APPENDIX A

Existing Conditions Technical Memorandum

Woodland
Transportation Infrastructure
Strategic Plan

Final Existing Conditions Technical Memorandum

Prepared for

Cowlitz-Wahkiakum Council of Governments
Administration Annex
207 N. 4th Avenue
Kelso, WA 98626

Prepared by

Parametrix
700 NE Multnomah, Suite 1000
Portland, OR 97232-4110
503-233-2400
www.parametrix.com

In Association with

The Transpo Group
11730 118th Avenue NE, Suite 600
Kirkland, WA 98034

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ACRONYMS

APE	Area of Potential Effect
CWCOG	Cowlitz-Wahkiakum Council of Governments
DOE	(Washington) Department of Ecology
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
GMA	Growth Management Act
HAC	High Accident Corridor
HAL	High Accident Location
HCM	Highway Capacity Manual
HPA	Hydraulic Project Approval
HSP	Highway System Plan
HSS	Highway of Statewide Significance
JARPA	Joint Aquatic Resources Permit Application
LRDP	Limited Route Development Plan
MEV	Million Entering Vehicles
MUTCD	Manual of Uniform Traffic Control Devices
MVMT	Million Vehicle Miles of Travel
NEPA	National Environmental Policy Act
NPDES	National Pollution Discharge Elimination System
NWI	National Wetlands Inventory
OFM	Office of Financial Management
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SR	State Route
SWRTC	Southwest Regional Transportation Council
TSP	Transportation System Plan
TISP	(Woodland) Transportation Infrastructure Strategic Plan
UGA	Urban Growth Area
USC	United States Code
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WMC	Woodland Municipal Code
WSDOT	Washington State Department of Transportation

1. INTRODUCTION

1.1 BACKGROUND

Incorporated in 1906, the City of Woodland has recently been experiencing significant growth in both population and employment. Between 1990 and 2004 the city's population grew by over 65 percent or at an annualized rate of 3.7 percent, making it the fastest growing city in the Cowlitz-Wahkiakum area. Some of this population growth has been attracted by the 32 percent increase in local jobs (1994 to 2004). Other factors influencing growth include the city's convenient location between two growing metropolitan areas (Longview/Kelso and Portland/Vancouver), lower housing costs, and small town atmosphere which have combined to make Woodland an attractive home for commuters. The city's employment includes a strong base in retail, service and industrial sectors.

Consistent with the growth in both population and employment, traffic volumes on major streets in Woodland have also grown over the past five to ten years (ranging from 2 to 4 percent per year in the eastern and northwestern portions of city). This growth has affecting existing traffic operations and accident experience within the City and presents challenges to be addressed by the community to ensure that adequate transportation resources are available to support future growth expectations.

The primary purpose of the Woodland Transportation Infrastructure Strategic Plan is to build upon the foundation provided by the Woodland Transportation Plan by fleshing out improvement recommendations for the I-5 interchanges, and refining other appropriate improvement recommendations, particularly to serve the Woodland Industrial/Port area. This study will be developed using a collaborative process and will culminate in a strategic infrastructure plan that addresses growing freeway and community traffic demand, increases arterial system connectivity, and provides enhanced and safer access to growing industrial and residential portions of the city, particularly along SR 503.

1.2 REPORT CONTENT AND ORGANIZATION

This report documents the unique transportation issues and general environment of the existing transportation system within the citywide study area. Applicable transportation, land use and environmental policies and statutory requirements have been summarized from local, regional, state and federal agencies. Existing transportation facilities, service levels and deficiencies are summarized for relevant modes including autos, trucks, bicycles, pedestrians, transit and rail. Baseline conditions related to land use and the natural environment have also been addressed.

Information contained in this technical memorandum will be used to identify short-term improvement needs and to establish a framework for the identification of longer-term needs and improvement options. Chapter 1 is this Introduction.

Chapter 2 addresses the characteristics and operational performance of the existing street system including traffic congestion and safety, system connectivity, service to all travel modes and other issues. Also included in this chapter is a discussion of the relevant local and state plans and policies that affect the development of improvements in the corridor, along with a listing of planned or proposed improvement projects derived from other recently adopted plans or programs.

Chapter 3 includes a discussion of the general context within which the development of improvement options for the Woodland study area should be assessed. This context includes

both existing and likely future land use patterns, as well as a variety of environmental factors that will influence the choice and design of improvements. The discussion includes both a general baseline conditions assessment, as well as a summary of local, state or federal regulations and policies, as appropriate. Baseline conditions summaries and regulatory requirements have been developed for:

- Land use patterns and *Comprehensive Plan*/Zoning designations;
- Biological resources including habitation and vegetative cover; wetland resources; waters of the U.S. and state; listed species; and relevant environmental laws, regulations and permits;
- Hazardous materials including identification of several parcels along the corridor where there may be a need to consider site remediation when developing improvement alternatives;
- Water quality including a discussion of existing street drainage and potential future requirements; and
- Wetlands and Waters of the United States that could be impacted by various improvement alternatives.

1.3 STUDY AREA

The geographical area which is included in the Woodland Transportation Infrastructure Strategic Plan (WTISP) is presented in Figure 1-1. This area includes the entire corporate limits of the City, as well as immediately surrounding unincorporated areas in Cowlitz and Clark Counties.

1.4 SUMMARY OF KEY FINDINGS AND CONCLUSIONS

This section provides a short summary of the key findings and conclusions with respect to the existing transportation system in the study area. Included in the discussion are issues related to congestion, safety, street connectivity, truck traffic, railroad crossings, roadway design issues, pedestrians/bicycle facilities, and environmental/permitting issues.

- **Congestion** - Consistent with the growth in both population and employment, traffic volumes on major streets in Woodland have also grown over the past five to ten years (ranging from 2 to 4 percent per year in the eastern and northwestern portions of city). This growth has also affected the I-5 interchanges at both SR 503 and Dike Access Road which have seen an increase in traffic. While these intersections still operate at acceptable levels of service, extensive traffic queuing occurs due to the closely spaced intersections between the southbound on-ramp to I-5 and CC Street. Generally, most other intersections in the city are currently operating at an acceptable level of service D or better with the exception of SR 503 (Lewis River Road) at N Goerig Street, SR 503 (Lewis River Road) at E Scott Avenue. and Buckeye Street at Goerig Street. All are currently unsignalized intersections.
- **Safety** - A more significant existing problem on major streets in the city is the high accident experience, particularly along sections of SR 503 (Goerig Street to Gun Club Road) and at the intersections of the state highway with Insel Road. Rear end accidents tend to predominate occurring at intersections and driveway accesses and indicating the effects of congestion and frequent turning movements. Existing accident experience has lead to many of the improvement recommendations in the city's Transportation Plan which involve widening of SR 503 to provide for center turn lanes and other improvements. Additionally, concern was raised during the

public process for the ability of heavy trucks to accelerate up the northbound on-ramp to I-5 from Dike Road.

- **Connectivity** - While east/west roadway connections are adequate from a traffic operations and delay perspective, connections from one part of the city to the other should be improved to enhance traffic flow and safety. Another key issue with respect to general street connectivity in the study area involves north/south traffic, particularly to the west of I-5 where improved truck access and circulation should be provided to/from the developing industrial properties.

- **Truck traffic** - There is a significant volume of truck traffic in the industrial sections of city and on other streets resulting from logging and quarry operations outside of the urban growth area. In the northwestern portion of the city, truck traffic comprises more than 20 percent of existing volumes, with significant levels also occurring in the southwestern portion of the city and as much as 5 percent of the traffic stream along SR 503. This level of truck traffic can have a major effect on traffic movement and on the development and consideration of improvement alternatives.

  In addition to increase in general vehicle traffic, major increases in truck traffic are also anticipated, much of which will be focused on travel to/from I-5. This truck traffic will be generated by local industrial development, by quarries east of the Lewis River in Clark County, and by local retail and service businesses, particularly along Pacific and Atlantic Avenues between SR 503 and Scott Avenue.

- **Railroad Crossings –** Several east/west street on the west side of Woodland are impacted by the existing at-grade crossings of the BNSF railroad. Of particularly significance are Davidson Avenue west of 5th Street and W Scott Avenue east of N Pekin Road. As the number of level of train traffic increases the connectivity of the local street network will be important to provide travel route alternatives.

