussion of various term improvement recommendations for preserving this system.

Information contained in this memo was largely obtained from the Federal Aviation Administration (FAA) and the Washington State Department of Transportation's (WSDOT) airport records, the Clark County *Comprehensive Plan Transportation Element*, and the *Metropolitan Transportation Plan* (MTP).

8.2 CONSISTENCY WITH PLANS AND POLICIES

Airports and air transportation services are provided in the context of a complex set of federal, state, and local governmental regulations, and each level of government has a certain degree of control over parts of the air transportation system. The Federal Aviation Administration (FAA) deals primarily with issues of safety and air traffic control. The Washington State Department of Transportation's (WSDOT) Aeronautics Division currently focuses primarily on general aviation airports and has some direct involvement with major passenger airports. Local jurisdictions (either city, county, or port district) influence land use and usually are the airport operating authorities.

8.2.1 County Plans and Policies

The Clark County *Comprehensive Plan* includes several goals, supporting policies and implementation strategies relating to air transportation. One of the goals is to *"develop a multi-modal transportation system"*. The goal is supported by a policy to include all affected jurisdictions in regional airport planning in order to provide compatibility with surrounding land uses and to support adequate ground transportation for the movement of people and goods to and from airports. As an implementation measure, the County should participate in any new airport site selection process that is led by the Ports, WSDOT's Aviation Division or any other governmental entity.

Land use plans that incorporated airport issues were completed in 1979 (countywide) and in 1987 (Ridgefield Subarea Plan) and 1988 (South County Subarea Plan). These plans have identified the location of existing airports and have recommended certain land use regulations be considered to protect the airports from being compromised by surrounding incompatible land uses. However, no county or city ordinances were specifically implemented. Generally, applicable federal and state laws affecting land use around airports have been acknowledged.

8.2.2 Metropolitan Transportation Plan

The *Metropolitan Transportation Plan* (MTP) for Clark County is the region's principal transportation planning document. It is developed through a coordinated process involving all local jurisdictions with the objective of identifying regional solutions to transportation needs. Specific goals and policies of the MTP that are relevant to the air transportation plan include an emphasis on providing for a balanced

transportation system that includes aviation and that considers safety as a prime concern in developing the regional transportation system.

8.2.3 State Plans and Policies

Airports are recognized as essential public facilities under the Washington State Growth Management Act (GMA). One of the several requirements of the GMA is that the comprehensive plan of each jurisdiction should include a process for identifying and siting essential public facilities, including airports and state and regional transportation facilities. Furthermore, *Washington State Bill 6422* requires every city, town, code city, charter city and county having a general aviation airport in its jurisdiction to discourage the siting of land uses that are incompatible with the airport. The provision applies to every jurisdiction under RCW 36.70A.200 (Siting of Essential Public Facilities), RCW 36.70A.510 (General Aviation Airports-Siting of Incompatible Uses). The local planning authority and the airport sponsor should work together to ensure that the needs of both the local and aviation communities are met and compatible land uses are planned for the future.

WSDOT also has an Airport Land Use compatibility Technical Assistance Program through the development of resource information regarding safety; land use decision making and a "best practices" handbook to serve as a desktop reference guide for cities, counties and airport sponsors to provide technical examples and model approaches to protecting aviation infrastructure and balancing quality of life. The Airport Land Use compatibility Program identified three areas that embody critical quality of life and safety issues relevant to airport operation and community health and welfare; they are concerns surrounding height hazards, safety and noise. In Washington State, the state standard for height hazards accepts the national standard, *14 CFR Part 77 Objects Affecting Navigable Airspace*. Any object that penetrates theses imaginary surfaces is considered an obstruction.

8.3 NEEDS AND DEFICIENCIES

8.3.1 Existing Facilities

There is one privately-owned, public access airport in the Battle Ground Urban Growth Area (UGA) – the Cedars North Airpark. This airpark is located south of NE 199th Street and approximately one-half mile east of SE. Grace/SE 142nd Avenue. According to FAA Form 5010 (which is used to summarize inventory information about every public access airport in the United States) this general aviation airport sits on approximately 15 acres and currently has a 2,400-foot by 50-foot mowed grass runway. Navigation aides are limited to a wind sock and visual flight rules apply. The airpark has nine based single-engine aircraft, an 80-foot by 100-foot tie down area for three aircraft, one small hangar and a storage building. The airpark has approximately 500 local and 2,500 itinerant aircraft operations per year for a total of 3,000 annual aircraft operations.

Regional aviation needs are provided through Portland International Airport (PDX), approximately 20 miles south of the Battle Ground UGA on the south side of the Columbia River in the State of Oregon. This regional air carrier airport provides regularly scheduled domestic and international passenger service, as well as air cargo service. Passenger airlines serving PDX include Air Canada, Alaska Airlines, America West, American, Continental, Delta, Frontier Hawaiian, Horizon, Lufthansa, Mexicana, Northwest, Skywest, Southwest, Sun Country, United and United Express. Cargo carriers serving PDX include Airborne, Air China, Kitty Hawk, AmeriFlight, BAX Global, Cargolux Airlines International, DHL Worldwide Express, Emery, Empire, Evergreen, Federal Express, and Korean Air.

8.3.2 Future Needs

A number of studies have been undertaken in the past 20 years regarding the provision of air transportation service to Clark County residents. An airport system plan was developed in 1984. Land use plans that incorporated airport issues were completed in 1979 (county-wide) and in 1987 (Ridgefield Subarea Plan) and 1988 (South County Subarea Plan). The Washington State Department of Transportation's Aviation Division, as well as local pilots' associations, have requested that an additional airport be sited in Clark County. In the late 1980's, a study was conducted to examine the feasibility of siting an airport in the Ridgefield Junction area. Public concern about the noise and traffic impacts of this airport resulted in not considering a new airport at that time. The February 2000 Clark County Airport Advisory Task Force Report concluded that there are inadequate general aviation capacity in the county and protection and preservation of existing facilities is needed. The report also stresses the need for a two-way dialog with the Port of Portland and the Oregon Department of Transportation as Clark County depends economically on the proximity to Oregon airports.

One of the several requirements of the State Growth Management Act is that the comprehensive plan of each jurisdiction should include a process for identifying and siting essential public facilities, including airports and state and regional transportation facilities. The local planning authority and the airport sponsor should work together to ensure that the needs of both the local and aviation communities are met and that land uses compatible with airport operations (both noise and safety) are planned for the future. Currently, the City of Battleground has an Airpark District zone in its Development Code that allows for airport development and operation. The City also identifies the Cedars North Airpark on its comprehensive plan map. However, there are currently no city ordinances specifically protecting navigable air space surrounding the airport or the approach slopes, nor are there regulations that address restrictions on incompatible land uses to preserve the function of the airport.

8.4 AIR TRANSPORTATION ACTION PLAN

8.4.1 Goals, Objectives and Action Strategies

Transportation Goal 4. A transportation system that provides for the efficient movement of goods and services

TO4.4. <u>The City will work with property owners surrounding the Cedars North Airpark and with the appropriate state and federal agencies to develop a plan for the airstrip area</u>

TA4.4.1. *The City will establish criteria for locating compatible land uses and property adjacent to the Cedars North Airpark.*

Land Use Goal 8. To provide for general aviation needs within airparks in a way that will minimize impacts to the surrounding area

LO8.1. <u>The City will work to determine the potential demand for general aviation needs and the future use of the airpark</u>

LUA8.1.1. *The City will create an airport overlay zone to balance the future operations of the current airpark and any future airparks with the surrounding uses.*

8.4.2 Recommendations

The City should consider developing specific ordinances consistent with state and FAA guidelines and regulations to protect navigable airspace surrounding the airpark when this area is annexed to the city. The ordinance should include specific height restrictions and specify slope protection.

The City should also consider where future residential, educational facilities, hospitals or other similar land uses might be permitted under current and proposed zoning within areas subject to aircraft noise or accidents.

9. PLAN IMPLEMENTATION AND FUNDING

The overall goal of Battle Ground's *Transportation System Plan* is to provide the safe, efficient and accessible movement of people and goods while achieving the City's vision for its future as an outstanding livable community. This goal recognizes the City's role as an employment, educational and business center for the north and central portions of Clark County. The goal also recognizes the importance of all travel modes to ensure that viable alternatives to auto travel are available and that the community's economic needs for transportation services are met.

Modal plans for walking, bicycling, transit, automobile, rail, air transportation, and truck freight were developed as part of the TSP and include action plans for projects, programs, and policies. This chapter represents a synthesis of the modal plans and includes a discussion of the priorities and strategies developed for each that have been combined into the recommended plan. This chapter also presents an assessment of anticipated transportation revenues, cost estimates for recommended multi-modal transportation projects, priorities for short, medium and long-term implementation, and identification of unfunded improvement needs for the 20-year planning period. A revenue shortfall has been identified and there is discussion of potential new funding sources included near the end of this chapter. Lastly, this chapter identifies issues that will require further refinement planning to determine an appropriate course of action.

9.1 SUMMARY OF PLAN RECOMMENDATIONS

9.1.1 Street Plan

The recommended action plan for operating and improving the street and highway system in the Battle Ground Urban Growth Area (UGA) is presented in detail in Chapter 4. This plan discusses specific goals, policies and strategies to improve the street system by addressing existing safety problems, likely future congestion problems, and the need for new or improved streets to serve both existing and future urban development. The Street Plan makes recommendations for modifying the city's existing functional classification system, and establishes level of service standards that are consistent with existing practices. Level of service (LOS) D is recommended for signalized intersections, and level of service E is recommended for stop-controlled side streets at unsignalized intersections. These standards are not consistent with state or regional standards for SR 502 and SR 503 in the Battle Ground UGA, which are based on a rural classification for these highways. It is recommended that WSDOT and RTC consider modifying their LOS C standards for these highways in the UGA to be consistent with the City's standard. The Street Plan also recommends that the City establish a neighborhood traffic management program for the implementation of traffic calming strategies to protect and enhance the livability of the community.

9.1.2 Freight Mobility

The Freight Mobility Plan addresses both truck traffic and rail and includes recommendations for establishing a truck route system within the UGA and for improving existing railroad grade crossings. The plan also establishes specific policies to accommodate and enhance the freight mobility system within the UGA.

9.1.3 Public Transit and Travel Demand Management

The Public Transit and Travel Demand Management (TDM) Plan addresses the role of transit and TDM in the Battle Ground transportation system and establishes overall policy guidance for these modes. The plan recommends that the City closely cooperate with C-TRAN to improve transit service in the UGA over the long term. Actions take should be dependent upon both community demand and available financial resources. Such improvements could include the addition of more routes to connect the community with Vancouver (potentially including light rail as population and employment densities warrant), as well a new service within Battle Ground to connect to various commercial, institutional and educational centers.

It is also recommended that Battle Ground continue with its current efforts to coordinate review of land development activity under SEPA with C-TRAN to ensure that opportunities to build transit-accessible development are maximized. It is also recommended that the City promote the use of alternative commute options to reduce motor vehicle travel generated by residents and employment sites in cooperation with regional efforts as administered by C-TRAN or other jurisdictions.

9.1.4 Non-Motorized

The Non-Motorized Transportation Plan establishes policy guidance for developing sidewalks, bicycle lanes, accessways and multi-use pathways within the UGA to enhance community livability. Several improvement strategies were developed and discussed leading to the identification of specific projects and general priorities.

9.1.5 Air Transportation

The Battle Ground Urban Growth includes one very small privately-owned, public access airport – Cedars North Airpark. The Air Transportation Plan includes a discussion of existing facilities at the airpark, potential future general aviation needs in North County, and issues related to airport land use compatibility. Specific policy guidance with respect to preserving and protecting airparks and their surrounding land uses is presented in this modal plan.