- **Roadway Design Issues –**
  - Sight distance is impaired at two locations along SR 503, approaching the N Goerig Street intersection from the south, and approaching the E Scott Avenue intersection also from the south. Additionally, the skewed angle of Goerig Street at its intersection with SR 503 makes it difficult to view traffic traveling westbound on SR 503.
  - Many segments of SR 503 do not currently meet WSDOT standards for access management. This can result in increased safety concerns as motorists stopping for on-coming traffic are rear-ended by those coming up from behind them. Frequent access points can also significantly reduce the capacity of a street or highway corridor to carry growing traffic volumes.
  - Limited right-of-way and/or the need to acquire right-of-way along several arterials possibly including SR-503.
  - Physical constraints around the Dike Road interchange related to rail, and short spacing between some major intersections (such as SR 503 from the I-5 ramps to CC Street, including Atlantic Avenue).
  - Confusion at the intersection of SR 503 with the I-5 northbound off-ramp/Atlantic Avenue as some travelers have been observed treating Atlantic Avenue as a one-way street (e.g., for northbound traffic), rather than an existing two-way street.

- **Pedestrian and Bicycle Facilities –** The existing pedestrian system currently has large gaps, particularly along SR 503 and N Pekin Road. Bicycle facilities are largely unavailable in the study area with the exception of roadway shoulder areas. Improvements for these modes should be considered to provide enhanced network connectivity to community destinations, employment centers, recreational facilities (like the Skateboard Park and Horseshoe Lake), and schools.
- **Emergency Response** – Concern has been raised about the negative effect of railroad blockage of Scott Avenue and Davidson Avenue on emergency response to northwestern Woodland. This issue is expected to become more severe when a new high school is built near Dike Road. Additionally, there is concern that congestion delays also impact emergency response times, particularly in relation to the location of the current and future police/fire stations.
- **Environmental Issues** - In addition to the challenges related to growth and travel demand, environmental constraints and permitting requirements must be considered in developing improvement recommendations. It will be important to pay particular attention to:
    - Existing natural resources (e.g., habitat, wetlands and flood plains), particularly along SR 503 east of the interchange with I-5. Some seasonal flooding also occurs in the vicinity of the I-5/Dike Road interchange.
    - Potential issues with hazardous materials sites. Additional site analysis will be required when specific improvements enter the design phase of project development.

Figure 1-1. Woodland Study Area

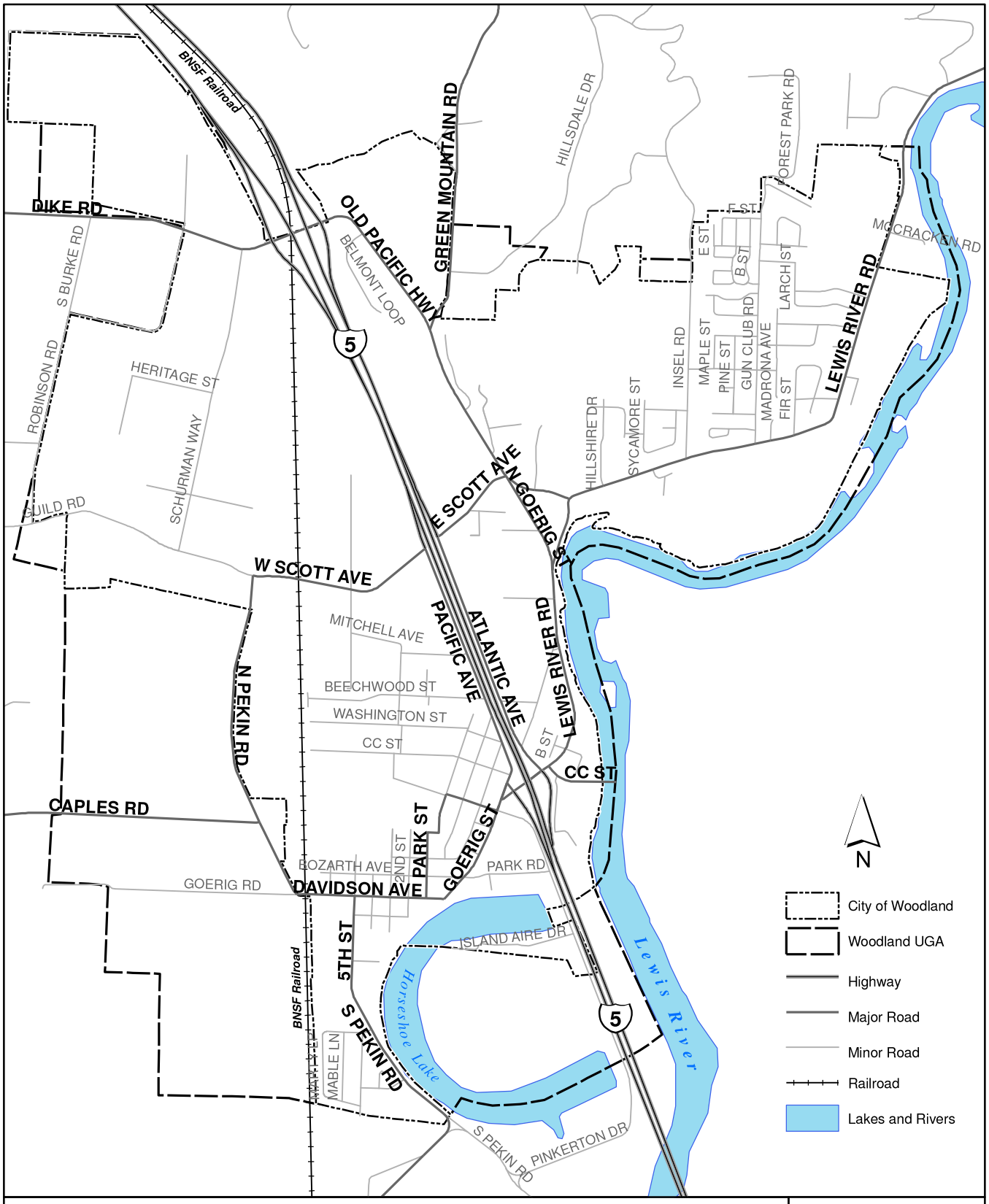


Figure 1-1: Woodland Study Area

Parametrix

The Transpo Group

Woodland Transportation Strategic Infrastructure Plan

Analysis by C. Hainey; Analysis Date: July 2007; Plot Date: July 2007; File Name: 1-1_StudyArea.mxd

2. EXISTING TRANSPORTATION CONDITIONS

2.1 INTRODUCTION

This chapter documents the existing transportation system conditions within the Woodland study area. The study area encompasses the entire City of Woodland and some of its surrounding unincorporated area on either side of Interstate 5, generally between the Lewis River and the Dike Road interchange. An overview of the existing street system is provided along with a physical description of the intersections selected for traffic analysis. An evaluation of existing operations at the study area intersections is provided, including intersection delays, volume-to-capacity ratios and levels of service. The report contains information about accident history on the study area road network and intersections. An overview of alternative transportation facilities, including bicycle/pedestrian, rail, transit and Port facilities is also provided, along with a summary of planned and pending study area street system improvements. Finally, this memo summarizes policies outlined in the Woodland Transportation System Plan (TSP) that are applicable to the transportation elements of this study.

2.2 ANALYSIS METHODOLOGY

The process used to assess existing transportation conditions within the corridor included the following steps:

1. *Assemble and Review Existing Data*
   - Field reconnaissance to verify existing street and intersection configuration (including turn lane channelization), traffic control including peak period signal timing, pedestrian/bicycle facilities, and existing property access.
   - Existing PM peak hour turning movement counts at a variety of intersections throughout the study area that were obtained from WSDOT, the TSP, and traffic impact studies prepared for proposed land development.
   - Detailed accident records of incidents that have occurred along SR 503 between January 2001 and December of 2006.
   - Previous studies conducted in the corridor including, as available, including traffic impact studies and the TSP, with relevance to the corridor. This includes identification of applicable TSP goals and policies, roadway functional classifications, alternative transportation policies, etc.
   - Existing street and development standards as applicable in the corridor.
   - Existing "as-built" plans for the I-5 interchanges at SR 503 and Dike Road, and along SR 503.
2. *Collect New Data As Needed*
   - Update PM peak hour turning movement counts at five intersections within the study area that were expected to experienced the greatest increases in traffic volume growth since data was collected for the TSP in 2003 and 2004.
   - Field reconnaissance to verify signal timing patterns for the devices along SR 503 in the vicinity of the I-5 interchange.

- Field reconnaissance to identify sight distance limitations along selected segments of SR 503.
- Development of a detailed photolog for all study area intersections and other selected locations.
- Development of a videolog for various roadway segments.

3. *Evaluate Existing Transportation Conditions*

   Using the data collected for the corridor under the prior sub-task, the Parametrix team assembled operational information and created a working database of all traffic, signal and operation, and geometric conditions, safety conditions, and other factors influencing the assessment of existing transportation conditions, needs and deficiencies. This database has been used for several purposes.