9.2 PLAN IMPLEMENTATION GOALS, OBJECTIVES AND ACTION STRATEGIES

In addition to the mode-specific goals, objectives and action strategies presented in the modal chapters, this TSP also includes policy guidance addresses the development of transportation improvements, and the overall management of the transportation system. More specifically, this guidance speaks to project financing, project development, concurrency of improvements with land development activities, and environmental sensibility and sustainability. This policy guidance is presented below.

9.2.1 Transportation Financing and Project Development

Transportation Goal 6. A transportation system that is affordable and durable

TO6.1. <u>The City will work to improve the durability of transportation improvements</u>

TA6.1.1. The City will examine its construction standards for transportation improvements and weigh current and future costs to determine if the appropriate standards are being used.

TA6.1.2. The City will update its construction standards as new technologies improve.
TA6.1.3. The City will review its maintenance program and determine if changes need to be made to maintain the longevity of the transportation system.

TO6.2. The City will work to identify multiple funding sources for new projects and maintenance
TA6.2.1. The City will coordinate with the state and federal government and other organizations to improve funding choices.
TA6.2.2. The City will continue to seek grants and other outside funds to match local funds.
TA6.2.3. The City will work with the State of Washington to establish a statewide street utility fee to provide additional resources for on-going roadway maintenance.
TA6.2.4. The City will revise its Transportation Impact Fee ordinance and list of TIF-eligible projects consistent with the improvement recommendations of the Transportation System Plan.

TO6.3. The City will strive to provide an equitable balance of funding for transportation improvements
TA6.3.1. The City will conduct a review of transportation spending to determine whether there is a connection between patterns of use and the source of funding and update local funding programs as appropriate.
TA6.3.2. The City will seek out opportunities for public/private partnerships for funding transportation improvements.
TA6.3.3. The City will explore whether additional transit funding is appropriate and continue to evaluate the service provided by C-TRAN.

Transportation Goal 7. The concurrent provision of transportation facilities

TO7.1. The City will strive to establish a transportation concurrency system that is equitable and maintains the City's ability to grow
TA7.1.1. The City will review the work done by the City of Vancouver and Clark County before establishing its new transportation concurrency system.
TA7.1.2. The City will work with a wide variety of stakeholders when establishing a transportation concurrency system.
TA7.1.3. The City will investigate the feasibility of including other travel modes in the concurrency system and develop the most appropriate system for Battle Ground.

9.2.2 Transportation/Environmental Sustainability

Transportation Goal 8. A sustainable transportation system to minimize adverse environmental impacts and encourage environmentally appropriate design and practices

TO8.1. The City will strive to reduce the impacts of the transportation system on water quality and quantity
TA8.1.1. The City will investigate alternative transportation design options that reduce stormwater runoff.
TA8.1.2. The City will work with state and federal agencies to determine how to reduce transportation impacts to water quality.
TA8.1.3. The City will make changes to the construction standards, Land Development Code, and maintenance practices as necessary to reduce impacts to water quality.

TO8.2. The City will strive to reduce the impacts of the transportation system on wildlife and aquatic habitat

TA8.2.1. The City will work with state and federal agencies to determine how to reduce transportation impacts to wildlife and aquatic habitat.

TA8.2.2. The City will make changes to the construction standards, Land Development Code, and maintenance practices as necessary to reduce impacts to wildlife and aquatic habitat.

TO8.3. The City will strive to reduce air quality impacts caused by the transportation system

TA8.3.1. In conjunction with RTC, the City will evaluate air quality impacts as part of its long-range transportation planning process.

TO8.4. The City will strive to reduce the energy consumed in the transportation system

TA8.4.1. The City will focus on reducing the portion of single occupancy vehicles by offering a range of transportation choices.

TO8.5. The City will strive to reduce noise impacts caused by the transportation system

TA8.5.1. The City will utilize natural features and land use transitions to minimize noise impacts and avoid the use of sound walls.

9.3 FINANCING OF IMPROVEMENTS

This section summarizes transportation revenue sources and programs currently used by the City of Battle Ground, presents an estimate of projected revenue over the next 20 years, and discusses potential new revenue sources to address a projected revenue shortfall.

The projection of future funding is based on historic funding levels. Transportation has traditionally been funded by "user fees" such as gas tax, vehicle licensing fees, permits or other revenue sources directly related to the use of the transportation system. Gas tax is imposed at the Federal level ($0.184 per gallon) which works out to cost the average motorist about $98 per year and at the State level ($0.23 per gallon) which costs the average motorist $125 per year[20]. The gas tax revenue is devoted primarily to highway purposes. At $0.23 cents per gallon, Washington State had the 23rd highest gas tax in the nation as of December 2001.[21] In 2003, the state legislature passed a nickel gas tax increase to fund a specific list of improvement projects around the state. This was followed by a further gas tax increase and various other new fees and charges in 2005 which is also dedicated to a list of specific improvements on state highways in each county.

The availability of federal, state and local moneys will have a significant impact on the ability to fund the projects proposed in the Battle Ground TSP. According to the *Metropolitan Transportation Plan* demands on the transportation system have grown significantly over the past 20-years. In the last two decades, Washington state population has increased by 43%, jobs have increase by 58% registered vehicles have increased by 57% and vehicle miles traveled has seen an 88% increase. , In this same two decades, personal income grew, on average, by 110% but the share of each dollar of personal income invested by the state in transportation facilities has fallen by more than half.

[20] *Metropolitan Transportation Plan for Clark County*, Southwest Washington Regional Transportation Council, December 2002.

[21] Ibid.

9.3.1 Existing Transportation Revenue Sources

The City of Battle Ground finances capital improvements, maintenance and operation for its transportation system with revenues from a variety of federal, state, local and private sources. Funding sources available to the City of Battle Ground include the following:

9.3.1.1 *Federal Funding*

The Transportation Equity Act for the 21st Century (TEA-21) and its successor, SAFETEA-LU that was recently adopted by Congress and signed into law, provides Federal transportation money to federal, state and local agencies. These programs have a multi-modal emphasis which gives agencies some measure of independence to invest in alternate modes of travel, including bicycle and pedestrian facilities, and park and ride facilities. Specific programs that have been available to the City of Battle Ground through TEA-21 include:

Surface Transportation Program (STP)

The Surface Transportation Program (STP) is a flexible, intermodal program that provides funding for any road or bridge project except for local roads or rural minor collectors, although a portion of the funds reserved for rural areas may be spent on rural minor collectors. The following information from the *Metropolitan Transportation Plan* outlines the subprograms that are available under STP:

- **Regional Allocation**: Available to cities, counties, and other public agencies on a county basis. Projects must be on a federal functionally-classified route of a rural major collector or above, except for planning studies and enhancement projects. RTC selects projects for funding in cooperation with local jurisdictions and agencies.
- **Statewide Competitive**: Available to all public agencies. Criteria for selection include Multimodal, Innovation, Mobility, Economic Development, Environmental, Financial, Preservation, and Customer Sensitivity/Safety. The State selects and prioritizes projects for funding.
- **Enhancements**: Available to all public agencies. For non-motorized transportation, beautification, scenic highways, pedestrian, and bike facilities. Projects to be submitted to the State for consideration are prioritized by RTC in cooperation with local jurisdictions and agencies. The State selects and prioritizes projects for funding.
- **Safety**: Available for cities and counties to improve safety. There are three programs under safety. (1) Railway/Highway Crossings funds are available to reduce fatalities, injuries, and damages through improved railway crossings. (2) Hazard Elimination funds are available to improve specific locations which constitute a danger to vehicles or pedestrians as shown by frequency of accidents. (3) High Accident Potential funds are to reduce a potentially unsafe situation. The costs are shared approximately 90% federal, and 10% local match. The State selects and prioritizes projects for funding.

Community Development Block Grant (CDBG)

This federal funding program is administered by the U.S. Department of Housing and Urban Development (HUD). Grants are targeted at low and moderate-income areas and are commonly used to build sidewalks or other small capital improvements.

9.3.1.2 *State Funding*

The State gas tax is the major state revenue source for highway maintenance and arterial construction funding. Some of the programs funded by these revenues are described below:

Transportation Improvement Board (TIB) Programs

The Transportation Improvement Board (TIB) invests State Gas Tax funds in local communities through several grant programs (see Table 9-1) serving local agencies. The TIB identifies, ranks and funds transportation projects based on criteria established by the Board for each program. The TIB encourages projects that are coordinated among government agencies and provide for public/private participation. The urban program requires a minimum 20 percent local match. Programs for which the City of Battle Ground is eligible include the following.

Table 9-1
Transportation Improvement Board Funding Programs

Funding Program	Eligible Agencies	Type of Projects
Transportation Partnerships Program (TPP)	Urban Counties Cities>5,000 population Transportation Benefit Districts	Regionally significant, improve mobility and economic development, multi-jurisdictional, multi-modal, Public/Private cooperative
Arterial Improvement Program (AIP)	City and County Arterial Streets (within Federal Urban Area Boundary)	Improve mobility, Safety, Address geometric and structural deficiencies
Pedestrian, Safety & Mobility Program (PSMP)	Urban and Small Cities	Enhance and promote pedestrian mobility, safety, system continuity and connectivity

In addition to its funding programs, the TIB has also provided matching funds for some federally funded local projects. The TIB also reviews and recommends route jurisdiction changes under the Route Jurisdiction Transfer (RJT) program.

Community Economic Revitalization Board (CERB)

The Community Economic Revitalization Board (CERB) was established by the legislature to make loans and/or grants for public facilities, including roads, which will stimulate investment and job opportunities, reduce unemployment, and foster economic development.

Public Works Trust Fund (PWTF)

The Public Works Board was created by the 1985 legislature. The mission of this Board is "to assist Washington's local governments and private water systems in meeting their public works needs to sustain livable communities." The Public Works Trust Fund (PWTF) provides low interest loans to local governments for infrastructure improvements and is funded by utility taxes. These loans have a 5-year term for pre-construction and 20-years for construction with an interest rate of one-half percent.

Washington State Department of Transportation

WSDOT administers many transportation related grants that are available to local agencies. However, many of these programs are biennial funding allocations from the legislature. These programs include:

- **School Safety Enhancements**: The purpose of this program is to fund capital projects for traffic and pedestrian safety improvements near schools.
- **City and County Congested Corridor Program**: The intent of this program is to improve the mobility of people and goods in the state by supporting economic development and environmentally responsive solutions to transportation needs. Urban counties and cities with more than 5,000 people are eligible for funding awards. The Transportation Improvement Board (TIB) is to select projects in this Program based on criteria that includes congestion relief and the availability of funding partners.

9.3.1.3 *Local Funding*

Local revenue for transportation improvements can come from a variety of sources including property taxes, street use permits, gas taxes, utility permits and transportation impact fees. These funding sources are described below.

Property Tax

Some local County transportation revenues come from property taxes. For example, Clark County's total property tax assessment is about $14.40 per $1,000 of assessed value of which about $2.25 is dedicated to the road fund.

Arterial Street Fund

The arterial street fund manages the distribution of the state gasoline tax to cities and counties based on each jurisdiction's population.

Transportation Impact Fees

Transportation impact fees (TIFs) were authorized in HB 2929 by the 1990 Legislature to address the impact of development activity on transportation facilities. The City of Battle Ground has enacted local TIFs by ordinance and the rates levied by this program are periodically reviewed.

Franchise Fees

Franchise fees are authorized to compensate the city for use of public street right-of-way by other utility providers such as cable television, electrical, or telephone services.

Developer Share

A land developer may be required to make street frontage improvements and/or to improve or construct new collector or local streets that provide property access or enhance local circulation for the benefit of the developer's property as a condition of development approval.