   - To update, validate, and use a traffic operations model for study area intersections using the SYNCHRO software and Highway Capacity Manual techniques for the purpose of identifying existing operational deficiencies.
   - To review the assembled accident data in order to identify safety deficiencies such as high crash locations that could influence future alternative design concepts.
   - To identify existing system constraints, deficiencies and opportunities not specifically related to traffic operations or safety. This could include such factors as street and roadway system deficiencies, particularly related to geometric design; issues related to neighborhood traffic intrusion, connectivity, access management conflicts, sight distance problems, and/or inadequate bicycle and pedestrian facilities; and pending roadway improvements that could influence the nature or timing of improvements for the study area.

2.3 EXISTING STREET SYSTEM CHARACTERISTICS

The following summarizes the existing roadway system including roadway geometry and locations of signalized intersections which are all situated along SR 503 (Lewis River Road). Figure 2-1 presents the existing roadway system including intersection lane channelization and traffic controls. The paragraphs below describe the characteristics of the major streets within the Woodland study area.

2.3.1 Descriptions of Existing Streets and Highways

2.3.1.1 State Routes

The City of Woodland transportation system includes two state highways, Interstate 5 and State Route (SR) 503. Both highways provide regional access to and from the City, while also providing for local circulation needs. SR 503, in particular, serves as a backbone to the City's transportation system.

Interstate 5 (I-5), which bisects the City of Woodland, is a six-lane interstate freeway providing north/south access from southern California to the Canadian border and is the primary freeway serving the west coast of the United States. The freeway has a speed limit of 70 mph. The Woodland UGA contains approximately a 2.1 mile section of I-5. Within Woodland, I-5 is classified by WSDOT as a rural interstate highway, as well as a Highway of Statewide Significance (HSS). The City of Woodland is served by two freeway interchanges with I-5. The southern most interchange (exit 21), accessed via SR 503, is the primary access

for the City of Woodland. The interchange with I-5 at SR 503 (exit 21) is a split diamond with the ramps to/from the south intersecting with SR 503 (Lewis River Road). Both of the ramp intersections are signalized. The ramps to/from the north are located at W and E Scott Avenues, approximately 0.7 miles to the north. Atlantic and Pacific Avenues are two-way frontage roads connecting the split interchange ramps. There is no direct connection between the ramps at E and W Scott Avenues across I-5. Stop signs provide traffic control on E or W Scott Avenue at the intersections with Atlantic and Pacific Avenues. The two existing bridges on I-5 over SR 503 have a sufficiency rating of 75.54 when last inspected in October 2005 (ratings run from 0 at the low end to 100 at the high end). Clearance over SR 503 on the northbound structure varies from 16-feet 0-inches to 16-feet 2-inches. Clearance at the southbound structure varies from 15-feet 7-inches to 15-feet 9-inches. Minimum clearance for a new structure would be 16-feet 6-inches.

At the north end of the city, I-5 has an interchange with Dike Access Road (exit 22). The Dike Access Road interchange serves the northern part of the study area. The interchange also provides access to the Columbia River, west of Woodland. The Dike Road interchange off-ramp intersections are controlled by stop signs.

State Route 503 (SR 503) provides regional access from I-5 to areas in east Cowlitz and Clark Counties, as well as parts of Skamania County. WSDOT classifies SR 503 in Woodland as a rural, minor arterial. It is not part of the national highway system, nor is it classified as an HSS. The portion of SR 503 under study runs from the I-5 interchange to McCracken Road at milepost 52.23. A focused area for detailed assessment in a Limited Route Development Plan (LRDP) runs from N Goerig Street at milepost 53.92 in the City of Woodland to McCracken Road at milepost 52.23. Within the detailed study area this roadway is primarily oriented in an east/west direction with level terrain.

Land uses along the SR 503 corridor are mainly residential with supporting uses such as schools, church, and retail/restaurant. The roadway serves as a connection to low density residential, recreational and forest areas to the east of Woodland. As a result, a portion of the traffic is recreational vehicles and logging trucks coming to/from the forest areas.

Within the city, SR 503 (also know as Lewis River Road) has four travel lanes at its interchange with I-5, with additional left-turn lanes at the intersections with the on- and off-ramps and at CC Street. East of CC Street, the roadway narrows to a three-lane cross-section, including a center, two-way, left-turn lane. This two-way turn lane provides storage for traffic turning into and out of the retail and service commercial uses along this section of the highway. The north side of this section of SR 503 has curbs, gutters and sidewalks, while the south side has an 8-foot wide shoulder. The speed limit is posted at 35 mph. Traffic signals are currently located at the I-5 southbound on-ramp, the I-5 northbound off-ramp, and the intersection with CC Street (see Figure 2-1).

Approximately one third of a mile east of I-5, SR 503 transitions from three lanes to two lanes. The east side of the road, between S Goerig Street and N Goerig Street, is paralleled by the Lewis River and a concrete dike wall. The west side of this section of roadway serves a mix of residential and commercial uses, many of which have direct access onto the highway. Six-foot paved shoulders are typical on this section of the highway.

Continuing north and east from N Goerig Street, SR 503 continues as a two-lane highway, primarily providing connections to the growing residential areas within the northeast part of the city and to the Upper Lewis River recreational area. Immediately east of E Scott Avenue, residential lots have direct access on both sides of the highway. Further, Insel Road and Gun Club Road intersect with SR 503. These collectors connect growing residential areas with the highway; however, several individual residential lots and local access streets also access SR 503, especially between Gun Club Road and Spruce Avenue. This section of SR 503 is posted

at 35 mph and has 2- to 4-foot shoulders on both sides of the highway. The curve between Fir Street and Evergreen Lane is posted with a 25 mph advisory speed sign.

East of the city limits, SR 503 has a 50 mph posted speed limit. This section of highway provides access to low density residential uses, many of which have direct access to the roadway. Roadway shoulders vary between 2 to 6 feet in width. Just north of the UGA boundary, the highway turns to the east, following the river. A 40 mph advisory speed is posted at this location.

2.3.1.2 Major Arterials

Major arterials provide for through traffic within a community and also connect to community centers. Typically, access to intersecting streets and individual properties is more restricted along major arterials so ensure that the traffic-carrying function of these roads is not degraded. Routes within the City of Woodland classified as major arterials include Atlantic Avenue, Pacific Avenue, Old Pacific Highway, and segments of Goerig Street, Dike Access Road, Davidson Avenue and E. Scott Avenue.

Atlantic and Pacific Avenues are frontage roads which parallel both sides of I-5. Atlantic Avenue is located on the east side of the freeway and provides access to northbound I-5. Pacific Avenue is located on the west side of the freeway and serves traffic exiting from southbound I-5. These frontage roads are under the jurisdiction of WSDOT. They provide for two-way travel and local access between Scott Avenue and SR 503. The speed limit on both roadways is 35 mph and the intersections with SR 503 and the I-5 freeway ramps are signalized.

West of I-5, **Goerig Street** is a two-lane major arterial that connects the west side of Woodland with the I-5 freeway interchange (exit 21). Goerig Street has curb, gutter, and sidewalks on both sides of the street and a speed limit of 25 mph. Goerig Street connects Davidson Avenue and the Woodland downtown business district with SR 503. East of I-5, at the N Goerig Street intersection with SR 503, the retaining wall located on the east side of N Goerig Street limits sight distance as you approach this intersection from the south.

Davidson Avenue is an east/west major arterial in the Woodland downtown business district providing access to SR 503 via Goerig Street. Davidson Avenue is a two-lane roadway with a 25 mph speed limit and sidewalks and parking allowed on both sides of the street within the downtown business district. West of 5th Street the roadway becomes a minor arterial. Davidson Avenue was recently reconstructed between Goerig Street and 5th Street.

Old Pacific Highway is a north/south arterial from I-5 interchange at Dike Access Road (exit 22) to E Scott Avenue. South of Green Mountain Road, the roadway has two travel lanes and a 35 mph speed limit. North of Green Mountain Road, the speed limit on the Old Pacific Highway increases to 50 mph. The roadway serves access to planned commercial developments. An all-way stop is located at the intersection with E Scott Avenue.

Dike Access Road is an east-west route providing access to the northern interchange with I-5 (exit 22) and the northwest industrial areas of the city. Between the I-5 interchange and Old Pacific Highway, the roadway is classified as a major arterial. West of the I-5 interchange the roadway is a minor arterial. The road has two travel lanes and a posted speed limit of 35 mph.

The segment of **E Scott Avenue** between Old Pacific Highway and Lewis River Road (SR 503) is classified as a major arterial. The roadway has two lanes with a speed limit of 25 mph. An all-way stop is located at the intersection with Old Pacific Highway. Side street stop control is located at the intersection of E Scott Avenue and SR 503. At this intersection SR 503 creates an S-curve which limits sight distance as it approaches E Scott Avenue from the south.

2.3.1.3 Minor Arterials

Minor arterials provide an important function in linking sections of the city together and providing localized traffic circulation within urban subareas. Typically, minor arterials link collector (neighborhood) streets and major arterials. Minor arterial streets within the study area include the following.

Dike Access Road is an east-west route providing access to the northern interchange with I-5 (exit 22) and the northwest industrial areas of the city. West of the I-5 interchange the roadway is a minor arterial. The road has two travel lanes and a posted speed limit of 35 mph. West of the city, this road provides access to the Columbia River.

W Scott Avenue is an east/west roadway that provides access to Pacific Avenue on the west side of I-5. W Scott Avenue is a two-lane, 35 mph roadway serving industrial developments within Woodland and rural areas northwest of Woodland. Just east of N Pekin Road, W Scott Avenue crosses the Burlington Northern Santa Fe (BNSF) Railroad tracks. The crossing is controlled by gates and flashing railroad signals.

E Scott Avenue connects Old Pacific Highway and Atlantic Avenue on the east side of I-5. The Atlantic Avenue/E Scott Avenue intersection provides direct access to northbound I-5. It is a two-lane, 25-mph roadway. East of Old Pacific Highway the roadway is classified as a major arterial and connects with SR 503.

CC Street is a two-lane arterial connecting SR 503 and the City of Woodland to Clark County. CC Street intersects with SR 503 at a signalized intersection approximately 150 feet east of the Atlantic Avenue/I-5 northbound off-ramp. CC Street crosses the Lewis River into Clark County connecting with NW Hayes Road to the north and NW Pacific Highway to the south. NW Hayes Road provides access to low density residential uses and lumber trucks. NW Pacific Highway provides connections to a mobile home park and quarry activities.

Bozarth Avenue is a two-lane roadway north of and parallel to Davidson Avenue. It provides an alternate access to the Central Business District as well as the surrounding residential area. The intersections at Park Street and Goerig Street are controlled with all-way stop signs.

Davidson Avenue is an east/west roadway connecting N Pekin Road and the downtown business district. West of 5th Street, Davidson Avenue is classified as a minor arterial. The roadway has a railroad crossing near the west end of the city limits. The crossing includes gates and flashing signal lights. Just west of the railroad crossing, Davidson Avenue splits into Goerig Street and N Pekin Road.

N Pekin Road is a two-lane, north/south minor arterial serving the west side of the city. The roadway is posted with a 35 mph speed limit and provides access to/from industrial areas located west of the railroad tracks. N Pekin road connects Davidson Avenue with W Scot Avenue to the north. The roadway serves primarily industrial and agricultural trips.

Schurman Way is a relatively new roadway providing north/south access between W Scott Avenue and Dike Access Road west of the BNSF Railroad tracks. The roadway has three lanes (two through lanes and a center turning lane) and is posted for 35 mph speeds.

S Pekin Road, also known as 5th Street within the City, connects downtown Woodland and Davidson Avenue to the unincorporated areas of Cowlitz County south of Woodland. The roadway has two travel lanes with a speed limit of 35 mph.

Other minor arterials outside the existing city limits include Green Mountain Road, Whalen Road, and Caples Road. Each of the roadways provides access between the City of Woodland and the unincorporated areas of Cowlitz County.

2.3.1.4 Collectors

Collector streets direct traffic from neighborhoods to the arterial system. They can provide a higher level of direct access to adjoining properties than arterials. Collector streets generally have two travel lanes and 25 to 30-mph speed limits. Intersections with arterials are typically controlled by stop signs on the collector street approach, except at the intersection of Park Street with Buckeye Street where the intersection is controlled by an all-way stop.

2.3.1.5 Local Streets

All public streets that are not classified as state highways, major arterials, minor arterials or collectors are considered local streets. Local streets serve abutting residential and commercial land uses. These streets typically have two travel lanes and 25 mph speed limits.

2.3.2 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 implemented by a variety of means. These include median controls (e.g., raised concrete medians), 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 closely related to street functional classification. 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.

Frequent driveway and cross-street access can significantly degrade traffic operations along major streets as motorists must contend with people slowing to turn into adjacent property or attempting to get back onto the major street from a side access location. Not only do frequent driveways adversely affect the operational capacity of a road, they also affect safety in that each driveway or intersecting street represents a potential conflict point for through-moving vehicles. The strip development that often occurs as a result of the lack of access control can also be inhospitable to pedestrians and can be difficult to adequately serve by transit due to the spread out nature of destinations.

Access management can be most effectively implemented during the land development process when access locations and localized street improvements can be adapted to ensure that adjacent street traffic-carrying functions are not degraded. Access management controls are more difficult to implement along streets with developed property due to possible right-of-way limitations and/or the concerns of property owners about business or on-site circulation impacts. In these cases, access controls can be incorporated into a roadway improvement project.

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. These rules establish a set of five highway access classifications for non-limited access highways. They articulate function, operational and design characteristics for each

state highway, including preferred intersection and driveway spacing.[1] The administrative rules also establish a process and associated fees for permitting access onto state highways from private property. The five 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. 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.

SR 503 has been designated as a Class 4 Managed Access roadway which identify a designed posted speed limit of 35 to 40 mph and spacing of intersecting streets at a minimum of one-half mile. In addition, the private or public access connections under this classification would allow one access point per parcel with a minimum access spacing of 250 feet on the same side of the highway. It should be noted that within the I-5 limited access interchange area, WSDOT controls all access to/from SR 503. Away from the limited access interchange area, the City of Woodland manages access and should use either the state standards identified in Table 2-1 below or City standards, whichever is most restrictive. Along SR 503, major intersections are currently spaced at approximately 500 feet, and private driveways, serving mostly residential uses, are located as close as 100 feet to intersections or other connections.

Table 2-1. SR 503 Access Management Classifications

Class	Section Description	Speed Limit (mph)	Typical Planned Median Treatment	Planned Intersection Spacing	Minimum Private Connection Spacing
4	I-5 to McCracken Road (SRMP 54.38 to 52.23)	35 to 40	No median requirements	0.5 mile	250 feet, one per parcel

Source: Washington Administrative Code, 468-51.

2.3.3 Key Study Area Intersections

Traffic operations analysis for the Woodland Transportation Infrastructure Strategic Plan focuses on key intersections located throughout the city. These intersections were also evaluated for the Woodland Transportation System Plan adopted in 2005, but updated traffic data and updated intersection operations analysis has been conducted for this study. Key intersections include the following. Traffic control and intersection lane channelization are presented in Figure 2-1.

The existing roadway channelization and intersection configurations were obtained from previous traffic studies, work completed as part of the City of Woodland traffic model development and verified using recent aerial photography. All intersections are currently stop controlled with three exceptions as identified in the list below.

- Signalized Intersections
  - SR 503 (Lewis River Rd) @ I-5 SB On-Ramp
  - SR 503 (Lewis River Rd) @ I-5 NB Off-Ramp
  - SR 503 (Lewis River Road) @ CC Street
- Unsignalized Intersections
  - SR 503 (Lewis River Rd) @ E Scott Avenue
  - SR 503 (Lewis Rover Rd) @ Insel Road
  - SR 503 (Lewis Rover Rd) @ Gun Club Road

[1] WAC 468-52-040, Access Control Classification System and Standards.

- SR 503 (Lewis Rover Rd) @ Goerig Street
- Dike Access Road @ Robinson Way
- Dike Access Road @ Schurman Way
- Dike Access Road @ I-5 SB Ramps
- Dike Access Road @ I-5 NB Ramps
- Green Mountain Road @ Old Pacific Hwy
- Guild Road @ Schurman Way
- W Scott Avenue @ N Pekin Road
- W Scott Avenue @ Pacific Avenue
- E Scott Avenue @ Atlantic Avenue
- E Scott Avenue @ Old Pacific Highway
- Caples Road @ N Pekin Road
- Davidson Avenue @ 5th Street
- Buckeye Street @ Goerig Street

2.4 EXISTING TRAFFIC VOLUMES AND INTERSECTION OPERATIONS

This section describes the existing traffic volumes and intersection operations at the study intersections.

2.4.1 Existing Traffic Volumes

Weekday PM peak hour traffic volumes were collected and summarized for each study intersection. Intersection turning movement volumes were adjusted to reflect 2007 peak hour traffic volumes. Table 2-2 shows a comparison of historical and 2007 weekday PM peak hour turning movements at intersections in the vicinity of the study area.