Revenue Bonds

Because some sources of transportation revenue are only available in small increments over a period of time, revenue bonds offer a means of generating larger amounts of capital to make major improvements in a shorter time period. Revenue bonds can be sold and secured against future gas tax or other guaranteed transportation revenue source. While revenue bonds provide an immediate source of cash to use in constructing large projects, a disadvantage of this revenue source is its long term commitment of funding from existing sources for repayment. No new revenues are generated with this approach.

General Obligation Bonds

This type of bond would also provide a large amount of transportation revenue for constructing many or larger projects over a relatively short period of time. However, this funding source must be approved by voters and is typically secured by property tax.

Local Improvement Districts (LIDs)

Local improvement districts levy special assessment charge on property owners within a defined area such as a neighborhood, street frontage or industrial/commercial district, with each property assessed a portion of total project cost. LIDs are commonly used for street paving, drainage, parking facilities and sewer lines. The justification for such levies is that many of these public works improvements provide a direct benefit or enhancement to the value of nearby land, thereby providing direct financial benefits to its owners. LIDs are used typically for local street projects that cannot be funded through other means. State law and City code govern the formation of LIDs, the assessment methodology, and other factors. LIDs are usually funded by the participants, but may also be combined with other funding sources to leverage all available resources.

9.3.2 Projected 20-Year Transportation Revenues

The 20-year projection of transportation revenues expected to be available to the City of Battle Ground was developed by the City's Public Works Department and is largely based on an extrapolation of funding received from existing sources. Total revenue expected to be received from these sources is projected to be approximately $40 million over the next 20 years:[22]

- 2006-2010 (short-term): $ 7,610,000
- 2011-2015 (mid-term): $14,537,000
- 2016-2025 (long-term): $17,875,000

In general, eligible expenditures for these revenues (e.g., operations, maintenance and/or capital improvements) are fixed by revenue type. For example, fees collected for system enhancements to address traffic impacts associated with land development cannot be used for street maintenance. State gas tax revenues are able to be used for capital improvements, operations and maintenance, and bond payments. Sate Transportation Improvement Board (TIB) and federal Surface Transportation Program (STP) funds are competitive and must be used for capital improvements. Community Development Block Grants are available only for improvements in lower income portions of a community and are typically used by the city for sidewalk improvements.

[22] Per spreadsheet from Sam Adams, Public Works director dated 10/24/05.

The amount of revenue collected is not as strictly controlled. Fees assessed to fund improvements associated with land development (Transportation Impact Fees) can be enacted, increased and decreased by the City Council without a public vote, provided statutory requirements are met for public comment. However, these decisions may have potential political and economic consequences. For example, an increase in TIFs could drive new development to nearby communities that have lower fees. Based on policy direction received during development of the TSP and to partially fund the anticipated revenue gap, it was assumed that the existing TIF would be significantly increased over the lifetime of the TSP.

Assumptions were also made about revenue that the City could reasonably expect to receive from other existing revenue sources. State gas tax revenue is expected to grow slowly consistent with past experience that is impacted by the increased fuel efficiency of motor vehicles. General fund revenue from City property tax is also assumed to be available consistent with today's practice of funding transportation operations and maintenance from gas tax and general fund sources. The city relies heavily on new street construction or street frontage improvements made by land developers in conjunction with project approvals to augment and enhance the city's existing transportation system. For purposes of this TSP, it is assumed that all new or improved neighborhood collector roads would be constructed by developers and some major collector roads where there is currently no reasonable roadway infrastructure in place.

With respect to revenue that could be received from various federal and state funding sources, the following assumptions have been made:

- *Surface Transportation Program (STP) funds* – the City of Battle Ground is an eligible recipient of federal STP funds from the Clark County regional allocation. These funds can be used for new roadway construction or improvement of existing roadways. For purposes of this TSP, it is assumed that the City will receive STP funding for one roadway project during each five-year period in the 20-year plan. The selected project would be on a major collector or arterial roadway and would likely provide opportunities for joint project sponsorship with Clark County.

- *Community Development Block Grant (CDBG) program* – the City currently received federal CDBG funds for sidewalk improvements in areas south of E. Main Street. A pending $300,000 grant award (and match) is included in the financial analysis for the TSP. Further, based on past experience, it is assumed that the city would receive approximately $125,000 every other year from this revenue source for the period from 2006 to 2010, rising to $250,000 ever other year for the period between 2011 and 2025. It should be noted that this revenue source can only be used in areas qualifying for assistance based on the income of residents and other factors.

- *Transportation Improvement Board (TIB) funds* – the City has received TIB grants in the past for major roadway improvement projects. For purposes of this TSP, it is assumed that the City would continue to receive revenue from this source in the amount of $1,500,000 every three years. Potential projects that would be submitted for TIB funding would include arterial roads where an opportunity existing for joint sponsorship with Clark County and/or C-TRAN.

While not entirely eliminating the anticipated gap between identified transportation needs and available financial resources, these revenue increases would provide sufficient funding to implement a wide variety of multi-modal improvement projects. Typical projects included in the TSP multi-modal action plan include congestion-related improvements, safety projects that address existing high crash rate locations and other safety needs; projects to encourage the use of alternative travel modes such as walking, bicycling and transit through the provision of needed infrastructure; economic and community

development projects (including providing street infrastructure to newly developing areas); and projects that make more efficient use of the existing transportation system.

Revenue estimates based on existing funding sources and the recommended TIF increases are summarized in Table 9-2.

Table 9-2
City of Battle Ground 20-Year Annual Transportation Revenue Estimates

Budget Item	2006-2010	2011-2015	2016-2025
Revenue Estimates			
Existing Revenue Sources:			
- State Gas Tax	$1,588,000	$1,787,000	$3,858,000
- Transportation Impact Fees (TIF)	$3,736,000	$4,487,000	$9,453,000
- General Fund	$1,073,000	$1,820,000	$6,649,000
- Federal Surface Transportation Program funds (1)	$1,500,000	$6,000,000	$4,000,000
- Federal Community Development Block Grant (2)	$800,000	$500,000	$1,250,000
- State Transportation Improvement Board (3)	$1,300,000	$3,500,000	$2,500,000
- Cash carried forward	$250,000	$19,000	$597,000
- Miscellaneous (interest income)	$24,000	$31,000	$75,000
Total Estimated Revenue from Existing Sources	*$10,271,000*	*$18,144,000*	*$28,382,000*
Anticipated New Revenue Sources:			
- TIF Increase (4)	$63,000	$82,000	$185,000
- Developer Contributions (5)	$11,105,000	$16,325,000	$7,740,000
Total Estimated Revenue from Anticipated New Sources	*$11,168,000*	*$16,407,000*	*$7,925,000*
Total Estimated Revenues	**$21,439,000**	**$34,551000**	**$36,307,000**
Fixed Expenditures			
Operations/Maintenance – Existing street system	$2,612,000	$3,607,000	$10,507,000
Total Fixed Expenditures	**$2,612,000**	**$3,607,000**	**$10,507,000**
Total Revenue Available for Capital Projects (w/o match)	**$18,827,000**	**$30,944,000**	**$25,800,000**

(1) Assumes average award of one large project every five years.
(2) Assumes current award of $150,000, then $250,000 every other year for the remaining 15 years.
(3) Assumes award of $1,300,000 in 2006-07 and then $1.5M to $3.0M once every 5 years starting in 2010-11 based on past trends.
(4) Assumes that existing TIF rate will be increased by approximately $330 per dwelling unit for the period from FY 2007 through FY 2009; and increasing by 2 percent per year thereafter.
(5) Assumes that all new neighborhood collectors and some major collectors would be built by land developers to provide necessary access and circulation.

The net result of the analysis documented in Table 9-2 is that the City will have available for expenditure over $19 million during the first five years of the 20-year planning period. During the second five-year period, approximately $31 million is expected to be available for multi-modal transportation system improvements. During the last ten-year period, approximately $26 million is projected to be available for transportation improvements.

9.3.3 Potential Sources of Additional Transportation Revenue

Battle Ground is not unique in struggling to match needs with available revenues for the local transportation system. This section includes a discussion of potential sources of transportation revenue

that could augment the revenue expectations identified in Table 9-2. Any of these potential sources would need to be evaluated in greater detail for potential revenue and administrative costs, and the degree of public and political acceptance. Summary of Potential Transportation Revenue Sources

Grants

As indicated previously, the City has the opportunity to pursue many state and federal funding programs, including grants from the Transportation Investment Board, the Community Development Block Grants (CDBG) program, the STP Regional Allocation, Safety or Enhancement Programs, or various programs from the Washington DOT. Successful applications for these grants and other programs will help to augment the revenue expectations from gas tax and TIFs that currently constitute the major sources of funding for the Battle Ground transportation system.

Regional Transportation Revenue Options

The Metropolitan Transportation Plan contains a discussion of various programs that have approved by the State Legislature for generating transportation revenue at the local level. Subject to voter approval, these programs have not been instituted in Clark County, but could be imposed in the future.

Local Option Fuel Tax
A local option fuel tax of up to 10 percent of the statewide motor vehicle fuel tax may be imposed by the county with voter approval. Revenue from this source must be used for highway purposes including: construction and maintenance of city streets, county and state roads, and related activities. The MTP estimates that this tax could raise an estimated $3.5 million per year countywide.

Commercial Parking Tax
Subject to voter approval, a county or city may impose a tax on the commercial parking business to be used for general transportation purposes. The tax could be based on gross proceeds or number of stalls, or on the customer. Some cities in the Puget Sound region, e.g. Bainbridge Island, Bremerton, Marysville, Mukilteo, SeaTac and Tukwila, have instituted this tax.

9.4 IMPROVEMENT PRIORITIES AND PHASING RECOMMENDATIONS

9.4.1 Operations and Maintenance

As of fiscal year 2005-06, approximately 28 percent of the revenues expected to be received from existing sources will be used to operate and maintain the current transportation system within the City (e.g. $420,100 versus $1,509,400). This general ratio of operations and maintenance (O&M) costs is expected to be increase during each of the planning horizon included in the TSP, resulting, over time in a significantly higher proportionate share of the overall revenue needs for the transportation system. By 2021-2025 time period, it is anticipated that O&M costs will absorb nearly 40 percent of the revenue anticipated from all existing sources. These increasing costs can be anticipated as the existing roadway, bicycle and sidewalk system begins to age and requires substantial more resources to maintain its current condition.

The transportation O&M budget of city is devoted to a wide variety of activities that are all essential to ensure that the transportation system continues to function acceptably: O&M costs include:

- Existing engineering and support staff to ensure that the system continues to operate and is repaired in accordance with an appropriate cycle of maintenance activity;

- Routine road maintenance activities including routine cleaning, grading and roadway patching, sub-grade stabilization, curb repair and replacement, shoulder grading and restoration (where there are no curbs), bikeway brooming/sweeping, bikeway maintenance, and sidewalk repair where necessary;

- Drainage system repair and enhancement including cleaning catch basins and piped drainage, ditching, culvert cleaning and culvert replacement where there are no curbs;

- Vegetation management including herbicide spraying, vegetation removal and chipping here needed to preserve or enhance sight distance or eliminate roadside hazards, and mowing;

- On-going sign repair and installation to address visibility needs and vandalism, and regular pavement marking to ensure adequate visibility for centerlines, fog lines and/or bike lanes, parking lanes, travel and turning lanes, turn arrows, crosswalks, and other pavement markings; and

- Chip sealing or other pavement overlay to address cracking and pavement edge deterioration. It is critical that the city provide a regular program of pavement overlays to protect the long-term life expectancy of the roadway system. This overlay program should occur at least every 10-15 years depending on traffic volumes and vehicle weights. If allowed to go beyond timing for the optimal overlay cycle, roadway maintenance costs will rise substantially as is discussed in the following sub-section.

As noted previously, O&M costs represent a significant share of the overall costs associated with the City's transportation system. However, it should be noted that the O&M cost estimates in Table 9-2 include only costs associated with the roadway system as it exists in 2005. As the existing and relatively new roadway system continues to age, the overall cost of operations and maintenance will rise. Additionally, as new roads are constructed and/or widened and improved, the long-term costs associated with maintaining and operating these roads will continue to rise.

Currently, the only revenue sources available to the city for O&M costs are its share of the state gas tax and the general fund. While these revenue sources are meeting today's O&M needs, they are not expected to keep pace with the rising O&M costs associated with an aging infrastructure and significant system expansion. The TSP strongly recommends that the City initiate a study to identify future O&M cost estimates including those associated with the regular and on-going expansion of the City's roadway, bikeway and sidewalk system. This study should then form the basis for further efforts to identify and develop long-term solutions to meeting transportation system O&M requirements.

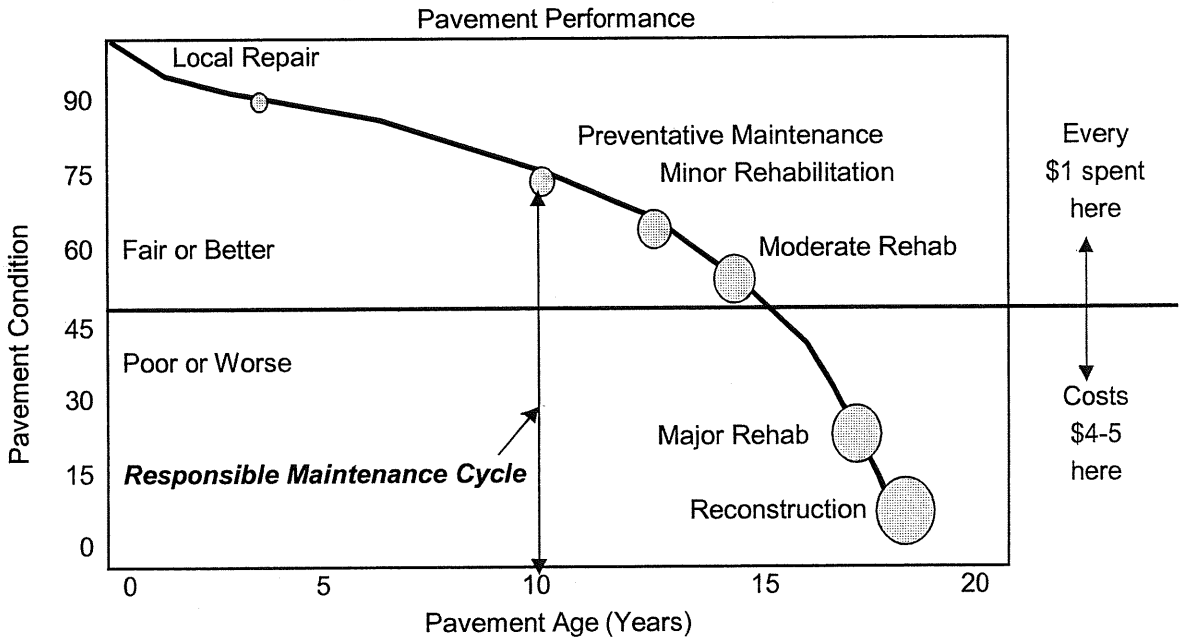
Roadway Life Cycle Maintenance

The graphic on the following page illustrates the typical life cycle of a roadway from construction through varying levels of deterioration that occur over time. From the day that a street is constructed environmental, chemical and mechanical factors begin to cause pavement deterioration. These factors include, but are not limited to, climatic conditions such as temperature variation and ultraviolet radiation, material durability, damage caused by inadequate drainage, poor construction technique, age, total traffic volumes, and the percent of heavy vehicles in the traffic stream. Street deterioration shows up as cracking, rutting, potholes, and a general disintegration of the pavement. If sufficiently advanced, street deterioration can result in complete failure of the roadway surface with substantial exposure of the aggregate subsurface. The average rate at which a street can experience deterioration is graphed below.

This graph, also called a deterioration curve, is frequently used by cities and counties to maximize their maintenance dollars by spending in a strategic fashion to prolong the life of a street.

The average street is generally in "excellent", "very good", or "good" condition between the time of construction and up to about 12 or 13 years. Maintenance activities during this period of time generally include localized repairs such as filling potholes, preventative maintenance such as chip sealing to prevent deterioration, or minor rehabilitation and surfacing. Typically, beyond 15 years, a street will begin to experience more significant deterioration.

Typical Pavement Management Cycle



Source: ODOT, 2003

Most jurisdictions have found that the maintenance cost of a road in the "fair", "poor", "very poor", or "failed" categories are at least four times more expensive as a road in the "good" to "excellent" categories. This is due to the type of treatment that a road needs for each stage of deterioration. Roads in the "fair" to "failed" categories require subsurface work such as replacing the road base, re-compaction of the road base, the placement of asphalt overlays (which are considerably more expensive than the alternative resurfacing technique of chip sealing), and safety or alignment improvements to meet today's engineering standards. One of the most effective ways to prolong the life of an asphalt road and to avoid the higher cost of overlays is to chip seal the road at a point in the life cycle of the pavement when only preventative maintenance or minor rehabilitation is required (e.g., between approximately 5 and 12 years of age). Chip sealing preserves the road by preventing storm water from getting in cracks in the road surface which can cause potholes, rutting and a condition called alligatoring (a cracking pattern resembling the patchwork skin of an alligator). A new surface also provides a better skid resistant roadway for motorists. Once the roadway deteriorates beyond the point where minor rehabilitation is sufficient to preserve the pavement, the cost of maintaining that roadway goes up by an order of magnitude.

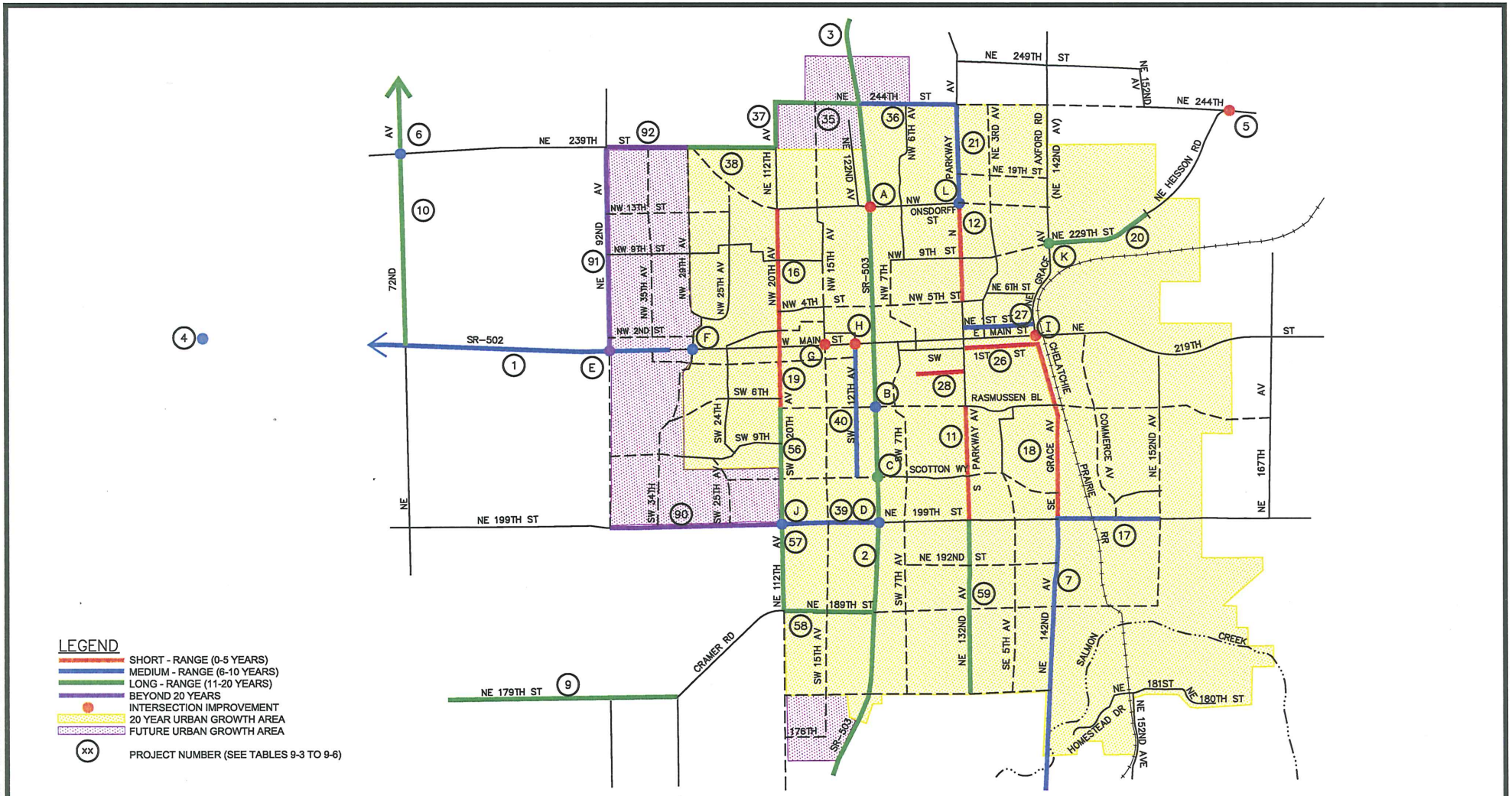
9.4.2 Capital Costs and Action Plans

This section presents a summary of the projects recommended for funding over the 20-year planning period that have been organized into three categories that reflect short- (2006-2010), medium- (2011-2015), and long-term (2016-2025) implementation. A fourth table presents projects for which a need has been identified but no funding is currently anticipated to be available. These projects would be implemented as funding became available from grants, increases in local taxing options beyond that which is included in Table 9-2 or by the imposition of a new funding source.

Tables 9-3 through 9-5 present the financially-constrained list of improvement projects identified for funding and implementation in and/or near the Battle Ground UGA by the City of Battle Ground, Clark County and WSDOT. These projects are also illustrated in Figures 9-1 and 9-2. Table 9-3 depicts projects recommended for implementation within the short-range planning period (fiscal year 2006 through 2010). Table 9-4 illustrates projects in the medium-range implementation period (fiscal year 2011 through 2015), while Table 9-5 represents the long-range period (2016 through 2025).