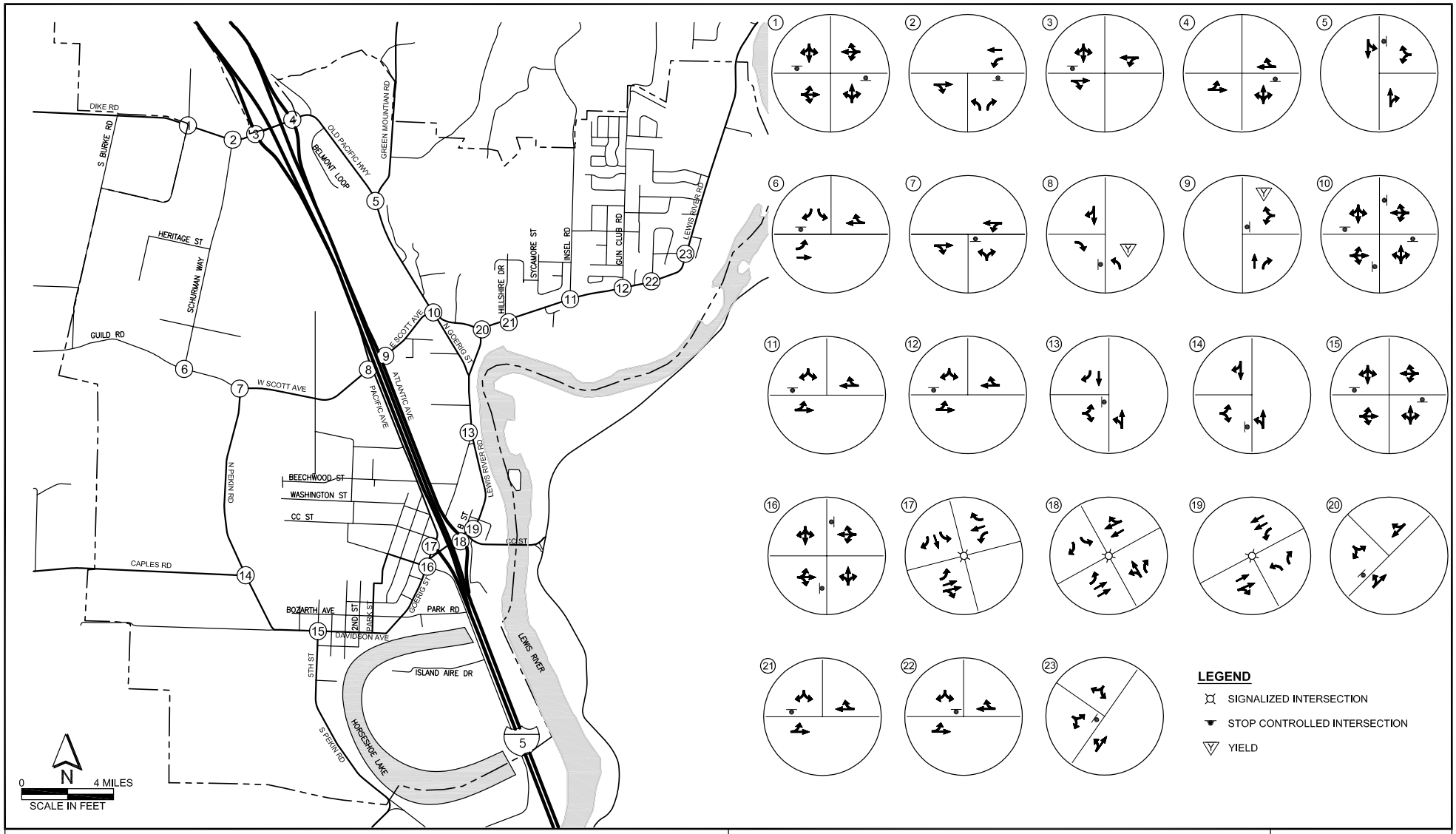
Intersection turning movement counts were obtained from data originally collected for the City of Woodland's Transportation System Plan, as well as from various development-related traffic studies conducted between 2003 and 2005. All traffic counts were conducted between 2003 and 2005. Additional counts were taken at select intersections in 2007. All counts were adjusted to be consistent with the 2007 conditions. Existing traffic count data sheets are included in Appendix A.

Table 2-2. Comparison of Historical and 2007 Intersection Traffic Volumes

Intersections	Count Year	Traffic Volume		Annual Growth
		Historical	2007	
W Scott Avenue @ Pacific Avenue	2004	405	478	6%
E Scott Avenue @ Atlantic Avenue	2004	309	366	6%
E Scott Avenue @ Old Pacific Highway	2004	387	406	2%
SR 503 (Lewis River Road) @ I-5 SB On Ramp	2004	2,018	2,115	2%
Weighted Average				**3%**

As shown in the table, the weighted average annual growth in the vicinity of the study area is about 3 percent per year. Based on the City's *2005 Transportation Plan*, traffic growth in the eastern and northwestern areas of Woodland has increased between 2 to 4 percent annually. This is consistent with the US Census which shows a population growth in the City of Woodland of 3 to 4 percent per year. Therefore, as a conservative estimate of growth at the study intersections, an annual growth of 4 percent per year was assumed to adjust older turning movements to 2007 conditions. Existing traffic volumes were rounded to the nearest five vehicles because weekday volumes fluctuate day-to-day. The 2007 PM peak hour traffic volumes are shown in Figure 2-2.

Figure 2-1. 2007 Intersection Characteristics



DATE: Oct 03, 2007 FILE: PO2398006F-01

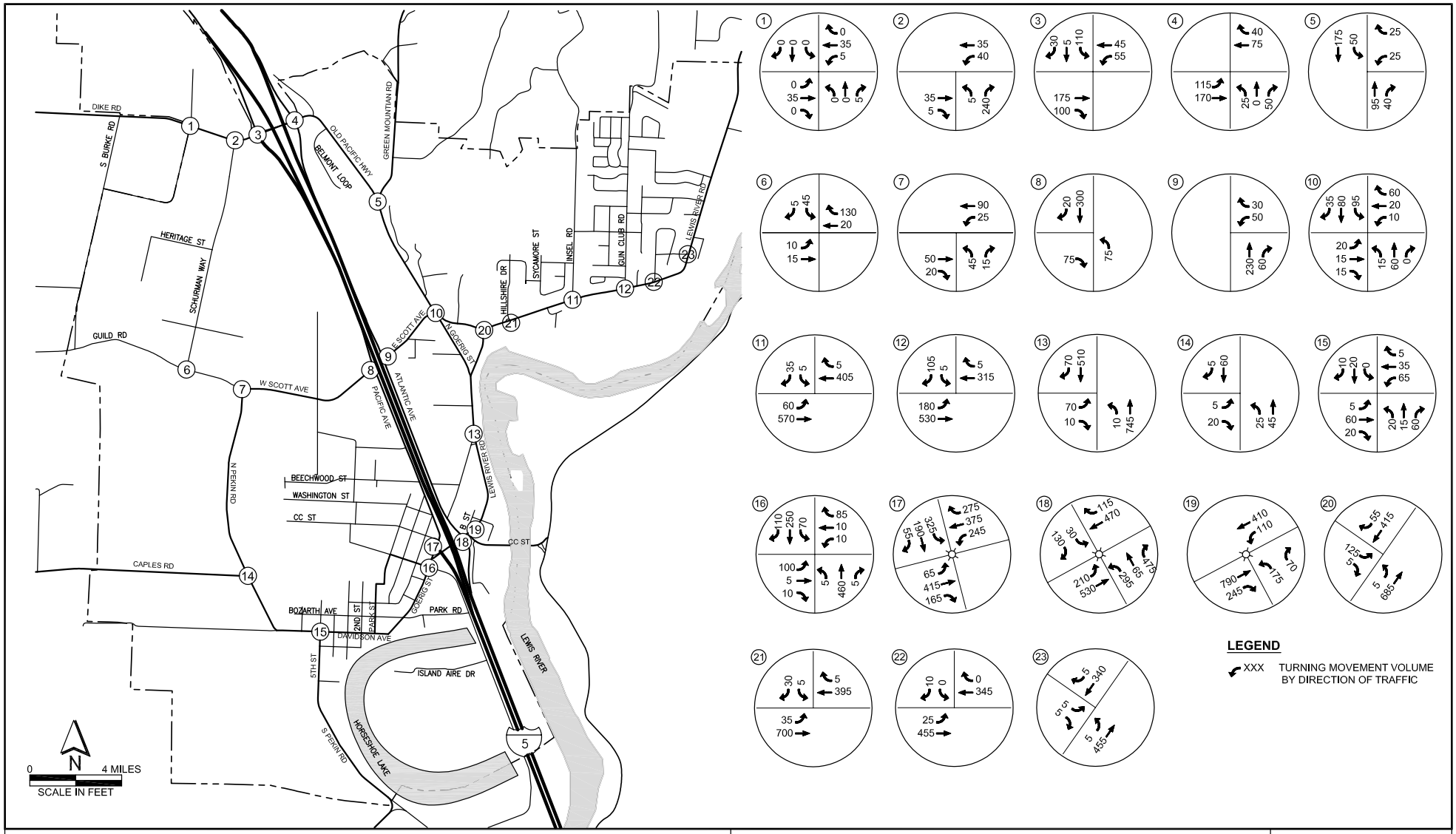
Figure 2-1
2007 Intersection Characteristics

Woodland Transportation Strategic Infrastructure Plan

Parametrix

The Transpo Group

Figure 2-2. 2007 Intersection PM Peak Hour Turning Movements



DATE: Oct 03, 2007 FILE: PO2398006F-02

Figure 2-2
2007 Intersection PM Peak Hour Turning Movements

Woodland Transportation Strategic Infrastructure Plan

Parametrix

The Transpo Group

2.4.2 Existing Truck Traffic

There are two main areas that generate significant truck traffic— the industrial sections of Woodland and the logging and quarry operations outside of the Woodland UGA. Another component of local truck traffic involves trucks exiting I-5 for services along Atlantic and Pacific Avenues. In addition, school transportation generates a considerable amount of bus traffic, especially in western parts of the study area. Primary truck and bus routes were identified in the 1995 Comprehensive Plan. Generally, circulation patterns are limited to state highways, major arterials, and minor arterials. Collector and local roads near industrial land uses also see truck activity. Trucks compose a significant percentage of the city's PM peak hour traffic. In the northwestern areas of Woodland trucks make up 10 to 25 percent of the total traffic. In the southwestern areas of the city, trucks make up 5 to 10 percent of the total traffic. Along SR 503 between I-5 and the city limits, trucks are 5 percent or less of the total PM peak hour traffic volumes based on recent intersection counts. Field observation of traffic movement along this corridor indicates that a significant portion of the truck traffic is comprised of recreational vehicles headed for lakes and Mount St. Helens east of Woodland.

2.4.3 Existing Intersection Operations

The traffic operations analysis provides a quantitative method for evaluating and comparing existing and future transportation alternatives. Traffic operations were evaluated based upon the LOS (level of service) methodologies of the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000). The HCM is a nationally recognized and locally accepted method of measuring traffic flow and congestion. Criteria range from LOS A, indicating free-flow conditions with minimal vehicle delays, to LOS F, indicating extreme congestion with significant vehicle delays.

2.4.3.1 Intersection Level of Service (LOS) Criteria

Signalized intersection LOS is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria are stated in terms of average delay per vehicle during a specified time period (for example, the PM peak hour). Vehicle delay is a complex measure based on many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Table 2-3 shows LOS criteria for signalized intersections, as described in HCM.

Table 2-3. Level of Service Criteria for Signalized Intersections

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

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

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2-4 shows LOS criteria for unsignalized intersections (both all-way and two-way, stop-controlled).

Table 2-4. Level of Service Criteria for Unsignalized Intersections

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

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

2.4.3.2 Intersection Level of Service Standards

The Level of Service (LOS) standard is measured using methodologies identified in HCM. The level of service standard is LOS D or better on state highways, major arterials, and minor arterials. Acceptable levels of traffic on collectors and local streets are established through street design standards.

Pursuant to the requirements of Washington's Growth Management Act (GMA) requirements, CWCOG and the Southwest Regional Transportation Council (SWRTC) established levels of service standards for state highways within Cowlitz and Clark Counties. CWCOG/SWRTC have established LOC C for Highways of Statewide Significance (HSS) in rural areas. For non-HSS facilities, CWCOG/SWRTC established LOS D for urban areas and LOS C for rural areas. Therefore, the city's LOS D standard would be consistent for SR 503 within the Urban Growth Area (UGA), with a LOS C standard outside the UGA. As the study area for the Woodland Transportation Strategic Infrastructure Plan is located within the City and the UGA; the LOS D standard applies.

2.4.3.3 Existing Traffic Operations Analysis Results

Intersection LOS analysis was performed for the study intersections based on 2007 weekday PM peak hour conditions. Table 2-5 summarizes the LOS results, delay, v/c ratio, and worst movements at the study intersections for 2007. Detailed level of service worksheets are presented in Appendix B.

As noted in the table all of the intersections currently meet the City's LOS D standard during the weekday PM peak hour with the exception of the intersections of SR 503 and Goerig Street at E Scott Avenue, and Buckeye Street at Goreig Street. The intersection of SR 503 and Goerig Street currently operates at LOS during the weekday PM peak hour, while the intersection of SR 503 with E Scott Avenue operations at LOS F during the same time period. Improvements are planned at both of these intersections as part of WSDOT's SR 503 widening and channelization project (see Section 2.7 on Planned and Pending

Improvements). The intersection of Buckeye Street with Goerig Street was identified as a problem location for improvement in the City's recently adopted Transportation System Plan.

Table 2-5. 2007 PM Peak Hour Intersection Traffic Operations

No.	Signalized Intersections		Control Delay (secs./vehicle)	V/C Ratio	LOS
17	SR 503 (Lewis River Rd) @ I-5 SB On-Ramp		17.3	0.62	B
18	SR 503 (Lewis River Rd) @ I-5 NB Off-Ramp		51.3	0.71	D
19	SR 503 (Lewis River Road) @ CC Street		20.3	0.56	C
No.	**Unsignalized Intersections**	**Critical Mvmt.**	**Control Delay (secs./vehicle)**	**V/C Ratio**	**LOS**
13	SR 503 (Lewis River Rd) @ Goerig Street	EB	**48.9**	**0.52**	**E**
20	SR 503 (Lewis River Rd) @ E Scott Avenue	EB	**55.2**	**0.69**	**F**
21	SR 503 (Lewis River Rd) @ Hillshire Drive	SB	13.7	0.09	B
11	SR 503 (Lewis River Rd) @ Insel Road	SB	13.5	0.09	B
12	SR 503 (Lewis River Rd) @ Gun Club Road	SB	12.2	0.19	B
22	SR 503 (Lewis River Rd) @ Fir Avenue	SB	10.3	0.02	B
23	SR 503 (Lewis River Rd) @ Evergreen Lane	EB	13.2	0.02	B
1	Dike Access Road @ Robinson Way	NB	8.8	0.01	A
2	Dike Access Road @ Schurman Way	NB	9.9	0.28	A
3	Dike Access Road @ I-5 SB Ramps	SB	14.7	0.32	B
4	Dike Access Road @ I-5 NB Ramps	NBR	11.8	0.14	B
5	Green Mountain Road @ Old Pacific Hwy	WB	11.1	0.09	B
6	Guild Road @ Schurman Way	SBL	9.9	0.07	A
7	W Scott Avenue @ N Pekin Road	NB	10.1	0.09	B
8	W Scott Avenue @ Pacific Avenue	EB	11.1	0.12	B
9	E Scott Avenue @ Atlantic Avenue	WBL	10.3	0.07	B
10	E Scott Avenue @ Old Pacific Highway	SB	9.4	0.30	A
14	Caples Road @ N Pekin Road	EB	9.0	0.03	A
15	Davidson Avenue @ 5th Street	NB	10.3	0.13	B
16	Buckeye Street @ Goerig Street	EB	**>80**	**0.98**	**F**

Note 1: bold indicates that the intersection currently exceeds the applicable traffic operational standard.
Note 2: EB means eastbound, WB means westbound, NB means northbound and SB means southbound.

2.5 ACCIDENT HISTORY

Historical accident data was provided by WSDOT for the study area including the I-5 interchanges at SR 503 and Dike Road, and along SR 503 from the interchange to McCracken Road. This data covered the five-year period from 2002 to 2006 (the most recent data available). No fatal accidents were reported, and, in general, 60 percent of the accidents along the SR 503 corridor from the I-5 ramps to Salmon Street were rear-end collisions. A majority of the accidents, 90 percent, occurred during the daylight hours with about 50 percent during the PM peak period. Summaries of reported accidents for roadways within the study area are provided in Tables 2-6 and 2-7.

Table 2-6 summarizes the accident history at intersections along SR 503. The majority of accidents at the intersections are rear-end collisions, according to WSDOT records. These collisions are likely caused by congestion including frequent stop-and-go traffic during the peak hours or related to vehicles stopped along the roadway waiting to complete a left-turn.

Rear-end collisions are also the predominate type of accident at the intersection with the highest accident rate which is SR 503 (Lewis River Road) at Insel Road. Typically, intersections with collision rates greater than 1.0 collision per million entering vehicles (MEV), or an average of more than ten accidents per year at signalized locations and more than five accidents per year at unsignalized locations are earmarked for continued evaluation and potential safety improvements. While Insel Road is outside this threshold, it is very close with 4 accidents per year and 0.94 accidents per million entering vehicles (MEV) which does suggest that there is a possible safety concern.