Table 9-3
Recommended Transportation System Improvements
Battle Ground UGA – Short-Range (2006-2010)

Project ID No.	Location	Improvement Recommended	Funding Sources: Battle-ground	Funding Sources: Other Agency	Cost
Clark County Improvements – Short Range (2006-2010)					
5	NE Heisson Road, east city limits to NE 244th Street	Improve to 2-lane rural collector standard		♦	$475,000
		Sub-total Clark County			**$475,000**
Battle Ground Improvements – Short Range (2006-2010)					
A	SR 503 and NW Onsdorff Blvd	Add fourth (westerly) leg of intersection and signalized	♦		$250,000
G	SR 502 and 15th Avenue	Add fourth (southerly) leg of intersection and signalize		♦ (1)	$250,000
H	SR 502 and NW 12th Avenue	Remove signal and restrict movements to right-in/right-out	♦		$27,000
I	E Main Street and NE/SE Grace Avenue	Realign intersection to four-legged configuration and signalize	♦		$860,000
11	S Parkway Avenue, SE 10th Street to NE 199th Street	Widen and add sidewalks to east side, redesign centerline profile, storm drainage, lighting, striping, signing, landscaping, bike lanes	♦		$700,000
12	N Parkway Avenue Phase 2, NW 5th Street to NW Onsdorff Blvd.	Widen and add sidewalks to both sides, storm drainage, lighting, striping, signing, landscaping, bike lanes	♦		$1,500,000
13	SW 6th Avenue, SW Scotton Way to NE 199th Street	Construct new road, storm drainage, sidewalks, landscaping, signing, bike lanes		♦ (1)	$608,000



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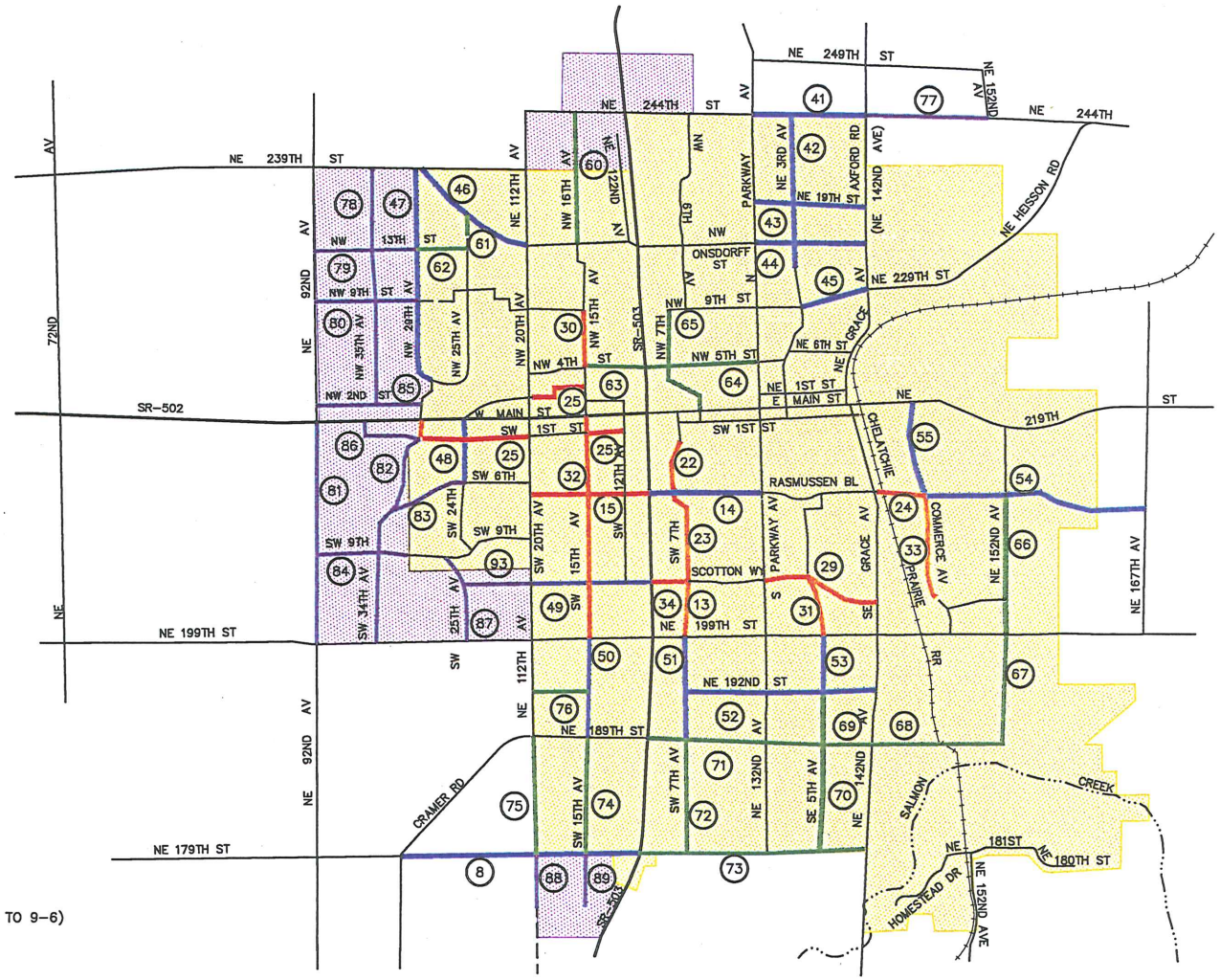
KEY

N

NOT TO SCALE

Figure 9-1
Recommended Improvements To Existing Roadways

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN



LEGEND

- SHORT – RANGE (0–5 YEARS)
- MEDIUM – RANGE (6–10 YEARS)
- LONG – RANGE (11–20 YEARS)
- BEYOND 20 YEARS
- 20 YEAR URBAN GROWTH AREA
- FUTURE URBAN GROWTH AREA
- (xx) PROJECT NUMBER (SEE TABLES 9–3 TO 9–6)

KEY

N

NOT TO SCALE

Figure 9-2
Recommended New Roadways

CITY OF BATTLE GROUND
TRANSPORTATION SYSTEM PLAN

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Table 9-3 Continued
Recommended Transportation System Improvements
Battle Ground UGA – Short-Range (2006-2010)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
Battle Ground Improvements – Short Range (2006-2010) Continued					
15	SW Rasmussen Blvd, Phase 2, SW 20th Avenue to SR 503	Construct new road, lighting, storm drainage, sidewalks, striping, landscaping, signing, bike lanes, install traffic signal at intersection of SR 503/Rasmussen Boulevard		♦ (1)	$1,500,000
16	NW 20th Avenue, SR 502 to NW Onsdorff Blvd	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing, bike facilities	♦		$1,000,000
18	SE Grace Avenue, E. Main Street to NE 199th Street	Widen roadway and add sidewalks, storm drainage, striping, lighting, landscaping, bike facilities	♦		$1,700,000
19	SW 20th Avenue, SR 502 to SW Rasmussen Blvd	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing, bike facilities	♦		$700,000
22	SW 7th Avenue Phase 1, south terminus to SW Rasmussen Boulevard	Construct new road, storm drainage, striping, lighting, landscaping, sidewalks, signing		♦ (1)	$250,000
23	SW 7th Avenue Phase 2, SW Rasmussen Boulevard to SW Scotton Way	Construct new road, storm drainage, striping, lighting, landscaping, sidewalks, signing, signal		♦ (1)	$1,750,000
24	SE Rasmussen Blvd, SE Grace Avenue to SE Commerce Avenue	New construction, railroad crossing, bike facilities, street lighting, storm drainage, striping, landscaping, signing and sidewalks		♦ (1)	$350,000
25	NW/SW 1st Streets, Frontages parallel to W Main Street	New construction completing frontage roads on north and south sides of road		♦ (1)	$850,000
26	SE 1st Street, S Parkway Avenue to S Grace Avenue	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing	♦		$500,000
28	SW 4th, S Parkway to west terminus	Widen road, pedestrian facilities, storm drainage, lighting, landscaping	♦		$500,000
29	SW Scotton Way Extension, east terminus to SE Grace Avenue	New construction includes bike facilities, street lighting, storm drainage, striping, landscaping, signing and sidewalks		♦ (1)	$500,000
30	NW 15th Avenue, NW 9th Street to NW 4th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$500,000
31	SE 5th Avenue, SE Scotton Way to NE 199th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$445,000
32	SW 15th Avenue, SR 502 to NE 199th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,820,000

NW 2nd AVE

Table 9-3 Continued
Recommended Transportation System Improvements
Battle Ground UGA – Short-Range (2006-2010)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
Battle Ground Improvements – Short Range (2006-2010) Continued					
33	SE Commerce Avenue, SE Rasmussen Blvd to existing terminus	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$925,000
34	SW Scotton Way SR 503 to west terminus	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,357,000
		Sub-total Battle Ground			***$18,842,000***

Source of Data: *Clark County 2005-2010 6-Year Transportation Improvement Program, City of Battle Ground 2005-2010-Year Transportation Improvement Program*, Parametrix.
Note: "Other" refers to funding from another agency or private sources (excluding grants made to the City).
Funding Sources: (1) – Developer contributions

Table 9-4 presents recommended roadway improvement projects for the second five years of the 20-year planning horizon, from 2011-2015.

Table 9-4
Recommended Transportation System Improvements
Battle Ground UGA – Medium-Range (2011-2015)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
WSDOT Improvements – Medium Range (2011-2015)					
1	SR 502, Duluth to Battle Ground city limits	Widen to four lanes with two-way left turn channelization		♦	$13,934,000
4	I-5/SR 502	Construct new interchange		♦	$35,510,000
		Sub-total WSDOT			***$49,444,000***
Clark County Improvements – Medium Range (2011-2015)					
6	NE 72nd Avenue and NE 239th Street	Upgrade intersection		♦	N/A
7	NE 142nd Avenue, NE 159th Street to NE 199th Street	Construct 2-lane rural minor collector standard		♦	$7,000,000
8	NE 179th Street, NE Cramer Road to SR 503	Construct 2-lane rural major collector standard	♦	♦	$5,359,000
		Sub-total Clark County			***$12,359,000***
Battle Ground Improvements – Medium Range (2011-2015)					
B	SR 503 and SW Rasmussen Blvd	Add east and west legs of intersection, signalize		♦ (1)	$360,000
D	SR 503 and NE 199th Street	Add second westbound left lane, lengthen eastbound right turn pocket to provide additional storage		♦ (1)	$215,000
F	SR 502 and 29th Avenue	Add fourth (southerly) leg of intersection and signalize		♦ (1)	$410,000

Table 9-4 Continued
Recommended Transportation System Improvements
Battle Ground UGA – Medium-Range (2011-2015)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
Battle Ground Improvements – Medium Range (2011-2015) Continued					
J	NE 199th Street and NE 112th Avenue	Signalize, add left turn lanes on all approaches	♦		$680,000
L	NW Onsdorff Blvd and N Parkway Avenue	Install all-way stop or modern roundabout	♦		$585,000
8	NE 179th Street, NE Cramer Road to SR 503	Construct 2-lane rural major collector standard	♦ (2)	♦	$5,359,000
14	SW Rasmussen Blvd, Phase 1, SR 503 to SW Parkway Avenue	Construct new road, lighting, storm drainage, sidewalks, striping, landscaping, signing, bike lanes	♦		$500,000
17	NE 199th Street Phase 2, SE Grace Avenue to east city limits	Widen to add sidewalks to both sides, drainage, lighting, striping, signing, landscaping, bike lanes	♦ (2)		$2,000,000
21	N Parkway Avenue, Phase 3, NE 244th Street to NW Onsdorff Blvd.	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, sidewalks, signing, signal	♦		$1,000,000
27	NE 1st Street, N Parkway Avenue to N Grace Avenue	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing	♦		$500,000
36	NE 244th Street, SR 503 to N Parkway Avenue	Improve to urban three-lane section with sidewalks and bike lanes	♦		$520,000
39	NE 199th Street, NE 112th Avenue to SR 503	Improve to urban three-lane section with sidewalks and bike lanes	♦		$505,000
40	SW 12th Avenue, SR 502 to SW Scotton Way	Improve to urban two-lane section with sidewalks and bike lanes	♦		$750,000
41	NE 244th Street, N Parkway Avenue to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks	♦		$1,110,000
42	NE 3rd Avenue, NE 244th Street to NE 9th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,745,000
43	NE 19th Street, N Parkway Avenue to NE 142nd Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$924,000
44	NE Onsdorff Blvd, N Parkway Avenue to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks		♦ (1)	$1,135,000
45	NE 10th Street, NE 3rd Avenue to NE Grace Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$780,000
46	NW Onsdorff Blvd, NE 239th Street to NE 20th Avenue	Construct new urban major collector with bike lanes and sidewalks.	♦ (2)		$1,008,000
47	NW 29th Avenue, NE 239th Street to NW 3rd Street	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$1,855,000