Table 2-6. Accident History for Major Intersections (2002 – 2006)

Intersection	Average Accidents per Year	Daily Total Entering Vehicles	Accidents per MEV [1]	Accident Majority Type
SR 503 (Lewis River Rd) @ I-5 SB On-Ramp	2.8	20,060	0.42	Rear-end
SR 503 (Lewis River Rd) @ I-5 NB Off-Ramp	3.0	25,780	0.35	Rear-end
SR 503 (Lewis River Road) @ CC Street	0.4	23,440	0.05	Rear-end
SR 503 (Lewis River Rd) @ Goerig St	0.7	13,000	0.14	Rear-end
SR 503 (Lewis River Rd) @ E Scott Ave	0.7	13,000	0.14	Entering at angle
SR 503 (Lewis River Road) @ Hillshire Drive	2.0	12,620	0.43	Rear-end
SR 503 (Lewis River Rd) @ River Rock Road	0.3	12,060	0.08	Rear-end
SR 503 (Lewis River Rd) @ Insel Road	4.0	11,720	0.94	Rear-end
SR 503 (Lewis River Rd) @ Gun Club Rd	2.7	11,000	0.66	Rear-end
SR 503 (Lewis River Rd) @ Fir Avenue	0.3	10,820	0.08	Rear-end
SR 503 (Lewis River Road) @ Salmon Street	0.3	10,060	0.09	Fixed Object

1. 2006 Traffic Volumes.
2. Accidents per million entering vehicles.

2.5.1 Highway Safety Analysis

WSDOT applies a formula that takes into account the number and severity of accidents to define High Accident Corridors (HACs). Based on the City's *2005 Transportation Plan* SR 503 from N. Goerig Street to north City limits is identified as a HAC, as well as along I-5 from SR 503 to Dike Road.

In addition to the HAC designation, a more detailed review of accidents along SR 503 was conducted. The results of the highway segment analysis are summarized in Table 2-7. The highway segments listed in Table 2-7 vary in length and traffic volume. To provide meaningful comparison, accidents along highway segments are typically analyzed in terms of accidents per million vehicle miles traveled (acc/mvmt). No universally accepted guideline exists for identifying hazards based on accident rates for highway segments alone; however, WSDOT publishes average accident rates by roadway classification. Table 2-7 lists the average accident rates for rural minor arterials, which is the classification of SR 503.

Table 2-7. Accident History for SR 503 Highway Segments (2002 – 2006)

Segment	Average Accidents per Year	Average Daily Vehicles	Accidents per MVMT [1]	WSDOT Average Accident Rate[2]	Accident Type (Majority)
I-5 Ramps to N Goerig Street	7.2	16,000	1.23	1.62	Read-end
N Goerig Street to Gun Club Road	9.0	11,000	2.60	1.62	Read-end
Gun Club Road to Salmon Street	3.7	13,000	1.59	1.62	Rear-end

1. Accidents per million vehicle miles.
2. Source: 2005 Annual State Highway Collision Data Summary (latest available); Rate for rural minor arterials.

The historical accident data obtained from the WSDOT indicates that the N Goerig Street to Gun Club Road segment is above the average accident rate for state highways classified as rural, minor arterials similar to SR 503. In both segments, congestion related rear-end accidents are the predominate type. It should also be noted that the Gun Club Road to Salmon Street segment has a high rate of collisions with fixed objects focused particularly near the curve between the Fir Avenue and Evergreen Lane intersections. This suggests that motorists may struggle to safely negotiate this curve in the corridor.

2.5.2 Pedestrian and Bicycle Collisions

According to WSDOT records, only one accident along SR 503 from N Goerig Street to Salmon Street between 2004 to 2006 involved a bicyclist, with none involving a pedestrian. The accident occurred near the SR 503 (Lewis River Road)/Gun Club Road intersection at mile post 53.04. No other pedestrian or bicycle related accidents were reported between 2004 and 2006. WSDOT does not currently identify any Pedestrian Accident Locations (PALs) within the Woodland study area.

2.6 OTHER TRANSPORTATION MODES

The predominate mode of travel throughout the SR 503 corridor and the City of Woodland is currently automobile. This section discusses other modes including transit, pedestrian and bicycle facilities, airport facilities, rail, and port within the corridor and the City.

2.6.1 Transit Service

The City of Woodland and surrounding area are served by a limited amount of existing bus service. The Lower Columbia Community Action Council (CAP) provides a daily transportation service along I-5 from Longview to Salmon Creek including stops in Kalama, Woodland, La Center, and Ridgefield. The CAP commuter transit route is designed to connect these smaller communities, such as Woodland, with the larger transportation system in the Longview/Kelso or Vancouver urban areas. Currently, the service makes three complete loops from 5:45 a.m. to 6:45 p.m. on Monday through Friday. Woodland residents can access the route at the Visitor Center/Park-and-Ride facility near the I-5/SR 503 interchange. According to CAP, average transit pick-up/drop-off activity at the Park-and-Ride during the final quarter of 2004 was approximately 6 to 7 person-trips per day.

2.6.2 Pedestrian and Bicycle Facilities

The majority of formal pedestrian and bicycle facilities are located outside the study area along the SR 503/Goerig Street/Davidson Avenue corridor, especially west of I-5. Land

development projects along Insel Road and Gun Club Roads have constructed sidewalks for internal pedestrian travel. Outside of these areas, pedestrians and bicyclists generally use the roadway shoulders, which are limited in width in many locations. When developing new subdivisions, the city requires dedication of right-of-way and construction of sidewalks. This results in a piecemeal pattern of sidewalks in the redeveloped areas.

2.6.3 Airport Facilities

The Woodland airport, though primarily used for recreation, is a notable part of the City's overall transportation system. It is owned and operated by the Washington State Aeronautics Commission, a division of the WSDOT. The single airport runway, 1,965 feet long and approximately 25 feet wide, is only suitable for small aircraft.

The airport serves an assortment of uses: recreational flying, search and rescue, and medical emergency. When Mount St. Helens erupted, personnel and supplies were transported via the Woodland airport. Thus, it is important to maintain the airport services for the overall benefit it provides Woodland area residents.

2.6.4 Rail Facilities

Burlington Northern Sante-Fe Railroad (BNSF) owns and operates a major west coast railroad system through the City. The BNSF west coast system extends from California to Vancouver, British Columbia. On the west side of Woodland, the rail system consists of a double-track mainline which runs on a north/south alignment through the study area. In addition to BNSF, Union Pacific (UP) also uses the system for freight hauling along the west coast while Amtrak uses the BNSF mainline for its passenger train operations. Currently, Amtrak does not offer passenger service stops in Woodland.

There are three at-grade rail crossings in Woodland running from north south: W Scott Avenue, Davidson Avenue, and Whalen Road. Each of these crossings is protected by railroad crossing signals and mechanical gates. Each crossing has pylons to discourage drivers from driving around closed gates. Additionally, there are four spur tracks serving businesses in Woodland.

Based on train counts obtained from WSDOT for 2006,[2] approximately 49 trains per day pass through Woodland in both directions. Ten of these daily trains carry passengers and the remainder carry freight. Train speeds through Woodland are 60 MPH for freight and 79 MPH for passenger trains. Given an average length of 700 feet for passenger trains, approximately 6 seconds would be required to clear one of the at-grade crossing in addition to the time required for gates to go down and come up. An average 7,000 foot freight train would pas through a crossing in 1 minute and 20 seconds.

Also based on information received from WSDOT, it is anticipated that a combination of public and private partners (e.g., state and federal governments and the railroad) may construct a siding track through Woodland to remove freight trains from the mainline while serving local customers. Currently the spur tracks tie directly into the mainline that causes delays while the trains slow to move into and out of the spurs. This project is known as the Woodland Siding and is estimated to cost about $15 million. The project does not have a specific funding source identified at this time.

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[2] Frederickson, Kirk, Washington State Department of Transportation, Rail Project Manager, e-mail, October 2, 2007.

2.6.5 Port Facilities

The Columbia River, located directly west and of the City of Woodland, is a major marine transportation route. Extensive cargoes are shipped through the Columbia/ Snake River system annually. Major ports along the system transfer cargoes to rail and truck routes throughout the United States. Cowlitz County has designated portions of the river shoreline for industrial use. The Port of Woodland has retained some of this land and intends to develop a transfer facility to handle marine freight activity.

2.7 PLANNED/PENDING IMPROVEMENTS

Based on the City of Woodland's *2005 Transportation Plan*, a variety of transportation system improvements are planned for the study area. These improvements are intended to address many of the existing and potential future traffic operational problems or key safety concerns that were identified in the Plan. A summary of key project recommendations that were presented in Table 8 of the Transportation Plan are summarized in Table 2-8.