Table 9-4 Continued
Recommended Transportation System Improvements
Battle Ground UGA – Medium-Range (2011-2015)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
Battle Ground Improvements – Medium Range (2011-2015) Continued					
48	SW 24th Avenue, SR 502 to SW 6th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$495,000
49	SW Scotton Way, SW 20th Avenue to SR 503	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$930,000
50	SW 15th Avenue, NE 199th Street to NE 189th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,085,000
51	SW 7th Avenue, NE 199th Street to NE 189th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$925,000
52	NE 192nd Street, SW 7th Avenue to NE 142nd Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,850,000
53	SE 5th Avenue, NE 199th Street to NE 192nd Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$605,000
54	SE Rasmussen Blvd, SE Commerce Avenue to NE 167th Avenue	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$2,236,000
55	SE Commerce Avenue, NE 219th Street to SE Rasmussen Blvd	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$775,000
		Sub-total Battle Ground			***$30,842,000***

Source of Data: *Washington State Highway System Plan, 2003-2022*, *Clark County 2005-2010 6-Year Transportation Improvement Program*, *City of Battle Ground 2005-2010-Year Transportation Improvement Program*, Parametrix.
Note: "Other" refers to funding from another agency or private sources (excluding grants made to the City).
Funding Sources: (1) – Developer contributions; (2) – Federal SAFETEA-LU and/or TIB

Table 9-5 presents recommended roadway improvement projects for the last ten years of the 20-year planning horizon, from 2016-2025.

Table 9-5
Recommended Transportation System Improvements
Battle Ground UGA – Long-Range (2016-2025)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
WSDOT Improvements – Long Range (2016-2025)					
2	SR 503, SR 500 to SR 502/Main Street	Widen to 6 lanes		♦	$45,030,000

Table 9-5 Continued
Recommended Transportation System Improvements
Battle Ground UGA – Long-Range (2016-2025)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
WSDOT Improvements – Long Range (2016-2025)					
3	SR 503, SR 502/Main Street to NE 132nd Avenue	Intermittent passing lanes or widen to 4 lanes		♦	$9,020,000
		Sub-total WSDOT			**$54,050,000**
Clark County Improvements – Long Range (2016-2025)					
9	NE 179th Street, NE 50th Avenue to NE Cramer Rd	Improve to provide 1 lane in each direction with turn lane		♦	$10,720,000
10	NE 72nd Avenue, SR 502 to NE 259th Street	Upgrade roadway		♦	N/A
		Sub-total Clark Country			**$10,720,000**
Battle Ground Improvements – Long Range (2016-2025)					
C	SR 503 and SW Scotton Way	Add east and west legs of intersection and signalize		♦ (1)	$350,000
K	N Grace Avenue and NE 229th Street	Add northbound right turn lane and convert to all-way stop	♦		$250,000
20	NE Heisson Road, NE 142nd Avenue to east city limits	Widen and add sidewalks, storm drainage, striping, lighting, landscaping, signing, bike facilities	♦		$1,900,000
35	NE 244th Street, NE 112th Avenue to SR 503	Improve to urban three-lane section with sidewalks and bike lanes	♦		$625,000
37	NE 112th Avenue, NE 244th St to NE 239th St	Improve to urban three-lane section with sidewalks and bike lanes	♦		$395,000
38	NE 239th St, NW Onsdorff Blvd to NE 112th Avenue	Improve to urban two-lane section with sidewalks and bike lanes	♦		$360,000
56	SW 20th Avenue, SW Rasmussen Blvd to NE 199th Street	Improve to urban three-lane section with sidewalks and bike lanes	♦		$780,000
57	NE 112th Avenue, NE 199th St to NE 189th St	Improve to urban three-lane section with sidewalks and bike lanes	♦		$505,000
58	NE 189th Street, NE 112th Avenue to SR 503	Improve to urban three-lane section with sidewalks and bike lanes	♦		$650,000
59	NE 132nd Avenue, NE 199th Street to NE 179th Street	Improve to urban three-lane section with sidewalks and bike lanes	♦		$1,750,000
60	NW 16th Avenue, NE 244th Street to NW Onsdorff Boulevard	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,075,000
61	NW 25th Avenue, NW Onsdorff Boulevard to NW 15th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$140,000
62	NW 13th Street, NW 29th Avenue to NW 25th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$449,000

Table 9-5 Continued
Recommended Transportation System Improvements
Battle Ground UGA – Long-Range (2016-2025)

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
Battle Ground Improvements – Long Range (2016-2025) Continued					
63	NW 4th Street, east of NE 15th Avenue to SR 503	Construct new urban neighborhood collector with bike lanes and sidewalks	♦		$425,000
64	NW 5th Street, SR 503 to N Parkway Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks	♦		$875,000
65	NW 7th Avenue, NW 9th Street to W Main Street	Construct new urban neighborhood collector with bike lanes and sidewalks	♦		$910,000
66	NE 152nd Avenue, SE Rasmussen Blvd to NE 199th Street	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$1,460,000
67	NE 152nd Avenue, NE 199th Street to NE 189th Street	Construct new urban major collector with bike lanes and sidewalks.	♦		$1,015,000
68	NE 189th Avenue, NE 142nd Avenue to NE 152nd Avenue	Construct new urban major collector with bike lanes and sidewalks.	♦		$1,410,000
69	NE 189th Avenue, NE 132nd Avenue to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks.	♦		$1,260,000
70	SE 5th Avenue, NE 192nd Street to NE 179th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,650,000
71	NE 189th Street, SR 503 to NE 132nd Avenue	Construct new urban major collector with bike lanes and sidewalks.	♦		$1,110,000
72	SW 7th Avenue, NE 189th Street to NE 179th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,375,000
73	NE 179th Street, SR 503 to NE 142nd Avenue	Construct new urban major collector with bike lanes and sidewalks.	♦ (2)		$2,380,000
74	SW 15th Avenue, NE 189th Street to NE 179th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$935,000
75	NE 112th Avenue, NE 189th Street to NE 179th Street	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$1,287,000
76	NE 192nd Street, SW 20th Avenue to SW 15th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$450,000
		Sub-total Battle Ground			***$25,771,000***

NW 2nd AVE

Source of Data: *Washington State Highway System Plan, 2003-2022, Clark County 2005-2010 6-Year Transportation Improvement Program, City of Battle Ground 2005-2010-Year Transportation Improvement Program*, Parametrix.

Note: "Other" refers to funding from another agency or private sources (excluding grants made to the City).

Funding Sources: (1) – Developer contributions; (2) – Federal SAFETEA-LU

Table 9-6 summarizes those projects that are not expected to be financial feasible within the 20-year planning horizon of the TSP. They have been included within the plan as recognized long-term needs, however, their actual timing is dependent on land development activity which could occur after 2025.

Table 9-6
Recommended Transportation System Improvements
Battle Ground UGA – Beyond 2025

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
Battle Ground Improvements – Beyond 2025					
E	SR 502 and NE 92nd Avenue	Add southerly leg of intersection, signalized, add right turn and left turn lanes on all approaches		♦	$1,600,000
77	NE 244th Street, NE 142nd Avenue to NE 152nd Avenue	Construct new urban major collector with bike lanes and sidewalks.	♦		$1,260,000
78	NW 35th Avenue, NE 239th Street to NW 2nd Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,840,000
79	NW 13th Street, NE 92nd Avenue to NW 29th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$905,000
80	NW 9th Street, NE 92nd Avenue to western terminus	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$1,280,000
81	NE 92nd Avenue, SR 502 to NE 199th Street	Construct new urban major collector with bike lanes and sidewalks.	♦ (2)		$2,350,000
82	SW 34th Avenue, SR 502 to NE 199th Street	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$2,530,000
83	SW 6th Street, SW 34th Avenue to SW 24th Avenue	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$590,000
84	SW 9th Street, NE 92nd Avenue to SW 34th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$815,000
85	NW 2nd Street, NE 92nd Avenue to NW 29th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$1,060,000
86	SW 1st Street, SW 34th Avenue to SW 29th Ave	Construct new frontage road on south side of highway		♦ (1)	$250,000
87	SW 25th Avenue, SW 9th Street to NE 199th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$845,000
88	NE 112th Avenue, NE 179th Street to NE 176th Street	Construct new urban major collector with bike lanes and sidewalks.		♦ (1)	$643,000
89	SW 15th Avenue, NE 179th Street to NE 176th Street	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$440,000

Table 9-6 Continued
Recommended Transportation System Improvements
Battle Ground UGA – Beyond 2025

Project ID No.	Location	Improvement Recommended	Funding Source: Battle Ground	Funding Source: Other Agency	Cost
Battle Ground Improvements – Beyond 2025					
90	NE 199th Street, NE 92nd Avenue to SW 20th/NE 112th Avenue	Improve to urban three-lane section with sidewalks and bike lanes		♦ (3)	$1,010,000
91	NE 92nd Avenue, NE 239th Street to SR 502	Improve to urban three-lane section with sidewalks and bike lanes		♦ (3)	$1,175,000
92	NE 239th Street, NE 92nd Avenue to NW Onsdorff Blvd.	Improve to urban three-lane section with sidewalks and bike lanes	♦		$590,000
93	SW Scotton Way, SW 25th Avenue to SW 20th Avenue	Construct new urban neighborhood collector with bike lanes and sidewalks		♦ (1)	$440,000
		Sub-total Battle Ground			***$19,623,000***

Note: "Other" refers to funding from another agency or private sources (excluding grants made to the City).
Anticipated Funding Sources: (1) – Developer contributions; (2) – Federal SAFETEA-LU; (3) Clark County

9.5 INTERAGENCY ISSUES

The transportation system of a single community does not operate in isolation from neighboring communities or from the on-going transportation operations, maintenance and implementation responsibilities of other nearby jurisdictions. The movement of people and commodities occurs regardless of the divisions between agencies who each have responsibilities for different portions of the transportation system. Recognizing this, it is important that on-going transportation system planning, operations, project development, and implementation be coordinated to provide the smoothest and most efficient service.

This section discusses some of the more significant interagency issues that should be addressed to successfully implement the Battle Ground Transportation System Plan. Included in the discussion is the need for coordination at the regional level with the Metropolitan Transportation Plan and the Clark County Comprehensive plan. Also addressed are issues requiring coordination with the Washington State Department of Transportation.

9.5.1 Relationship to Metropolitan Transportation Plan

As noted in the mode-specific chapters, the Regional Transportation Council (RTC) prepares and adopts a Metropolitan Transportation Plan (MTP) to satisfy federal requirements for continuing, coordinated and comprehensive transportation planning in Clark County. As a part of the MTP, RTC is responsible for establishing an inter-jurisdictional functional classification system of streets and highways to form the basis for federal funding of improvement projects. Differences between the recommended classification system for the Battle Ground UGA and the MTP classifications were identified and discussed in Chapter 4. These differences should be addressed and resolved in the next update of the MTP.