Table 2-8. Transportation Improvement Projects

TSP ID Number	Project Name	Project Limits	Project Description
S-3A	SR 503 Widening and Channelization	Urban growth boundary to Evergreen Lane	Widen roadway to provide left-turn lanes at collector and local access roads. Consolidate and define access to SR 503
S-3B	SR 503 Widening and Channelization	Evergreen Lane to Fir Avenue	Widen roadway to provide left-turn lanes at collector and local access roads. Consolidate and define access to SR 503. Implement signing, illumination, and guardrail improvements to reduce safety hazards.
S-3C	SR 503 Widening and Channelization	Fir Avenue to E Scott Avenue	Widen roadway to provide left turn lanes or two-way left turn lane. Consolidate and define access to SR 503. Install traffic signals at Hillshire Drive, Insel Road, and Gun Club Road as warranted
S-3D	SR 503 Widening and Channelization	E Scott Avenue to Goerig Street	Widen roadway to provide left-turn lane at Scott Avenue and collector streets. Install traffic control at E Scott Avenue, as warranted. Consolidate and define access to SR 503
S-3E	SR 503 Widening and Channelization	Goerig Street to Atlantic Avenue	Widen roadway to complete 4/5 lane highway. Consolidate and define access to SR 503
R-2	N Pekin Road	Davidson Avenue to W Scott Avenue	Reconstruct and widen to provide left-turn lanes to serve future development. Improve and pave road shoulders for non-motorized uses.
R-3	Old Pacific Highway	E Scott Avenue to Dike Access Road	Reconstruct and widen to 2/3 lanes to provide left-turn lanes or center two-way left turn lane. Project should include construction of a sidewalk and paved shoulder on the west side of the roadway. 5 ft bike lanes also to be provided on both sides of roadway.

Table 2-8. Transportation Improvement Projects Continued

TSP ID Number	Project Name	Project Limits	Project Description
R-5	E Scott Avenue	SR 503 to Old Pacific Highway	Reconstruct roadway and widen to provide tow travel lanes with paved shoulder for non-motorized uses, implement signing on surrounding roadways to direct traffic via E Scott Avenue to northern I-5 interchange ramps.
R-6	Davidson Avenue	6th Street to RR tracks	Reconstruct, widen, and pave arterial to provide two travel lanes with paved shoulders for bicycle use and sidewalks on the north side of the street.
R-9	5th Street/S. Pekin Road	Bozarth Avenue to Davidson Avenue	Upgrade existing roadway to current design standards with curb, gutter, and sidewalk.
I-1	Davidson Avenue/ RR Crossing Intersection	Intersection	Reconstruct intersection to reduce grade and sight restrictions
I-2	W Scott Avenue/ RR Crossing Intersection	Intersection	Reconstruct intersection to reduce grade and sight restrictions.
I-4	Old Pacific Highway at E Scott Avenue	Intersection	Construct turn lanes and traffic signal or roundabout when warranted.
I-5	N Goerig Street at SR 503	Intersection	Close, or partially close, intersection at SR 503/N Goerig Street to improve safety and operations. Initially restrict north to northwest left turns after completion of E Scott Avenue improvements.
I-6	Buckeye Street at Goerig Street	Intersection	Install traffic signal when warranted.
NC-7	Schurman Way Extension	W Scott Avenue to Davidson Avenue (via Goerig Street)	Construct a new roadway to provide access to areas west of N Pekin Road and upgrade connection to downtown Woodland via Goerig Rd.

Source: 2005 Transportation Plan, City of Woodland

Several of the projects identified in Table 2-8 are further discussed below.

2.7.1 State Highway Improvements

SR 503 Widening and Channelization (projects S-3A to S-3E) – This series of projects will enhance safety and operations along SR 503 within the city. The existing corridor lacks adequate turn lanes and traffic controls to support continued residential growth in east Woodland. The information developed as part of our work in the corridor will be used to define a specific cross-section for the highway. However, likely improvements include left-turn lanes at intersections of SR 503 with collector roads including Hillshire Drive, Insel Road, and Gun Club Road. Traffic signals would also be considered at these intersections, when warranted per the *Manual on Uniform Traffic Control Devices* (MUTCD). Left-turn lanes also may be required at other local or collector streets between Fir Avenue and the city's north UGA limits. Addition of turn lanes and a traffic signal (or other traffic control, when warranted) also has been identified for the intersection of SR 503 at E Scott Avenue. Construction of a north-to-west left turn lane would facilitate potential restriction of some turns at SR 503 at N Goerig Street, just south of this intersection. Spot safety and drainage

improvements also will be implemented. These may include guardrails, improved shoulders, signing, and/or illumination.

2.7.2 City of Woodland Improvements

2.7.2.1 Roadway Widening and Reconstruction

E Scott Avenue (project R-5) – The City plans to reconstruct this roadway between SR 503 and Old Pacific Highway. This roadway would be widened to include two travel lanes with paved shoulders for non-motorized uses. Signage would be provided to direct traffic via E Scott Avenue to northern I-5 interchange.

2.7.2.2 Intersections Improvements

As discussed previously, the SR 503 project will include improvements to intersections within the project limits. This would include the intersections of **SR 503 at E Scott Avenue** (project S-3D) and **SR 503 at N Goerig Street**. Improvements to the intersection of SR 503 with E Scott Avenue would enhance safety and operations. When the improved connection between SR 503 and Old Pacific Highway is completed via E Scott Avenue, then the intersection of N Goerig Street at SR 503 (project I-5) can be closed (or partially closed) to reduce safety and operational issues.

2.7.3 Pedestrian and Bicycle Facilities

As part of the roadway improvements, pedestrian and bicycle facility enhancements are included. Sidewalks and bicycle lanes will be constructed as part of the SR 503 improvements, as well as other major roadway improvement projects throughout the city.

2.8 POLICY GUIDANCE FOR FUTURE ROADWAY IMPROVEMENTS

This section discusses the City of Woodland, Cowlitz County, and WSDOT policies and goals which pertain to future roadway improvements.

2.8.1 City Goals and Policies

The goals and policies that guide the City implementation of transportation improvements are outlined in the City's *2005 Transportation Plan*. The City's overall goal is to provide a convenient, safe, and efficient multi-modal transportation system that promotes the mobility of people and goods within and through the city. In support of this, the City has defined specific goals for modes including developing and improving the city's arterial and collector system to link residential, commercial, and industrial areas of the city with each other and with the regional highway system.

In addition to goals, the following policies help guide implementation of roadway improvements:

- *A LOS D or better is established for arterial state highways (SR 503), major arterials, and minor arterials. The levels of service shall be calculated according to the most recent Highway Capacity Manual or approved alternative method.*
- *Conduct periodic reviews and updates of the city's street design standards and development requirements to support cost effective implementation of arterial collector, and local streets and facilities for pedestrian and bicycle travel. The standard should require new developments, to provide a grid of collector and local roads to serve residential and commercial areas of the city to minimize the impact on*

adjacent arterials. New developments should provide fully improved streets to provide access and circulation to support their increased traffic.

- *Access to properties along state highways, and major and minor arterials should be consolidated whenever possible to maximize the capacity of the facilities and reduce potential safety conflicts. New accesses to state highways and major and minor arterial should be restricted, whenever practical. The city should work with WSDOT to adopt and implement standards for access permitting on state highways within the city boundaries as per Revised Code of Washington (RCW) 47.50.030.*
- *The city should work with WSDOT to provide signing and improvements to the arterial system to encourage use of Dike Road interchange for travel between I-5 and SR 503.*
- *Local and collector street system improvement projects should include, where possible, provisions of curbs, storm drainage, sidewalks, street lights, and landscaped planting/utility strips, as well as adequate roadway widths and surfaces.*
- *Sidewalks and bicycle lanes should be included, where feasible, as part of identified improvements to SR 503 and other arterials within the UGA.*
- *Develop and sign a system of bicycle routes providing for travel within the city with connections to regional and major local destinations.*

2.8.2 County Goals and Policies

Cowlitz County is about to undertake an update to their existing Comprehensive Plan. Goals and policies of this update should be coordinated with the City of Woodland and the on-going work effort to develop the Woodland Transportation Strategic Infrastructure Plan.

2.8.3 State Goals and Policies

WSDOT's *Highway Design Manual* is a comprehensive guide to transportation design projects. Along with this document, WSDOT has developed the *Draft 2007-2026 Highway System Plan* (HSP) which identifies needs, prioritizes strategies for addressing needs, and determines performance measures based on five categories: preservation, safety, economic vitality, mobility, and environment quality and health. There are three tiers of investment with tier one being the low cost investments giving the high return and short delivery time. Investments along SR 503 are included in tier two which have moderate to high cost that deliver potential network benefits to both highways and local roads.