Through the MTP, RTC is responsible for establishing level of service (LOS) standards for state highways of regional significance (such as SR 502 and SR 503). These standards designate the portions

of these highways located within the Battle Ground UGA as rural highways and establish a rural standard of LOS C. The rural designation is inconsistent with the existing character of SR 502 in the UGA that serves as "Main Street" through a portion of the commercial heart of the City. Speeds are limited to 40 mph and adjacent land uses are urban. SR 502 in the UGA should be reclassified as an urban highway serving this community of 14,000 people. Over the long-term it is also envisioned that SR 503 will become more urban in character with the addition of traffic signalized, all-way intersections at NW Onsdorff Boulevard, SW Rasmussen Boulevard and SW Scotton Way. The speed limit on this highway will likely be reduced over time to reflect the traffic operational effects of these new signals. Additionally, on-going land development patterns in the UGA will result in increased urban densities along this highway that will require access. While it is anticipated that these access needs will be satisfied through driveways located along the streets that intersect SR 503, increased urbanization will also affect travel speeds along the highway. It is recommended that SR 503 in the UGA be reclassified as an urban highway with the associated LOS D standard.

RTC is also responsible for incorporating the regionally significant roadway improvement projects of local jurisdictions into the MTP and the regional Transportation Improvement Program (TIP), and conducting air quality conformity analysis of these projects. Collectively all roadway improvements within Clark County must undergo air quality conformity analysis to demonstrate that they are within the "budget" for emissions from mobile sources that is contained in the State Implementation Plan for maintaining the National Ambient Air Quality standards for ozone (smog) and carbon monoxide. Projects can only be programmed in the regional TIP if they come from a conforming *MTP*. Thus, it will be necessary for the recommended regionally-significant roadway improvements in the Battle Ground TSP (major collectors and above) to be included in this conformity analysis to ensure their eligibility for federal funding.

Over the 20-year period for implementation of the recommendations in the Battle Ground TSP, it will be important for there to be on-going communication between RTC and the City of Battle Ground to ensure that there will be a reasonable level of federal funding for regionally-significant roadway improvement projects in the UGA. Battle Ground's continued participation in RTC's technical and policy bodies is recommended.

9.5.2 Relationship to County Transportation System Plan

Coordination between the Battle Ground TSP and the Transportation Element of the County's Comprehensive Plan is important to ensure that a consistent and appropriately-sized roadway system is provided within and adjacent to the UGA. The County currently owns and is responsible for non-state highway roads outside of the city limits. While the County has indicted that is does not have the financial resources to upgrade its roads within the UGA in response to urban development pressures, it will retain responsibility for operating and maintaining these roads in a safe and reliable manner until such time as they are transferred to the city.

The County's *Comprehensive Plan* and *Capital Facilities Plan* identified the need for significant upgrading and improved roadways outside of the UGAs in the County to provide for intercity travel and to serve rural residential development and other rural land uses. Roadway improvements that directly affect travel into and out of the Battle Ground UGA should be coordinated with the City to ensure that the timing of improvements is generally compatible and that the ultimate capacity and functional use of these roads as they cross jurisdictional boundaries are consistent. The County's proposed improvements on NE 179th Street, NE 72nd Avenue and NE 142nd Avenue are examples of such projects.

Additionally, consideration should be given to ensuring that there is consistent functional classification between County roads and city streets. Chapter 4 identifies several differences between Battle Ground the County classifications that should be addressed and resolved.

9.5.3 Relationship to State Highway System Plan

The State Highway System Plan establishes policy direction and identifies improvement needs for the State Highway System in Washington State. Of particular significance to the Battle Ground TSP are plan recommendations that affect SR 502, SR 503 and Interstate 5 in northern Clark County. The timing and nature of these improvements should be closely coordinated with the City of Battle Ground to ensure that the regionally significant state highway function of roads such as SR 502 and SR 503 is balanced with the need for local multi-modal circulation and access within the UGA including pedestrian and bicycle movement.

Improvements along SR 502 including the proposed new interchange at I-5 should also be coordinated with the City to ensure not only that adequate capacity is provided for intercity trips from the freeway to the UGA, but also that the City's 50-year vision for a western gateway to the community can be realized.

APPENDIX A

Level of Service Definitions

Appendix A
Level of Service Definitions

The Level of Service (LOS) concept was developed to subjectively describe the degree of comfort that the driver feels as they travel through an intersection. Included in this description are such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles. Six grades are used to describe intersection levels of service, ranging from A (the best), to F (the worst) as further explained below.

Table A-1
Level of Service Criteria for Signalized Intersections

Level of Service	Description	Control Delay per Vehicle (seconds)
A	Extremely favorable progression with most vehicles arriving during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤10
B	Good progression, short cycle lengths, or both, with more vehicles stopping than with LOS A, causing higher levels of average delay.	>10 and ≤20
C	Higher delays resulting from fair progression, longer cycle lengths, or both. . Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	>20 and ≤35
D	Congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.	>35 and ≤55
E	Lengthy delay values associated with LOS E generally indicate poor progression , long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	>55 and ≤80
F	LOS F is considered unacceptable to most drivers. It indicates oversaturated conditions with arrival flow rates exceeding the theoretical capacity of the intersection. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures due to poor progression and long cycle lengths.	>80

Source: *Highway Capacity Manual*, 1997

Table A-2
Level-of-Service Criteria for Unsignalized intersections

Delay Range (Seconds)	Level of Service	Minor Street Traffic Characteristics
≤10	A	Little or no delay. Queues are seldom more than one vehicle.
>10 and ≤15	B	Short traffic delays. Occasionally there is more than one vehicle in the queue.
>15 and ≤25	C	Average traffic delays. There is often more than one vehicle in the queue. Drivers begin to feel constricted.
>25 and ≤35	D	Long traffic delays. Queues are regularly more than one vehicle. Drivers feel quite restricted.
>35 and ≤50	E	Very long traffic delays. Demand is near or equal to the probable maximum number of vehicles that can be accomodated by the movement. There is almost always more than one vehicle in the queue.
>50	F	Forced flow conditions with extensive delays caused by geometric and/or operational constraints external to the intersection.

Source: Highway Capacity Manual, 1997.

APPENDIX B

Accident Records and Accident Rate Calculations

Appendix B
Accident Records and Accident Rate Calculations

City of Battle Ground, OR 05/19/2004
Dates of Data: 01/01/2001 - 11/30/2003
Top intersections with at least 1 crash/year
Sorted by Accident Rate

Variables
Peak hour to ADT factor: 10
ADT to annual traffic factor: 261

Intersections	3-year Crash Total	Volumes (PM Peak) NB	WB	SB	EB	TOTAL	ADT	Accidents Per Year	3-year Accident Rate
E Main Street & 5th Avenue	33	216	626	301	866	2,009	20,090	11	2.16
SR 503 & Onsdorff Boulevard	17	882	111	413	0	1,406	14,060	6	1.59
SR-502 (W Main St) & SR 503 (10th Ave)	34	1109	943	417	943	3,412	34,120	12	1.31
SR 503 & NE 244th Street	13	787	144	407	287	1,625	16,250	4	1.05
SR 502 (W Main Street) & 20th Avenue	16	665	716	319	656	2,356	23,560	5	0.89
NE 199th Street & S Grace Avenue	5	180	245	170	268	863	8,630	2	0.76
E Main Street & Parkway Avenue	9	313	386	258	716	1,673	16,730	3	0.71
SR 503 & NE 199th Street	13	1318	427	531	433	2,709	27,090	4	0.63
NE 199th Street & S Parkway Avenue	5	9	282	243	578	1,112	11,120	2	0.59
SR 502 (W Main Street) & 15th Avenue	6	0	660	138	798	1,596	15,960	2	0.49
E Main Street & S Grace Avenue	2	193	158	0	309	660	6,600	1	0.40
SR-502 (W Main Street) & 12th Avenue	6	7	887	452	735	2,081	20,810	2	0.38
E Main Street & N Grace Avenue	2	0	240	148	500	888	8,880	1	0.30
SR 503 & NE 189th Street	3	1302	9	659	156	2,126	21,260	1	0.19
SR 502 (W Main Street) & 29th Avenue	1	0	452	76	675	1,203	12,030	0	0.11

APPENDIX C

Pending/Programmed Improvement Projects

Appendix C - Pending/Programmed Improvement Projects

Map ID	Roadway	Segment	Project Description	Agency Lead	Time Frame
1	SR 502	NE 179th St./I-5 to Battle Ground west city limits	Widen to 4 lanes with two-way left-turn channelization	WSDOT	2003-2022
2	SR 503	SR 500 to SR 502/Main St.	Widen to 6 lanes	WSDOT	2003-2022
3	SR 503	SR 502/Main St. to NE 132nd Ave.	Intermittent passing lanes or widen to 4 lanes	WSDOT	2003-2022
4	I-5/SR502	I-5 – SR 502 Interchange Project	New interchange on I-5 in the vicinity of SR 502, locally known as NE 219th Street.	WSDOT	2003-2022
5	NE Heisson Rd./NE 244th Street	At intersection	Upgrade intersection	Clark County	2005-2010
6	NE 72nd Avenue/NE 239th Street	At intersection	Intersection improvements (specific project description not provided)	Clark County	2005-2010
7	NE 142nd Ave.	NE 159th St. to NE 199th St.	Construct a 2-lane rural minor collector standard, south of City of Battle Ground Urban Growth Boundary (UGB)	Clark County	2005-2010
8	NE 179th St.	Cramer Rd. to SR 503	Construct a 2-lane rural major collector standard	Clark County	2005-2010
9	NE 179th St.	NE 50th Ave. to Cramer Rd.	Improve to provide 1 lane in each direction with turn lane	Clark County	2005-2010
10	NE 72nd Avenue	SR 502 to NE 259th Street	Upgrade roadway	Clark County	2005-2010
11	S Parkway Avenue	SE 10th Street to 199th Street	Widen to three lanes with median, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2005
12	N Parkway, Phase 2	5th Street to Onsdorff Blvd	Widen road to three lanes with median, storm drainage, bicycle and pedestrian facilities, lighting, striping and landscaping	Battle Ground	2006
13	SW 6th Ave.	NE 199th Street to Scotton Way	Construct new access road, storm drainage, bicycle and pedestrian facilities, lighting and landscaping	Battle Ground	2006
14	Rasmussen Blvd., Phase 1	S Parkway Avenue to SR 503	New three lane road, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2006
15	Rasmussen Blvd., Phase 2	S Parkway Avenue to SW 20th Avenue	Construct new three lane road, storm drainage, bicycle and pedestrian facilities, lighting, landscaping and new signal at SR 503	Battle Ground	2006
16	NW 20th Avenue	SR 502 to Onsdorff Blvd.	Widen to three lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2007
17	199th Street, Phase 2	S Grace Avenue to east city limits	Widen to three lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2007
18	S Grace Avenue	E Main Street to 199th Street	Widen roadway and add sidewalks, storm drainage, striping, lighting, landscaping, bike facilities	Battle Ground	2007

Map ID	Roadway	Segment	Project Description	Agency Lead	Time Frame
19	SW 20th Avenue	SR 502 to Rasmussen Blvd	Widen to three lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2007
I	Grace Avenue/E Main Street	At intersection	Align S Grace with N Grace Avenue, install new traffic signal, pedestrian enhancements	Battle Ground	2007
20	Heisson Road	142nd Avenue to east city limits	Widen to three lane facility, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2008
21	N Parkway Avenue, Phase 3	Onsdorff Blvd to 244th Street	Widen existing road to three lanes, bicycle and pedestrian facilities, storm drainage, lighting and landscaping	Battle Ground	2008
22	SW 7th Avenue, Phase 1	South terminus to Rasmussen Blvd.	Construct new road, storm drainage, pedestrian facilities, lighting, landscaping	Battle Ground	2008
23	SW 7th Avenue, Phase 2	Rasmussen Blvd. to NE 199th St.	Construct new road, storm drainage, pedestrian facilities, lighting, landscaping	Battle Ground	2008
24	SE Rasmussen Blvd.	SE Grace Ave. to Commerce Ave.	Construct new road, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2009
25	NW/SW 1st Streets	Frontage roads parallel to W Main Street	New roads paralleling SR 502, storm drainage, pedestrian and bicycle facilities, lighting, landscaping	Battle Ground	2009
26	SE 1st Street	S Parkway Avenue to S Grace Avenue	Widen road, pedestrian facilities, storm drainage, lighting, landscaping	Battle Ground	2009
27	NE 1st Street	N Parkway Avenue to N Grace Avenue	Widen road, pedestrian facilities, storm drainage, lighting, landscaping	Battle Ground	2009
28	SW 4th St.	S Parkway to west terminus	Widen road, pedestrian facilities, storm drainage, lighting, landscaping	Battle Ground	2009
29	Scotton Way Extension	East terminus to S Grace Avenue	Construct new road, storm drainage, bicycle and pedestrian facilities, lighting, landscaping	Battle Ground	2009

Source: WSDOT, Highway System Plan, 2003-2022
Clark County, 2005-2010 Six-Year Transportation Improvement Program
Battle Ground, Six-Year Transportation Improvement Program, 2005-2010

APPENDIX D

Battle Ground UGA Population and Employment Forecasts

Appendix D - Battle Ground UGA Population and Employment Forecasts

Battle Ground TAZ	RTC 2000				Battle Ground Total 2023 (based on vacant land)			
		Employment				Employment		
	HH	Retail	Other	Total	HH	Retail	Other	Total
442	66	0	8	8	10	0	6	6
906	0	0	0	0	89	0	2	2
sum	66	0	8	8	99	0	8	8
443	75	0	16	16	211	117	251	368
903	0	0	0	0	33	79	81	160
904	0	0	0	0	59	1	85	86
905	0	0	0	0	277	254	0	254
936	0	0	0	0	456	452	0	452
sum	75	0	16	16	1,036	903	417	1,320
444	82	0	170	170	423	0	120	120
907	0	0	0	0	11	0	243	243
908	0	0	0	0	89	0	40	40
sum	82	0	170	170	523	0	403	403
445	103	0	9	9	441	0	9	9
446	262	7	47	54	5	265	128	393
895	0	0	0	0	392	1	5	6
sum	262	7	47	54	397	266	133	399
447	17	0	7	7	2	2	435	437
918	0	0	0	0	38	0	122	122
919	0	0	0	0	44	0	4	4
920	0	0	0	0	5	3	2	5
sum	17	0	7	7	89	5	563	568
448	115	40	35	75	15	106	35	141
922	0	0	0	0	65	34	11	45
923	0	0	0	0	6	57	27	84
924	0	0	0	0	35	168	69	237
sum	115	40	35	75	121	365	142	507
449	310	0	201	201	186	0	10	10
916	0	0	0	0	132	0	0	0
917	0	0	0	0	0	118	230	348
921	0	0	0	0	0	0	0	0
953	0	0	0	0	0	0	0	0
sum	310	0	201	201	318	118	240	358
450	352	471	353	824	3	1	21	22
925	0	0	0	0	352	153	66	219
926	0	0	0	0	0	255	167	422
927	0	0	0	0	0	258	177	435
sum	352	471	353	824	355	667	431	1,098
451	208	20	181	201	40	10	51	61
913	0	0	0	0	0	10	442	452
914	0	0	0	0	145	0	0	0
915	0	0	0	0	108	0	0	0
sum	208	20	181	201	293	20	493	513
452	311	48	307	355	0	58	162	220
928	0	0	0	0	0	33	138	171
929	0	0	0	0	202	6	6	12
930	0	0	0	0	125	0	50	50
sum	311	48	307	355	327	97	356	453

Battle Ground TAZ	RTC 2000				Battle Ground Total 2023 (based on vacant land)			
		Employment				Employment		
	HH	Retail	Other	Total	HH	Retail	Other	Total
453	36	1	129	130	249	0	33	33
910	0	0	0	0	10	1	51	52
911	0	0	0	0	69	0	1,292	1,292
912	0	0	0	0	0	0	237	237
sum	36	1	129	130	328	1	1,613	1,614
454	27	0	2	2	3	0	2	2
909	0	0	0	0	62	0	0	0
sum	27	0	2	2	65	0	2	2
455	75	125	150	275	372	3	150	153
950	0	0	0	0	1	193	23	216
sum	75	125	150	275	373	196	173	369
456	122	100	158	258	220	0	0	0
948	0	0	0	0	0	60	95	155
949	0	0	0	0	1	93	81	174
sum	122	100	158	258	221	153	176	329
457	244	593	1,050	1,643	213	0	10	10
944	0	0	0	0	37	179	202	381
945	0	0	0	0	3	219	571	790
946	0	0	0	0	0	3	201	204
947	0	0	0	0	0	460	205	665
sum	244	593	1,050	1,643	253	861	1,189	2,050
458	359	32	48	80	216	22	38	60
943	0	0	0	0	144	10	10	20
sum	359	32	48	80	360	32	48	80
459	472	231	160	391	248	0	0	0
939	0	0	0	0	0	95	24	119
940	0	0	0	0	2	172	127	299
941	0	0	0	0	16	17	62	79
942	0	0	0	0	253	0	0	0
sum	472	231	160	391	519	284	213	497
460	70	0	9	9	235	0	4	4
937	0	0	0	0	334	0	0	0
938	0	0	0	0	211	0	5	5
sum	70	0	9	9	780	0	9	9
461	107	0	116	116	120	0	0	0
932	0	0	0	0	20	0	116	116
sum	107	0	116	116	140	0	116	116
462	45	0	10	10	128	0	5	5
933	0	0	0	0	5	0	5	5
sum	45	0	10	10	133	0	10	10
463	214	0	31	31	184	0	2	2
934	0	0	0	0	30	0	29	29
sum	214	0	31	31	214	0	31	31
530	82	0	28	28	41	0	28	28
956	0	0	0	0	10	0	0	0
957	0	0	0	0	31	0	0	0
sum	82	0	28	28	82	0	28	28

Battle Ground TAZ	RTC 2000				Battle Ground Total 2023 (based on vacant land)			
		Employment				Employment		
	HH	Retail	Other	Total	HH	Retail	Other	Total
531	206	0	219	219	53	0	149	149
900	0	0	0	0	167	0	0	0
901	0	0	0	0	171	0	10	10
935	0	0	0	0	5	33	41	74
954	0	0	0	0	4	118	49	167
958	0	0	0	0	78	0	20	20
sum	206	0	219	219	478	151	269	420
533	78	0	19	19	47	0	14	14
902	0	0	0	0	134	1	0	1
931	0	0	0	0	118	107	5	112
sum	78	0	19	19	299	108	19	127
551	94	0	44	44	89	0	42	42
955	0	0	0	0	5	0	2	2
sum	94	0	44	44	94	0	44	44
553	192	0	138	138	90	0	128	128
897	0	0	0	0	20	0	5	5
898	0	0	0	0	273	1	5	6
899	0	0	0	0	6	230	77	307
952	0	0	0	0	32	0	0	0
sum	192	0	138	138	421	231	215	446
554	76	0	24	24	7	0	22	22
896	0	0	0	0	74	0	2	2
sum	76	0	24	24	81	0	24	24
573	36	0	39	39	20	0	7	7
951	0	0	0	0	296	0	32	32
sum	36	0	39	39	316	0	39	39
574	66	0	19	19	66	0	19	19
575	197	0	49	49	197	0	49	49
577	68	0	129	129	60	0	129	129
591	25	0	2	2	109	84	2	86
	4,792	1,668	3,907	5,575	9,588	4,542	7,612	12,154
Population	12,890				25,792			

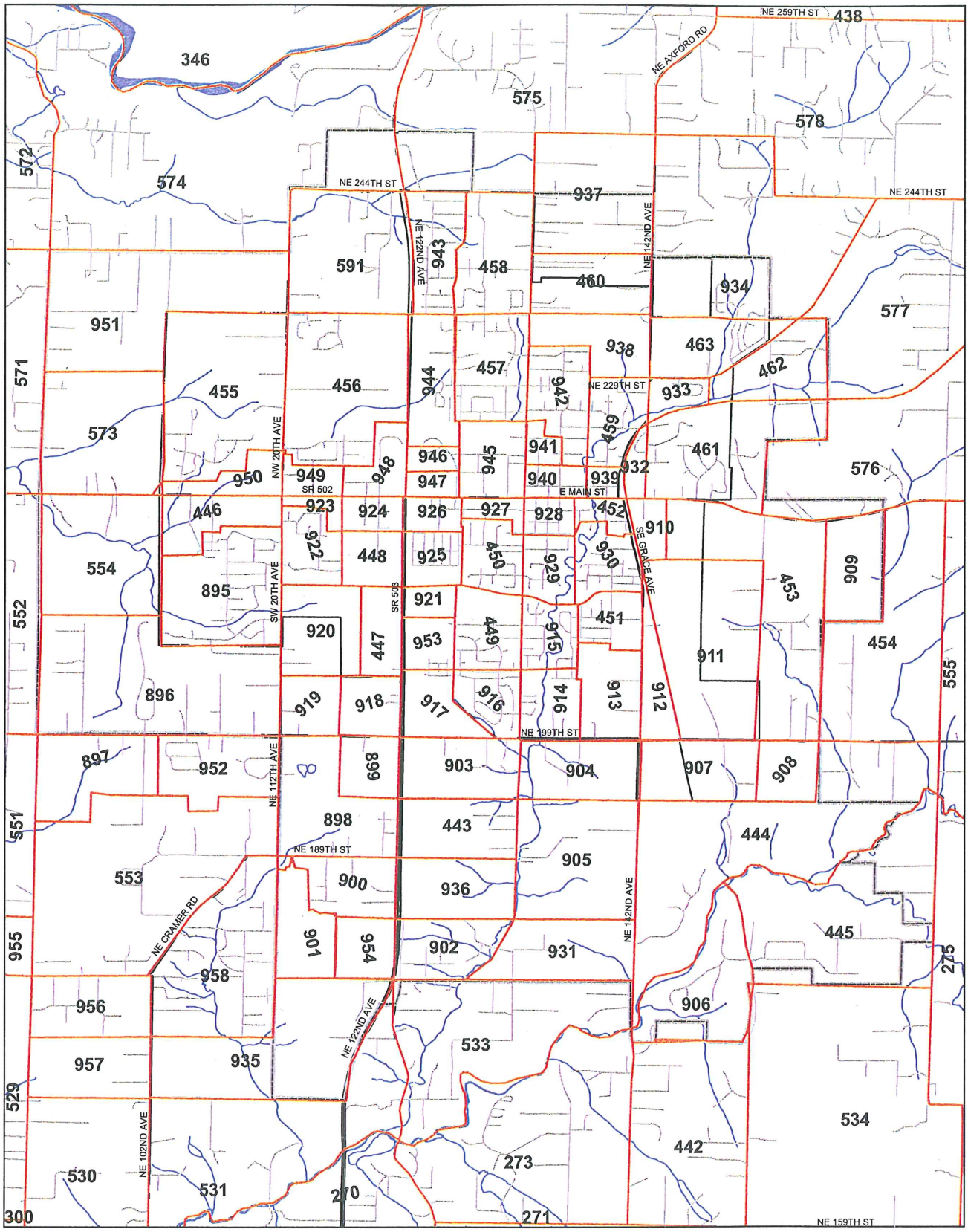

Figure D-1: Battle Ground Area Transportation Analysis Zones

Legend

- Transportation Analysis Zones
- Major Roads
- Roads
- City Boundary
- Urban Growth Area
- Rivers
- Streams

N
W E
S

1 inch equals 2,000 feet